Manual No.'19 • PAC-T-327

MITSUBISHI HEAVY INDUSTRIES

TECHNICAL MANUAL

INVERTER PACKAGED AIR-CONDITIONERS

(Split system, air to air heat pump type)

HYPER INVERTER

CEILING CASSETTE - 4WAY TYPE

Single type	Twin type
FDT40ZSXVH	FDT71VNXPVH
50ZSXVH	100VNXPVH
60ZSXVH	100VSXPVH
	125VNXPVH
	125VSXPVH
	Triple Type
	FDT140VNXTVH
	140VSXTVH

V Multi system

(OUTDOOR UNIT)	(INDOOR UNIT)
FDC71VNX	FDT40VH
100VNX	50VH
100VSX	60VH
125VNX	
125VSX	
140VNX	
140VSX	

MICRO INVERTER

CEILING CASSETTE - 4WAY TYPE

Twin type	Triple type
FDT100VNAPVH	FDT140VNATVH
100VSAPVH	140VSATVH
125VNAPVH	
125VSAPVH	
	Double twin type
	FDT200VSADVH
	250VSADVH

V Multi system

(OUTDOOR UNIT)	(INDOOR UNIT)
FDC100VNA	FDT50VH
100VSA	60VH
125VNA	
125VSA	
140VNA	
140VSA	
200VSA	
250VSA	

MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.

TABLE OF CONTENTS

1. HYPER INVERTER PACKAGED AIR-CONDITIONERS 2
2. MICRO INVERTER PACKAGED AIR-CONDITIONERS 268
3. V MULTI SYSTEM 360
4. OPTION PARTS 394

1. HYPER INVERTER PACKAGED AIR-CONDITIONERS

CONTENTS

1.1 SPECIFICATIONS 5
1.2 EXTERIOR DIMENSIONS 15
(1) Indoor units 15
(2) Outdoor units 16
(3) Remote control (Option parts) 19
1.3 ELECTRICA L WIRING 22
(1) Indoor units 22
(2) Outdoor units 23
1.4 NOISE LEVEL 27
1.5 TEMPER ATURE AND VELOCITY DISTRIBUTION 30
1.6 PIPING SYSTEM 32
1.7 RANGE OF USAGE & LIMI TATIONS 34
1.8 SELECTION CHART 38
1.8.1 Capacity tables 38
1.8.2 Correction of cooling and heating capacity in relation to air flow rate control (Fan speed) 46
1.8.3 Correction of cooling and heating capacity in relation to one way length of refrigerant piping .. 46
1.8.4 Height difference between the indoor unit and outdoor unit 46
1.9 APPLICATION DATA 48
1.9.1 Installation of indoor unit 48
1.9.2 Electric wiring work installation 54
1.9.3 Installation of wired remote control (Option) 58
1.9.4 Installation of outdoor unit 70
(1) Models SRC40 − 60ZSX-S 70
(2) Model FDC71VNX 74
(3) Models FDC100 − 140VNX, 100 − 140VSX 82
1.9.5 Instructions for branching pipe set (DIS-WA1,WB1,TA1,TB1) 90
1.10 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER 93
1.10.1 Remote control (Option parts) 93
1.10.2 Operation control function by the wired remote control 96
1.10.3 Operation control function by the indoor control 99
(1) Auto operation 99
(2) Operations of functional items during cooling/heating 100
(3) Dehumidifying (DRY) operation 100
(4) Timer operation 101
(5) Hot start (Cold draft prevention at heating) 102
(6) Hot keep 102
(7) Auto swing control 103
(8) Thermostat operation 104
(9) Filter sign 105

(10) Compressor inching prevention control 105
(11) Drain pump control 106
(12) Drain pump motor (DM) control 106
(13) Operation check/drain pump test run operation mode 106
(14) Cooling, dehumidifying frost protection 107
(15) Heating overload protection 107
(16) Anomalous fan motor 107
(17) Plural unit control - Control of 16 units group by one remote control 108
(18) High ceiling control 108
(19) Abnormal temperature sensor (return air/indoor heat exchanger) broken wire/short-circuit detection ...109
(20) External input/output control (CnT or CnTA) 109
(21) Operation permission/prohibition 111
(22) Temporary stop input 113
(23) Selection of cooling/heating external input function 113
(24) Fan control at heating startup 114
(25) Room temperature detection temperature compensation during heating 114
(26) Return air temperature compensation 114
(27) High power operation (RC−EX3A only) 114
(28) Energy-saving operation (RC−EX3A only) 114
(29) Warm-up control (RC−EX3A only) 114
(30) Home leave mode (RC−EX3A only) 114
(31) Auto temperature setting (RC−EX3A only) 114
(32) Fan circulator operation (RC−EX3A only) 115
(33) The operation judgment is executed every 5 minutes (RC−EX3A only) ..115
(34) Auto fan speed control (RC−EX3A only) 115
(35) Indoor unit overload alarm (RC−EX3A only) 115
(36) Peak-cut timer (RC−EX3A only) 115
(37) Motion sensor control (RC−EX3A only) 116
1.10.4 Operation control function by the outdoor control 117
(Ⅰ) Models SRC40−60 117
(1) Defrost operation 117
(2) Cooling overload protective control 117
(3) Cooling high pressure control 118
(4) Cooling low outdoor air temperature protective control 118
(5) Heating high pressure control 119
(6) Heating overload protective control 119
(7) Heating low outdoor air temperature protective control 120
(8) Compressor overheat protection 120
(9) Current safe 121
(10) Current cut 121
(11) Outdoor unit failure 121
(12) Serial signal transmission error protection 121
(13) Rotor lock 121

(14) Outdoor fan motor protection 121
(15) Outdoor fan control at low outdoor temperature 121
(16) Refrigeration cycle system protection 122
(Ⅱ) **Models FDC71−140 .....123**
(1) Determination of comressor speed (Frequency) 123
(2) Compressor start control 123
(3) Compressor soft start control 124
(4) Outdoor fan control 125
(5) Defrost operation 127
(6) Protective control/anomalous stop control by compressor's number of revolutions 128
(7) Silent mode 132
(8) Test run 132
(9) Pump-down control 132
(10) Base heater ON/OFF output control (Option) 133
1.11 MAINTENANCE DATA 134
1.11.1 Diagnosing of microcomputer circuit 134
(1) Selfdiagnosis function 134
(2) Troubleshooting procedure 139
(3) Troubleshooting at the indoor unit 139
(4) Troubleshooting at the outdoor unit 142
(5) Check of anomalous operation data with the remote control 164
(6) Power transistor module (including the driver PCB) inspection procedure 167
(7) Inverter checker for diagnosis of inverter output 169
(8) Outdoor unit control failure diagnosis circuit diagram 170
1.11.2 Troubleshooting flow 178
(1) List of troubles 178
(2) Troubleshooting 180
1.12 TECHNICAL INFORMATION 253

■ How to read the model name

Example: FDT 40 Z SXVH

- SXVH — Series code
- Z — Inverter type
- 40 — Product capacity
- FDT — Model name
  - FDT : Ceiling cassette-4 way type
  - SRC : Outdoor unit

Example: FDT 100 VNX P VH

- VH — Series code
- P — ◌ (blank) : Single type; P : Twin type; T : Triple type; D : Double twin type
- VNX — Applicable power source...See the specification
- 100 — Product capacity
- FDT — Model name
  - FDT : Ceiling cassette-4 way type
  - FDC : Outdoor unit

1.1 SPECIFICATIONS

(1) Single type

Item			Model	FDT40ZSXVH	
				Indoor unit **FDT40VH**	Outdoor unit **SRC40ZSX-S**
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	4.0 [1.1(Min.) - 4.7(Max.)]	
	Nominal heating capacity (range)		kW	4.5 [0.6(Min.) - 5.4(Max.)]	
	Power consumption	Cooling	kW	0.93	
		Heating		1.03	
	Max power consumption			2.60	
	Running current	Cooling	A	4.3 / 4.5	
		Heating		4.8 / 5.0	
	Inrush current, max current			5, 12	
	Power factor	Cooling	%	94	
		Heating		93 / 94	
	EER	Cooling		4.30	
	COP	Heating		4.37	
	Sound power level	Cooling	dB(A)	50	63
		Heating			
	Sound pressure level	Cooling		P-Hi: 36 Hi: 33 Me: 30 Lo: 26	50
		Heating		P-Hi: 36 Hi: 33 Me: 28 Lo: 20	49
	Silent mode sound pressure level			—	Cooling : 42 / Heating : 43
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	640 x 800(+71) x 290
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9 / 0.2) near equivalent	Stucco white Munsell : (4.2Y7.5 / 1.1), RAL : 7044
Net weight			kg	Unit 19 Panel 5	45
Compressor type & Q'ty				—	RMT5113MCE2 (Twin rotary type) x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.45 (MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 1.5kg in outdoor unit (Incl. the amount for the piping of : 15m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Capillary tubes + Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 1
Fan motor (Starting method)			W	50 < Direct line start >	34 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 19 Hi: 16 Me: 13 Lo: 10	36
		Heating			33
Available external static pressure			Pa	0	0
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1 (Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for compressor)
Electric heater			W	0	—
Operation control	Remote control			(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") Pipe ϕ 6.35 (1/4") x 0.8 O/U ϕ 6.35 (1/4")	
				Gas line : ϕ 12.7 (1/2") ϕ 12.7(1/2") x 0.8 ϕ 12.7 (1/2")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.30m	
	Vertical height diff. between O/U and I/U		m	Max.20m (Outdoor unit is higher)	Max.20m (Outdoor unit is lower)
	Drain hose			Hose connectable VP25(O.D.32)	Hole size ϕ 20 x 5pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	4.8	
Interconnecting wires	Size x Core number			1.5mm^2 x 4 cores (Including earth cable) / Terminal block (Screw fixing type)	
IP number				IPX0	IPX4
Standard accessories				Mounting kit, Drain hose	Drain elbow, Drain hole grommet
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-H1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item			Model	FDT50ZSXVH	
				Indoor unit **FDT50VH**	Outdoor unit **SRC50ZSX-S**
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	5.0 [1.1(Min.) - 5.6(Max.)]	
	Nominal heating capacity (range)		kW	5.4 [0.6(Min.) - 6.3(Max.)]	
	Power consumption	Cooling	kW	1.29	
		Heating		1.31	
	Max power consumption			2.90	
	Running current	Cooling	A	5.9 / 6.2	
		Heating		6.0 / 6.3	
	Inrush current, max current			5, 15	
	Power factor	Cooling	%	95	
		Heating		95	
	EER	Cooling		3.88	
	COP	Heating		4.12	
	Sound power level	Cooling	dB(A)	55	63
		Heating		56	
	Sound pressure level	Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	50
		Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	49
	Silent mode sound pressure level			—	Cooling : 42 / Heating : 43
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	640 x 800 (+71) x 290
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white Munsell : (4.2Y7.5/1.1), RAL : 7044
Net weight			kg	Unit 19 Panel 5	45
Compressor type & Q'ty				—	RMT5113MCE2 (Twin rotary type) x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.45 (MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 1.5kg in outdoor unit (Incl. the amount for the piping of : 15m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Capillary tubes + Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 1
Fan motor (Starting method)			W	50 < Direct line start >	34 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	39
		Heating			33
Available external static pressure			Pa	0	0
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1 (Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for compressor)
Electric heater			W	0	—
Operation control	Remote control			(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") Pipe ϕ 6.35(1/4") x 0.8 O/U ϕ 6.35 (1/4")	
				Gas line : ϕ 12.7 (1/2") ϕ 12.7(1/2") x 0.8 ϕ 12.7 (1/2")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.30m	
	Vertical height diff. between O/U and I/U		m	Max.20m (Outdoor unit is higher)	Max.20m (Outdoor unit is lower)
	Drain hose			Hose connectable VP25(O.D.32)	Hole size ϕ 20 x 5pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			1.5mm^2 x 4 cores (Including earth cable) / Terminal block (Screw fixing type)	
IP number				IPX0	IPX4
Standard accessories				Mounting kit, Drain hose	Drain elbow, Drain hole grommet
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-H1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item			Model	FDT60ZSXVH	
				Indoor unit **FDT60VH**	Outdoor unit **SRC60ZSX-S**
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	5.6 [1.1(Min.) - 6.3(Max.)]	
	Nominal heating capacity (range)		kW	6.7 [0.6(Min.) - 7.1(Max.)]	
	Power consumption	Cooling	kW	1.52	
		Heating		1.56	
	Max power consumption			2.90	
	Running current	Cooling	A	6.9 / 7.2	
		Heating		7.1 / 7.4	
	Inrush current, max current			5, 15	
	Power factor	Cooling	%	96	
		Heating		96	
	EER	Cooling		3.68	
	COP	Heating		4.29	
	Sound power level	Cooling	dB(A)	58	65
		Heating		59	64
	Sound pressure level	Cooling		P-Hi: 44 Hi: 34 Me: 30 Lo: 27	52
		Heating		P-Hi: 44 Hi: 34 Me: 30 Lo: 23	
	Silent mode sound pressure level			—	Cooling : 42 / Heating : 43
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	640 x 800 (+71) x 290
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white Munsell : (4.2Y7.5/1.1), RAL : 7004
Net weight			kg	Unit 21 Panel 5	45
Compressor type & Q'ty				—	RMT5113MCE2 (Twin rotary type) x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.45 (MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 1.5kg in outdoor unit (Incl. the amount for the piping of : 15m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Capillary tubes + Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 1
Fan motor (Starting method)			W	50 < Direct line start >	34 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 26 Hi: 17 Me: 14 Lo: 11	41.5
		Heating			39
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1 (Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for compressor)
Electric heater			W	0	—
Operation control	Remote control			(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") Pipe ϕ 6.35(1/4") x 0.8 O/U ϕ 6.35 (1/4")	
				Gas line : ϕ 12.7 (1/2") ϕ 12.7(1/2") x 0.8 ϕ 12.7 (1/2")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.30m	
	Vertical height diff. between O/U and I/U		m	Max.20m (Outdoor unit is higher)	Max.20m (Outdoor unit is lower)
	Drain hose			Hose connectable VP25(O.D.32)	Hole size ϕ 20 x 5pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			1.5mm^2 x 4 cores (Including earth cable) / Terminal block (Screw fixing type)	
IP number				IPX0	IPX4
Standard accessories				Mounting kit, Drain hose	Drain elbow, Drain hole grommet
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-H1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

(2) Twin type

Item			Model	FDT71VNXPVH	
				Indoor unit FDT40VH (2 units)	Outdoor unit FDC71VNX
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	7.1 [3.2(Min.) - 8.0(Max.)]	
	Nominal heating capacity (range)		kW	8.0 [3.6(Min.) - 9.0(Max.)]	
	Power consumption	Cooling	kW	1.85	
		Heating		1.99	
	Max power consumption			3.18	
	Running current	Cooling	A	8.2 / 8.6	
		Heating		8.8 / 9.2	
	Inrush current, max current			5, 17	
	Power factor	Cooling	%	98	
		Heating		98	
	EER	Cooling		3.84	
	COP	Heating		4.02	
	Sound power level	Cooling	dB(A)	50	66
		Heating			
	Sound pressure level	Cooling		P-Hi: 36 Hi: 33 Me: 30 Lo: 26	51
		Heating		P-Hi: 36 Hi: 33 Me: 28 Lo: 20	48
	Silent mode sound pressure level			—	—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	750 x 880(+88) x 340
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2)near equivalent	Stucco white (4.2Y7.5/1.1)near equivalent
Net weight			kg	Unit 19 Panel 5	60
Compressor type & Q'ty				—	RMT5118MDE2 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.675 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 2.95kg in outdoor unit (Incl. the amount for the piping o f : 30m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 1
Fan motor (Starting method)			W	50 < Direct line start >	86 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 19 Hi: 16 Me: 13 Lo: 10	60
		Heating			50
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve (for compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8") x 0.8 ①ϕ 9.52(3/8") x 0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2") x 0.8 ①ϕ 15.88(5/8") x 1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.50m	
	Vertical height diff. between O/U and I/U		m	Max.30m(Outdoor unit is higher)	Max.15m(Outdoor unit is lowe)
	Drain hose			Hose connectable VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	—
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item			Model	FDT100VNXPVH	
				Indoor unit FDT50VH (2 units)	Outdoor unit FDC100VNX
Power source				1 Phase,220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	10.0 [4.0(Min.) - 11.2(Max.)]	
	Nominal heating capacity (range)		kW	11.2 [4.0(Min.) - 12.5(Max.)]	
	Power consumption	Cooling	kW	2.56	
		Heating		2.67	
	Max power consumption			4.27	
	Running current	Cooling	A	11.4 / 11.9	
		Heating		11.8 / 12.4	
	Inrush current, max current			5, 24	
	Power factor	Cooling	%	98	
		Heating		98	
	EER	Cooling		3.91	
	COP	Heating		4.19	
	Sound power level	Cooling	dB(A)	55	70
		Heating		56	
	Sound pressure level	Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	48
		Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	50
	Silent mode sound pressure level			—	—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	1300 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 19 Panel 5	105
Compressor type & Q'ty				—	RMT5134MDE2 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg(Pre-charged up to the piping length of 30m)Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 2
Fan motor (Starting method)			W	50 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	100
		Heating			
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater			W	—	20(Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8") x 0.8 ①ϕ 9.52(3/8") x 0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2") x 0.8 ①ϕ 15.88(5/8") x 1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.100m	
	Vertical height diff. between O/U and I/U		m	Max.30m（Outdoor unit is higher）	Max.15m（Outdoor unit is lower）
	Drain hose			Hose connectable VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores（Including earth cable）/ Termainal block（Screw fixing type）	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	Edging
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item \ Model				FDT100VSXPVH	
				Indoor unit FDT50VH (2 units)	Outdoor unit FDC100VSX
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	10.0 [4.0(Min.) - 11.2(Max.)]	
	Nominal heating capacity (range)		kW	11.2 [4.0(Min.) - 16.0(Max.)]	
	Power consumption	Cooling	kW	2.56	
		Heating		2.67	
	Max power consumption			5.34	
	Running current	Cooling	A	3.8 / 4.0	
		Heating		3.9 / 4.1	
	Inrush current, max current			5, 15	
	Power factor	Cooling	%	97	
		Heating		99	
	EER	Cooling		3.91	
	COP	Heating		4.19	
	Sound power level	Cooling	dB(A)	55	70
		Heating		56	
	Sound pressure level	Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	48
		Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	50
	Silent mode sound pressure level			—	—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	1300 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 19 Panel 5	105
Compressor type & Q'ty				—	RMT5134MDE3 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg(Pre-charged up to the piping length of 30m)Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 2
Fan motor (Starting method)			W	50 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	100
		Heating			
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8") x 0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2") x 0.8 ①ϕ 15.88(5/8")x1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.100m	
	Vertical height diff. between O/U and I/U		m	Max.30m（Outdoor unit is higher）	Max.15m（Outdoor unit is lower）
	Drain hose			Hose connectable VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores（Including earth cable）/ Termainal block（Screw fixing type）	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	Edging
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

PJF000Z551 A

Item			Model	FDT125VNXPVH	
				Indoor unit FDT60VH (2 units)	Outdoor unit FDC125VNX
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	12.5 [5.0(Min.) - 14.0(Max.)]	
	Nominal heating capacity (range)		kW	14.0 [4.0(Min.) - 17.0(Max.)]	
	Power consumption	Cooling	kW	3.26	
		Heating		3.22	
	Max power consumption			5.22	
	Running current	Cooling	A	14.5 / 15.1	
		Heating		14.3 / 14.9	
	Inrush current, max current			5, 26	
	Power factor	Cooling	%	98	
		Heating		98	
	EER	Cooling		3.83	
	COP	Heating		4.35	
	Sound power level	Cooling	dB(A)	58	70
		Heating		59	
	Sound pressure level	Cooling		P-Hi: 44 Hi: 34 Me: 30 Lo: 27	48
		Heating		P-Hi: 44 Hi: 34 Me: 30 Lo: 23	50
	Silent mode sound pressure level			—	—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	1300 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 21 Panel 5	105
Compressor type & Q'ty				—	RMT5134MDE2 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg(Pre-charged up to the piping length of 30m)Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 2
Fan motor (Starting method)			W	50 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 26 Hi: 17 Me: 14 Lo: 11	100
		Heating			
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8") x 0.8 ①ϕ 9.52(3/8") x 0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2") x 0.8 ①ϕ 15.88(5/8") x 1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.100m	
	Vertical height diff. between O/U and I/U		m	Max.30m(Outdoor unit is higher)	Max.15m(Outdoor unit is lower)
	Drain hose			Hose connectable VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	Edging
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item			Model	FDT125VSXPVH	
				Indoor unit FDT60VH (2 units)	Outdoor unit FDC125VSX
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	12.5 [5.0(Min.) - 14.0(Max.)]	
	Nominal heating capacity (range)		kW	14.0 [4.0(Min.) - 18.0(Max.)]	
	Power consumption	Cooling	kW	3.26	
		Heating		3.22	
	Max power consumption			6.52	
	Running current	Cooling	A	4.8 / 5.0	
		Heating		4.7 / 5.0	
	Inrush current, max current			5, 15	
	Power factor	Cooling	%	98 / 99	
		Heating		99 / 98	
	EER	Cooling		3.83	
	COP	Heating		4.35	
	Sound power level	Cooling	dB(A)	58	70
		Heating		59	
	Sound pressure level	Cooling		P-Hi: 44 Hi: 34 Me: 30 Lo: 27	48
		Heating		P-Hi: 44 Hi: 34 Me: 30 Lo: 23	50
	Silent mode sound pressure level			—	—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	1300 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 21 Panel 5	105
Compressor type & Q'ty				—	RMT5134MDE3 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg(Pre-charged up to the piping length of 30m)Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 2
Fan motor (Starting method)			W	50 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 26 Hi: 17 Me: 14 Lo: 11	100
		Heating			
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8") x 0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2") x 0.8 ①ϕ 15.88(5/8") x 1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.100m	
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher)	Max.15m (Outdoor unit is lower)
	Drain hose			Hose connectable VP25 (O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	Edging
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

(3) Triple type

Item			Model	FDT140VNXTVH	
				Indoor unit FDT50VH (3 units)	Outdoor unit FDC140VNX
Power source				1 Phase,220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	14.0 [5.0(Min.) - 16.0(Max.)]	
	Nominal heating capacity (range)		kW	16.0 [4.0(Min.) - 18.0(Max.)]	
	Power consumption	Cooling	kW	3.93	
		Heating		4.00	
	Max power consumption			5.60	
	Running current	Cooling	A	17.4 / 18.2	
		Heating		17.7 / 18.6	
	Inrush current, max current			5, 26	
	Power factor	Cooling	%	98	
		Heating		98	
	EER	Cooling		3.56	
	COP	Heating		4.00	
	Sound power level	Cooling	dB(A)	55	72
		Heating		56	
	Sound pressure level	Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	49
		Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	52
	Silent mode sound pressure level			—	—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	1300 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 19 Panel 5	105
Compressor type & Q'ty				—	RMT5134MDE2 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg (Pre-charged up to the piping length of 30m) Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 2
Fan motor (Starting method)			W	50 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	100
		Heating			
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater			W	—	20(Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8")x0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2")x0.8 ①ϕ 15.88(5/8")x1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.100m	
	Vertical height diff. between O/U and I/U		m	Max.30m(Outdoor unit is higher)	Max.15m(Outdoor unit is lower)
	Drain hose			Hose connectable VP25(O.D.32)	Holes size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	Edging
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item \ Model				FDT140VSXTVH	
				Indoor unit FDT50VH (3 units)	Outdoor unit FDC140VSX
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	14.0 [5.0(Min.) - 16.0(Max.)]	
	Nominal heating capacity (range)		kW	16.0 [4.0(Min.) - 20.0(Max.)]	
	Power consumption	Cooling	kW	3.93	
		Heating		4.00	
	Max power consumption			7.00	
	Running current	Cooling	A	5.8 / 6.1	
		Heating		5.9 / 6.2	
	Inrush current, max current			5, 15	
	Power factor	Cooling	%	98	
		Heating		98	
	EER	Cooling		3.56	
	COP	Heating		4.00	
	Sound power level	Cooling	dB(A)	55	72
		Heating		56	
	Sound pressure level	Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	49
		Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	52
	Silent mode sound pressure level			—	—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	1300 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 19 Panel 5	105
Compressor type & Q'ty				—	RMT5134MDE3 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg(Pre-charged up to the piping length of 30m)Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 2
Fan motor (Starting method)			W	50 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	100
		Heating			
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater			W	—	20(Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8") x 0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2") x 0.8 ①ϕ 15.88(5/8")x1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.100m	
	Vertical height diff. between O/U and I/U		m	Max.30m(Outdoor unit is higher)	
	Drain hose			Hose connectable VP25(O.D.32)	Max.15m(Outdoor unit is lower)
Drain pump, max lift height			mm	Built-in drain pump , 850	Hole size ϕ 20 x 3pcs
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores（Including earth cable）/ Termainal block（Screw fixing type）	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	Edging
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

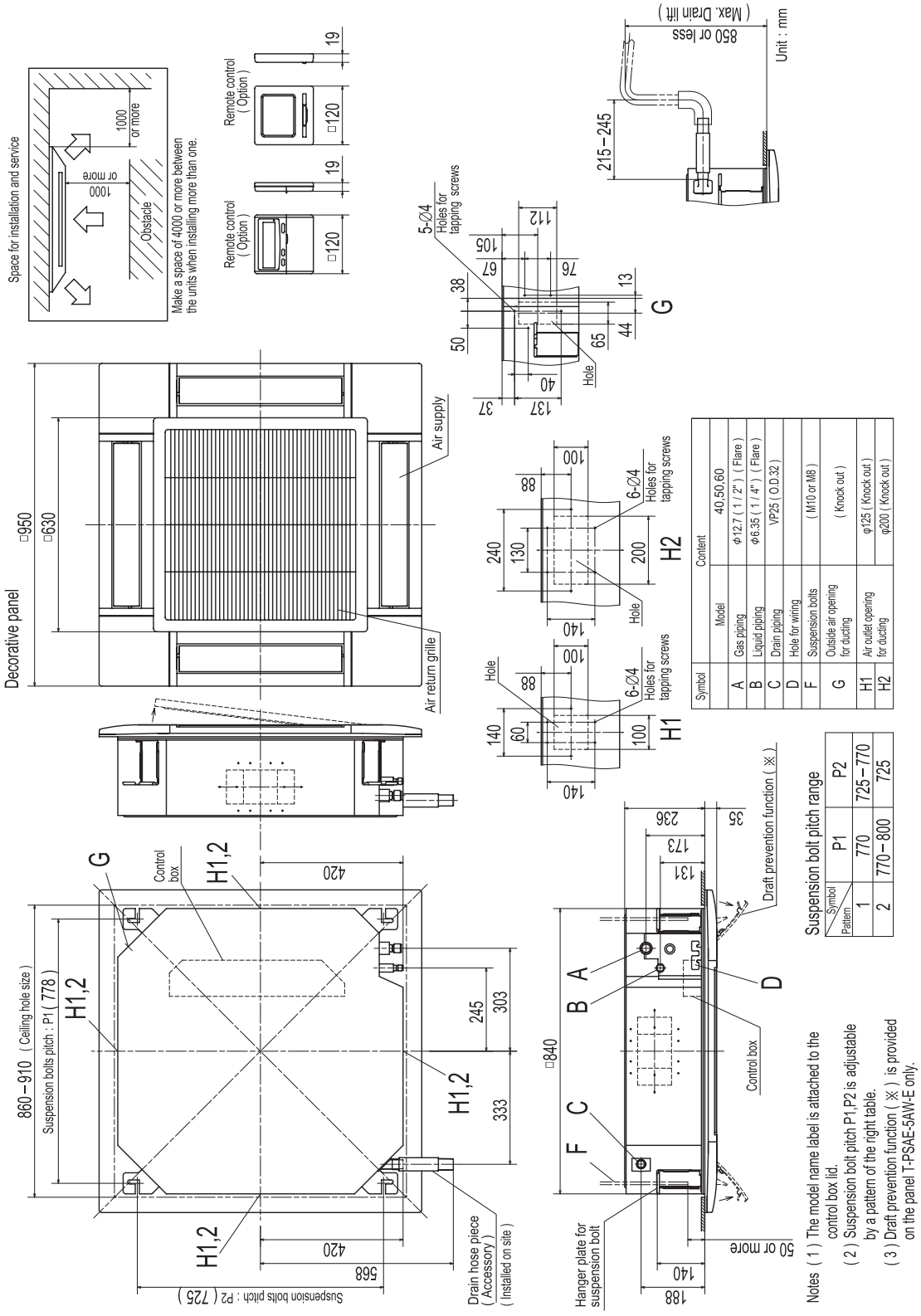
Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

1.2 EXTERIOR DIMENSIONS

(1) Indoor units

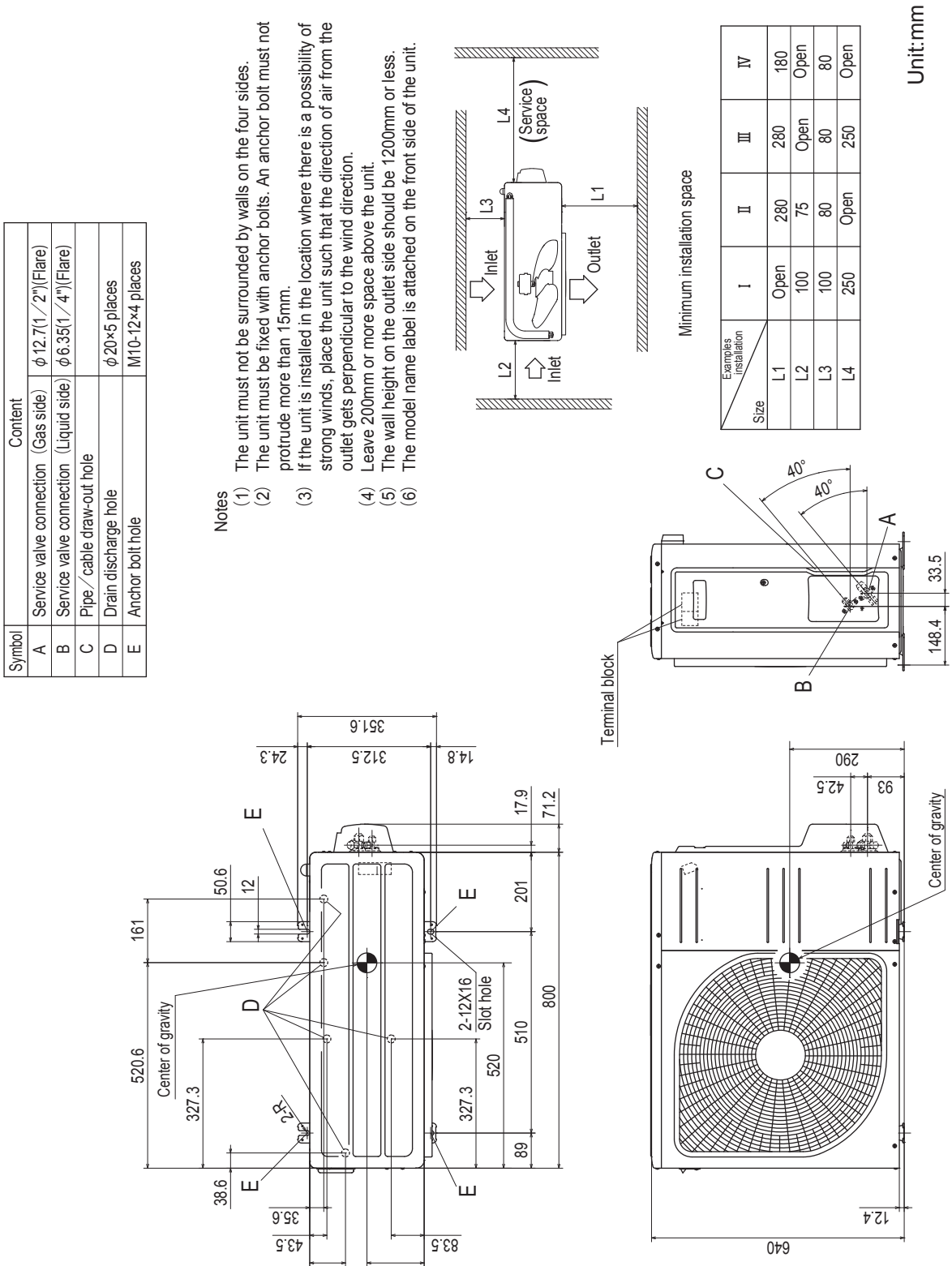
Models FDT40VH, 50VH, 60VH



PJF000Z552

(2) Outdoor units

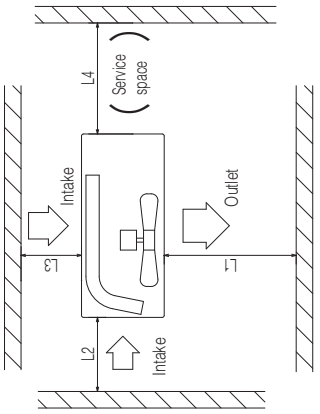
Models SRC40ZSX-S, 50ZSX-S, 60ZSX-S



RCT000Z020

Model FDC71VNX

Notes
(1) It must not be surrounded by walls on the four sides.
(2) The unit must be fixed with anchor bolts. An anchor bolt must not protrude more the 15mm.
(3) Where the unit is subject to strong winds, lay it in such a direction that the blower outlet faces perpendicularly to the dominant wind direction.
(4) Leave 1m or more space above the unit.
(5) A wall in front of the blower outlet must not exceed the units height.
(6) The model name label is attached on the lower right corner of the front panel.

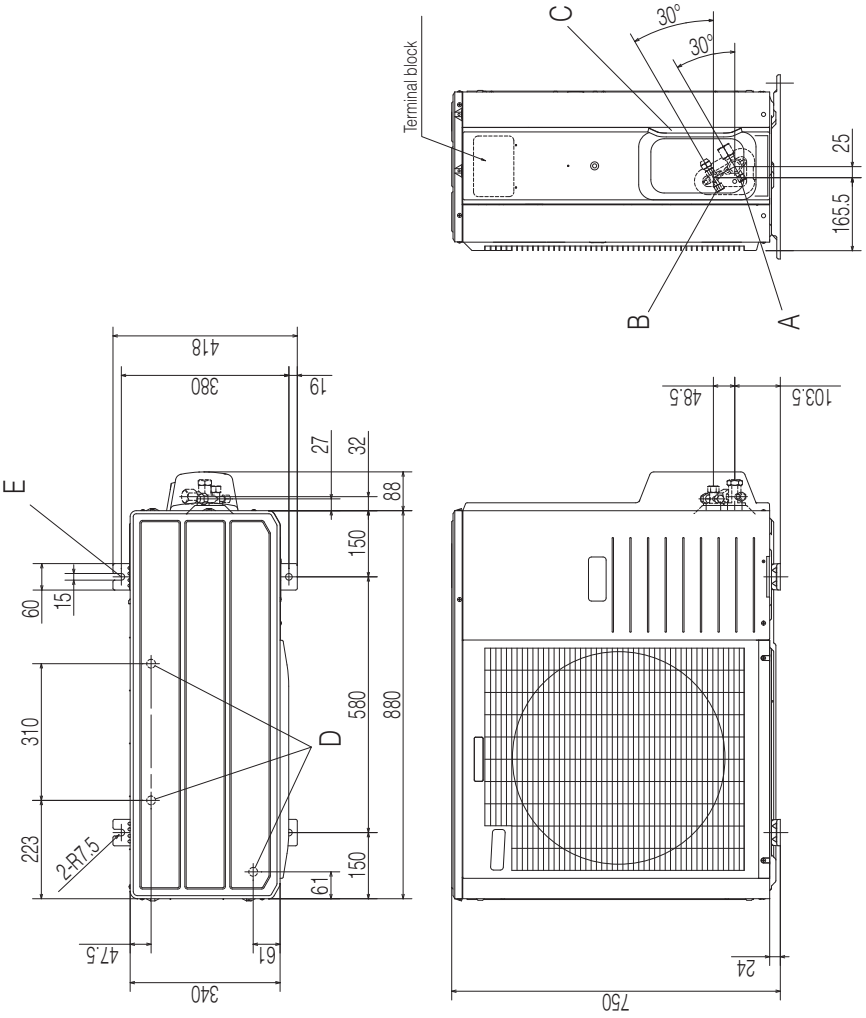


Minimum installation space

Examples of installation / Dimensions	I	II	III
L1	Open	Open	500
L2	300	250	Open
L3	100	150	100
L4	250	250	250

Unit:mm

Symbol	Content	
A	Service valve connection (gas side)	ϕ15.88 (5/8") (Flare)
B	Service valve connection (liquid side)	ϕ9.52 (3/8") (Flare)
C	Pipe/cable draw-out hole	
D	Drain discharge hole	ϕ20 × 3 places
E	Anchor bolt hole	M10 × 4 places



PCA001Z603A

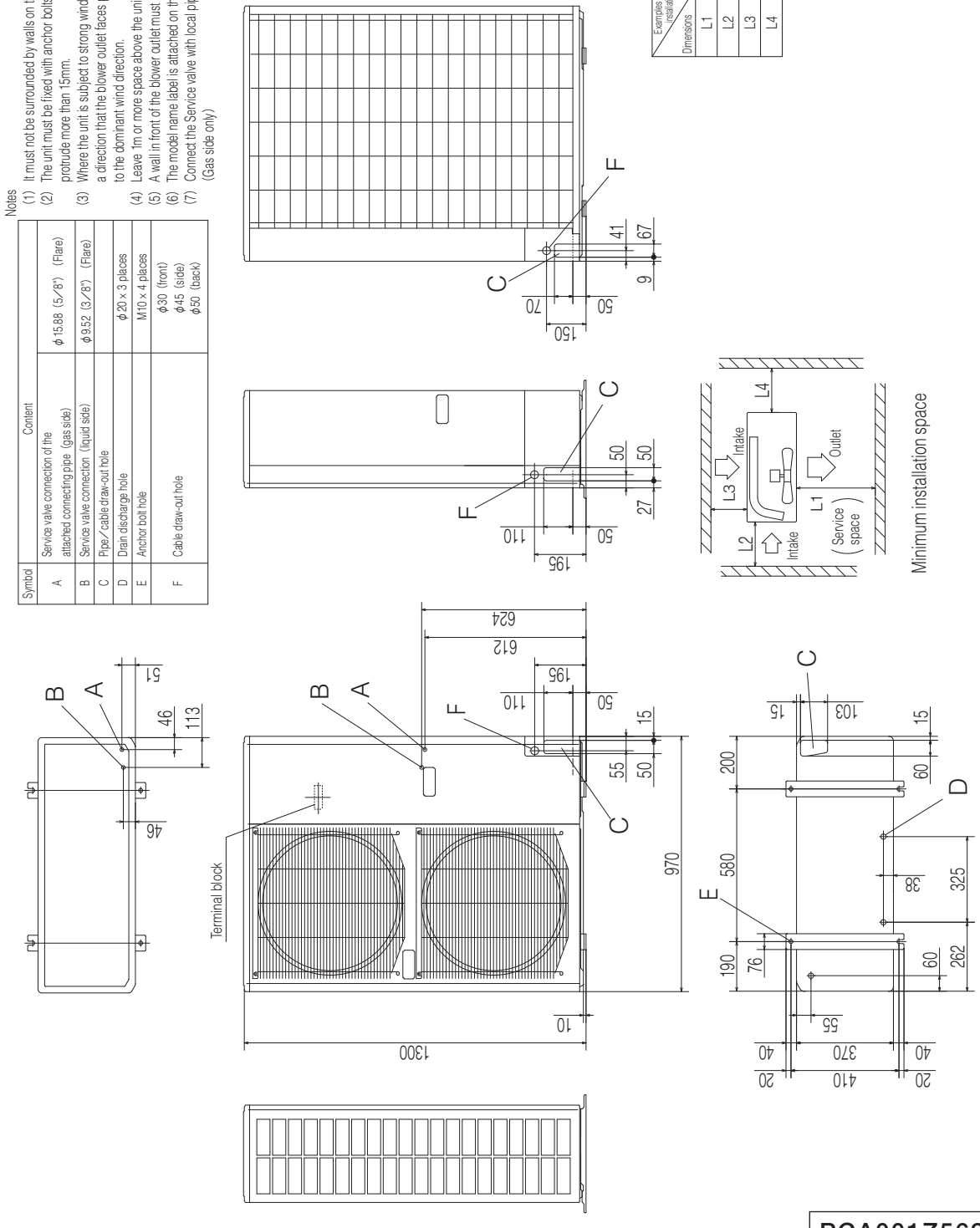
Models FDC100VNX, 125VNX, 140VNX
100VSX, 125VSX, 140VSX

Notes
(1) It must not be surrounded by walls on the four sides.
(2) The unit must be fixed with anchor bolts. An anchor bolt must not protrude more than 15mm.
(3) Where the unit is subject to strong winds, lay it in such a direction that the blower outlet faces perpendicularly to the dominant wind direction.
(4) Leave 1m or more space above the unit.
(5) A wall in front of the blower outlet must not exceed the units height.
(6) The model name label is attached on the lower right corner of the front panel.
(7) Connect the Service valve with local pipe by using the pipe of the attachment. (Gas side only)

Symbol	Content	
A	Service valve connection of the attached connecting pipe (gas side)	ϕ15.88 (5/8") (Flare)
B	Service valve connection (liquid side)	ϕ9.52 (3/8") (Flare)
C	Pipe/ cable draw-out hole	
D	Drain discharge hole	ϕ20 × 3 places
E	Anchor bolt hole	M10 × 4 places
F	Cable draw-out hole	ϕ30 (front) ϕ45 (side) ϕ50 (back)

Examples of installation / Dimensions	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4	5	5	5

Unit:mm



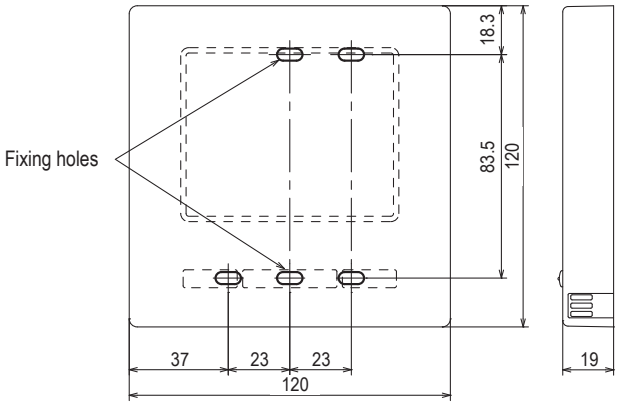
PCA001Z569C

(2) Remote control (Option parts)

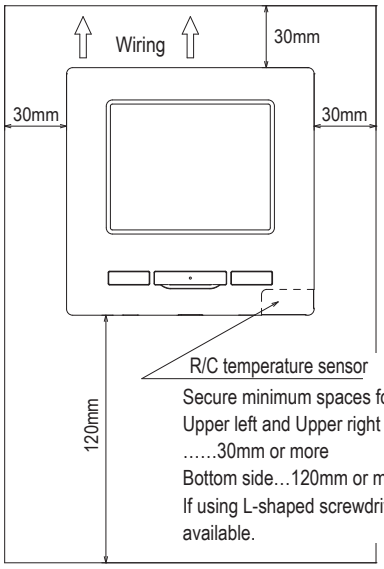
(a) Wired remote control

Model RC-EX3A

Dimensions (Viewed from front)



Installation space



Secure minimum spaces for disassembling the case.
Upper left and Upper right sides
……30mm or more
Bottom side…120mm or more
If using L-shaped screwdriver, 50mm or more is available.

● Do not install the remote control at following places.

1) It could cause break-down or deformation of remote control.
   - Where it is exposed to direct sunlight
   - Where the ambient temperature becomes 0 °C or below, or 40 °C or above
   - Where the surface is not flat
   - Where the strength of installation area is insufficient
2) Moisture may be attached to internal parts of the remote control, resulting in a display failure.
   - Place with high humidity where condensation occurs on the remote control
   - Where the remote control gets wet
3) Accurate room temperature may not be detected using the temperature sensor of the remote control.
   - Where the average room temperature cannot be detected
   - Place near the equipment to generate heat
   - Place affected by outside air in opening/closing the door
   - Place exposed to direct sunlight or wind from air-conditioner
   - Where the difference between wall and room temperature is large
4) When you are using the automatic grille up and down panel in the IU, you may not be able to confirm the up and down motion.
   - Where the IU cannot be visually confirmed

R/C cable:0.3mm²x2 cores

When the cable length is longer than 100 m, the max size for wires used in the R/C case is 0.5 mm² . Connect them to wires of larger size near the outside of R/C. When wires are connected, take measures to prevent water, etc. from entering inside.

≦ 200 m	0.5 mm² x 2 cores
≦ 300m	0.75 mm² x 2 cores
≦ 400m	1.25 mm² x 2 cores
≦ 600m	2.0 mm² x 2 cores

● When installing the unit at a hospital, telecommunication facility, etc., take measures to suppress electric noises.

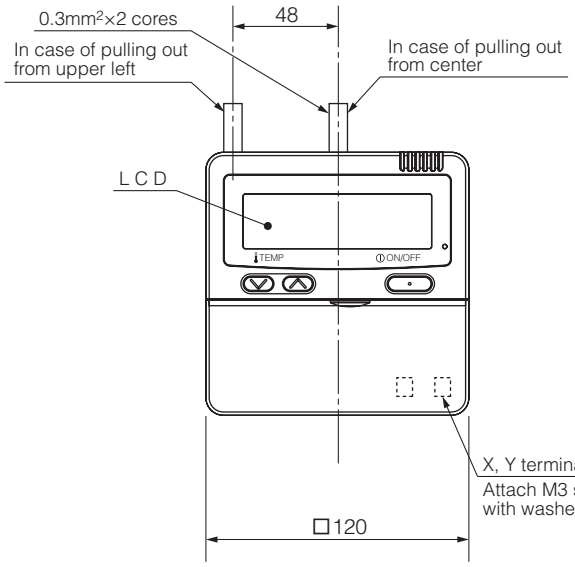
It could cause malfunction or break-down due to hazardous effects on the inverter, private power generator, high frequency medical equipment, radio communication equipment, etc.
The influences transmitted from the remote control to medical or communication equipment could disrupt medical activities, video broadcasting or cause noise interference.

Adapted RoHS directive

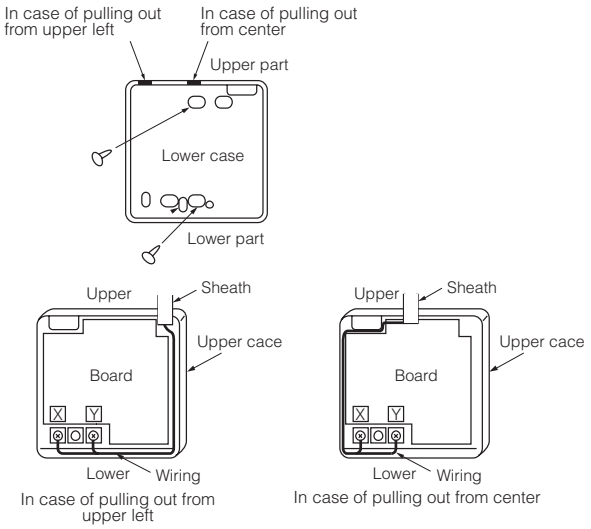
PJZ000Z333

Model RC-E5

Exposed mounting

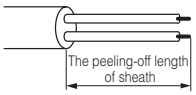


Wiring outlet
Cut off the upper thin part of remote control lower case with a nipper or knife, and grind burrs with a file etc.



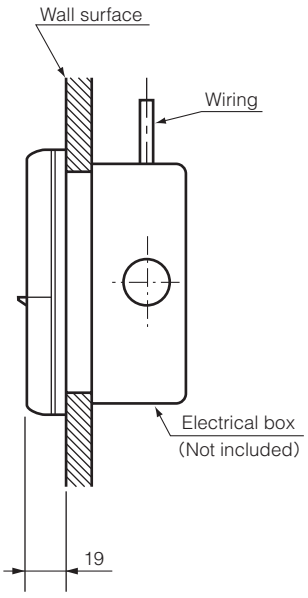
The peeling-off length of sheath

Pulling out from upper left	Pulling out from center
X wiring : 215mm Y wiring : 195mm	X wiring : 170mm Y wiring : 190mm

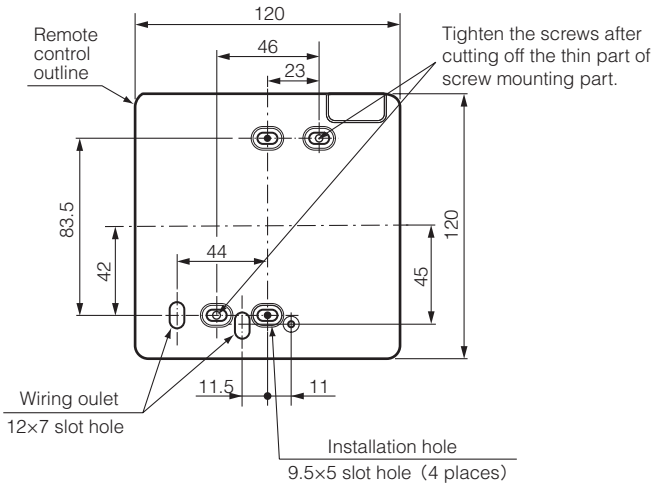


Exterior appearance (Munsell color)	Pearl white (N8.5) near equivalent

Embedded mounting



Remote control installation dimensions



1) Installation screw for remote control
M4 screw (2 pieces)

Unit:mm

Wiring specifications

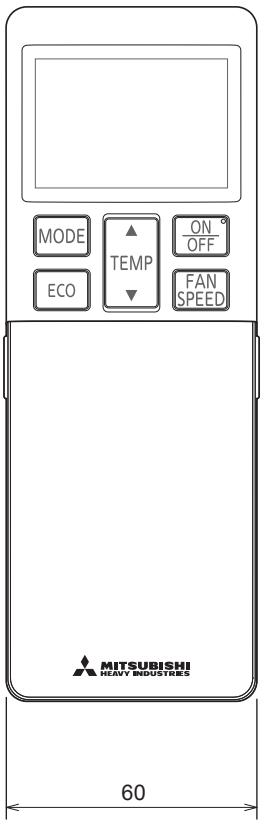
1) If the prolongation is over 100m, change to the size below.
But, wiring in the remote control case should be under 0.5mm². Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

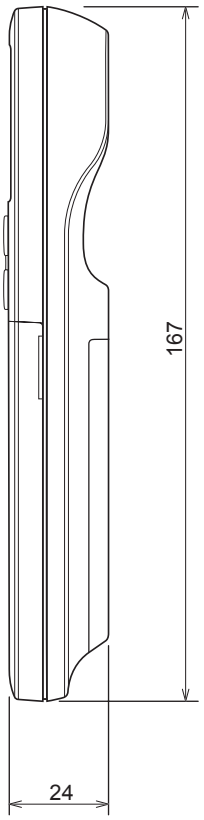
Length	Wiring thickness
100 to 200m	0.5mm²×2 cores
Under 300m	0.75mm²×2 cores
Under 400m	1.25mm²×2 cores
Under 600m	2.0mm²×2 cores

PJZ000Z295

(b) Wireless remote control (RCN-E2)

Unit: mm





1.3 ELECTRICAL WIRING

(1) Indoor units

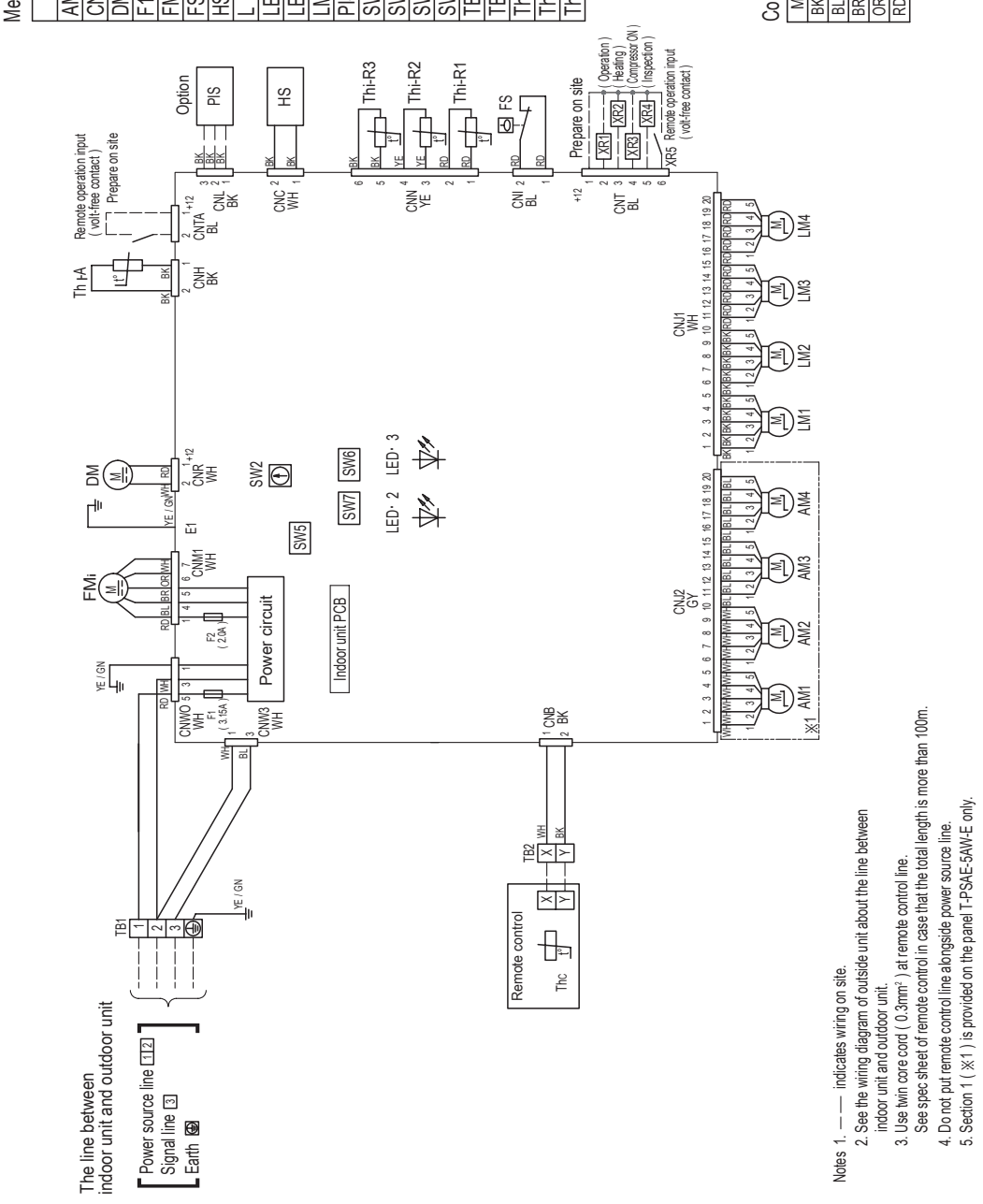
Models FDT 40VH, 50VH, 60VH

Meaning of marks

Item	Description
AM1-4	Draft prevention function motor
CNB-Z	Connector
DM	Drain pump motor
F1,2	Fuse
FMi	Fan motor
FS	Float switch
HS	Humidity sensor
L	Reactor
LED・2	Indication lamp (Green-Nomal operation)
LED・3	Indication lamp (Red-Inspection)
LM1-4	Louver motor
PIS	Motion sensor
SW2	Remote control communication address
SW5	Plural units Master / Slave setting
SW6	Model capacity setting
SW7-1	Operation check,drain pump motor test run
TB1	Terminal block (Power source) (□ mark)
TB2	Terminal block (Signal line) (□ mark)
Thc	Temperature sensor (Remote control)
Thi-A	Temperature sensor (Return air)
Thi-R1,2,3	Temperature sensor (Heat exchanger)

Color marks

Mark	Color	Mark	Color
BK	Black	WH	White
BL	Blue	YE	Yellow
BR	Brown	GY	Gray
OR	Orange	YE / GN	Yellow / Green
RD	Red		

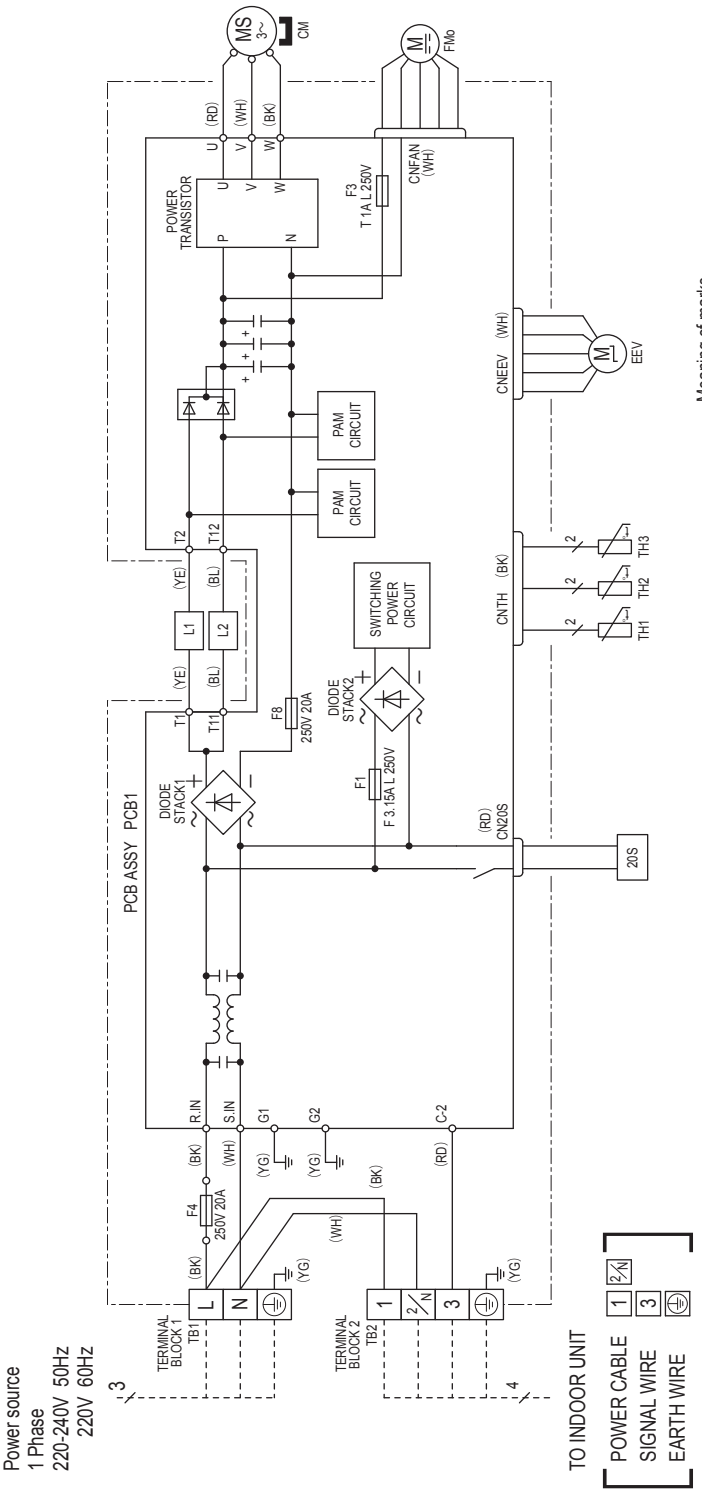


Notes 1. — — indicates wiring on site.
2. See the wiring diagram of outside unit about the line between indoor unit and outdoor unit.
3. Use twin core cord (0.3mm²) at remote control line.
See spec sheet of remote control in case that the total length is more than 100m.
4. Do not put remote control line alongside power source line.
5. Section 1 (※1) is provided on the panel T-PSAE-5AW-E only.

PJF000Z554

(2) Outdoor units

Models SRC40ZSX-S, 50ZSX-S, 60ZSX-S



Meaning of marks

Item	Description
20S	Solenoid coil for 4-way valve
CN20S CNEEV CNFAN CNTH	Connector
CM	Compressor motor
EEV	Electric expansion valve (coil)
FMo	Fan motor
L1,2	Reactor
TH1	Heat exchanger temperature sensor
TH2	Outdoor air temperature sensor
TH3	Discharge pipe temperature sensor

Color marks

Mark	Color
BK	Black
BL	Blue
RD	Red
WH	White
YE	Yellow
YG	Yellow/Green

Power cable, indoor-outdoor connecting wires

Model name	MAX running current (A)	Power cable wire size x number*	Power cable length (m)	Connecting cable wire size x number*
SRC40ZSX-S SRC50ZSX-S SRC60ZSX-S	15	2.0mm² x 3	13	1.5mm² x 4

* The wire numbers include earth wire (Yellow/Green).
◦ Switchgear or circuit breaker capacity should be chosen according to national or regional electricity regulations.
◦ The power cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the national or regional electricity regulations.

RWC000Z298

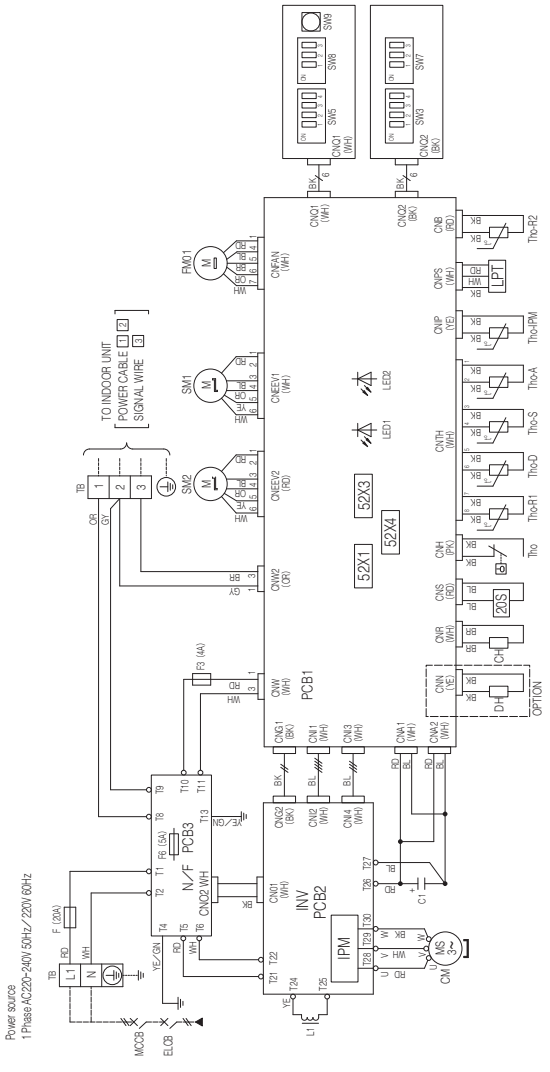
Model FDC71VNX

Meaning of marks

Item	Description
CM	Compressor motor
FM01	Fan motor
CH	Crankcase heater
DH	Drain pan heater
52X1	Auxiliary relay (for CH)
52X3	Auxiliary relay (for 20S)
52X4	Auxiliary relay (for DH)
20S	Solenoid valve for 4-way valve
SM1	Expansion valve for cooling
SM2	Expansion valve for heating
63H1	High pressure switch
Tho-A	Sensor (Outdoor air temperature)
Tho-D	Sensor (Discharge pipe temperature)
Tho-R1,R2	Sensor (Heat exchanger temperature)
Tho-S	Sensor (Suction pipe temperature)
Tho-IPM	Sensor (IPM)
LPT	Low pressure sensor
IPM	Intelligent power module
TB	Terminal block
FF3	Fuse
CnA-Z	Connector
SW9	Pump down switch
SW3,5	Local setting switch
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
L1	Reactor

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
OR	Orange
RD	Red
WH	White
YE	Yellow
YE/GN	Yellow/Green
GY	Gray
PK	Pink



Local setting switch SW3, SW5 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3˚C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW5-3,4	Trial operation	Method of trial operation 1. Trial operation can be performed by using SW5-3. 2. Cooling trial operation will be performed when SW5-4 is OFF, and heating trial operation when SW5-4 is ON. 3. Be sure to turn OFF SW5-3 after the trial operation is finished.

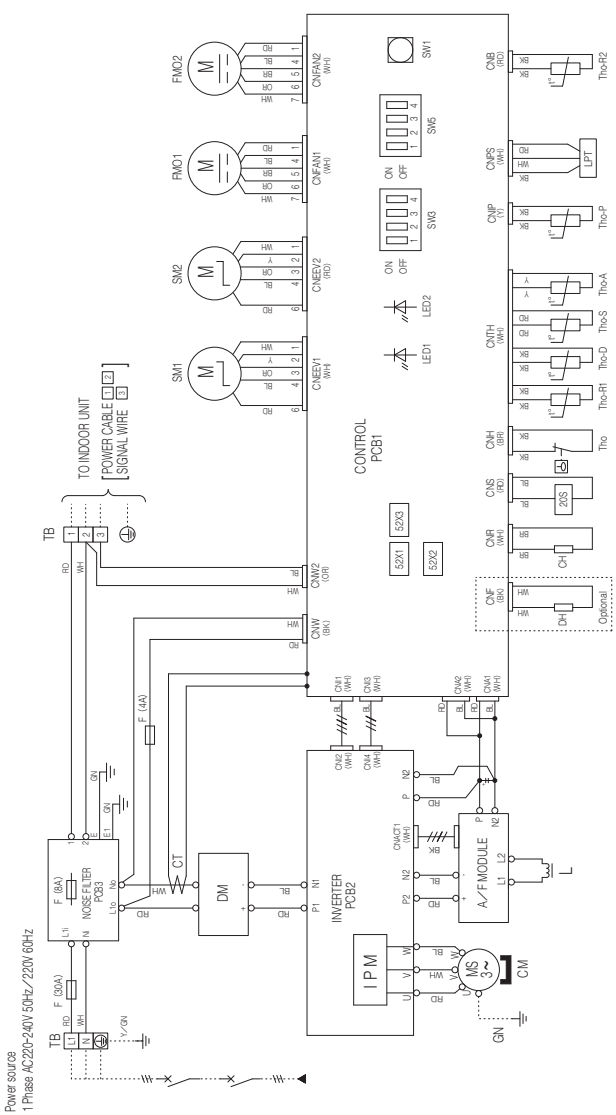
Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size
FDC71	17	3.5	21	ϕ1.6mm x 3	ϕ16mm

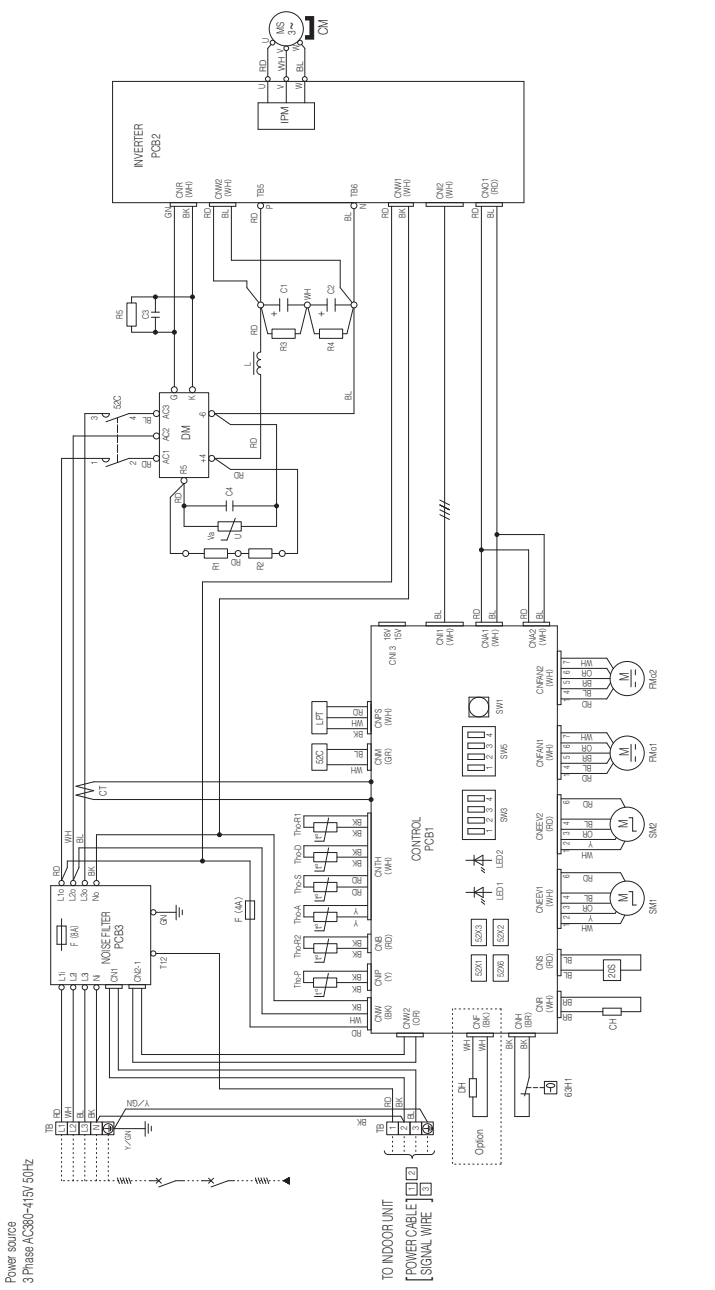
- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.
- Refer to installation manual or technical manual about usage of local setting switch.
- Don't operate SW3-3,SW5-1,SW5-2,SW7,SW8

PCA001Z605

Models FDC100VNX, 125VNX, 140VNX



Models FDC100VSX, 125VSX, 140VSX



Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CnA~Z	Connector
CT	Current sensor
DH	Drain pan heater
DM	Diode module
F	Fuse
FMo1,2	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
LPT	Low pressure sensor
SM1	Expansion valve for cooling
SM2	Expansion valve for heating
SW1	Pump down switch
SW3,5	Local setting switch
TB	Terminal block
Tho-A	Sensor (Outdoor air temperature)
Tho-D	Sensor (Discharger pipe temperature)
Tho-R1,2	Sensor (Heat exchanger pipe temperature)
Tho-S	Sensor (Suction pipe temperature)
Tho-P	Sensor (IPM)
20S	Solenoid valve for 4-way valve
52C	Relay
52X1	Auxiliary relay (for CH)
52X2	Auxiliary relay (for DH)
52X3	Auxiliary relay (for 20S)
52X6	Auxiliary relay (for 52C)
63H1	High pressure switch

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
OR	Orange
RD	Red
WH	White
Y	Yellow
Y/GN	Yellow/Green
GR	Gray
P	Pink

Local setting switch SW3 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not tunrning when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ① Trial operation can be performed by using SW3-3, 4. ② Compressor will be in the operation when SW3-3 is ON. ③ Cooling trial operation will be performed when SW3-4 is OFF. and heating trial operation when SW3-4 is ON. ④ Be sure to turn OFF SW3-3 after the trial operation is finished.

Power cable, indoor-outdoor connecting wires

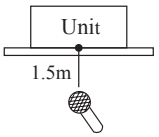
Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size (mm)
FDC100	15	3.5	27	ϕ 1.6mm x 3	ϕ 1.6
FDC125					
FDC140					

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

PCA001Z571A

1.4 NOISE LEVEL

Notes(1) The data are based on the following conditions.
Ambient air temperature: Indoor unit 27℃WB. Outdoor unit 35℃DB.
(2) The data in the chart are measured in an anechoic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.



Measured based on JIS B 8616
Mike position

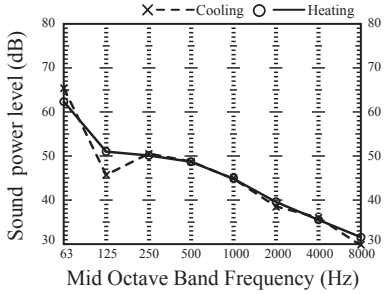
Mike (in front & below unit)

(1) Indoor units

(a) Sound power level

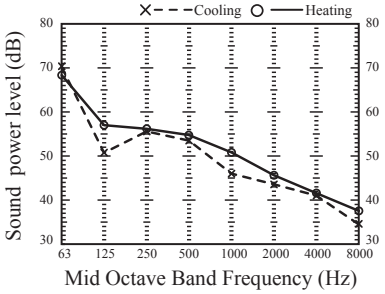
Model FDT40VH

Noise level Cooling : 50 dB (A)
Heating : 50 dB (A)



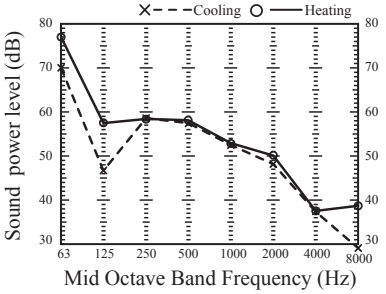
Model FDT50VH

Noise level Cooling : 55 dB (A)
Heating : 56 dB (A)



Model FDT60VH

Noise level Cooling : 58 dB (A)
Heating : 59 dB (A)

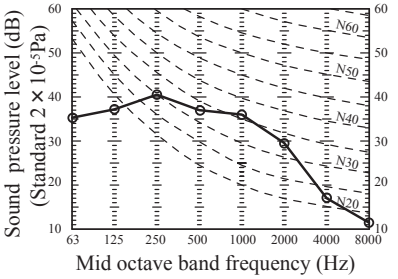


(b) Sound pressure level

Model FDT40VH

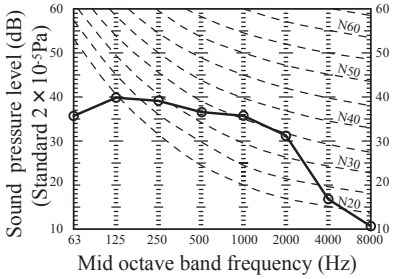
Noise level 36 dB(A) at P-Hi
33 dB(A) at Hi
30 dB(A) at Me
26 dB(A) at Lo

Cooling



Noise level 36 dB(A) at P-Hi
33 dB(A) at Hi
28 dB(A) at Me
20 dB(A) at Lo

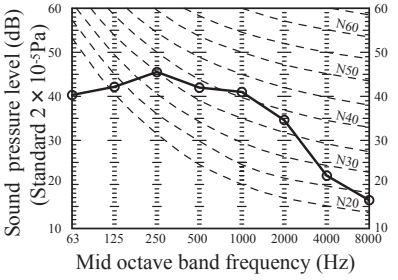
Heating



Model FDT50VH

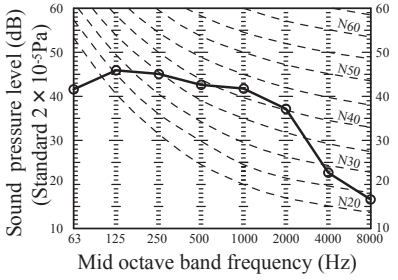
Noise level 41 dB(A) at P-Hi
33 dB(A) at Hi
30 dB(A) at Me
26 dB(A) at Lo

Cooling



Noise level 42 dB(A) at P-Hi
33 dB(A) at Hi
28 dB(A) at Me
20 dB(A) at Lo

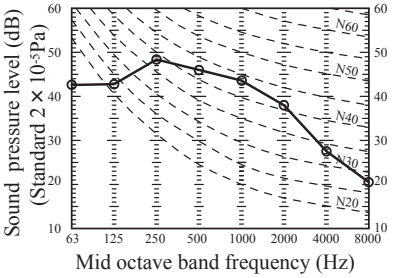
Heating



Model FDT60VH

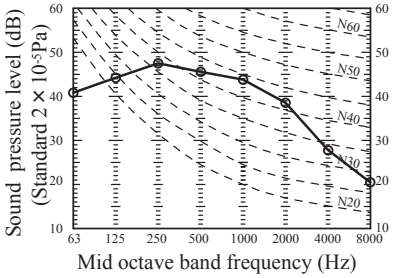
Noise level 44 dB(A) at P-Hi
34 dB(A) at Hi
30 dB(A) at Me
27 dB(A) at Lo

Cooling



Noise level 44 dB(A) at P-Hi
34 dB(A) at Hi
30 dB(A) at Me
23 dB(A) at Lo

Heating

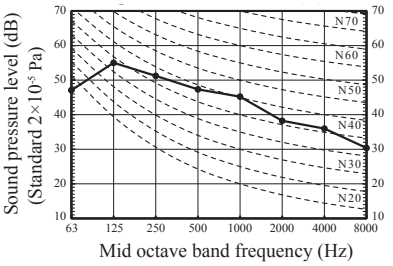


(2) Outdoor units

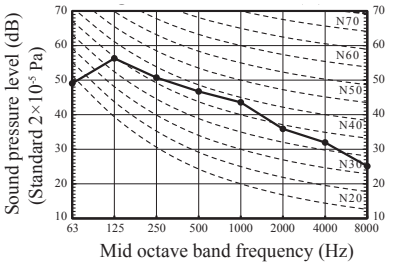
Measured based or JIS B 8616 or JIS C 9612
Mike position: at highest noise level in position as mentined below.
Distance from front side 1m

Models SRC40ZSX-S, 50ZSX-S

Cooling noise level 50 dB (A)

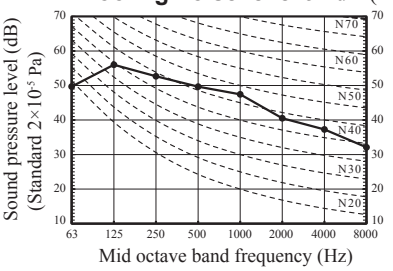


Heating noise level 49 dB (A)

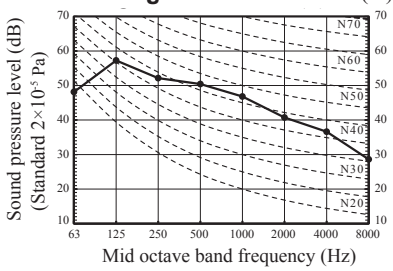


Model SRC60ZSX-S

Cooling noise level 52 dB (A)

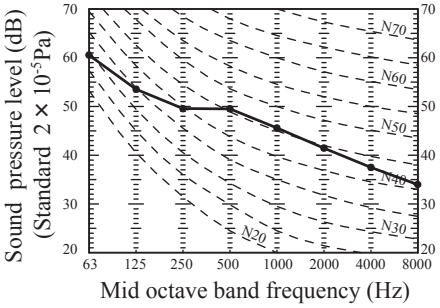


Heating noise level 52 dB (A)

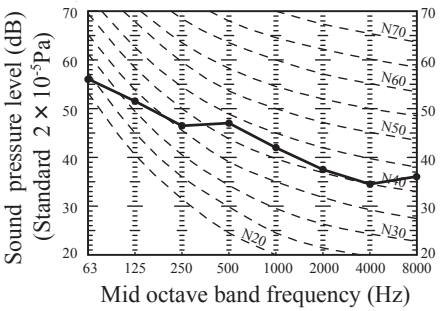


Model FDC71VNX

Cooling noise level 51 dB (A)

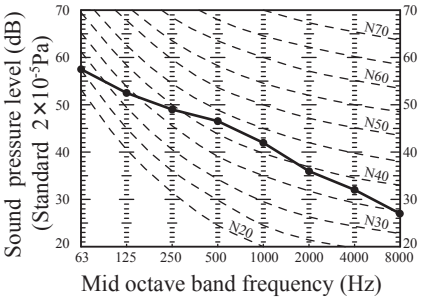


Heating noise level 48 dB (A)

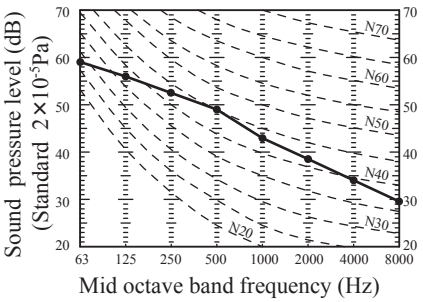


Model FDC100VNX,100VSX

Cooling noise level 48 dB (A)

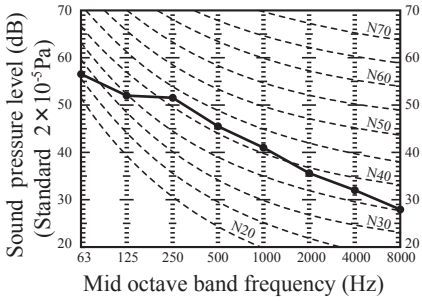


Heating noise level 50 dB (A)

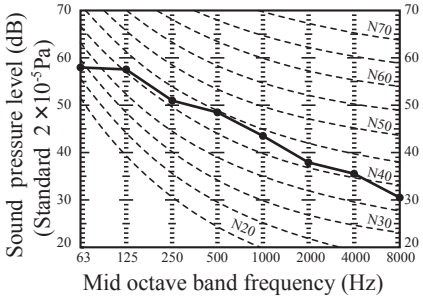


Models FDC125VNX,125VSX

Cooling noise level 48 dB (A)

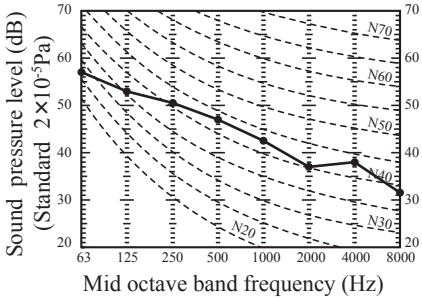


Heating noise level 50 dB (A)

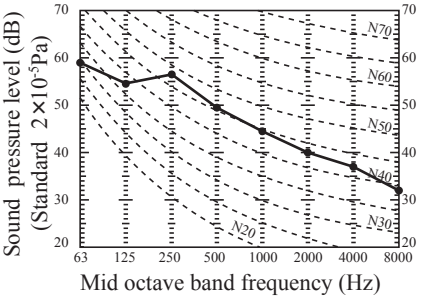


Models FDC140VNX,140VSX

Cooling noise level 49 dB (A)



Heating noise level 52 dB (A)



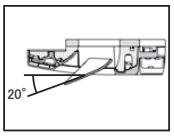
1.5 TEMPERATURE AND VELOCITY DISTRIBUTION

Indoor temperature
Cooling 27°CDB / 19°CWB
Heating 20°CDB
Note: These figures represent the typical main range of temperature and velocity distribution at the center of air outlet within the published conditions.
In the actual installation, they may differ from the typical figures under the influence of air temperature conditions, ceiling height, operation conditions and obstacles.

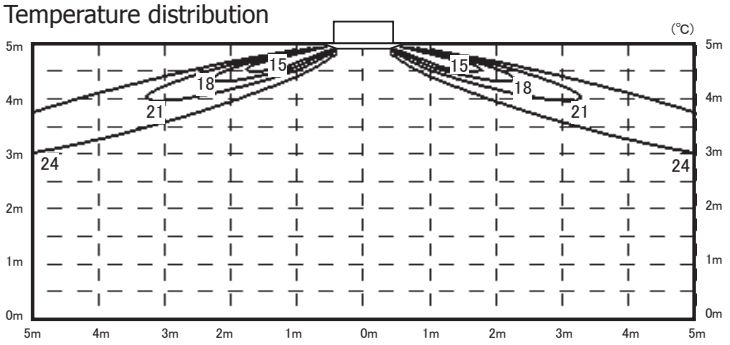
Models FDT40VH, 50VH

Cooling Air flow: P-Hi

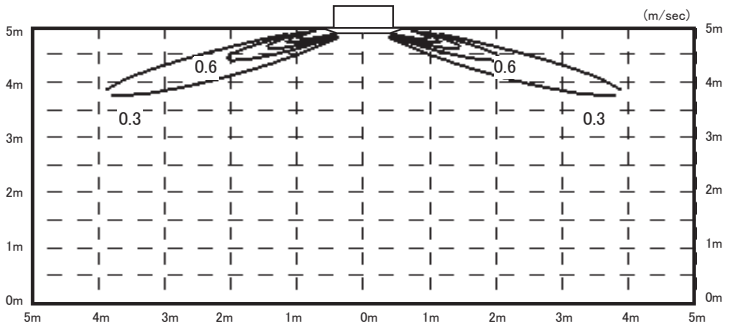
Louver position



Temperature distribution

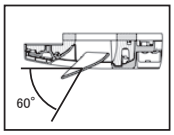


Velocity distribution

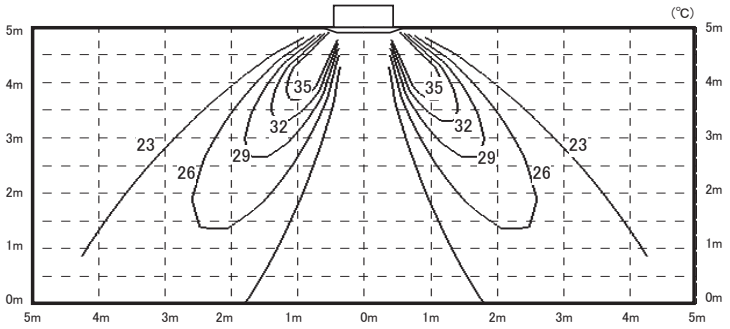


Heating Air flow: P-Hi

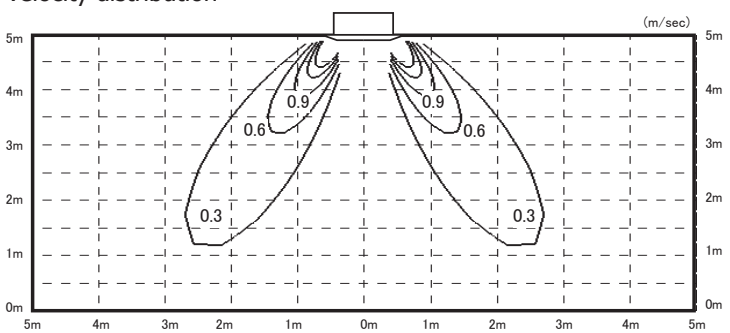
Louver position



Temperature distribution



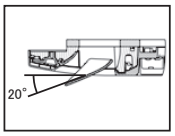
Velocity distribution



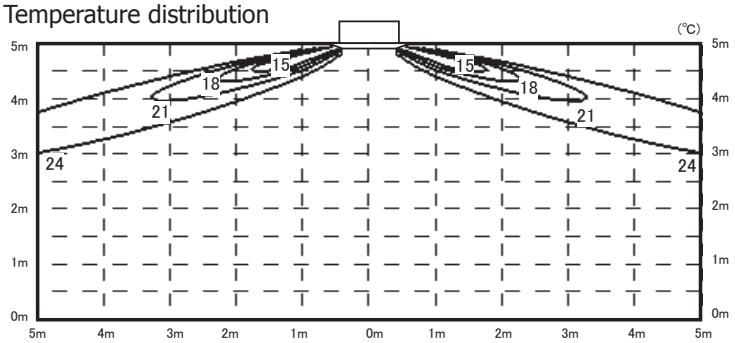
Model FDT60VH

Cooling Air flow: P-Hi

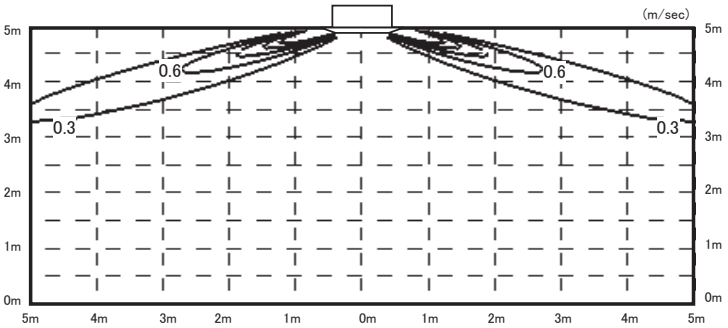
Louver position



Temperature distribution

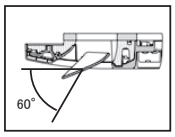


Velocity distribution

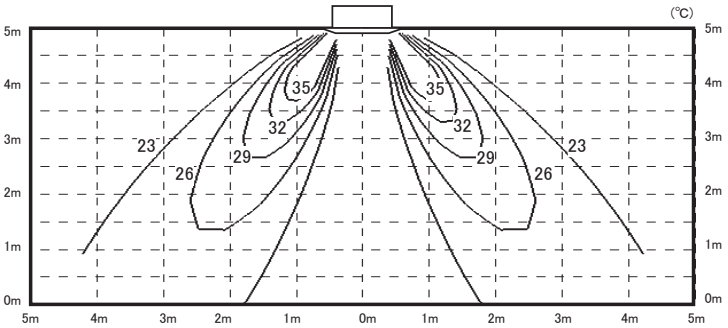


Heating Air flow: P-Hi

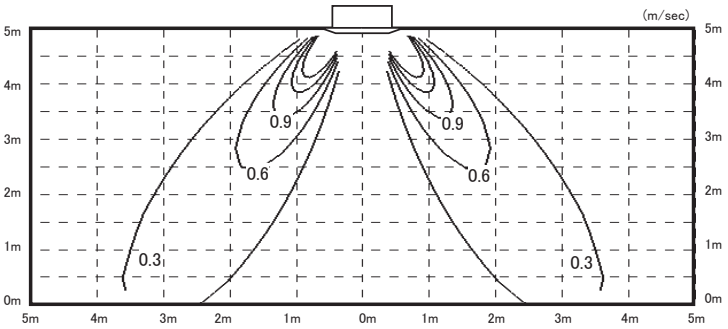
Louver position



Temperature distribution



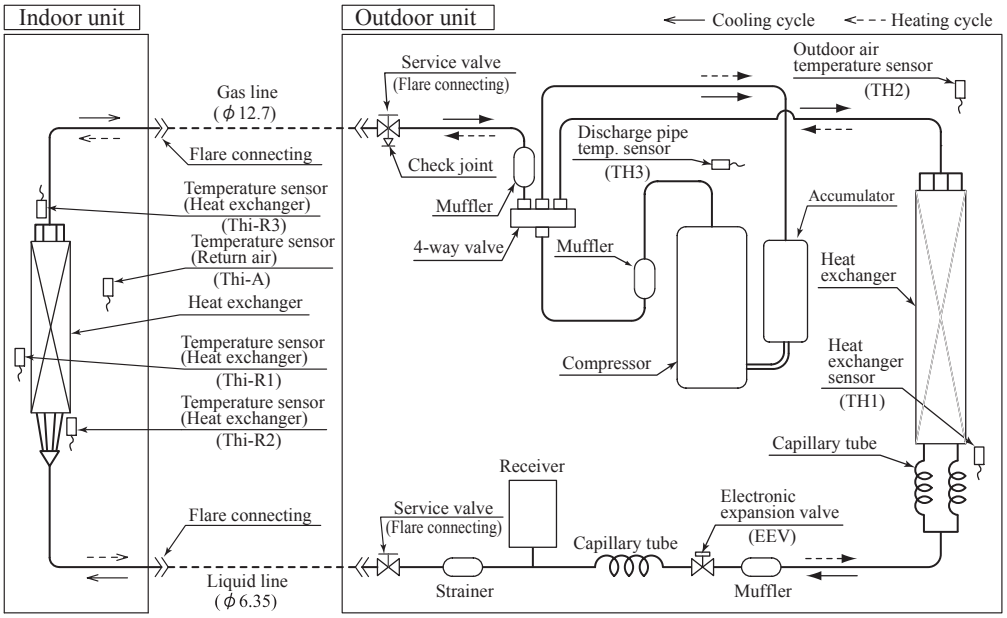
Velocity distribution



1.6 PIPING SYSTEM

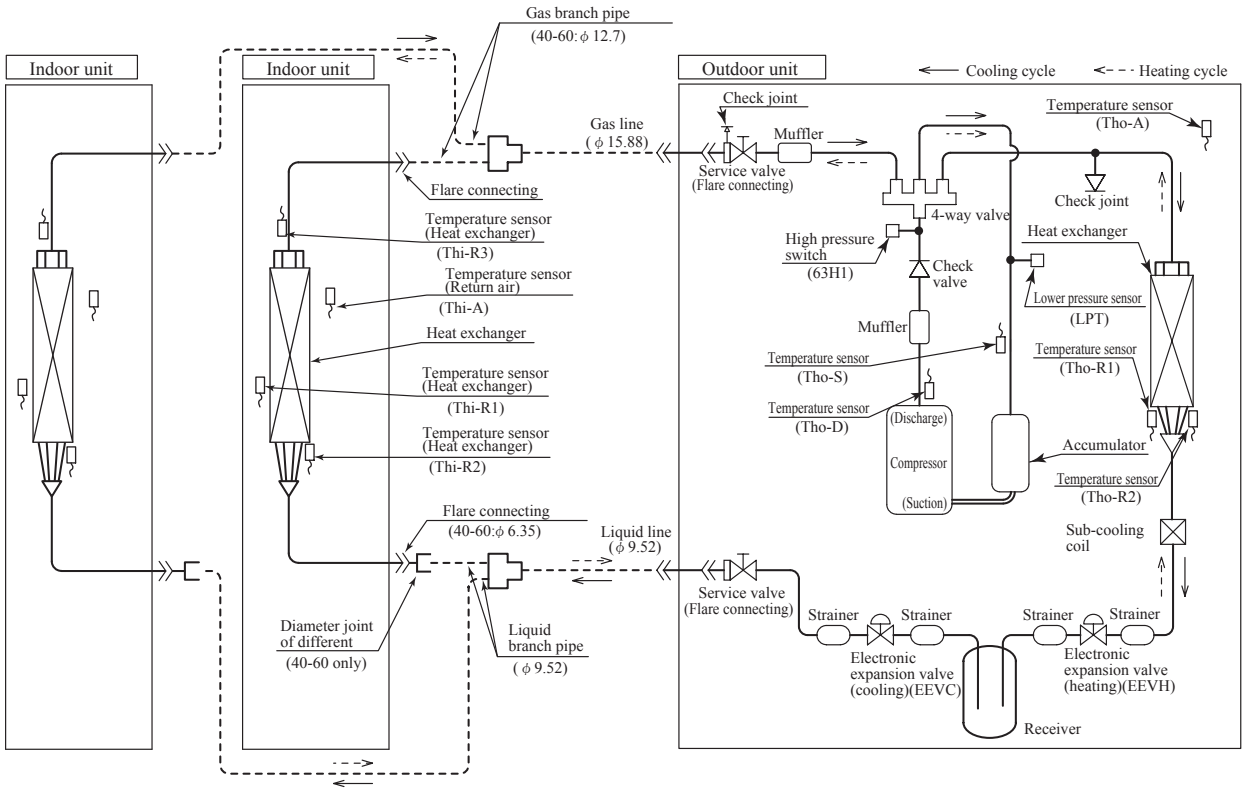
(1) Single type

Models 40, 50, 60



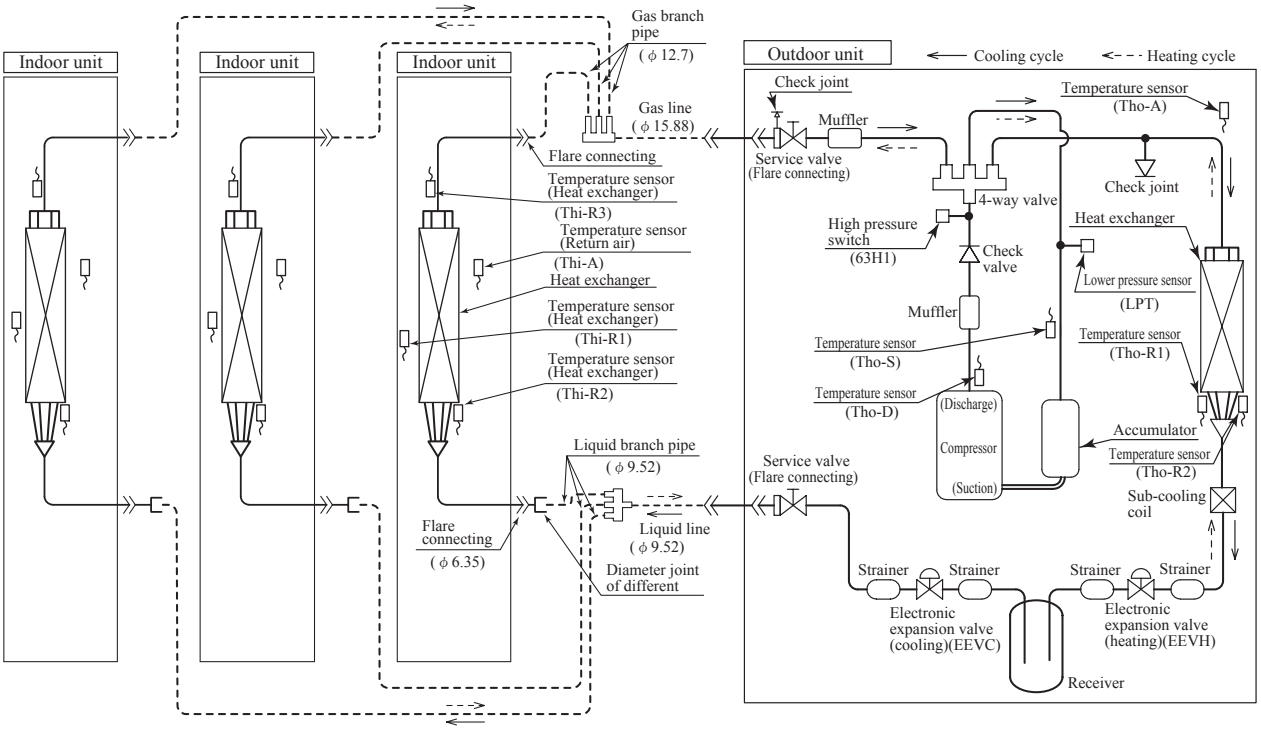
(2) Twin type

Models 71, 100, 125



(3) Triple type

Model 140



Preset point of the protective devices

Parts name	Mark	Equipped unit	FDT40, 50, 60 model	FDT71, 100, 125, 140 model
Temperature sensor (for protection overloading in heating)	**Thi-R**	Indoor unit	OFF 63℃ ON 56℃	
Temperature sensor (for frost prevention)	**Thi-R**		OFF 1.0℃ ON 10℃	
Temperature sensor (for protection high pressure in cooling.)	**Tho-R (TH1)**	Outdoor unit	OFF 63℃ ON 53℃	OFF 65℃ ON 51℃
Temperature sensor (for detecting discharge pipe temp.)	**Tho-D (TH3)**	Outdoor unit	OFF 115℃ ON 95℃	OFF 115℃ ON 85℃
High pressure switch (for protection)	**63H1**	Outdoor unit	—	OFF 4.15MPa ON 3.15MPa
Low pressure sensor (for protection)	**LPT**	Outdoor unit	—	OFF 0.079MPa ON 0.227MPa

Note(1) Values in ( ) shown in the case of SRC40, 50, 60 models.

1.7 RANGE OF USAGE & LIMITATIONS

Operating temperature range		See the next page.
		When snow accumulate, install a snow hood. <SRC40−60> When used below -5˚C, install a snow hood. <FDC71−140>
Recommendable area to install		Considering to get sufficient heating capacity, the area where the averaged lowest ambient air temperature in day time during winter is above 0˚C, and it has no accumulation of snow.
Installation site		The limitations of installation space are shown in the page for outline drawing. Install the indoor unit at least 2.5m higher than the floor surface.
Temperature and humidity conditions surrounding the indoor unit in the ceiling (Note 2)		Dew point temperature : 23˚C or less, relative hummdity : 80% or less<SRC40−60> Dew point temperature : 28˚C or less, relative hummdity : 80% or less<FDC71−140>
Limitations on unit and piping installation		See page 36 and 37.
Compressor ON-OFF cycling	Cycle time	Max.4 times/h (Inching prevention 10 minutes)<SRC40−60> 7 minutes or mMax.ore (from OFF to OFF) or (from ON to ON)<FDC71−140>
	Stop time	3 minutes or more
Power source	Voltage range	Rating ±10%
	Voltage drop at start-up	Min.85% of rating
	Phase-to-phase umbalance	3% or less

Note 1. Do not install the unit in places which :
1) Flammable gas may leak.
2) Carbon fiber, metal particles, powder, etc. are floating.
3) Cosmetic or special sprays are used frequently.
4) Exposed to oil splashes or steam (e.g. kitchen and machine plant).
5) Exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent).
6) Exposed to ammonia substance (e.g. organic fertilizer).
7) Matters affecting devices, such as sulfuric gas, chlorine gas, acid, alkali, etc. may generate or accumulate.
8) Chimney smoke is hanging.
9) Sucking the exhaust gas from heat exchanger.
10) Adjacent to equipment generating electromagnetic waves or high frequency waves.
11) There is light beams that affect the receiving device of indoor unit in case of the wireless specification.
12) Snow falls heavily.
13) At an elevation of 1000 meters or higher.
14) On mobile machine (e.g. vehicle, ship, etc.)
15) Splashed with water to indoor unit (e.g. laundry room).
16) Indoor units of twin and triple specifications separately in a room with partition.

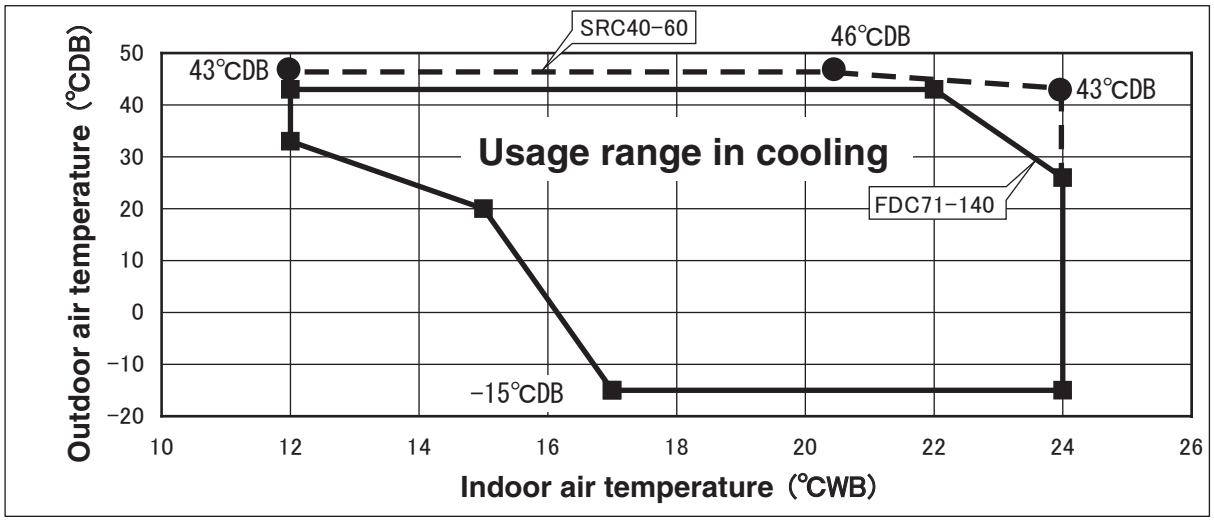
Note 2. If ambient temperature and humidity exceed the above values, add polyurethane foam insulation on the outer plate (10mm or thicker) of indoor unit.

Note 3. Both gas and liquid pipes need to be cover with 20mm or thicker heat insulation materials at the place where humidity exceeds 70%.

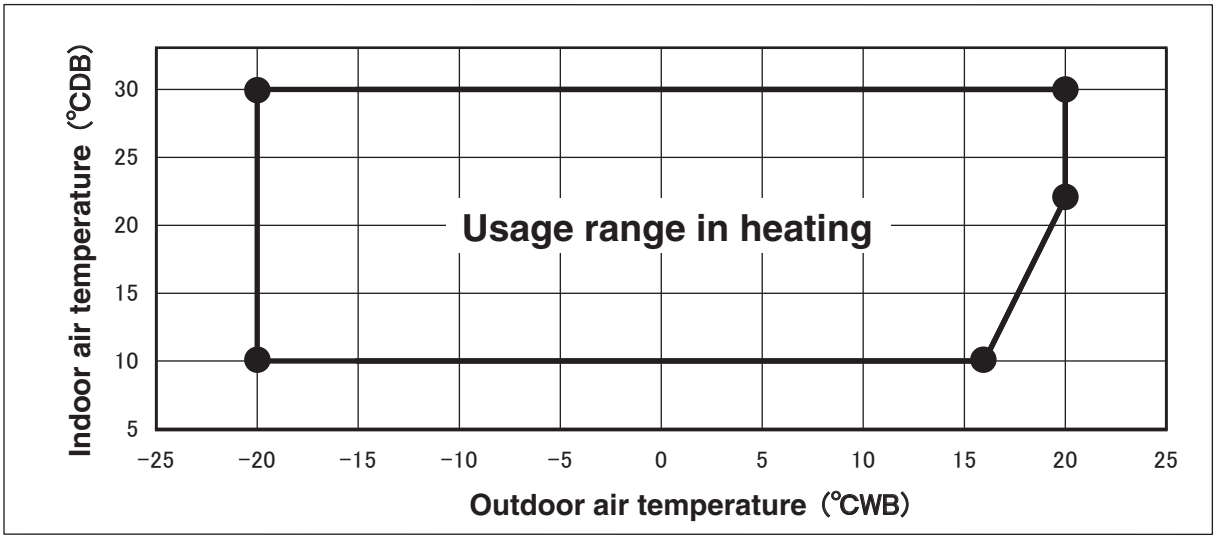
PCA001Z804
PJF000Z195 C

Operating temperature range

■ **Cooling**



■ **Heating**



Decline in cooling and heating capacity or operation stop may occur when the outdoor unit is installed in places where natural wind can increase or decrease its design air flow rate.

"CAUTION" Cooling operation under low outdoor air temperature conditions

PAC models can be operated in cooling mode at low outdoor air temperature condition within above temperature range. However in case of severely low temperature conditions if the following precaution is not observed, it may not be operated in spite of operable temperature range mentioned above and cooling capacity may not be established under certain conditions.

[Precaution]

In case of severely low temperature condition

1) Install the outdoor unit at the place where strong wind cannot blow directly into the outdoor unit.
2) If there is no installation place where can prevent strong wind from directly blowing into the outdoor unit, mount the flex flow adapter (prepared as option part) or like such devices onto the outdoor unit in order to divert the strong wind.

[Reason]

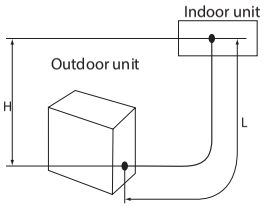
Under the low outdoor air temperature conditions of -5℃ or lower, the outdoor fan is controlled at lower or lowest speed by outdoor fan control, but if strong wind directly blow into the outdoor unit, the outdoor heat exchanger temperature will drop more.

This makes high and low pressures to drop as well. This low pressure drop makes the indoor heat exchanger temperature to drop and will activate anti-frost control at indoor heat exchanger at frequent intervals, that cooling operation may not be established for any given time.

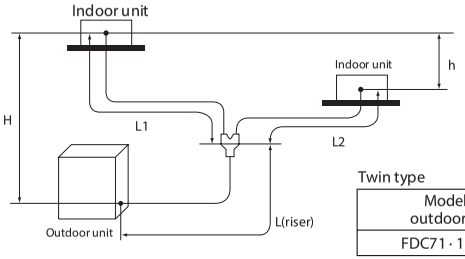
Limitation on unit and piping installation - single, twin.

Descriptions	Models for outdoor unit		Dimensional limitations	Marks appearing in the drawing	
				Single type	Twin type
One-way pipe length	SRC40 · 50 · 60		≦ 30m	L	
	FDC71		≦ 50m		
	FDC100 · 125		≦ 100m		L + L1 + L2
Main pipe length	FDC71		≦ 50m		L
	FDC100 · 125		≦ 100m		
One-way pipe length after first branching point	FDC71		≦ 20m		L1, L2
	FDC100 · 125		≦ 30m		
Difference of pipe length after first branching point			≦ 10m		L1 - L2 L2 - L1
Total pipe length after the second branching point			≦ 15m		
Elevation difference between indoor and outdoor unit	When outdoor unit is positioned higher	SRC40 · 50 · 60	≦ 20m	H	H
		FDC71	≦ 30m		
		FDC100 · 125			
	When outdoor unit is positioned lower	SRC40 · 50 · 60	≦ 20m	H	H
		FDC71	≦ 15m		
		FDC100 · 125			
Elevation difference among indoor units			≦ 0.5m		h

Single type



Twin type



Twin type

Model for outdoor units	Branch piping set (option)
FDC71 · 100 · 125	DIS-WA1G

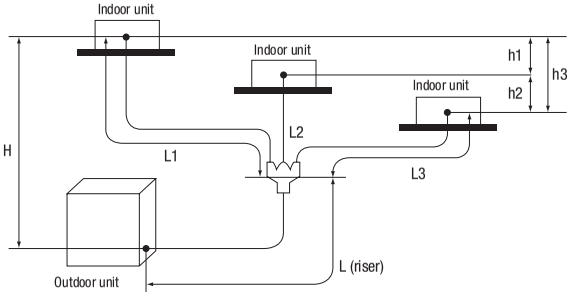
(1) A riser pipe must be part of the main.
A branching pipe set should be installed horizontally at point as close to an indoor unit as possible.
(2) Reduce refrigerant amount by according to table below from the factory charge when refrigerant piping is shorter than 3m.

Model for outdoor units	Refrigerant to be reduced
FDC71 · 100 · 125	1.0 kg

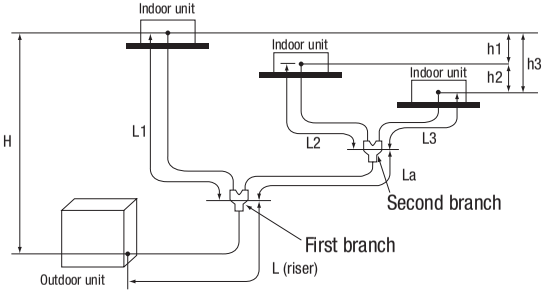
Limitation on unit and piping installation - triple.

Descriptions	Models for outdoor unit	Dimensional limitations	Marks appearing in the drawing	
			Triple type A	Triple type B
One-way pipe length	FDC140	≦ 100m	L + L1 + L2 + L3	L + La + L1 + L2 + L3 ※1
Main pipe length	FDC140	≦ 100m	L	L
One-way pipe length first branching point to indoor units between	FDC140	≦ 30m	L1,L2,L3	L1 ※1
One-way pipe length between first branching point from and second branching point	FDC140	≦ 5m		La
One-way pipe length first branching point and indoor units	FDC140	≦ 27m		La + L2,La + L3 ※1
Piping length difference among piping to indoor units from first branch		< 3m	L1 - L2,L1 - L3,L2 - L3	(not possible)
		3m ≦, ≦ 10m	(not possible)	L1 - (La + L2),L1 - (La + L3) ※1
One-way pipe length difference from second branching point to indoor units		≦ 10m		L2 - L3
Elevation difference between indoor and outdoor	When the outdoor unit is positioned higher	≦ 30m	H	H
	When the outdoor unit is positioned lower	≦ 15m		
Elevation difference among indoor units		≦ 0.5m	h1,h2,h3	h1,h2, h3

Triple type A



Triple type B



※1
Install the indoor units so that L + L1 becomes the longest one-way pipe.
Keep the pipe length difference between L1 and (La + L2) or (La + L3) within 10m.

Branch piping set (option)

Model for outdoor units	Triple type A	Triple type B	
	Branch piping	First branch	Second branch
FDC140	DIS-TA1G	DIS-WA1G	DIS-WA1G

(1) A riser pipe must be part of the main.
A branching pipe set should be installed horizontally at point as close to an indoor unit as possible.
(2) Reduce refrigerant amount by 1.0kg from the factory charge when refrigerant piping is shorter than 3m.

1.8 SELECTION CHART

Correct the cooling and heating capacity in accordance with the operating conditions. The net cooling and heating capacity can be obtained in the following way.

Net capacity = Capacity shown in the capacity tables (1.8.1) × Correction factors shown in the table (1.8.2) (1.8.3) (1.8.4).

Caution: In case that the cooling operation during low outdoor air temperature below -5°C is expected, install the outdoor unit where it is not influenced by natural wind. Otherwise protection control by low pressure will be activated much more frequently and it will cause insufficient capacity or breakdown of the compressor in worst case.

1.8.1 Capacity tables

Model FDT40ZSXVH Indoor unit FDT40VH Outdoor unit SRC40ZSX-S

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 °CDB		21 °CDB		23 °CDB		26 °CDB		27 °CDB		28 °CDB		31 °CDB		33 °CDB	
	12 °CWB		14 °CWB		16 °CWB		18 °CWB		19 °CWB		20 °CWB		22 °CWB		24 °CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					3.38	3.31	3.56	3.49	3.65	3.58	3.75	3.68	3.95	3.87	4.15	3.90
13					3.46	3.39	3.65	3.58	3.75	3.68	3.85	3.76	4.05	3.97	4.26	3.91
15					3.54	3.47	3.74	3.67	3.84	3.76	3.95	3.78	4.15	4.04	4.36	3.93
17					3.62	3.55	3.83	3.75	3.94	3.85	4.04	3.80	4.26	4.06	4.47	3.95
19					3.69	3.57	3.91	3.83	4.02	3.87	4.15	3.83	4.41	4.09	4.67	3.98
21					3.81	3.60	3.99	3.91	4.10	3.89	4.26	3.85	4.56	4.12	4.87	4.01
23					3.85	3.61	4.04	3.96	4.15	3.91	4.30	3.86	4.59	4.13	4.88	4.01
25			3.73	3.66	3.89	3.63	4.08	3.97	4.20	3.92	4.34	3.87	4.61	4.13	4.89	4.01
27			3.76	3.68	3.93	3.64	4.13	3.98	4.25	3.93	4.36	3.87	4.60	4.13		
29			3.70	3.63	3.86	3.62	4.06	3.96	4.18	3.91	4.30	3.86	4.54	4.12		
31			3.64	3.57	3.80	3.60	4.00	3.92	4.12	3.90	4.24	3.85	4.48	4.11		
33	3.23	3.17	3.44	3.37	3.74	3.58	3.94	3.86	4.06	3.88	4.18	3.83	4.42	4.09		
35	3.28	3.21	3.44	3.37	3.68	3.56	3.88	3.80	4.00	3.87	4.12	3.82	4.36	4.08		
37	3.23	3.17	3.38	3.31	3.62	3.55	3.82	3.74	3.94	3.85	4.06	3.81	4.30	4.07		
39	3.17	3.11	3.32	3.25	3.56	3.49	3.76	3.68	3.88	3.80	4.00	3.79	4.23	4.06		
41	3.12	3.06	3.27	3.20	3.50	3.43	3.70	3.63	3.82	3.74	3.93	3.78	4.17	4.05		
43	3.06	3.00	3.21	3.15	3.44	3.37	3.64	3.57	3.76	3.68	3.87	3.76	4.10	4.02		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	2.19	2.15	2.11	2.06	2.01
-17.7	-18	2.34	2.30	2.26	2.22	2.17
-15.7	-16	2.50	2.46	2.42	2.38	2.33
-13.5	-14	2.67	2.63	2.59	2.55	2.50
-11.5	-12	2.83	2.79	2.75	2.71	2.67
-9.5	-10	3.00	2.96	2.92	2.88	2.84
-7.5	-8	3.17	3.13	3.09	3.05	3.01
-5.5	-6	3.23	3.20	3.16	3.12	3.09
-3.0	-4	3.29	3.26	3.23	3.20	3.17
-1.0	-2	3.36	3.33	3.30	3.28	3.25
1.0	0	3.42	3.40	3.38	3.35	3.33
2.0	1	3.45	3.43	3.41	3.39	3.37
3.0	2	3.67	3.65	3.63	3.61	3.59
5.0	4	4.11	4.09	4.07	4.04	4.01
7.0	6	4.55	4.53	4.50	4.47	4.44
9.0	8	4.78	4.75	4.72	4.69	4.66
11.5	10	5.01	4.98	4.95	4.91	4.88
13.5	12	5.30	5.26	5.21	5.14	5.10
15.5	14	5.58	5.53	5.48	5.37	5.32
16.5	16	5.73	5.67	5.61	5.48	5.44

PJF000Z587

Model FDT50ZSXVH Indoor unit FDT50VH Outdoor unit SRC50ZSX-S

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 °CDB		21 °CDB		23 °CDB		26 °CDB		27 °CDB		28 °CDB		31 °CDB		33 °CDB	
	12 °CWB		14 °CWB		16 °CWB		18 °CWB		19 °CWB		20 °CWB		22 °CWB		24 °CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					4.22	3.98	4.45	4.36	4.56	4.31	4.69	4.24	4.94	4.53	5.19	4.38
13					4.32	4.01	4.56	4.40	4.68	4.33	4.81	4.26	5.07	4.55	5.32	4.39
15					4.42	4.03	4.68	4.43	4.80	4.36	4.93	4.29	5.19	4.56	5.45	4.41
17					4.53	4.06	4.79	4.45	4.92	4.38	5.06	4.31	5.32	4.59	5.58	4.42
19					4.62	4.09	4.89	4.48	5.02	4.40	5.19	4.34	5.51	4.62	5.84	4.46
21					4.76	4.13	4.99	4.50	5.13	4.43	5.32	4.36	5.70	4.65	6.09	4.49
23					4.81	4.14	5.04	4.51	5.19	4.44	5.37	4.37	5.73	4.65	6.10	4.49
25			4.66	4.38	4.86	4.15	5.10	4.52	5.25	4.45	5.42	4.38	5.76	4.66	6.11	4.49
27			4.70	4.40	4.91	4.17	5.16	4.54	5.31	4.47	5.46	4.39	5.75	4.66		
29			4.62	4.37	4.83	4.15	5.08	4.52	5.23	4.45	5.38	4.38	5.68	4.64		
31			4.54	4.35	4.75	4.12	5.00	4.50	5.15	4.43	5.30	4.36	5.60	4.63		
33	4.04	3.93	4.31	4.22	4.67	4.10	4.93	4.48	5.08	4.42	5.23	4.35	5.53	4.62		
35	4.11	3.95	4.30	4.21	4.59	4.08	4.85	4.47	5.00	4.40	5.15	4.33	5.45	4.61		
37	4.04	3.93	4.23	4.15	4.52	4.06	4.77	4.45	4.92	4.38	5.07	4.31	5.37	4.59		
39	3.97	3.89	4.16	4.08	4.45	4.04	4.70	4.43	4.85	4.37	4.99	4.30	5.29	4.58		
41	3.90	3.82	4.09	4.01	4.38	4.02	4.62	4.41	4.77	4.35	4.92	4.28	5.21	4.57		
43	3.83	3.75	4.01	3.93	4.30	4.00	4.55	4.40	4.69	4.33	4.84	4.27	5.13	4.56		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	2.63	2.58	2.53	2.47	2.42
-17.7	-18	2.81	2.77	2.72	2.66	2.61
-15.7	-16	3.00	2.95	2.91	2.85	2.80
-13.5	-14	3.20	3.15	3.11	3.05	3.00
-11.5	-12	3.40	3.35	3.31	3.26	3.20
-9.5	-10	3.60	3.55	3.51	3.46	3.41
-7.5	-8	3.80	3.75	3.71	3.66	3.61
-5.5	-6	3.88	3.83	3.79	3.75	3.71
-3.0	-4	3.95	3.92	3.88	3.84	3.80
-1.0	-2	4.03	4.00	3.97	3.93	3.90
1.0	0	4.10	4.08	4.05	4.03	4.00
2.0	1	4.14	4.12	4.10	4.07	4.05
3.0	2	4.41	4.38	4.36	4.33	4.30
5.0	4	4.94	4.91	4.88	4.85	4.82
7.0	6	5.46	5.43	5.40	5.37	5.33
9.0	8	5.74	5.70	5.67	5.63	5.59
11.5	10	6.02	5.98	5.94	5.89	5.85
13.5	12	6.36	6.31	6.25	6.17	6.12
15.5	14	6.70	6.64	6.57	6.44	6.39
16.5	16	6.87	6.80	6.73	6.58	6.52

PJF000Z587

Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)
HC : Heating capacity (kW)

Model FDT60ZSXVH Indoor unit FDT60VH Outdoor unit SRC60ZSX-S

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃DB		21 ℃DB		23 ℃DB		26 ℃DB		27 ℃DB		28 ℃DB		31 ℃DB		33 ℃DB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					4.73	4.64	4.98	4.88	5.11	5.01	5.25	5.15	5.53	5.42	5.81	5.67
13					4.84	4.74	5.11	5.01	5.24	5.14	5.39	5.28	5.67	5.56	5.96	5.70
15					4.95	4.85	5.24	5.14	5.38	5.27	5.52	5.41	5.82	5.70	6.11	5.73
17					5.07	4.97	5.37	5.26	5.51	5.40	5.66	5.52	5.96	5.84	6.25	5.76
19					5.17	5.07	5.48	5.37	5.63	5.52	5.81	5.56	6.17	5.95	6.54	5.82
21					5.33	5.21	5.59	5.48	5.74	5.63	5.96	5.60	6.39	6.00	6.82	5.88
23					5.39	5.23	5.65	5.54	5.81	5.66	6.01	5.61	6.42	6.01	6.83	5.88
25			5.22	5.12	5.44	5.24	5.71	5.60	5.88	5.68	6.07	5.63	6.45	6.01	6.84	5.89
27			5.27	5.16	5.50	5.26	5.78	5.66	5.94	5.70	6.11	5.64	6.44	6.01		
29			5.18	5.08	5.41	5.23	5.69	5.58	5.86	5.67	6.02	5.61	6.36	5.99		
31			5.09	4.99	5.32	5.20	5.60	5.49	5.77	5.65	5.94	5.59	6.27	5.97		
33	4.53	4.44	4.82	4.72	5.23	5.13	5.52	5.41	5.69	5.58	5.85	5.57	6.19	5.95		
35	4.60	4.51	4.81	4.71	5.15	5.05	5.43	5.32	5.60	5.49	5.77	5.54	6.10	5.93		
37	4.52	4.43	4.73	4.64	5.06	4.96	5.35	5.24	5.51	5.40	5.68	5.52	6.01	5.89		
39	4.44	4.35	4.65	4.56	4.98	4.88	5.26	5.15	5.43	5.32	5.59	5.48	5.92	5.80		
41	4.37	4.28	4.58	4.49	4.90	4.80	5.18	5.08	5.34	5.23	5.51	5.40	5.83	5.71		
43	4.29	4.20	4.50	4.41	4.82	4.72	5.10	5.00	5.26	5.15	5.42	5.31	5.74	5.63		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature ℃DB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20	3.26	3.20	3.14	3.07	3.00
-17.7	-18	3.49	3.43	3.37	3.30	3.24
-15.7	-16	3.72	3.66	3.61	3.54	3.48
-13.5	-14	3.97	3.91	3.85	3.79	3.73
-11.5	-12	4.22	4.16	4.10	4.04	3.98
-9.5	-10	4.47	4.41	4.35	4.29	4.23
-7.5	-8	4.72	4.66	4.60	4.54	4.48
-5.5	-6	4.81	4.76	4.70	4.65	4.60
-3.0	-4	4.90	4.86	4.81	4.77	4.72
-1.0	-2	5.00	4.96	4.92	4.88	4.84
1.0	0	5.09	5.06	5.03	4.99	4.96
2.0	1	5.14	5.11	5.08	5.05	5.02
3.0	2	5.47	5.44	5.41	5.37	5.34
5.0	4	6.12	6.09	6.05	6.01	5.98
7.0	6	6.78	6.74	6.70	6.66	6.61
9.0	8	7.12	7.08	7.03	6.98	6.94
11.5	10	7.47	7.41	7.36	7.31	7.26
13.5	12	7.89	7.82	7.76	7.65	7.59
15.5	14	8.31	8.23	8.15	7.99	7.93
16.5	16	8.53	8.44	8.35	8.16	8.09

PJF000Z587

(2) Twin type

Model FDT71VNXPVH Indoor unit FDT40VH (2units) Outdoor unit FDC71VNX

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃DB		21 ℃DB		23 ℃DB		26 ℃DB		27 ℃DB		28 ℃DB		31 ℃DB		33 ℃DB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					4.87	4.77	6.02	5.90	6.59	6.46	6.79	6.65	7.19	7.05	7.59	7.44
13					5.33	5.22	6.32	6.19	6.82	6.68	7.03	6.89	7.45	7.30	7.88	7.72
15					5.79	5.67	6.63	6.50	7.05	6.91	7.27	7.12	7.71	7.56	8.16	7.77
17					6.26	6.13	6.94	6.80	7.27	7.12	7.51	7.36	7.97	7.81	8.44	7.82
19					6.59	6.46	7.16	7.02	7.44	7.29	7.68	7.52	8.15	7.99	8.63	7.85
21					6.93	6.79	7.38	7.23	7.60	7.45	7.84	7.55	8.33	8.09	8.82	7.88
23					6.91	6.77	7.35	7.20	7.57	7.42	7.81	7.54	8.30	8.09	8.78	7.87
25			6.46	6.33	6.89	6.75	7.32	7.17	7.54	7.39	7.78	7.54	8.26	8.08	8.74	7.86
27			6.45	6.32	6.87	6.73	7.30	7.15	7.52	7.37	7.74	7.53	8.18	8.02		
29			6.34	6.21	6.75	6.62	7.19	7.05	7.41	7.26	7.64	7.49	8.09	7.93		
31			6.23	6.11	6.64	6.51	7.08	6.94	7.31	7.16	7.54	7.39	7.99	7.83		
33	5.77	5.65	6.05	5.93	6.53	6.40	6.97	6.83	7.20	7.06	7.44	7.29	7.90	7.74		
35	5.67	5.56	5.95	5.83	6.42	6.29	6.86	6.72	7.10	6.96	7.34	7.19	7.81	7.65		
37	5.58	5.47	5.85	5.73	6.31	6.18	6.72	6.59	6.95	6.81	7.18	7.04	7.64	7.49		
39	5.49	5.38	5.76	5.64	6.20	6.08	6.59	6.46	6.81	6.67	7.03	6.89	7.46	7.31		
41	5.39	5.28	5.67	5.56	6.09	5.97	6.45	6.32	6.66	6.53	6.87	6.73	7.29	7.14		
43	5.30	5.19	5.57	5.46	5.97	5.85	6.31	6.18	6.51	6.38	6.71	6.58	7.12	6.98		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature ℃DB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20	3.95	3.93	3.91	3.88	3.86
-17.7	-18	4.18	4.16	4.14	4.11	4.09
-15.7	-16	4.42	4.39	4.37	4.34	4.32
-13.5	-14	4.68	4.65	4.63	4.60	4.57
-11.5	-12	4.94	4.91	4.88	4.85	4.82
-9.5	-10	5.20	5.17	5.14	5.11	5.08
-7.5	-8	5.46	5.43	5.40	5.36	5.33
-5.5	-6	5.59	5.55	5.52	5.48	5.44
-3.0	-4	5.71	5.68	5.64	5.60	5.56
-1.0	-2	5.84	5.80	5.76	5.72	5.67
1.0	0	5.97	5.92	5.88	5.83	5.79
2.0	1	6.03	5.98	5.94	5.89	5.85
3.0	2	6.45	6.40	6.35	6.30	6.25
5.0	4	7.29	7.23	7.18	7.12	7.06
7.0	6	8.13	8.06	8.00	7.93	7.87
9.0	8	8.42	8.36	8.29	8.23	8.16
11.5	10	8.72	8.65	8.59	8.52	8.46
13.5	12	9.20	9.13	9.06	9.00	8.92
15.5	14	9.69	9.61	9.53	9.47	9.39
16.5	16	9.93	9.85	9.77	9.71	9.62

PJF000Z587

Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)
HC : Heating capacity (kW)

Model FDT100VNXPVH Indoor unit FDT50VH (2 uints) Outdoor unit FDC100VNX

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃DB		21 ℃DB		23 ℃DB		26 ℃DB		27 ℃DB		28 ℃DB		31 ℃DB		33 ℃DB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					8.33	7.93	8.84	8.66	9.10	8.61	9.38	8.48	9.94	9.06	10.50	8.77
13					8.63	8.01	9.17	8.81	9.43	8.68	9.73	8.55	10.32	9.12	10.92	8.82
15					8.93	8.09	9.49	8.88	9.77	8.75	10.09	8.62	10.71	9.18	11.34	8.87
17					9.23	8.17	9.82	8.96	10.11	8.82	10.44	8.69	11.10	9.25	11.75	8.92
19					9.44	8.23	10.04	9.01	10.34	8.87	10.68	8.74	11.35	9.29	12.01	8.96
21					9.64	8.29	10.26	9.06	10.57	8.92	10.91	8.78	11.59	9.33	12.28	9.00
23					9.64	8.29	10.28	9.07	10.59	8.93	10.94	8.79	11.63	9.33	12.32	9.00
25			8.95	8.65	9.64	8.29	10.30	9.07	10.62	8.93	10.97	8.79	11.66	9.34	12.36	9.01
27			8.91	8.64	9.64	8.29	10.33	9.08	10.64	8.94	10.96	8.79	11.59	9.33		
29			8.84	8.62	9.51	8.25	10.16	9.04	10.48	8.90	10.80	8.76	11.45	9.30		
31			8.76	8.58	9.37	8.21	10.00	9.00	10.32	8.87	10.65	8.73	11.30	9.28		
33	8.21	7.90	8.58	8.41	9.23	8.17	9.83	8.96	10.16	8.83	10.49	8.70	11.15	9.25		
35	7.77	7.61	8.31	8.14	9.09	8.13	9.66	8.92	10.00	8.80	10.34	8.67	11.01	9.23		
37	7.68	7.53	8.18	8.02	8.92	8.09	9.49	8.88	9.81	8.76	10.13	8.63	10.77	9.19		
39	7.58	7.43	8.04	7.88	8.76	8.05	9.31	8.84	9.62	8.72	9.93	8.59	10.54	9.15		
41	7.49	7.34	7.91	7.75	8.59	8.00	9.14	8.80	9.43	8.68	9.73	8.55	10.31	9.12		
43	7.40	7.25	7.78	7.62	8.42	7.96	8.96	8.76	9.24	8.64	9.52	8.51	10.08	9.08		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature				
		℃DB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20	7.30	7.24	7.18	7.12	7.06
-17.7	-18	7.74	7.68	7.62	7.55	7.49
-15.7	-16	8.18	8.12	8.05	7.99	7.92
-13.5	-14	8.54	8.47	8.40	8.33	8.27
-11.5	-12	8.89	8.82	8.75	8.68	8.61
-9.5	-10	9.25	9.17	9.10	9.03	8.95
-7.5	-8	9.60	9.53	9.45	9.38	9.30
-5.5	-6	10.00	9.92	9.84	9.76	9.68
-3.0	-4	10.39	10.31	10.23	10.14	10.06
-1.0	-2	10.79	10.70	10.62	10.53	10.44
1.0	0	11.18	11.09	11.01	10.91	10.82
2.0	1	11.38	11.29	11.20	11.10	11.01
3.0	2	11.38	11.29	11.20	11.10	11.01
5.0	4	11.38	11.29	11.20	11.11	11.01
7.0	6	11.37	11.29	11.20	11.11	11.01
9.0	8	11.85	11.76	11.67	11.58	11.48
11.5	10	12.32	12.23	12.15	12.05	11.95
13.5	12	12.97	12.88	12.78	12.68	12.72
15.5	14	13.62	13.52	13.41	13.32	13.49
16.5	16	13.95	13.84	13.72	13.63	13.87

PJF000Z587

Model FDT100VSXPVH Indoor unit FDT50VH (2 uints) Outdoor unit FDC100VSX

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃DB		21 ℃DB		23 ℃DB		26 ℃DB		27 ℃DB		28 ℃DB		31 ℃DB		33 ℃DB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					8.33	7.93	8.84	8.66	9.10	8.61	9.38	8.48	9.94	9.06	10.50	8.77
13					8.63	8.01	9.17	8.81	9.43	8.68	9.73	8.55	10.32	9.12	10.92	8.82
15					8.93	8.09	9.49	8.88	9.77	8.75	10.09	8.62	10.71	9.18	11.34	8.87
17					9.23	8.17	9.82	8.96	10.11	8.82	10.44	8.69	11.10	9.25	11.75	8.92
19					9.44	8.23	10.04	9.01	10.34	8.87	10.68	8.74	11.35	9.29	12.01	8.96
21					9.64	8.29	10.26	9.06	10.57	8.92	10.91	8.78	11.59	9.33	12.28	9.00
23					9.64	8.29	10.28	9.07	10.59	8.93	10.94	8.79	11.63	9.33	12.32	9.00
25			8.95	8.65	9.64	8.29	10.30	9.07	10.62	8.93	10.97	8.79	11.66	9.34	12.36	9.01
27			8.91	8.64	9.64	8.29	10.33	9.08	10.64	8.94	10.96	8.79	11.59	9.33		
29			8.84	8.62	9.51	8.25	10.16	9.04	10.48	8.90	10.80	8.76	11.45	9.30		
31			8.76	8.58	9.37	8.21	10.00	9.00	10.32	8.87	10.65	8.73	11.30	9.28		
33	8.21	7.90	8.58	8.41	9.23	8.17	9.83	8.96	10.16	8.83	10.49	8.70	11.15	9.25		
35	7.77	7.61	8.31	8.14	9.09	8.13	9.66	8.92	10.00	8.80	10.34	8.67	11.01	9.23		
37	7.68	7.53	8.18	8.02	8.92	8.09	9.49	8.88	9.81	8.76	10.13	8.63	10.77	9.19		
39	7.58	7.43	8.04	7.88	8.76	8.05	9.31	8.84	9.62	8.72	9.93	8.59	10.54	9.15		
41	7.49	7.34	7.91	7.75	8.59	8.00	9.14	8.80	9.43	8.68	9.73	8.55	10.31	9.12		
43	7.40	7.25	7.78	7.62	8.42	7.96	8.96	8.76	9.24	8.64	9.52	8.51	10.08	9.08		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature				
		℃DB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20	11.29	11.20	11.11	11.02	10.93
-17.7	-18	11.34	11.25	11.16	11.06	10.97
-15.7	-16	11.38	11.29	11.20	11.11	11.02
-13.5	-14	11.38	11.29	11.20	11.11	11.02
-11.5	-12	11.38	11.29	11.20	11.11	11.02
-9.5	-10	11.38	11.29	11.20	11.11	11.02
-7.5	-8	11.37	11.29	11.20	11.11	11.02
-5.5	-6	11.38	11.29	11.20	11.11	11.02
-3.0	-4	11.38	11.29	11.20	11.11	11.01
-1.0	-2	11.38	11.29	11.20	11.11	11.01
1.0	0	11.38	11.29	11.20	11.10	11.01
2.0	1	11.38	11.29	11.20	11.10	11.01
3.0	2	11.38	11.29	11.20	11.10	11.01
5.0	4	11.38	11.29	11.20	11.11	11.01
7.0	6	11.37	11.29	11.20	11.11	11.01
9.0	8	11.85	11.76	11.67	11.58	11.48
11.5	10	12.32	12.23	12.15	12.05	11.95
13.5	12	12.97	12.88	12.78	12.68	12.72
15.5	14	13.62	13.52	13.41	13.32	13.49
16.5	16	13.95	13.84	13.72	13.63	13.87

PJF000Z587

Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed. (Cooling only)
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)
HC : Heating capacity (kW)

Model FDT125VNXPVH Indoor unit FDT60VH (2 uints) Outdoor unit FDC125VNX

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃CDB		21 ℃CDB		23 ℃CDB		26 ℃CDB		27 ℃CDB		28 ℃CDB		31 ℃CDB		33 ℃CDB	
	12 ℃CWB		14 ℃CWB		16 ℃CWB		18 ℃CWB		19 ℃CWB		20 ℃CWB		22 ℃CWB		24 ℃CWB	
℃CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					10.41	10.20	11.05	10.83	11.37	11.14	11.72	11.14	12.42	11.91	13.12	11.65
13					10.79	10.46	11.46	11.23	11.79	11.37	12.16	11.26	12.91	12.03	13.65	11.77
15					11.16	10.58	11.87	11.61	12.22	11.49	12.61	11.38	13.39	12.15	14.17	11.88
17					11.54	10.71	12.27	11.73	12.64	11.61	13.05	11.50	13.87	12.27	14.69	11.99
19					11.80	10.80	12.55	11.82	12.93	11.70	13.34	11.59	14.18	12.34	15.02	12.06
21					12.05	10.89	12.83	11.90	13.21	11.78	13.64	11.67	14.49	12.42	15.34	12.13
23					12.05	10.89	12.85	11.91	13.24	11.79	13.67	11.68	14.54	12.43	15.40	12.15
25			11.19	10.97	12.05	10.89	12.88	11.92	13.27	11.80	13.71	11.69	14.58	12.44	15.45	12.16
27			11.14	10.92	12.05	10.89	12.91	11.93	13.30	11.81	13.70	11.69	14.49	12.42		
29			11.05	10.83	11.88	10.83	12.70	11.86	13.10	11.75	13.51	11.63	14.31	12.38		
31			10.95	10.73	11.71	10.77	12.49	11.80	12.90	11.69	13.31	11.58	14.13	12.33		
33	10.26	10.05	10.73	10.52	11.53	10.71	12.29	11.74	12.70	11.63	13.11	11.52	13.94	12.28		
35	9.71	9.52	10.39	10.18	11.36	10.65	12.08	11.67	12.50	11.57	12.92	11.47	13.76	12.24		
37	9.60	9.41	10.22	10.02	11.15	10.58	11.86	11.60	12.26	11.50	12.67	11.40	13.47	12.17		
39	9.48	9.29	10.05	9.85	10.94	10.51	11.64	11.41	12.03	11.44	12.41	11.33	13.18	12.10		
41	9.36	9.17	9.89	9.69	10.74	10.44	11.42	11.19	11.79	11.37	12.16	11.26	12.89	12.03		
43	9.25	9.07	9.72	9.53	10.53	10.32	11.21	10.99	11.55	11.30	11.90	11.19	12.60	11.95		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature ℃CDB				
℃CDB	℃CWB	16	18	20	22	24
-19.8	-20	9.12	9.05	8.97	8.90	8.83
-17.7	-18	9.67	9.60	9.52	9.44	9.37
-15.7	-16	10.23	10.15	10.07	9.98	9.90
-13.5	-14	10.67	10.59	10.50	10.42	10.33
-11.5	-12	11.11	11.03	10.94	10.85	10.76
-9.5	-10	11.56	11.47	11.38	11.29	11.19
-7.5	-8	12.00	11.91	11.82	11.72	11.62
-5.5	-6	12.49	12.40	12.30	12.20	12.10
-3.0	-4	12.99	12.89	12.79	12.68	12.57
-1.0	-2	13.48	13.38	13.27	13.16	13.05
1.0	0	13.98	13.87	13.76	13.64	13.52
2.0	1	14.22	14.11	14.00	13.88	13.76
3.0	2	14.22	14.11	14.00	13.88	13.76
5.0	4	14.22	14.11	14.00	13.88	13.76
7.0	6	14.22	14.11	14.00	13.88	13.77
9.0	8	14.81	14.70	14.59	14.47	14.35
11.5	10	15.41	15.29	15.18	15.06	14.94
13.5	12	16.22	16.09	15.97	15.85	15.90
15.5	14	17.03	16.90	16.76	16.65	16.86
16.5	16	17.44	17.30	17.16	17.04	17.34

PJF000Z587

Model FDT125VSXPVH Indoor unit FDT60VH (2 uints) Outdoor unit FDC125VSX

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃CDB		21 ℃CDB		23 ℃CDB		26 ℃CDB		27 ℃CDB		28 ℃CDB		31 ℃CDB		33 ℃CDB	
	12 ℃CWB		14 ℃CWB		16 ℃CWB		18 ℃CWB		19 ℃CWB		20 ℃CWB		22 ℃CWB		24 ℃CWB	
℃CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					10.41	10.20	11.05	10.83	11.37	11.14	11.72	11.14	12.42	11.91	13.12	11.65
13					10.79	10.46	11.46	11.23	11.79	11.37	12.16	11.26	12.91	12.03	13.65	11.77
15					11.16	10.58	11.87	11.61	12.22	11.49	12.61	11.38	13.39	12.15	14.17	11.88
17					11.54	10.71	12.27	11.73	12.64	11.61	13.05	11.50	13.87	12.27	14.69	11.99
19					11.80	10.80	12.55	11.82	12.93	11.70	13.34	11.59	14.18	12.34	15.02	12.06
21					12.05	10.89	12.83	11.90	13.21	11.78	13.64	11.67	14.49	12.42	15.34	12.13
23					12.05	10.89	12.85	11.91	13.24	11.79	13.67	11.68	14.54	12.43	15.40	12.15
25			11.19	10.97	12.05	10.89	12.88	11.92	13.27	11.80	13.71	11.69	14.58	12.44	15.45	12.16
27			11.14	10.92	12.05	10.89	12.91	11.93	13.30	11.81	13.70	11.69	14.49	12.42		
29			11.05	10.83	11.88	10.83	12.70	11.86	13.10	11.75	13.51	11.63	14.31	12.38		
31			10.95	10.73	11.71	10.77	12.49	11.80	12.90	11.69	13.31	11.58	14.13	12.33		
33	10.26	10.05	10.73	10.52	11.53	10.71	12.29	11.74	12.70	11.63	13.11	11.52	13.94	12.28		
35	9.71	9.52	10.39	10.18	11.36	10.65	12.08	11.67	12.50	11.57	12.92	11.47	13.76	12.24		
37	9.60	9.41	10.22	10.02	11.15	10.58	11.86	11.60	12.26	11.50	12.67	11.40	13.47	12.17		
39	9.48	9.29	10.05	9.85	10.94	10.51	11.64	11.41	12.03	11.44	12.41	11.33	13.18	12.10		
41	9.36	9.17	9.89	9.69	10.74	10.44	11.42	11.19	11.79	11.37	12.16	11.26	12.89	12.03		
43	9.25	9.07	9.72	9.53	10.53	10.32	11.21	10.99	11.55	11.30	11.90	11.19	12.60	11.95		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature ℃CDB				
℃CDB	℃CWB	16	18	20	22	24
-19.8	-20	11.07	10.99	10.90	10.81	10.72
-17.7	-18	12.32	12.22	12.12	12.02	11.92
-15.7	-16	13.06	12.95	12.85	12.74	12.63
-13.5	-14	13.64	13.52	13.42	13.31	13.20
-11.5	-12	13.98	13.87	13.77	13.66	13.54
-9.5	-10	14.22	14.11	14.00	13.88	13.77
-7.5	-8	14.22	14.11	14.00	13.88	13.77
-5.5	-6	14.22	14.11	14.00	13.88	13.77
-3.0	-4	14.22	14.11	14.00	13.88	13.77
-1.0	-2	14.22	14.11	14.00	13.88	13.77
1.0	0	14.22	14.11	14.00	13.88	13.77
2.0	1	14.22	14.11	14.00	13.88	13.77
3.0	2	14.22	14.11	14.00	13.88	13.77
5.0	4	14.22	14.11	14.00	13.88	13.77
7.0	6	14.22	14.11	14.00	13.88	13.77
9.0	8	14.81	14.70	14.59	14.47	14.35
11.5	10	15.41	15.29	15.18	15.06	14.94
13.5	12	16.22	16.09	15.97	15.85	15.90
15.5	14	17.03	16.90	16.76	16.65	16.86
16.5	16	17.44	17.30	17.16	17.04	17.34

PJF000Z587

Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed.(Cooling only)
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)
HC : Heating capacity (kW)

(3) Triple type

Model FDT140VNXTVH Indoor unit FDT50VH (3 uints) Outdoor unit FDC140VNX

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃CDB		21 ℃CDB		23 ℃CDB		26 ℃CDB		27 ℃CDB		28 ℃CDB		31 ℃CDB		33 ℃CDB	
	12 ℃CWB		14 ℃CWB		16 ℃CWB		18 ℃CWB		19 ℃CWB		20 ℃CWB		22 ℃CWB		24 ℃CWB	
℃CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					11.66	8.87	12.38	9.60	12.73	9.42	13.13	9.26	13.91	9.74	14.70	9.34
13					12.08	9.00	12.83	9.72	13.21	9.54	13.62	9.37	14.45	9.84	15.28	9.43
15					12.50	9.12	13.29	9.84	13.68	9.66	14.12	9.48	14.99	9.95	15.87	9.53
17					12.92	9.26	13.75	9.97	14.16	9.78	14.62	9.60	15.54	10.06	16.45	9.62
19					13.21	9.35	14.06	10.05	14.48	9.87	14.95	9.68	15.88	10.13	16.82	9.69
21					13.50	9.44	14.36	10.14	14.80	9.95	15.28	9.76	16.23	10.20	17.19	9.75
23					13.50	9.44	14.40	10.15	14.83	9.96	15.31	9.77	16.28	10.21	17.25	9.76
25			12.53	9.86	13.50	9.44	14.43	10.16	14.87	9.97	15.35	9.78	16.33	10.22	17.30	9.77
27			12.48	9.84	13.50	9.44	14.46	10.17	14.90	9.98	15.34	9.78	16.23	10.20		
29			12.37	9.80	13.31	9.38	14.23	10.10	14.68	9.92	15.13	9.73	16.03	10.16		
31			12.26	9.76	13.11	9.32	13.99	10.03	14.45	9.86	14.91	9.67	15.82	10.12		
33	11.49	9.12	12.02	9.67	12.92	9.26	13.76	9.97	14.23	9.80	14.69	9.62	15.61	10.07		
35	10.88	8.88	11.63	9.54	12.72	9.19	13.53	9.90	14.00	9.74	14.47	9.57	15.41	10.03		
37	10.75	8.83	11.45	9.47	12.49	9.12	13.29	9.84	13.74	9.68	14.18	9.50	15.08	9.97		
39	10.62	8.78	11.26	9.41	12.26	9.05	13.04	9.77	13.47	9.61	13.90	9.43	14.76	9.90		
41	10.49	8.74	11.07	9.34	12.02	8.98	12.80	9.71	13.21	9.54	13.62	9.37	14.44	9.84		
43	10.35	8.68	10.89	9.28	11.79	8.91	12.55	9.64	12.94	9.48	13.33	9.30	14.11	9.78		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature				
		℃CDB				
℃CDB	℃CWB	16	18	20	22	24
-19.8	-20	10.42	10.34	10.26	10.17	10.09
-17.7	-18	11.06	10.97	10.88	10.79	10.70
-15.7	-16	11.69	11.60	11.50	11.41	11.32
-13.5	-14	12.20	12.10	12.00	11.91	11.81
-11.5	-12	12.70	12.60	12.50	12.40	12.30
-9.5	-10	13.21	13.11	13.00	12.90	12.79
-7.5	-8	13.71	13.61	13.50	13.39	13.28
-5.5	-6	14.28	14.17	14.06	13.94	13.83
-3.0	-4	14.84	14.73	14.61	14.49	14.37
-1.0	-2	15.41	15.29	15.17	15.04	14.91
1.0	0	15.97	15.85	15.72	15.59	15.45
2.0	1	16.26	16.13	16.00	15.86	15.73
3.0	2	16.25	16.13	16.00	15.86	15.73
5.0	4	16.25	16.13	16.00	15.86	15.73
7.0	6	16.25	16.12	16.00	15.87	15.73
9.0	8	16.93	16.80	16.68	16.54	16.40
11.5	10	17.61	17.48	17.35	17.21	17.07
13.5	12	18.53	18.39	18.25	18.12	18.17
15.5	14	19.46	19.31	19.16	19.02	19.27
16.5	16	19.93	19.77	19.61	19.48	19.82

PJF000Z587

Model FDT140VSXTVH Indoor unit FDT50VH (3 uints) Outdoor unit FDC140VSX

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃CDB		21 ℃CDB		23 ℃CDB		26 ℃CDB		27 ℃CDB		28 ℃CDB		31 ℃CDB		33 ℃CDB	
	12 ℃CWB		14 ℃CWB		16 ℃CWB		18 ℃CWB		19 ℃CWB		20 ℃CWB		22 ℃CWB		24 ℃CWB	
℃CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					11.66	8.87	12.38	9.60	12.73	9.42	13.13	9.26	13.91	9.74	14.70	9.34
13					12.08	9.00	12.83	9.72	13.21	9.54	13.62	9.37	14.45	9.84	15.28	9.43
15					12.50	9.12	13.29	9.84	13.68	9.66	14.12	9.48	14.99	9.95	15.87	9.53
17					12.92	9.26	13.75	9.97	14.16	9.78	14.62	9.60	15.54	10.06	16.45	9.62
19					13.21	9.35	14.06	10.05	14.48	9.87	14.95	9.68	15.88	10.13	16.82	9.69
21					13.50	9.44	14.36	10.14	14.80	9.95	15.28	9.76	16.23	10.20	17.19	9.75
23					13.50	9.44	14.40	10.15	14.83	9.96	15.31	9.77	16.28	10.21	17.25	9.76
25			12.53	9.86	13.50	9.44	14.43	10.16	14.87	9.97	15.35	9.78	16.33	10.22	17.30	9.77
27			12.48	9.84	13.50	9.44	14.46	10.17	14.90	9.98	15.34	9.78	16.23	10.20		
29			12.37	9.80	13.31	9.38	14.23	10.10	14.68	9.92	15.13	9.73	16.03	10.16		
31			12.26	9.76	13.11	9.32	13.99	10.03	14.45	9.86	14.91	9.67	15.82	10.12		
33	11.49	9.12	12.02	9.67	12.92	9.26	13.76	9.97	14.23	9.80	14.69	9.62	15.61	10.07		
35	10.88	8.88	11.63	9.54	12.72	9.19	13.53	9.90	14.00	9.74	14.47	9.57	15.41	10.03		
37	10.75	8.83	11.45	9.47	12.49	9.12	13.29	9.84	13.74	9.68	14.18	9.50	15.08	9.97		
39	10.62	8.78	11.26	9.41	12.26	9.05	13.04	9.77	13.47	9.61	13.90	9.43	14.76	9.90		
41	10.49	8.74	11.07	9.34	12.02	8.98	12.80	9.71	13.21	9.54	13.62	9.37	14.44	9.84		
43	10.35	8.68	10.89	9.28	11.79	8.91	12.55	9.64	12.94	9.48	13.33	9.30	14.11	9.78		

Heating mode : HC (kW)

Outdoor air temp.		Indoor air temperature				
		℃CDB				
℃CDB	℃CWB	16	18	20	22	24
-19.8	-20	12.09	12.00	11.90	11.80	11.71
-17.7	-18	13.61	13.51	13.40	13.29	13.18
-15.7	-16	14.63	14.52	14.40	14.28	14.17
-13.5	-14	15.24	15.12	15.00	14.88	14.76
-11.5	-12	15.64	15.53	15.40	15.27	15.15
-9.5	-10	15.95	15.83	15.70	15.57	15.44
-7.5	-8	16.15	16.02	15.90	15.77	15.64
-5.5	-6	16.25	16.13	16.00	15.86	15.73
-3.0	-4	16.25	16.13	16.00	15.86	15.72
-1.0	-2	16.25	16.13	16.00	15.86	15.73
1.0	0	16.25	16.13	16.00	15.86	15.73
2.0	1	16.25	16.13	16.00	15.86	15.73
3.0	2	16.25	16.13	16.00	15.86	15.73
5.0	4	16.25	16.13	16.00	15.86	15.73
7.0	6	16.25	16.13	16.00	15.87	15.73
9.0	8	16.93	16.80	16.68	16.54	16.40
11.5	10	17.61	17.48	17.35	17.21	17.07
13.5	12	18.53	18.39	18.25	18.12	18.17
15.5	14	19.46	19.31	19.16	19.02	19.27
16.5	16	19.93	19.77	19.61	19.48	19.82

PJF000Z587

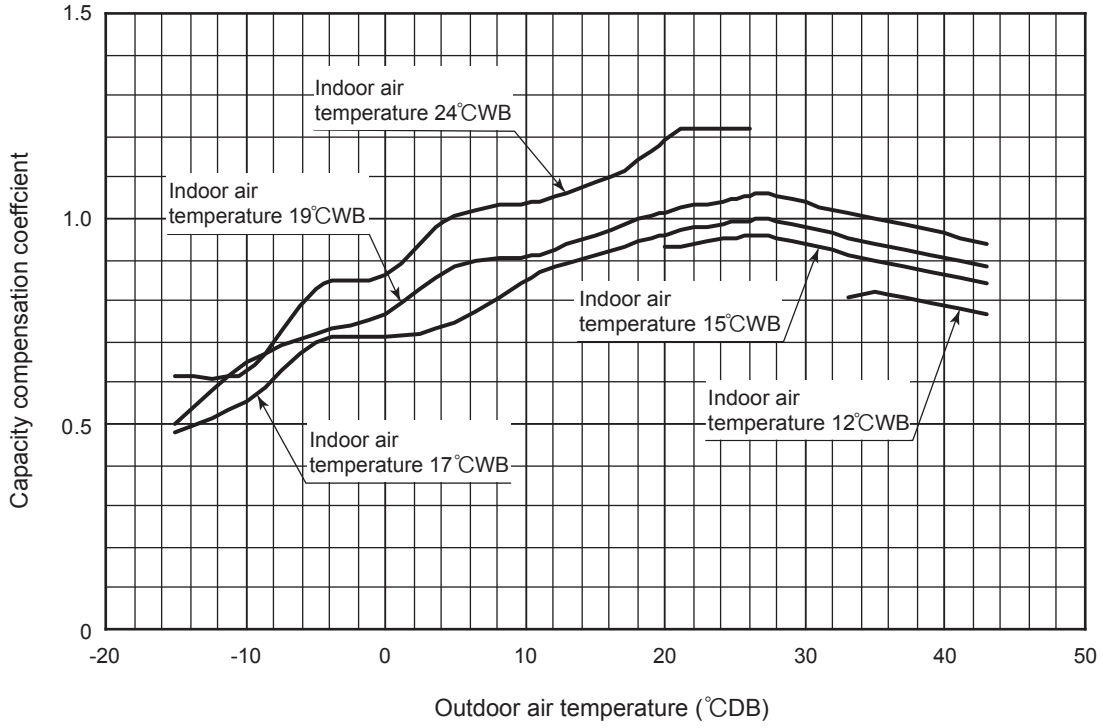
Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed.(Cooling only)
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)
HC : Heating capacity (kW)

[References data]

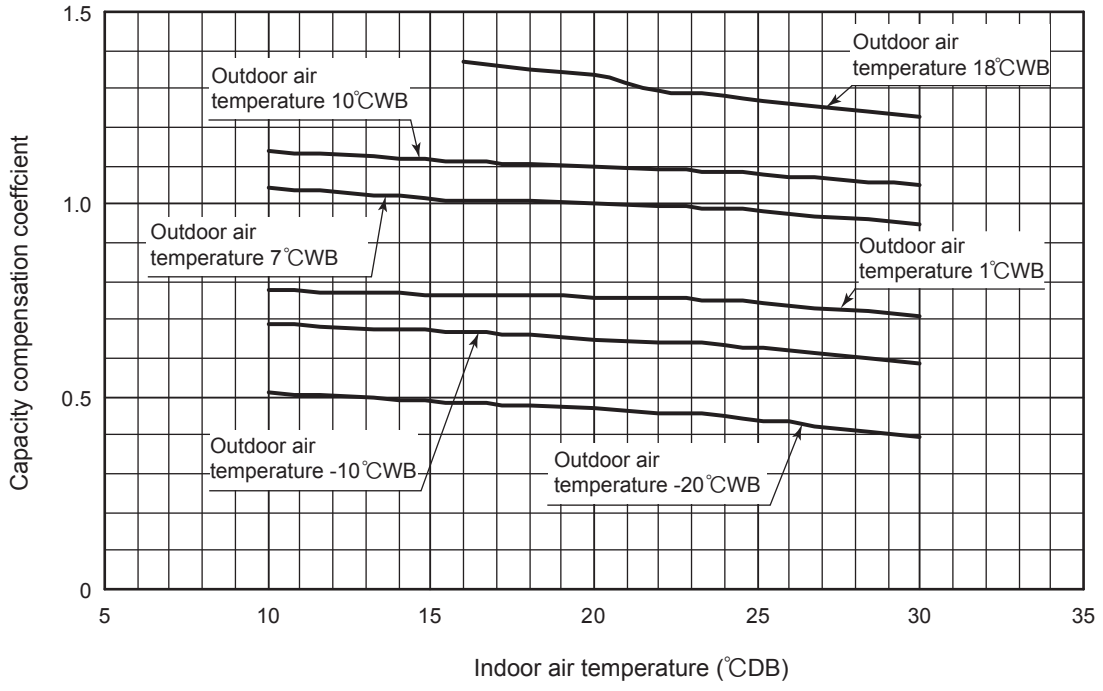
Capacity variation against outdoor and indoor temperature at the maximum compressor speed capacity compensation coefficient shows the ratio to nominal capacity.

(I) Models SRC40, 50, 60ZSX-S

① Cooling

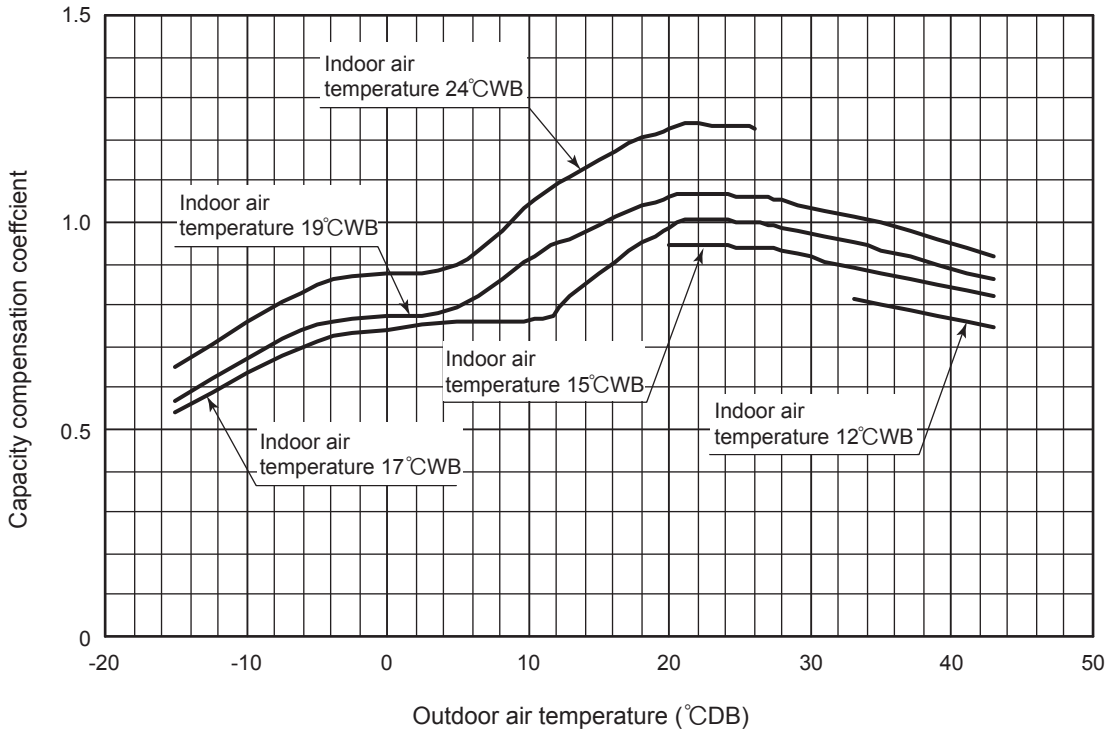


② Heating

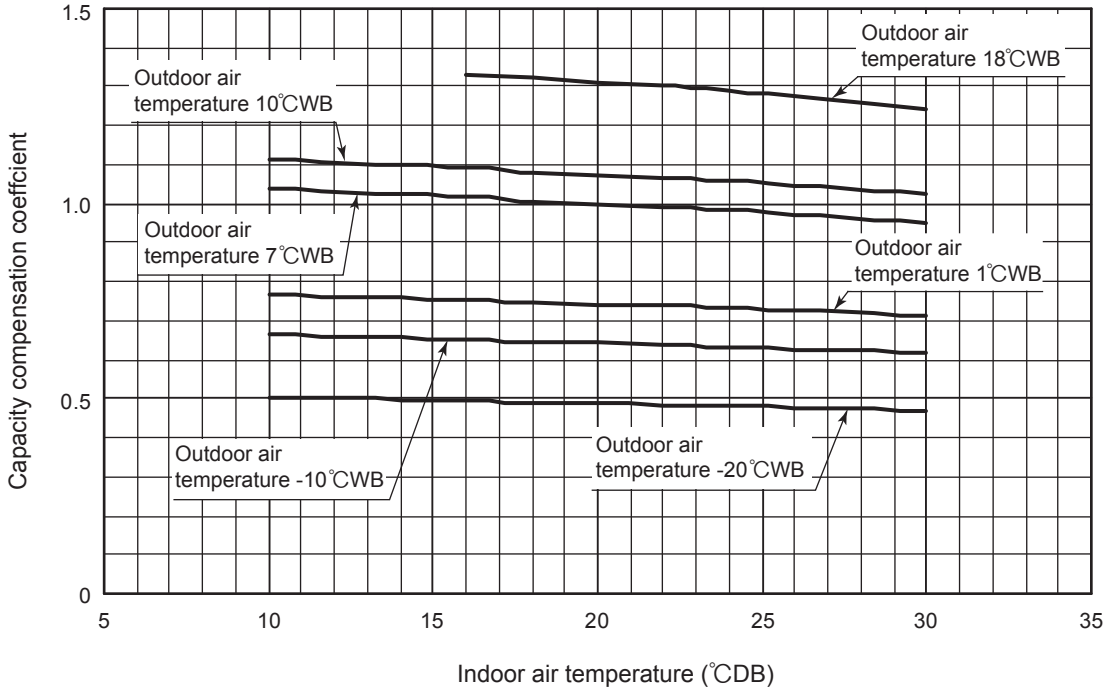


(Ⅱ) Model FDC71VNX

① Cooling

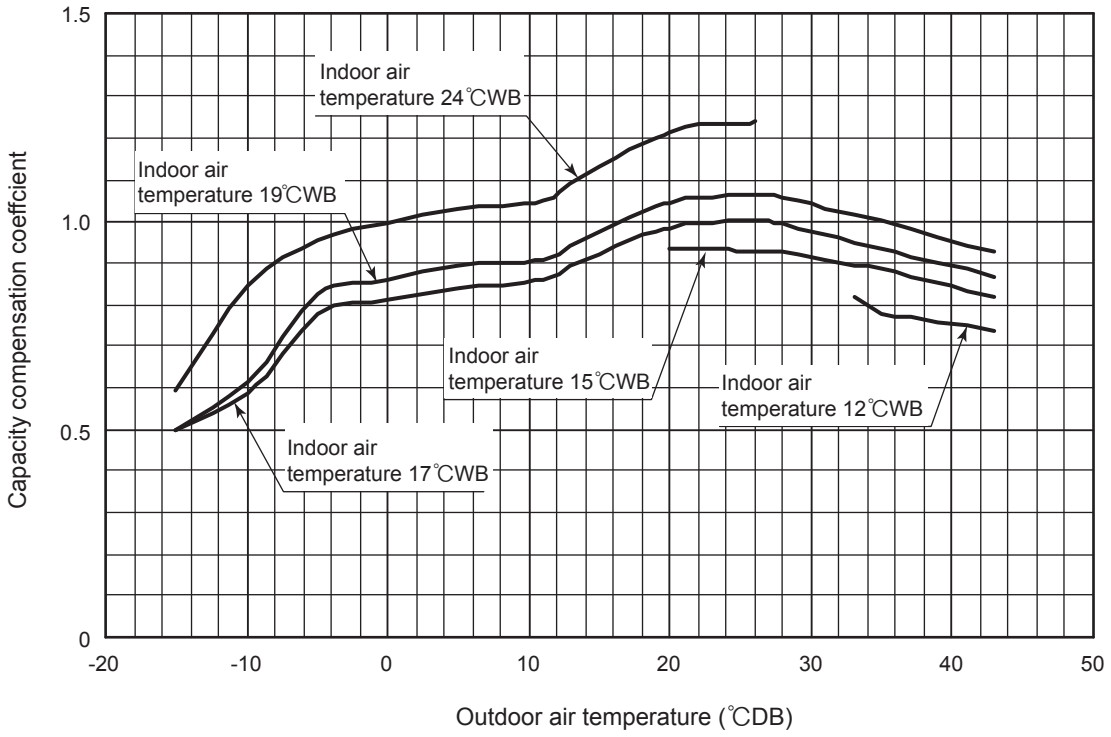


② Heating

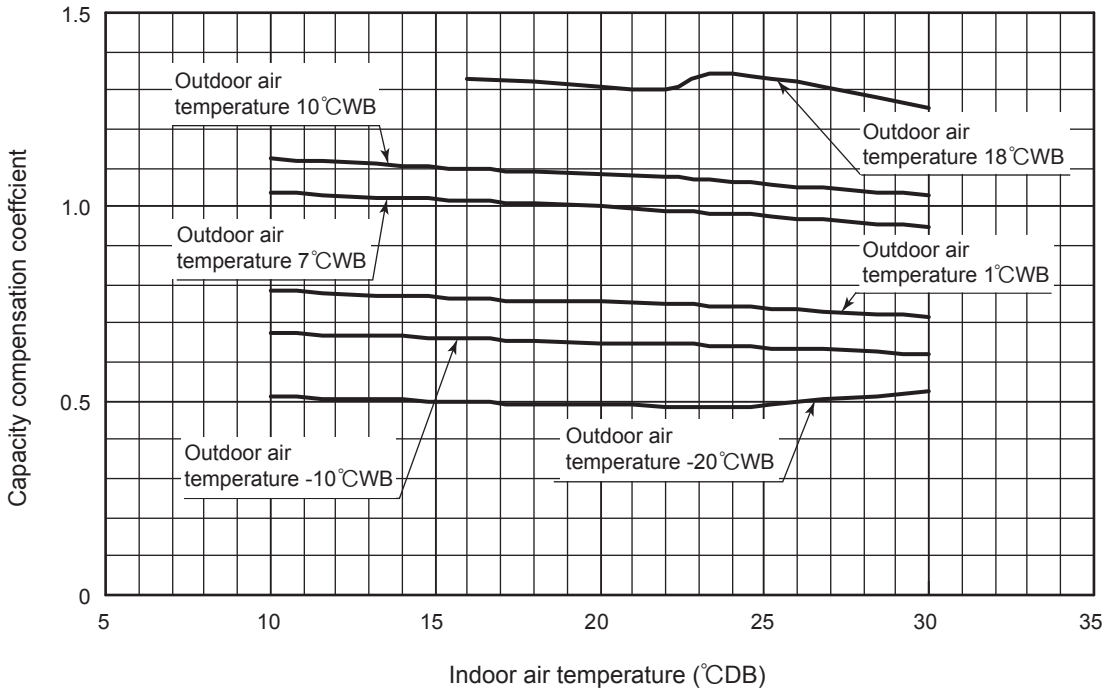


㈢ Models FDC100, 125, 140VNX, 100, 125, 140VSX

① Cooling



② Heating



1.8.2 Correction of cooling and heating capacity in relation to air flow rate control (Fan speed)

Fan speed	P-Hi or Hi	Me	Lo
Coefficient	1.00	0.97	0.95

1.8.3 Correction of cooling and heating capacity in relation to one way length of refrigerant piping

It is necessary to correct the cooling and heating capacity in relation to the one way equivalent piping length between the indoor and outdoor units.

(1) Models SRC40-60

Piping length (m)	7	10	15	20	25	30
Cooling	1	0.99	0.975	0.965	0.95	0.935
Heating	1	1	1	1	1	1

(2) Models FDC71-140

Equivalent piping length (1)(m)			7.5	10	15	20	25	30	35	40	45	50	55
Heating			1	1	1	1	1	0.998	0.998	0.993	0.993	0.988	0.988
Cooling	FDC71 model	ϕ15.88	1	0.996	0.989	0.982	0.975	0.968	0.961	0.954	0.947	0.940	0.933
	FDC100 model		1	0.991	0.978	0.964	0.951	0.937	0.924	0.910	0.897	0.883	0.870
	FDC125 model		1	0.986	0.968	0.950	0.932	0.914	0.896	0.878	0.860	0.842	0.824
	FDC140 model		1	0.985	0.966	0.946	0.927	0.907	0.888	0.868	0.849	0.829	0.810
	FDC71 model	ϕ19.05	1.008	1.006	1.003	1	0.997	0.994	0.991	0.988	0.985	0.982	0.979
	FDC100 model		1.016	1.013	1.007	1.002	0.996	0.991	0.985	0.980	0.974	0.969	0.963
	FDC125 model		1.022	1.018	1.009	1.001	0.992	0.984	0.975	0.967	0.958	0.950	0.941
	FDC140 model		1.026	1.021	1.011	1.002	0.992	0.983	0.973	0.964	0.954	0.945	0.935

Equivalent piping length (1)(m)			60	65	70	75	80	85	90	95	100	105
Heating			0.983	0.983	0.978	0.978	0.973	0.973	0.968	0.968	0.963	0.963
Cooling	FDC71 model	ϕ15.88	—	—	—	—	—	—	—	—	—	—
	FDC100 model		0.856	0.843	0.829	0.816	0.803	0.789	0.776	0.762	0.749	0.736
	FDC125 model		0.806	0.788	0.770	0.752	0.734	0.716	0.698	0.680	0.662	0.644
	FDC140 model		0.790	0.771	0.751	0.732	0.712	0.693	0.673	0.654	0.634	0.615
	FDC71 model	ϕ19.05	—	—	—	—	—	—	—	—	—	—
	FDC100 model		0.959	0.955	0.951	0.948	0.944	0.940	0.936	0.932	0.929	0.926
	FDC125 model		0.935	0.929	0.924	0.919	0.912	0.908	0.902	0.897	0.892	0.887
	FDC140 model		0.928	0.920	0.913	0.907	0.900	0.894	0.888	0.882	0.876	0.870

Note (1) Calculate the equivalent length using the following formula.
However, install the piping so that the piping length is within +5 m of the limit length (actual length) for the respective types.

• Equivalent length =Actual length + (Equivalent bend length x number of bends in the piping.)
Equivalent length per bend. (Models FDC71-140 only)

Gas pipe diameter (mm)	ϕ12.7	ϕ15.88	ϕ19.05
Equivalent bend length	0.20	0.25	0.30

1.8.4 Height difference between the indoor unit and outdoor unit

When the outdoor unit is located below indoor units in cooling mode, or when the outdoor unit is located above indoor units in heating mode, the correction coefficient mentioned in the below table should be subtracted from the value in the above table.

Height difference between the indoor unit and outdoor unit in the vertical height difference	5m	10m	15m	20m	25m	30m
Adjustment coefficient	0.99	0.98	0.97	0.96	0.95	0.94

Piping length limitations

Item \ Model	SRC40, 50, 60	FDC71	FDC100, 125, 140
Max. one way piping length	30m	50m	100m
Max. vertical height difference	Outdoor unit is higher 20m Outdoor unit is lower 20m	Outdoor unit is higher 30m Outdoor unit is lower 15m	

Note (1) Values in the table indicate the one way piping length between the indoor and outdoor units.

How to obtain the cooling and heating capacity

Example : The net cooling capacity of the model FDT100VNXPVH with the air flow "P-Hi", the piping length of 15m, the outdoor unit located 5m lower than the indoor unit, indoor wet-bulb temperature at 19.0℃ and outdoor dry-bulb temperature 35℃ is

Net cooling capacity = 10.0 × 1.00 × 0.978 × 0.99 ≒ 9.7kW

- 10.0: Net cooling total capacity of FDT100VNXPVH (Outdoor temp. : 35℃DB Indoor temp. : 19℃WB) shown in table 1.8.1
- 1.00: Air flow : P-Hi shown in table 1.8.2
- 0.978: Piping length :15m (Gas pipe size is ϕ15.88) shown in table 1.8.3
- 0.99: Height diff. :5m (Outdoor unit : below) shown in table 1.8.4

1.9 APPLICATION DATA

1.9.1 Installation of indoor unit

PJF012D051

This manual is for the installation of the indoor unit.
For electrical wiring work (Indoor unit), refer to page 54. For remote control installation, refer to page 58. For wireless kit installation, refer to page 395. For electrical wiring work (Outdoor unit) and refrigerant pipe work installation for outdoor unit, refer to page 70. For motion sensor kit installation, refer to page 403. This unit must always be used with the panel.

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, ⚠WARNING and ⚠CAUTION .
  ⚠WARNING : Wrong installation would cause serious consequences such as injuries or death.
  ⚠CAUTION : Wrong installation might cause serious consequences depending on circumstances.
  Both mentions the important items to protect your health and safety so strictly follow them by any means.
- The meanings of "Marks" used here are as shown on the right:
  ⃠ Never do it under any circumstances. | ❗ Always do it according to the instruction.
- After completing the installation, do commissioning to confirm there are no abnormalities, and explain to the customers about "SAFETY PRECAUTIONS", correct operation method and maintenance method (air filter cleaning, operation method and temperature setting method) with user's manual of this unit.
  Ask your customers to keep this installation manual together with the user's manual. Also, ask them to hand over the user's manual to the new user when the owner is changed.

⚠WARNING

- **Installation should be performed by the specialist.**
  If you install the unit by yourself, it may lead to serious trouble such as water leakage, electric shock, fire, and injury due to overturn of the unit.
- **Install the system correctly according to these installation manuals.**
  Improper installation may cause explosion, injury, water leakage, electric shock, and fire.
- **Check the density refered by the foumula (accordance with ISO5149).**
  If the density exceeds the limit density, please consult the dealer and installate the ventilation system.
- **Use the genuine accessories and the specified parts for installation.**
  If parts unspecified by our company are used it could cause water leakage, electric shock, fire, and injury due to overturn of the unit.
- **Ventilate the working area well in case the refrigerant leaks during installation.**
  If the refrigerant contacts the fire, toxic gas is produced.
  In case of R32, the refrigerant could be ignited because of its flammability.
- **Install the unit in a location that can hold heavy weight.**
  Improper installation may cause the unit to fall leading to accidents.
- **Install the unit properly in order to be able to withstand strong winds such as typhoons, and earthquakes.**
  Improper installation may cause the unit to fall leading to accidents.
- **Do not mix air in to the cooling cycle on installation or removal of the air-conditioner.**
  If air is mixed in, the pressure in the cooling cycle will rise abnormally and may cause explosion and injuries.
- **Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.**
  Power source with insufficient capacity and improper work can cause electric shock and fire.
- **Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal.**
  Loose connections or hold could result in abnormal heat generation or fire.
- **Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services panel property.**
  Improper fitting may cause abnormal heat and fire.
- **Check for refrigerant gas leakage after installation is completed.**
  If the refrigerant gas leaks into the house and comes in contact with a fan heater, a stove, or an oven, toxic gas is produced.
- **Use the specified pipe, flare nut, and tools for R32 or R410A.**
  Using existing parts (R22) could cause the unit failure and serious accident due to explosion of the cooling cycle.
- **Tighten the flare nut according to the specified method by with torque wrench.**
  If the flare nut were tightened with excess torque, it could cause burst and refrigerant leakage after a long period.
- **Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulfide gas can occur.**
  Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety. This can also cause the corrosion of the indoor unit and a resultant unit failure or refrigerant leak.
- **Connect the pipes for refrigeration circuit securely in installation work before compressor is operated.**
  If the compressor is operated when the service valve is open without connecting the pipe, it could cause explosion and injuries due to abnormal high pressure in the system.
- **Stop the compressor before removing the pipe after shutting the service valve on pump down work.**
  If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle.
- **Only use prescribed optional parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not repair by yourself. And consult with the dealer about repair.**
  Improper repair may cause water leakage, electric shock or fire.
- **Consult the dealer or a specialist about removal of the air-conditioner.**
  Improper installation may cause water leakage, electric shock or fire.
- **Turn off the power source during servicing or inspection work.**
  If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.
- **Do not run the unit when the panel or protection guard are taken off.**
  Touching the rotating equipment, hot surface, or high voltage section could cause an injury to be caught in the machine, to get burned, or electric shock.
- **Shut off the power before electrical wiring work.**
  It could cause electric shock, unit failure and improper running.

⚠ CAUTION

- **Perform earth wiring surely.**
  Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure and electric shock due to a short-circuit.
- **Earth leakage breaker must be installed.**
  If the earth leakage breaker is not installed, it can cause electric shocks.
- **Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.**
  Using the incorrect one could cause the system failure and fire.
- **Do not use any materials other than a fuse of correct capacity where a fuse should be used.**
  Connecting the circuit by wire or copper wire could cause unit failure and fire.
- **Do not install the indoor unit near the location where there is possibility of flammable gas leakages.**
  If the gas leaks and gathers around the unit, it could cause fire.
- **Do not install and use the unit where corrosive gas (such as sulfurous acid gas etc.) or flammable gas (such as thinner, petroleum etc.) may be generated or accumulated, or volatile flammable substances are handled.**
  It could cause the corrosion of heat exchanger, breakage of plastic parts etc. And inflammable gas could cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **Do not use the indoor unit at the place where water splashes such as laundry.**
  Indoor unit is not waterproof. It could cause electric shock and fire.
- **Do not use the indoor unit for a special purpose such as food storage, cooling for precision instrument, preservation of animals, plants, and a work of art.**
  It could cause the damage of the items.
- **Do not install nor use the system near equipments which generate electromagnetic wave or high harmonics.**
  Equipments like inverter equipment, private power generator, high-frequency medical equipment, or telecommunication equipment might influence the air-conditioner and cause a malfunction and breakdown. Or the air conditioner might influence medical equipments or telecommunication equipments, and obstruct their medical activity or cause jamming.
- **Do not install the remote control at the direct sunlight.**
  It could cause breakdown or deformation of the remote control.
- **Do not install the indoor unit at the place listed below.**
  · Places where flammable gas could leak.
  · Places where carbon fiber, metal powder or any powder is floated.
  · Place where the substances which affect the air conditioner are generated such as sulfide gas, chloride gas, acid, alkali or ammonic atmospheres.
  · Places exposed to oil mist or steam directly.
  · On vehicles and ships
  · Places where machinery which generates high harmonics is used.
  · Places where cosmetics or special sprays are frequently used.
  · Highly salted area such as beach.
  · Heavy snow area
  · Places where the system is affected by smoke from a chimney.
  · Altitude over 1000m
- **Do not install the indoor unit in the locations listed below (Be sure to install the indoor unit according to the installation manual for each model because each indoor unit has each limitation)**
  · Locations with any obstacles which can prevent inlet and outlet air of the unit
  · Locations where vibration can be amplified due to insufficient strength of structure.
  · Locations where the infrared receiver is exposed to the direct sunlight or the strong light beam. (in case of the infrared specification unit)
  · Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  · Locations where drainage cannot run off safely.
  It can affect performance or function and etc..
  Do not install the motion sensor mounting panel at following places. It could cause detection error, incapacity of detection, or characteristic degradation.
  • Place where vibration is applied to it for a long period of time.
  • Place where static electricity or electromagnetic wave generates.
  • Place where it is exposed to high temperature or humidity for a long period of time.
  • Dusty place or where the lens face could be fouled or damaged.
- **Do not put any valuables which will break down by getting wet under the air-conditioner.**
  Condensation could drop when the relative humidity is higher than 80% or drain pipe is clogged, and it damages user's belongings.
- **Do not use the base frame for the outdoor unit which is corroded or damaged after a long period of use.**
  It could cause the unit falling down and injury.
- **Pay attention not to damage the drain pan by weld sputter when brazing work is done near the unit.**
  If sputter entered into the unit during brazing work, it could cause damage (pinhole) of drain pan and leakage of water. To avoid damaging, keep the indoor unit packed or cover the indoor unit.
- **Install the drain pipe to drain the water surely according to the installation manual.**
  Improper connection of the drain pipe may cause dropping water into room and damaging user's belongings.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **For drain pipe installation, be sure to make descending slope of greater than 1/100, not to make traps, and not to make air-bleeding.**
  Check if the drainage is correctly done during commissioning and ensure the space for inspection and maintenance.
- **Ensure the insulation on the pipes for refrigeration circuit so as not to condense water.**
  Incomplete insulation could cause condensation and it would wet ceiling, floor, and any other valuables.
- **Do not install the outdoor unit where is likely to be a nest for insects and small animals.**
  Insects and small animals could come into the electronic components and cause breakdown and fire. Instruct the user to keep the surroundings clean.
- **Pay extra attention, carrying the unit by hand.**
  Carry the unit with 2 people if it is heavier than 20kg. Do not use the plastic straps but the grabbing place, moving the unit by hand. Use protective gloves in order to avoid injury by the aluminum fin.
- **Make sure to dispose of the packaging material.**
  Leaving the materials may cause injury as metals like nail and woods are used in the package.
- **Do not operate the system without the air filter.**
  It may cause the breakdown of the system due to clogging of the heat exchanger.
- **Do not touch any button with wet hands.**
  It could cause electric shock.
- **Do not touch the refrigerant piping with bare hands when in operation.**
  The pipe during operation would become very hot or cold according to the operating condition, and it could cause a burn or frostbite.
- **Do not clean up the air-conditioner with water.**
  It could cause electric shock.
- **Do not turn off the power source immediately after stopping the operation.**
  Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdown.
- **Do not control the operation with the circuit breaker.**
  It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury.

①Before installation

●Install correctly according to the installation manual.

●Confirm the following points:

○Unit type/Power source specification

○Pipes/Wires/Small parts ○Accessory items

When moving the indoor unit, hold only the hanging hardware (4 places) only, with care not to apply forces to any other parts of the unit (particularly the refrigerant pipe, drain pipe, and resin parts).

Accessory item

For unit hanging		For refrigerant pipe			For drain pipe			
Flat washer (M10)	Level gauge	Pipe cover(big)	Pipe cover (small)	Strap	Pipe cover(big)	Pipe cover(small)	Drain hose	Hose clamp
								
8	1	1	1	4	1	1	1	1
For unit hanging	For unit hight position adjustment and hanging support	For heat insulation of gas pipe	For heat insulation of liquid tube	For pipe cover fixing	For heat insulation of drain socket	For heat insulation of drain socket	For drain pipe connecting	For drain hose mounting

②Selection of installation location for the indoor unit

① Select the suitable areas to install the unit under approval of the user.

- Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on the ceiling.
- In case of the panel having the motion sensor, the installation height must be no higher than 4 m. It could reduce the sensitivity of motion sensor, disabling the detection.
- Areas where there is enough space to install and service.
- Areas where it can be drained properly. Areas where drain pipe descending slope can be taken.
- Areas where there is no obstruction of air flow on both air return grille and air supply port.
- Areas where fire alarm will not be accidentally activated by the air-conditioner.
- Areas where the supply air does not short-circuit.
- Areas where it is not influenced by draft air.
- Areas not exposed to direct sunlight.
- Areas where dew point is lower than around 28°C and relative humidity is lower than 80%.

This indoor unit is tested under the condition of JIS (Japan Industrial Standard) high humidity condition and confirmed there is no problem. However, there is some risk of condensation drop if the air conditioner is operated under the severer condition than mentioned above.
If there is a possibility to use it under such a condition, attach additional insulation of 10 to 20mm thick for entire surface of indoor unit, refrigeration pipe and drain pipe.

- Areas where TV and radio stays away more than 1m. (It could cause jamming and noise.)
- Areas where any items which will be damaged by getting wet are not placed such as food, table wares, server, or medical equipment under the unit.
- Areas where there is no influence by the heat which cookware generates.
- Areas where not exposed to oil mist, powder and/or steam directly such as above fryer.
- Areas where lighting device such as fluorescent light or incandescent light doesn't affect the operation.
  (A beam from lighting device sometimes affects the infrared receiver for the wireless remote control and the air-conditioner might not work properly.)

②Check if the place where the air-conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the strength is not enough, it could cause injury due to unit falling.

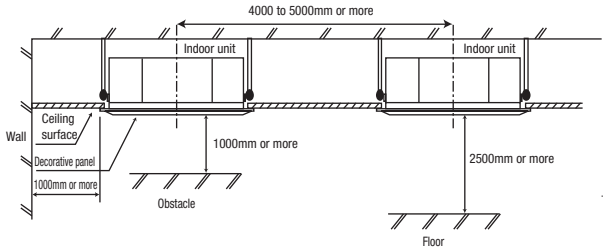
③If there are 2 units of wireless type, keep them away for more than 6m to avoid malfunction due to cross communication.

④When plural indoor units are installed nearby, keep them away for more than 4 to 5m.

Space for installation and service

●When it is not possible to keep enough space between indoor unit and wall or between indoor units, close the air supply port where it is not possible to keep space and confirm there is no short-circuit of air flow.

●Install the indoor unit at a height of more than 2.5m above the floor.



Where there are pipe joints on the way of embedded piping, provide adequate openings for inspection of the joints.

Set blow-out pattern

●Select the most proper number of blow-out air supply port direction from 4 way, 3 way or 2 way according to the shape of the room and installation position. (1 way is not available.)

●If it is necessary to change the number of air supply port, prepare the covering materials. (sold as accessory)

●Instruct the user not to use low fan speed when 2 way or 3 way air supply is used.

●Do not use 2 way air supply port under high temperature and humidity environment. (Otherwise it could cause condensation and leakage of water.)

●It is possible to set the air flow direction port by port independently. Refer to the user's manual for details.

③Preparation before installation

●If suspension bolt becomes longer, do reinforcement of earthquake resistant.

○For grid ceiling

When suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt.

○In case the unit is hanged directly from the slab and is installed on the ceiling plane which has enough strength.

When suspension bolt length is over 1000mm, apply the earthquake resistant brace to the bolt.

●Prepare four (4) sets of suspension bolt, nut and spring washer (M10 or M8) on site.

Ceiling opening, Suspension bolts pitch, Pipe position

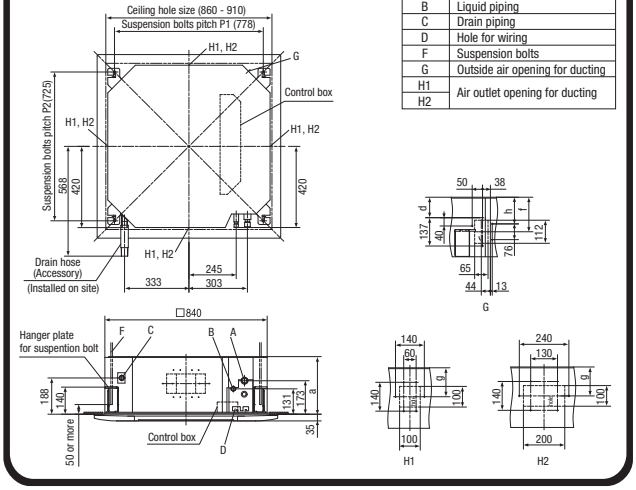
※It is possible the suspension bolts pitch to adjust accoding to the this table.

Type \ Mark	P1	P2
1	770	725-770
2	770-800	725

(mm)

Series	Type	a	d	f	g	h
Single Split (PAC) series	40 to 71 type	236	37	105	88	67
	100 to 140 type	298	99	167	140	129
VRF (KX) series	28 to 71 type	236	37	105	88	67
	90 to 160 type	298	99	167	140	129

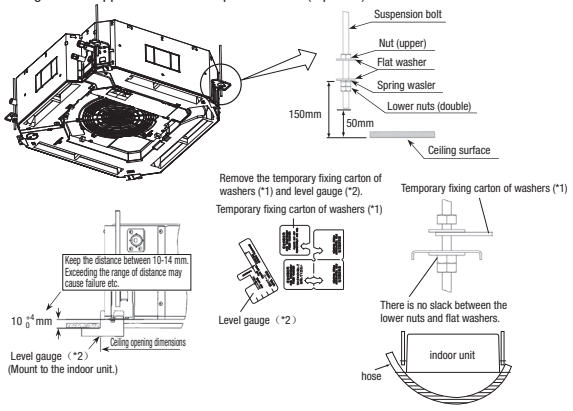
Symbol	
A	Gas piping
B	Liquid piping
C	Drain piping
D	Hole for wiring
F	Suspension bolts
G	Outside air opening for ducting
H1 H2	Air outlet opening for ducting



④Installation of indoor unit

Work procedure

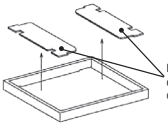
1. Set the suspension bolt length to about 50 mm from the ceiling.
2. Temporarily locate the lower nuts of the suspension bolts (4 places) at a position approximately 150 mm from the ceiling.
3. Temporarily locate the upper nuts of the suspension bolts (4 places) at positions sufficiently distance from the lower nuts so that they do not interfere with the suspension of the indoor unit and with its height adjustment.
4. Set the upper nuts of the suspension bolts and upper washers (4 places) at positions sufficiently distance from the lower nuts. Then, push and insert the temporary fixing carton of washers (*1) onto suspension bolts. Make sure that the upper washers do not slide down.
5. Suspend the indoor unit.
6. After suspending the indoor unit, mount the level gauge (*2) to the air outlet of the indoor unit, and adjust the suspension height of the indoor unit. Loosen the upper nuts (4 places), and adjust the suspension height using the lower nuts (4 places). Confirm there is no slack between the lower nuts and flat washers of the indoor unit hanger plate (4 places).
7. Remove the temporary fixing carton of washers (from all 4 places).
8. Make sure that the indoor unit is installed horizontally. Confirm the levelness of the indoor unit using a level gauge or transparent hose filled with water.
   (Keep the height difference at both ends of the indoor unit within 3 mm.)
9. Tighten the upper nuts of the suspension bolts (4 places).

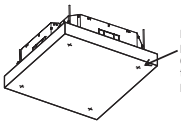


④Installation of indoor unit (continued)

Protection of the indoor unit

- If it is not possible to install the panel for a while or if attaching the ceiling board after installing the indoor unit, protect the indoor unit by using upper carton.





Caution

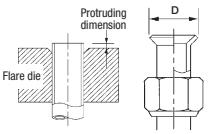
- Do not adjust the unit height by adjusting the upper nuts. Doing so will cause unexpected stress on the indoor unit and cause the unit to become deformed, prevent the panel from being installed, and be generated fan interference noise.
- Make sure that the indoor unit is installed horizontally and set the appropriate gap between the underside of the unit and the ceiling plane. Improper installation may cause air leakage, dew condensation, water leakage and noise.
- Even after the panel has been installed, the unit height can still be finely adjusted. Refer to the panel installation manual for details.
- Make sure there is no gap between the panel and the ceiling surface, and between the panel and the indoor unit. Any gap may cause air and/or water to leak, or condensation to form.

⑤Refrigerant pipe

Caution

- Be sure to use new pipes for the refrigerant pipes. Use the flare nut attached to the product.
  Regarding whether existing pipes can be reused or not, and the washing method, refer to the instruction manual of the outdoor unit, catalogue or technical data.
  1) In case of reuse: Do not use old flare nut, but use the nut attached to the unit.
  2) In case of reuse: Flare the end of pipe replaced partially for R32 or R410A.

⚠WARNING : When flared joints are reused indoors, the flare part shall be re-fabricated. (only for R32)



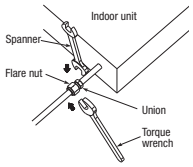
Pipe dia. d mm	Min. pipe wall thickness mm	Protruding dimension for flare, mm		Flare O.D. D mm	Flare nut tightening torque N·m
		Rigid (Clutch type)			
		For R32 For R410A	Conventional tool		
6.35	0.8	0 – 0.5	0.7 – 1.3	8.9 – 9.1	14 – 18
9.52	0.8			12.8 – 13.2	34 – 42
12.7	0.8			16.2 – 16.6	49 – 61
15.88	1			19.3 – 19.7	68 – 82
19.05	1.2			23.6 – 24.0	100 – 120

- Use phosphorus deoxidized copper alloy seamless pipe (C1220T) for refrigeration pipe installation. In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.
- Do not use any refrigerant other than the designated refrigerant.
  Using other refrigerant except the designated refrigerant, may degrade inside refrigeration oil. And air getting into refrigeration circuit may cause over-pressure and resultant it may result in bursting, etc.
- Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc.
- Use special tools for R32 or R410A refrigerant.

Work procedure

1. Remove the flare nut and blind flanges on the pipe of the indoor unit.
   ※ Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them. (Gas may come out at this time, but it is not abnormal.)
   - Pay attention whether the flare nut pops out. (as the indoor unit is sometimes pressured.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on the indoor unit.
   ※Bend radius of pipe must be 4D or larger. Once a pipe is bent, do not readjust the bending. Do not twist a pipe or collapse to 2/3D or smaller.
   - Make sure to use flare nuts assembled on the unions. Usage of other flare nuts could cause refrigerant leakage.

   ※Do a flare connection as follows:
   - Make sure to hold the nut on indoor unit pipe side using double spanner method as indicated when fastening / loosening flare nuts in order to prevent unintentional twisting of the copper pipe.
   - When fastening the flare nut, align the refrigeration pipe with the center of flare nut, screw the nut for 3-4 times by hand and then tighten it by spanner with the specified torque mentioned in the table above.

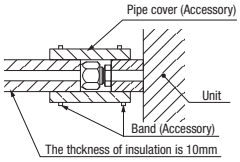


3. Cover the flare connection part of the indoor unit with attached insulation material after a gas leakage inspection, and tighten both ends with attached straps.
   - Make sure to insulate both gas pipes and liquid pipes completely.
     ※Incomplete insulation may cause dew condensation or water dropping.
   - Use heat-resistant (120 °C or more) insulations on the gas side pipes.
   - In case of using at high humidity condition, reinforce insulation of refrigerant pipes. Surface of insulation may cause dew condition or water dropping, if insulations are not reinforced.
4. Refrigerant is charged in the outdoor unit.
   As for the additional refrigerant charge for the indoor unit and piping, refer to the installation manual attached to the outdoor unit.

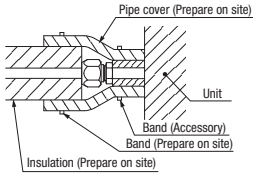
⑤Refrigerant pipe (continued)

Caution:
Refrigerating machine oil should not be applied to the threads of union or external surface of flare. It is because, even if the same tightening torque is applied, the oil is likely to decrease the slide friction force on the threads and increase, in turn, the axial component force so that it could crack the flare by the stress corrosion.
Refrigerating machine oil may be applied to the internal surface of flare only.

<The case of using thicness of insulation is 10mm>



<The case of using reinfoced insulation>



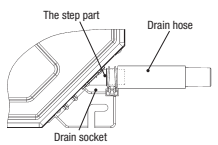
⑥Drain pipe

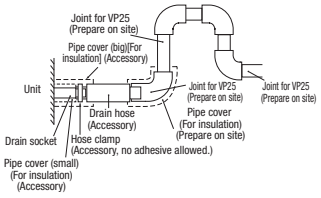
Caution

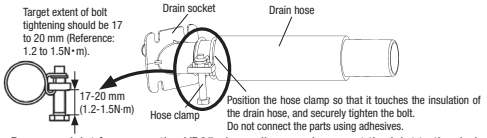
- Install the drain pipe according to the installation manual in order to drain properly.
  Imperfection in draining may cause flood indoors and wetting the household goods, etc.
- Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful and inflammable gas is generated. Toxic gas would flow into the room and it would cause serious damage to user's health and safety (some poisoning or deficiency of oxygen). In addition, it may cause corrosion of heat exchanger and bad smell.
- Connect the pipe securely to avoid water leakage from the joint.
- Insulate the pipe properly to avoid condensation drop.
- Check if the water can flow out properly from both the drain outlet on the indoor unit and the end of the drain pipe after installation.
- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway. In addition, do not put air vent on the drain pipe. Check if water is drained out properly from the pipe during commissioning. Also, keep sufficient space for inspection and maintenance.

Work procedure

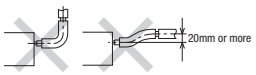
1. Make sure that the drain hose (the soft PVC side) is inserted into the end of the step part of the drain socket.
   Fix the hose clamp so that its bolt is located on the outside of the indoor unit, and the bolt are fastened in a vertical orientation.
   - Do not apply adhesives on this end.
2. Position the hose clamp so that it touches the insulation of the drain hose, and then tighten the bolt.
3. Turn the bolt several times until it is securely tightened, but do not tighten it excessively.



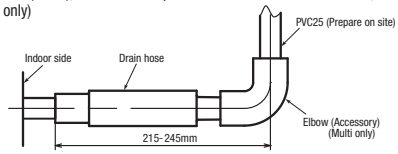




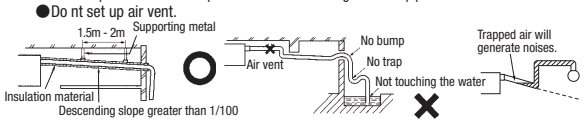
4. Prepare a joint for connecting VP25 pipe, adhere and connect the joint to the drain hose (the rigid PVC side), and adhere and connect VP25 pipe (prepare on site).
   ※As for drain pipe, apply VP25 made of rigid PVC which is on the market.
   - Make sure that the adhesive will not get into the supplied drain hose.
     It may cause the flexible part broken after the adhesive is dried up and gets rigid.
   - The flexible drain hose is intended to absorb a small difference at installation of the unit or drain pipes. Intentional bending, expanding may cause the flexible hose broken and water leakage.



   - As for drain pipe, apply VP25 (OD32).
     If apply PVC25 (OD25), connect the expanded connector to the drain hose, with adhesive.
     (Multi unit only)

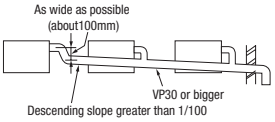


5. Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway.
   - Pay attention not to give stress on the pipe on the indoor unit side, and support and fix the pipe as close place to the unit as possible when connecting the drain pipe.
   - Do nt set up air vent.



⑥Drain pipe (continued)

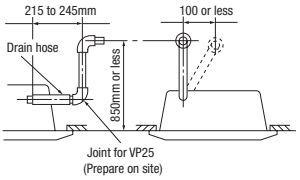
●When sharing a drain pipe for more than 1 unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP30 or bigger size for main drain pipe.



6. Insulate the drain pipe.
   ● Be sure to insulate the drain socket and rigid PVC pipe installed indoors otherwise it may cause dew condensation and water leakage.
   ※After drainage test implementation, cover the drain socket part with pipe cover (small size), then use the pipe cover (big size) to cover the pipe cover (small size), clamps and part of the drain hose, and fix and wrap it with tapes to wrap and make joint part gapless.

Drain up

● The position for drain pipe outlet can be raised up to 850mm above the ceiling. Use elbows for installation to avoid obstacles inside ceiling. If the horizontal drain pipe is too long before vertical pipe, the backflow of water will increase when the unit is stopped, and it may cause overflow of water from the drain pan on the indoor unit. In order to avoid overflow, keep the horizontal pipe length and offset of the pipe within the limit shown in the figure below.

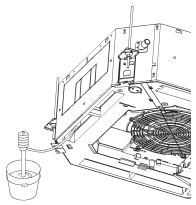


Drain test

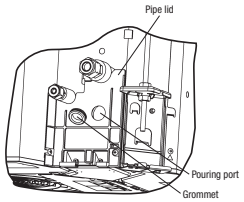
● After installing the drain pipe, make sure that drain system works correctly and that no water leaks from the joint and drain pan. Check whether the motor sound of the drain pump is normal.
● Conduct a drain test when installing, even during the heating season.
● In the case of new buildings, be sure to complete the test before fixing the ceiling.

1. Pour about 1,000 cc of test water into the drain pan of the indoor unit. Exercise care not to allow electrical equipment such as the drain pump and other components to become wet while filling water.
   Pour test water through the pouring port of the pipe lid using a feed water pump or a similar device, or through the refrigerant pipe joint.

●In case of pouring water from the air outlet



●In case of pouring water from the pouring port of the pipe lid



2. Make sure that water drains out completely and that no water leaks from any joints of the drain pipe during the test.
   Test to confirm that the water drains out correctly while listening to the drain pump motor operating sound.
   At the drain socket (transparent), it is possible to check whether the water drains out correctly.
3. Unplug the rubber plug on the indoor unit so that the remaining water drains from the drain pan after the draining test.
   After checking the water drainage, fix the rubber plug correctly. Installation work for the drain pipe must be performed for the entire drain pipe up to the indoor unit.
   If the pipe lid has been removed in order to pour water, mount the pipe lid again.

Drain pump operation

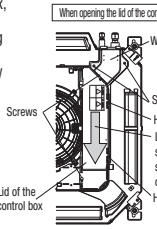
●In case electrical wiring work completed
Drain pump can be operated by the wired remote control.
For the operation method, refer to Operation for drain pump in the installation manual for wiring work.
●In case electrical wiring work not completed
Drain pump will run continuously when the dip switch"SW7-1" on the indoor unit PCB is turned ON, the connector CnB is disconnected, and then the power source (230VAC on the terminal block ① and ②) is turned ON.
Make sure to turn OFF "SW7-1" and reconnect the connector CnB after the test.

⑦Wiring-out position and wiring connection

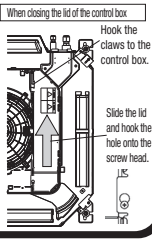
● Electrical installation work must be performed according to the installation manual by an electrical installation service provider qualified by a power provider of the country, and be executed according to the technical standards and other regulations applicable to electrical installation in the country.
Be sure to use an exclusive circuit.
● Use specified cord, fasten the wiring to the terminal securely, and hold the cord securely in order not to apply unexpected stress on the terminal.
● Do not put both power source line and signal line on the same route. It may cause miscommunication and malfunction.
● Be sure to do D type earth work.
● For the details of electrical wiring work, see attached instruction manual for electrical wiring work.

1. Loosen the 2 screws of the lid of the control box, and slide the lid in the direction of the arrow shown in the figure. It will then be possible to open the lid.
2. Unhook the lid from the control box, and remove the lid.
3. Remove the 2 screws from the wiring cover, and remove the wiring cover.
4. Hold each wire inside the unit, and securely fasten them to the terminal block.
5. Fix the wiring using clamps.
6. Install the wiring cover and the lid of the control box.

When opening the lid of the control box



When closing the lid of the control box

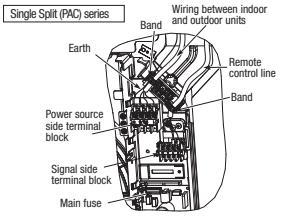


Main fuse specification

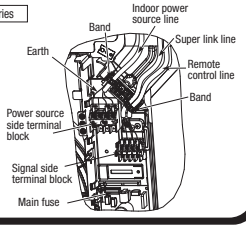
Specification	Part No.
T3.15A L250V	SSA564A149AF

⑦Wiring-out position and wiring connection (continued)

Single Split (PAC) series



VRF (KX) series



⑧Panel installation

●Install the panel on the indoor unit after electrical wiring work.
●Refer to the attached manual for panel installation for details.

⑨Check list after installation

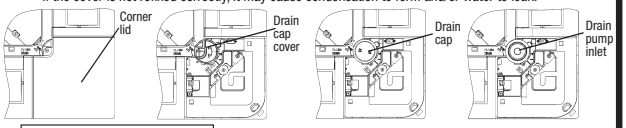
●Check the following items after all installation work completed.

Check if;	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Power source voltage is same as mentioned in the model name plate?	PCB burnt out, not working at all	
There is mis-wiring or mis-connection of piping?	PCB burnt out, not working at all	
Earth wiring is connected properly?	Electric shock	
Cable size comply with specified size?	PCB burnt out, not working at all	
Any obstacle blocks airflow on air inlet and outlet?	Insufficient capacity	

⑩How to check the dirt of drain pan and cleanimg the inlet of the drain pump. (Maintenance)

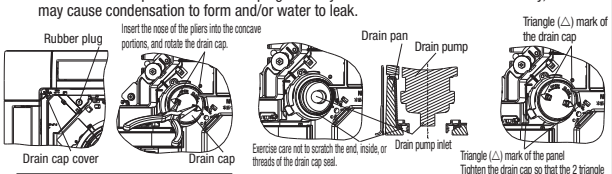
The method of checking the dirt of drain pan

●It is possible to check dirt on the drain pan and drain pump inlet without removing the panel.
1. Open the inlet grille and remove the corner lid on the drain pan side.
2. Remove the drain cap cover (1 screw) from the panel corner.
3. Check the dirt on the drain pan from the drain cap, and check the drain pump inlet. If the drain pan is very dirty, remove the drain pan and clean it.
4. After checking, refix the drain cap cover securely.
   If the cover is not refixed correctly, it may cause condensation to form and/or water to leak.



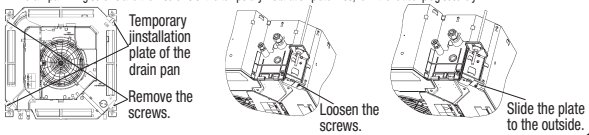
Cleaning of drain pump inlet

●It is possible to clean the drain pump inlet and surrounding area by removing the drain cap only; it is not necessary to remove the panel and drain pan.
●Before removing the drain cap, remove the rubber plug and drain water from the drain pan.
1. Remove the drain cap cover as described above.
2. Insert the nose of the pliers into the concave portions (2 places) of the drain cap, and rotate the pliers about 1 turn in the CCW direction. The drain cap is removed.
3. When cleaning the drain pump inlet, use a soft plastic tool. If a metallic tool is used, the drain cap mounting portion may be scratched and water may leak.
4. Before mounting the drain cap, rinse it and **remove any foreign material from the inside of the cap.** If the drain cap is installed with foreign material inside it, it may cause water to leak.
5. Insert the nose of the pliers into the concave portions of the drain cap and rotate the pliers to install the drain cap. Rotate the drain cap about 1 turn in the CW direction until it stops rotating. If the drain cap is not rotated for 1 or more turns, the cap will not have been installed correctly.
   Remove the drain cap, and then install it again correctly.
6. After tightening the drain cap, make sure the triangle (△) mark of the drain cap comes close to the triangle mark on the panel. If these triangle marks are not close to each other, tighten the drain cap further.
7. Refix the drain cap cover and rubber plug securely. If the cover is not refixed correctly, it may cause condensation to form and/or water to leak.



Notes for removing the drain pan

●Before removing the drain pan, drain water from the drain pan. Remove the rubber plug and drain water.
●The drain pan is installed by the temporary installation plate. Remove the 2 drain pan fixing screws, and loosen the 2 screws of the temporary installation plate.
Slide the temporary installation plate to the outside of the drain pan. And then,it is possible to remove the drain pan.
●When reinstalling the drain pan, slide the temporary installation plate to the inside and temporarily fix the drain pan. Then, tighten the 2 drain pan fixing screws and the 2 screws of the temporary installation plate. Also, refix the rubber plug securely.



PJF012D037 B

• Panel installation

Read this manual together with the indoor unit's installation manual.

⚠ WARNING

- **Fasten the wiring to the terminal securely and hold the cable securely so as not to apply unexpected stress on the terminal. Loose connection or hold will cause abnormal heat generation or fire.**
- **Make sure the power source is turned off when electric wiring work. Otherwise, electric shock, malfunction and improper running may occur.**

Function

The Anti draft panel has the anti draft mechanism. If the Anti draft panel is installed and the anti draft function is set, the anti draft function will be oprerated and reduce the draft feeling. (Refer to ⑯ Panel setting for details.)

- Standard panel : without the anti draft mechanism
- Anti draft panel : with the anti draft mechanism

① Before installation

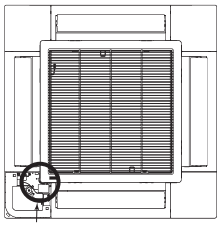
- Follow installation manual carefully, and install the panel properly.
- Check the following items.

○ Accessories

Accessories

Bolt		4 pieces	For panel installation
Strap		4 pieces	For avoiding the corner panel from falling
Screw		4 pieces	For fixing the corner panel

Note: Accessories are laid in the position removing the corner lid.



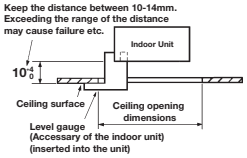
Accessories holding position

② Checking the indoor unit installation position

- Read this manual together with the air-conditioner installation manual carefully.
- Check if the opening size for the indoor unit is correct with the level gauge supplied in the indoor unit.
- Check if the gap between the plane and the indoor unit is correct by inserting the level gauge into the air outlet port of the indoor unit. (See below drawing)
- Adjust the installation elevation if necessary.
- Remove the level gauge before installing the panel.

Caution

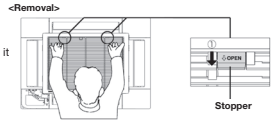
If there is a height difference beyond the design limit between the installation level of the indoor unit and the panel, the panel may be subject to excessive stress during installation and it may cause distortion and damage.



- The installation level of the indoor unit can be adjusted finely from the opening provided on the corner, even after panel is Installed. (Refer to ⑥ Installing the panel for details.)

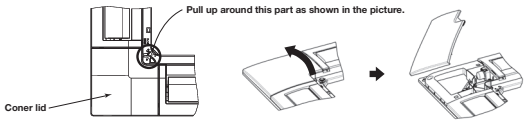
③ Removing the inlet grille

1. Hold the stoppers on the inlet grille (2 places) toward OPEN direction, open the inlet grille.
2. Remove the hooks of the inlet grille from the panel while it is in the open position.



④ Removing the corner lid

- Pull the corner lid toward the direction indicated by the arrow and remove it. (Same way for all 4 corner lids)



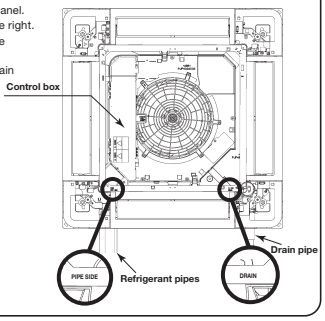
⑤ Orientation of the panel installation

Take note that there is an orientation to install the panel.

- Install the panel with the orientation shown on the right.
- Align the "PIPE SIDE" mark (on the panel) with the refrigerant pipes on the indoor unit.
- Align the "DRAIN" mark (on the panel) with the drain pipe on the indoor unit.

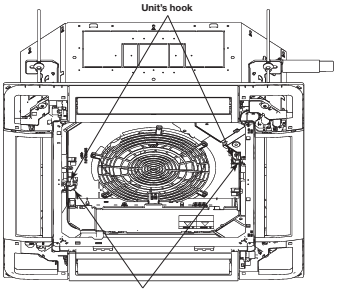
CAUTION

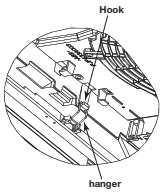
In case the orientation of the panel is not correct, it will lead to air leakage and also it is not possible to connect the flap motor wiring.

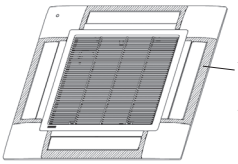


⑥ Installing the panel

1. Temporary hanging
   - Lift up the hanger (2 places) on the panel for temporary support.
   - Hang the panel on the hook on the indoor unit.







The Anti draft panel moves the parts of the anti draft mechanism (shaded area,4 places).Note that they may break if they are moved forcibly by hand. Although the parts (shaded area) of the Standard panel are separate parts from the body, they do not move.

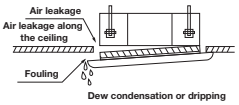
Caution

- The parts (shaded area), of the anti draft mechanism around the air outlet, are separate parts. Handle the panel with care. Especialy, the shaded area of the Anti draft panel move. Note that they may break if they are moved forcibly by hand.

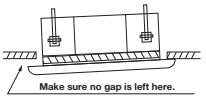
2. Fix the panel on the indoor unit
   - Fasten the panel on the indoor unit with the 4 bolts supplied with the panel.

Caution

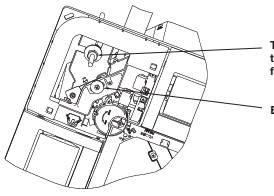
- Improperly tightened fixing bolts cause the problems listed below, so make sure that bolts are securely tightened.



- If there is a gap between the ceiling and the panel even after the fixing bolts are tightened, adjust the installation level of the indoor unit again.



- It is possible to adjust the installation height of the indoor unit with the panel installed as long as there is no influence on the drain pipe inclination and/or the indoor unit levelness.

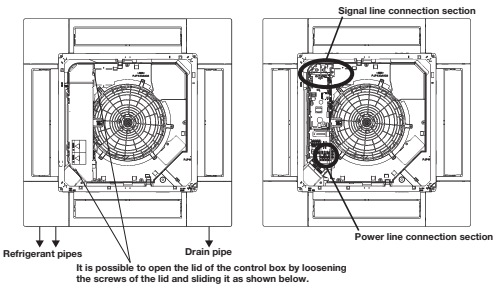


Caution

Do not give any stress on the panel when adjusting the height of the indoor unit to avoid unexpected distortion. It may cause the distortion of panel or failing to close the inlet grille, and the parts of the anti draft mechanism.

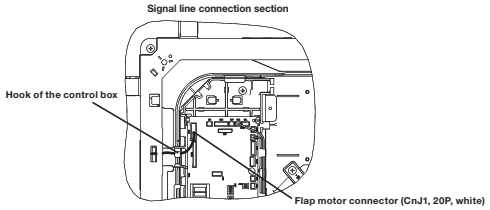
⑦ Electrical wiring

The wiring work varies depending on the panel type. Select the wiring work appropriate for the panel type.
The connection positions of the indoor unit are as shown below irrespective of the panel type.



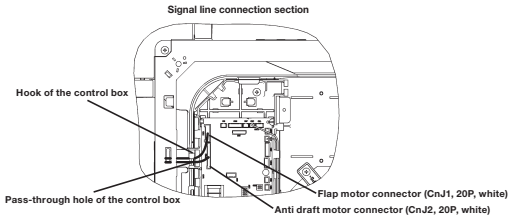
<For the Standard panel>
1. Loosen 2 screws on the control box lid of the indoor unit, and remove the lid by sliding it.
2. Pass the flap motor wiring (20-wire) through the hook of the control box, and connect to CnJ1 (20P, white).
3. Fix the control box lid of the indoor unit, and tighten 2 screws.

For the Standard panel



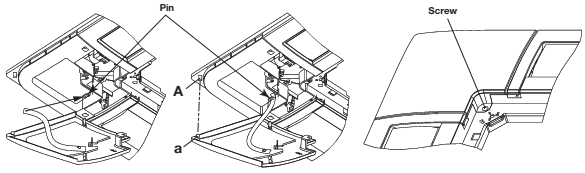
<For the Anti draft panel>
1. Loosen 2 screws on the control box lid of the indoor unit, and remove the lid by sliding it.
2. Pass the flap motor cable (20-wire) through the hook of the control box, and connect to CnJ1 (20P, white).
3. Pass the anti draft motor cable (20-wire) through the hook of the control box, and connect to CnJ2 (20P, white).
4. Fix the control box lid of the indoor unit, and tighten the 2 screws.

For the Anti draft panel



⑧ Installing a corner lid

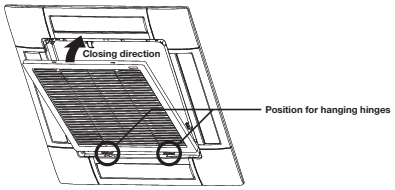
1. To avoid unexpected falling of the corner lid, put the strap onto the corner lid's pin with turning the strap up.
2. Then hang the strap of a corner lid onto the panel's pin.
3. First insert the part "a" of a corner lid into the part "A" of the panel, and then engage 2 hooks.
4. Fix with screw.



⑨ Installing the inlet grille

To attach the inlet grille, follow the procedure described in ⑤ Removing the inlet grille in the reverse order.
1. Hang the hooks of the inlet grille in the hole of the panel. (The hooks of the grille can be hanged in 4 side of the panel as following.)
2. After the grille is hanged, close the grille while the stoppers(2 places) on the grille are kept pressed to "OPEN" direction. When the grille comes to the original position, release the stoppers to hold the grille. Make sure to hear the sound of "CLICK" in both stoppers.

<Installation>



Caution

- Installing the inlet grille from the hinge side.
- Be careful in the inlet grille Installing, unstable installing may cause grille falling.
- Repair or replace the distorted, broken stopper at once, or the grille falling may occur.

⑩ Panel setting

<Flap swing range setting (Individual flap cotrol setting)>

It is possible to change the swing range of the flap by the wired remote control. Once the upper and lower limit positions are set, the flap will swing within the set range.It is also possible to set the different range to each flap.

<Anti draft setting>

The anti draft function will not be operated if the anti draft panel is installed and its wirings are only connected. To operate the anti draft function, enable the anti draft setting by using the wired or wireless remote control.

Note: It is not possible to set by the following remote control models or older.
Wired:RC-EX1A, RC-E5, RCH-E3
Wireless: RCN-E1R

Once you have enabled the settings in this mode, the anti draft function is operated when the air-conditioner is started, and the parts of the anti draft mechanism are always open when the air-conditioner is operating. When the air-conditioner is stopped, they are closed. It is possible to enabled or disabled the anti draft function for each air outlet.

For the setting details, refer to the user's manual supplied with the remote control.

1.9.2 Electric wiring work installation

PSC012D117

Electrical wiring work must be performed by an electrician qualified by a local power provider according to the electrical installation technical standards and interior wiring regulations applicable to the installation site.

Security instructions

- **Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.**
- **The precautionary items mentioned below are distinguished into two levels, ⚠WARNING and ⚠CAUTION .**
  ⚠WARNING : Wrong installation would cause serious consequences such as injuries or death.
  ⚠CAUTION : Wrong installation might cause serious consequences depending on circumstances.
  Both mentions the important items to protect your health and safety so strictly follow them by any means.
- **The meanings of "Marks" used here are as shown on the right:**
  ⃠ Never do it under any circumstances. ❗ Always do it according to the instruction.
- **Accord with following items. Otherwise, there will be the risks of electric shock and fire caused by overheating or short-circuit.**

⚠WARNING

- **Be sure to have the electric wiring work done by qualified electrical installer, and use exclusive circuit.**
  Power source with insufficient capacity and improper work can cause electric shock and fire.
- **Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal.**
  Loose connections or hold could result in abnormal heat generation or fire.
- **Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services panel property.**
  Improper fitting may cause abnormal heat and fire.
- **Use the genuine option parts. And installation should be performed by a specialist.**
  If you install the unit by yourself, it could cause water leakage, electric shock and fire.
- **Do not repair by yourself. And consult with the dealer about repair.**
  Improper repair may cause water leakage, electric shock or fire.
- **Consult the dealer or a specialist about removal of the air-conditioner.**
  Improper installation may cause water leakage, electric shock or fire.
- **Turn off the power source during servicing or inspection work.**
  If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.
- **Shut off the power before electrical wiring work.**
  It could cause electric shock, unit failure and improper running.

⚠CAUTION

- **Perform earth wiring surely.**
  Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure and electric shock due to a short-circuit.
- **Earth leakage breaker must be installed.**
  If the earth leakage breaker is not installed, it can cause electric shocks.
- **Make sure to install earth leakage breaker on power source line. (countermeasure thing to high harmonics.)**
  Absence of breaker could cause electric shock.
- **Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.**
  Using the incorrect one could cause the system failure and fire.
- **Do not use any materials other than a fuse of correct capacity where a fuse should be used.**
  Connecting the circuit by wire or copper wire could cause unit failure and fire.
- **Use power source line of correct capacity.**
  Using incorrect capacity one could cause electric leak, abnormal heat generation and fire.
- **Do not mingle solid cord and stranded cord on power source and signal side terminal block.**
  In addition, do not mingle difference capacity solid or stranded cord.
  Inappropriate cord setting could cause loosing screw on terminal block, bad electrical contact, smoke and fire.
- **Do not turn off the power source immediately after stopping the operation.**
  Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdown.
- **Do not control the operation with the circuit breaker.**
  It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury.

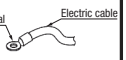
Control mode switching

- The control content of indoor units can be switched in following way. (☐ is the default setting)

Switch No.	Control Content	
SW2	Indoor unit address (0-Fh)	
SW5-1	Master/Slave Switching (plural /Slave unit Setting)	
SW5-2		
SW6-1～4	Model capacity setting	
SW7－1	ON	Operation check, Drain motor test run
	OFF	Normal operation

①Electrical wiring connection

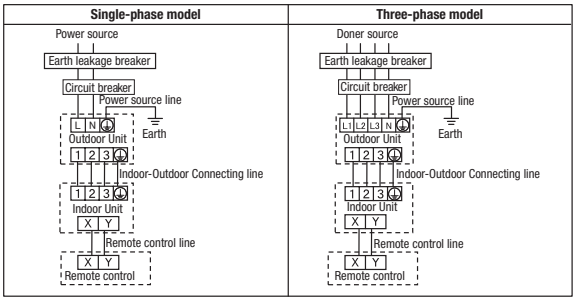
- Electrical wiring work must be performed by an electlician an qualified by a local power provider. These wiring specifications are determined on the assumption that the following instructions are observed:
  ① Do not use cords other than copper ones.
  Do not use any source line lighter than one specified in parentheses for each type below.
  –braided cord (code designation 60245 IEC 51), if allowed in the relevant part 2;
  –ordinary tough rubber sheathed cord (code designation 60245 IEC 53);
  –flat twin tinsel cord (code designation 60227 IEC 41);
  –ordinary polyvinyl chloride sheathed cord (code designation 60227 IEC 53);
  ② Connect the power source to the outdoor unit.
  ③ Pay extra attention so as not to confuse signal line and power source line connection, because an error in their connection can be burn all the boards at once.
- Connect ground wires before connecting wires between the indoor and outdoor units and between indoor units. The ground wires need to be longer than the wires between the indoor and outdoor units, and protected from undue stress.
- Do not turn on the power source before completing the work.
- The ground wires must be connected by the Class D grounding connection.
- Use the round crimp terminals for connections to the terminal block.



- Use dedicated branch circuits, avoiding combination with other devices. Otherwise, it could trip the power source breaker, resulting in secondary accidents.
- Install the overcurrent and earth leakage breakers (sensitivity current: 30 mA) specified to respective models.
- Do not connect indoor and outdoor signal cables to extension cables on the way. If the joint is wetted with intruding water, it could cause a ground insulation failure or poor connection, resulting in communication errors. (If it is inevitable to connect cables on the way, make sure to prevent the water intrusion completely.)
- When running wires (wires for power source, remote controller, connecting between indoor and outdoor units, or other) behind the ceiling, protect them using copper or other pipes against assault by rat, or other.
- It is up to 3.5 mm^2 the size of power supply cables connected to indoor units. When using cables of 5.5 mm^2 or larger, provide a dedicated pull box for branching connection to indoor units.
- If signal and power source cables are connected mistakenly, it could burn down all PCBs.
  ① Even if the power source of 220/240/380/415 V is connected mistakenly to A-B signal cable, it is protected at initial occasion only.
  ② If the remote control fails to detect the unit No. (address) at 15 minutes after turning the power on, check and repair all signal cables for misconnection.
  ③ Cut the jumper wire J10SL1 of burnt PCB, and reconnect connectors CnK (yellow) and CnK1 (white) to CnK2 (black).
  ④ If any anomaly is found on wires between the A-B terminal block and the PCB, replace them.
- At the outside of indoor and outdoor units, take care to avoid direct contacts between remote control and power source cables.
- In no event connect the power source of 220/240/380/415 V to the remote control terminal block. It could cause failures.
- Connections of wiring between units, ground wire and remote control cable
  ① When connecting wires between units, ground wire or remote control wire, connect them according to the number of terminals on the power source terminal block or signal terminal block in the control box. Connect the ground wire to the ground terminal on the power source terminal block.
  ② Make sure to install an earth leakage breaker for the power source. Select a breaker for inverter circuit.
  ③ When the earth leakage breaker is exclusive for the earth leakage protection, it is necessary to connect also an isolating switch (Switch + Class B fuse) or wiring circuit breaker in series to the earth leakage breaker.
  ④ Install the isolating switch close to the unit.
- Connect wires securing by tightening screws firmly. Confirm also no connector or wire (from terminal) is disconnected in the control box.
- When installing an auxiliary electric heater, consult the electric heater manual or technical data.

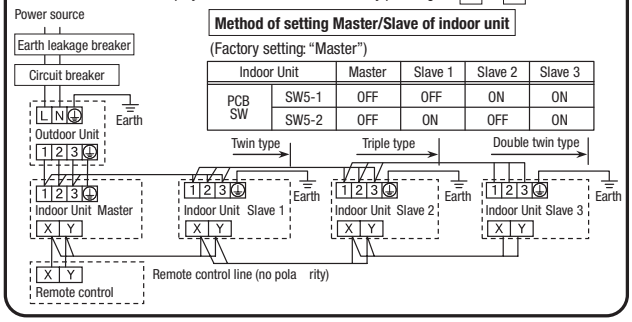
Cable connection for single unit installation

①As for connecting method of power source, select from following connecting patterns. In principle, do not directly connect power souce line to inside unit.
※As for exceptional connecting method of power source, discuss with the power provider of the country with referring to technical documents, and follow its instruction.
②For cable size and circuit breaker selection, refer to the outdoor unit installation manual.



Cable connection for a V multi configuration installation

①Connect the same pairs number of terminal block "①, ②, and ③"and " ⓧ and ⓨ" between master and slave indoor units.
②Do the same address setting of all inside units belong to same refrigerant system by rotary switch SW2 on indoor unit's PCB (Printed circuit board).
③Set slave indoor unit as "slave 1" through "slave 3" by address switch SW5-1, 5-2 on PCB.
④When the AIR CON NO. button on the remote control unit is pressed after turning on the power, an indoor unit's address number will be displayed. Do not fail to confirm that the connected indoor unit's numbers are displayed on the remote control unit by pressing the ▲ or ▼ button.



Method of setting Master/Slave of indoor unit

(Factory setting: "Master")

Indoor Unit		Master	Slave 1	Slave 2	Slave 3
PCB SW	SW5-1	OFF	OFF	ON	ON
	SW5-2	OFF	ON	OFF	ON

②Remote control, wiring and functions

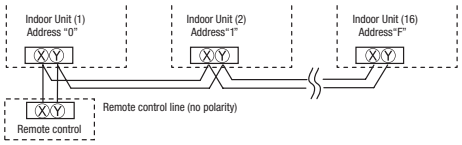
●Do not install it on the following places
①Places exposed to direct sunlight
②Places near heat devices
③High humidity places
④Hot surface or cold surface enough to generate condensation
⑤Places exposed to oil mist or steam directly.
⑥Uneven surface

Installation and wiring of remote control

①Install remote control referring to the attached installation manual.
②Wiring of remote control should use 0.3mm² ×2 core wires or cables.
The insulation thickness is 1mm or more. (on-site configuration)
③Maximum prolongation of remote control wiring is 600 m.
If the prolongation is over 100m, change to the size below.
But, wiring in the remote control case should be under 0.5mm² . Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.
100 - 200m ..... 0.5mm² × 2 cores
Under 300m ..... 0.75mm² × 2 cores
Under 400m ..... 1.25mm² × 2 cores
Under 600m ..... 2.0mm² × 2 cores
④Avoid using multi-core cables to prevent malfunction.
⑤Keep remote control line away from earth (frame or any metal of building).
⑥Make sure to connect remote control line to the remote control and terminal block of indoor unit. (No polarity)

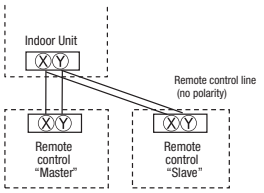
Control plural indoor units by a single remote control

①A remote control can control plural indoor units (Up to 16).
In above setting, all plural indoor units will operate under same mode and temperature setting.
②Connect all indoor units with 2 core remote control line.
③Set unique remote control communication address from "0" to "F" to each inside unit by the rotary switch SW2 on the indoor unit's PCB.



Master/ slave setting when more than one remote control unit are used

A maximum of two remote control units can be connected to one indoor unit (or one group of indoor units.)
The air-conditioner operation follows the last operation of the remote control regardless of the master/slave setting of it.
Acceptable combination is "two (2) wired remote controls", "one (1) wired remote control and one (1) wireless kit" or "two (2) wireless kits".
Set one to "Master" and the other to "Slave".
Note:The setting "Remote control unit sensor enabled" is only selectable with the master remote control unit in the position where you want to check room temperature.

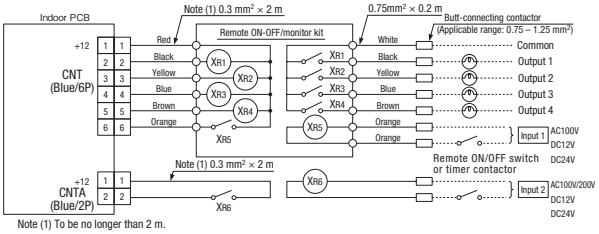


③Operation and confirmation from remote control

No.	Item	Operation from the eco touch remote control (RC-EX series)	Operation from the standard remote control (RC-E series)
1	Check the number of units connected in the multi remote control system.	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [IU address]	① Press the AIR CON NO button to display the IU address. ② Press the ▲ or ▼ button and check addresses of connected indoor units one by one.
2	Check if each unit is connected properly in the remote control system.	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [IU address] ⇒ [Check run mode]	① Press the AIR CON NO button to display the IU address. ② Press the ▲ or ▼ button and select one of IU addresses. ③ Press the (MODE) button. The unit starts to blow air.
3	Setting main/sub remote controls	[Menu] ⇒ [Service setting] ⇒ [R/C function settings] ⇒ [Service password] ⇒ [Main/Sub of R/C]	Set SW1 to "Sub" for the sub remote control unit.
4	Checking operation data	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [Operation data]	Press the CHECK button. ⇒ "OPER DATA ▼" is displayed. ⇒ Press the (SET) button. ⇒ "DATA LOADING" is displayed. ⇒ Select one of addresses for connected indoor units by pressing the ▲ or ▼ button. ⇒ Press the (SET) button. ⇒ "DATA LOADING" is displayed. ⇒ Select data by pressing the ▲ or ▼ button.
5	Checking inspection display	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [Error display]	Press the CHECK button. ⇒ "OPER DATA ▼" is displayed. ⇒ Press the ▼ button. ⇒ "ERROR DATA ▲" is displayed. ⇒ Press the (SET) button. ⇒ "DATA LOADING" is displayed. ⇒ Data is displayed.
6	Cooling test run from remote control	[Menu] ⇒ [Service setting] ⇒ [Installation settings] ⇒ [Service password] ⇒ [Test run] ⇒ [Cooling test run] ⇒ [Start]	① Start the system by pressing the ON/OFF button. ② Select "❄ (Cool)" with the (MODE) button. ③ Press the TEST button for 3 seconds or longer. The screen display will switch to "❄ TEST RUN ▼". ④ Pressing the (SET) button, while the "❄ TEST RUN ▼" is displayed, starts the cooling test run. The screen display will switch to "❄ TEST RUN".
7	Trial operation of drain pump from remote control	[Menu] ⇒ [Service setting] ⇒ [Installation settings] ⇒ [Service password] ⇒ [Test run] ⇒ [Drain pump test run] ⇒ [Run]	① Start the system by pressing the ON/OFF button. The display will change to "❄ TEST RUN ▼". ② Press the ▼ button once to display "DRAIN PUMP ▲▼". ③ Pressing the (SET) button starts the drain pump operation. The display will show "TO STOP".

The menu configuration may vary depending on models of the remote control. If the model of your remote control is different, refer to the installation manual attached to the remote control.

④ Function of CNT connector of indoor printed circuit board



Note (1) To be no longer than 2 m.

●XR1-4 are DC 12 V relays. (Equivalent to Omron's LY2F)
●XR5 is a DC 12 V, 24 V or 100 V, 200 V relay. (Equivalent to Omron's MY2F)
●Maker and model of CnT connector (Site side)
Connector : Molex 5264-06
Terminal : Molex 5263T
●CnTA connector is used on FDT, or other. <Check with the specifications.> (Site side) Maker and model
Connector : J.S.T. Mfg. XAP02V-1-E
Terminal : J.S.T. Mfg. SXA-01T-P0.6
●Output 1 – 4 and input1/2 can be selected/set as required from following items.
Factory default is set as shown below.

Output

①	RUN output	⑧	Fan ON output 3
②	Heating output	⑨	Defrost/oil return output
③	Compressor ON output	⑩	Ventilation output
④	Inspection (error) output	⑪	Heater output
⑤	Cooling output	⑫	Free cleaning output
⑥	Fan ON output 1	⑬	Indoor overload error output
⑦	Fan ON output 2		

Input

①	RUN/STOP	⑤	Setting temp. shift
②	RUN permit prohibition	⑥	Compulsory thermostat OFF
③	Emergency stop	⑦	Temporary stop
④	Cooling/Heating	⑧	Silent mode

Factory default setting

CnT-2	Output 1	RUN output	CnT-5	Output 4	Inspection (error) output
CnT-3	Output 2	Heating output	CnT-6	Input 1	RUN/STOP
CnT-4	Output 3	Compressor ON output	CnTA	Input 2	RUN/STOP

●For the setting method, refer to the technical data.

⑤ Operation and setting from remote control

A : Refer to the instruction manual for RC-EX series
B : Refer to the installation manual for RC-EX series
C : Loading a utility software vie Internet

○ : Nearly same function setting and operations are possible.
△ : Similar function setting and opperations are possible.

*1: Remote controls before RC-EX1A don't have this function.
*2: Remote controls before RC-EX3 don't have this function.

Setting & display item			Description	RC-EX3A	RC-E5
1.Remote Control network					
1	Control plural indoor units by a single remote control		A remote control can control plural indoor units up to 16 (in one group of remote control network). An address is set to each indoor unit.		○
2	Main/sub setting of remote controls		A pair of remote controls (including option wireless remote control) can be connected within the remote control network. Set one to "Main" and the other to "Sub".	B	○
2.TOP scrren, Switch manipulation					
1	Menu		"Control","State", or "Details" can be selected. (3-8)	A	
2	Operation mode		"Cooling","Heating","Fan","Dry" or "Auto" can be set.	A	○
3	Set temp.		"Set temperature" can be set by 0.5℃ interval.	A	○
4	Air flow direction		"Air flow direction" [Individual flap control] can be set. Select Enable or Disable for the "3D AUTO" (in case of FDK). *1	A	△
5	Fan speed		"Fan speed" can be set.	A	○
6	Timer setting		"Timer operation" can be set.	A	○
7	ON/OFF		"On/Off operation of the system" can be done.	A	○
8	F1 SW	*1	The system operates and is controlled according to the function specified to the F1 switch.	A	
9	F2 SW	*1	The system operates and is controlled according to the function specified to the F2 switch.	A	
10	Select the language	*2	Select the language to display on the remote control. ・ Select from English, German, French, Spanish, Italian, Dutch, Turkish, Portuguese, Russian,Polish, Japanese and Chinese.	A	
3.Useful functions					
1	Individual flap control		The moving range (the positions of upper limit and lower limit) of the flap for individual flap can be set. Set also the left and right limit positions for FDK. *1	A	△
2	Anti draft setting When the panel with the anti-draft function is assembled.	*1	・ Details .....You can set Enable or Disable for anti draft motion performed at each blow outlet in each operation mode. ・ ON/OFF setting .....You can set ON/OFF (operation/stop) of anti draft function for the enabled blow outlet set in Details. *2	A	
3	Timer settings	Set On timer by hour	The period of time to start operation after stopping can be set. ・ The period of set time can be set within range of 1hour-12houres (1hr interval). ・ The operation mode, set temp-and fan speed at starting operation can be set.	A	△
		Set Off timer by hour	The period of time to stop operation after starting can be set. ・ The period of set time can be set within range of 1hour-12houres (1hr interval).	A	△
		Set On timer by clock	The clock time to start operation can be set. ・ The set clock time can be set by 5-minutes intervals. ・ [Once (one time only)] or [Everyday] operation can be switched. ・ The operation mode, set temp. and fan speed at starting operation can be set.	A	△
		Set Off timer by clock	The clock time to stop operation can be set. ・ The set clock time can be set by 5-minute intervals. ・ [Once (one time only)] or [Everyday] operation can be switched.	A	△
		Confirmation of timer settings	Status of timer settings can be seen.	A	
4	Favorite setting [Administrator password]	*1	Set the operation mode, setting temperature, air flow capacity and air flow direction for the choice setting operations. Set them for the Favorite set 1 and the Favorite set 2 respectively.	A	
5	Weekly timer		On timer and Off timer on weekly basis can be set. ・ 8-operation patterns per day can be set at a maximum. ・ The setting clock time can be set by 5-minute intervals. ・ Holiday setting is available. ・ The operation mode, set temp. and fan speed at starting operation can be set.	A	△
6	Home leave mode [Administrator password]		When leaving home for a long period like a vaction leave, the unit can be operated to maintain the room temperature not to be hotter in summer or not to be colder in winter. ・ The judgment to switch the operation mode (Cooring ⇔ Heating) is done by the both factors of the set temp. and outdoor air temp. ・ The set temp. and fan speed can be set.	A	
7	External Ventilation When the ventilator is combined.		On/Off operation of the external ventilator can be done. It is necessary to set from [Menu] ⇒ [Service setting] ⇒ [R/C function settings] ⇒ [Ventilation setting]. ・ If the "Independent" is selected for the ventilation setting, the ventilator can be operated or stopped.	A	○
8	Select the language		Select the language to display on the remote control. ・ Select from English, German, French, Spanish, Italian, Dutch, Turkish, Portuguese, Russian,Polish, Japanese and Chinese. *1	A	
9	Silent mode control	*2	The period of time to operate the unit by prioritizing the quietness can be set. ・ Start and end can be set for the silent mode	A	
4.Energy-saving setting			Administrator password		
1	Sleep timer		To prevent the timer from keeping ON, set hours to stop operation automatically with this timer. ・ The selectable range of setting time is from 30 to 240 minutes. (10-minute intervals) ・ When setting is "Enable", this timer will activate whenever the ON timer is set.	A	△
2	Peak-cut timer		Power consumption can be reduced by restructing the maximum capacity. Set the [Start time], the [End time] and the capacity limit % (Peak-cut %). ・ 4-operation patterns per day can be set at maximum. ・ The setting time can be changed by 5-minute intervals. ・ The selectable range of capacity limit % (Peak-cut %) is from 0% to 40-80% (20% interval) ・ Holiday setting is available.	A	
3	Automatic temp set back		After the elapse of the set time period, the current set temp. will be set back to the [Set back time.] ・ The setting can be done in cooling and heating mode respectively. ・ Selectable range of the set time is from 20 min. to 120 min. (10 min. interval). ・ Set the [Set back temp.] by 1℃ interval.	A	△
4	Motion sensor control When the panel with the motion sensor is assembled.	*1	When the motion sensor is used, it is necessary to set Enable or Disable for the "Power control" and the "Auto-off".	A	
5.Filter					
1	Filter sign reset	Filter sign reset	The filter sign can be reset.	A	
		Setting next cleaning date	The next cleaning date can be set.	A	
6.User setting					
1	Internal settings	Clock setting	The current date and time can be set or revised. ・ If a power failure continues no longer than 80 hours, the clock continues to tick by the built-in power source.	A	△
		Date and time display	[Display] or [Hide] the date and/or time can be set, and [12H] or [24H] display can be set.	A	
		Summer time	When select [Enable], the +1hour adjustment of current time can be set. When select [Disable], the [Summer time] adjustment can be reset.	A	
		Contrast	The contrast of LCD can be adjusted higher or lower.	A	
		Backlight	Switching on/off a light can be set and period of the lighting time can be set within the range of 5sec-90 sec (5sec interval).	A	
		Control sound	It can set with or without [Control sound (beep sound)] at touch panel.	A	
		Operation lamp luminance	*1 This is used to adjust the luminance of operation lamp.	A	
2	Administrator settings [Administrator password]	Permission/Prohibition setting	・ Permission/Prohibition setting of operation can be set. [On/Off] [Change set temp] [Change operation mode] [Change flap direction] [Change fan speed] [High power operation] [Energy-saving operation] [Timer] Request for administrator can be set. [Individual flap control] [Weekly timer] [Select the language] [Anti draft setting] *1	A	△
		Outdoor unit silent mode timer	The period of time to operate the outdoor unit by prioritizing the quiteness can be set. ・ The [Start time] and the [End time] for operating outdoor unit in silent mode can be set. ・ The period of the operation time can be set once aday by 5-minute interals.	A	△
		Setting temp. range	The upper/lower limit of temp. setting range can be set. ・ The limitation of indoor temp. setting range can be set for each operation mode in cooling and heating.	A	△

⑤ Operation and setting from remote control (continued)

Setting & display item				Description	RC-EX3A	RC-E5
2	Administrator settings	Temp increment setting		The temp increment setting can be changed by 0.5˚C or 1.0˚C.	A	
		Set temp display		Ways of displaying setting temperatures can be selected.	A	
	[Administrator password]	R/C display setting		Register [Room name] [Name of I/U] Display [Indoor temp display] or not. Display [Error code display] or not. Display [Heating stand-by display] [Defrost operation display] [Auto cooling/heating display] [Display temp of R/C, Room, Outdoor] or not	A	△
		Change administrator password		The administrator password can be changed. (Default setting is "0000")	A	
				The administrator password can be reset.	B	
		F1/F2 function setting	*1	Functions can be set for F1 and F2. Selectable functions: [Anti draft ON/OFF] *2 [High power operation], [Energy-saving operation], [Silent mode cont.], [Home leave mode], [Favorite set 1], [Favorite set 2] and [Filter sign reset].	A	
7.Service setting						
1	Installer settings	Installation date		The [Installation date] can be registed. ・ When registering the [Instaration date], the [Next service date] is displayed automatically. (For changing the [Next service date], please refer the item of [Service & Maintenance])	B	
	[Service password]	Company information		The [Company information] can be registed and can be displayed on the R/C. ・ The [Company] can be registered within 26 characters. ・ The [Phone No.] can be registed within 13 digits.	B	
		Test run		On/Off operation of the test run can be done.	B	○
			Cooling test run	The [Cooling test run] can be done at 5˚C of set temp. for 30 minutes.		
			Drain pump test run	Only drain pump can be operated.		
		Staric pressure adjustment		In case of combination with only the ducted indoor unit which has a function of static pressure adjustment, the static pressure is adjustable. ・ It can be set for each indoor unit individually.	B	
		Change auto-address		The set address of each indoor unit decided by auto-address setting method can be changed to any other address. (For multiple KX units only)	B	△
		Address setting of main IU		Main indoor unit address can be set. ・ Only the Main indoor unit can change operation mode and the Sub indoor units dominated by the Main indoor shall follow. ・ The Main indoor unit can domain 10 indoor units at a maximum.	B	△
		IU back-up function		When a pair of indoor units (2 groups) is connected to one unit of remote control, it can be set Enable or Disable for the [IU rotation], [IU capacity back-up] and [IU fault back-up]	B	
		Motion sensor setting When the panel with the motion sensor is assembled.	*1	Set Enable or Disable for the infrared sensor detectors of indoor units connected to the remote control. If Disable is selected, it cannot be control the motion sensor control for the energy-saving setting.	B	
2	R/C function setting	Main/Sub R/C		The R/C setting of [Main/Sub] can be changed.	B	○
	[Service password]	Return air temp		When two or more indoor units are connected to one unit of remote control, suction sensors, which are used for the judgement by thermostat, can be selected. ・ It can be selected from [Individual], [Master IU] and [Average temp].	B	
		R/C sensor		It can be set the mode to switch to the remote control sensor. It can be selected from cooling and heating.	B	△
		R/C sensor adjustment		The offset value of [R/C sensor] sensing temp. can be set respectively in heating and cooling.	B	△
		Operation mode		Enable or Disable can be set for each operation mode.	B	△
		ºC / ºF		Set the unit for setting temperatures. ・ °C or °F can be selected.	B	
		Fan speed		Fan speeds can be selected.	B	○
		External input		When two or more indoor units are connected to one unit of remote control, the range to apply CNT inputs can be set.	B	○
		Upper/lower flap control		[Stop at fixed position] or [Stop at any position] can be selected for the upper and lower louvers.	B	○
		Left/right flap control	*1	[Fixed position stop] or [Stop at any position] can be selected for the right and left louvers.	B	
		Ventilation setting		Combination control for ventilator can be set.	B	○
		Auto-restart		The operation control method after recovery of power failure happened during operation can be set.	B	○
		Auto temp setting		[Enable] or [Disable] of [Auto temp setting] can be selected.	B	
		Auto fan speed		[Enable] or [Disable] of [Auto fan speed] can be selected.	B	
3	IU settings	Fan speed setting		The fan speed for indoor units can be set.	B	○
		Filter sign		The setting of filter sign display timer can be done from following patterns.	B	○
	[Service password]	External input 1		The connect of control by external input 1 can be changed.	B	○
		External input 1 signal		The type of external input 1 signal can be changed.	B	○
		External input 2		The connect of control by external input 2 can be changed.	B	
		External input 2 signal		The type of external input 2 signal can be changed.	B	
		Heating thermo-OFF temp adjustment		The judgement temp. of heating themo-off can be adjusted within the range from 0 to +3˚C (1˚C interval)	B	△
		Return temperature adjustment		The sensing temp. of return air temp. sensor built in the indoor unit can be adjusted within the range of ±2˚C.	B	△
		Fan control in cooling thermo-OFF		Fan control, when the cooling thermostat is turned OFF, can be changed.	B	○
		Fan control in heating thermo-OFF		Fan control, when the heating thermostat is turned OFF, can be changed.	B	○
		Anti-frost temp		Judgment temperature for the anti-frost control during cooling can be changed.	B	○
		Anti-frost control		When the anti-frost control of indoor unit in cooling is activated, the fan speed can be changed.	B	○
		Drain pump operation		In any operation mode in addition to cooling and dry mode, the setting of drain pump operation can be done.	B	○
		Keep fan operating after cooling is stopped		The time period residual fan operation after stopping or thermo-off in cooling mode can be set.	B	○
		Keep fan operating after heating is stopped		The time period residual fan operation after stopping or thermo-off in heating mode can be set.	B	○
		Intermittent fan operation in heating		The fan operation rule following the residual fan operation after stopping or themo-off in heating mode can be set.	B	○
		Fan circulator operation		In case that the fan is operated as the circulator, the fan control rule can be set.	B	
		Control pressure adjust		When only the OA processing units are operated, control pressure value can be changed.	B	
		Auto operation mode		The [Auto rule selection] for switching the operation mode automatically can be selected from 3 patterns.	B	
		Thermo. rule setting		When selecting [Outdoor air temp. control], the judgment temp can be offset by outdoor temp..	B	
		Auto fan speed control		Auto switching range for the auto fan speed control can be set.	B	
		IU overload alarm		If the difference between the setting temperature and the suction temperature becomes larger than the temperature difference set for the overload alarm, at 30 minutes after the start of operation, the overload alarm signal is transmitted from the external output (CNT-5).	B	
		External output setting	*1	Functions assigned to the external outputs 1 to 4 can be changed.	B	
4	Service & Maintenance	IU address		Max 16 indoor units can be connected to one remote control, and all address No. of the connected indoor units can be displayed. ・ The indoor unit conforming to the address No. can be identified by selecting the address No. and tapping [Check] to operate the indoor fan.	B	○
	[Service password]	Next service date		The [Next service date] can be registered. ・ The [Next service date] and [Company information] is displayed on the message screen.	A B	○
		Operation data		The [Operation data] for indoor unit and outdoor unit can be displayed.	B	○
		Error display			B	△
			Error history	The error history can be displayed.		
			Display anomaly data	The operation data just before the latest error stop can be displayed.		
			Erase anomaly data	Anomaly operation data can be erased.		
			Reset periodical check	The timer for the periodical check can be reset.		
		Saving IU settings		The I/U settings memorized in the indoor PCB connected to the remote control can be saved in the memory of the remote control.	B	
		Special settings		[Erase IU address] [CPU reset] [Restore of default setting] [Touch panel calibration]	B	△
		Indoor unit capacity display	*1	Address No. and capacities of indoor units connected to the remote control are displayed.	B	
8.Contact company				Shows registered [Contact company] and [Contact phone].		
9.Inspection						
	Confirmation of Inspection			This is displayed when any error occurs.	A	△
10.PC connection						
	USB connection			Weekly timer setting and etc., can be set from PC.	C	

◆ Listed items may not function depending on the specifications of indoor and outdoor units which are combined.

1.9.3 Installation of wired remote control (Option parts)

(1) Model RC-EX3A

1） Safety precautions

●Please read this manual carefully before starting installation work to install the unit properly.
Every one of the followings is important information to be observed strictly.

⚠WARNING	Failure to follow these instructions properly may result in serious consequences such as death, severe injury, etc.
⚠CAUTION	Failure to follow these instructions properly may cause injury or property damage.

It could have serious consequences depending on the circumstances.

●The following pictograms are used in the text.

	Never do.		Always follow the instructions given.

●Keep this manual at a safe place where you can consult with whenever necessary. Show this manual to installers when moving or repairing the unit. When the ownership of the unit is transferred, this manual should be given to a new owner.

⚠WARNING



Consult your dealer or a professional contractor to install the unit.
Improper installation made on your own may cause electric shocks, fire or dropping of the unit.



Installation work should be performed properly according to this installation manual.
Improper installation work may result in electric shocks, fire or break-down.



Be sure to use accessories and specified parts for installation work.
Use of unspecified parts may result in drop, fire or electric shocks.



Install the unit properly to a place with sufficient strength to hold the weight.
If the place is not strong enough, the unit may drop and cause injury.



Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.
Power source with insufficient and improper work can cause electric shock and fire.



Shut OFF the main power source before starting electrical work.
Otherwise, it could result in electric shocks, break-down or malfunction.



Do not modify the unit.
It could cause electric shocks, fire, or break-down.



Be sure to turn OFF the power circuit breaker before repairing/ inspecting the unit.
Repairing/inspecting the unit with the power circuit breaker turned ON could cause electric shocks or injury.

⚠WARNING

Do not install the unit in appropriate environment or where inflammable gas could generate, flow in, accumulate or leak.

If the unit is used at places where air contains dense oil mist, steam, organic solvent vapor, corrosive gas (ammonium, sulfuric compound, acid, etc) or where acidic or alkaline solution, special spray, etc. are used, it could cause electric shocks, break-down, smoke or fire as a result of significant deterioration of its performance or corrosion.

Do not install the unit where water vapor is generated excessively or condensation occurs.

It could cause electric shocks, fire, or break-down.

Do not use the unit in a place where it gets wet, such as laundry room.

It could cause electric shocks, fire, or break-down.

Do not operate the unit with wet hands.

It could cause electric shocks.

Do not wash the unit with water.

It could cause electric shocks, fire, or break-down.

Use the specified cables for wiring, and connect them securely with care to protect electronic parts from external forces.

Improper connections or fixing could cause heat generation, fire, etc.

Seal the inlet hole for remote control cable with putty.

If dew, water, insect, etc. enters through the hole, it could cause electric shocks, fire or break-down.

If dew or water enters the unit, it may cause screen display anomalies.

When installing the unit at a hospital, telecommunication facility, etc., take measures to suppress electric noises.

It could cause malfunction or break-down due to hazardous effects on the inverter, private power generator, high frequency medical equipment, radio communication equipment, etc.

The influences transmitted from the remote control to medical or communication equipment could disrupt medical activities, video broadcasting or cause noise interference.

Do not leave the remote control with its upper case removed.

If dew, water, insect, etc. enters through the hole, it could cause electric shocks, fire or break-down.

⚠CAUTION

Do not install the remote control at following places.

(1) It could cause break-down or deformation of remote control.
- Where it is exposed to direct sunlight
- Where the ambient temperature becomes 0 ˚C or below, or 40 ˚C or above
- Where the surface is not flat
- Where the strength of installation area is insufficient

(2) Moisture may be attached to internal parts of the remote control, resulting in a display failure.
- Place with high humidity where condensation occurs on the remote control
- Where the remote control gets wet

(3) Accurate room temperature may not be detected using the temperature sensor of the remote control.
- Where the average room temperature cannot be detected
- Place near the equipment to generate heat
- Place affected by outside air in opening/closing the door
- Place exposed to direct sunlight or wind from air-conditioner
- Where the difference between wall and room temperature is large

To connect to a personal computer via USB, use the dedicated software.
Do not connect other USB devices and the remote control at the same time.

It could cause malfunction or break-down of the remote control/personal computer.

2） Accessories & Prepare on site

Following parts are provided.

Accessories	R/C main unit, wood screw (ø3.5 x 16) 2 pcs, Quick reference

Following parts are arranged at site. Prepare them according to the respective installation procedures.

Item name	Q'ty	Remark
Switch box For 1 piece or 2 pieces (JIS C 8340 or equivalent)	1	These are not required when installing directly on a wall.
Thin wall steel pipe for electric appliance directly on a wall. (JIS C 8305 or equivalent)	As required	
Lock nut, bushing (JIS C 8330 or equivalent)	As required	
Lacing (JIS C 8425 or equivalent)	As required	Necessary to run R/C cable on the wall.
Putty	Suitably	For sealing gaps
Molly anchor	As required	
R/C cable (0.3 mm^2 x 2 pcs)	As required	See right table when longer than 100 m

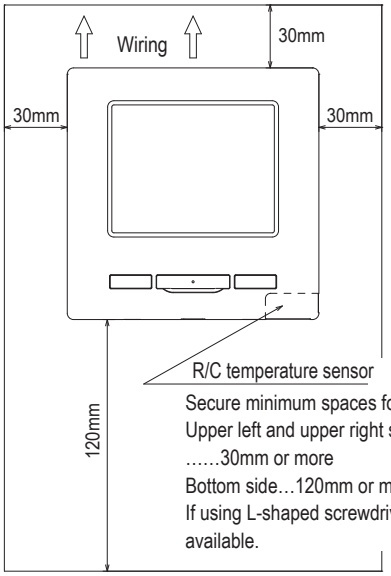
When the cable length is longer than 100 m, the max size for wires used in the R/C case is 0.5 mm^2 . Connect them to wires of larger size near the outside of R/C. When wires are connected, take measures to prevent water, etc. from entering inside.

≦ 200 m	0.5 mm^2 x 2 cores
≦ 300m	0.75 mm^2 x 2 cores
≦ 400m	1.25 mm^2 x 2 cores
≦ 600m	2.0 mm^2 x 2 cores

3） Installation place

Secure the installation space shown in the figure.
For the installation method, “embedding wiring” or “exposing wiring” can be selected.
For the wiring direction, “Backward”, “Upper center” or “Upper left” can be selected.
Determine the installation place in consideration of the installation method and wiring direction.

Installation space

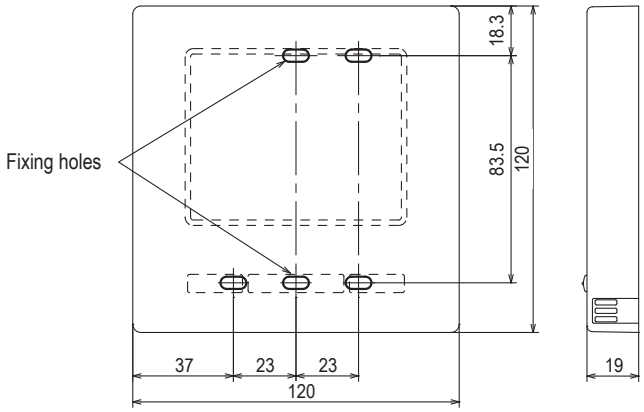


Secure minimum spaces for disassembling the case.
Upper left and upper right sides
……30mm or more
Bottom side…120mm or more
If using L-shaped screwdriver, 50mm or more is available.

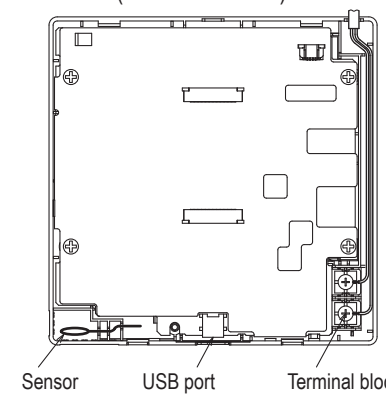
4) Installation procedure

Perform installation and wiring work for the remote control according to the following procedure.

Dimensions (Viewed from front)



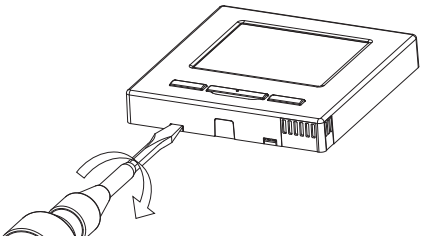
PCB side (Viewed from rear)



To disassemble the R/C case into the upper and lower pieces after assembling them once

· Insert the tip of flat head screwdriver or the like in the recess at the lower part of R/C and twist it lightly to remove. It is recommended that the tip of the screwdriver be wrapped with tape to avoid damaging the case.

Take care to protect the removed upper case from moisture or dust.

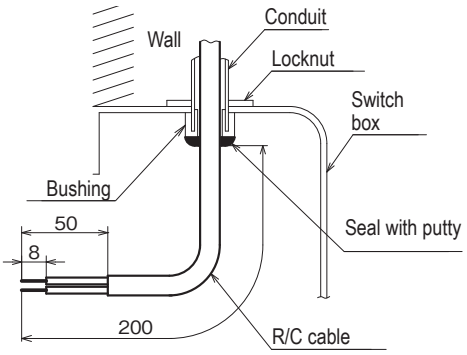


In case of embedding wiring

(When the wiring is retrieved "Backward")

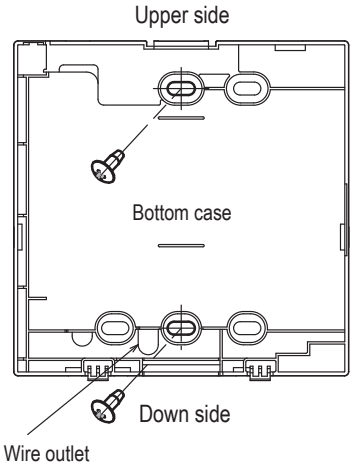
① Embed the switch box and the R/C wires beforehand.

Seal the inlet hole for the R/C wiring with putty.

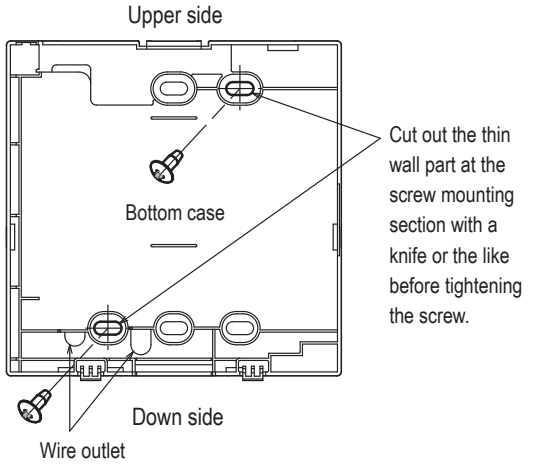


② When wires are passed through the bottom case, fix the bottom case at 2 places on the switch box.

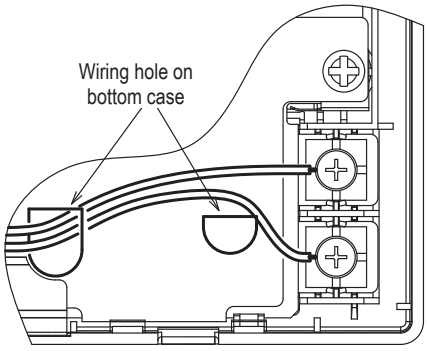
Switch box for 1 pcs



Switch box for 2 pcs

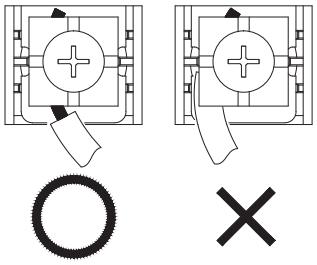


③ Connect wires from X and Y terminals of R/C to X and Y terminals of indoor unit. R/C wires (X, Y) have no polarity. Fix wires such that the wires will run around the terminal screws on the top case of R/C.
④ Install the upper case with care not to pinch wires of R/C.



Cautions for wire connection

Use wires of no larger than 0.5 mm^2 for wiring running through the remote control case. Take care not to pinch the sheath.
Tighten by hand (0.7 N·m or less) the wire connection. If the wire is connected using an electric driver, it may cause failure or deformation.

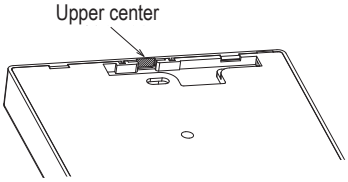


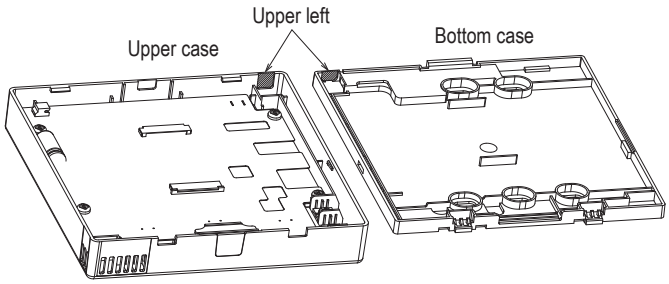
In case of exposing wiring

(When the wiring is taken out from the "upper center" or "upper left" of R/C)

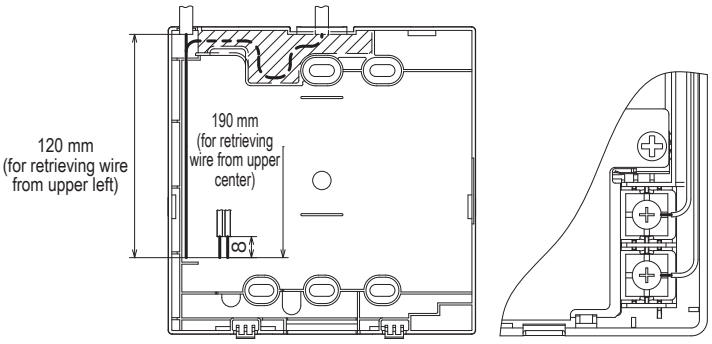
① Cut out the thin wall sections on the cases for the size of wire.

When taking the wiring out from the upper center, open a hole before separating the upper and bottom cases. This will reduce risk of damaging the PCB and facilitate subsequent work.
When taking the wiring out from the upper left, take care not to damage the PCB and not to leave any chips of cut thin wall inside.



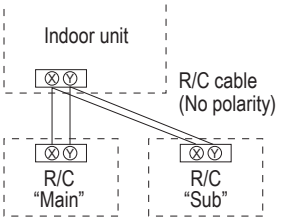


② Fix the bottom R/C case on a flat surface with two wood screws.
③ In case of the upper center, pass the wiring behind the bottom case. (Hatched section)
④ Connect wires from X and Y terminals of R/C to X and Y terminals of indoor unit. R/C wires (X, Y) have no polarity. Fix wires such that the wires will run around the terminal screws on the top case of R/C.
⑤ Install the top case with care not to pinch wires of R/C.
⑥ Seal the area cut in ① with putty.



5) Main/Sub setting when more than one remote control are used

Up to two units of R/C can be used at the maximum for 1 indoor unit or 1 group.
One is main R/C and the other is sub R/C.
Operating range is different depending on the main or sub R/C.



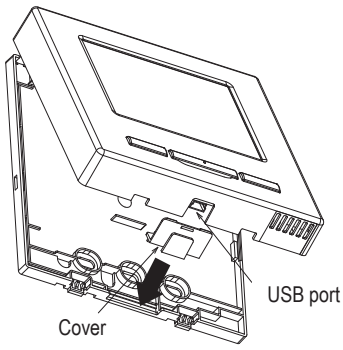
○ : operable × : not operable

R/C operations			Main	Sub
Run/Stop, Change set temp., Change flap direction, Auto swing, Change fan speed operations			○	○
High power operation, Energy-saving operation			○	○
Silent mode control			○	×
Useful functions	Individual flap control		○	×
	Anti draft setting		○	×
	Timer		○	○
	Favorite setting		○	○
	Weekly timer		○	×
	Home leave mode		○	×
	External ventilation		○	○
	Select the language		○	○
	Silent mode control		○	×
Energy-saving setting			○	×
Filter	Filter sign reset		○	○
User setting	Initial settings		○	○
	Administrator settings	Permission/ Prohibition setting	○	×
		Outdoor unit silent mode timer	○	×
		Setting temp. range	○	×
		Temp increment setting	○	×
		Set temp. display	○	○
		R/C display setting	○	○
		Change administrator password	○	○
		F1/F2 function setting	○	○

R/C operations				Main	Sub
Service setting	Installation settings	Installation date		○	×
		Company information		○	○
		Test run		○	×
		Static pressure adjustment		○	×
		Change auto-address		○	×
		Address setting of main IU		○	×
		IU back-up function		○	×
		Motion sensor setting		○	×
	R/C function settings	Main/Sub of R/C		○	○
		Return air temp.		○	×
		R/C sensor		○	×
		R/C sensor adjustment		○	×
		Operation mode		○	×
		ºC / ºF		○	×
		Fan speed		○	×
		External input		○	×
		Upper/lower flap control		○	×
		Left/right flap control		○	×
		Ventilation setting		○	×
		Auto-restart		○	×
		Auto temp. setting		○	×
		Auto fan speed		○	×
	IU settings			○	×
	Service & Maintenance	IU address		○	○
		Next service date		○	×
		Operation data		○	×
		Error display	Error history	○	○
			Display/erase anomaly data	○	×
			Reset periodical check	○	○
		Saving IU settings		○	×
		Special settings	Erase IU address	○	×
			CPU reset	○	○
			Restore of default setting	○	×
			Touch panel calibration	○	○
		Indoor unit capacity display		○	×

Advice: Connection to personal computer

It can be set from a personal computer via the USB port (mini-B).
Connect after removing the cover for USB port of upper case.
Replace the cover after use.
Special software is necessary for the connection.
For details, view the web site.

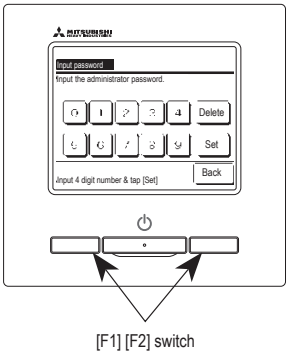


Advice: Initializing of password

Administrator password (for daily setting items) and
service password (for installation, test run and maintenance) are used.

○ The administrator password at factory default is "0000". This setting can be changed (Refer to User's Manual).
If the administrator password is forgotten, it can be initialized by holding down the [F1] and [F2] switches together for five seconds on the administrator password input screen.

○ Service password is "9999", which cannot be changed.
When the administrator password is input, the service password is also accepted.



Advice

When connecting two or more FDT/FDTC to one R/C, unify the panel type either to a panel with anti draft function or a standard panel.

PJA012D730B

(2) Model RC-E5

Read together with indoor unit's installation manual.

⚠WARNING

- Fasten the wiring to the terminal securely and hold the cable securely so as not to apply unexpected stress on the terminal.
  Loose connection or hold will cause abnormal heat generation or fire.
- Make sure the power source is turned off when electric wiring work.
  Otherwise, electric shock, malfunction and improper running may occur.

⚠CAUTION

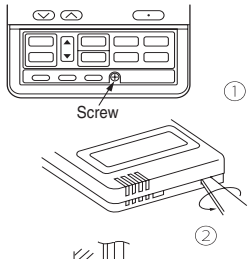
- Do not install the remote control at the following places in order to avoid malfunction.
  (1) Places exposed to direct sunlight
  (2) Places near heat devices
  (3) High humidity places
  (4) Hot surface or cold surface enough to generate condensation
  (5) Places exposed to oil mist or steam directly
  (6) Uneven surface
- Do not leave the remote control without the upper case.
  In case the upper cace needs to be detached, protect the remote control with a packaging box or bag in order to keep it away from water and dust.

Accessories	Remote control, wood screw (ø3.5×16) 2 pieces
Prepare on site	Remote control cord (2 cores) the insulated thickness in 1mm or more. [In case of embedding cord] Erectrical box, M4 screw (2 pieces) [In case of exposing cord] Cord clamp (if needed)

Installation procedure

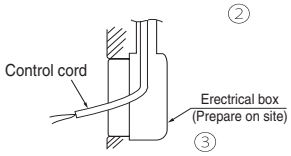
① Open the cover of remote control, and remove the screw under the buttons without fail.

② Remove the upper case of remote control.
Insert a flat-blade screwdriver into the dented part of the upper part of the remote control, and wrench slightly.

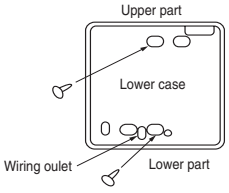


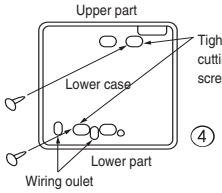
[In case of embedding cord]

③ Embed the erectrical box and remote control cord beforehand.

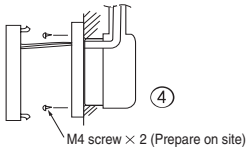


④ Prepare two M4 screws (recommended length is 12-16mm) on site, and install the lower case to erectrical box.
Choose either of the following two positions in fixing it with screws.





Tighten the screws after cutting off the thin part of screw mounting part.

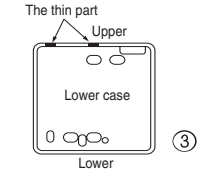


⑤ Connect the remote control cord to the terminal block.
Connect the terminal of remote control (X,Y) with the terminal of indoor unit (X,Y). (X and Y are no polarity)

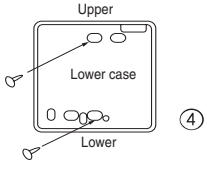
⑥ Install the upper case as before so as not to catch up the remote control cord, and tighten with the screws.

[In case of exposing cord]

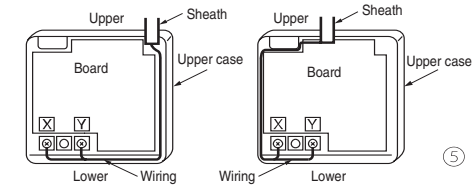
③ You can pull out the remote control cord from left upper part or center upper part.
Cut off the upper thin part of remote control lower case with a nipper or knife, and grind burrs with a file etc.



④ Install the lower case to the flat wall with attached two wooden screws.

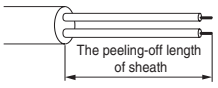


⑤ Connect the remote control cord to the terminal block.
Connect the terminal of remote control (X,Y) with the terminal of indoor unit (X,Y).
(X and Y are no polarity)
Wiring route is as shown in the right diagram depending on the pulling out direction.



The wiring inside the remote control case should be within 0.3mm^2 (recommended) to 0.5mm^2.
The sheath should be peeled off inside the remote control case.
The peeling-off length of each wire is as below.

Pulling out from upper left	Pulling out from upper center
X wiring : 215mm Y wiring : 195mm	X wiring : 170mm Y wiring : 190mm



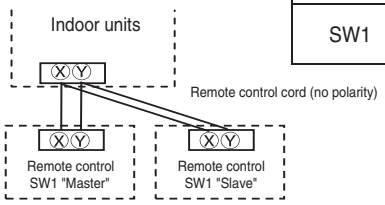
⑥ Install the upper case as before so as not to catch up the remote control cord, and tighten with the screws.
⑦ In case of exposing cord, fix the cord on the wall with cord clamp so as not to slack.

Installation and wiring of remote control

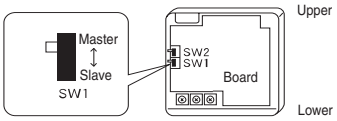
① Wiring of remote control should use 0.3mm^2 × 2 cores wires or cables. (on-site configuration)
② Maximum prolongation of remote control wiring is 600 m.
If the prolongation is over 100m, change to the size below.
But, wiring in the remote control case should be under 0.5mm^2 . Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.
100 - 200m·····0.5mm^2 × 2 cores
Under 300m·····0.75mm^2 × 2 cores
Under 400m·····1.25mm^2 × 2 cores
Under 500m·····2.0mm^2 × 2 cores

Master/ slave setting when more than one remote controls are used

A maximum of two remote controls can be connected to one indoor unit (or one group of indoor units.)



Switch	Setting	Contents
SW1	M	Master remote control
	S	Slave remote control

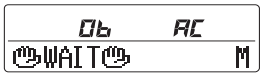


Set SW1 to "Slave" for the slave remote control. It was factory set to "Master" for shipment.
Note: The setting "Remote control sensor enabled" is only selectable with the master remote control in the position where you want to check room temperature.
The air-conditioner operation follows the last operation of the remote control regardless of the master/ slave setting of it.

The indication when power source is supplied

When power source is turned on, the following is displayed on the remote control until the communication between the remote control and indoor unit settled.
Master remote control : " WAIT M"
Slave remote control : " WAIT S"

At the same time, a mark or a number will be displayed for two seconds first.
This is the software's administration number of the remote control, not an error cord.



※ The left mark is only an example. Other marks may appear.

When remote control cannot communicate with the indoor unit for half an hour, the below indication will appear.
Check wiring of the indoor unit and the outdoor unit etc.



The range of temperature setting

When shipped, the range of set temperature differs depending on the operation mode as below.

Heating : 16-30˚C (55-86˚F)

Except heating (cooling, fan, dry, automatic) : 18-30˚C (62-86˚F)

●Upper limit and lower limit of set temperature can be changed with remote control.

Upper limit setting: valid during heating operation. Possible to set in the range of 20 to 30˚C (68 to 86˚F).

Lower limit setting: valid except heating (automatic, cooling, fan, dry) Possible to set in the range of 18 to 26˚C (62 to 79˚F).

When you set upper and lower limit by this function, control as below.

1. When ⑫TEMP RANGE SET, remote control function of function setting mode is "INDN CHANGE" (factory setting),
   【If upper limit value is set】
   During heating, you cannot set the value exceeding the upper limit.

   【If lower limit value is set 】
   During operation mode except heating, you cannot set the value below the lower limit.

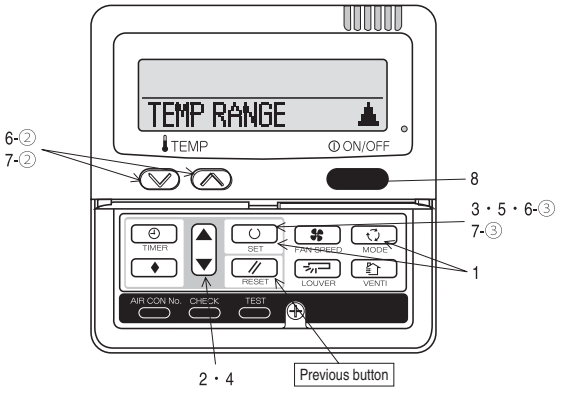
2. When ⑫TEMP RANGE SET, remote control function of function setting mode is "NO INDN CHANGE"
   【If upper limit value is set】
   During heating, even if the value exceeding the upper limit is set, upper limit value will be sent to the indoor unit. But, the indication is the same as the temperature set.

   【If lower limit value is set 】
   During except heating, even if the value lower than the lower limit is set, lower limit value will be sent to the indoor unit. But, the indication is the same as the temperature set.

●How to set upper and lower limit value

1. Stop the air-conditioner, and press (SET) and (MODE) button at the same time for over three seconds .
   The indication changes to "FUNCTION SET ▼".
2. Press ▼ button once, and change to the "TEMP RANGE ▲ " indication.
3. Press (SET) button, and enter the temperature range setting mode.
4. Select "UPPER LIMIT ▼" or "LOWER LIMIT ▲" by using ▲ ▼ button.
5. Press (SET) button to fix.
6. When "UPPER LIMIT ▼" is selected (valid during heating)
   ① Indication: "☝ ∨ ∧ SET UP" → "UPPER 30˚C ∨"
   ② Select the upper limit value with temperature setting button ▽ △. Indication example: "UPPER 26˚C ∨ ∧" (blinking)
   ③ Press (SET) button to fix. Indication example: "UPPER 26˚C" (Displayed for two seconds)
   After the fixed upper limit value displayed for two seconds, the indication will return to "UPPER LIMIT ▼".
7. When "LOWER LIMIT ▲" is selected (valid during cooling, dry, fan, automatic)
   ① Indication: "☝ ∨ ∧ SET UP" → "LOWER 18˚C ∧"
   ② Select the lower limit value with temperature setting button ▽ △. Indication example: "LOWER 24˚C ∨ ∧" (blinking)
   ③ Press (SET) button to fix. Indication for example: "LOWER 24˚C" (Displayed for two seconds)
   After the fixed lower limit value displayed for two seconds, the indication will return to "LOWER LIMIT ▼".
8. Press ON/OFF button to finish.

- It is possible to finish by pressing ON/OFF button on the way, but unfinished change of setting is unavailable.
- During setting, if you press (RESET) button, you return to the previous screen.



The functional setting

●The initial function setting for typical using is performed automatically by the indoor unit connected, when remote control and indoor unit are connected.
As long as they are used in a typical manner, there will be no need to change the initial settings.
If you would like to change the initial setting marked "○", set your desired setting as for the selected item.
The procedure of functional setting is shown as the following diagram.

[Flow of function setting]

Start : Stop air-conditioner and press "○" (SET) and "▽" (MODE) buttons at the same time for over three seconds.
Finalize : Press "○" (SET) button.
Reset : Press "✎" (RESET) button.
Select : Press ▲ ▼ button.
End : Press ON/OFF button.
It is possible to finish above setting on the way, and unfinished change of setting is unavailable.
"○" : Initial settings
"※" : Automatic criterion

Record and keep the setting

Consult the technical data etc. for each control details

Stop air-conditioner and press ○ (SET) + ▽ (MODE) buttons at the same time for over three seconds.

FUNCTION SET ▼

FUNCTION ▼ (Remote control function)

Function / **setting**

01	ESP SET		
		ESP VALID	○ Validate setting of ESP:External Static Pressure
		ESP INVALID	Invalidate setting of ESP
02	AUTO RUN SET		
		AUTO RUN ON	※
		AUTO RUN OFF	※ Automatical operation is impossible
03	TEMP SW		
		VALID	○
		INVALID	Temperature setting button is not working
04	MODE SW		
		VALID	○
		INVALID	Mode button is not working
05	ON/OFF SW		
		VALID	○
		INVALID	On/Off button is not working
06	FAN SPEED SW		
		VALID	※
		INVALID	※ Fan speed button is not working
07	LOUVER SW		
		VALID	※
		INVALID	※ Louver button is not working
08	TIMER SW		
		VALID	○
		INVALID	Timer button is not working
09	SENSOR SET		
		SENSOR OFF	○ Remote thermistor is not working.
		SENSOR ON	Remote thermistor is working.
		SENSOR +3.0℃	Remote thermistor is working, and to be set for producing +3.0˚C increase in temperature.
		SENSOR +2.0℃	Remote thermistor is working, and to be set for producing +2.0˚C increase in temperature.
		SENSOR +1.0℃	Remote thermistor is working, and to be set for producing +1.0˚C increase in temperature.
		SENSOR -1.0℃	Remote thermistor is working, and to be set for producing -1.0˚C increase in temperature.
		SENSOR -2.0℃	Remote thermistor is working, and to be set for producing -2.0˚C increase in temperature.
		SENSOR -3.0℃	Remote thermistor is working, and to be set for producing -3.0˚C increase in temperature.
10	AUTO RESTART		
		INVALID	○
		VALID	
11	VENT LINK SET		
		NO VENT	○
		VENT LINK	In case of Single split series, by connecting ventilation device to CNT of the indoor printed circuit board (in case of VRF series, by connecting it to CND of the indoor printed circuit board), the operation of ventilation device is linked with the operation of indoor unit.
		NO VENT LINK	In case of Single split series, by connecting ventilation device to CNT of the indoor printed circuit board (in case of VRF series, by connecting it to CND of the indoor printed circuit board), you can operate /stop the ventilation device independently by ▽ (VENT) button.
12	TEMP RANGE SET		
		INDIN CHANGE	○ If you change the range of set temperature, the indication of set temperature will vary following the control.
		NO INDIN CHANGE	If you change the range of set temperature, the indication of set temperature will not vary following the control, and keep the set temperature.
13	I/U FAN		
		HI-MID-LO	※ Air flow of fan becomes the three speed of ※ -※ -※ or ※ -※ -※ -※ .
		HI-LO	※ Air flow of fan becomes the two speed of ※ -※ .
		HI-MID	Air flow of fan becomes the two speed of ※ -※ .
		1 FAN SPEED	※ Air flow of fan is fixed at one speed.
14	POSITION		If you change the remote control function "14 POSITION", you must change the indoor function "04 POSITION" accordingly.
		4POSITION STOP	○ You can select the louver stop position in the four.
		FREE STOP	The louver can stop at any position.
15	MODEL TYPE		
		HEAT PUMP	※
		COOLING ONLY	※
16	EXTERNAL CONTROL SET		
		INDIVIDUAL	○ If you input signal into CnT of the indoor printed circuit board from external, the indoor unit will be operated independently according to the input from external. If you input into CNT of the indoor printed circuit board from external, all units which connect to the same remote control are operated according to the input from external.
		FOR ALL UNITS	
17	ROOM TEMP INDICATION SET		
		INDICATION OFF	○
		INDICATION ON	In normal working indication, indoor unit temperature is indicated instead of air flow. (Only the master remote control can be indicated.)
18	※ INDICATION		
		INDICATION ON	○
		INDICATION OFF	Heating preparation indication should not be indicated.
19	℃/℉ SET		
		℃	○ Temperature indication is by degree C.
		℉	Temperature indication is by degree F.

(Indoor unit function) I/U FUNCTION ▲

Indoor unit No. are indicated only when plural indoor units are connected.

I/U000 ▲
I/U001 ≑
I/U002 ≑
I/U003 ≑
I/U004 ≑

To set other indoor unit, press AIR CON No. button, which allows you to go back to the indoor unit selection screen (for example: I/U 000 ▲).

Function / **setting**

02	FAN SPEED SET		
		STANDARD	※
		HIGH SPEED 1	※
		HIGH SPEED 2	
03	FILTER SIGN SET		
		INDICATION OFF	
		TYPE 1	○ The filter sign is indicated after running for 180 hours.
		TYPE 2	The filter sign is indicated after running for 600 hours.
		TYPE 3	The filter sign is indicated after running for 1000 hours.
		TYPE 4	The filter sign is indicated after running for 1000 hours, then the indoor unit will be stopped by compulsion after 24 hours.
04	POSITION		If you change the indoor function "04 POSITION", you must change the remote control function "14 POSITION" accordingly.
		4POSITION STOP	○ You can select the louver stop position in the four.
		FREE STOP	The louver can stop at any position.
05	EXTERNAL INPUT		
		LEVEL INPUT	○
		PULSE INPUT	
06	OPERATION PERMISSION/PROHIBITION		
		INVALID	○
		VALID	Permission/prohibition control of operation will be valid.
07	EMERGENCY STOP		
		INVALID	○
		VALID	With the VRF series, it is used to stop all indoor units connected with the same outdoor unit immediately. When stop signal is inputed from remote on-off terminal "CNT-6", all indoor units are stopped immediately.
08	※ SP OFFSET		
		OFFSET +3.0℃	To be reset for producing +3.0˚C increase in temperature during heating.
		OFFSET +2.0℃	To be reset for producing +2.0˚C increase in temperature during heating.
		OFFSET +1.0℃	To be reset for producing +1.0˚C increase in temperature during heating.
		NO OFFSET	○
09	RETURN AIR TEMP		
		OFFSET +2.0℃	To be reset producing +2.0˚C increase in return air temperature of indoor unit.
		OFFSET +1.5℃	To be reset producing +1.5˚C increase in return air temperature of indoor unit.
		OFFSET +1.0℃	To be reset producing +1.0˚C increase in return air temperature of indoor unit.
		NO OFFSET	○
		OFFSET -1.0℃	To be reset producing -1.0˚C increase in return air temperature of indoor unit.
		OFFSET -1.5℃	To be reset producing -1.5˚C increase in return air temperature of indoor unit.
		OFFSET -2.0℃	To be reset producing -2.0˚C increase in return air temperature of indoor unit.
10	※ FAN CONTROL		
		LOW FAN SPEED	○ When heating thermostat is OFF, fan speed is low speed.
		SET FAN SPEED	When heating thermostat is OFF, fan speed is set speed.
		INTERMITTENCE	When heating thermostat is OFF, fan speed is operated intermittently.
		FAN OFF	When heating thermostat is OFF, the fan is stopped. When the remote thermistor is working, "FAN OFF" is set automatically. Do not set "FAN OFF" when the indoor unit's thermistor is working.
11	FROST PREVENTION TEMP		Change of indoor heat exchanger temperature to start frost prevention control.
		TEMP HIGH	
		TEMP LOW	○
12	FROST PREVENTION CONTROL		Working only with the Single split series.
		FAN CONTROL ON	○ To control frost prevention, the indoor fan tap is raised.
		FAN CONTROL OFF	
13	DRAIN PUMP LINK		
		⚙△	○ Drain pump is run during cooling and dry.
		⚙△AND※	Drain pump is run during cooling, dry and heating.
		⚙△AND※AND≋	Drain pump is run during cooling, dry, heating and fan.
		⚙△AND≋	Drain pump is run during cooling, dry and fan.
14	⚙ FAN REMAINING		
		NO REMAINING	○ After cooling is stopped is OFF, the fan does not perform extra operation.
		0.5 HOUR	After cooling is stopped is OFF, the fan perform extra operation for half an hour.
		1 HOUR	After cooling is stopped is OFF, the fan perform extra operation for an hour.
		6 HOUR	After cooling is stopped is OFF, the fan perform extra operation for six hours.
15	※ FAN REMAINING		
		NO REMAINING	○ After heating is stopped or heating thermostat is OFF, the fan does not perform extra operation.
		0.5 HOUR	After heating is stopped or heating thermostat is OFF,the fan perform extra operation for half an hour.
		2 HOUR	After heating is stopped or heating thermostat is OFF,the fan perform extra operation for two hours.
		6 HOUR	After heating is stopped or heating thermostat is OFF, the fan perform extra operation for six hours.
16	※ FAN INTERMITTENCE		
		NO REMAINING	○
		2min ON 5min OFF	During heating is stopped or heating thermostat is OFF, the fan perform intermittent operation for five minutes with low fan speed after twenty minutes' OFF.
		5min ON 5min OFF	During heating is stopped or heating thermostat is OFF, the fan perform intermittent operation for five minutes with low fan speed after five minutes' OFF.
17	PRESSURE CONTROL		
		STANDARD	※
		TYPE1	※ Connected "OA Processing" type indoor unit, and is automatically defined.

ON/OFF button (finished)

Note 1: The initial setting marked "※" is decided by connected indoor and outdoor unit, and is automatically defined as following table.

Function No.	Item	Default	Model
Remote control function02	AUTO RUN SET	AUTO RUN ON	"Auto-RUN" mode selectable indoor unit.
		AUTO RUN OFF	Indoor unit without "Auto-RUN" mode
Remote control function06	FAN SPEED SW	VALID	Indoor unit with two or three step of air flow setting
		INVALID	Indoor unit with only one of air flow setting
Remote control function07	LOUVER SW	VALID	Indoor unit with automatically swing louver
		INVALID	Indoor unit without automatically swing louver
Remote control function13	I/U FAN	HI-MID-LO	Indoor unit with three step of air flow setting
		HI-LO	Indoor unit with two step of air flow setting
		HI-MID	
		1 FAN SPEED	Indoor unit with only one of air flow setting
Remote control function15	MODEL TYPE	HEAT PUMP	Heat pump unit
		COOLING ONLY	Exclusive cooling unit

Note 3: As for plural indoor unit, set indoor functions to each master and slave indoor unit.
But only master indoor unit is received the setting change of indoor unit function "05 EXTERNAL INPUT" and "06 PERMISSION / PROHIBISHION".

Note2: Fan setting of "HIGH SPEED"

Fan tap		Indoor unit air flow setting			
		※ -※ -※ - ※	※ -※ - ※	※ -※	※
FAN SPEED SET	STANDARD	UH - Hi - Me - Lo	Hi - Me - Lo	Hi - Lo	Hi - Me
	HIGH SPEED1, 2	UH - UH - Hi - Me	UH - Hi - Me	UH - Me	UH - Hi

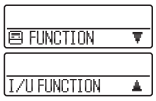
Initial function setting of some indoor unit is "HIGH SPEED".

How to set function

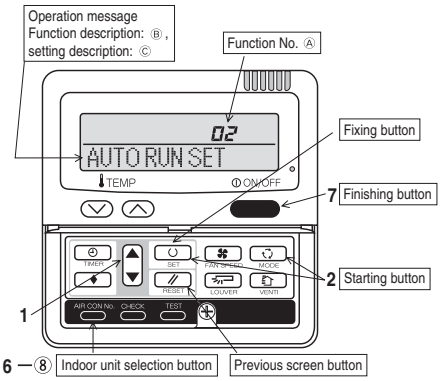
1. **Stop air-conditioner and press (SET) (MODE) buttons at the same time for over three seconds, and the "FUNCTION SET ▼" will be displayed.**



2. **Press (SET) button.**
3. **Make sure which do you want to set, "FUNCTION ▼" (remote control function) or "I/U FUNCTION ▲" (indoor unit function).**
4. **Press ▲ or ▼ button.**
   Selecct "FUNCTION ▼" (remote control function) or "I/U FUNCTION ▲" (indoor unit function).



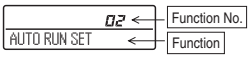
5. **Press (SET) button.**



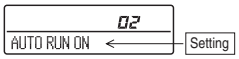
6. **【On the occasion of remote control function selection】**

① "DATA LOADING" (Indication with blinking)
↓
Display is changed to "01 ESP SET".

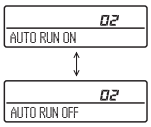
② Press ▲ or ▼ button.
"No. and function"are indicated by turns on the remote control function table, then you can select from them.
(For example)



③ Press (SET) button.
The current setting of selected function is indicated.
(for example) "AUTO RUN ON" ← If "02 AUTO RUN SET" is selected



④ Press ▲ or ▼ button.
Select the setting.



⑤ Press (SET)
"SET COMPLETE" will be indicated, and the setting will be completed.
Then after "No. and function" indication returns, Set as the same procedure if you want to set continuously ,and if to finish, go to 7.



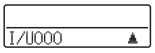
7. **Press ON/OFF button.**
   Setting is finished.

【On the occasion of indoor unit function selection】

① "DATA LOADING" (Blinking for 2 to 23 seconds to read the data)
↓
Indication is changed to "02 FAN SPEED SET".
Go to ②.

[Note]

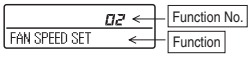
(1) If plural indoor units are connected to a remote control, the indication is "I/U 000" (blinking) ← The lowest number of the indoor unit connected is indicated.



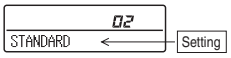
(2) Press ▲ or ▼ button.
Select the number of the indoor unit you are to set
If you select "ALL UNIT ▼", you can set the same setting with all unites.

(3) Press (SET) button.

② Press ▲ or ▼ button.
"No. and function" are indicated by turns on the indoor unit function table, then you can select from them.
(For example)



③ Press (SET) button.
The current setting of selected function is indicated.
(For example) "STANDARD" ← If "02 FAN SPEED SET" is selected.



④ Press ▲ or ▼ button.
Select the setting.

⑤ Press (SET) button.
"SET COMPLETE" will be indicated, and the setting will be completed.
Then after "No. and function" indication returns, set as the same procedure if you want to set continuously , and if to finish, go to 7.



※ When plural indoor units are connected to a remote control, press the AIR CON No. button, which allows you to go back to the indoor unit selection screen. (example "I/U 000 ▲")

- It is possible to finish by pressing ON/OFF button on the way, but unfinished change of setting is unavailable.
- During setting, if you press (RESET) button, you return to the previous screen.
- Setting is memorized in the control and it is saved independently of power failure.

【How to check the current setting】

When you select from "No. and funcion" and press set button by the previous operation, the "Setting" displayed first is the current setting.
(But, if you select "ALL UNIT ▼", the setting of the lowest number indoor unit is displayed.)

1.9.4 Installation of outdoor unit

(1) Models SRC40-60ZSX-S

RWC012A060

Model	SRC20,25,35,40,50,60ZSX-S SRC20,25,35ZSX-SA
R410A REFRIGERANT USED	

• This installation manual deals with an outdoor unit installation only. For an indoor unit installation, refer to page 48.

SAFETY PRECAUTIONS

• Before installation, read the "SAFETY PRECAUTIONS" carefully and strictly follow it during the installation work in order to protect yourself.
• The precautionary items mentioned below are distinguished into two levels, ⚠WARNING and ⚠ CAUTION .

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, can result in serious consequences such as death or severe injury.
⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, can result in personal injury or property damage.

Both mention the important items to protect your health and safety. Therefore, strictly follow them by any means.

• Be sure to confirm no operation problem on the equipment after completing the installation. If unusual noise can be heard during the test run, consult the dealer.
• Be sure to explain the operating methods as well as the maintenance methods of this equipment to the user according to the user's manual.
• Be sure to keep the installation manual together with user's manual at a place where it is easily accessible to the user any time. Moreover, ask the user to hand the manuals to a new user, whenever required.

⚠ WARNING

- **Be sure to use only for residential purpose.**
  If this unit is installed in inferior environment such as machine shop, vehicle (like ship), warehouse, etc., it can malfunction.
- **Installation must be carried out by the qualified installer completely in accordance with the installation manual.**
  Installation by non qualified person or incorrect installation can cause serious troubles such as water leak, electric shock, fire and personal injury.
- **Be sure to wear protective goggles and gloves while performing installation work.**
  Improper safety measures can result in personal injury.
- **Use the original accessories and the specified components for the installation.**
  Using parts other than those prescribed may cause water leak, electric shock, fire and personal injury.
- **Do not install the unit near the location where leakage of flammable gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire resulting in property damage and personal injury.
- **When installing the unit in small rooms, make sure that refrigerant density does not exceed the limit (Reference: ISO5149) in the event of leakage.**
  If refrigerant density exceeds the limit, consult the dealer and install the ventilation system.
  Otherwise lack of oxygen can occur resulting in serious accident.
- **Install the unit in a location where unit will remain stable, horizontal and free of any vibration transmission.**
  Unsuitable installation location can cause the unit to fall resulting in material damage and personal injury.
- **Do not run the unit with removed panels or protections.**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shock.
- **This unit is designed specifically for R410A.**
  Using any other refrigerant can cause unit failure and personal injury.
- **Do not vent R410A into atmosphere.**
  R410A is a fluorinated greenhouse gas with a Global Warming Potential(GWP)=2088.
- **Make sure that no air enters the refrigerant circuit when the unit is installed and removed.**
  If air enters the refrigerant circuit, the pressure in the refrigerant circuit will become too high, which can cause burst and personal injury.
- **Be sure to use the prescribed pipes, flare nuts and tools for R410A.**
  Using existing parts (for R22 or R407C) can cause refrigerant circuit burst resulting in unit failure and personal injury.
- **Be sure to connect both liquid and gas connecting pipes properly before operating the compressor.**
  Do not open the liquid and gas service valves before completing piping work, and evacuation.
  If the compressor is operated when connecting pipes are not connected and service valves are open, air can be sucked into the refrigerant circuit which can cause anomalous high pressure resulting in burst or personal injury.
- **Be sure to tighten the flare nuts to specified torque using the torque wrench.**
  Tightening flare nuts with excess torque can cause burst and refrigerant leakage after a long period.
- **During pump down work, be sure to stop the compressor before closing service valves and removing connecting pipes.**
  If the connecting pipes are removed when the compressor is in operation and service valves are open, air can be sucked into the refrigerant circuit which can cause anomalous high pressure resulting in burst or personal injury.
- **In the event of refrigerant leakage during installation, be sure to ventilate the working area properly.**
  If the refrigerant comes into contact with naked flames, poisonous gases will be produced.
- **Electrical work must be carried out by the qualified electrician, strictly in accordance with national or regional electricity regulations.**
  Incorrect installation can cause electric shock, fire or personal injury.
- **Make sure that earth leakage breaker and circuit breaker of appropriate capacities are installed.**
  Circuit breaker should be able to disconnect all poles under over current. Absence of appropriate breakers can cause electric shock, personal injury or property damage.
- **Be sure to switch off the power source in the event of installation, maintenance or service.**
  If the power source is not switched off, there is a risk of electric shock, unit failure or personal injury.
- **Be sure to tighten the cables securely in terminal block and relieve the cables properly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Do not process, splice or modify the power cable, or share the socket with other power plugs.**
  Improper power cable or power plug can cause fire or electric shock due to poor connection, insufficient insulation or over-current.
- **Do not perform any change in protective device or its setup condition yourself.**
  Changing protective device specifications can cause electric shock, fire or burst.
- **Be sure to clamp the cables properly so that they do not touch any internal component of the unit.**
  If cables touch any internal component, it can cause overheating and fire.
- **Be sure to install service cover properly.**
  Improper installation can cause electric shock or fire due to intrusion of dust or water.
- **Be sure to use the prescribed power and connecting cables for electrical work.**
  Using improper cables can cause electric leak, anomalous heat production or fire.
- **This appliance must be connected to main power source by means of a circuit breaker or switch with a contact separation of at least 3mm.**
  Improper electrical work can cause unit failure or personal injury.
- **When plugging this unit, a plug conforming to the norm IEC60884-1 must be used.**
  Using improper plug can cause electric shock or fire.
- **Be sure to connect the power source cable with power source properly.**
  Improper connection can cause intrusion of dust or water resulting in electric shock or fire.

⚠ CAUTION

- **Take care when carrying the unit by hand.**
  If the unit weight is more than 20kg, it must be carried by two or more persons.
  Do not carry the unit by the plastic straps. Always use the carry handle.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electrical parts and cause damage resulting in fire or personal injury. Instruct the user to keep the surroundings clean.
- **If the outdoor unit is installed at height, make sure that there is enough space for installation, maintenance and service.**
  Insufficient space can result in personal injury due to falling from the height.
- **Do not install the unit near the location where neighbours are bothered by noise or air generating from the unit.**
  It can affect surrounding environment and cause a claim.
- **Do not install in the locations where unit is directly exposed to corrosive gases (like sulphide gas, chloride gas), sea breeze or salty atmosphere.**
  It can cause corrosion of heat exchanger and damage to plastic parts.
- **Do not install the unit close to the equipments that generate electromagnetic waves and/or high-harmonic waves.**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns.
  The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Do not install the unit in the locations where:**
  - There are heat sources nearby.
  - Unit is directly exposed to rain or sunlight.
  - There is any obstacle which can prevent smooth air circulation from inlet and outlet side of the unit.
  - Unit is directly exposed to oil mist and steam such as kitchen.
  - Chemical substances like ammonia (organic fertilizer), calcium chloride (snow melting agent) and acid (sulfurous acid etc.), which can harm the unit, will generate or accumulate.
  - Drain water can not be discharged properly.
  - TV set or radio receiver is placed within 1m.
  - Height above sea level is more than 1000m.
    It can cause performance degradation, corrosion and damage of components, unit malfunction and fire.
- **Dispose of all packing materials properly.**
  Packing materials contain nails and wood which can cause personal injury.
  Keep the polybag away from children to avoid the risk of suffocation.
- **Do not put anything on the outdoor unit.**
  Object may fall causing property damage or personal injury.
- **Do not touch the aluminum fin of the outdoor unit.**
  Aluminium fin temperature is high during heating operation. Touching fin can cause burn.
- **Do not touch any refrigerant pipe with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending on the operating condition. Touching pipes can cause personal injury like burn (hot/cold).
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations.**
  The isolator should be locked in OFF state in accordance with EN60204-1.

1. ACCESSORIES AND TOOLS

Standard accessories (Supplied with outdoor unit)		Q'ty
(1)	Drain grommet	4
(2)	Drain elbow	1

*Not included for SRC20, 25, or 35ZSX-SA.

Locally procured parts	
(a)	Anchor bolt(M10-M12)×4 pcs
(b)	Putty
(c)	Electrical tape
(d)	Connecting pipe
(e)	Connecting cable
(f)	Power cable
(g)	Clamp and screw (for finishing work)

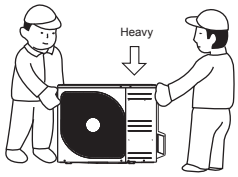
Tools for installation work		
Plus headed driver	Spanner wrench	Vacuum pump*
Knife	Torque wrench [14.0-62.0N・m(1.4-6.2kgf・m)]	Gauge manifold *
Saw	Wrench key (Hexagon) [4mm]	Charge hose *
Tape measure	Flaring tool set *	Vacuum pump adapter* (Anti-reverse flow type)
Pipe cutter	Flare adjustment gauge	Gas leak detector *

*Designed specifically for R410A

2. OUTDOOR UNIT INSTALLATION

1. Haulage

- Always carry or move the unit with two or more persons.
- The right hand side of the unit as viewed from the front (outlet side) is heavier.
  A person carrying the right hand side must take care of this fact. A person carrying the left hand side must hold the handle provided on the front panel of the unit with his right hand and the corner column section of the unit with his left hand.



⚠ CAUTION

When a unit is hauled, take care of its gravity center position which is shifted towards right hand side. If the unit is not hauled properly, it can go off balance and fall resulting in serious injury.

2. Selecting the installation location

Select the suitable installation location where:

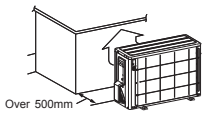
- Unit will be stable, horizontal and free of any vibration transmission.
- There is no obstacle which can prevent smooth air circulation from inlet and outlet side of the unit.
- There is enough space for service and maintenance of unit.
- Neighbours are not bothered by noise or air generating from the unit.
- Outlet air of the unit does not blow directly to animals or plants.
- Drain water can be discharged properly.
- There is no risk of flammable gas leakage.
- There are no other heat sources nearby.
- Unit is not directly exposed to rain or sunlight.
- Unit is not directly exposed to oil mist and steam.
- Chemical substances like ammonia (organic fertilizer), calcium chloride (snow melting agent) and acid (sulfurous acid etc.), which can harm the unit, will not generate or accumulate.
- Unit is not directly exposed to corrosive gases (like sulphide gas, chloride gas), sea breeze or salty atmosphere.
- No TV set or radio receiver is placed within 1m.
- Unit is not affected by electromagnetic waves and/or high-harmonic waves generated by other equipments.
- Strong wind does not blow against the unit outlet.
- Heavy snowfalls do not occur (If installed, provide proper protection to avoid snow accumulation).

NOTE

If the unit is installed in the area where there is a possibility of strong wind or snow accumulation, the following measures are required.

(1) Location of strong wind

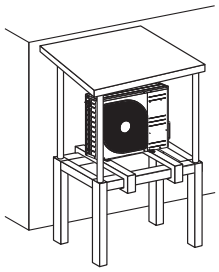
- Place the unit with its outlet side facing the wall.
- Place the unit such that the direction of air from the outlet gets perpendicular to the wind direction.





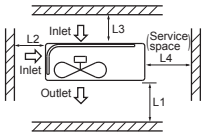
(2) Location of snow accumulation

- Install the unit on the base so that the bottom is higher than snow cover surface.
- Install the unit under eaves or provide the roof on site.



3. Installation space

- There must be 1 meter or larger space between the unit and the wall in at least 1 of the 4 sides. Walls surrounding the unit from 4 sides is not acceptable. The wall height on the outlet side should be 1200 mm or less. Refer to the following figure and table for details.



(mm)

Example installation / Size	I	II	III	IV
L1	Open	280	280	180
L2	100	75	Open	Open
L3	100	80	80	80
L4	250	Open	250	Open

NOTE

When more than one unit are installed side by side, provide a 250mm or wider interval between them as a service space.

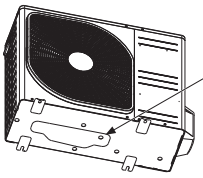
⚠ CAUTION

When more than one unit are installed in parallel directions, provide sufficient inlet space so that short-circuiting may not occur.

4. Drain piping work (If necessary)

Carry out drain piping work by using a drain elbow and a drain grommet supplied separately as accessories if condensed water needs to be drained out.
(1) Install drain elbow and drain grommet.
(2) Seal around the drain elbow and drain grommet with putty or adequate caulking material.

<SRC20/25/35/40/50/60ZSX-S>

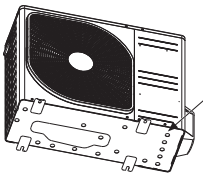


Do not put a grommet on this hole.
This is a supplementary drain hole to discharge drain water, when a large amount of it is gathered.

⚠ CAUTION

Do not use drain elbow and drain grommet if there is a possibility to have several consecutive days of sub zero temperature. (There is a risk of drain water freezing inside and blocking the drain.)

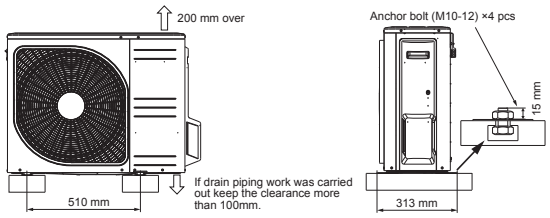
<SRC20/25/35ZSX-SA>



Do not block the drain holes when installing the outdoor unit.

5. Installation

- Install the unit on a flat level base.
- While installing the unit, keep space and fix the unit's legs with 4 anchor bolts as shown in the figure below. The protrusion of an anchor bolt from the foundation surface must be kept within 15mm.



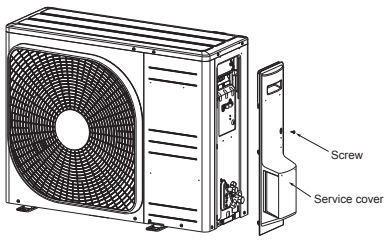
⚠ CAUTION

- Install the unit properly so that it does not fall over during earthquake, strong wind, etc.
- Make sure that unit is installed on a flat level base. Installing unit on uneven base may result in unit malfunction.

3. PREPARATION FOR WORK

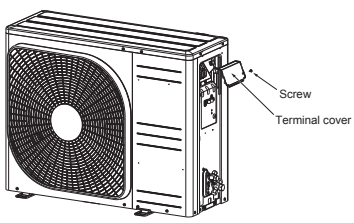
1. Removing service cover

Remove the screw. Slide service cover downwards and remove it.



2. Removing terminal cover

Remove the screw and take out terminal cover.

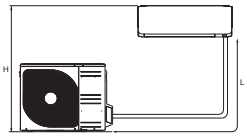


4. CONNECTING PIPING WORK

1. Restrictions on unit installation

Abide by the following restrictions on unit installation.
Improper installation can cause compressor failure or performance degradation.

	Dimensional restrictions	
	Model SRC20/25/35	Model SRC40/50/60
Connecting pipe length(L)	25m or less	30m or less
Elevation difference between indoor and outdoor units(H)*	15m or less	20m or less



* Outdoor unit installation position can be higher as well as lower than the indoor unit installation position.

2. Preparation of connecting pipe

2.1. Selecting connecting pipe

Select connecting pipe according to the following table.

	Model SRC20/25/35	Model SRC40/50/60
Gas pipe	ø9.52	ø12.7
Liquid pipe	ø6.35	ø6.35

- Pipe wall thickness must be greater than or equal to 0.8 mm.
- Pipe material must be O-type (Phosphorus deoxidized seamless copper pipe ICS 23.040.15, ICS 77.150.30).

NOTE

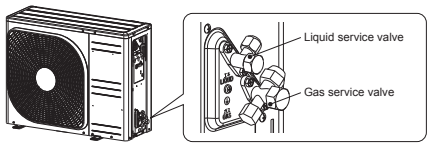
If it is required to reuse the existing connecting pipe system, refer to 5. UTILIZATION OF EXISTING PIPE.

2.2. Cutting connecting pipe

(1) Cut the connecting pipe to the required length with pipe cutter.
(2) Hold the pipe downward and remove the burrs. Make sure that no foreign material enters the pipe.
(3) Cover the connecting pipe ends with the tape.

3. Piping work

Check that both liquid and gas service valves are fully closed.
Carry out the piping work with service valves fully closed.

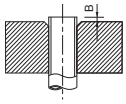


3.1. Flaring pipe

(1) Take out flare nuts from the service valves of outdoor unit and engage them onto connecting pipes.
(2) Flare the pipes according to table and figure shown below.
Flare dimensions for R410A are different from those for conventional refrigerant.
Although it is recommended to use the flaring tools designed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a flare adjustment gauge.



Copper pipe outer diameter	A 0 −0.4
ø6.35	9.1
ø9.52	13.2
ø12.7	16.6

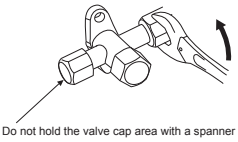


Copper pipe outer diameter	Rigid (clutch) type	
	R410A	Conventional
ø6.35	0-0.5	1.0-1.5
ø9.52		
ø12.7		

3.2. Connecting pipes

(1) Connect pipes on both liquid and gas sides.
(2) Tighten nuts to specified torque shown in the table below.

Service valve size (mm)	Tightening torque (N·m)
ø6.35 (1/4")	14-18
ø9.52 (3/8")	34-42
ø12.7 (1/2")	49-61



Do not hold the valve cap area with a spanner

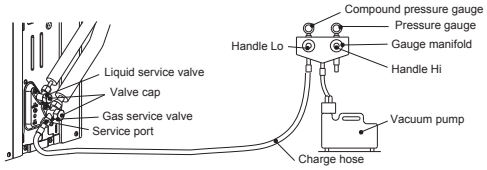
⚠ CAUTION

- Do not apply refrigerating machine oil to the flared surface. It can cause refrigerant leakage.
- Do not apply excess torque to the flared nuts. The flared nuts may crack resulting in refrigerant leakage.

4. Evacuation

(1) Connect vacuum pump to gauge manifold. Connect charge hose of gauge manifold to service port of outdoor unit.
(2) Run the vacuum pump for at least one hour after the vacuum gauge shows -0.1MPa (–76cm Hg).
(3) Confirm that the vacuum gauge indicator does not rise even if the system is left for 15 minutes or more.
Vacuum gauge indicator will rise if the system has moisture left inside or has a leakage point.
Check the system for the leakage point. If leakage point is found, repair it and return to (1) again.
(4) Close the Handle Lo and stop the vacuum pump.
Keep this state for a few minutes to make sure that the compound pressure gauge pointer does not swing back.
(5) Remove valve caps from liquid service valve and gas service valve.
(6) Turn the liquid service valve's rod 90 degree counterclockwise with a hexagonal wrench key to open valve.
Close it after 5 seconds, and check for gas leakage.
Using soapy water, check for gas leakage from indoor unit's flare and outdoor unit's flare and valve rods.
Wipe off all the water after completing the check.
(7) Disconnect charging hose from gas service valve's service port and fully open liquid and gas service valves. (Do not attempt to turn valve rod beyond its stop.)
(8) Tighten service valve caps and service port cap to the specified torque shown in the table below.

Service valve size (mm)	Service valve cap tightening torque (N·m)	Service port cap tightening torque (N·m)
ø6.35 (1/4")	20-30	10-12
ø9.52 (3/8")		
ø12.7 (1/2")	25-35	



⚠ CAUTION

- To prevent the entering of different oil into the refrigeration system, do not use tools designed for any other refrigerant type (R22, R407C, etc.).
- To prevent vacuum pump oil from entering into the refrigerant system, use a counterflow prevention adapter.

5. Additional refrigerant charge

Additional refrigerant charge is required only when connecting pipe length exceeds 15 m.

5.1 Calculating additional refrigerant charge

Additional refrigerant charge can be calculated using the formula given below.
Additional refrigerant charge (g) = { Connecting pipe length (m) – Factory charged length 15 (m) } x 20 (g/m)

NOTE

- If additional refrigerant charge calculation result is negative, there is no need to remove the refrigerant.
- If refrigerant recharge is required for the unit with connecting pipe length 15m or shorter, charge the factory charged volume as shown in the table below.

	Model SRC 20/25/35	Model SRC40/50/60
Factory charged volume(kg)	1.45	1.50

5.2 Charging refrigerant

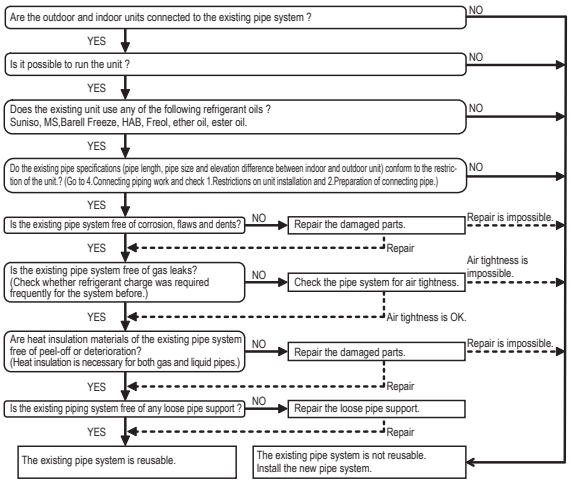
(1) Charge the R410A refrigerant in liquid phase from service port with both liquid and gas service valves shut. Since R410A refrigerant must be charged in the liquid phase, make sure that refrigerant is discharged from the cylinder in the liquid phase all the time.
(2) When it is difficult to charge a required refrigerant volume, fully open both liquid and gas service valves and charge refrigerant, while running the unit in the cooling mode. When refrigerant is charged with the unit being run, complete the charge operation within 30 minutes.
(3) Write the additional refrigerant charge calculated from the connecting pipe length on the label attached on the service cover.

⚠ CAUTION

Running the unit with an insufficient quantity of refrigerant for a long time can cause unit malfunction.

5. UTILIZATION OF EXISTING PIPE

(1) Check whether an existing pipe system is reusable or not by using the following flow chart.



NOTE

- Consult with our distributor in the area, if you need to recover refrigerant and charge it again.

(2) Clean the existing pipe system according to the procedure given below.
(a) Carry out forced cooling operation of existing unit for 30 minutes.
For 'Forced cooling operation' refer to the indoor unit installation manual.
(b) Stop the indoor fan and carry out forced cooling operation for 3 minutes (Liquid return).
(c) Close the liquid service valve of the outdoor unit and carry out pump down operation (Refer to 6. PUMP DOWN).
(d) Blow with nitrogen gas. If discolored refrigeration oil or any foreign matter is discharged by the blow, wash the pipe system or install a new pipe system.
(3) Remove the flare nuts from the existing pipe system. Go back to 4.Connecting Piping work and proceed to step 2.2 Cutting connecting pipe.

⚠ CAUTION

Do not use the old flare nuts (of existing unit). Make sure that the flare nuts supplied with the (new) outdoor unit are used.

* If the existing piping is specified as liquid pipe ø9.52 or gas pipe ø12.7, refer to the following. (SRC40,50 and 60 only)

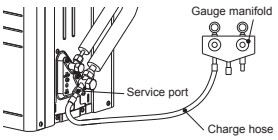
<Table of pipe size restrictions>

Additional charge volume per meter of pipe		0.06kg/m
Pipe size	Liquid pipe	ø9.52
	Gas pipe	ø12.7
Maximum one-way pipe length		10
Length covered without additional charge		5

Additional charge volume (kg) = {Main pipe length (m) - Length covered without additional charge shown in the table (m)} X Additional charge volume per meter of pipe shown in the table (kg/m)

6. PUMP DOWN

(1) Connect charge hose of gauge manifold to service port of outdoor unit.
(2) Close the liquid service valve with hexagonal wrench key.
(3) Fully open the gas service valve with hexagonal wrench key.
(4) Carry out forced cooling operation (For forced cooling operation procedure, refer to indoor unit installation manual).
(5) When the low pressure gauge becomes 0.01MPa, close the gas service valve and stop forced cooling operation.



7. ELECTRICAL WIRING WORK

⚠ WARNING

- Make sure that all the electrical work is carried out in accordance with the national or regional electrical standards.
- Make sure that the earth leakage breaker and circuit breaker of appropriate capacities are installed (Refer to the table given below).
- Do not turn on the power until the electrical work is completed.
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It does not improve power factor. Moreover, it can cause an abnormal overheat accident).

Breaker specifications

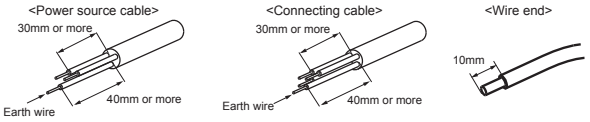
Model	Phase	Earth leakage breaker	Circuit breaker
SRC20/25/35	Single phase	Leakage current: 30mA, 0.1sec or less	Over current: 16A
SRC40/50/60			Over current: 20A

Main fuse specification

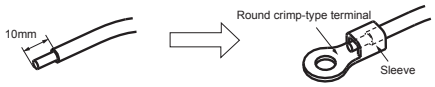
Model	Specification	Parts No.	Code on LABEL,WIRING
SRC20/25/35	250V 15A	SSA564A136	F7
SRC40/50/60	250V 20A	SSA564A136A	F4

1.Preparing cable

(1) Selecting cable
Select the power source cable and connecting cable in accordance with the specifications mentioned below.
(a) Power source cable
3-core* 2.0mm^2 or more, conformed with 60245 IEC57(CENELEC H05RN-F)
When selecting the power source cable length, make sure that voltage drop is less than 2%.
If the wire length gets longer, increase the wire diameter.
(b) Connecting cable
4-core* 1.5mm^2, conformed with 60245 IEC57(CENELEC H05RN-F)
* 1 Earth wire is included (Yellow/Green).
(2) Arrange each wire length as shown below.
Make sure that each wire is stripped 10mm from the end.



(3) Attach round crimp-type terminal to each wire as shown in the below.
Select the size of round crimp-type terminal after considering the specifications of terminal block and wire diameter.



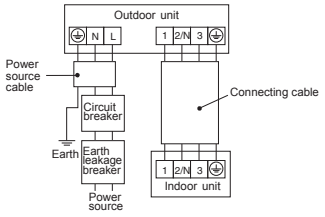
⚠ CAUTION

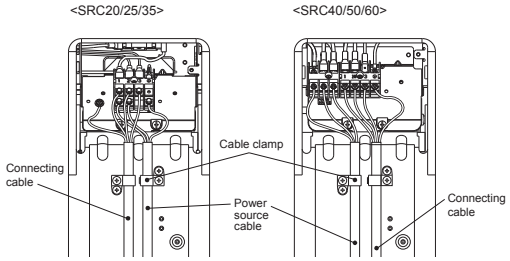
Power source cable and connecting cable must conform to the specifications mentioned in the manual.
Using cables with wrong specifications may result in unit malfunction.

2.Connecting cable

(1) Remove the service cover.
(2) Connect the cables according to the instructions and figures given below.
(a) Connect the earth wire of power source cable.
An earth wire must be connected before connecting the other wires of power source cable.
Keep the earth wire longer than the remaining two wires of power source cable.
(b) Connect the remaining two wires (N and L) of power source cable.
(c) Connect the wires of connecting cable. Make sure that for each wire, outdoor and indoor side terminal numbers match.
(3) Fasten the cables properly with cable clamps so that no external force may work on terminal connections.
Moreover, make sure that cables do not touch the piping, etc. When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection.

<Circuit diagram>

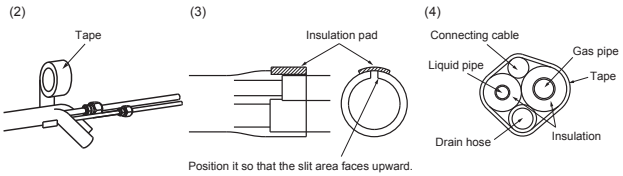




8. FINISHING WORK

1. Heating and condensation prevention

(1) Dress the connecting pipes (both liquid and gas pipes) with insulation to prevent it from heating and dew condensation.
Use the heat insulating material which can withstand 120°C or higher temperature. Make sure that insulation is wrapped tightly around the pipes and no gap is left between them.
(2) Wrap the refrigerant pipings of indoor unit with indoor unit heat insulation using tape.
(3) Cover the flare-connected joints (indoor side) with the indoor unit heat insulation and wrap it with an insulation pad (standard accessory provided with indoor unit).
(4) Wrap the connecting pipes, connecting cable and drain hose with the tape.



NOTE

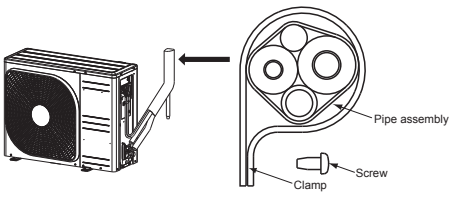
Locations where relative humidity exceeds 70%, both liquid and gas pipes need to be dressed with 20mm or thicker heat insulation materials.

⚠ CAUTION

- Improper insulation can cause condensate(water) formation during cooling operation. Condensate can leak or drip causing damage to household property.
- Poor heat insulating capacity can cause pipe outer surface to reach high temperature during heating operation. It can cause cable deterioration and personal injury.

2.Finishing work

(1) Make sure that the exterior portion of connecting pipes, connecting cable and drain hose is wrapped properly with tape. Shape the connecting pipes to match with the contours of the pipe assembly route.
(2) Fix the pipe assembly with the wall using clamps and screws. Pipe assembly should be anchored every 1.5m or less to isolate the vibration.
(3) Install the service cover securely. Water may enter the unit if service cover is not installed properly, resulting in unit malfunction and failure.



⚠ CAUTION

Make sure that the connecting pipes do not touch the components within the unit. If pipes touch the internal components, it may generate abnormal sounds and/or vibrations.

9. INSTALLATION TEST CHECK POINTS

After finishing the installation work, check the following points again before turning on the power.
Conduct test run (Refer to indoor unit installation manual) and ensure that the unit operates properly.

Power source voltage complies with the rated voltage of air-conditioner.	
Earth leakage breaker and circuit breaker are installed.	
Power cable and connecting cable are securely fixed to the terminal block.	
Both liquid and gas service valves are fully open.	

No gas leaks from the joints of the service valves.	
Indoor and outdoor side pipe joints have been insulated.	
Drain hose (if installed) is fixed properly.	
Screw of the service cover is tightened properly.	

PSC012D062F A

Inverter driven single split PAC
71V
Designed for R410A refrigerant

◎This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 45.
◎When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces

SAFETY PRECAUTIONS

- We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into ⚠WARNING and ⚠CAUTION. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠CAUTION. **These are very important precautions for safety. Be sure to observe all of them without fail.**
- The meaning of "Marks" used here are as shown below.

⃠	Never do it under any circumstance.	❗ ⏚	Always do it according to the instruction

- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user

Check before installation work

- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

⚠ WARNING

❗
- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.
- **Install the system in full accordance with the instruction manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, It may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substandard performance, control failure and personal injury.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.**
  Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire,
- **Be sure to shut off the power before starting electrical work.**
  Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.

❗
- **Do not perform brazing work in the airtight room**
  It can cause lack of oxygen.
- **Use the prescribed pipes, flare nuts and tools for R410A.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- **Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.**
  Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant
- **Only use prescribed optional parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not perform any change of protective device itself or its setup condition**
  The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.
- **Be sure to switch off the power source in the event of installation, inspection or servicing.**
  If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.**
  If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit

⃠
- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
- **Do not run the unit with removed panels or protections**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.

⚠ CAUTION

- **Carry out the electrical work for ground lead with care**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks,it could cause explosion or ignition.
- **Use the circuit breaker for all pole with correct capacity.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations.**
  The isolator should be locked in accordanced with EN60204-1.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.**
  If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **Perform installation work properly according to this installation manual.**
  Improper installation can cause abnormal vibrations or increased noise generation.
- **Earth leakage breaker must be installed**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place..
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.**
  If safety facilities are not provided, it can cause personal injury due to falling from the installation place.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base flame can cause the unit falling down and cause personal injury.
- **Do not install the unit in the locations listed below**
  - Locations where carbon fiber, metal powder or any powder is floating.
  - Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  - Vehicles and ships
  - Locations where cosmetic or special sprays are often used.
  - Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  - Locations where any machines which generate high frequency harmonics are used.
  - Locations with salty atmospheres such as coastlines
  - Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
  - Locations where the unit is exposed to chimney smoke
  - Locations at high altitude (more than 1000m high)
  - Locations with ammonic atmospheres
  - Locations where heat radiation from other heat source can affect the unit
  - Locations without good air circulation.
  - Locations with any obstacles which can prevent inlet and outlet air of the unit
  - Locations where short circuit of air can occur (in case of multiple units installation)
  - Locations where strong air blows against the air outlet of outdoor unit

  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  - Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  - Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  - Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  - Locations where vibration and operation sound generated by the outdoor unit can affect seriously. (on the wall or at the place near bed room)
  - Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  - Locations where drainage cannot run off safely.

  It can affect surrounding environment and cause a claim
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
  It can cause the damage of the items.
- **Do not touch any buttons with wet hands**
  It can cause electric shocks
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not clean up the unit with water**
  It can cause electric shocks
- **Do not operate the outdoor unit with any article placed on it.**
  You may incur property damage or personal injure from a fall of the article.
- **Do not step onto the outdoor unit.**
  You may incur injury from a drop or fall.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A has adopted a different size indoor unit service valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R410A tools listed in the table on the right before installing or servicing this unit.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, which results in performance degradation.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

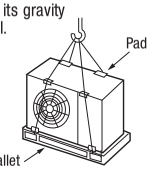
	Dedicated R410A tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position. If not properly balanced, the unit can be thrown off-balance and fall.

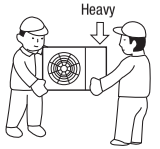
1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When some compelling reason necessitates the unpacking of the unit before it is carried in, use nylon slings or protective wood pieces so as not to damage the unit by ropes lifting it.



2) Portage

- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

- ○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- ○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
- ○ A place where the unit is not exposed to oil splashes.
- ○ A place where it can be free from danger of flammable gas leakage.
- ○ A place where drain water can be disposed without any trouble.
- ○ A place where the unit will not be affected by heat radiation from other heat source.
- ○ A place where snow will not accumulate.
- ○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- ○ A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- ○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- ○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
- ○ A place where strong wind will not blow against the outlet air blow of the unit.

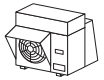
4) Caution about selection of installation location

(1) If the unit is installed in the area where the snow will accumulate, following measures are required.
The bottom plate of unit and intake, outlet may be blocked by snow.

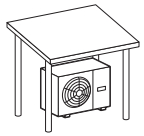
1. Install the unit on the base so that the bottom is higher than snow cover surface.



2. Provide a snow hood to the outdoor unit on site.
Regarding outline of a snow hood, refer to our technical manual.



3. Install the unit under eaves or provide the roof on site.

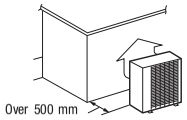


Since drain water generated by defrost control may freeze, following measures are required.

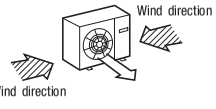
- ● Don't execute drain piping work by using a drain elbow and drain grommets (option parts). [Refer to Drain piping work.]
- ● Recommend setting Defrost Control (SW3-1) and Snow Guard Fan Control (SW3-2). [Refer to Setting SW3-1, SW3-2.]

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

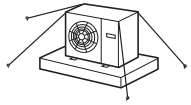
1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



3.The unit should be installed on the stable and level foundation. If the foundation is not level, tie down the unit with wires.

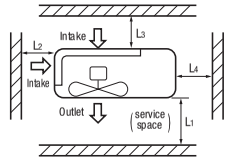


5) Installation space

- ● Walls surrounding the unit in the four sides are not acceptable.
- ● There must be a 1-meter or larger space in the above.
- ● When more than one unit are installed side by side, provide a 250mm or wider interval between them as a service space. In order to facilitate servicing of controllers, please provide a sufficient space between units so that their top plates can be removed easily.
- ● Where a danger of short-circuiting exists, install guide louvers.
- ● When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- ● Where piling snow can bury the outdoor unit, provide proper snow guards.

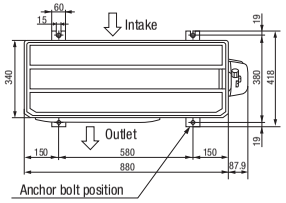
(mm)

Example installation / Size	71V		
	I	II	III
L1	Open	Open	500
L2	300	250	Open
L3	100	150	100
L4	250	250	250

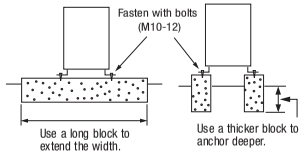


6) Installation

① Anchor bolt fixed position



② Notabilia for installation



- ● In installing the unit, fix the unit's legs with bolts specified on the above.
- ● The protrusion of an anchor bolt on the front side must be kept within 15 mm.
- ● Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- ● Refer to the above illustrations for information regarding concrete foundations.
- ● Install the unit in a level area. (With a gradient of 5 mm or less.)
Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

- ● When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site. So that strong wind will not blow against the outdoor heat exchanger directly. Regarding outline of a snow hood, refer to our technical manual.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

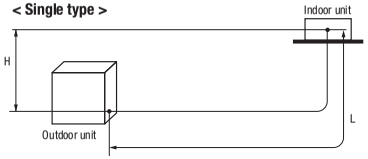
- ● Check the following points in light of the indoor unit specifications and the installation site.
- ● Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Restrictions		Dimensional restrictions	Marks appearing in the drawing on the right	
			Single type	Twin type
One-way pipe length of refrigerant piping	Model 71V	50m or less	L	L1+L1+L2
Main pipe length			L	L
One-way pipe length after the first branching point		20m or less	—	L1, L2
Difference of pipe length after the first branching point		10m or less	—	L1—L2
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher,	30m or less	H	H
	When the outdoor unit is positioned lower,	15m or less	H	H
Elevation difference between indoor units		0.5m or less	—	h

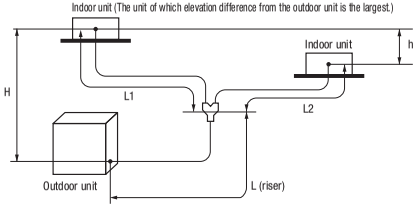
⚠CAUTION

- ● The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, please see " 6. UTILIZATION OF EXISTING PIPING."

< Single type >



< Twin type >



2) Determination of pipe size

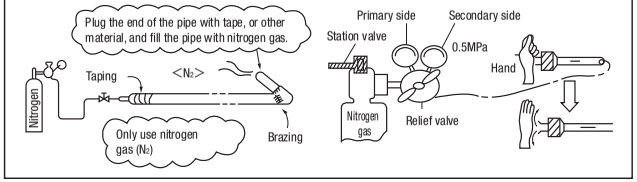
● Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

		Model 71V	
		Gas pipe	Liquid pipe
Outdoor unit connected		φ15.88 Flare	φ9.52 Flare
Refrigerant piping (branch pipeL)		φ15.88	φ9.52
In the case of a single type	Indoor unit connected	φ15.88	φ9.52
	Capacity of indoor unit	Model 71V	
In the case of a twin type	Branching pipe set	DIS-WA1	
	Refrigerant piping (branch pipe L1,L2)	φ12.7	φ9.52
	Indoor unit connected	φ12.7	φ6.35
	Capacity of indoor unit	Model 40V×2	

About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.



⚠CAUTION

- ●When the 40V model is connected as an indoor unit, always use a φ9.52 liquid pipe for the branch (branching pipe – indoor unit) and a different diameter joint supplied with the branching pipe set for connection with the indoor unit (φ6.35 on the liquid pipe side).
  If a φ6.35 pipe is used for connection with a branching pipe, a refrigerant distribution disorder may occur, causing one of the indoor units to fall short of the rated capacity.
- ●A riser pipe must be a part of the main. A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.
  A branching part must be dressed with a heat-insulation material supplied as an accessory.
- ●For the details of installation work required at and near a branching area, see the installation manual supplied with your branching pipe set.

3) Refrigerant pipe wall thickness and material

● Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.

Pipe diameter [mm]	6.35	9.52	12.7	15.88
Minimum pipe wall thickness [mm]	0.8	0.8	0.8	1.0
Pipe material*	O-type pipe	O-type pipe	O-type pipe	O-type pipe

NOTE ● Select pipes having a wall thickness larger than the specified minimum pipe thickness.

*Phosphorus deoxidized seamless copper pipe C1220T, JIS H 3300

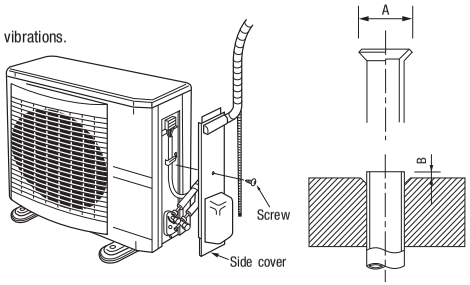
4) On-site piping work

⚠IMPORTANT

● Take care so that installed pipes may not touch components within a unit.
If touching with an internal component, it will generate abnormal sounds and/or vibrations.

How to remove the side cover Please remove the screw of a side cover and remove to the front.

- ● Carry out the on site piping work with the service valve fully closed.
- ● Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
- ● Bend a pipe to a radius as large as practical.(R100-R150) Do not bend a pipe repeatedly to correct its form.
- ● Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- ● The pipe should be anchored every 1.5m or less to isolate the vibration.
- ●Tighten a flare joint securely with a double spanner.



Flared pipe end: A (mm)

Copper pipe outer diameter	A 0 −0.4
φ6.35	9.1
φ9.52	13.2
φ12.7	16.6
φ15.88	19.7

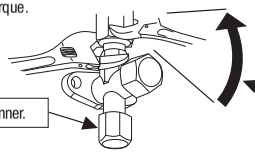
Copper pipe protrusion for flaring: B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R410A tool	With a conventional tool
φ6.35	0-0.5	0.7-1.3
φ9.52		
φ12.7		
φ15.88		

⚠ CAUTION **Do not apply force beyond proper fastening torque in tightening the flare nut.**

Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.

Service valve size (mm)	Tightening torque (N-m)	Tightening angle (°)	Recommended length of a tool handle (mm)
φ6.35 (1/4")	14-18	45-60	150
φ9.52 (3/8")	34-42	30-45	200
φ12.7 (1/2")	49-61	30-45	250
φ15.88(5/8")	68-82	15-20	300



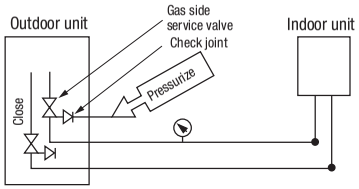
Do not hold the valve cap area with a spanner.

Use a torque wrench. If a torque wrench is not available, fasten the flare nut manually first and then tighten it further, using the left table as a guide.

5) Air tightness test

① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the service valve's check joint equipped on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient Temperature fall 1°C, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
e) If a pressure drop is observed in checking e) and a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.

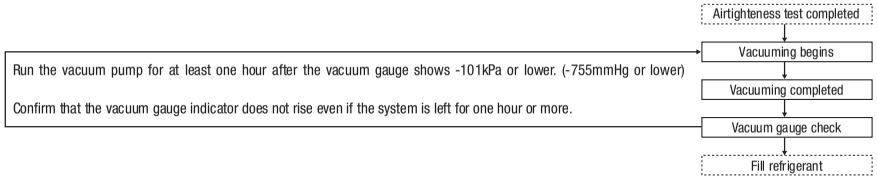
② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.



6) Evacuation

<Work flow>

When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.



Pay attention to the following points in addition to the above for the R410A and compatible machines.

○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe φ6.35)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
Model 71V	2.35	20	0.06	2.95	30

- This unit contains factory charged refrigerant covering 30m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 30m refrigerant piping. When refrigerant piping exceeds 30m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 30m.
- When refrigerant piping is shorter than 3m, reduce refrigerant by 1kg from the factory charged volume and adjust to 1.95kg.
- If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, please see "6. UTILIZATION OF EXISTING PIPING."

Formula to calculate the volume of additional refrigerant required

Additional charge volume (kg) = { Main pipe length (m) – Length covered without additional charge 30 (m) } x 0.06 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)

*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

- For an installation measuring 3m or longer, but not more than 20m, in pipe length, please charge the standard refrigerant charge volume, when you recharge refrigerant after servicing etc.
- When refrigerant piping is shorter than 3m, recharge 1.95kg of refrigerant.
  Ex.) For a 10m installation, charge 2.35 kg of refrigerant.
  For a 25m installation, charge "2.35 + (25-20) x 0.06 = 2.65 kg."

(2) Charging refrigerant

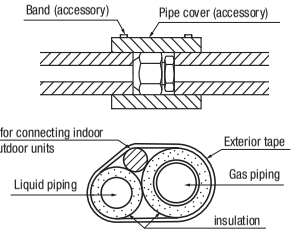
- Since R410A refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- Charge refrigerant always from the liquid side service port with the service valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.

8) Heating and condensation prevention

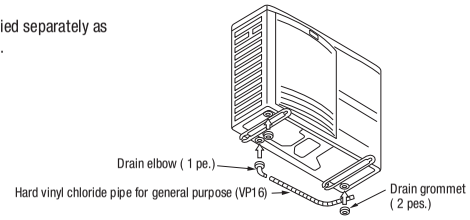
(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
- Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.

(2) Use a heat insulating material that can withstand 120°C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
- All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
- Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
- Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
- Although it is verified in a test that this air-conditioning unit shows satisfactory performance under JIS condensation test conditions, **both gas and liquid pipes need to be dressed with 20 mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**



3. DRAIN PIPING WORK

● Execute drain piping by using a drain elbow and drain grommets supplied separately as optional parts, where water drained from the outdoor unit is a problem.



○ There are 3 drain holes provided on the bottom plate of an outdoor unit to discharge condensed water.
○ When condensed water needs to be led to a drain, etc., install the unit on a flat base (supplied separately as an optional part) or concrete blocks.
○ Connect a drain elbow as shown in the illustration and close the other two drain holes with grommets.

4. ELECTRICAL WIRING WORK For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

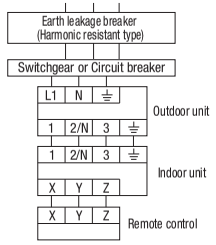
- Do not use any supply cord lighter than one specified in parentheses for each type below.
  - braided cord (code designation 60245 IEC 51),
  - ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
  - flat twin tinsel cord (code designation 60227 IEC 41);

  Do not use anything lighter than polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If impropery grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
- The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an acccident such as an electric shock or a fire.
- Do not turn on the power until the electrical work is completeted .
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident)
- For power source cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.

Power cable, indoor-outdoor connecting wires

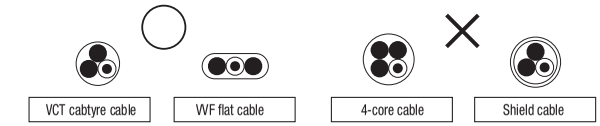
● Always perform grounding system installation work with the power cord unplugged.

⚠ CAUTION Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.

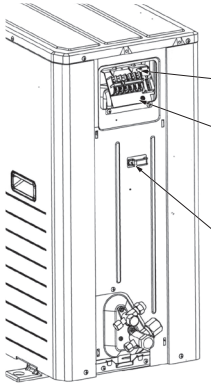


Model	Power source	Power cable thickness (mm^2)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness x number
71V	Single phase 3 wire 220-240V 50Hz	3.5	17	21	ϕ1.6mm	ϕ1.6mm x 3

● The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
● Switchgear or Circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
● The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, follow the internal cabling regulations. Adapt it to the regulation in effect in each country.



● Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
● In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
● Grounding terminals are provided in the control box.



Power source, signal line and ground terminal block

Grounding terminal

○ Do not connect to the grounding wire from another unit, but install a dedicated wire up to the grounding wire from the distribution board.

Wiring clamp

○ Fasten cables and protect the terminal connections from external force.

Wiring diagram

○ It is attached on the back side of the service panel.

5. TEST RUN

⚠ WARNING

- Before conduct a test run, do not fail to make sure that the service valves are closed.
- Turn on power 6 hours prior to a test run to energize the crank case heater.
- In case of the first operation after turning on power, even if the unit does not move for 30 minutes, it is not a breakdown.
- Always give a 3-minute or longer interval before you start the unit again whenever it is stopped.
- Removing the service panel will expose high-voltage live parts and high-temperature parts, which are quite dangerous. Take utmost care not to incur an electric shock or burns. Do not leave the unit with the service panel open.

} A failure to observe these instructions can result in a compressor breakdown.

⚠ CAUTION

- When you operate switches for on-site setting, be careful not to touch a live part.
- You cannot check discharge pressure from the liquid service valve charge port.
- The 4-way valve (20S) is energized during a heating operation.
- When power source is cut off to reset the unit, give 3 or more minutes before you turn on power again after power is cut off. If this procedure is not observed in turning on power again, "E-5" (Communication error) may occur.

About insulation resistance

- An insulation resistance value may drop to several M ohms immediately after installation or when the unit is left for a long time without power, because refrigerant is gathered in the compressor. When the earth-leakage breaker is actuated due to low insulation resistance, please check the following:

(1) Check whether a normal insulation resistance value is restored about 6 hours after power is turned. Turning on power will energize the compressor and heat it to evaporate refrigerant gathered in it.
(2) Check whether the earth-leakage breaker is a harmonic resistant type.
This unit is equipped with an inverter and therefore, the use of a harmonic resistant type earth-leakage breaker is necessary to prevent a false actuation.

1) Test run method

Please remove a side cover.

(1) A test run can be initiated from an outdoor unit by using SW5-4 and SW5-4 for on-site setting.
(2) Switching SW3-3 to ON will start the compressor.
(3) The unit will start a cooling operation, when SW5-4 is OFF, or a heating operation, when SW5-4 is ON.
(4) **Do not fail to switch SW5-3 to OFF when a test run is completed.**

※ **In case of the first operation after turning on the power source, when the unit runs in the cooling mode at outside temperature 5°C or lower, it automatically changes into the cooling mode after it runs in the heating mode for 10 minutes.**

SW-3-3	SW-3-4	
ON	OFF	Cooling during a test run
	ON	Heating during a test run
OFF	—	Normal or After the test operation

2) Checking the state of the unit in operation

Please remove a service panel.

Use check joints provided on the piping before and after the four-way valve installed inside the outdoor unit for checking discharge pressure and suction pressure.
As indicated in the table shown on the right, pressure detected at each point will vary depending on whether a cooling or heating operation has been selected.

	Check joint of the pipe	Charge port of the gas service valve
Cooling operation	Discharge pressure (High pressure)	Suction pressure (Low pressure)
Heating operation	Suction pressure (Low pressure)	Discharge pressure (High pressure)

3) Setting SW3-1, SW3-2.

Please remove a service panel.

(1) Defrost control switching (SW3-1)
- ·When this switch is turned ON, the unit will run in the defrost mode more frequently.
- ·Set this switch to ON, when installed in a region where outdoor temperature falls below zero during the season the unit is run for a heating operation.

(2) Snow guard fan control (SW3-2)
- ·When this switch is turned on, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3℃ or lower and the compressor is not running.
- ·When the unit is used in a very snowy country, set this switch to ON.

4) Failure diagnosis in a test run

Error indicated on the remote control unit	Printed circuit board LED(The cycles of 5 seconds)		Failure event	Action
	Red LED	Green LED		
E34	Blinking once	Blinking continuously	Open phase	Check power cables for loose contact or disconnection
E40	Blinking once	Blinking continuously	63H1 actuation or operation with service valves shut (occurs mainly during a heating operation)	1. Check whether the service valves are open. 2. If an error has been canceled when 3 minutes have elapsed since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.
E49	Blinking once	Blinking continuously	Low pressure error or operation with service valves shut (occurs mainly during a cooling operation)	

- If an error code other than those listed above is indicated, refer to the wiring diagram of the outdoor unit and the indoor unit.

5) The state of the electronic expansion valve.

The following table illustrates the steady states of the electronic expansion valve.

	When power is turned on	When the unit comes to a normal stop		When the unit comes to an abnormal stop	
		During a cooling operation	During a heating operation	During a cooling operation	During a heating operation
Valve for a cooling operation	Complete shut position	Complete shut position	Full open position	Full open position	Full open position
Valve for a heating operation	Full open position	Full open position	Complete shut position	Full open position	Full open position

6) Heed the following on the first operation after turning on the circuit breaker.

This outdoor unit may start in the standby mode (waiting for a compressor startup), which can continue up to 30 minutes, to prevent the oil level in the compressor from lowering on the first operation after turning on the circuit breaker. If that is the case, do not suspect a unit failure.

Items to checkbefore a test run

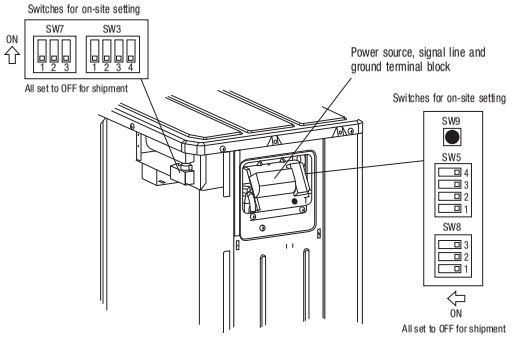
- When you leave the outdoor unit with power supplied to it, be sure to close the panel.

Item No.used in the installation manual	Item	Check item	Check
2	Refrigerant plumbing	If brazed, was it brazed under a nitrogen gas flow?	
		Were air-tightness test and vacuum extraction surely performed?	
		Are heat insulation materials installed on both liquid and gas pipes?	
		Are service valves surely opened for both liquid and gas systems?	
		Have you recorded the additional refrigerant charge volume and refrigerant pipe length on the panel's label?	
4	Electric wiring	Is the unit free of cabling errors such as uncompleted connection, an absent or reversed phase?	
		Are properly rated electrical equipments used for circuit breakers and cables?	
		Doesn't cabling cross-connect between units, where more than one unit are installed?	
		Aren't indoor-outdoor signal wires connected to remote control wires?	
		Do indoor-outdoor connecting cables connect between the same terminal numbers?	
		Are either VCT cabtyre cables or WF flat cables used for indoor-outdoor connecting cables?	
		Does grounding satisfy the D type grounding (type III grounding) requirements?	
		Is the unit grounded with a dedicated grounding wire not connected to another unit's grounding wire?	
		Are cables free of loose screws at their connection points?	
		Are cables held down with cable clamps so that no external force works onto terminal connections?	
—	Indoor unit	Is indoor unit installation work completed?	
		Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

Test run procedure

- Always carry out a test run and check the following in order as listed.

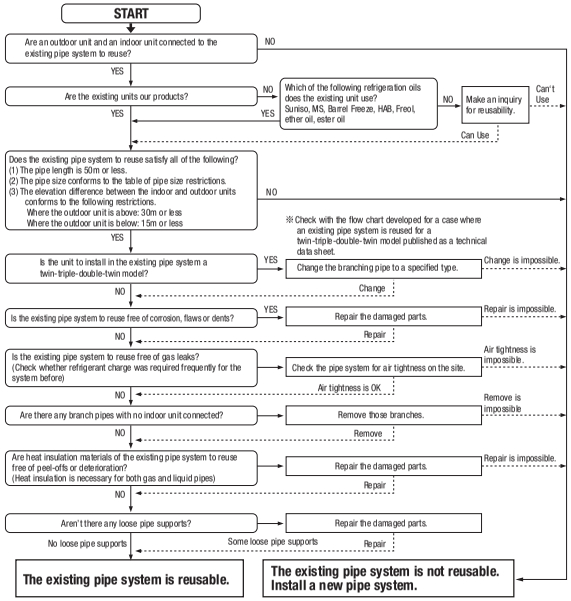
Turn	The contents of operation	Check
①	Open the gas side service valve fully.	
②	Open the liquid side service valve fully.	
③	Close the panel.	
④	Where a remote control unit is used for unit setup on the installation site, follow instructions for unit setup on the installation site with a remote control unit.	
⑤	SW5-3 / SW5-4 OFF: the unit will start a cooling operation. SW5-3 / SW5-4 ON: the unit will start a heating operation.	
⑥	When the unit starts operation, press the wind direction button provided on the remote control unit to check its operation.	
⑦	Place your hand before the indoor unit's diffuser to check whether cold (warm) winds come out in a cooling (heating) operation.	
⑧	Make sure that a red LED is not blinking.	
⑨	When you complete the test run, please turn on SW5-3 for 1 second and be sure to end a test run.	
⑩	Where options are used, check their operation according to the respective instruction manuals.	



※1 Do not operate SW3-3, SW5-1, SW5-2, SW8.
※2 Refer to TECHNICAL MANUAL about SW9. (Pump down SW)

6. UTILIZATION OF EXISTING PIPING.

Check whether an existing pipe system is reusable or not by using the following flow chart.



⚠ WARNING <Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the excising unit (in the order of (1), (2), (3) and (4))

(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side service valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.

- For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R410A.
- **Turn on-site setting switch SW8-1** to the ON position. (Where the gas pipe size is ϕ 19.05)

<Table of pipe size restrictions>

◎:Standard pipe size ○:Usable △:Restricted to shorter pipe length limits Cool ↓ : Cooling capacity drop

Additional charge volume per meter of pipe		0.06kg/m		0.08kg/m
Pipe size	Liquid pipe	ϕ9.52	ϕ9.52	ϕ12.7
	Gas pipe	ϕ12.7	ϕ15.88	ϕ15.88
71V	Usability	Cool ↓	◎	△
	Maximum one-way pipe length	35	50	25
	Length covered without additional charge	30	30	15

- **The pipe length should be at least 3m. If the pipe length is shorter than 3m, the quantity of refrigerant needs to be reduced. Please consult with our distributor in the area, if you need to recover refrigerant and charge it again.**
- Any combinations of pipe sizes not listed in the table are not usable.

<Pipe system after the branching pipe>

◎:Standard pipe size ○:Usable

Additional charging amount of refrigerant per 1m			0.06kg/m	
Pipe size	Liquid pipe		ϕ9.52	
	Gas pipe		ϕ12.7	ϕ15.88
Model	Combination type	Combination of capacity		
FDC71	Twin	40+40	◎	○

- Any combinations of pipe sizes not listed in the tableare not usable.

<The model types of existing units of which branching pipes are reusable.>

The branching pipes used with models other than those listed above are not reusable.

Use our genuine branching pipes for R410A.

Formula to calculate additional charge volume

Additional charge volume (kg) = {Main pipe length (m) − Length covered without additional charge shown in the table (m)} × Additional charge volume per meter of pipe shown in the table (kg/m) + Total length of branch pipes (m) × Additional charge volume per meter of pipe shown in the table (kg/m)

※ If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.

Example) When an 71V (single installation) is installed in a 30m long existing pipe system (liquid ϕ 12.7, gas ϕ 15.88), the quantity of refrigerant to charge additionally should be (30m-15m) x 0.08kg/m = 1.2 kg.

Example) When an 71V (twin installation) is installed in a 30m long existing pipe system (main pipe length 20m, liquid ϕ 12.7, gas ϕ 15.88; pipe length after branching pipe 5m x 2, liquid ϕ 9.52, gas ϕ 12.7), the quantity of refrigerant to charge additionally should be (20m-15m) x 0.08kg/m + 5m x 2 x 0.06kg/m = 1.0 kg.

<Where the existing unit cannot be run for a cooling operation.>

Wash the pipe system or install a new pipe system.

- If you choose to wash the pipe system, contact our distributor in the area.

PSC012D066H D

Inverter driven split PAC
100VN～140VN,100VS～140VS
100VNX～140VNX,100VSX～140VSX
Designed for R410A refrigerant

◎This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 45.
◎When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces

SAFETY PRECAUTIONS

- We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into ⚠WARNING and ⚠CAUTION. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠CAUTION. **These are very important precautions for safety. Be sure to observe all of them without fail.**
- The meaning of "Marks" used here are as shown below.

⃠	Never do it under any circumstance.	❗	Always do it according to the instruction

- For 3 phase power source outdoor unit,EN61000-3-2 is not applicable if consent by the utility company or nortification to the utility company is given before usage.
- 3 phase power source unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a house-hold appliance it could cause electromagnetic interference.
- 5 and 6 HP units of single phase power source are equipment complying with IEC 61000-3-12.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user

Check before installation work

[Accessory]

Edging		1 piece	knock-out hole protection

- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

⚠ WARNING

❗
- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.
- **Install the system in full accordance with the instruction manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, it may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substandard performance, control failure and personal injury.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.**
  Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire,
- **Be sure to shut off the power before starting electrical work.**
  Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.

❗
- **Do not perform brazing work in the airtight room**
  It can cause lack of oxygen.
- **Use the prescribed pipes, flare nuts and tools for R410A.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- **Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.**
  Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant
- **Only use prescribed optional parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not perform any change of protective device itself or its setup condition**
  The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.
- **Be sure to switch off the power source in the event of installation, inspection or servicing.**
  If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.**
  If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit

⃠
- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
- **Do not run the unit with removed panels or protections**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.

⚠ CAUTION

- **Carry out the electrical work for ground lead with care**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks,it could cause explosion or ignition.
- **Use the circuit breaker for all pole with correct capacity.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations.**
  The isolator should be locked in accordanced with EN60204-1.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.**
  If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **Perform installation work properly according to this installation manual.**
  Improper installation can cause abnormal vibrations or increased noise generation.
- **Earth leakage breaker must be installed**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place..
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.**
  If safety facilities are not provided, it can cause personal injury due to falling from the installation place.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base flame can cause the unit falling down and cause personal injury.
- **Do not install the unit in the locations listed below**
  - Locations where carbon fiber, metal powder or any powder is floating.
  - Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  - Vehicles and ships
  - Locations where cosmetic or special sprays are often used.
  - Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  - Locations where any machines which generate high frequency harmonics are used.
  - Locations with salty atmospheres such as coastlines
  - Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
  - Locations where the unit is exposed to chimney smoke
  - Locations at high altitude (more than 1000m high)
  - Locations with ammonic atmospheres (e.g. organic fertilizer).
  - Locations with calcium chloride (e.g. snow melting agent).
  - Locations where heat radiation from other heat source can affect the unit
  - Locations without good air circulation.
  - Locations with any obstacles which can prevent inlet and outlet air of the unit
  - Locations where short circuit of air can occur (in case of multiple units installation)
  - Locations where strong air blows against the air outlet of outdoor unit

  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  - Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  - Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  - Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  - Locations where vibration and operation sound generated by the outdoor unit can affect seriously. (on the wall or at the place near bed room)
  - Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  - Locations where drainage cannot run off safely.

  It can affect surrounding environment and cause a claim
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
  It can cause the damage of the items.
- **Do not touch any buttons with wet hands**
  It can cause electric shocks
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not clean up the unit with water**
  It can cause electric shocks
- **Do not operate the outdoor unit with any article placed on it.**
  You may incur property damage or personal injure from a fall of the article.
- **Do not step onto the outdoor unit.**
  You may incur injury from a drop or fall.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A has adopted a different size indoor unit service valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R410A tools listed in the table on the right before installing or servicing this unit.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, which results in performance degradation.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

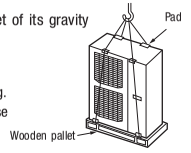
	Dedicated R410A tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position.
If not properly balanced, the unit can be thrown off-balance and fall.

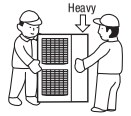
1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When some compelling reason necessitates the unpacking of the unit before it is carried in, use nylon slings or protective wood pieces so as not to damage the unit by ropes lifting it.



2) Portage

- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

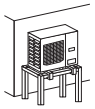
○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
○ A place where the unit is not exposed to oil splashes.
○ A place where it can be free from danger of flammable gas leakage.
○ A place where drain water can be disposed without any trouble.
○ A place where the unit will not be affected by heat radiation from other heat source.
○ A place where snow will not accumulate.
○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
○ A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
○ A place where strong wind will not blow against the outlet air blow of the unit.

Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

4) Caution about selection of installation location

(1) If the unit is installed in the area where the snow will accumulate, following measures are required.
The bottom plate of unit and intake, outlet may be blocked by snow.

1.Install the unit on the base so that the bottom is higher than snow cover surface.



2.Provide a snow hood to the outdoor unit on site. Regarding outline of a snow hood, refer to our technical manual.



3.Install the unit under eaves or providen the roof on site.

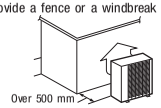


Since drain water generated by defrost control may freeze, following measures are required.

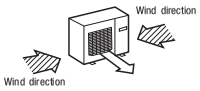
● Don't execute drain piping work by using a drain elbow and drain grommets (option parts). [Refer to Drain piping work.]
● Recommend setting Defrost Control (SW3-1) and Snow Guard Fan Control (SW3-2). [Refer to Setting SW3-1, SW3-2.]
● Attach heater on a base plate on site, if there is possibility to freeze drain water.
In case that the product has a corrective drainage system, the drainage paths should have suitable measure against freezing but be sure not to melt the material of drainage paths with heat.

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

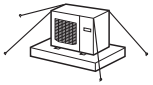
1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



3.The unit should be installed on the stable and level foundation. If the foundation is not level, tie down the unit with wires.

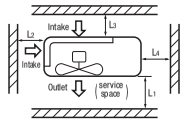


5) Installation space

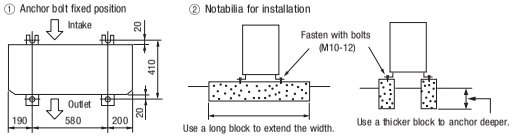
● Walls surrounding the unit in the four sides are not acceptable.
● There must be a 1-meter or larger space in the above.
● Where a danger of short-circuiting exists, install guide louvers.
● When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
● Where piling snow can bury the outdoor unit, provide proper snow guards.
● A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.

(mm)

Size \ Example installation	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4	5	5	5



6) Installation



● In installing the unit, fix the unit's legs with bolts specified on the left.
● The protrusion of an anchor bolt on the front side must be kept within 15 mm.
● Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
● Refer to the left illustrations for information regarding concrete foundations.
● Install the unit in a level area. (With a gradient of 5 mm or less.)
Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

● When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site.
So that strong wind will not blow against the outdoor heat exchanger directly. Regarding outline of a snow hood, refer to our technical manual.

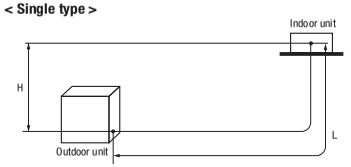
2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

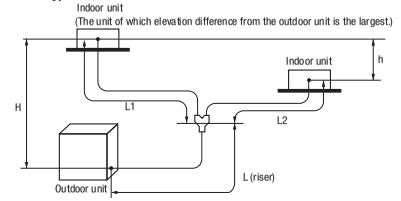
● Check the following points in light of the indoor unit specifications and the installation site.
● Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Descriptions	One-way pipe length difference from the first branching point to the indoor unit			Marks appearing in the drawing			
	Model for outdoor units		Dimensional limitations	Single type	Twin type	< 3m Triple type A	≧ 3m Triple type B
One-way pipe length of refrigerant piping	100VN,125VN,100VS,125VS		≦ 50m	L	L+L1+L2	—	—
	140VN,140VS					L+L1+L2+L3	L+La+L1+L2+L3
	100VNX,125VNX,100VSX,125VSX		≦ 100m			—	—
	140VNX,140VSX					L+L1+L2+L3	L+La+L1+L2+L3
Main pipe length	100VN,125VN,100VS,125VS		≦ 50m	—	L	—	—
	140VN,140VS					L	L
	100VNX,125VNX,100VSX,125VSX		≦ 100m			—	—
	140VNX,140VSX					L	L
One-way pipe length between the first branching point from to the second branching point	Triple type	140VN,140VS, 140VNX,140VSX	≦ 5m	—	—	—	La
One-way pipe length after the first branching point	Twin type	All Models	≦ 30m	—	L1, L2	—	—
	Triple type	140VN,140VS, 140VNX,140VSX			—	L1, L2, L3	L1 (1)
One-way pipe length after the first branching point and second branching point	Triple type	140VN,140VS 140VNX,140VSX	≦ 27m	—	—	—	La+L2, La+L3 (1)
One-way pipe length difference from the first branching point to the indoor unit	Twin type	All Models	≦ 10m	—	| L1—L2 |	—	—
	Triple type	140VN,140VS, 140VNX,140VSX	≦ 3m		—	| L1—L2 | , | L2—L3 | , | L3—L1 |	
			≦ 10m			—	L1—(La+L2), L1—(La+L3) (1)
One-way pipe length difference from the second branching point to the indoor unit	Triple type	140VN,140VS, 140VNX,140VSX	≦ 10m	—	—	—	| L2—L3 |
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher,		≦ 30m	H	H	H	H
	When the outdoor unit is positioned lower,		≦ 15m				
Elevation difference between indoor units			≦ 0.5m	—	h	h1, h2, h3	h1, h2, h3

< Single type >



< Twin type >



⚠CAUTION

- The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, see " 6. UTILIZATION OF EXISTING PIPING."
- With the triple pipe connection, the way of use is different when the difference of one-way pipe length after the first branching point is 3m to 10m. For details, refer to the above table and right figure.

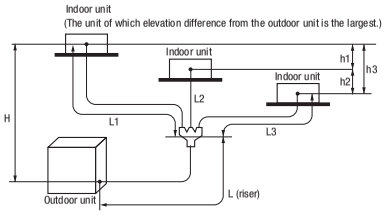
Note (1) Install the indoor units so that L + L1 becomes the longest one-way pipe.
Keep the pipe length difference between L1 and (La + L2) or (La + L3) within 10m.

2) Determination of pipe size

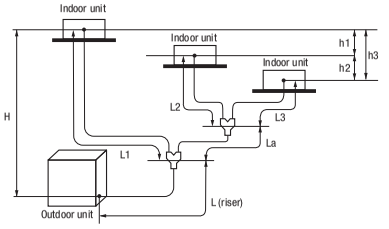
- Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

		Model 100V		Model 125V		Model 140V	
		Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
Outdoor unit connected		ϕ15.88 Flare	ϕ9.52 Flare	ϕ15.88 Flare	ϕ9.52 Flare	ϕ15.88 Flare	ϕ9.52 Flare
Refrigerant piping (Main pipe L)		ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
In the case of a single type	Indoor unit connected	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 100V		Model 125V		Model 140V	
In the case of a twin type	Branching pipe set	DIS-WA1		DIS-WA1		DIS-WA1	
	Refrigerant piping (branch pipe L1,L2)	ϕ12.7	ϕ9.52	ϕ12.7	ϕ9.52	ϕ15.88	ϕ9.52
	Indoor unit connected	ϕ12.7	ϕ6.35	ϕ12.7	ϕ6.35	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 50V×2		Model 60V×2		Model 71V×2	
In the case of a triple type A	Branching pipe set	–		–		DIS-TA1	
	Refrigerant piping (branch pipe L1,L2,L3)					ϕ12.7	ϕ9.52
	Indoor unit connected					ϕ12.7	ϕ6.35
	Capacity of indoor unit					Model 50Vx3	
In the case of a triple type B	Branching pipe set	–		–		DIS-WA1	
	Refrigerant piping (branch pipe La)					ϕ15.88	ϕ9.52
	Refrigerant piping (branch pipe L1)					ϕ12.7	ϕ9.52
	Branching pipe set (After branch pipe La)					DIS-WA1	
	Refrigerant piping (branch pipe L2,L3)					ϕ12.7	ϕ9.52
	Indoor unit connected					ϕ12.7	ϕ6.35
	Capacity of indoor unit					Model 50V×3	

< Triple type A >



< Triple type B >



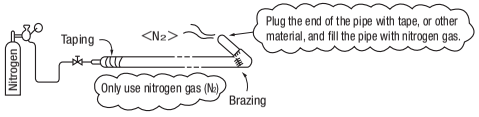
⚠CAUTION

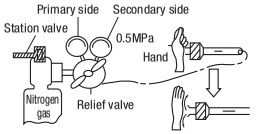
- When the 50V or 60V model is connected as an indoor unit, always use a ϕ9.52 liquid pipe for the branch (branching pipe – indoor unit) and a different diameter joint supplied with the branching pipe set for connection with the indoor unit (ϕ6.35 on the liquid pipe side).
  If a ϕ6.35 pipe is used for connection with a branching pipe, a refrigerant distribution disorder may occur, causing one of the indoor units to fall short of the rated capacity.
- A riser pipe must be a part of the main. A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.
  A branching part must be dressed with a heat-insulation material supplied as an accessory.
- For the details of installation work required at and near a branching area, see the installation manual supplied with your branching pipe set.

About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.





3) Refrigerant pipe wall thickness and material

- Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.
- This unit uses R410A. Always use 1/2H pipes having a 1.0mm or thicker wall for ϕ19.05 or larger pipes, because O-type pipes do not meet the pressure resistance requirement.

Pipe diameter [mm]	6.35	9.52	12.7	15.88	22.22	25.4	28.58
Minimum pipe wall thickness [mm]	0.8	0.8	0.8	1.0	1.0	1.0	1.0
Pipe material*	O-type pipe	O-type pipe	O-type pipe	O-type pipe	1/2H-type pipe	1/2H-type pipe	1/2H-type pipe

*Phosphorus deoxidized seamless copper pipe C1220T, JIS H 3300

NOTE

- Select pipes having a wall thickness larger than the specified minimum pipe thickness.

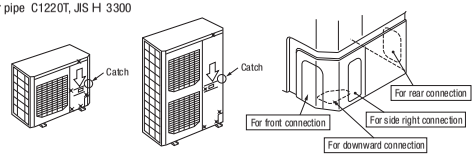
4) On-site piping work

⚠IMPORTANT

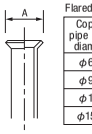
- Take care so that installed pipes may not touch components within a unit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

How to remove the service panel

First remove the five screws (× mark) of the service panel and push it down into the direction of the arrow mark and then remove it by pulling it toward you.

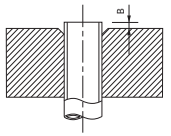


- The pipe can be laid in any of the following directions: side right, front, rear and downward.
- Remove a knock-out plate provided on the pipe penetration to open a minimum necessary area and attach an edging material supplied as an accessory by cutting it to an appropriate length before laying a pipe.
- Carry out the on site piping work with the service valve fully closed.
- Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
- Bend a pipe to a radius as large as practical.(R100-R150) Do not bend a pipe repeatedly to correct its form.
- Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- The pipe should be anchored every 1.5m or less to isolate the vibration.



Flared pipe end: A (mm)

Copper pipe outer diameter	A (0 −0.4)
ϕ6.35	9.1
ϕ9.52	13.2
ϕ12.7	16.6
ϕ15.88	19.7



Copper pipe protrusion for flaring: B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R410A tool	With a conventional tool
ϕ6.35	0-0.5	0.7-1.3
ϕ9.52		
ϕ12.7		
ϕ15.88		

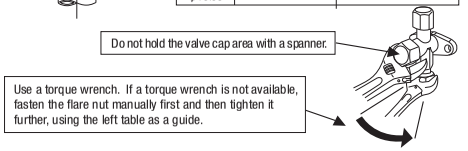
- Tighten a flare joint securely with a double spanner.

⚠ CAUTION

Do not apply force beyond proper fastening torque in tightening the flare nut.

Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.

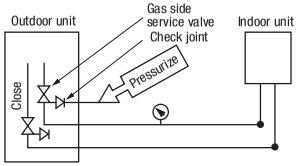
Service valve size (mm)	Tightening torque (N-m)	Tightening angle (°)	Recommended length of a tool handle (mm)
ϕ6.35 (1/4")	14-18	45-60	150
ϕ9.52 (3/8")	34-42	30-45	200
ϕ12.7 (1/2")	49-61	30-45	250
ϕ15.88 (5/8")	68-82	15-20	300



5) Air tightness test

① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the service valve's check joint equipped on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient Temperature fall 1°C, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
e) If a pressure drop is observed in checking e) and a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.

② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.



6) Evacuation

<Work flow> When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.

Run the vacuum pump for at least one hour after the vacuum gauge shows -101kPa or lower. (-755mmHg or lower)
Confirm that the vacuum gauge indicator does not rise even if the system is left for one hour or more.

Airtightness test completed
↓
Vacuuming begins
↓
Vacuuming completed
↓
Vacuum gauge check
↓
Fill refrigerant

Pay attention to the following points in addition to the above for the R410A and compatible machines.

○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

<Single type>

Item / Capacity	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
100VN–140VN 100VS–140VS	2.0	0	0.06	3.8	30
100VNX–140VNX 100VSX–140VSX	2.7			4.5	

<Twin, triple type>

Item / Capacity	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)		Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
			Main pipe	Branch pipe		
100VN–140VN 100VS–140VS	2.0	0	0.06		3.8	30
100VNX–140VNX 100VSX–140VSX	2.7				4.5	

- A standard refrigerant charge volume means a refrigerant charge volume for an installation with 0m long refrigerant piping.
- This unit contains factory charged refrigerant covering 30m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 30m refrigerant piping. When refrigerant piping exceeds 30m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 30m.
- When refrigerant piping is shorter than 3m, reduce refrigerant by 1kg from the factory charged volume and adjust to 2.8kg or 3.5kg.
- If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, see "6. UTILIZATION OF EXISTING PIPING."

Formula to calculate the volume of additional refrigerant required

Additional charge volume (kg) = { Main pipe length (m) – Length covered without additional charge 30 (m) } x 0.06 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)

*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

- **To charge refrigerant again, recover refrigerant from the system first and then charge the volume calculated from the above table (Standard refrigerant charge volume + additional charge volume for total pipe length.)**

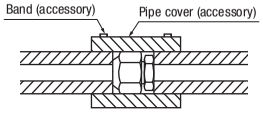
(2) Charging refrigerant

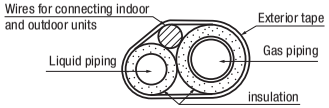
- Since R410A refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- Charge refrigerant always from the liquid side service port with the service valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.

8) Heating and condensation prevention

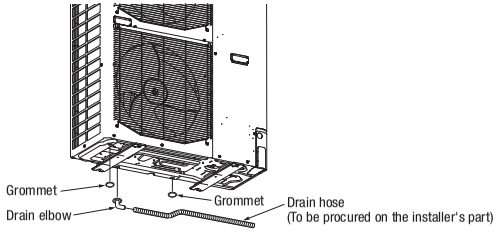
(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
(2) Use a heat insulating material that can withstand 120°C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
- Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
- Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
- Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
- Although it is verified in a test that this air-conditioning unit shows satisfactory performance under JIS condensation test conditions, **both gas and liquid pipes need to be dressed with 20 mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**



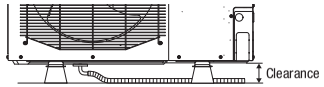


3. DRAIN PIPING WORK

- Execute drain piping by using a drain elbow and drain grommets supplied separately as option parts, where water drained from the outdoor unit is a problem.
- Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
- Condensed water may flow out from vicinity of service valve or connected pipes.
- Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)
- Do not use drain elbow and grommet made of plastic for drain piping when base heater for outdoor unit is used. Plastic grommet and elbow will be damaged and burnt in worst case.
- Prepare another drain tray made of metallic material for collecting drain when base heater is used.



- When condensed water needs to be led to a drain, etc., install the unit on a flat base (supplied separately as an option part) or concrete blocks.
  Then, please secure space for the drain elbow and the drain hose.

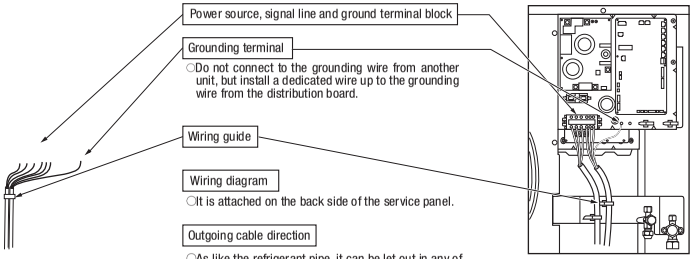


4. ELECTRICAL WIRING WORK For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- Do not use any supply cord lighter than one specified in parentheses for each type below.
  - braided cord (code designation 60245 IEC 51),
  - ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
  - flat twin tinsel cord (code designation 60227 IEC 41);

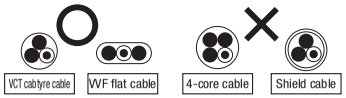
  Do not use anything lighter than polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If impropery grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
- The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an acccident such as an electric shock or a fire.



Model 100VN-140VN
100VS-140VS

Model 100VNX - 140VNX
100VSX - 140VSX

- Do not turn on the power until the electrical work is completeted .
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident)
- For power source cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.
- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.



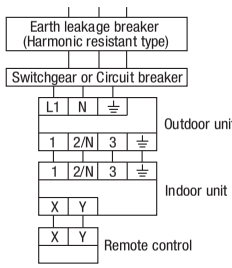
Main fuse specification

Model	Specification	Part No.
100VN-140VN 100VNX-140VNX	250V 30A	SSA564A049A
100VS-140VS 100VSX-140VSX	—	—

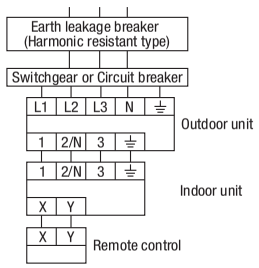
Power cable, indoor-outdoor connecting wires

- Always perform grounding system installation work with the power cord unplugged.

⚠ CAUTION Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.



Model 100VN - 140VN
100VNX - 140VNX



Model 100VS - 140VS
100VSX - 140VSX

Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
100VN-140VN	Single phase 3 wire 220-240V 50Hz 220V 60Hz	5.5	24	25	ϕ1.6mm	ϕ1.6mm x 3
100VNX			26	23		
125VNX,140VNX						
100VS-140VS	3 phase 4 wire 380-415V 50Hz 380V 60Hz	3.5	15	27		
100VSX-140VSX						

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear or Circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

※At the connection with the duct type indoor unit.

Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
100VN,100VNX	Single phase 3 wire 220-240V 50Hz 220V 60Hz	5.5	25	24	ϕ1.6mm	ϕ1.6mm x 3
125VN			27	22		
140VN		8	28	32		
125VNX			29	31		
140VNX			30	30		
100VS,100VSX	3 phase 4 wire 380-415V 50Hz 380V 60Hz	3.5	16	26		
125VS,125VSX			18	23		
140VS,140VSX			19	21		

5. TEST RUN

⚠ WARNING

- Before conduct a test run, make sure that the service valves are closed.
- Turn on power 6 hours prior to a test run to energize the crank case heater.
- In case of the first operation after turning on power, even if the unit does not move for 30 minutes, it is not a breakdown.
- Always give a 3-minute or longer interval before you start the unit again whenever it is stopped.
- Removing the service panel will expose high-voltage live parts and high-temperature parts, which are quite dangerous. Take utmost care not to incur an electric shock or burns. Do not leave the unit with the service panel open.

} A failure to observe these instructions can result in a compressor breakdown.

⚠ CAUTION

- When you operate switches (SW3, SW5) for on-site setting, be careful not to touch a live part.
- You cannot check discharge pressure from the liquid service valve charge port.
- The 4-way valve (20S) is energized during a heating operation.
- When power source is cut off to reset the unit, give 3 or more minutes before you turn on power again after power is cut off. If this procedure is not observed in turning on power again, "Communication error between outdoor and indoor unit" may occur.

1) Test run method

(1) A test run can be initiated from an outdoor unit by using SW3-3 and SW3-4 for on-site setting.
(2) Switching SW3-3 to ON will start the compressor.
(3) The unit will start a cooling operation, when SW3-4 is OFF, or a heating operation, when SW3-4 is ON.
(4) **Do not fail to switch SW3-3 to OFF when a test run is completed.**

SW-3-3	SW-3-4	
ON	OFF	Cooling during a test run
	ON	Heating during a test run
OFF	—	Normal or After the test operation

2) Checking the state of the unit in operation

Use check joints provided on the piping before and after the four-way valve installed inside the outdoor unit for checking discharge pressure and suction pressure.
As indicated in the table shown on the right, pressure detected at each point will vary depending on whether a cooling or heating operation has been selected.

	Check joint of the pipe	Charge port of the gas service valve
Cooling operation	Discharge pressure (High pressure)	Suction pressure (Low pressure)
Heating operation	Suction pressure (Low pressure)	Discharge pressure (High pressure)

3) Setting SW3-1, SW3-2, on-site

(1) Defrost control switching (SW3-1)
- When this switch is turned ON, the unit will run in the defrost mode more frequently.
- Set this switch to ON, when installed in a region where outdoor temperature falls below zero during the season the unit is run for a heating operation.

(2) Snow guard fan control (SW3-2)
- When this switch is turned on, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3℃ or lower and the compressor is not running.
- When the unit is used in a very snowy country, set this switch to ON.

4) Failure diagnosis in a test run

Error indicated on the remote control unit	Printed circuit board LED (The cycles of 5 seconds)		Failure event	Action
	Red LED	Green LED		
E34	Blinking once	Blinking continuously	Open phase	Check power cables for loose contact or disconnection
E40	Blinking once	Blinking continuously	63H1 actuation or operation with service valves shut (occurs mainly during a heating operation)	1. Check whether the service valves are open. 2. If an error has been canceled when 3 minutes have elapsed since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.
E49	Blinking once	Blinking continuously	Low pressure error or operation with service valves shut (occurs mainly during a cooling operation)	

● If an error code other than those listed above is indicated, refer to the wiring diagram of the outdoor unit and the indoor unit.

5) The state of the electronic expansion valve.

The following table illustrates the steady states of the electronic expansion valve.

	When power is turned on	When the unit comes to a normal stop		When the unit comes to an abnormal stop	
		During a cooling operation	During a heating operation	During a cooling operation	During a heating operation
Valve for a cooling operation	Complete shut position	Complete shut position	Full open position	Full open position	Full open position
Valve for a heating operation	Full open position	Full open position	Complete shut position	Full open position	Full open position

6) Heed the following on the first operation after turning on the circuit breaker.

This outdoor unit may start in the standby mode (waiting for a compressor startup), which can continue up to 30 minutes, to prevent the oil level in the compressor from lowering on the first operation after turning on the circuit breaker. If that is the case, do not suspect a unit failure.

Items to check before a test run

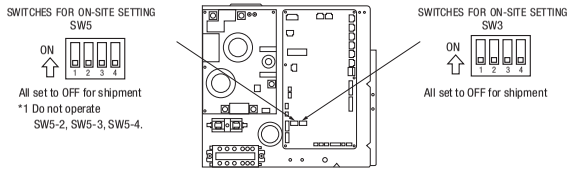
● When you leave the outdoor unit with power supplied to it, be sure to close the panel.

Item No.used in the installation manual	Item	Check item	Check
2	Refrigerant plumbing	If brazed, was it brazed under a nitrogen gas flow?	
		Were air-tightness test and vacuum extraction surely performed?	
		Are heat insulation materials installed on both liquid and gas pipes?	
		Are service valves surely opened for both liquid and gas systems?	
		Have you recorded the additional refrigerant charge volume and refrigerant pipe length on the panel's label?	
4	Electric wiring	Is the unit free of cabling errors such as uncompleted connection, an absent or reversed phase?	
		Are properly rated electrical equipments used for circuit breakers and cables?	
		Doesn't cabling cross-connect between units, where more than one unit are installed?	
		Aren't indoor-outdoor signal wires connected to remote control wires?	
		Do indoor-outdoor connecting cables connect between the same terminal numbers?	
		Are either VCT cabtyre cables or WF flat cables used for indoor-outdoor connecting cables?	
		Does grounding satisfy the D type grounding (type III grounding) requirements?	
		Is the unit grounded with a dedicated grounding wire not connected to another unit's grounding wire?	
		Are cables free of loose screws at their connection points?	
		Are cables held down with cable clamps so that no external force works onto terminal connections?	
—	Indoor unit	Is indoor unit installation work completed?	
		Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

Test run procedure

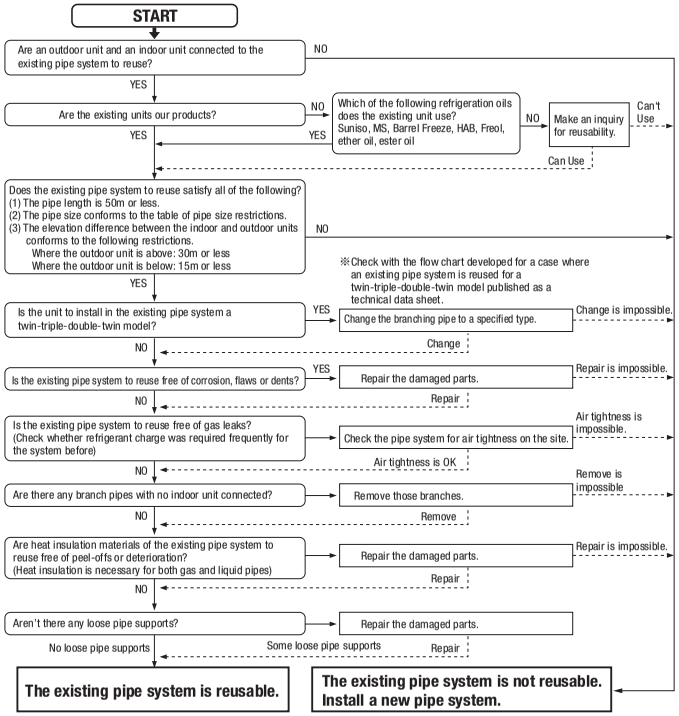
● Always carry out a test run and check the following in order as listed.

Turn	The contents of operation	Check
①	Open the gas side service valve fully.	
②	Open the liquid side service valve fully.	
③	Close the panel.	
④	Where a remote control unit is used for unit setup on the installation site, follow instructions for unit setup on the installation site with a remote control unit.	
⑤	SW3-3 ON / SW3-4 OFF: the unit will start a cooling operation.	
	SW3-3 ON / SW3-4 ON: the unit will start a heating operation.	
⑥	When the unit starts operation, press the wind direction button provided on the remote control unit to check its operation.	
⑦	Place your hand before the indoor unit's diffuser to check whether cold (warm) winds come out in a cooling (heating) operation.	
⑧	Make sure that a red LED is not blinking.	
⑨	When you complete the test run, do not forget to turn SW3-3 to the OFF position.	
⑩	Where options are used, check their operation according to the respective instruction manuals.	



6. UTILIZATION OF EXISTING PIPING.

Check whether an existing pipe system is reusable or not by using the following flow chart.



⚠ WARNING <Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the excising unit (in the order of (1), (2), (3) and (4))

(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side service valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.
- For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R410A.
- **Turn on-site setting switch SW5-1** to the ON position. (Where the gas pipe size is φ19.05)

<Where the existing unit cannot be run for a cooling operation.>

Wash the pipe system or install a new pipe system.
- If you choose to wash the pipe system, contact our distributor in the area.

<Table of pipe size restrictions>

◎:Standard pipe size ○:Usable
△:Restricted to shorter pipe length limits ×:Not usable

Additional charging amount of refrigerant per 1m		0.06kg/m		0.08kg/m	
Pipe size	Liquid pipe	φ9.52	φ9.52	φ12.7	φ12.7
	Gas pipe	φ15.88	φ19.05	φ15.88	φ19.05
100VN 100VS	Usability	◎	○※1	△	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15
125VN 125VS	Usability	◎	○※1	△	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15
140VN 140VS	Usability	◎	○※1	△	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15

Additional charging amount of refrigerant per 1m		0.02kg/m	0.06kg/m		0.08kg/m	
Pipe size	Liquid pipe	φ6.35	φ9.52	φ9.52	φ12.7	φ12.7
	Gas pipe	φ15.88	φ15.88	φ19.05	φ15.88	φ19.05
100VNX 100VSX	Usability	△	◎	○※1	△	△※1
	Maximum one-way pipe length	20	100	100	50	50
	Length covered without additional charge	10	30	30	15	15
125VNX 125VSX	Usability	△	◎	○※1	△	△※1
	Maximum one-way pipe length	20	100	100	50	50
	Length covered without additional charge	10	30	30	15	15
140VNX 140VSX	Usability	△	◎	○※1	△	△※1
	Maximum one-way pipe length	20	100	100	50	50
	Length covered without additional charge	10	30	30	15	15

<Pipe system after the branching pipe>

			After 1st branch ※4			After 2nd branch		
Additional charging amount of refrigerant per 1m			0.06kg/m			0.06kg/m		
Pipe size	Liquid pipe		φ9.52			φ9.52		
	Gas pipe		φ12.7	φ15.88	φ19.05※1	φ12.7	φ15.88	φ19.05※1
Model	Combination type	Combination of capacity						
100V	Twin	50+50	◎	○	×	–	–	–
125V	Twin	60+60	◎	○	×	–	–	–
140V	Twin	71+71	×	◎	○	–	–	–
	Triple A	50+50+50	◎	○	×	–	–	–
	Triple B	50+50+50	×	◎※5	○※5	◎	○	×

※1 Because of its insufficient pressure resistance, **turn the dip switch SW5-1** provided on the outdoor unit board to the ON position for φ19.05 × t1.0.
(In the case of a twin-triple-double-twin model, this also applies to the case where φ19.05 × t1.0 is used in a pipe system after the first branching point.)
However, you need not turn the dip switch SW5-1 to the ON position, if 1/2H pipes or pipes having 1.2 or thicker walls are used.

※2 When the main pipe length exceeds 40m, a significant capacity drop may be experienced due to pressure loss in the liquid pipe system. Use φ12.7 for the liquid main.

※3 Keep the total pipe length, not one-way pipe length, below the specified maximum pipe length.

※4 Piping size after branch should be equal or smaller than main pipe size.

※5 Piping size from first branch to indoor unit should be φ9.52 (Liquid) / φ12.7 (Gas).

- When refrigerant piping is shoter than 3m, reduce refrigerant by 1kg from factory charged volume.
- Any combinations of pipe sizes not listed in the table or marked with × in the table are not usable.

<The model types of existing units of which branching pipes are reusable.>

Models later than Type 8.
- FDC ＊ ＊ ＊ 8 □ □ □
- FDCP ＊ ＊ ＊ 8 □ □ □

The branching pipes used with models other than those listed above are not reusable because of their insufficient pressure resistance. Please use our genuine branching pipes for R410A.

- ＊ ＊ ＊ are numbers representing horsepower. □□□ is an alphanumeric letter.

Formula to calculate additional charge volume

Additional charge volume (kg) = {Main pipe length (m) − Length covered without additional charge shown in the table (m)} × Additional charge volume per meter of pipe shown in the table (kg/m) + Total length of branch pipes (m) × Additional charge volume per meter of pipe shown in the table (kg/m)

※ If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.
Example) When an 140V (single installation) is installed in a 20m long existing pipe system (liquid φ12.7, gas φ19.05), the quantity of refrigerant to charge additionally should be (20m-15m) x 0.08kg/m = 0.4 kg.

1.9.5 Instructions for branching pipe set (DIS-WA1, WB1, TA1, TB1)

For R410A

PSB012D865 G

⚠ WARNING / CAUTION

- This set is for R410A refrigerant.
- Select a branching pipe set correctly rated for the combined total capacity of connected indoor units and install it according to this manual.
  An improperly installed branching pipe set can cause degraded performance or an abnormal unit stop.
- Provide good heat insulation to the pipes by following instructions contained in this manual.
  Improper heat insulation can result in degraded performance or a water leak accident from condensation.
- Please make sure that only parts supplied as accessories or the manufacturer's approved parts are used in installing the unit, because a leak of refrigerant can result in a lack-of-oxygen accident, if it reaches a concentration beyond the tolerable limit.

This manual explains how to use a branching pipe set that is indispensable in connecting pipes for a twin/triple/double-twin configuration installation (system). For the details of piping work, unit installation work and electrical installation work, please refer to the installation manuals and installation guides supplied with your outdoor and indoor units.

1. Branching pipe set specifications

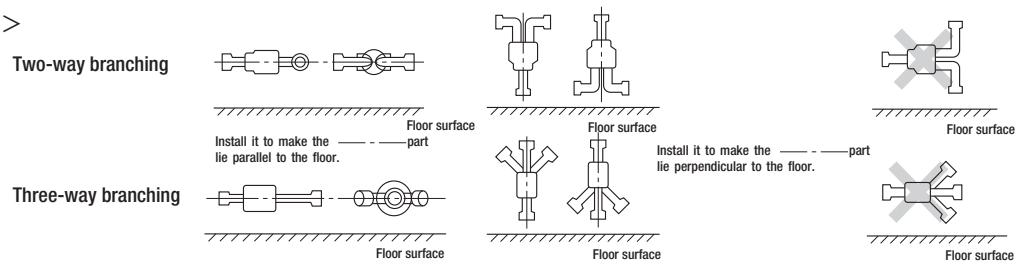
(1) Please make sure that you have chosen the right branching pipe set and the specifications of the parts contained in it by checking with the table below.
(2) Connect pipes as illustrated in the table below. The pipe from an outdoor unit must be brazed to the pipe connection port "①" and the pipes from indoor units to "②," "③" and "④."

Branching pipe set type	Supported outdoor/indoor unit combinations		Part lists			
	Outdoor unit model	Indoor unit model	Branching pipe set for a liquid pipe	Branching pipe set for a gas pipe	Different diameter pipe joint	Heat insulation material
DIS-WA1 (Two-way branching set)	3HP	1.5HP＋1.5HP	ID9.52 ① ② ③ ID9.52 ID9.52 1 piece	ID15.88 ① ② ③ ID15.88 ID15.88 1 piece	Joint A ID9.52 2 pieces Flare joint (for indoor unit side connection) Joint B OD15.88 2 pieces ID12.7	One each for liquid and gas
	4HP	2HP＋2HP				
		1.5HP＋2.5HP				
	5HP	2.5HP＋2.5HP				
		2HP＋3HP				
	6HP	3HP＋3HP				
		2HP＋4HP				
DIS-WB1 (Two-way branching set)	8HP	4HP＋4HP	ID9.52 ① ② ③ ID12.7 ID9.52 1 piece	ID15.88 ① ② ③ ID25.4 ID15.88 1 piece	Joint C OD12.7 1 piece ID9.52	One each for liquid and gas
		3HP＋5HP				
	10HP	5HP＋5HP				
DIS-TA1 (Three-way branching set)	6HP	2HP＋2HP＋2HP	ID9.52 ① ② ③ ④ ID9.52 1 piece	ID12.7 ① ② ③ ④ ID15.88 1 piece	Joint A ID9.52 3 pieces Flare joint (for indoor unit side connection)	One each for liquid and gas
DIS-TB1 (Three-way branching set)	8HP	3HP＋3HP＋3HP	ID9.52 ① ② ③ ④ ID9.52 1 piece	ID15.88 ① ② ③ ④ ID25.4 1 piece	Joint A ID9.52 2 pieces Flare joint (for indoor unit side connection) Joint B OD15.88 1 piece ID12.7 Joint D ID12.7 1 piece OD9.52	One each for liquid and gas

(3) To connect pipes for a Double Twin installation (involving 4 indoor units), please see 2-7. "Double Twin configuration."
(4) A branching pipe set must always be installed into the posture as illustrated in the drawing below.

ID stands for inner diameter and OD, outer diameter.

＜Posture to install into＞

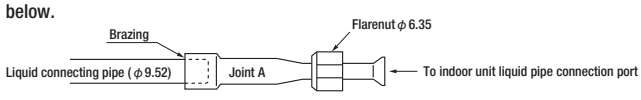


2. Pipe connecting procedure

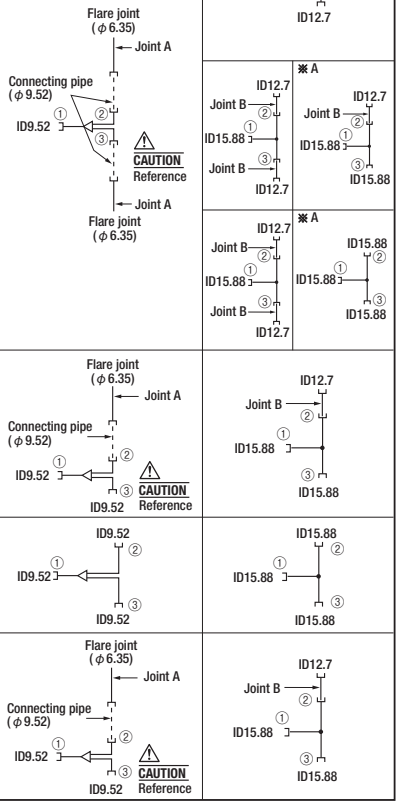
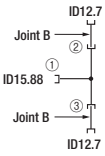
Braze the different diameter pipe joint found in the set matching the connected outdoor and indoor unit capacities according to the instructions set out below.

⚠ CAUTION

In connecting an indoor unit of which capacity is 1.5HP, 2HP or 2.5HP, always use a ϕ9.52 liquid pipe to connect to the branching pipe (branching pipe – indoor unit).
In connecting to an indoor unit (liquid pipe side: ϕ6.35), use the different diameter pipe joint A supplied with the set and follow the procedure set out below.

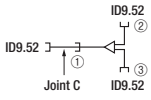
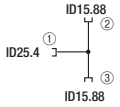
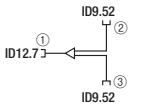
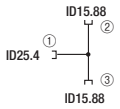


2-1 DIS-WA1

Supported combinations		Liquid branching pipe	Gas branching pipe
Outdoor unit model	Indoor unit model		
3HP	1.5HP＋1.5HP		
4HP	2HP＋2HP		
	1.5HP＋2.5HP		
5HP	2.5HP＋2.5HP		
	2HP＋3HP		
6HP	3HP＋3HP		
	2HP＋4HP		

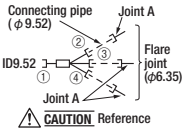
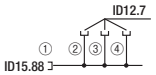
Note When connect the indoor unit of an old model that is shown in the model list, use the joint supplied with the branch piping set like ※A

2-2 DIS-WB1

Supported combinations		Liquid branching pipe	Gas branching pipe
Outdoor unit model	Indoor unit model		
8HP	3HP＋5HP 4HP＋4HP		
10HP	5HP＋5HP		

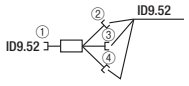
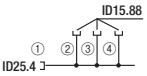
2-3 DIS-TA1

Applicable to the difference in length of pipes after the branch being less than 3 m
* Connection is not allowed when the difference in length of pipes is larger than 3 m.

Supported combinations		Liquid branching pipe	Gas branching pipe
Outdoor unit model	Indoor unit model		
6HP	2HP＋2HP＋2HP		

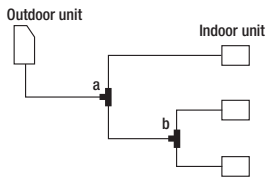
2-4 DIS-TB1

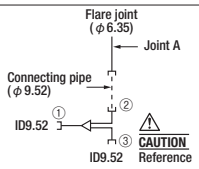
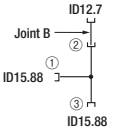
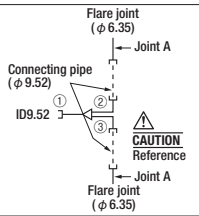
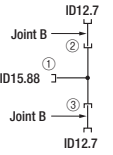
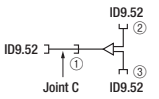
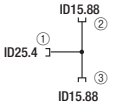
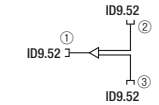
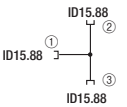
Applicable to the difference in length of pipes after the branch being less than 3 m
* Connection is not allowed when the difference in length of pipes is larger than 3 m.

Supported combinations		Liquid branching pipe	Gas branching pipe
Outdoor unit model	Indoor unit model		
8HP	3HP＋3HP＋3HP		

2-5. Triple type for same model/same capacity or different model/same capacity

When the difference in length of pipes after the branch is longer than 3 m and shorter than 10 m

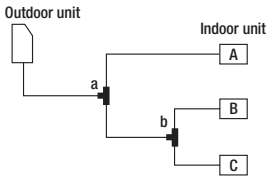


Outdoor unit model	Indoor unit model	Branching pipe	Branching pipe set type	Liquid branching pipe	Gas branching pipe
6HP	2HP＋2HP＋2HP	a	DIS-WA1		
		b			
8HP	3HP＋3HP＋3HP	a	DIS-WB1		
		b	DIS-WA1		

2-6. Triple type for same model/different capacity or different model/different capacity

Applicable to the difference in length of pipes after the branch being less than 3 m

* Connection is not allowed when the difference in length of pipes is larger than 3 m.



Connecting position

Outdoor unit model	Indoor unit model	A	B	C
10HP	2.5HP+2.5HP+5HP	5HP	2.5HP	2.5HP
	3HP+3HP+4HP	4HP	3HP	3HP

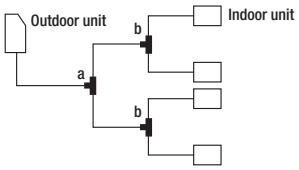
Outdoor unit model	Indoor unit model	Branching pipe	Branching pipe set type	Liquid branching pipe	Gas branching pipe
10HP	2.5HP+2.5HP+5HP	a	DIS-WB1	ID9.52 ② / ① ID12.7 / ③ ID9.52	ID15.88 ② / ① ID25.4 / ③ ID15.88
		b	DIS-WA1	Flare joint (φ6.35) Joint A / Connecting pipe (φ9.52) / ② ID9.52 ③ ① / ⚠ CAUTION Reference / Joint A Flare joint (φ6.35)	ID12.7 Joint B ② ① ID15.88 ③ Joint B ID12.7 / ※A: ID15.88 ② ① ID15.88 ③ ID15.88
10HP	3HP+3HP+4HP	a	DIS-WB1	ID9.52 ② / ① ID12.7 / ③ ID9.52	ID15.88 ② / ① ID25.4 / ③ ID15.88
		b	DIS-WA1	ID9.52 ② / ① ID9.52 / ③ ID9.52	ID15.88 ② / ① ID15.88 / ③ ID15.88

Note When connect the indoor unit of an old model that is shown in the model list, use the joint supplied with the branch piping set like※ A.

2-7. Double Twin type

Pipes should be connected as follows for a Double Twin installation (4 connected indoor units. The capacity of an outdoor unit available for this configuration is either 8HP or 10HP only):

Outdoor unit capacity	Indoor unit capacity
8HP	2HP×4 units
10HP	2.5HP×4 units



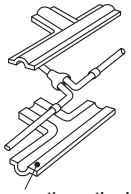
Branching pipe	Branching pipe set type	Outdoor unit model	Liquid branching pipe	Gas branching pipe
a	DIS-WB1	8HP	ID9.52 ② / ① ID9.52 / Joint C / ③ ID9.52	ID15.88 ② / ① ID25.4 / ③ ID15.88
		10HP	ID9.52 ② / ① ID12.7 / ③ ID9.52	
b	DIS-WA1	8HP	Flare joint (φ6.35) Joint A / Connecting pipe (φ9.52) / ② ID9.52 ③ ① / ⚠ CAUTION Reference / Joint A Flare joint (φ6.35)	ID12.7 Joint B ② ① ID15.88 ③ Joint B ID12.7
		10HP		※A: ID15.88 ② ① ID15.88 ③ ID15.88 / ID12.7 Joint B ② ① ID15.88 ③ Joint B ID12.7

Note When connect the indoor unit of an old model that is shown in the model list, use the joint supplied with the branch piping set like※ A.

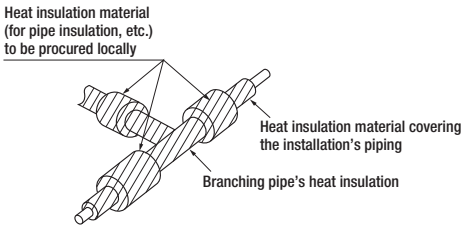
3. Heat insulation work

(1) Condensation can also occur on liquid pipes with this model. Please provide good heat insulation to both liquid and gas pipes.

(2) For the heat insulation of a branching pipe, always use the heat insulation material supplied with the set and provide heat insulation according to the instructions set out below.



1. It has an adhesive layer on the entire inner face. Remove a separator and wrap it around the branching pipe.



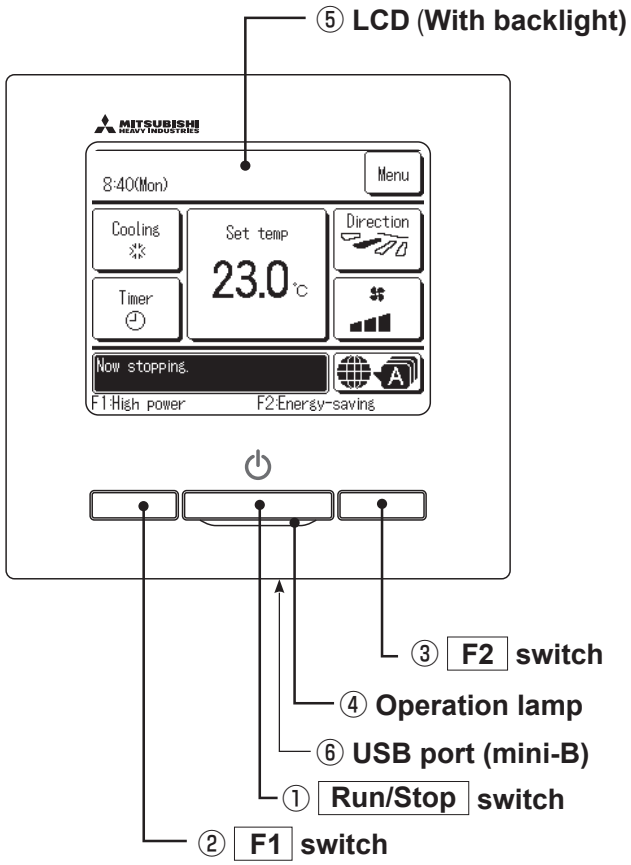
2. Apply a heat insulation material (to be procured locally) to the joint between the branching pipe's heat insulation and the heat insulation material covering the installation's piping as described above and wrap a tape over the gap shown as a hatched (///) area to complete dressing of the piping.

1.10 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

1.10.1 Remote control (Option parts)

(1) Wired remote control

Model RC-EX3A



Touch panel system, which is operated by tapping the LCD screen with a finger, is employed for any operations other than the ①Run/Stop, ②F1 and ③F2 switches.

① Run/Stop switch

One push on the button starts operation and another push stops operation.

② F1 switch③ F2 switch

This switch starts operation that is set in F1/F2 function change.

④ Operation lamp

This lamp lights in green(yellow-green) during operation. It changes to red(orange) if any error occurs.
Operation lamp luminance can be changed.

⑤ LCD (With backlight)

A tap on the LCD lights the backlight.
The backlight turns off automatically if there is no operation for certain period of time.
Lighting period of the backlight lighting can be changed.
If the backlight is ON setting, when the screen is tapped while the backlight is turned off,the backlight only is turned on.(Operations with switches ①,② and ③are excluded.)

⑥ USB port

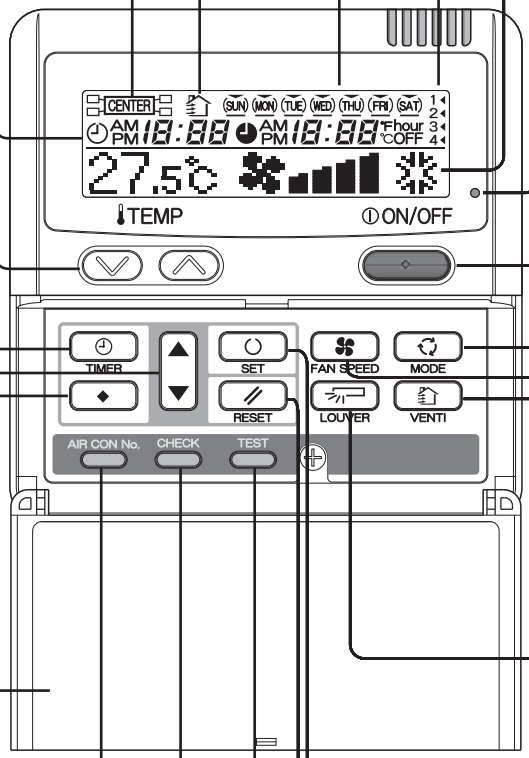
USB connector (mini-B) allows connecting to a personal computer.
For operating methods, refer to the instruction manual attached to the software for personal computer (remote control utility software).

Note(1) When connecting to a personal computer, do not connect simultaneously with other USB devices.
Please be sure to connect to the computer directly,without going through a hub, etc.

Model RC-E5

The figure below shows the remote control with the cover opened. Note that all the items that may be displayed in the liquid crystal display area are shown in the figure for the sake of explanation
Characters displayed with dots in the liquid crystal display area are abbreviated.

The figure below shows the remote control with the cover opened.



Ventilaion display
Displayed during ventilation operation

Central control display
Displayed when the air conditioning system is controlled by central control.

Timer operation display
Displays the timer operation setting.

Temperature setting buttons
These buttons are used to set the temperature of the room.

Timer button
This button is used to set the timer mode.

Timer setting buttons
These buttons are used to set the timer mode and the time.

ESP button
This button is used to select the auto static pressure adjustment mode.

Cover

AIR CON No. button
Display the indoor unit number connected to this remote control.

CHECK button
This button is used at servicing.

TEST button
This button is used during test operation.

Weekly timer display
Displays the settings of the weekly timer.

Operation setting display area
Displays setting temperature, air flow volume, operation mode and oparation message.

Operation/check indicator light
During oparation: Lit in green
In case of error: Flashing in red

Operation/stop button
This button is used to operate and stop the air-conditioning system.
Press the button once to operate the system and press it once again to stop the system.

MODE button
This button is used to change the operation mode.

FAN SPEED button
This button is used to set the air flow volume.

VENT button
This button is used to operate external ventilator.

LOUVER button
This button is used to operate/stop the swing louver.

SET button
•This button is used to fix the setting.
•This button is used to set the silent mode.

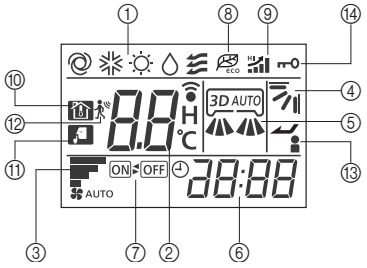
RESET button
•Press this button while making settings to go back to the previous operation.
•This button is also used to reset the "**FILTER CLEANING**" display. (Press it after cleaning the air filter)

∗ All displays are described in the liguid crystal display for explanation.

(2) Wireless remote control

RCN-E2

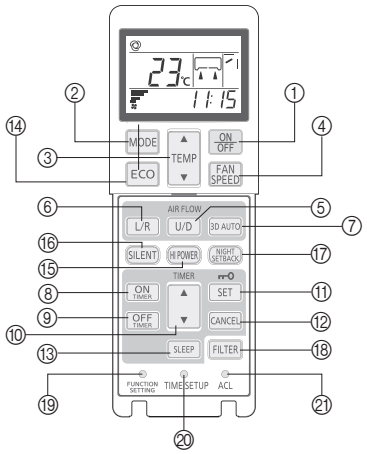
Indication section



①	OPERATION MODE display	Indicates selected operation mode.
②	SET TEMP display	Indicates set temperature.
	SLEEP TIMER time display	Indicates the amount of time remaining on the sleep timer.
	Indoor function setting number display	Indicates the setting number of the indoor function setting.
③	FAN SPEED display	Indicates the selected air flow volume.
④	UP/DOWN AIR FLOW display	Indicates the up/down louver position.
⑤	LEFT/RIGHT AIR FLOW display	Indicates the left/right louver position.
⑥	Clock display	Indicates the current time. If the timer is set, the ON TIMER and OFF TIMER setting times are indicated.
⑦	ON/OFF TIMER display	Displayed when the timer is set.
⑧	ECO mode display	Displayed when the energy-saving operation is active.
⑨	HI POWER display	Displayed when the high power operation is active.
⑩	NIGHT SETBACK display	Displayed when the home leave mode is active.
⑪	SILENT display	Displayed when the silent mode control is active.
⑫	Motion sensor display	Displayed when the infrared sensor control(motion sensor control) is enabled.
⑬	Anti draft setting display	Displayed when anti draft setting is enabled.
⑭	Child lock display	Displayed when child lock is enabled.

Operation section

Transmitter:Sends signal to the air-conditioner.



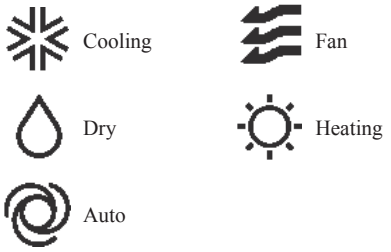
①	ON/OFF button	When this is pressed once, the air-conditioner starts to operate and when this is pressed once again, it stops operating.
②	MODE button	Every time this button is pressed, displays switch as below (AUTO) → (COOL) → (HEAT) → (DRY) → (FAN) → (AUTO)
③	TEMP button	Change the set temperature by pressing ▲ or ▼ button.
④	FAN SPEED button	The fan speed is switched in the following order: 1-speed → 2-speed → 3-speed → 4-speed → AUTO → 1-speed.
⑤	U/D button	Used to determine the up/down louver position.
⑥	L/R button	Used to determine the left/right louver position.
⑦	3D AUTO button	Used to switch whether or not to enable or disable 3D AUTO mode.
⑧	ON TIMER button	Used to set the ON TIMER.
⑨	OFF TIMER button	Used to set the OFF TIMER.
⑩	SELECT button	Used to switch the time when setting the timer or adjusting the time. Used to switch the settings of the indoor function.
⑪	SET button	Used to determine the setting when setting the timer or adjusting the time. Used to determine the settings of the indoor function. When press and hold SET button ,Child Lock is enabled.
⑫	CANCEL button	Used to cancel the timer setting.
⑬	SLEEP button	Used to set the sleep timer.
⑭	ECO button	Pressing this button starts the energy-saving operation. Pressing this button again cancels it.
⑮	HI POWER button	Pressing this button starts the high power operation. Pressing this button again cancels it.
⑯	SILENT button	Pressing this button starts the silent mode control. Pressing this button again cancels it.
⑰	NIGHT SETBACK button	Pressing this button starts the home leave mode. Pressing this button again cancels it.
⑱	FILTER button	Pressing this button resets FILTER SIGN.
⑲	FUNCTION SETTING switch	Used to set the indoor function.
⑳	TIME SETUP switch	Used to set the current time.
㉑	ACL switch	Used to reset the microcomputer.

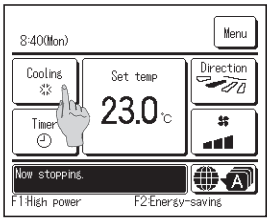
1.10.2 Operation control function by the wired remote control

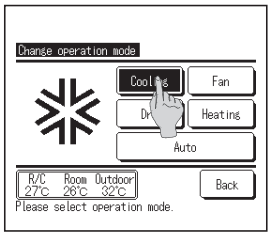
●Model RC-EX3A

(1) Switching sequence of the operation mode switches of remote control

(a) Tap the change operation mode button on the TOP screen.
(b) When the change operation mode screen is displayed, tap the button of desired mode.
(c) When the operation mode is selected, the display returns to the TOP screen.
Icons displayed have the following meanings.





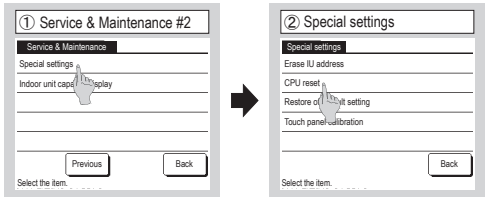


Notes(1) Operation modes which cannot be selected depending on combinations of indoor unit and outdoor unit are not displayed.
(2) When the Auto is selected,the cooling and heating switching operation is performed automatically according to indoor and outdoor temperatures.

(2) CPU reset

Reset CPU from the remote control as follows.

TOP screen → Menu ⇒ Service setting ⇒ Service & Maintenance ⇒ Service password



The selected screen is displayed.

The selected screen is displayed.

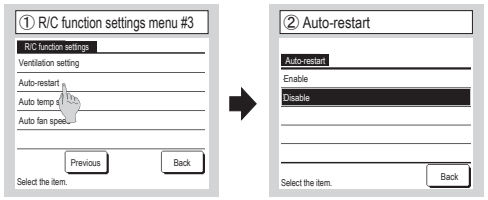
CPU reset

Microcomputers of indoor unit and outdoor unit connected are reset (State of restoration after power failure).

(3) Power failure compensation function (Electric power source failure)

Enable the Auto-restart function from the remote control as follows.

TOP screen → Menu ⇒ Service setting ⇒ R/C function settings ⇒ Service password



If the unit stops during operation,

Enable

It returns to the state before the power failure as soon as the power source is restored (After the end of the primary control at the power on).

Disable

It stops after the restoration of power source.

●Since the status of remote control is retained in memory always, it restarts operations according to the contents of memory as soon as the power source is restored. Although the timer mode is cancelled, the weekly timer, peak cut timer and silent mode timer operate according to the following contents:

・When the clock setting is valid : These timer settings are also valid.
・When the clock setting is invalid : These timer settings become “Invalid” since the clock setting is invalid.
These timer settings have to be changed to “Valid” after the timer setting.

●Content memorized with the power failure compensation are as follows.

Note(1) Items (f) and (g) are memorized regardless whether the power failure compensation is effective or not while the setting of silent mode is cancelled regardless whether the power failure compensation is effective or not.

(a) At power failure – Operating/stopped
If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized.

(b) Operation mode

(c) Air flow volume mode

(d) Room temperature setting

(e) Louver auto swing/stop
However, the stop position (4-position) is cancelled so that it returns to Position (1).

(f) "Remote control function items" which have been set with the administrator or installation function settings ("Indoor function items" are saved in the memory of indoor unit.)

(g) Weekly timer, peak-cut timer or silent mode timer settings

(h) Remote control function setting

(4) Alert displays

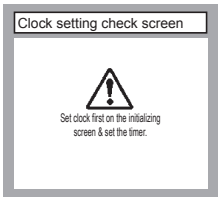
If the following (a) to (c) appear, check and repair as follows.

(a) Communication check between indoor unit and remote control



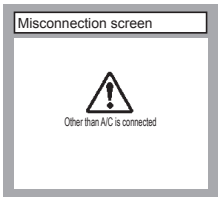
●This appears if communications cannot be established between the remote control and the indoor unit.
Check whether the system is correctly connected (indoor unit, outdoor unit, remote control) and whether the power source for the outdoor unit is connected.

(b) Clock setting check



●This appears when the timer settings are done without clock setting.
Set the clock setting before the timer settings.

(c) Misconnection



●This appears when something other than the air-conditioner has been connected to the remote control.
Check the location to which the remote control is connected.

● **Model RC-E5**

(1) Switching sequence of the operation mode switches of remote control



(2) CPU reset

This functions when "CHECK" and "ESP" buttons on the remote control are pressed simultaneously. Operation is same as that of the power source reset.

(3) Power failure compensation function (Electric power source failure)

- This becomes effective if "Power failure compensation effective" is selected with the setting of remote control function.
- Since it memorizes always the condition of remote control, it starts operation according to the contents of memory no sooner than normal state is recovered after the power failure. Although the auto swing stop position and the timer mode are cancelled, the weekly timer setting is restored with the holiday setting for all weekdays.
  After recovering from the power failure, it readjusts the clock and resets the holiday setting for each weekday so that the setting of weekly timer becomes effective.
- Content memorized with the power failure compensation are as follows.

Note (1) Items (f), (g) and (h) are memorized regardless whether the power failure compensation is effective or not while the setting of silent mode is cancelled regardless whether the power failure compensation is effective or not.

(a) At power failure – Operating/stopped
If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized. (Although the timer mode is cancelled at the recovery from power failure, the setting of weekly timer is changed to the holiday setting for all weekdays.)

(b) Operation mode

(c) Air flow volume mode

(d) Room temperature setting

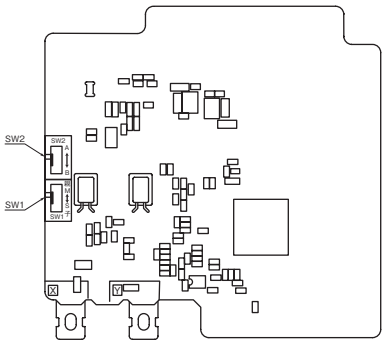
(e) Louver auto swing/stop
However, the stop position (4-position) is cancelled so that it returns to Position (1).

(f) "Remote control function items" which have been set with the remote control function setting ("Indoor function items" are saved in the memory of indoor unit.)

(g) Upper limit value and lower limit value which have been set with the temperature setting control

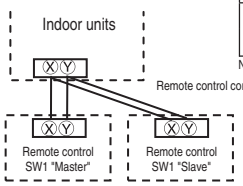
(h) Sleep timer and weekly timer settings (Other timer settings are not memorized.)

[Parts layout on remote control PCB]



Master/ slave setting when more than one remote controls are used

A maximum of two remote controls can be connected to one indoor unit (or one group of indoor units.)



Switch	Setting	Content
SW1	M	Master remote control
	S	Slave remote control

Note (1) Don't change SW2 because it is not used normally.

Caution

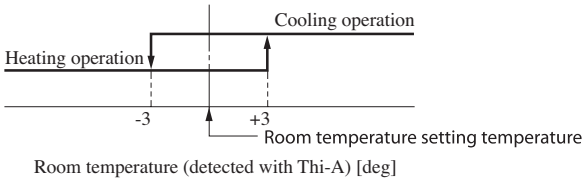
When using multiple remote controls, the following dispiays or settings cannot be done with the slave remote control. It is available only with the master remote control.

①Louver position setting (set upper or lower limit of swinging range)
②Setting indoor unit functions
③Setting temperature range
④Operation data display
⑤Error data display
⑥Silent mode setting
⑦Test operation of drain pump
⑧Remote control sensor setting

1.10.3 Operation control function by the indoor control

(1) Auto operation

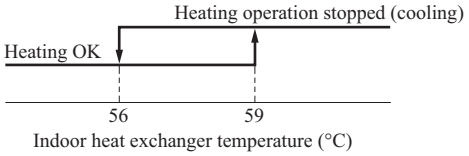
(a) If "Auto" mode is selected by the remote control, the heating and the cooling are automatically switched according to the difference between outdoor air temperature and setting temperature and the difference between setting temperature and return air temperature. (When the switching of cooling mode ↔ heating mode takes place within 3 minutes, the compressor does not operate for 3 minutes by the control of 3-minute timer.) This will facilitate the cooling/heating switching operation in intermediate seasons and the adaptation to unmanned operation at stores, etc (ATM corner of bank).



Notes (1) Temperature range of switching cooling/heating mode can be changed by RC-EX3 from ±1.0 – ±4.0.

(2) Room temperature control during auto cooling/auto heating is performed according to the room temperature setting temperature. (DIFF: ±1 deg)

(3) If the indoor heat exchanger temperature rises to 59°C or higher during heating operation, it is switched automatically to cooling operation. In addition, for 1 hour after this switching, the heating operation is not performed, regardless of the temperature shown at right.



(b) The following automatic controls are performed other than (a) above.

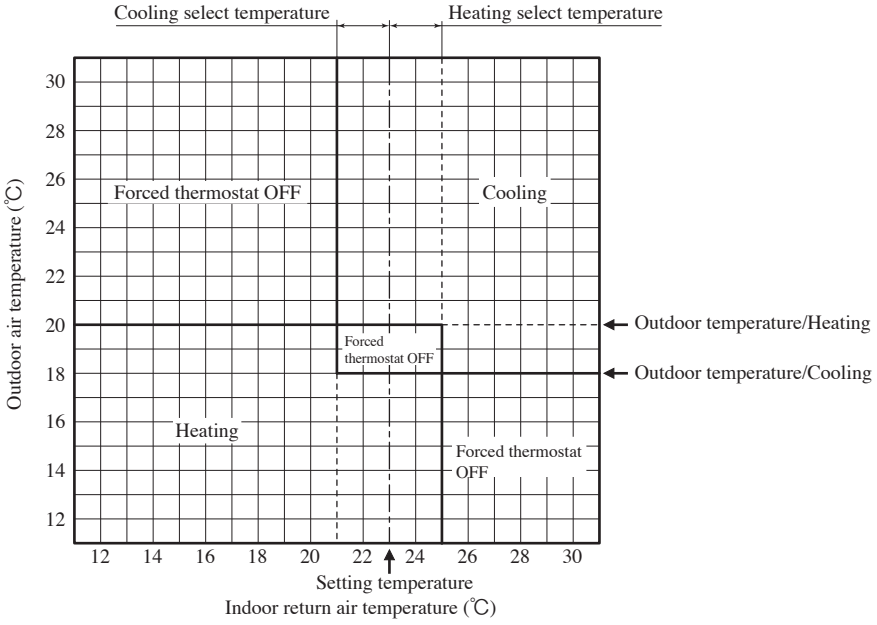
(i) Cooling or heating operation mode is judged according to the conditions of the "Judgment based on Setting temperature + Cooling select temperature and Indoor return air temperature" and the "Judgment based on Outdoor temperature".

1) In "Setting temperature - Cooling select temperature < Indoor return air temperature" and "Outdoor temperature/Cooling < Outdoor return air temperature" ⇒ Operation mode: Cooling

2) "Setting temperature + Heating select temperature > Indoor return air temperature" and "Outdoor temperature/Heating > Outdoor air temperature" ⇒ Operation mode: Heating

3) The outdoor air temperature of the above judgment conditions is sampled at every 10 minutes.

4) In the range where the above cooling and heating zones are overlapped ⇒ Forced thermostat OFF



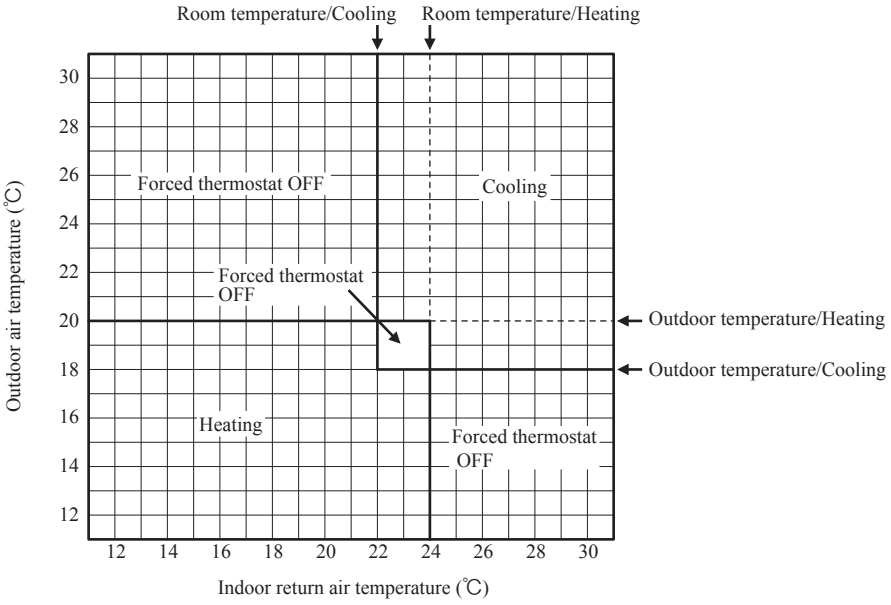
(ii) Regardless of the setting temperature, the cooling or heating operation mode is judged according to the "Judgment based on Room temperature/Cooling or Heating and Outdoor temperature/Cooling or Heating".

1) In case of "Room temperature/Cooling < Indoor return air temperature" and "Outdoor temperature/Cooling < Outdoor air tem perature" ⇒ Operation mode: Cooling

2) In case of "Room temperature/Heating > Indoor return air temperature" and "Outdoor temperature /Heating > Outdoor air tem perature" ⇒ Operation mode: Heating

3) The outdoor air temperature of the above judgment conditions is sampled at every 10 minutes.

4) In the range where the above cooling and heating zones are overlapped ⇒ Forced thermostat OFF



(2) Operations of functional items during cooling/heating

Operation / Functional item	Cooling		Fan	Heating			Dehumidifying
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Hot start (Defrost)	
Compressor	○	×	×	○	×	○	○/×
4-way valve	×	×	×	○	○	○(×)	×
Outdoor unit fan	○	×	×	○	×	○(×)	○/×
Indoor unit fan	○	○	○	○/×	○/×	○/×	○/×
Drain pump (3)	○	×(2)	×(2)	○/×(2)			Thermostat ON: ○ Thermostat OFF: ×(2)

Notes (1) ○: Operation ×: Stop ○/×: Turned ON/OFF by the control other than the room temperature control.
(2) ON during the drain motor delay control.
(3) Drain pump ON setting may be selected with the indoor unit function setting of the wired remote control.

(3) Dehumidifying (DRY) operation

Indoor ambient temperatures and humidity are controlled simultaneously with the relative humidity sensor (HS) and the suction temperature sensor [Thi-A (or the remote control sensor when it is activated)], which are installed at the suction inlet.

(a) When the operation has been started with cooling, if there is a difference of 2°C or less between the suction and setting temperatures, the tap of indoor fan is lowered by one tap. This tap is retained for 3 minutes after changing the tap.

(b) After the above condition, when a difference between suction and setting temperature is lower than 3°C, and the relative humidity is high, the tap of indoor unit fan is lowered by one tap.
When the difference between suction and setting temperature is larger than 3°C, the fan of indoor unit fan is raised by one tap. This tap is retained for 3 minutes after changing the tap.

(c) When relative humidity becomes lower, the indoor unit fan tap is retained.

(d) In case of the thermostat OFF, the indoor unit fan tap at the thermostat ON is retained.

(4) Timer operation

(a) RC-EX3A

(i) Sleep timer

Set the time from the start to stop of operation. The time can be selected in the range from 30 to 240 minutes (in the unit of 10-minute).

Note (1) Enable the "Sleep timer" setting from the remote control. If the setting is enabled, the timer operates at every time.

(ii) Set OFF timer by hour

Set the time to stop the unit after operation, in the range from 1 to 12 hours (in the unit of hour).

(iii) Set ON timer by hour

Set the time to start the unit after the stop of operation, in the range from 1 to 12 hours (in the unit of hour). It is allowed also to set simultaneously the indoor temperature, operation mode, air flow rate and warm-up enabled/disabled.

(iv) Set ON timer by clock

Set the time to start operation. The time can be set in the unit of 5-minute. This setting can be activated only once or at every time. It is allowed also to set simultaneously the indoor temperature, operation mode, air flow rate and warm-up enabled/disabled.

Note (1) It is necessary to set the clock to use this timer.

(v) Set OFF timer by clock

Set the time to stop operation. The time can be set in the unit of 5-minute. This setting can be activated only once or at every time.

Note (1) It is necessary to set the clock to use this timer.

(vi) Weekly timer

Set the ON or OFF timer for a week. Up to 8 patterns can be set for a day. The day-off setting is provided for holidays and non-business days.

Note (1) It is necessary to set the clock to use the weekly timer.

(vii) **Combination of patterns which can be set for the timer operations**

	Sleep time	Set OFF timer by hour	Set ON timer by hour	Set OFF timer by clock	Set ON timer by clock	Weekly timer
Sleep time		×	×	○	○	○
Set OFF timer by hour	×		×	×	×	×
Set ON timer by hour	×	×		×	×	×
Set OFF timer by clock	○	×	×		○	×
Set ON timer by clock	○	×	×	○		×
Weekly timer	○	×	×	×	×	

Note (1) ○: Allowed ×: Not

(b) RC-E5

(i) Sleep timer

Set the duration of time from the present to the time to turn off the air-conditioner.

It can be selected from 10 steps in the range from "OFF 1 hour later" to "OFF 10 hours later". After the sleep timer setting, the remaining time is displayed with progress of time in the unit of hour.

(ii) OFF timer

Time to turn OFF the air-conditioner can be set in the unit of 10 minutes.

(iii) ON timer

Time to turn ON the air-conditioner can be set. Indoor temperature can be set simultaneously.

(iv) Weekly timer

Timer operation (ON timer, OFF timer) can be set up to 4 times a day for each weekday.

(v) Timer operations which can be set in combination

Item / Item	Timer	OFF timer	ON timer	Weekly timer
Timer		×	○	×
OFF timer	×		○	×
ON timer	○	○		×
Weekly timer	×	×	×	

Notes (1) ○: Allowed ×: Not

(2) Since the ON timer, sleep timer and OFF timer are set in parallel, when the times to turn ON and OFF the air-conditioner are duplicated, the setting of the OFF timer has priority.

(5) Hot start (Cold draft prevention at heating)

(a) Operating conditions

When either one of following conditions is satisfied, the hot start control is performed.

(i) From stop to heating operation

(ii) From cooling to heating operation

(iii) Form heating thermostat OFF to ON

(iv) After completing the defrost operation (only on units with thermostat ON)

(b) Contents of operation

(i) Indoor fan motor control at hot start

1) Within 7 minutes after starting heating operation, the fan mode is determined depending on the condition of thermostat (fan control with heating thermostat OFF).

a) Thermostat OFF

i) Operates according to the fan control setting at heating thermostat OFF.

ii) Even if it changes from thermostat OFF to ON, the fan continues to operate with the fan control at thermostat OFF till the heat exchanger thermistor (Thi-R1 or R2, whichever higher) detects 35°C or higher.

iii) When the heat exchanger thermistor (Thi-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set air flow volume.

b) Thermostat ON

i) When the heat exchanger thermistor (Thi-R1 or R2, whichever higher) detects 25°C or lower, the fan is turned OFF and does not operate.

ii) When the heat exchanger thermistor (Thi-R1 or R2, whichever higher) detects 25°C or higher, the fan operates with the fan control at heating thermostat OFF.

iii) When the heat exchanger thermistor (Thi-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set air flow volume.

c) If the fan control at heating thermostat OFF is set at the "Set air flow volume" (from the remote control), the fan operates with the set air flow volume regardless of the thermostat ON/OFF.

2) Once the fan motor is changed from OFF to ON during the thermostat ON, the indoor fan motor is not turned OFF even if the heat exchanger thermistor detects lower than 25°C.

Note (1) When the defrost control signal is received, it complies with the fan control during defrost operation.

3) Once the hot start is completed, it will not restart even if the temperature on the heat exchanger thermistor drops.

(ii) During the hot start, the louver is kept at the horizontal position.

(iii) When the fan motor is turned OFF for 7 minutes continuously after defrost operation, the fan motor is turned ON regardless of the temperatures detected with the indoor heat exchanger thermistors (Thi-R1, R2).

(c) Ending condition

(i) If one of following conditions is satisfied during the hot start control, this control is terminated, and the fan is operated with the set air flow volume.

1) Heat exchanger thermistor (Thi-R1 or R2, whichever higher) detects 35°C or higher.

2) It has elapsed 7 minutes after starting the hot start control.

(6) Hot keep

Hot keep control is performed at the start of the defrost operation.

(a) Control

(i) When the indoor heat exchanger temperature (detected with Thi-R1 or R2) drops to less than 35°C, the speed of indoor fan follows fan setting at the time of thermostat OFF.

(ii) During the hot keep, the louver is kept at the horizontal position.

(7) Auto swing control

Note Even if [Auto Swing] is selected, the louver position with anti draft function is fixed to position 1.

(a) RC-EX3A

(i) Louver control

1) To operate the swing louver when the air-conditioner is operating, press the "Direction" button on the TOP screen of remote control. The wind direction select screen will be displayed.
2) To swing the louver, touch the "Auto swing" button. The lover will move up and down. To fix the swing louver at a position, touch one of [1] - [4] buttons. The swing lover will stop at the selected position.
3) Louver operation at the power on with a unit having the louver 4-position control function
   The louver swings one time automatically (without operating the remote control) at the power on.
   This allows the microcomputer recognizing and inputting the louver motor (LM) position.

(ii) Automatic louver level setting during heating

At the hot start and the heating thermostat OFF, regardless whether the auto swing switch is operated or not (auto swing or louver stop), the louver takes the level position (in order to prevent blowing of cool wind). The louver position display LCD continues to show the display which has been shown before entering this control.

(iii) Louver free stop control

If you touch the "Menu" → "Next" → "R/C settings" buttons one after another on the TOP screen of remote control, the "Flap control" screen is displayed. If the free stop is selected on this screen, the louver motor stops upon receipt of the stop signal from the remote control. If the auto swing signal is received from the remote control, the auto swing will start from the position before the stop.

(b) RC-E5

(i) Louver control

1) Press the "LOUVER" button to operate the swing louver when the air-conditioner is operating.
   "SWING" is displayed for 3 seconds and then the swing louver moves up and down continuously.
2) To fix the swing louver at a position, press one time the "LOUVER" button while the swing louver is moving so that four stop positions are displayed one after another per second.
   When a desired stop position is displayed, press the "LOUVER" button again. The display stops, changes to show the "STOP 1" for 5 seconds and then the swing louver stops.
3) Louver operation at the power on with a unit having the louver 4-position control function
   The louver swings one time automatically (without operating the remote control) at the power on.
   This allows inputting the louver motor (LM) position, which is necessary for the microcomputer to recognize the louver position.

Note (1) If you press the "LOUVER" button, the swing motion is displayed on the louver position LCD for 10 seconds. The display changes to the "SWING" display 3 seconds later.

(ii) Automatic louver level setting during heating

At the hot start with the heating thermostat OFF, regardless whether the auto swing switch is operated or not (auto swing or louver stop), the louver takes the level position (In order to prevent the cold start). The louver position display LCD continues to show the display which has been shown before entering this control.

(iii) Louver-free stop control

When the louver-free stop has been selected with the indoor function of wired remote control "POSITION", the louver motor stops when it receives the stop signal from the remote control. If the auto swing signal is received from the remote control, the auto swing will start from the position where it was before the stop.

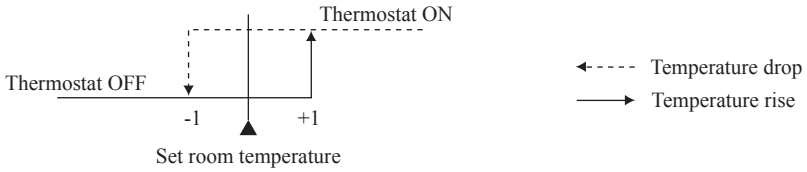
Note (1) When the indoor function of wired remote control "POSITION" has been switched, switch also the remote control function "POSITION" in the same way.

(8) Thermostat operation

(a) Cooling

(i) Thermostat is operated with the room temperature control.

(ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.

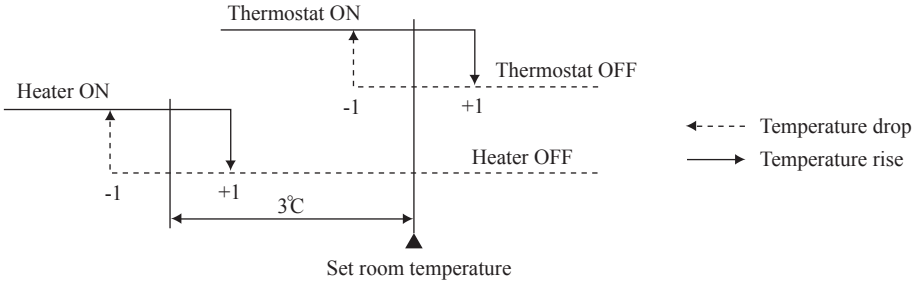


(iii) Thermostat is turned ON when the room temperature is in the range of -1 < Set temperature < +1 at the start of cooling operation (including from heating to cooling).

(b) Heating

(i) Thermostat is operated with the room temperature control.

(ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.



(iii) Thermostat is turned ON when the room temperature is in the range of -1 < Set point < +1 at the start of heating operation (including from cooling to heating).

(c) Fan control during heating thermostat OFF

(i) Following fan controls during the heating thermostat OFF can be selected with the indoor function setting of the wired remote control.

① Low fan speed (Factory default), ② Set fan speed, ③ Intermittence, ④ Fan OFF

(ii) When the "Low fan speed (Factory default)" is selected, the following taps are used for the indoor fans.

・For DC motor : ULo tap

(iii) When the "Set fan speed" is selected, it is operated with the set fan speed also in the thermostat OFF condition.

(iv) If the "Intermittence" is selected, following controls are performed:

1) If the thermostat is turned OFF during the heating operation, the indoor unit moves to the hot control and turns OFF the indoor fan if the heat exchanger thermistors (both Thi-R1 and R2) detect 25°C or lower.
2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo for 2 minutes. In the meantime the louver is controlled at level.
3) After operating at ULo for 2 minutes, the indoor fan moves to the state of 1) above.
4) If the thermostat is turned ON, it moves to the hot start control.
5) When the heating thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from ULo to stop.
   The remote control uses the operation data display function to display temperatures and updates values of temperature even when the indoor fan is turned OFF.
6) When the defrosting starts while the heating thermostat is turned OFF or the thermostat is turned OFF during defrosting, the indoor fan is turned OFF. (Hot keep or hot start control takes priority.) However, the suction temperature is updated at every 7-minute.
7) When the heating thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.

(v) When the "Fan OFF" is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF. The same occurs also when the remote control sensor is effective.

(d) Fan control during cooling thermostat OFF

(i) Following fan controls during the cooling thermostat OFF can be selected with the indoor function setting of the wired remote control.
① Low fan speed, ② Set fan speed (Factory default), ③ Intermittence, ④ Fan OFF

(ii) When the "Low fan speed" is selected, the following taps are used for the indoor fans.
・For DC motor : ULo tap

(iii) When the "Set fan speed" is selected, it is operated with the set fan speed also in the thermostat OFF condition.

(iv) If the "Intermittence" is selected, following controls are performed:

1) If the thermostat is turned OFF during the cooling operation, the indoor unit fan motor stope.

2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo for 2 minutes. In the meantime the louver is controlled at level.

3) After operating at ULo for 2 minutes, the indoor fan moves to the state of 1) above.

4) If the thermostat is turned ON, the fan starts operation at set fan speed.

5) When the cooling thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from ULo to stop.
By using operation data display function at wireless remote control, the tempenature as displayad and the value is updated including the fan stops.

6) When the cooling thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.

(v) When the "Fan OFF" is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF. The same occurs also when the remote control sensor is effective.

(9) Filter sign

As the operation time (Total ON time of ON/OFF switch) accumulates to 180 hours (1), "FILTER CLEANING" is displayed on the remote control. (This is displayed when the unit is in trouble and under the centralized control, regardless of ON/OFF)

Notes (1) Time setting for the filter sign can be made as shown below using the indoor function of wired remote control "Filter sign". (It is set at setting 1 at the shipping from factory.)

Filter sign setting	Function
Setting **1**	Setting time: 180 hrs (Factory default)
Setting **2**	Setting time: 600 hrs
Setting **3**	Setting time: 1,000 hrs
Setting **4**	Setting time: 1,000 hrs (Unit stop) (2)

(2) After the setting time has elapsed, the "FILTER CLEANING" is displayed and, after operating for 24 hours further (counted also during the stop), the unit stops.

(10) Compressor inching prevention control

(a) 3-minute timer

When the compressor has been stopped by the thermostat, remote control operation switch or anomalous condition, its restart will be inhibited for 3 minutes. However, the 3-minute timer is invalidated at the power on the electric power source for the unit.

(b) 3-minute forced operation timer

(i) Compressor will not stop for 3 minutes after the compressor ON. However, it stops immediately when the unit is stopped by means of the ON/OFF switch or by when the thermister turned OFF the change of operation mode.

(ii) If the thermostat is turned OFF during the forced operation control of heating compressor, the louver position (with the auto swing) is returned to the level position.

Note (1) The compressor stops when it has entered the protective control.

(11) Drain pump control

(a) This control is operated when the inverter frequency is other than 0 Hz during the cooling operation and automatic cooling and dehumidifying operations.

(b) Drain pump ON condition continues for 5 minutes even when it enters the OFF range according to (i) above after turning the drain pump ON, and then stops. The 5-minute delay continues also in the event of anomalous stop.

(c) The drain pump is operated with the 5-minute delay operation when the compressor is changed from ON to OFF.

(d) Even in conditions other than the above (such as heating, fan, stop, cooling thermostat OFF), the drain pump control is performed by the drain detection.

(e) Following settings can be made using the indoor function setting of the wired remote control.

(i) ❄◇〔Standard (in cooling & dry)〕: Drain pump is run during cooling and dry.

(ii) ❄◇AND☼〔Operate in standard & heating〕: Drain pump is run during cooling, dry and heating.

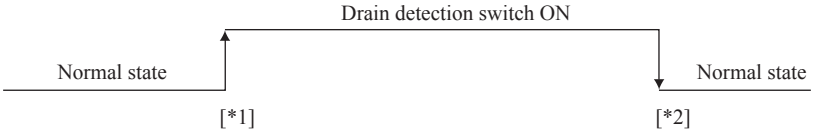
(iii) ❄◇AND☼AND≡〔Operate in heating & fan〕: Drain pump is run during cooling, dry, heating and fan.

(iv) ❄◇AND≡〔Operate in standard & fan〕: Drain pump is run during cooling, dry and fan.

Note (1) Values in〔 〕are for the RC-EX3A model.

(12) Drain motor (DM) control

(a) Drain detection switch is turned ON or OFF with the float switch (FS) and the timer.



[＊1] Drain detection switch is turned "ON" when the float switch "Open" is detected for 3 seconds continuously in the drain detectable space.

[＊2] Drain detection switch is turned "OFF" when the float switch "Close" is detected for 10 seconds continuously.

(i) It detects always from 30 seconds after turning the power ON.

1) There is no detection of anomalous draining for 10 seconds after turning the drain pump OFF.

2) Turning the drain detection switch "ON" causes to turn ON the drain pump forcibly.

3) Turning the drain detection switch "OFF" releases the forced drain pump ON condition.

(b) Indoor unit performs the control A or B depending on each operating condition.

	Indoor unit operation mode				
	Stop (1)	Cooling	Dry	Fan (2)	Heating
Compressor ON		Control A			
Compressor OFF	Control B				

Notes (1) Including the stop from the cooling, dehumidifying, fan and heating, and the anomalous stop
(2) Including the "Fan" operation according to the mismatch of operation modes

(i) Control A

1) If the float switch detects any anomalous draining condition, the unit stops with the anomalous stop (displays E9) and the drain pump starts. After detecting the anomalous condition, the drain motor continues to be ON.

2) It keeps operating while the float switch is detecting the anomalous condition.

(ii) Control B

If the float switch detects any anomalous drain condition, the drain motor is turned ON for 5 minutes, and at 10 seconds after the drain motor OFF it checks the float switch. If it is normal, the unit is stopped under the normal mode or, if there is any anomalous condition, E9 is displayed and the drain motor is turned ON. (The ON condition is maintained during the drain detection.)

(13) Operation check/drain pump test run operation mode

(a) If the power is turned on by the dip switch (SW7-1) on the indoor unit control PCB when electric power source is supplied, it enters the mode of operation check/drain pump test run. It is ineffective (prohibited) to change the switch after turning power on.

(b) When the communication with the remote control has been established within 60 seconds after turning power on by the dip switch (SW7-1) ON, it enters the operation check mode. Unless the remote control communication is established, it enters the drain pump test run mode.

Note (1) To select the drain pump test run mode, disconnect the remote control connector (CNB) on the indoor PCB to shut down the remote control communication.

(c) Operation check mode

There is no communication with the outdoor unit but it allows performing operation in respective modes by operating the remote control.

(d) Drain pump test run mode

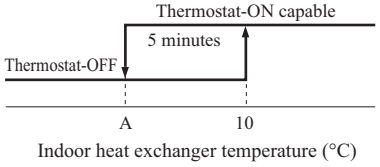
As the drain pump test run is established, the drain pump only operates and during the operation protective functions by the microcomputer of indoor unit become ineffective.

(14) Cooling, dehumidifying frost protection

(a) To prevent frosting during cooling mode or dehumidifying mode operation, the thermostat-OFF if the indoor heat exchanger temperature (detected with Thi-R) drops to 1.0 °C or lower at 4 minutes after the thermostat-ON. If the indoor unit heat exchanger temperature is 1.0 °C or lower after 5 minutes, the indoor unit is controlled thermostat-OFF. If it becomes 10°C or higher, the control terminates. When the indoor heat exchanger temperature has become as show, the indoor unit send outdoor unit the "Anti-frost" signal.

• Frost prevention temperature setting can be selected with the indoor unit function setting of the wired remote control.

Item \ Symbol	A
Temperature - Low (Factory default)	1.0
Temperature - High	2.5



(b) Selection of indoor fan speed

If it enters the frost prevention control during cooling operation (excluding dehumidifying), the indoor fan speed is switched.

(i) When the indoor return air detection temperature (detected with Thi-A) is 18°C or higher and the indoor heat exchanger temperature (detected with Thi-R) detects the compressor frequency drop start temperature A°C+1°C, of indoor fan speed is increased by 20min^{-1}.

(ii) If the phenomenon of (i) above is detected again after the acceleration of indoor fan, indoor fan speed is increased further by 20min^{-1}.

Note (1) Indoor fan speed can be increased by up to 2 taps.

• Compressor frequency drop start temperature

Hs > 50%

Symbol \ Item	Low	High
A	1.0	2.5
B	2.5	4.0

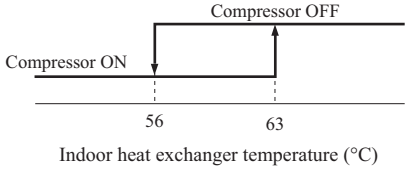
Hs ≦ 50%

Symbol \ Item	Low	High
A	-0.5	1.0
B	1.0	2.5

Note (1) Frost prevention temperature setting can be selected with the indoor unit function setting of the wired remote control.

(15) Heating overload protection

(a) If the indoor heat exchanger temperature (detected with Thi-R) at 63°C or higher is detected for 2 seconds continuously, the compressor stops. When the compressor is restarted after a 3-minute delay, if a temperature at 63°C or higher is detected for 2 seconds continuously within 60 minutes after initial detection and if this is detected 5 times consecutively, the compressor stops with the anomalous stop (E8). Anomalous stop occurs also when the indoor heat exchanger temperature at 63°C or higher is detected for 6 minutes continuously.



(b) Indoor unit fan speed selection

If, after second detection of heating overload protection up to fourth, the indoor fan is set at below Hi tap when the compressor is turned ON, the indoor fan speed is increased by 1 tap.

(16) Anomalous fan motor

(a) After starting the fan motor, if the fan motor speed is 200 min^{-1} or less is detected for 30 seconds continuously and 4 times within 60 minutes, then fan motor stops with the anomalous stop (E16).

(b) If the fan motor fails to reach at -50 min^{-1} less than the required speed, it stops with the anomalous stop (E20).

(17) Plural unit control – Control of 16 units group by one remote control

(a) Function

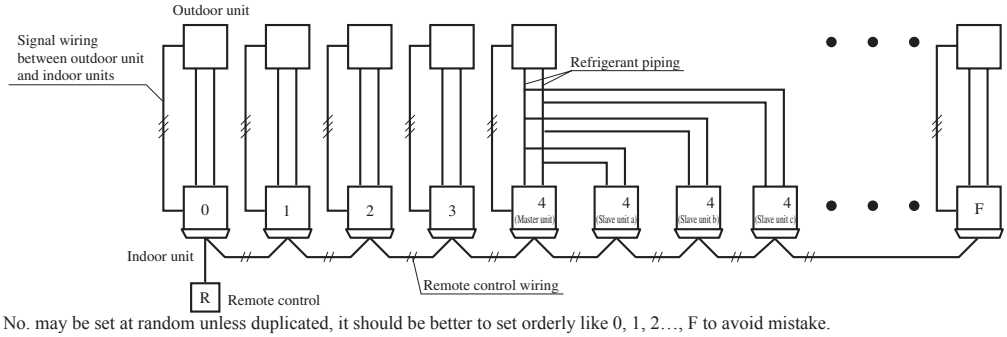
One remote control can control a group of multiple number of unit (Max. 16 indoor units). "Operation mode" which is set by the remote control can operate or stop all units in the group one after another in the order of unit. No.(1). Thermostat and protective function of each unit function independently.

Note (1) Unit No. is set by SW2 on the indoor control PCB. Unit No. setting by SW2 is necessary for the indoor unit only. In cases of the twin, triple and double twin specification, it is necessary set for the master and the slave units. This can be selected by SW5. (All are set for the master unit at the shipping from factory.)

SW2: For setting of 0 – 9, A – F
SW5: For setting of master and slave units
(See table shown at right.)

SW5 setting

Switch / Unit	SW5-1	SW5-2
Master unit	OFF	OFF
Slave unit a	OFF	ON
Slave unit b	ON	OFF
Slave unit c	ON	ON



(2) Unit No. may be set at random unless duplicated, it should be better to set orderly like 0, 1, 2…, F to avoid mistake.

(b) Display to the remote control

(i) Central or each remote control basis, heating preparation: the smallest unit No. among the operating units in the remote mode (or the center mode unless the remote mode is available) is displayed.

(ii) Inspection display, filter sign: Any of unit that starts initially is displayed.

(c) Confirmation of connected units

(i) In case of RC-EX3A remote control
If you touch the buttons in the order of "Menu" → "Service setting" → "Service & Maintenance" → "Service password" → "IU address" on the TOP screen of remote control, the indoor units which are connected are displayed.

(ii) In case of RC-E5 remote control
Pressing "AIR CON No." button on the remote control displays the indoor unit address. If "▲" "▼" button is pressed at the next, it is displayed orderly starting from the unit of smallest No.

(d) In case of anomaly

If any anomaly occurs on a unit in a group (a protective function operates), that unit stops with the anomalous stop but any other normal units continue to run as they are.

(e) Signal wiring procedure

Signal wiring between indoor and outdoor units should be made on each unit same as the normal wiring. For the group control, connect the remote control wiring to each indoor unit via terminal block for the remote control.

Connect the remote control wiring separately from the power source cable or wires of other electric devices (AC220V or higher).

(18) High ceiling control

When sufficient air flow rate cannot be obtained from the indoor unit which is installed at a room with high ceiling, the air flow rate can be increased by changing the fan tap. To change the fan tap, use the indoor unit function "FAN SPEED SET" on the wired remote control.

Fan tap		Indoor unit air flow setting			
		- - -	- -	-	-
FAN SPEED SET	STANDARD	P-Hi2 - Hi - Me - ULo	Hi - Me - ULo	Hi - ULo	Hi - Me
	HIGH SPEED1	P-Hi2 - P-Hi1 - Hi - Me	P-Hi1 - Hi - Me	P-Hi1 - Me	P-Hi1 - Hi
	HIGH SPEED2	P-Hi2 - Hi - Me - ULo	Hi - Me - ULo	Hi - ULo	Hi - Me

Notes (1) Factory default is STANDARD.
(2) At the hot-start and heating thermostat OFF, or other, the indoor unit fan is operated at the low speed tap of each setting.
(3) This function is not able to be set with wireless remote controls or simple remote control (RCH-E3)

(19) Abnormal temperature sensor (return air/indoor heat exchanger) broken wire/short-circuit detection

(a) Broken wire detection

When the return air temperature sensor detects -55°C or lower or the heat exchanger temperature sensor detect -55°C or lower for 5 seconds continuously, the compressor stops. After a 3-minute delay, the compressor restarts but, if it is detected again within 60 minutes after the initial detection for 6 minutes continuously, stops again (the return air temperature sensor: E7, the heat exchanger temperature sensor: E6).

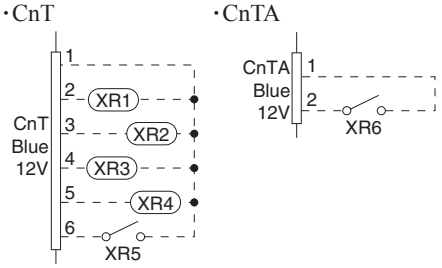
(b) Short-circuit detection

If the heat exchanger temperature sensor detects short-circuit for 5 seconds continuously at 2 minutes and 20 seconds after the compressor ON during cooling operation, the compressor stops (E6).

(20) External input/output control (CnT or CnTA)

External input/output connectors are provided on the indoor unit control PCB, and each input/output is possible to be changed by RC-EX3A.

Be sure to connect the wired remote control to the indoor unit. Remote operation with CnT/CnTA only is not possible.



Input/Output	Connector		Factory default setting	RC-EX3A function name
Output	CnT-2	(XR1)	Operation output	External output 1
	CnT-3	(XR2)	Heating output	External output 2
	CnT-4	(XR3)	Compressor ON output	External output 3
	CnT-5	(XR4)	Inspection(Error) output	External output 4
"Input	CnT-6	(XR5)	Remote operation input	External input 1
(Volt-free contact)"	CnTA	(XR6)	Remote operation input	External input 2

■ Priority order for combinations of CnT and CnTA input.

		CnTA					
		① Operation stop level	② Operation stop pulse	③ Operation permission/prohibition	④ Operation permission/prohibition pulse	⑤ Cooling/heating selection level	⑥ Cooling/heating selection pulse
CnT	① Operation stop level	CnT ①	CnT ①	CnT ① +CnTA ②	CnT ①	CnT ① /CnTA ⑤	CnT ① /CnTA ⑥
	② Operation stop pulse	CnT ②	CnT ②	CnT ② +CnTA ③	CnT ②	CnT ② /CnTA ⑤	CnT ② /CnTA ⑥
	③ Operation permission/prohibition level	CnT ③ >CnTA ①	CnT ③ >CnTA ②	CnT ③ +CnTA ③	CnT ③	CnT ③ /CnTA ⑤	CnT ③ /CnTA ⑥
	④ Operation permission/prohibition pulse	CnT ④	CnT ④	CnT ④ +CnTA ③※	CnT ④	CnT ④ /CnTA ⑤	CnT ④ /CnTA ⑥
	⑤ Cooling/heating selection level	CnT ⑤ /CnTA ①	CnT ⑤ /CnTA ②	CnT ⑤ /CnTA ③	CnT ⑤ /CnTA ④	CnT ⑤	CnT ⑤
	⑥ Cooling/heating selection pulse	CnT ⑥ /CnTA ①	CnT ⑥ /CnTA ②	CnT ⑥ /CnTA ③	CnT ⑥ /CnTA ④	CnT ⑥	CnT ⑥

Note (1) Following operation commands are accepted when the operation prohibition is set with CnTA as indicated with *.
Individual operation command from remote control, test run command from outdoor unit and operation command from option device, CnT input.

Reference: Explanation on the codes and the combinations of codes in the table above

1. In case of CnT "Number", the CnT "Number" is adopted and CnTA is invalidated.
2. In case of CnTA "Number", the CnTA "Number" is adopted and CnT is invalidated.
3. In case of CnT "Number"/CnTA "Number", the CnT "Number" and the CnTA "Number" become independent functions each other.
4. In case of CnT "Number" + CnTA "Number", the CnT "Number" and the CnTA "Number" become competing functions each other.
5. In case of CnT "Number" > CnTA "Number", the function of CnT "Number" supersedes that of CnTA "Number".
6. In case of CnT "Number" < CnTA "Number", the function of CnTA "Number" supersedes that of CnT "Number".

(The "Number" above means ① - ⑥ in the table.)

(a) Output for external control (remote display)

Indoor unit outputs the following signal for operation status monitoring.

	Output name	Condition
1	Operation output	During operation
2	Heating output	During heating operation
3	Compressor ON output	During compressor operation
4	Inspection(Error) output	When anomalous condition occurs.
5	Cooling output	During cooling operation
6	Fan operation output 1	When indoor unit's fan is operating
7	Fan operation output 2	When indoor unit's fan is operating, and fan speed is higher than Hi speed.
8	Fan operation output 3	When indoor unit's fan is operating, and fan speed is Lower than Me speed.
9	Defrost/oil return output	When indoor unit receive defrost/oil return signal from the outdoor unit.
10	Ventilation output	When "Venti.ON" is selected from remote control
11	Free cooling output	When the ambient temperature is between 10 - 18°C in cooling and fan operation
12	Indoor unit overload alrm output	Refer to "IU overload alarm"
13	Heater output	Refer to "(8) Thermostat operation (b) Heating"

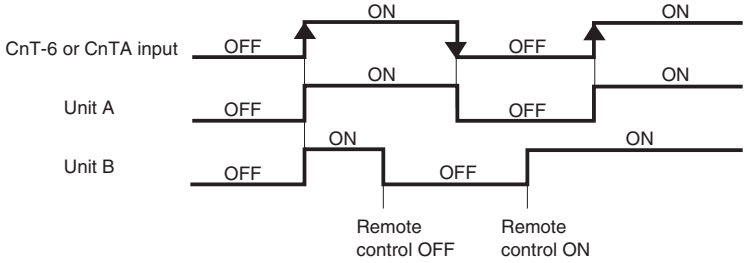
(b) Input for external control

The external input for the indoor unit can be selected from the following input.

	Input name	Content
1	Run/Stop	Refer to [(20) (c) Remote operation input]
2	Premission/Prohibition	Refer to [(21) Operation permission/prohibition]
3	Cooling/Heating	Refer to [(23) Selection of cooling/heating external input function]
4	Emergency stop	Indoor/outdoor units stop the operation, and [E63] is displayed.
5	Setting temperature shift	Set temperature is shifted by +2/-2°C in cooling/heating.
6	Forced thermo-OFF	Unit goes thermo off.
7	Temporary stop	Refer to [(22) Temporary stop input]
8	Silent mode	Outdoor unit silent mode is activated.

(i) In case of "Level input" setting (Factory default)

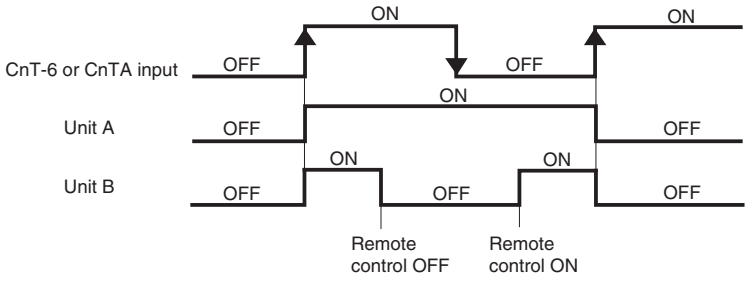
Input signal to CnT-6 or CnTA is OFF→ON …… unit ON
Input signal to CnT-6 or CnTA is ON→OFF …… unit OFF
Operation is not inverted.



Note (1) The latest operation has priority
It is available to operate/stop by remote control or central control

(ii) In case of "Pulse input" setting (Local setting)

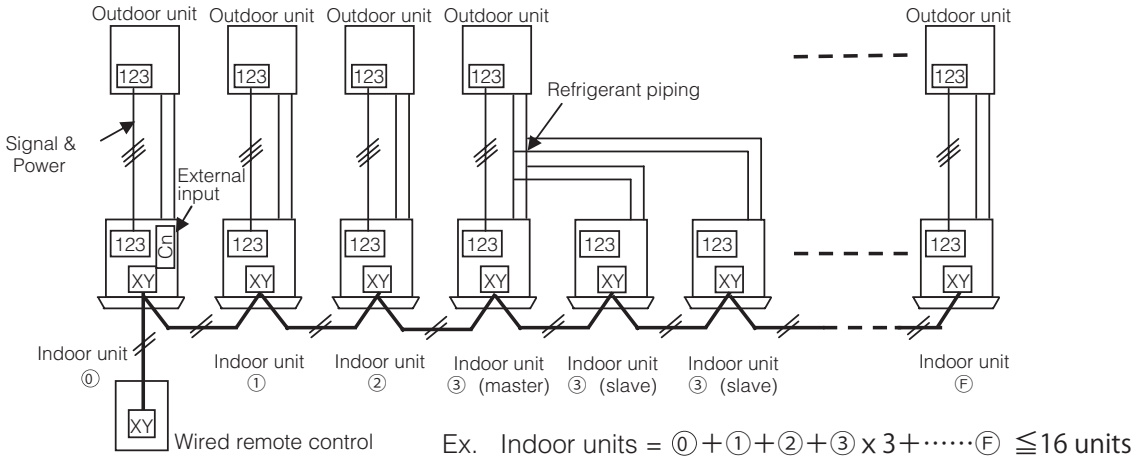
It is effective only when the input signal to CnT-6 or CnTA is changed OFF→ON, and at that time unit operation [ON/OFF] is inverted.



(c) Remote operation

(i) In case of multiple units (Max. 16 indoor units group) are connected to one wired remote control

When the R/C function setting of wired remote control for "External control set" is changed from "Individual (Factory default)" to " For all units", all units connected in one wired remote control system can be controlled by external operation input.



Ex. Indoor units = ⓪+①+②+③ x 3+……Ⓕ ≦16 units

	Individual operation (Factory default)		All units operation (Local setting)	
CnT-6 or CnTA	ON	OFF	ON	OFF
	Only the unit directly connected to the remote control can be operated.	Only the unit directly connected to the remote control can be stopped opeartion.	All units in one remote control system can be operated.	All units in one remote control system can be stopped operation.
	Unit ① only	Unit ① only	Units ① – Ⓕ	Units ① – Ⓕ

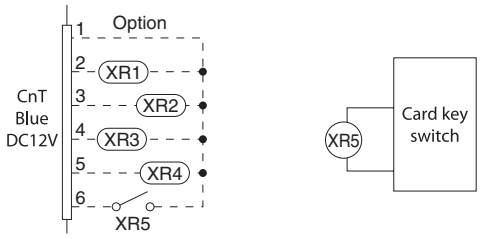
When more than one indoor unit (Max. 16 indoor units) are connected in one wired remote control system:
(1) With the factory default, external input to CnT-6 or CnTA is effective for only the unit ①.
(2) When setting "For all unit" (Local setting), all units in one remote control system can be controlled by external input to CnT-6 or CnTA on the indoor unit ①.
(3) External input to CnT-6 or CnTA on the other indoor unit than the unit ① is not effective.

(21) Operation permission/prohibition

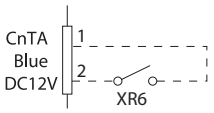
(In case of adopting card key switches or commercially available timers)

When the indoor function setting of wired remote control for "Operation permission/prohibition" is changed from "Invalid (Factory default)" to " Valid", following control becomes effective.

・CnT



・CnTA



Note (1) CnTA function can be changed by RC-EX3A.

	Normal operation (Factory default)		Operation permission/prohibition mode "Valid" (Local setting)	
CnT-6 or CnTA	ON	OFF	ON	OFF
	Operation	Stop	Operation permission*1	Operation prohibition (Unit stops)

*1 **Only the "LEVEL INPUT" is acceptable for external input**, however when the indoor function setting of "Level input (Factory default)" or "Pulse input" is selected by the function for "External input" of the wired remote control, operation status will be changed as follows.

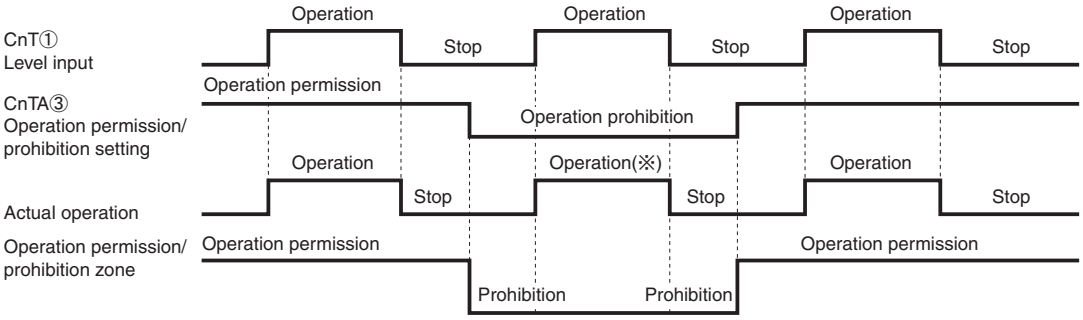
In case of "Level input" setting	In case of "Pulse input" setting
Unit operation from the wired remote control becomes available*(1)	Unit starts operation *(2)

*(1) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Level input (Factory default)";
① When card key switch is ON (CnT-6 or CnTA ON: Operation permission), start/stop operation of the unit from the wired remote control becomes available.
② When card key switch is OFF (CnT-6 or CnTA OFF: Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes unavailable.

*(2) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Pulse input (Local setting)";
① When card key switch is ON (Operation permission), the unit starts operation in conjunction with ON signal, and also start/stop operation of the unit from the wired remote control becomes available.
② When card key switch is OFF (Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes unavailable.

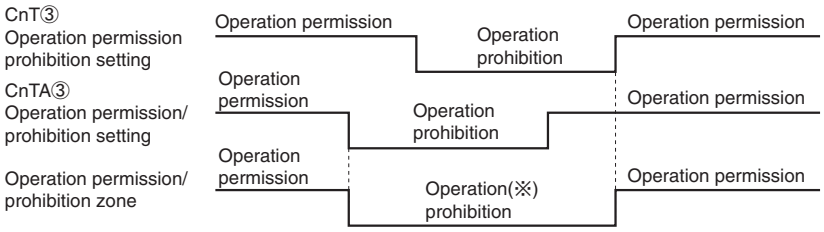
(3) This function is invalid only at "Center mode" setting done by central control.

(a) In case of CnT ① Operation stop level > CnTA ③ Operation permission/prohibition level



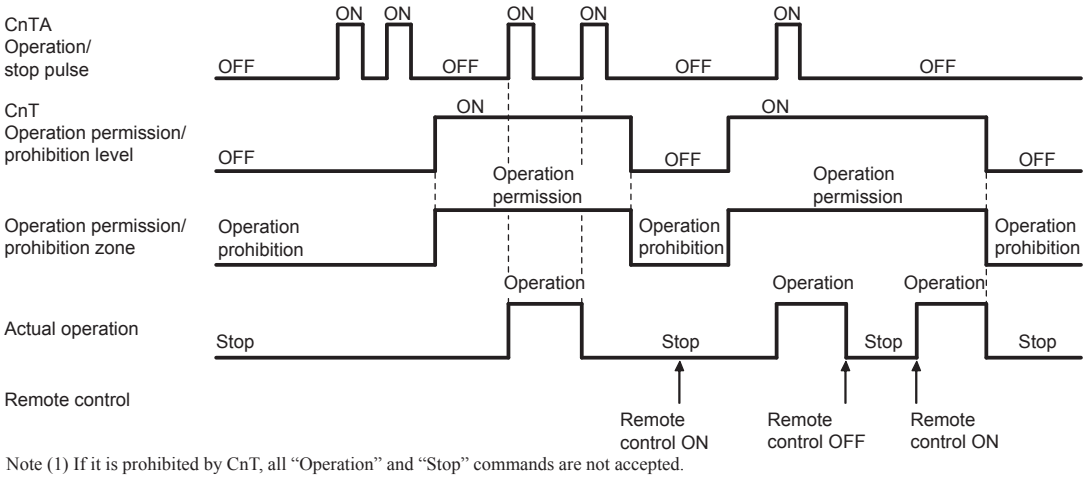
(※) CnT level input supersedes CnTA operation prohibition.

(b) In case of CnT ③ operation permission/prohibition level + CnTA ③ operation permission/prohibition level



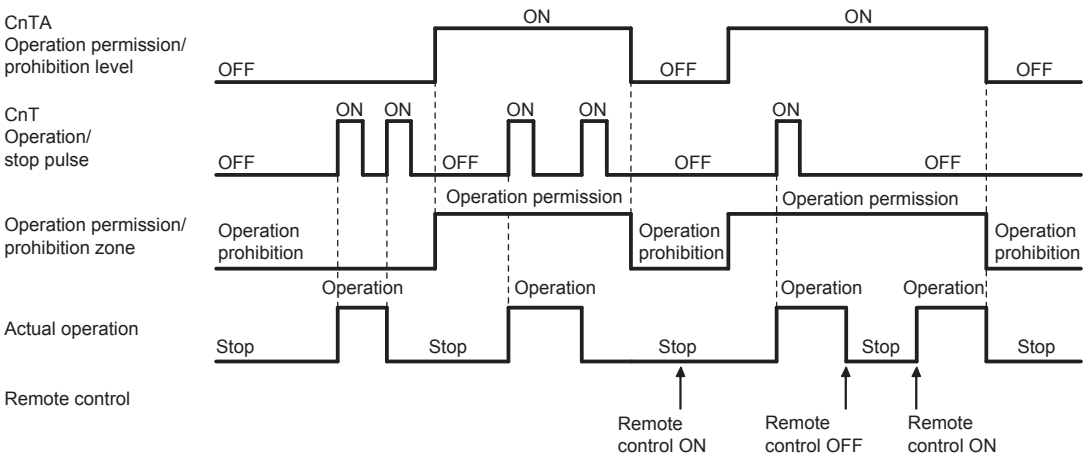
(※) Operation prohibition zone is determined by the OR judgment between CnT operation prohibition zone and CnTA operation prohibition zone.

(c) In case of CnT ③ operation permission/prohibition level > CnTA ② operation/stop pulse



Note (1) If it is prohibited by CnT, all "Operation" and "Stop" commands are not accepted.

(d) In case of CnT ② operation/stop pulse + CnTA ③ operation permission/prohibition level

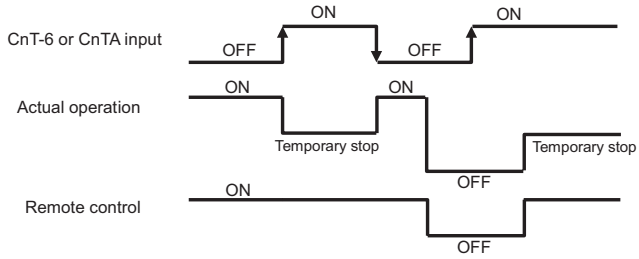


(22) Temporary stop input

In case of temporary stop, operation lamp of remote control lights, but indoor/outdoor unit stop the operation.

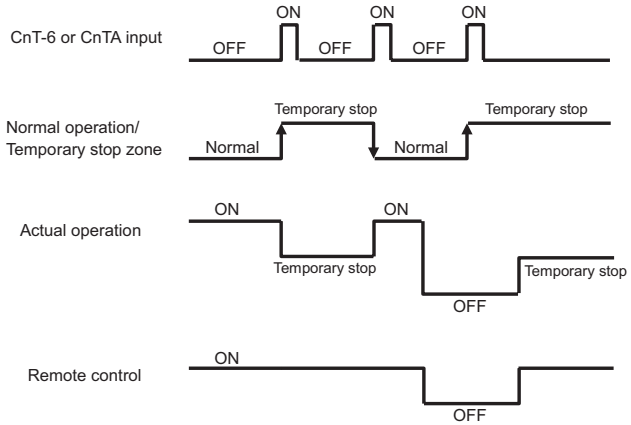
(a) In case of "level input" setting (Factory default)

Input signal to CnT-6 or CnTA is OFF → ON : Temporary stop
Input signal to CnT-6 or CnTA is OFF → ON : Normal operation



(b) In case of "pulse input" setting (Local setting)

It is effective only when the input signal is changed OFF→ON, and "temporary stop/normal operation" is inverted.



(23) Selection of cooling/heating external input function

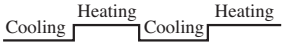
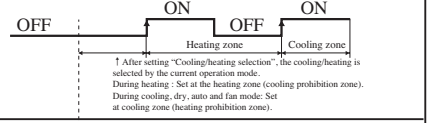
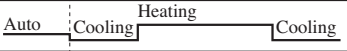
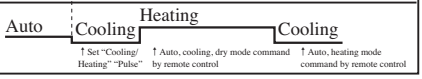
(a) When "External input 1 setting: Cooling/heating" is set by the indoor unit function from remote control, the cooling or heating is selected with CnT-6 or CnTA.

(b) When the external input 1 method selection: Level input is set by the indoor unit function:
- CnT-6 or CnTA: OPEN → Cooling operation mode
- CnT-6 or CnTA: CLOSE → Heating operation mode

(c) When the external input 1 method selection: Pulse input is set by the indoor unit function:
If the external input is changed OPEN → CLOSE, operation modes are inverted (Cooling → Heating or Heating → Cooling).

(d) If the cooling/heating selection signal is given by the external input, the operation mode is transmitted to the remote control.

■ Selection of cooling/heating external input function

External input selection	External input method	Operation	
External input selection Cooling/heating selection	⑤ Level	External terminal input (CnT or CnTA)	
		Cooling/heating	
		Cooling/heating (Competitive)	
	⑥ Pulse	External terminal input (CnT or CnTA)	
		Cooling/heating	
		Cooling/heating (Competitive)	

Note (1) Regarding the priority order for combinations of CnT and CnTA, refer to page 109.

(24) Fan control at heating startup

(a) Starting conditions

At the start of heating operation, if the difference of setting temperature and return air temperature is 5°C or higher after the end of hot start control, this control is performed.

(b) Contents of control

(i) Sampling is made at each minute and, when the indoor heat exchanger temperature (detected with Thi-R) is 37°C or higher, present number of revolutions of indoor fan speed is increased by $10min^{-1}$.

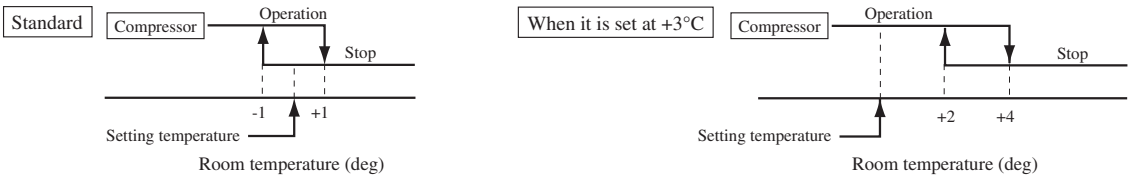
(ii) If the indoor heat exchanger temperature drops below 37°C at next sampling, present number of revolutions of indoor fan speed is reduced by $10min^{-1}$.

(c) Ending conditions

Indoor fan speed is reduced to the setting air flow volume when the compressor OFF is established and at 30 minutes after the start of heating operation.

(25) Room temperature detection temperature compensation during heating

With the standard specification, the compressor is turned ON/OFF with the thermostat setting temperature. When the thermostat is likely to turn OFF earlier because the unit is installed at the ceiling where warm air tends to accumulate, the setting can be changed with the wired remote control indoor unit function "SP OFFSET". The compressor and the heater are turned ON/OFF at one of the setting temperature +3, +2 or +1°C in order to improve the feeling of heating. The setting temperature, however, has the upper limit of 30°C.



(26) Return air temperature compensation

This is the function to compensate the deviation between the detection temperature by the return air temperature thermistor and the measured temperature after installing the unit.

(a) It is adjustable in the unit of 0.5°C with the wired remote control indoor unit function "RETURN AIR TEMP".

• +1.0°C, +1.5°C, +2.0°C • -1.0°C, -1.5°C, -2.0°C

(b) Compensated temperature is transmitted to the remote control and the compressor to control them.

Note (1) The detection temperature compensation is effective on the indoor unit thermistor only.

(27) High power operation (RC-EX3A only)

It operates at with the set temperature fixed at 16°C for cooling, 30°C for heating and maximum indoor fan speed for 15 minutes maximum.

(28) Energy-saving operation (RC-EX3A only)

It operates with the setting temperature fixed at 28°C for cooling, 22°C for heating or 25°C for auto. When fan control in cooling/heating thermo-OFF setting is "Set fan speed", fan speed during thermo-OFF is changed to "Low". (Maximum capacity is restricted at 80%.)

(29) Warm-up control (RC-EX3A only)

Operation will be started 5 to 60 minutes before use according to the forecast made by the microcomputer which calculates when the operation should be started in order to warm up the indoor temperature near the setting temperature at the setting time of operation start.

(30) Home leave mode (RC-EX3A only)

When the unit is not used for a long period of time, the room temperature is maintained at a moderate level, avoiding extremely hot or cool temperature.

(a) Cooling or heating is operated according to the outdoor temperature (factory setting 35°C for cooling, 0°C for heating) and the setting temperature. (factory setting 33°C for cooling, 10°C for heating)

(b) Setting temperature and indoor fan speed can be set by RC-EX3A.

(31) Auto temperature setting (RC-EX3A only)

Setting temperature is adjusted automatically at the adequate temperature the center setting temperature is 24°C by correcting the outdoor air temperature.

(32) Fan circulator operation (RC-EX3A only)

When the fan is used for circulation, the unit is operated as follows depending on the setting with the remote control.

(a) If the invalid is selected with the remote control, the fan is operated continuously during the fan operation. (normal fan mode)

(b) If the valid is selected with the remote control, the fan is operated or stopped when on the difference of the remote control temperature sensor and the return air temperature sensor becomes bigger than 3°C.

(33) The operation judgment is executed every 5 minutes (RC-EX3A only)

Setting temperature Ts is changed according to outdoor temperature.

This control is valid with cooling and heating mode. (Not auto mode)

(a) Operate 5 minutes forcedly.

(b) Setting temperature is adjusted every 10 minutes.

(i) Cooling mode.
Ts = outdoor temperature − offset value

(ii) Heating mode.
Ts = outdoor temperature − offset value

(c) If the return air temperature lower than 18°C in cooling or return air temperature becomes higher than 25°C in heating, unit goes thermostat OFF.

(34) Auto fan speed control (RC-EX3A only)

In order to reach the room temperature to the set temperature as quickly as possible, the air flow rate is increased when the set temperature of thermostat differs largely from the return air temperature. According to temperature difference between set temperature and return air temperature, indoor fan tap are controlled automalically.

・Auto 1: Changes the indoor fan tap within the range of Hi ↔ Me ↔ Lo.

・Auto 2: Changes the indoor fan tap within the range of P-Hi ↔ Hi ↔ Me ↔ Lo.

(35) Indoor unit overload alarm (RC-EX3A only)

If the following condition is satisfied at 30 minutes after starting operation, RC-EX3A shows maintenance code "M07" and the signal is transmitted to the external output (CnT-2-5).

・Cooling, Dry, Auto(Cooling) : Indoor air temperature = Set room temperature by remote control + Alarm temperature difference

・Heating, Auto(Heating) : Indoor air temperature = Set room temperature by remote control - Alarm temperature difference

Alarm temperature difference is selectable between 5 to 10°C.

If the following condition is satisfied or unit is stopped, the signal is disappeared.

・Cooling, Dry, Auto(Cooling) : Indoor air temperature = Set room temperature + Alarm temperature difference -2°C

・Heating, Auto(Heating) : Indoor air temperature = Set room temperature - Alarm temperature difference +2°C

(36) Peak-cut timer (RC-EX3A only)

Power consumption can be reduced by restricting the maximum capacity.

Set the [Start time], the [End time] and the capacity limit % (Peak-cut %).

・4-operation patterns per day can be set at maximum.

・The setting time can be changed by 5-minutes interval.

・The selectable range of capacity limit % (Peak-cut %) is from 0% to 40-80% (20% interval).

・Holiday setting is available.

(37) Motion sensor control (RC-EX3A only)

The sensor determines the presence of people and the amount of activity, and the following controls are done by the motion sensor.

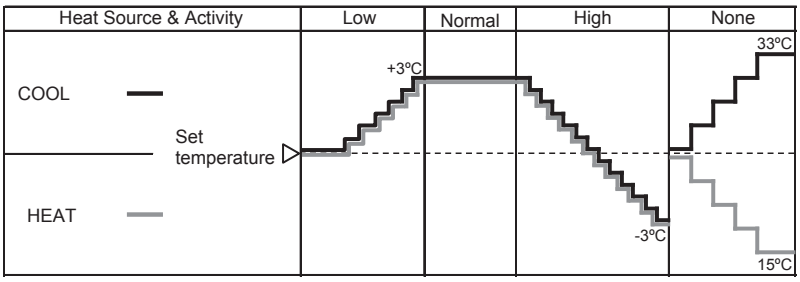
Following settings are necessary to activate motion sensor control.

(a) Infrared (motion) sensor setting: Installation setting of remote control
The indoor unit which is set to "Enable" become valid.

(b) Infrared (motion) sensor control: Energy-saving setting of remote control
The function which is set to "Enable" become valid.

(i) Power saving / comfort control
The set temperature is adjusted according to the presence of people and their amount of activity detected by the infrared (motion) sensor.

MODE:AUTO/COOL/HEAT mode operation



Low	**When the extent of human activity is low**
High	**When the extent of human activity is high**
None	**When there is no one in the room**

- When the "None" continues for 1 hour, the FAN SPEED is set Lo.

Notes (1) When the following operations are set, power saving control will be canceled.
① Energy-saving, Home leave mode, Warm-up control, Cooling operation check.
② When the operation mode is changed DRY or FAN.
(2) Not operable while the air-conditioner is OFF.

(ii) Auto-off control
When no activity is detected for 1 hour, unit will go stand-by mode.※ Unit will re-start operation automatically with the original set temperature by activity detection during the stand-by mode. When stand-by mode continues for 12 hours, unit stops.

※Compressor keeps stopped regardless of the set temperature.

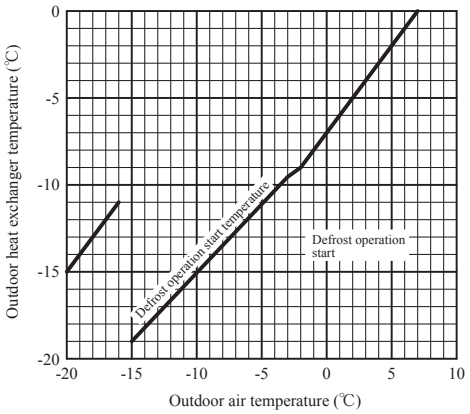
1.10.4 Operation control function by the outdoor control

(Ⅰ) Models SRC40-60

(1) Defrost operation

(a) Starting conditions (Defrost operation can be started only when all of the following conditions are satisfied.)

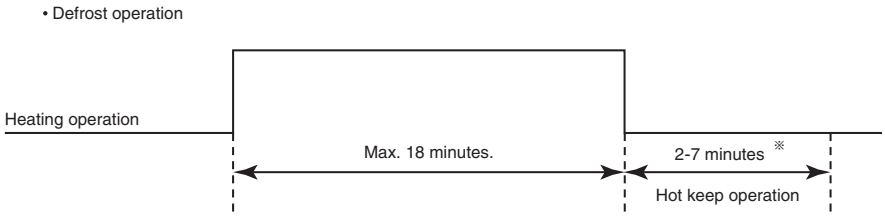
1) After start heating operation
   When it elapsed 35 minutes. (Total compressor operation time)
2) After finish of defrost operation
   When it elapsed 35 minutes. (Total compressor operation time)
3) Outdoor heat exchanger sensor (TH1) temperature
   When the temperature has been −5ºC or less for 3 minutes continuously.
4) The difference between the outdoor air sensor temperature and the outdoor heat exchanger sensor temperature is as following.



5) During continuous compressor operation
   In case satisfied all of following conditions.
   • Connect compressor speed 0 rps 10 times or more.
   • Satisfy 1), 2) and 3) conditions above.
   • Outdoor air temperature is 3°C or less.

(b) Ending conditions (Operation returns to the heating cycle when either one of the following is satisfied.)

1) Outdoor heat exchanger sensor (TH1) temperature: 10ºC or higher
2) Continued operation time of defrost operation → For more than 18 minutes.



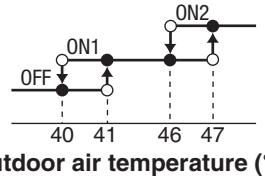
※Depends on an operation condition, the time can be longer than 7 minutes.

(2) Cooling overload protective control

(a) Operating conditions

When the outdoor air temperature (TH2) has become continuously for 30 seconds at 41°C or more, or 47ºC or more with the compressor running, the lower limit speed of compressor is brought up.

Outdoor air temperature	41°C or more	47°C or more
Lower limit speed	30 rps	40 rps



Outdoor air temperature (°C)

(b) Detail of operation

1) The outdoor fan is stepped up by 3 speed step. [Upper limit 8 th speed.]
2) The lower limit of compressor speed is set to 30 or 40 rps.
   However, when the thermo OFF, the speed is reduced to 0 rps.

(c) Reset conditions

When either of the following condition is satisfied.

1) The outdoor air temperature is lower than 40°C.
2) The compressor speed is 0 rps.

(3) Cooling high pressure control

(a) Purpose

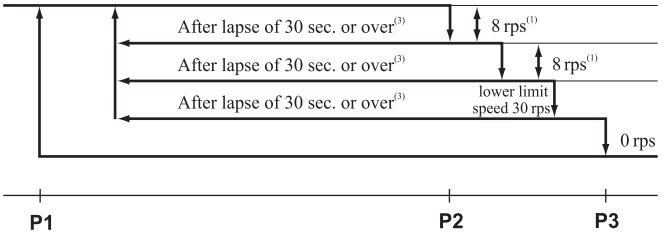
Prevents anomalous high pressure operation during cooling.

(b) Detector

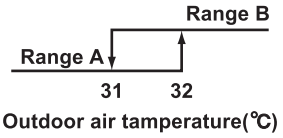
Outdoor heat exchanger sensor (TH1).

(c) Detail of operation

(Example) Compressor speed



	TH1(°C)		
	P1	P2	P3
Range A	51	53	56
Range B	53	58	63



Notes (1) When the outdoor heat exchanger temperature is in the range of P2-P3℃, the speed is reduced by 8 rps at each 20 seconds.
(2) When the temperature is P3℃ or higher, the compressor is stopped.
(3) When the outdoor heat exchanger temperature is in the range of P1-P2℃, if the compressor speed is been maintained and the operation has continued for more than 20 seconds at the same speed, it returns to the normal cooling operation.

(4) Cooling low outdoor air temperature protective control

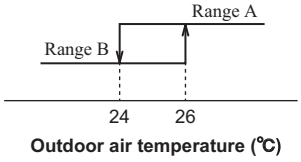
(a) Operating conditions

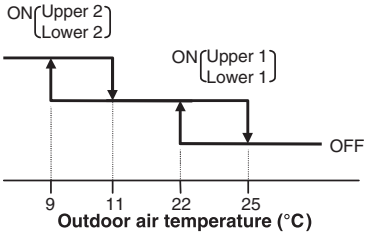
When the outdoor air temperature (TH2) is 22°C or lower continues for 20 seconds while the compressor speed is other than 0 rps.

(b) Detail of operation

1) It controls the upper and lower limit values for the compressor speed according to the following table.
2) It checks the outdoor temperature (TH2) once every hour to judge the operation range.

Compressor speed: Upper/lower limit (rps)				
Lower 1		Upper 1	Lower 2	Upper 2
Range B	Range A			
35	Release	75	45	60





(c) Reset conditions

When either of the following condition is satisfied.

1) The outdoor air temperature (TH2) is D°C or higher.
2) The compressor speed is 0 rps.

(5) Heating high pressure control

(a) Starting condition

When the indoor heart exchanger temperature (Thi-R) has risen to a specified temperature while the compressor is turned on.

(b) Compressor speed is controlled according to the zones of indoor heat exchanger temperature as shown by the following table.

	Thi-R<P1	P1≦Thi-R<P2	P2≦Thi-R<P3	P3≦Thi-R
Protection control speed (NP)	Normal	Retention	NP-4rps	NP-8rps
Sampling time (s)	Normal	10	10	10

Unit:°C

NP \ Thi-R	P1	P2	P3
NP<50	45	52	54.5
50≦NP<115	45	52	57
115≦NP<120	45-43	52-50	57-55
120≦NP	43	50	55

(6) Heating overload protective control

(a) Operating condition

When the outdoor air temperature (TH2) is 13ºC or higher continues for 30 seconds while the compressor speed is other than 0 rps.

(b) Detail of operation

(i) Taking the upper limit of compressor speed range at 90(75) rps, if the output speed obtained with the fuzzy calculation exceeds the upper limit, the upper limit value is maintained.

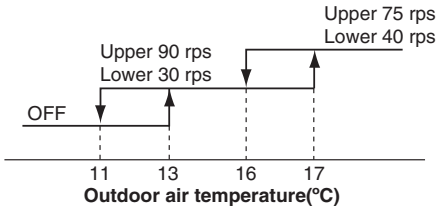
(ii) The lower limit of compressor speed is set to 30(40) rps and even if the calculated result lower than that after fuzzy calulation, the speed is kept to 30(40) rps. However, when the thermostat OFF, the speed is reduced to 0 rps.

(iii) Inching prevention control is activated and inching prevention control is carried out with the minimum speed set at 40 rps.

(iv) The outdoor fan speed is stepped down by 3 speed step.(Low limit 2nd speed)

(c) Reset condition

The outdoor air temperature (TH2) is lower than 11ºC.



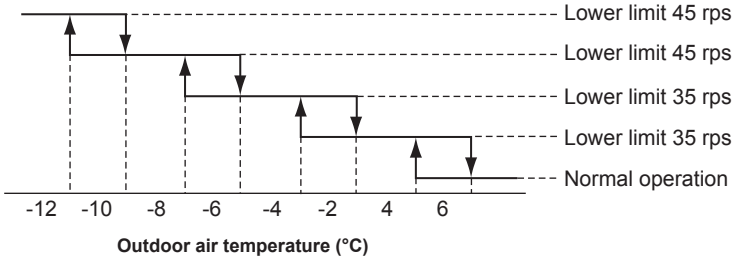
(7) Heating low outdoor air temperature protective control

(a) Operating conditions

When the outdoor air temperature (TH2) is lower than 4℃ or higher continues for 30 seconds while the compressor speed is other than 0 rps.

(b) Detail of operation

The lower limit compressor speed is change as shown in the figure below.



(c) Reset conditions

When either of the following condition is satisfied.

1) The outdooe air temperature (TH2) becomes 6℃.
2) The compressor speed is 0 rps.

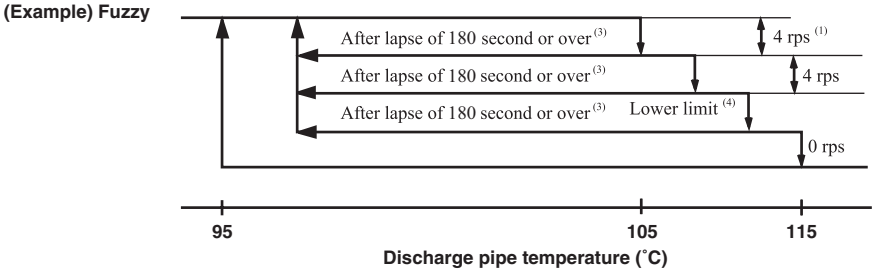
(8) Compressor overheat protection

(a) Purpose

It is designed to prevent deterioration of oil, burnout of motor coil and other trouble resulting from the compressor overheat.

(b) Detail of operation

1) Speeds are controlled with temperature detected by the sensor (TH3) mounted on the discharge pipe.



Notes (1) When the discharge pipe temperature is in the range of 105-115ºC, the speed is reduced by 4 rps.
(2) When the discharge pipe temperature is raised and continues operation for 20 seconds without changing, then the speed is reduced again by 4 rps.
(3) If the discharge pipe temperature is in the range of 95-105ºC even when the compressor speed is maintained for 180 seconds when the temperature is in the range of 95-105ºC, the speed is raised by 1 rps and kept at that speed for 180 seconds. This process is repeated until the com-mand speed is reached.
(4) Lower limit speed

	Cooling	Heating
Lower limit speed	25 rps	32 rps

2) If the temperature of 115ºC is detected by the sensor on the discharge pipe, then the compressor will stop immediately. When the discharge pipe temperature drops and 3 minutes has elapsed the unit starts again within 1 hour but there is no start at the third time.

(9) Current safe

(a) Purpose

Current is controlled not to exceed the upper limit of the setting operation current.

(b) Detail of operation

Input current to the converter is monitored with the current sensor fixed on the printed circuit board of the outdoor unit and, if the operation current value reaches the limiting current value, the compressor speed is reduced.

If the mechanism is actuated when the compressor speed is less than 30 rps, the compressor is stopped immediately.

Operation starts again after 3 minutes.

(10) Current cut

(a) Purpose

Inverter is protected from overcurrent.

(b) Detail of operation

Output current from the inverter is monitored with a shunt resistor and, if the current exceeds the setting value, the compressor is stopped immediately. Operation starts again after 3 minutes.

(11) Outdoor unit failure

This is a function for determining when there is trouble with the outdoor unit during air-conditioning.

The compressor is stopped if any one of the following in item (i), (ii) is satisfied. Once the unit is stopped by this function, it is not restarted.

(i) When the input current is measured at 1 A or less for 3 continuous minutes or more.

(ii) If the outdoor unit sends a 0 rps signal to the indoor unit 3 times or more within 20 minutes of the power being turned on.

(12) Serial signal transmission error protection

(a) Purpose

Prevents malfunction resulting from error on the indoor ↔ outdoor signals.

(b) Detail of operation

If the compressor is operating and a serial signal cannot be received from the indoor control with outdoor control having serial signals continues for 7 minutes and 35 seconds, the compressor is stopped.

After the compressor has been stopped, it will be restarted after the compressor start delay if a serial signal can be received again from the indoor control.

(13) Rotor lock

If the motor for the compressor does not turn after it has been started, it is determined that a compressor lock has occurred and the compressor is stopped.

(14) Outdoor fan motor protection

If the outdoor fan motor has operated at 75 min^{-1} or under for more than 30 seconds, the compressor and fan motor are stopped.

(15) Outdoor fan control at low outdoor temperature

(a) Cooling

1) Operating conditions

When the outdoor air temperature (TH2) is 22ºC or lower continues for 30 seconds while the compressor speed is other than 0 rps.

2) Detail of operation

After the outdoor fan operates at A speed for 60 seconds; the corresponding outdoor heat exchanger temperature shall implement the following controls.

● Value of A

	Outdoor fan
Outdoor air temperature > 10˚C	2nd speed
Outdoor air temperature ≦ 10˚C	1st speed

a) Outdoor heat exchanger temperature (TH1) ≦ 21ºC
After the outdoor fan speed drops (down) to 1 speed for 60 seconds; if the outdoor heat exchanger temperature is lower than 21ºC, gradually reduce the outdoor fan speed by 1 speed. (Lower limit 1st speed)

b) 21ºC < Outdoor heat exchanger temperature (TH1) ≦ 38ºC
After the outdoor fan speed maintains at A speed for 20 seconds; if the outdoor heat exchanger temperature is 21°C-38°C, maintain outdoor fan speed.

c) Outdoor heat exchanger tempeature (TH1) > 38ºC
After the outdoor fan speed rises (up) to 1 speed for 60 seconds; if the outdoor heat exchanger temperature is higher than 38ºC, gradually increase outdoor fan speed by 1 speed. (Upper limit 3rd speed)

3) Reset conditions

When either of the following conditions is satisfied.

a) The outdoor air temperature (TH2) is 25ºC or higher.

b) The compressor speed is 0 rps.

(b) Heating

1) Operating conditions

When the outdoor air temperature (TH2) is 4ºC or lower continues for 30 seconds while the compressor speed is other than 0 rps.

2) Detail of operation

The outdoor fan is stepped up by 2 speed step at each 20 seconds. (Upper limit 8th speed)

3) Reset conditions

When either of the following conditions is satisfied.

a) The outdoor air temperature (TH2) is 6ºC or higher.

b) The compressor speed is 0 rps.

(16) Refrigeration cycle system protection

(a) Starting conditions

1) When A minutes have elapsed after the compressor ON or the completion of the defrost operation

2) Other than the defrost operation

3) When, after satisfying the conditions of 1) and 2) above, the compressor speed, indoor air temperature (Thi-A) and indoor heat exchanger temperature (Thi-R) have satisfied the conditions in the following table for 5 minutes:

Operation mode	A	Compressor speed (N)	Room temperature (Thi-A)	Room temperature (Thi-A)/ Indoor heat exchanger temperature (Thi-R)
Cooling	5	40≦N	10≦Thi-A≦40	Thi-A−4<Thi-R
Heating(1)	9	40≦N	0≦Thi-A≦40	Thi-R<Thi-A+4

Note (1) Except that the fan speed is Hi in heating operation and silent mode control.

(b) Contents of control

1) When the conditions of (i) above are satisfied, the compressor stops.

2) Error stop occurs when the compressor has stopped 3 times within 60 minutes.

(c) Reset condition

When the compressor has been turned OFF.

(Ⅱ) Models FDC71-140

(1) Determination of compressor speed (Frequency)

Required frequency

(a) Cooling/dehumidifying operation

Unit: rps

Model		FDC71	FDC100	FDC125	FDC140
Max. required frequency	Usual operation	88	75	95(92)	95(92)
	Silent mode, outdoor air temperature ≦ 15°C	80	50	60	70
Min. required frequency		20	20	20	20

Note (1) Value in ( ) are for the 3 phase models.

(b) Heating operation

Unit: rps

Model		FDC71	FDC100	FDC125	FDC140
Max. required frequency	Usual operation	112	100	120	120
	Silent mode	90	60	70	70
Min. required frequency		20	20	20	20

(c) If the indoor fan speed becomes “Me” or “Lo”, Max required frequency goes down accordingly depending on indoor unit model.

(d) Max. required frequency under high outdoor air temperature in cooling mode.
Maximum required frequency is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		FDC71	FDC100	FDC125	FDC140
Max. required frequency	Outdoor air temperature is 40°C or higher	76	75	75	75
	Outdoor air temperature is 46°C or higher	62	70	70	70

(e) Max. required frequency under outdoor air temperature in heating mode.
Maximum required frequency is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		FDC71	FDC100	FDC125	FDC140
Max. required frequency	Outdoor air temperature is 18°C or higher	76	75	80	85

(f) Selection of max. required frequency by heat exchanger temperature.

(i) Maximum required frequency is selected according to the outdoor heat exchanger temperature (Tho-R) during cooling/dehumidifying or according to the indoor heat exchanger temperature (Thi-R) during heating mode.

(ii) When there are 3 indoor heat exchanger temperatures (Thi-R), whichever the highest applies,

Unit: rps

Model			FDC71	FDC100	FDC125	FDC140
Max. required frequency	Cooling/ dehumidifying	Outdoor heat exchanger temperature is 56(61)°C or higher	60	75	95〔92〕	95〔92〕
	Heating	Indoor heat exchanger temperature is 56(61)°C or higher	60	100	100	100

Notes (1) Value in ( ) are for the FDC71 model.
(2) Value in 〔 〕 are for the 3 phase models.

(g) When any of the controls from (a) to (f) above may duplicate, whichever the smallest value among duplicated controls is taken as the maximum required frequency.

(h) During heating, it is operated with the maximum required frequency until the indoor heat exchanger temperature becomes 40°C or higher.

(2) Compressor start control

(a) Compressor starts upon receipt of the thermostat ON signal from the indoor unit.

(b) However, at initial start after turning the power source breaker, it may enter the standby state for maximum 30 minutes (“ PREPARATION” is displayed on the remote control) in order to prevent the oil loss in the compressor.
If the cooling/dehumidifying/heating operation is selected from the remote control when the outdoor unit is in the standby state, “ PREPARATION” is displayed for 3 seconds on the remote control.

(3) Compressor soft start control

(a) Compressor protection start I

[Control condition] Normally, the compressor operation frequency is raised in this start pattern.

[Control contents] (i) Starts with the compressor's target frequency at **A** rps.
However, when the outdoor air temperature (Tho-A) is 35°C or higher during cooling/dehumidifying or the indoor return air temperature (Thi-A) is 25°C or higher during heating, it starts at **C** rps.

(ii) At 30 seconds after the start of compressor, its target frequency changes to **B** rps and the compressor is operated for 2 - 4 minutes with its operation frequency fixed at **B** rps.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC71	Cooling/Dehumidifying	42	42	40
	Heating	62	62	40
FDC100	Cooling/Dehumidifying	45	45	25
	Heating	45	45	25
FDC125, 140	Cooling/Dehumidifying	45	45	25
	Heating	45	45	25

(b) Compressor protection start III

[Control condition] Number of compressor starts is only 1 counted after the power source breaker ON.

[Control contents] Operates by selecting one of following start patterns according to the operation mode and the outdoor air temperature (Tho-A).

(i) Low frequency operation control during cooling/dehumidifying

[Control condition] Upon establishing the conditions of compressor protection start III, the low frequency operation control is performed during cooling/dehumidifying.

[Control contents] 1) Starts with the compressor's target frequency at **A** rps. When the outdoor air temperature (Tho-A) is 35°C or higher, it starts at **C** rps.

2) At 30 seconds after the compressor start, the compressor's target frequency is changed to **B** rps and the compressor's operation frequency is fixed for 10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC71	Cooling/Dehumidifying	42	42	40
FDC100	Cooling/Dehumidifying	45	45	25
FDC125, 140	Cooling/Dehumidifying	45	45	25

(ii) Low frequency operation control during heating

[Control condition] When the conditions of compressor protection start III are established and one of following conditions 1) is satisfied, the low number of revolutions operation control is performed during heating.

1) At 30 minutes or more after turning the power source breaker on.

[Control contents] 1) Starts the compressor with its target frequency at **A** rps. However, when the indoor return air temperature (Thi-A) is 25°C or higher, it start at **C** rps.

2) At 30 seconds after the start of compressor, the compressor's target frequency is changed to **B** rps and the compressor's operation frequency is fixed for 10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC71	Heating	42	42	40
FDC100	Heating	45	45	25
FDC125, 140	Heating	45	45	25

(4) Outdoor fan control

(a) Outdoor fan tap and fan motor speed

Unit: min^{-1}

Model	Mode	Fan motor tap						
FDC71		① speed	② speed	③ speed	④ speed	⑤ speed	⑥ speed	⑦ speed
	Cooling/Dehumidifying	200	400	600	710	810	850	950
	Heating	200	400	600	710	810	850	950
FDC100		① speed	② speed	③ speed	④ speed	⑤ speed	⑥ speed	⑦ speed
	Cooling/Dehumidifying	200	370	560	640	745	870	910
	Heating	200	370	560	650	830	870	910
FDC125, 140		① speed	② speed	③ speed	④ speed	⑤ speed	⑥ speed	⑦ speed
	Cooling/Dehumidifying	200	370	560	640	745	870	910
	Heating	200	370	560	650	830	870	910

(b) Fan tap control during cooling/defumidifying operation

Fan taps are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).

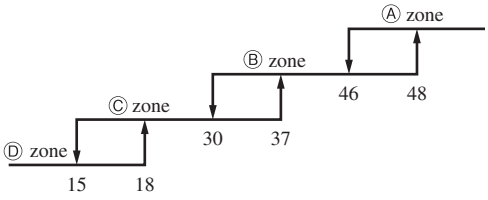
Note (1) It is detected by Tho-R1 or R2, whichever the higher.

	Ⓐ zone	Ⓑ zone	Ⓒ zone	Ⓓ zone
ⓐ zone	Tap 5(6)	Tap 5(6)	Tap 5(6)	Tap 4
ⓑ zone	Tap 5(6)	Tap 5(6)	Tap 4(6)	Tap 3
ⓒ zone	Tap 4	Tap 4	Tap 3	Tap 2
ⓓ zone	Tap 3	Tap 3	Tap 2	Tap 1

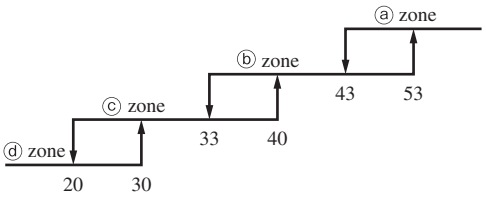
• Silent mode only

	Ⓐ zone	Ⓑ zone	Ⓒ zone	Ⓓ zone
ⓐ zone	Tap 5	Tap 5	Tap 5	Tap 4
ⓑ zone	Tap 5	Tap 5	Tap 3	Tap 3
ⓒ zone	Tap 4	Tap 3	Tap 3	Tap 2
ⓓ zone	Tap 3	Tap 3	Tap 2	Tap 1

Note (1) Value in ( ) are for the model FDC71.



Outdoor air temperature (˚C)



Outdoor heat exchanger temperature (˚C)

(c) Fan tap control during heating operation

Fan taps are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).

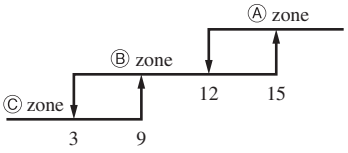
Note (1) It is detected by Tho-R1 or R2, whichever the lower.

	Ⓐ zone	Ⓑ zone	Ⓒ zone
ⓐ zone	Tap 3	Tap 3	Tap 4
ⓑ zone	Tap 3	Tap 4(5)	Tap 5
ⓒ zone	Tap 4	Tap 5	Tap 6

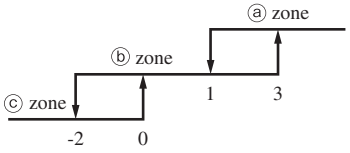
• Silent mode only

	Ⓐ zone	Ⓑ zone	Ⓒ zone
ⓐ zone	Tap 3	Tap 3	Tap 3
ⓑ zone	Tap 3	Tap 3	Tap 5
ⓒ zone	Tap 4	Tap 5	Tap 6

Note (1) Value in ( ) is for the model FDC71.



Outdoor air temperature (˚C)

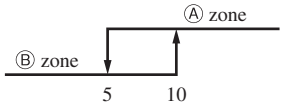


Outdoor heat exchanger temperature (˚C)

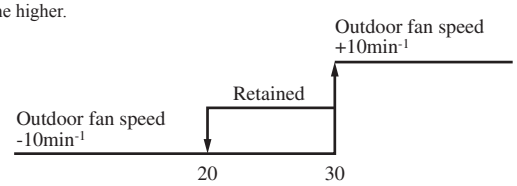
(d) Outdoor fan control at cooling low outdoor air

(i) When all the following conditions are established after the start of compressor, the following control is implemented. If the outdoor air temperature (Tho-A) is in the zone Ⓑ in the cooling/dehumidifying mode, it has elapsed 20 seconds from the start of outdoor fan and the outdoor fan is at the tap 1 speed, the outdoor fan speed is controlled according to the outdoor heat exchanger temperature (Tho-R1, R2).

Note (1) It is detected with Tho-R1 or R2, whichever the higher.



Outdoor air temperature (˚C)



Outdoor heat exchanger temperature (˚C)

(ii) The outdoor heat exchanger temperature is detected always and, when the number of revolutions of the outdoor fan speed has been increased or decreased, there is no change of fan speed for 20 seconds.

(iii) Rage of the outdoor fan speed under this control is as follows.

1) Lower limit: 130min^{-1}
2) Upper limit: 500min^{-1}

(iv) As any of the following conditions is established, this control terminates.

1) When the outdoor air temperature is in the zone Ⓐ and the outdoor heat exchanger temperature at 30°C or higher is established for 40 seconds or more continuously.
2) When the outdoor fan speed is 500min^{-1} and the outdoor heat exchanger temperature at 30°C or higher is established for 40 seconds or more continuously.
3) When the outdoor heat changer temperature at 45°C or higher is established for 40 seconds or more.

(e) Outdoor fan control by the power transistor radiator fin temperature

When all the following conditions are established later than 3 minutes after the start of compressor, the following control is implemented.

(i) Cooling/dehumidifying

1) Outdoor air temperature (Tho-A) ≧ 33°C
2) Compressor's actual frequency ≧ **A** rps
3) Power transistor radiator fin temperature ≧ **C** °C

(ii) Heating

1) Outdoor air temperature (Tho-A) ≧ 16°C
2) Compressor's actual frequency ≧ **B** rps
3) Power transistor radiator fin temperature ≧ **C** °C

(iii) Control contents

1) Raises the outdoor fan tap by 1 tap.
2) When the sampling is for 60 minutes and the value of power transistor radiator fin temperature (Tho-P) is as follows.
   a) When the power transistor radiator fin temperature (Tho-P) ≧ **C** °C, the outdoor fan tap is raised by 1 speed further.
   b) When **C** °C > power transistor radiator fin temperature (Tho-P) ≧ **D** °C, present outdoor fan tap is maintained.
   c) When the power transistor radiator fin temperature (Tho-P) ≧ **D** °C, the outdoor fan tap is dropped by 1 speed.

(iv) Ending conditions

When the operation under the condition of item 2), c) above and with the outdoor fan tap, which is determined by the item (b) is detected 2 times consecutively.

• Compressor's frequency and power transistor radiator fin temperature

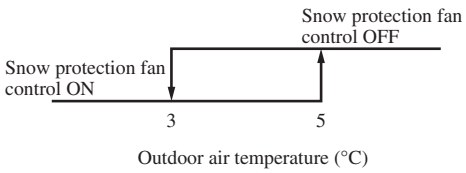
Item / Model	A	B	C	D
FDC71	60	70	80	75
FDC100	65	65	72	68
FDC125, 140	65	65	72	68

(f) Caution at the outdoor fan start control (3 phase model only)

When the outdoor fan is running at 400min^{-1} before operating the compressor, it may operate with the compressor only, without starting up the outdoor fan this is normal.

(g) Snow protection fan control

If the dip switch (SW3-2) on the outdoor control PCB is turned ON, the outdoor fan is operated for 30 seconds at 4 tap speed once in every 10 minutes depending on the outdoor air temperature (detected with Tho-A) in the stop mode or anomalous stop mode.



(5) Defrost operation

(a) Starting conditions

If all of the following defrost conditions A or conditions B are satisfied, the defrost operation starts.

(i) Defrost conditions A

1) Cumulative compressor operation time after the end of defrost operation has elapsed 37 [45] minutes, and the cumulative compressor operation time after the start of heating operation (remote control ON) has elapsed 30 minutes.
2) After 5 minutes from the compressor ON
3) After 5 minutes from the start of outdoor fan
4) After satisfying all above conditions, if temperatures of the outdoor heat exchanger temperature thermistor (Tho-R1, R2) and the outdoor air temperature thermistor (Tho-A) become lower than the defrost operation starting temperature as shown by the right figure for 15 seconds continuously, or the suction gas saturation temperature (SST) and the outdoor air temperature (Tho-A), which are obtained from the value detected by the low pressure sensor (LPT) stay for 3 minutes within the range below the defrost operation start temperature as shown by the right figure.However, it excludes for 10 minutes after the startof compressor and the outdoor air temperature is as shown by the lower figure.



Outdoor air temperature (°C)

Note (1) Figures in [ ] is for model FDC71.

(ii) Defrost conditions B

1) When previous defrost ending condition is the time out of defrost operation and it is in the heating operation after the cumulative compressor operation time after the end of defrost operation has become 30 minutes.
2) After 5 minutes from the start of compressor
3) After 5 minutes from the start of outdoor fan

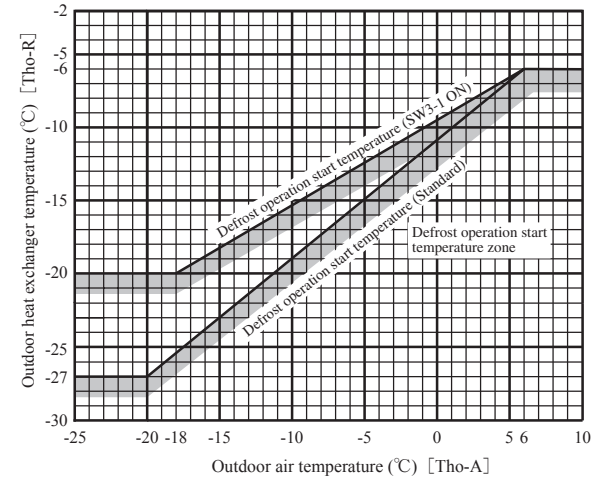
(b) Ending conditions

When any of the following conditions is satisfied, the heating operation starts.

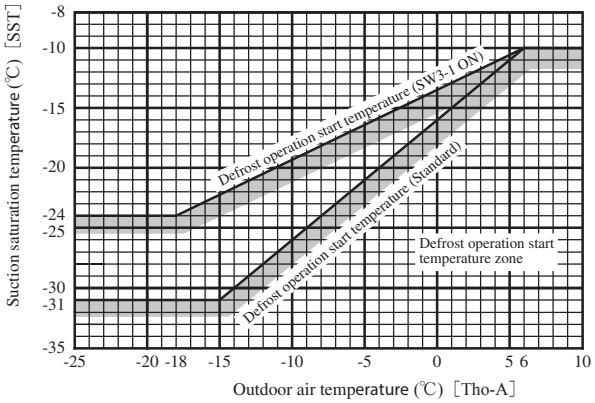
(i) When it has elapsed 8 minutes and 20 seconds after the start of defrost operation. (After 10 minutes and 20 seconds for model FDC71)

(ii) When the outdoor heat exchanger temperatures (Tho-R1, R2), whichever the lower, becomes 12°C (model FDC71: 16°C) or higher for 10 seconds continuously.

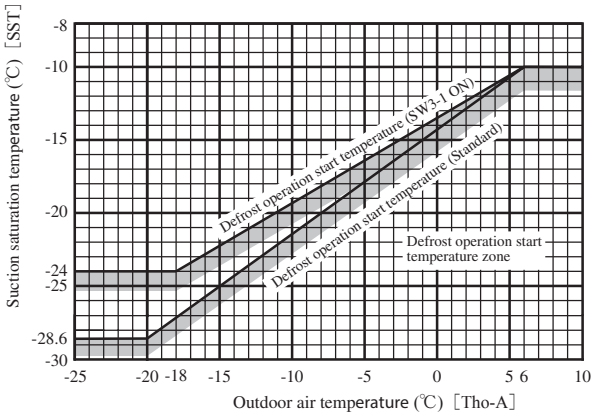
Model FDC71-140



Model FDC71



Model FDC100-140



(c) Switching of defrost control with SW3-1

(i) If SW3-1 on the outdoor control PCB is turned to ON, it becomes easier to enter the defrost operation. Use this when installing a unit at snowing regions.

(ii) Control contents

1) It allows entering the defrost operation under the defrost condition A when the cumulative heating operation time becomes 30 minutes. It is 37 [45] minutes at SW3-1 OFF (Factory default).
2) It allows entering the defrost operation under the defrost condition B when the cumulative heating operation time becomes 25 minutes. It is 30 minutes at SW3-1 OFF (Factory default).
3) It allows the defrost operation with the outdoor heat exchanger temperature (Tho-R) and suction pressure saturation temperature (SST) being higher than normal.

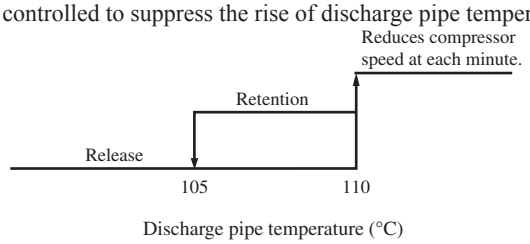
Note (1) Figures in [ ] is for model FDC71.

(6) Protective control/anomalous stop control by compressor's number of revolutions

(a) Compressor discharge pipe temperature protection

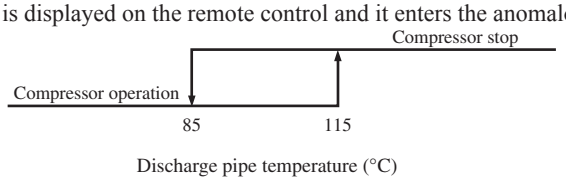
(i) Protective control

As the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of discharge pipe temperature.



(ii) Anomalous stop control

1) If the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor stops.
2) When it is detected 2 times within 60 minutes or after continuous 60 minutes, including the stop of compressor, E36 is displayed on the remote control and it enters the anomalous stop mode.



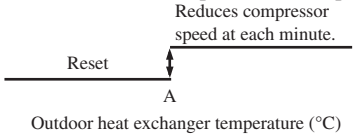
(iii) Reset of anomalous stop mode

As it drops to the reset value of 85°C or lower for 45 minutes continuously, it becomes possible to restart from the remote control.

(b) Cooling high pressure protection

(i) Protective control

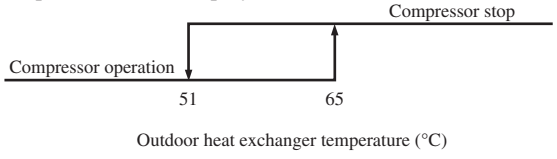
1) When the outdoor air temperature (Tho-A) is 40°C or higher and the outdoor heat exchanger temperature (Tho-R) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of high pressure.
2) Control value A is updated to an optimum value automatically according to the operating conditions.



Control value A
54-60°C

(ii) Anomalous stop control

1) As the outdoor heat exchanger temperature (Tho-R) exceeds the setting value, the compressor stops.
2) If it is detected 5 times within 60 minutes or 65°C or higher continues for 60 minutes, including the stop of compressor, E35 is displayed on the remote control and it enters the anomalous stop mode.



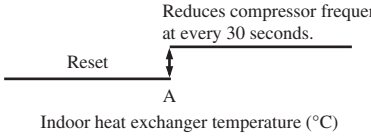
(iii) Reset of anomalous stop mode

As it reaches the reset value of 51°C or lower, it becomes possible to restart from the remote control.

(c) Heating high pressure protection

(i) Protective control

1) As the indoor heat exchanger temperature (Thi-R) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of high pressure.
2) Control value A is updated to an optimum value automatically according to the operating conditions.



Model	Existing piping adaptation switch: SW5-1 (SW8-1: model FDC71)	
	OFF (Shipping)	ON
	Control value A (°C)	
FDC71	52-58	46-52
FDC100-140	48-54	

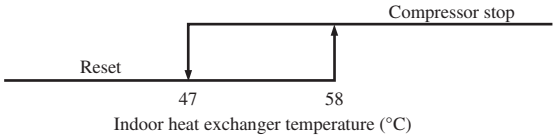
Note (1) Adaptation to existing piping is at ON.

(ii) Anomalous stop control

Operation control function by the indoor unit control - See the heating overload protection, page 18.

(iii) Adaptation to existing piping, stop control

If the existing piping adaptation switch, SW5-1 (model FDC71: SW8-1), is turned ON, the compressor stops to protect existing piping when the indoor heat exchanger temperature (Thi-R) exceeds the setting value.



(d) Anomaly detection control by the high pressure switch (63H1)

(i) If the pressure rises and operates the high pressure switch (opens at 4.15MPa/closes at 3.15MPa), the compressor stops.

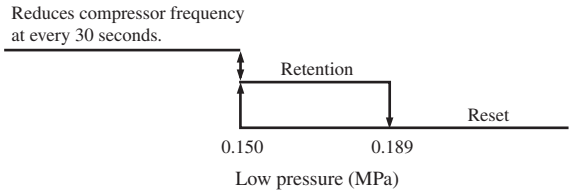
(ii) Under any of the following conditions, E40 is displayed and it enters the anomalous stop mode.

1) When it occurs 5 times within 60 minutes that pressure rises and the compressor is stopped by 63H1.
2) When 63H1 has been in the open state for 60 minutes continuously, including the stop of compressor.

(e) Low pressure control

(i) Protective control

If the value detected by the low pressure sensor (LPT) exceeds the setting value, the compressor speed (frequency) is controlled to restrain the drop of pressure.



(ii) Anomalous stop control

1) When a value detected by the low pressure sensor (LPT) satisfies any of the following conditions, the compressor stops to run for its protection.
   a) When the low pressure drops to 0.079MPa or under for 15 seconds continuously.
   b) At 10 minutes after the start of compressor, the suction overheat becomes 30°C and the low pressure becomes 0.15MPa or under for 60 seconds continuously.
2) E49 is displayed under any of the following conditions and it enters the anomalous stop mode.
   a) When the low pressure drops 3 times within 60 minutes and the compressor stops under any of the above conditions.
   b) When a value detected with the low pressure sensor becomes 0.079MPa or under for 5 minutes, including the stop of compressor.
3) However, when the control condition 1). a) is established during the compressor protection start III, E49 is displayed at initial stop and it enters the anomalous stop mode.

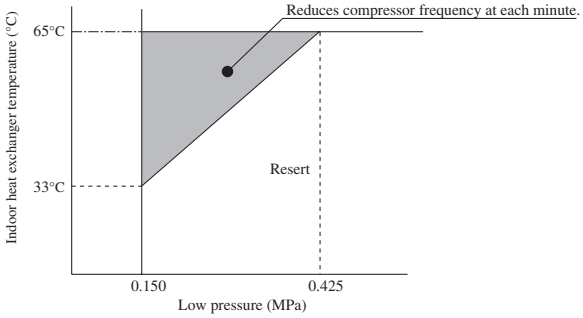
(f) Compressor pressure ratio protection control (Model FDC100 – 140 only)

(i) During heating operation, if the indoor heat exchanger temperature (Thi-R) and low pressure sensor (LPT) exceed the setting values at 10 minutes after the start of compressor, the compressor speed (frequency) is controlled to protect the compressor.

(ii) This control is not performed during the outdoor fan ON and for 10 minutes from the start of outdoor fan.

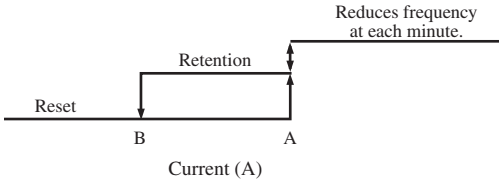
(iii) This control is not performed during defrost operation and at 10 minutes after the reset of defrost operation.

(iv) When there are 2 indoor heat exchanger temperatures (Thi-R), the highest temperature is detected.

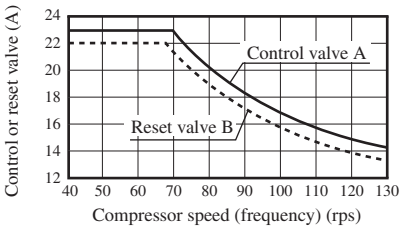


(g) Over-current protection current safe controls I, II

Detecting the outdoor inverter input (primary) current and the output (secondary) current, if the current values exceed setting values, the compressor speed (frequency) is controlled to protect the inverter.



(Fig. C) The control value "A" and the reset value vary depending on the compressor speed.



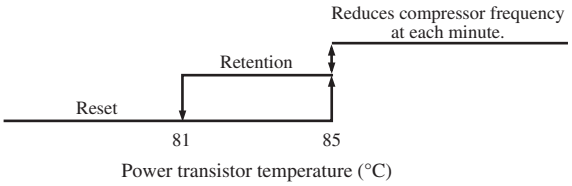
Model		Cooling		Heating	
		Control value A	Reset value B	Control value A	Reset value B
Primary current side	FDC71	15.0	14.0	16.0	15.0
	FDC100	11.0 (23.0)	10.0 (22.0)	11.0 (23.0)	10.0 (22.0)
	FDC125, 140	11.0 (23.0)	10.0 (22.0)	11.0 (25.0)	10.0 (24.0)
Secandary current side	FDC71	13.0	12.0	13.0	12.0
	FDC100	11.5 (Fig.C)	10.5 (Fig.C)	11.5 (Fig.C)	10.5 (Fig.C)
	FDC125, 140	11.5 (Fig.C)	10.5 (Fig.C)	11.5 (Fig.C)	10.5 (Fig.C)

Note (1) Value in ( ) are for the single phase models.

(h) Power transistor temperature protection

(i) Protective control

If the power transistor temperature (detected with TIP) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of power transistor temperature.



(i) Anomalous power transistor current

(i) Prevents over-current on the inverter. If the current value in the power transistor exceeds the setting value, the compressor stops.

(ii) If the current value in the power transistor exceeds the specified value and the compressor stops 4 times within 30 minutes, E42 is displayed on the remote control and it enters the anomalous stop mode.

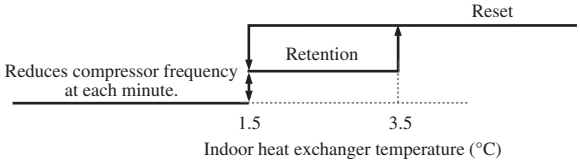
(j) Anomalous inverter PCB

If the power transistor detects any anomaly for 15 minutes, including the stop of compressor, E51 is displayed on the remote control and it enters the anomalous stop mode.

(k) Anti-frost control by the compressor frequency control

(i) If the indoor heat exchanger temperature (detected with Thi-R) exceeds the setting value at 4 minutes after the start of compressor, the compressor speed (frequency) is controlled to initiate the anti-frost control of indoor heat exchanger.

(ii) When there are 2 indoor heat exchanger temperatures (Thi-R), the lowest temperature is detected.



(iii) Regarding the anti-frost control by the operation stop, refer to the operation control function by the indoor control and the cooling, dehumidifying frost prevention of page 18.

(l) Dewing prevention control

[Control condition]

During cooling and dehumidifying operation, if all the following conditions are established, the compressor speed (frequency) is reduced to prevent dewing and water splash.

(i) Cooling electronic expansion valve aperture (EEVC) is 500 pulses.

(ii) Suction overheat is 10°C or higher.

(iii) Compressor speed (frequency) is **A** rps or higher.

[Control contents]

(i) When the suction overheat is 10°C or higher, the compressor speed (frequency) is reduced at each 1 minute.

(ii) Compressor speed (frequency) does not rise till the cooling expansion valve becomes 460 pulses.

Model	**A** rps
FDC71	42
FDC100-140	60

(iii) This control takes **A** rps as its lower limit so that compressor speed is not controlled when it is less than **A** rps.

(m) Refrigerant quantity shortage protection

Under the compressor protection start III control during cooling and dehumidifying operations, the following control is performed by detecting the indoor heat exchanger temperature (Thi-R) and the indoor return air temperature (Thi-A).

[Control condition]

When the state that the indoor heat exchanger temperature (Thi-R) does not become lower than the indoor return air temperature (Thi-A) by 4°C or more continues for 1 minute.

[Control contents]

It judges that the flowing of refrigerant in to the indoor unit is insufficient so that the compressor is stopped and E57 is displayed on the remote control.

(n) Broken wire detection on temperature thermistor and low pressure sensor

(i) Outdoor heat exchanger thermistor, outdoor air temperature thermistor and low pressure sensor

If the following is detected for 5 second continuously within 2 minutes to 2 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note (1) During defrosting and for 3 minutes after the end of defrosting, it is not detected.

- Outdoor heat exchanger thermistor: -50°C or lower
- Outdoor air temperature thermistor: -45°C or lower
- Low pressure sensor: 0V or under or 4.0V or over

(ii) Discharge pipe temperature thermistor, suction pipe temperature thermistor

If the following is detected for 5 seconds continuously within 10 minutes to 10 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note (1) During defrosting and for 3 minutes after the end of defrosting, it is not detected.

- Discharge pipe temperature thermistor: -10°C or lower
- Suction pipe temperature thermistor: -50°C or lower

(o) Fan motor error

(i) If the fan speed of 100min^{-1} or under is detected for 30 seconds continuously under the outdoor fan control (with the operation command of fan tap at ① speed or higher), the compressor stops.

(ii) When the fan motor speed drops to 100min^{-1} or under 5 times within 60 minutes and the compressor stops, it enters the anomalous stop mode with E48 displayed on the remote control.

(p) Anomalous stop by the compressor start stop

(i) When it fails to shift to the compressor DC motor's rotor position defection operation at 5 seconds after establishing the compressor start condition, the compressor stops temporarily and restarts 3 minutes later.

(ii) If it fails to shift to the position detection operation again at second time, it judges the anomalous compressor start and stops the compressor by the anomalous stop (E59).

(7) Silent mode

(a) As "Silent mode start" signal is received from the remote control, it operates by dropping the outdoor fan tap and the compressor speed (frequency).

(b) For details, refer to items (1) and (4) above.

(8) Test run

(a) It is possible to operate from the outdoor unit using the dip switch on the outdoor unit control PCB.

SW3-3 (SW5-3)	ON	SW3-4 (SW5-4)	OFF	Cooling test run
			ON	Heating test run
	OFF	Normal and end of test run		

Make sure to turn SW3-3 (SW5-3) to OFF after the end of operation.

Note (1) Value in ( ) are for the model FDC71.

(b) Test run control

(i) Operation is performed at the maximum compressor speed (frequency), which is determined for each model.

(ii) Each protective control and error detection control are effective.

(iii) If SW3-4 (SW5-4) is switched during test run, the compressor is stoped for once by the stop control and the cooling/heating operation is switched.

Note (1) Value in ( ) is for the model FDC71.

(iv) Setting and display of remote control during test run

Item / Mode	Contents of remote control setting/display
Cooling test run	Setting temperature of cooling is 5°C.
Heating test run	Setting temperature of heating (preparation) is 30°C.

(9) Pump-down control

Turning ON the pump-down switch SW1 (SW9) for 2 seconds during the operation stop or anomalous stop (excluding the thermostat OFF), the pump-down operation is performed. (This is invalid when the indoor unit is operating. This is effective even when the indoor unit is stopped by the anomalous stop or the power source is turned OFF.)

Note (1) Value in ( ) is for the model FDC71.

(a) Control contents

(i) Close the service valve at the liquid side. (It is left open at the gas side.)

(ii) Compressor is started with the target speed (frequency) at FDC71:62, FDC100. 125, 140:45 rps in the cooling mode.

(iii) Red and green lamps (LED) flash continuously on the outdoor control PCB.

(iv) Each of protection and error detection controls, excluding the low pressure control, anti-frost control and dewing prevention control, is effective.

(v) Outdoor unit fan is controlled as usual.

(vi) Electronic expansion valve is fully opened.

(b) Control ending conditions

Stop control is initiated depending on any of the following conditions.

(i) Low pressure of 0.087MPa or lower is detected for 5 seconds continuously.

1) Red LED: Light, Green LED: Flashing, Remote control: Displays stop.
2) It is possible to restart when the low pressure is 0.087MPa or higher.
3) Electronic expansion valve (cooling/heating) is kept fully open.

(ii) Stop by the error detection control

1) Red LED: Keeps flashing, Green LED: Flashing
2) Restart is prohibited. To return to normal operation, reset the power source.
3) Electronic expansion valve (cooling/heating) is left fully open.

(iii) When the cumulative operation time of compressor under the pump-down control becomes 5 minutes.

1) Red LED: Stays OFF, Green LED: Flashing, Remote control: Stop
2) It is possible to pump-down again.
3) Electronic expansion valve (cooling/heating) is left fully open.

Note (1) After the stop of compressor, close the service valve at the gas side.

Caution: Since pressing the pump-down switch cancels communications with the indoor unit, the indoor unit and the remote control display "Transmission error – E5". This is normal.

(10) Base heater ON/OFF output control (Option)

(a) Base heater ON conditions

When all of following conditions are satisfied, the base heater is turned ON.

· Outdoor air temperature (detected with Tho-A) is 3ºC or lower.

· In the heating mode

· When the compressor is turned ON

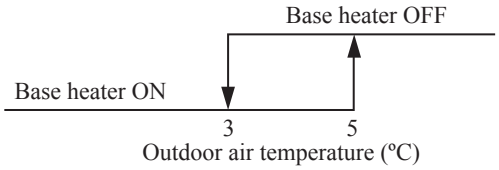
(b) Base heater OFF conditions

When either one of following conditions is satisfied, the base heater is turned OFF.

· Outdoor air temperature (detected with Tho-A) is 5ºC or higher.

· When the compressor stop has been detected for 30 minutes continuously

· In the cooling or dehumidifying mode



1.11 MAINTENANCE DATA

1.11.1 Diagnosing of microcomputer circuit

(1) Selfdiagnosis function

(a) Check indicator table

Whether a failure exists or not on the indoor unit and outdoor unit can be know by the contents of remote control error code, indoor/outdoor unit green LED (power pilot lamp and microcomputer normality pilot lamp) or red LED (check pilot lamp).

(i) Indoor unit

Remote control		Indoor control PCB		Outdoor control PCB		Location of trouble	Description of trouble	Repair method	Reference page
Error code	Red LED	Red LED	Green LED (1)	Red LED	Green LED (1)				
No-indication	Stays OFF	Stays OFF	Keeps flashing	Stays OFF	Keeps flashing	—	• **Normal operation**	—	—
		Stays OFF	Stays OFF	2-time flash	Stays OFF	Indoor unit power source	• Power OFF, broken wire/blown fuse, broken transformer wire	Repair	187
		* 3-time flash	Keeps flashing	Stays OFF	Keeps flashing	Remote control wires	• Poor connection, breakage of remote control wire * For wire breaking at power ON, the LED is OFF.	Repair	188
						Remote control	• Defective remote control PCB	Replacement of remote control	
WAIT or INSPECT I/U		Stays OFF	Keeps flashing	2-time flash	Keeps flashing	Indoor-outdoor units connection wire	• Poor connection, breakage of indoor-outdoor units connection wire	Repair	189-198
						Remote control	• Improper setting of master and slave by remote control		
E1		Stays OFF	* Keeps flashing	Stays OFF	Keeps flashing	Remote control wires (Noise)	• **Poor connection of remote control signal wire (White)** * For wire breaking at power ON, the LED is OFF • **Intrusion of noise in remote control wire**	Repair	200
						Remote control indoor control PCB	*• Defective remote control or indoor control PCB (defective communication circuit)?	Replacement of remote control or PCB	
E5		2-time flash	Keeps flashing	2-time flash	Keeps flashing	Indoor-outdoor units connection wire	• **Poor connection of wire between indoor-outdoor units during operation (disconnection, loose connection)** • **Anomalous communication between indoor-outdoor units by noise, etc.**	Repair	201
		2-time flash	Keeps flashing	Stays OFF	Keeps flashing	(Noise)	• **CPU-runaway on outdoor control PCB**	Power reset or Repair	
						Outdoor control PCB	*• Occurrence of defective outdoor control PCB on the way of power source (defective communication circuit)?	Replacement of PCB	
		2-time flash	Keeps flashing	Stays OFF	Keeps flashing	Outdoor control PCB	• **Defective outdoor control PCB on the way of power source**	Replacement	
						Fuse	• **Blown fuse**		
E6		1-time flash	Keeps flashing	Stays OFF	Keeps flashing	Indoor heat exchanger temperature sensor	• **Defective indoor heat exchanger temperature sensor** (defective element, broken wire, short-circuit) • Poor contact of temperature sensor connector	Replacement, repair of temperature sensor	202
						Indoor control PCB	*• **Defective indoor control PCB (Defective temperature sensor input circuit)?**	Replacement of PCB	
E7		1-time flash	Keeps flashing	Stays OFF	Keeps flashing	Indoor return air temperature sensor	• **Defective indoor return air temperature sensor** (defective element, broken wire, short-circuit) • Poor contact of temperature sensor connector	Replacement, repair of temperature sensor	203
						Indoor control PCB	*• **Defective indoor control PCB (Defective temperature sensor input circuit)?**	Replacement of PCB	
E8	Keeps flashing	1-time flash	Keeps flashing	Stays OFF	Keeps flashing	Installation or operating condition	• **Heating over-load** (Anomalously high indoor heat exchanger temperature)	Repair	204
						Indoor heat exchanger temperature sensor	• **Defective indoor heat exchanger temperature sensor (short-circuit)**	Replacement of temperature sensor	
						Indoor control PCB	*• **Defective indoor control PCB** (Defective temperature sensor input circuit)?	Replacement of PCB	
E9		1-time flash	Keeps flashing	Stays OFF	Keeps flashing	Drain trouble	• **Defective drain pump (DM), broken drain pump wire**, disconnected connector	Replacement, repair of DM	205
						Float switch	• **Anomalous float switch operation** (malfunction)	Repair	
						Indoor control PCB	*• **Defective indoor control PCB** (Defective float switch input circuit) *• **Defective indoor control PCB** (Defective DM drive output circuit)?	Replacement of PCB	
						Option	• **Defective option parts** (At optional anomalous input setting)	Repair	
E10		Stays OFF	Keeps flashing	Stays OFF	Keeps flashing	Number of connected indoor units	• **When multi-unit control by remote control is performed, the number of units is over**	Repair	206
E11		Keeps flshing	Keeps flshing	Stays OFF	Keeps flshing	Address setting error	• Address setting error of indoor units	Repair	207
E14		3-time flash	Keeps flashing	Stays OFF	Keeps flashing	Indoor unit No. setting	•No master is assigned to slaves.	Repair	208
						Rcmote control wires	•Anomalous remote control wire connection, broken wire between master and slave units		
E16		1(2)-time flash	Keeps flashing	Stays OFF	Keeps flashing	Indoor fan motor	• **Defective indoor fan motor**	Replacement, repair	209
						Indoor power PCB	• **Defective indoor power PCB**	Replacement	
E18		1-time flash	Keeps flashing	Stays OFF	Keeps flashing	Address setting error	• Address setting error of master and slave indoor units	Repair	210
E19		1-time flash	Keeps flashing	Stays OFF	Keeps flashing	Indoor control PCB	• **Indoor unit operation check error**	Repair	211
E20		1(2)-time flash	Keeps flashing	Stays OFF	Keeps flashing	Indoor fan motor	• Indoor motor rotation speed anomaly	Replacement, repair	212
						Indoor power PCB	• Defective indoor power PCB	Replacement	
E21		1-time flash	Keeps flashing	Stays OFF	Keeps flashing	Panel switch detection	• Defective panel switch operation	Repair	213
E28		Stays OFF	Keeps flashing	Stays OFF	Keeps flashing	Remote control temperature sensor	• Broken wire of remote control temperature sensor	Repair	214

Notes (1) **Normal indicator lamp (Indoor, outdoor units: Green) extinguishes (or lights continuously) only when CPU is anomalous. It keeps flashing in any trouble other than anomalous CPU.**

(2) * mark in the description of trouble means that, in ordinary diagnosis, it cannot identify the cause definitely, and, if the trouble is repaired by replacing the part, it is judged consequently that the replaced part was defective.

(ii) Outdoor unit

1) SRC40-60ZSX-S

Remote control		Indoor control PCB		Location of trouble	Description of trouble	Repair method	Reference page
Error code	Red LED	Red LED	Green LED				
E35	Keeps flashing	Stays OFF	Keeps flashing	Installation, operation status	• Higher outdoor heat exchanger temperature	Repair	215
				Outdoor heat exchanger temperature sensor	• Defective outdoor heat exchanger temperature sensor	Replacement, repair of temperature sensor	
				Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E36		Stays OFF	Keeps flashing	Installation, operation status	• Higher discharge temperature	Repair	217
				Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor	Replacement, repair of temperature sensor	
				Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E37		Stays OFF	Keeps flashing	Outdoor heat exchanger temperature sensor	• Defective outdoor heat exchanger temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	218
				Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E38		Stays OFF	Keeps flashing	Outdoor air temperature sensor	• Defective outdoor air temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	219
				Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E39		Stays OFF	Keeps flashing	Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	220
				Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E40		Stays OFF	Keeps flashing	Installation, operation status	• Service valve (gas side) closing operation	Replacement	221
E42		Stays OFF	Keeps flashing	Outdoor control PCB, compressor	• Current cut (Anomalous compressor over-current)	Replacement of PCB	225•226
				Installation, operation status	• Service valve closing operation	Repair	
E47		Stays OFF	Keeps flashing	Outdoor control PCB	• Defective active filter	Repair PCB replacement	228
E48		Stays OFF	Keeps flashing	Outdoor fan motor	• Defective outdoor fan motor	Replacement	231
				Outdoor control PCB	• Defective outdoor control PCB		
E51		Stays OFF	Keeps flashing	Power transistor error (outdoor control PCB)	• Power transistor error	Replacement of PCB	236
E57		Stays OFF	Keeps flashing	Operation status	• Shortage in refrigerant quantity	Repair	242
				Installation status	• Service valve closing operation	Service valve opening check	
E58		Stays OFF	Keeps flashing	• Overload operation • Overcharge • Compressor locking	• Current safe stop	Replacement	244
E59		Stays OFF	Keeps flashing	Compressor, outdoor control PCB	• Anomalous compressor startup	Replacement	245
E60		Stays OFF	Keeps flashing	Compressor	• Anomalous compressor rotor lock	Replacement	252
WAIT or INSPECT I/U		Stays OFF	Keep flashing	Indoor-outdoor connection wire	• Poor connection, breakage of indoor-outdoor unit connection wire	Repair	—

Notes (1) * mark in the description of trouble means that, in ordinary diagnosis, it cannot identify the cause definitely, and, if the trouble is repaired by replacing the part, it is judged consequently that the replaced part was defective.

2) FDC71-140VNX, 100-140VSX
FDC100-140VNA, 100-140VSA

Remote control		Indoor control PCB		Outdoor control PCB		Outdoor inventer PCB	Location of trouble	Description of trouble	Repair method	Reference page
Error code	Red LED	Red LED	Green LED (1)	Red LED	Green LED (1)	Yellow LED				
E35		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	Keeps flashing	Installation or operating condition	• Higher outdoor heat exchanger temperature	Repair	216
							Outdoor heat exchanger temperature sensor	• Defective outdoor heat exchanger temperature sensor	Replacement of temperature sensor	
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E36		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Installation or operating condition	• Higher discharge temperature	Repair	217
							Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor	Replacement, repair of temperature sensor	
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E37		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Outdoor heat exchanger temperature sensor	• Defective outdoor heat exchanger temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	218
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E38		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Outdoor air temperature sensor	• Defective Outdoor air temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	219
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E39		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	220
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E40		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Installation or operating condition	• Rising high pressure (Operation of 63H1) • Service valve closing operation	Repair	222
							Outdoor control PCB	*• Defective outdoor control PCB (Defective 63H input circuit)?	Replacement of PCB	
E41		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	6-time flash	Inverter PCB or radiator fin	• Power transistor overheat	Replacement of PCB or Repair	223
E42		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	1-time flash	Outdoor control PCB compressor	• Current cut (Anomalous compressor over-current)	Replacement of PCB	225•226
							Installation or operating condition	• Service valve closing operation	Repair	
E45		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	Keeps flashing	Outdoor control PCB	• Anomalous outdoor control PCB communication	Replacement of PCB	227
							Inverter PCB	• Anomalous inverter PCB communication		
E47		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	7-time flash	Inverter PCB active filter	• Defective inverter PCB (Model FDC 71 only) Defective active filter of control.	Replacement	229
							Outdoor control PCB active filter	• Defective outdoor control PCB (Models FDC100-140VNA only) Defective active filter of control.	Replacement of PCB	230
E48		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	Keeps flashing	Outdoor fan motor	• Anomalous outdoor fan motor	Replacement, repair	232•233
							Outdoor control PCB	*• Defective outdoor control PCB (Defective motor input circuit)?	Replacement of PCB	
E49		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Installation or operating condition	• Low pressure error • Service valve closing operation	Repair	234•235
							Low pressure sensor	• Anomalous low pressure, broken wire of low pressure sensor or poor connector connection	Replacement, repair of sensor	
							Outdoor control PCB	*• Defective outdoor control PCB (Defective sensor input circuit)?	Replacement of control PCB	
E51		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	6-time flash	Inverter PCB	• Anomalous inverter PCB	Replacement of PCB	237
E53		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Suction pipe temperature sensor	• Defective suction pipe temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	239
							Outdoor control PCB	*• Defective outdoor PCB (Defective sensor input circuit)?	Replacement of control PCB	
E54		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	Keeps flashing	Low pressure sensor	• Defective low pressure sensor	Replacement of sensor	240
							Outdoor control PCB	• Defective outdoor control PCB (Defective sensor input circuit)?	Replacement of control PCB	
E57		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Operation status	• Shortage in refrigerant quantity	Repair	243
							Installation status	• Service valve closing operation	Service valve opening check	
E59		Stays OFF	Keeps flashing	5 time flash	Keeps flashing	Stays OFF	Compressor inverter PCB	• Anomalous compressor startup	Replacement	246-249

Note (1) * mark in the description of trouble means that, in ordinary diagnosis, it cannot identify the cause definitely, and, if the trouble is repaired by replacing the part, it is judged consequently that the replaced part was defective.

3) FDC200, 250VSA

Remote control		Indoor control PCB		Outdoor control PCB		Outdoor inventer PCB	Location of trouble	Description of trouble	Repair method	Reference page
Error code	Red LED	Red LED	Green LED (1)	Red LED	Green LED (1)	Yellow LED				
E35		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	Keeps flashing	Installation or operating condition	• Higher outdoor heat exchanger temperature	Repair	216
							Outdoor heat exchanger temperature sensor	• Defective outdoor heat exchanger temperature sensor	Replacement of temperature sensor	
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E36		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Installation or operating condition	• Higher discharge temperature	Repair	217
							Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor	Replacement, repair of temperature sensor	
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E37		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Outdoor heat exchanger temperature sensor	• Defective outdoor heat exchanger temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	218
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E38		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Outdoor air temperature sensor	• Defective outdoor air temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	219
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E39		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Discharge pipe temperature sensor	• Defective discharge pipe temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	220
							Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature sensor input circuit)?	Replacement of PCB	
E40		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Installation or operating condition	• Rising high pressure (Operation of 63H1) • Service valve closing operation	Repair	222
							Outdoor control PCB	*• Defective outdoor control PCB (Defective 63H input circuit)?	Replacement of PCB	
E41		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	2-time or 8-time flash	Inverter PCB or radiator fin	• Power transistor overheat	Replacement of PCB or Repair	224
E42		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	1-time or 9-time flash	Outdoor control PCB compressor	• Current cut (Anomalous compressor over-current)	Replacement of PCB	225・226
							Installation or operating condition	• Service valve closing operation	Repair	
E45		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	Keeps flashing	Outdoor control PCB	• Anomalous outdoor control PCB communication	Service valve opening check	227
							Inverter PCB	• Anomalous inverter PCB communication	Replacement of PCB	
E48		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Outdoor fan motor	• Anomalous outdoor fan motor	Replacement, repair	232
							Outdoor control PCB	*• Defective outdoor control PCB (Defective motor input circuit)?	Replacement of PCB	
E49		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Installation or operating condition	• Low pressure error • Service valve closing operation	Repair	234・235
							Low pressure sensor	• Anomalous low pressure, broken wire of low pressure sensor or poor connector connection	Replacement, repair of sensor	
							Outdoor control PCB	*• Defective outdoor control PCB (Defective sensor input circuit)?	Replacement of control PCB	
E51		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	2-time or 8-time flash	Inverter PCB	• Anomalous inverter PCB	Replacement of PCB	238
E53		Stays OFF	Keeps flashing	1-time flash	Keeps flashing	Keeps flashing	Suction pipe temperature sensor	• Defective suction pipe temperature sensor, broken wire or poor connector connection	Replacement, repair of temperature sensor	239
							Outdoor control PCB	*• Defective outdoor PCB (Defective sensor input circuit)?	Replacement of control PCB	
E54		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Low pressure sensor	• Defective low pressure sensor	Replacement of sensor	240
							Outdoor control PCB	• Defective outdoor control PCB (Defective sensor input circuit)?	Replacement of control PCB	
E55		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Compressor under dome temperature sensor	• Defective compressor under dome temperature sensor (Model FDC250 only)	Replacement of temperature sensor	241
							Outdoor control PCB	• Defective outdoor control PCB (Defective sensor input circuit)? (Model FDC250 only)	Replacement of control PCB	
E57		Stays OFF	Keeps flashing	1-time flash	Keeps flashing		Operation status	• Shortage in refrigerant quantity	Repair	243
							Installation status	• Service valve closing operation	Service valve opening check	
E59		Stays OFF	Keeps flashing	5-time flash	Keeps flashing	4-time flash	Compressor inverter PCB	• Anomalous compressor startup	Replacement	250・251

Note (1) * mark in the description of trouble means that, in ordinary diagnosis, it cannot identify the cause definitely, and, if the trouble is repaired by replacing the part, it is judged consequently that the replaced part was defective.

(iii) Option control in-use

		Indoor unit control PCB		Outdoor unit control PCB		Description of trouble	Repair method
Error code	Red LED	Red LED	Green LED	Red LED	Green LED		
E75	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Keeps flashing	• Communication error (Defective communication circuit on the main unit of SC-SL2NA-E or SC-SL4-AE/BE) ete.	Replacement

(iv) Display sequence of error codes or inspection indicator lamps

■ **Occurrence of one kind of error**

Displays are shown respectively according to errors.

■ **Occurrence of plural kinds of error**

Section	Category of display
Error code on remote control	• Displays the error of higher priority (When plural errors are persisting)
Red LED on indoor control PCB	E1>E5>·····>E10>E32>·····E60
Red LED on outdoor control PCB (1)	• Displays the present errors. (When a new error has occurred after the former error was reset.)

■ **Error detecting timing**

Section	Error description	Error code	Error detecting timing
Indoor	Drain trouble (Float switch activated)	E9	Whenever float switch is activated after 30 seconds had past since power ON.
	Communication error at initial operation	"WAIT"	No communication between indoor and outdoor units is established at initial operation.
	Remote control communication circuit error	E1	Communication between indoor unit and remote control is interrupted for more than 2 minutes continuously after initial communication was established.
	Communication error during operation	E5	Communication between indoor and outdoor units is interrupted for more than 2 minutes continuously after initial communication was established.
	Excessive number of connected indoor units by controlling with one remote control	E10	Whenever excessively connected indoor units is detected after power ON.
	Return air temperature sensor anomaly	E7	-50°C or lower is detected for 5 seconds continuously within 60 minutes after initial detection of this anomalous temperature.
	Indoor heat exchanger temperature sensor anomaly	E6	-50°C or lower is detected for 5 seconds continuously within 60 minutes after initial detection of this anomalous temperature. Or 70°C or higher is detected for 5 seconds continuously
Outdoor	Outdoor air temperature sensor anomaly	E38	-45(-55)°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature. Or -45(-55)°C or lower is detected for 5 seconds continuously within 20 seconds after compressor ON.
	Outdoor heat exchanger temperature sensor anomaly	E37	-50(-55)°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature. Or -50(-55)°C or lower is detected for 5 seconds continuously within 20 seconds after compressor ON.
	Discharge pipe temperature sensor anomaly	E39	-10(-25)°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.
	Suction pipe temperature sensor anomaly	E53	-50°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.
	Low pressure sensor anomaly	E54	0V or lower or 4.0V or higher is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous pressure.
	Compressor under dome temperature sensor anomaly	E55	-50°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.

Note (1) Value in ( ) are for the models SRC40-60.

■ **Error log and reset**

Error indicator	Memorized error log	Reset
Remote control display	• Higher priority error is memorized.	• Stop the unit by pressing the ON/OFF switch of remote control. • If the unit has recovered from anomaly, it can be operated.
Red LED on indoor control PCB	• Not memorized.	
Red LED on outdoor control PCB	• Memorizes a mode of higher priority.	

■ **Resetting the error log**

• Resetting the memorized error log in the remote control

Holding down "CHECK" button, press "TIMER" button to reset the error log memorized in the remote control.

• Resetting the memorized error log in the indoor unit

The remote control transmits error log erase command to the indoor unit when "VENTI" button is pressed while holding down "CHECK" button.

Receiving the command, the indoor unit erase the log and answer the status of no error.

(2) Troubleshooting procedure

When any trouble has occurred, inspect as follows. Details of respective inspection method will be described on later pages.

Trouble → Confirmation of power source (Indoor/ outdoor unit) → Confirmation of remote control and LEDs on the PCB of indoor unit and outdoor unit (Indoor/ outdoor unit, remote control) → Check of the anomalous operation data on the remote control → Inspection of the unit/ control → Replacement/ repair of faulty part, test run, adjustment

(3) Troubleshooting at the indoor unit

(a) FDT series

With the troubleshooting, find out any defective part by checking the voltage (AC, DC), resistance, etc. at respective connectors at around the indoor PCB, according to the inspection display or operation status of unit (the compressor does not run, fan does not run, the 4-way valve does not switch, etc.), and replace or repair in the unit of following part.

(i) Replacement part related to indoor PCB's

Control PCB, power source PCB, temperature sensor (return air, indoor heat exchanger), remote control switch, limit switch, transformer and fuse

Note (1) With regard to parts of high voltage circuits and refrigeration cycle, judge it according to ordinary inspection methods.

(ii) Instruction of how to replace indoor control PCB

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the replacement in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, WARNING and CAUTION.
  Both mentions the important items to protect your health and safety so strictly follow them by any means.

⚠ WARNING	Wrong installation would cause serious consequences such as injuries or death.
⚠ CAUTION	Wrong installation might cause serious consequences depending on circumstances.

- After completing the replacement, do commissioning to confirm there are no anomaly.

⚠ WARNING

- Replacement should be performed by the specialist.
  If you replace the PCB by yourself, it may lead to serious trouble such as electric shock or fire.
- Replace the PCB correctly according to these instructions.
  Improper replacement may cause electric shock or fire.
- Shut off the power before electrical wiring work.
  Replacement during the applying the current would cause the electric shock, unit failure or improper running.
  It would cause the damage of connected equipment such as fan motor,etc.
- Fasten the wiring to the terminal securely, and hold the cable securely so as not to apply unexpected stress on the terminal.
  Loose connections or hold could result in abnormal heat generation or fire.
- Check the connection of wiring to PCB correctly before turning on the power, after replacement.
  Defectiveness of replacement may cause electric shock or fire.

⚠ CAUTION

- In connecting connector onto the PCB, connect not to deform the PCB. It may cause breakage or malfunction.
- Insert connecter securely, and hook stopper. It may cause fire or improper running.
- Bundle the cables together so as not to be pinched or be tensioned. It may cause malfunction or electric shock for disconnection or deformation.

1) Model FDT series

a) Replace the control PCB

i) Unscrew terminal (Arrow A) of the "E1" wiring (yellow/green) that is connected to PCB.

ii) Replace the PCB only after all the wirings connected to the connector are removed.

iii) Fix the board such that it will not pinch any of the wires.

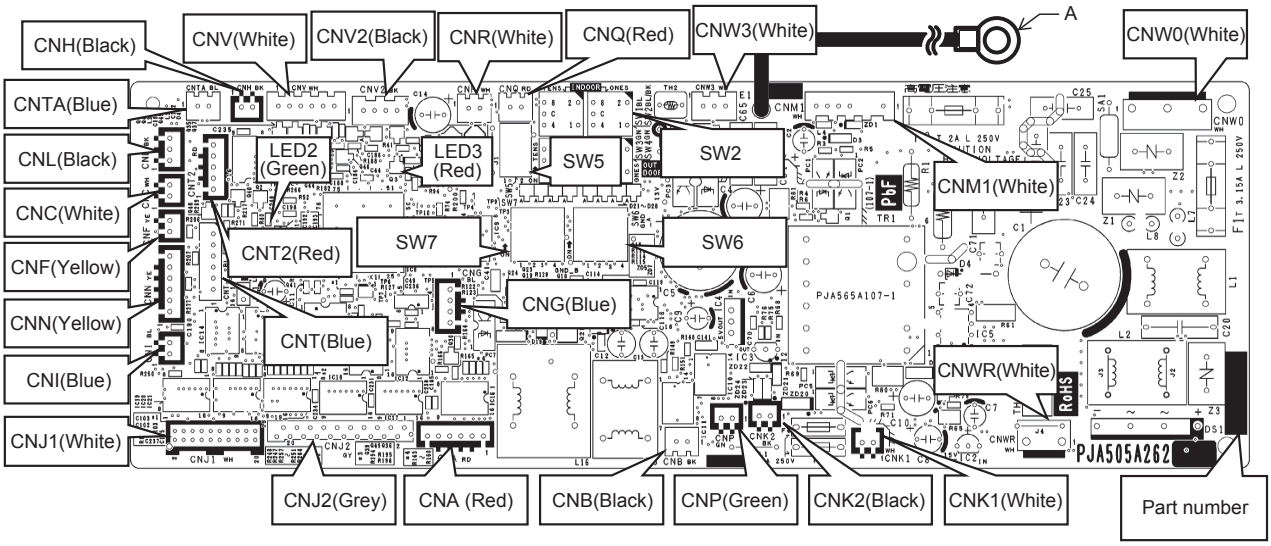
iv) Switch setting must be same setting as that of the removed PCB.

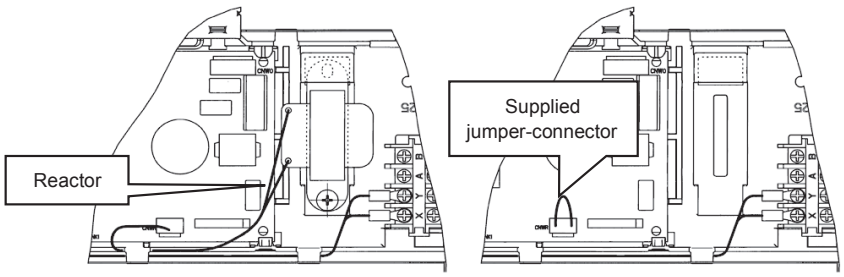
v) Reconnect the all wirngs to the PCB, that was removed in ii).

vi) Rescrew the terminal (Arrow A) of the "E1" wiring, that was removed in i).

vii) When there is no wire to connect to CNWR, connect the supplied jumper-connector. (Refer to Fig.2) If nothing is connected to CNWR, it doesn't work even when power is turned on.

b) Control PCB (※Parts mounting are different by the kind of PCB.)





Equipped with reactor Fig.2 Equipped without reactor

PSC012D050A C

●DIP switch setting list

Switch	Description		Default setting		Remark
SW2	Address No. setting at plural indoor units control by 1 R/C		0		0-F
SW5-1	Master/Slave setting	Master*/Slave	OFF		See table 2.
SW5-2			OFF		
SW6-1	Model selection		As per model		See table 1.
SW6-2					
SW6-3					
SW6-4					
SW7-1	Test run, drain motor	Normal*/Test run	OFF	Normal	
SW7-2	Reserved		OFF		Keep OFF
SW7-3	Reserved		OFF		Keep OFF
SW7-4	Reserved		OFF		Keep OFF
JSL1	Superlink terminal spare	Normal*/switch to spare	With		

* Default setting

Table 1: Indoor unit model selection with SW6-1-SW6-4

Switch	40VH	50VH	60VH
SW6-1	ON	ON	ON
SW6-2	ON	OFF	ON
SW6-3	OFF	ON	ON
SW6-4	OFF	OFF	OFF

Table 2: Indoor unit Master/Slave setting with SW5-1,SW5-2

Switch	SW5-1	SW5-2
Master	OFF	OFF
Slave1	OFF	ON
Slave2	ON	OFF
Slave3	ON	ON

(4) Troubleshooting at the outdoor unit

When troubleshooting the outdoor unit, firstly assess the overview of malfunction and try to presume the cause and the faulty part by checking the error code dispalyed on the remote control and flashing pattern of indicator lamps (Red LED and Green LED), and then proceed further inspection and remedy it.

Self-diagnosis system by microcomputor on indoor unit and outdoor unit PCB can assist to find the cause of malfunction smoothly by making a diagnosis of not only the anomaly of microcomputer, but also the anomaly in power source system, installation space, overload resulting from improper charging amount of refrigerant and etc.

Unless the power is reset, the error log is saved in memory and the inspection indicator lamps on outdoor unit PCB keep flashing after automatical recovering from malfunction.

After automatical recovering from malfunction, if any another error mode which has a higher priority than the previous error saved in memory occurs, it is overwritten in memory and is displayed.

[Reset of power source]

Be sure to avoid electrical shock, when replacing or checking the outdoor unit control PCB, because some voltage is still retained in the electrolytic capacitor on the PCB even after shutting down the power source to the outdoor unit.

Be sure to start repairing work, after confirming that the red LED or green LED on the PCB has been extiguished for more than 10 seconds after more than 3 minutes had been passed since power shut down, and reconfirming that voltage has been discharged sufficiently by measuring the voltage (DC) between both terminals of electrolytic capacitor (C58) (Measurment of voltage may be disturbed by the moisture-proof coating. In such case, remove the coating and measure it by taking care of avoiding electrical shock)

Note(1) The red LED or green LED isn't installed on models FDC71-100VNP.

(a) Module of part to be replaced for outdoor unit control

Outdoor unit control PCB, Inverter PCB, Temperature sensor (of outdoor heat exchanger, discharge pipe, outdoor air, IPM, suction pipe and under dome), Fuses (for power source and control PCB), Noise filter, Capacitor and Reactor.

(b) Replacement procedure of outdoor control PCB

Precautions for Safety

- Since the following precaution is the important contents for safety, be sure to observe them.
  WARNING and CAUTION are described as follows:

⚠WARNING	Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to.
⚠CAUTION	Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.

⚠ WARNING

- Securely replace the PCB according to this procedure.
  If the PCB is incorrectly replaced, it will cause an electric shock or fire.
- Be sure to check that the power source for the outdoor unit is turned OFF before replacing the PCB. The PCB replacement under current-carrying will cause an electric shock or fire.
- After finishing the PCB replacement, check that wiring is correctly connected with the PCB before power distribution. If the PCB is incorrectly replaced, it will cause an electric shock or fire.

⚠ CAUTION

- Band the wiring so as not to tense because it will cause an electric shock.

PCA012D049A A

(i) Model FDC71VNX

1) Replace the PCB **after elapsing 3 minutes from power OFF.** **(Be sure to measure voltage (DC)** between T26 and T27 on inverter PCB, and **check that the voltage is discharged sufficiently(10V or less)**.(Refer to Fig.2))
2) Disconnect the connectors from the control PCB.
3) Match the switches setting (SW4) with the former PCB.
4) Connect the connectors to the control PCB.(Confirm the **connectors are not half inserted**.)

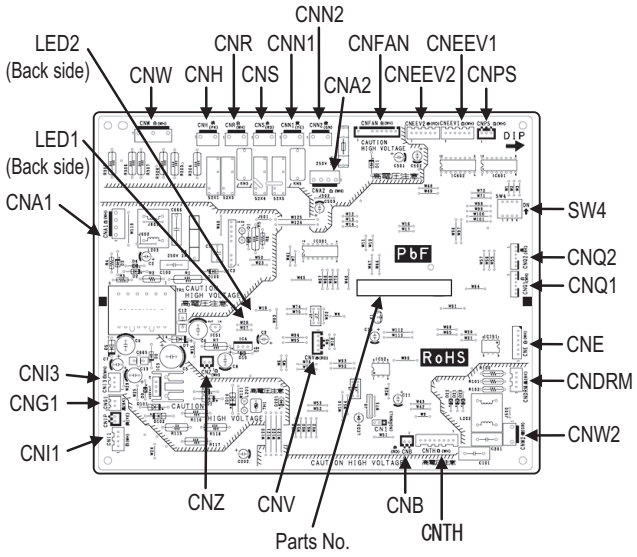


Fig.1 Parts arrangement view

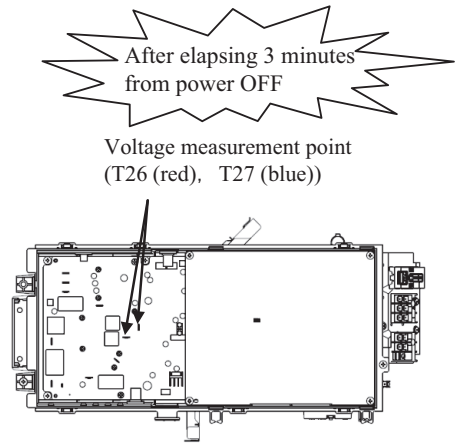


Fig.2 Position of terminal

*Presence and shape of electric component may vary according to model.

Connectors are not
half inserted

PCA012D043 C

(ii) Models FDC100VNX, 125VNX, 140VNX
FDC100VSX, 125VSX, 140VSX

1) Replace the PCB **after elapsing 3 minutes from power OFF**.
(**Be sure to measure voltage (DC)** on both capacitor terminals located in control back, and **check that the voltage is discharged sufficiently**.)
2) Disconnect the connectors from the control PCB.
3) Disconnect the white wiring passing through CT1 on the PCB before replacing the PCB.
4) Match the setting switches (SW3-5, JSW) with the former PCB.
5) Tighten up a screw after passing white wiring through CT1 of the changed.
6) Connect the connectors with the control PCB referring to the parts arrangement of Fig.1.
(Confirm the **connectors are not half inserted**.)

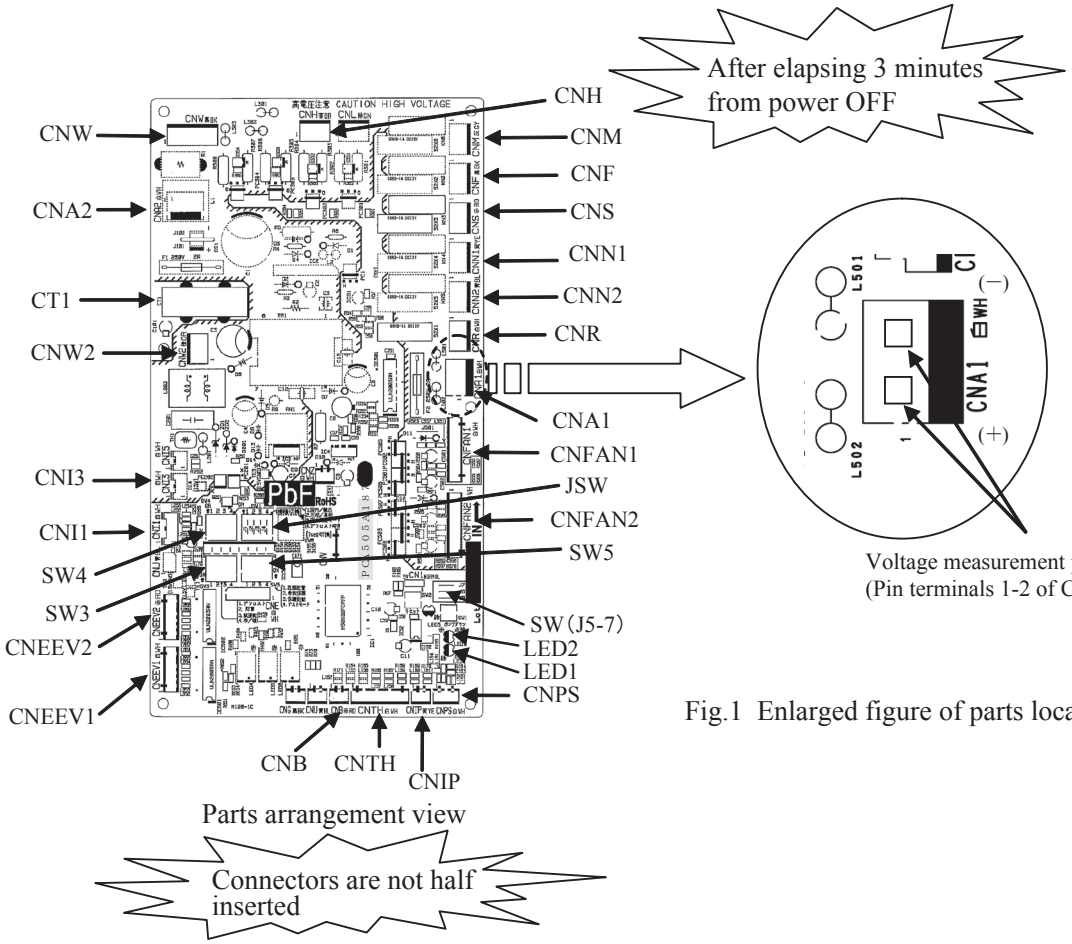


Fig.1 Enlarged figure of parts location

PCA012D083 Ⓐ

(iii) Models FDC100VNA, 125VNA, 140VNA

1) Disassembly

a) After the breaker is shut down, remove the service panel, top panel and rear panel. (Refer to Fig.1).

b) Don't touch the main PCB until three minutes have passed after the breaker is shut doun.
(After having shut down the breaker, some capacitor is held by high voltage. It is very dangerous to touch the main PCB in this condition.)
In the situation that hamesses are connected to main PCB, **be sure to measure voltage (DC)** on main PCB, and **check that the voltage is discharged sufficientlv (DC voltage 30 V or less).** (Refer to Fig.2)

c) Disconnect the connectors, faston terminals and round terminals from the main PCB as shown in Fig.2.
And then remove the fixing screws (3 places) as shown in Fig.3.
After removing the main PCB, wipe off the heat conduction sheet neatly from the copper plate.

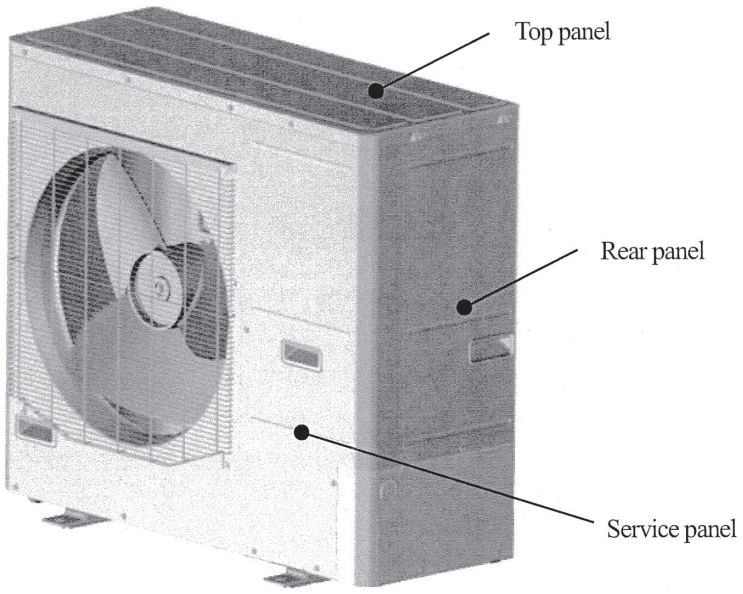


Fig.1 Outdoor unit overall view

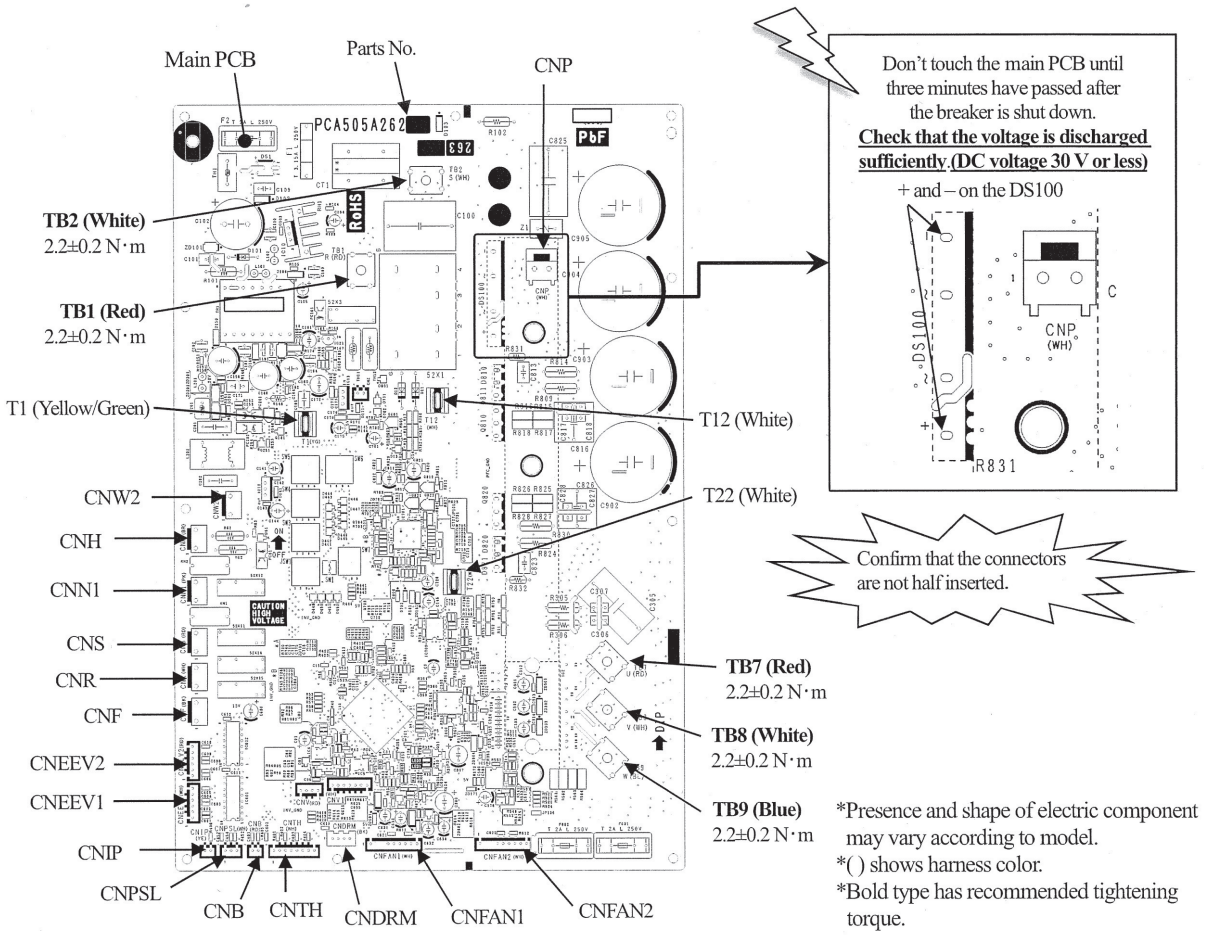


Fig.2 Parts arrangement view of main PCB and voltage measurement points

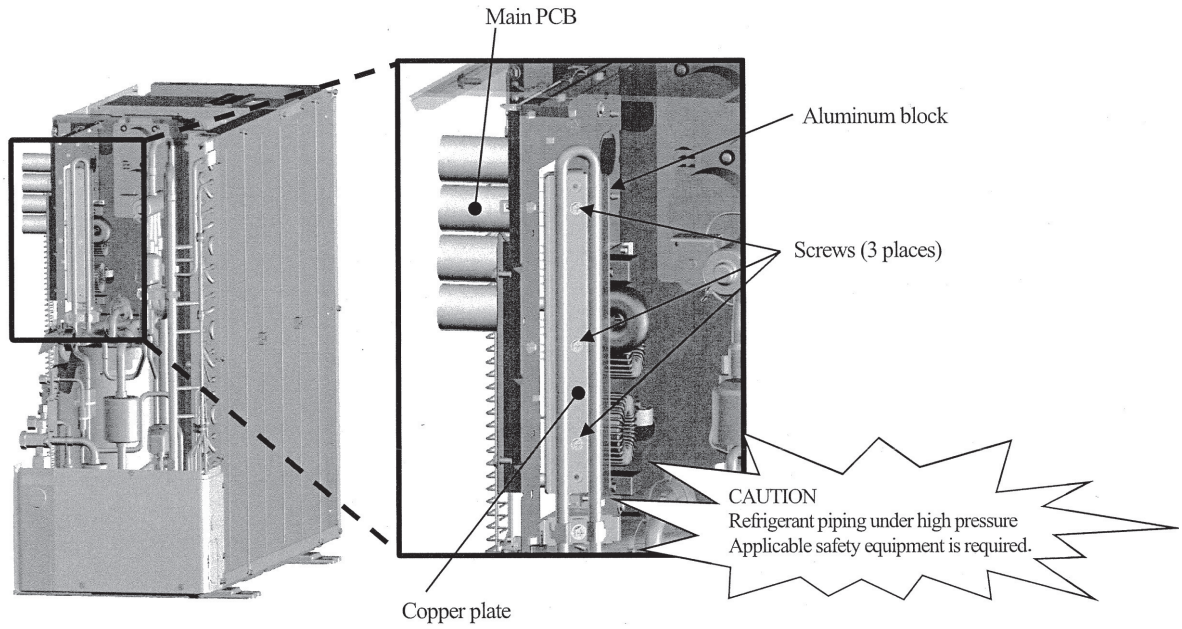


Fig.3 Outdoor unit side view

2) Exchange

a) Match the setting of new main PCB switches (JSW1, SW3-7) with former main PCB. (Refer to Fig.4)

b) Tum over the separator of new heat conduction sheet and paste the heat conduction sheet on the aluminum block. (Refer to Fig.5)

c) Install the attached hamess clip on the new main PCB as shown in Fig.6.

3) Installation

a) Install the new main PCB on the control and tighten the screw as shown in Fig.7.

b) Reconnect the connectors, faston terminals and round terminals to the main PCB as before. (Refer to Fig.2) (Confirm that the **connectors are not half inserted**.)

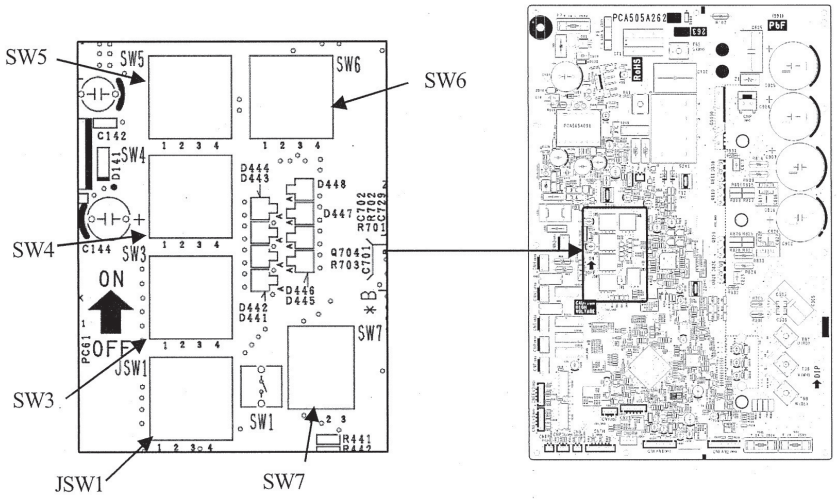


Fig.4 Switch position of main PCB

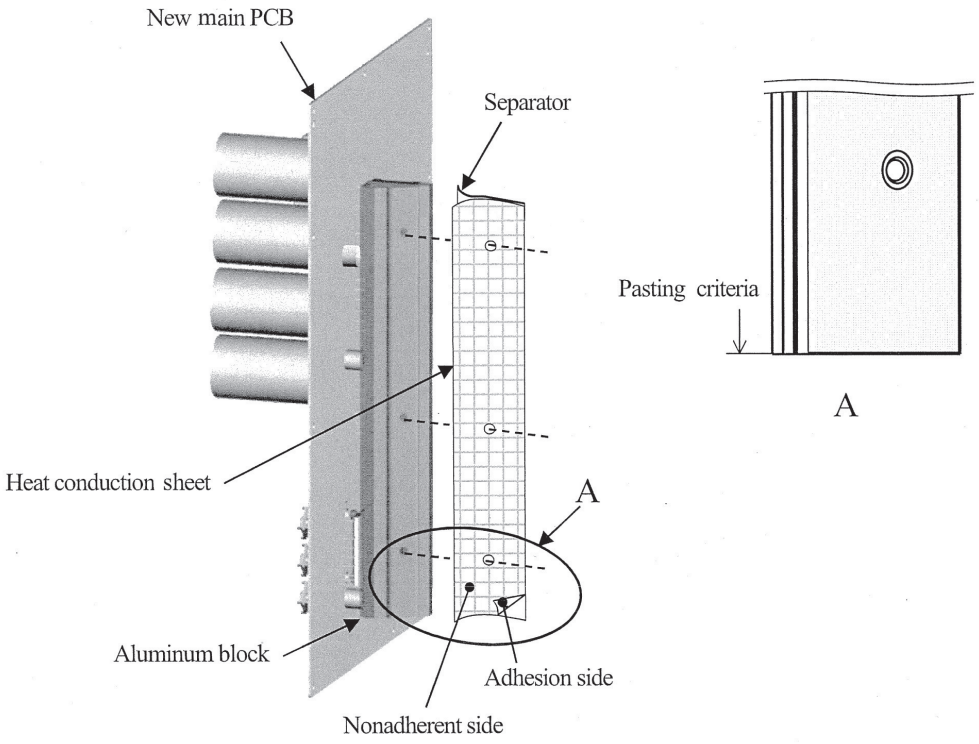


Fig.5 Detail of paste for the heat conduction sheet

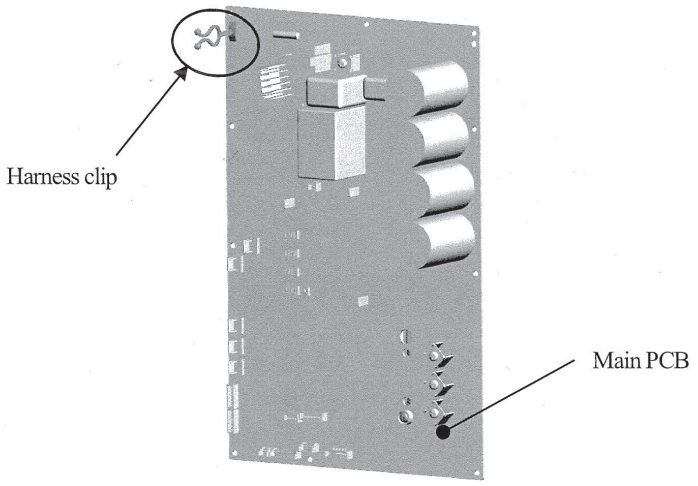


Fig.6 Install of the harness clip

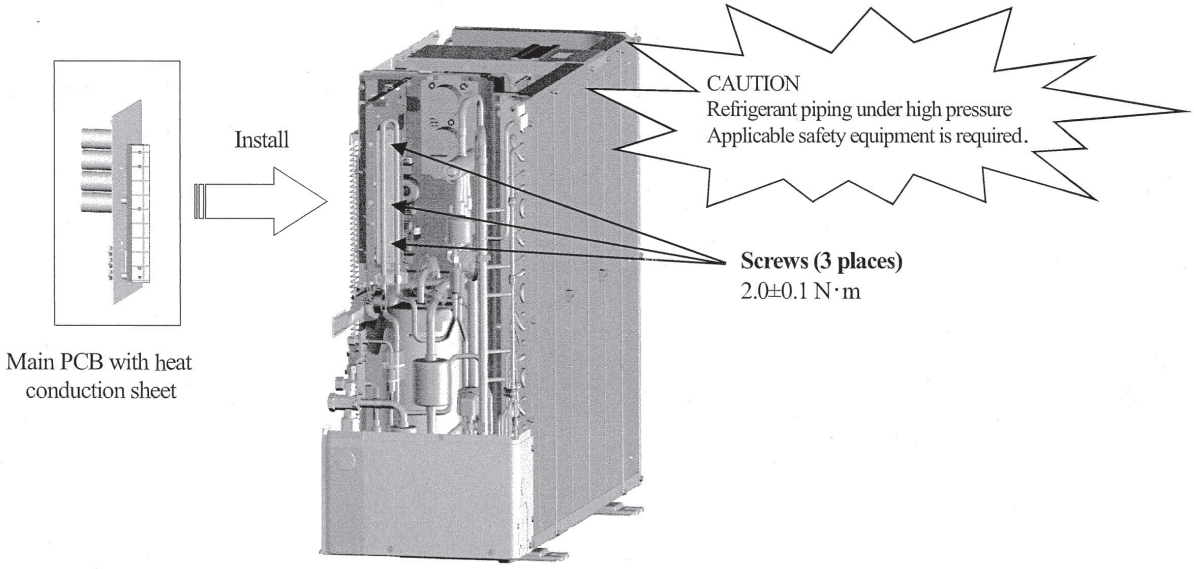
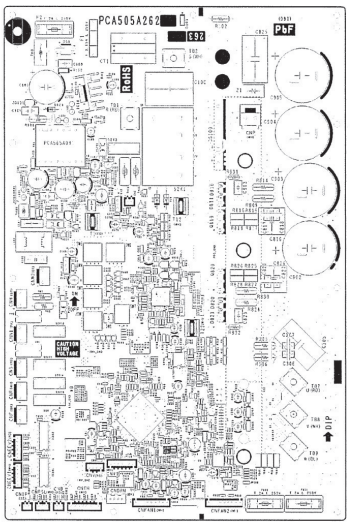


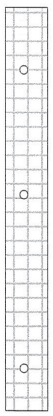
Fig.7 Install of the main PCB

●Accessories

Check the following accessories are packed in. (Except this manual)



Main PCB ×1



Heat conduction sheet
×1



Harness clip
×1

PCA012D084 Ⓐ

(iv) Models FDC100VSA, 125VSA, 140VSA

1) Disassembly

a) After the breaker is shut down, remove the service panel, top panel and rear panel. (Refer to Fig.1).

b) Don't touch the main PCB until three minutes have passed after the breaker is shut doun.
(After having shut down the breaker, some capacitor is held by high voltage. It is very dangerous to touch the main PCB in this condition.)
In the situation that hamesses are connected to main PCB, **be sure to measure voltage (DC)** on main PCB, and **check that the voltage is discharged sufficientlv (DC voltage 30 V or less).** (Refer to Fig.2)

c) Disconnect the connectors, faston terminals and round terminals from the main PCB as shown in Fig.2.
And then remove the fixing screws (3 places) as shown in Fig.3.
After removing the main PCB, wipe off the heat conduction sheet neatly from the copper plate.

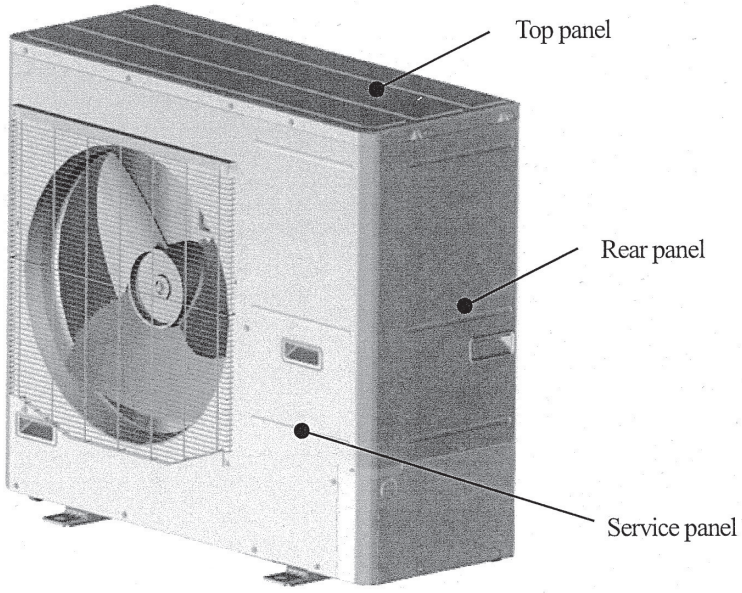


Fig.1 Outdoor unit overall view

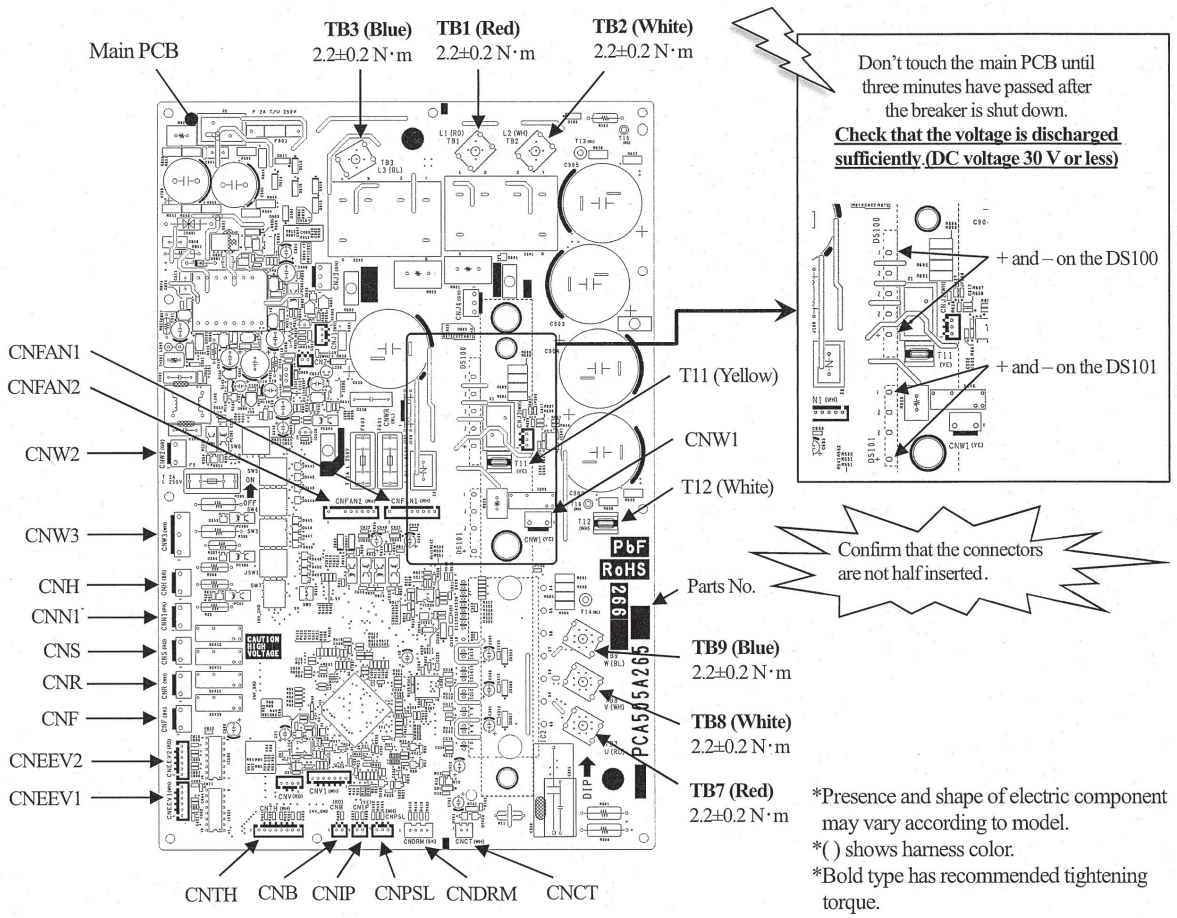


Fig.2 Parts arrangement view of main PCB and voltage measurement points

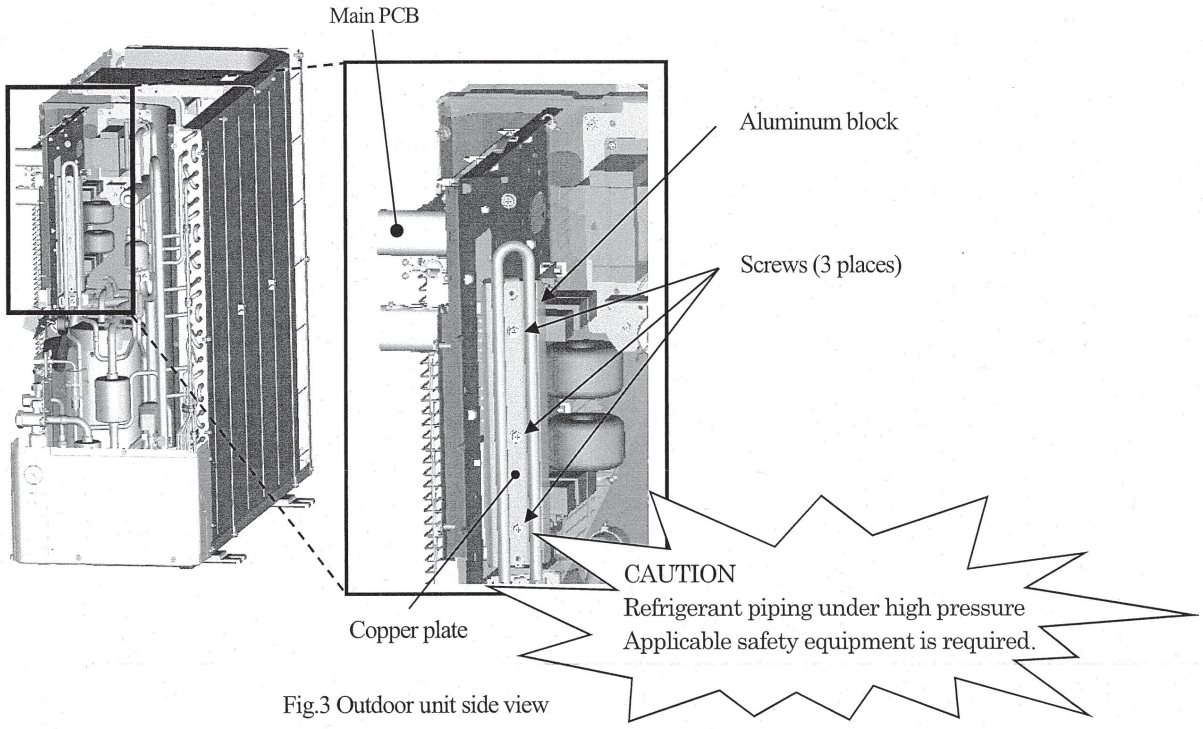


Fig.3 Outdoor unit side view

2) Exchange

a) Match the setting of new main PCB switches (JSW1, SW3-7) with former main PCB. (Refer to Fig.4)

b) Tum over the separator of new heat conduction sheet and paste the heat conduction sheet on the aluminum block. (Refer to Fig.5)

3) Installation

a) Install the new main PCB on the control and tighten the screw as shown in Fig.6.

b) After the new Main PCB is installed on the control, reconnect the connectors, faston terminals, and round terminals to the main PCB as before. (Refer to Fig.2)
(Confirm that the **connectors are not half inserted**.)

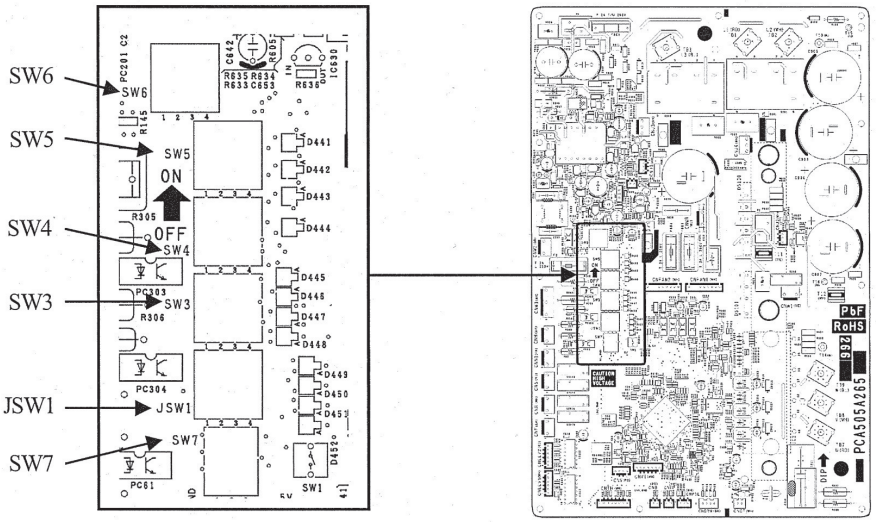


Fig.4 Switch position of main PCB

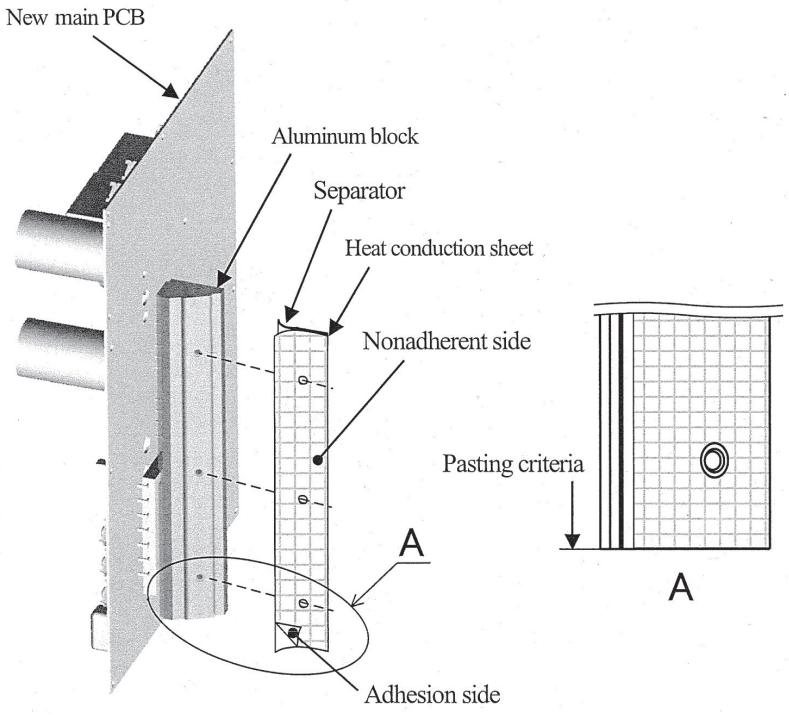


Fig.5 Detail of paste for the heat conduction sheet

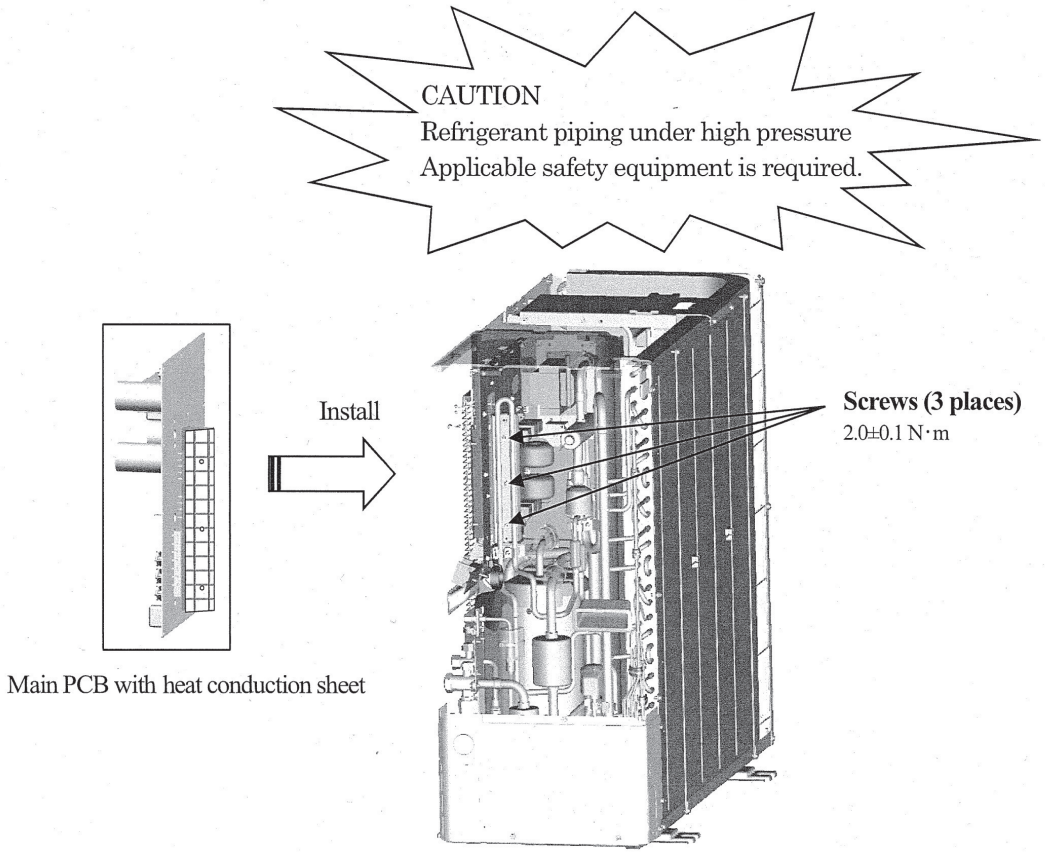
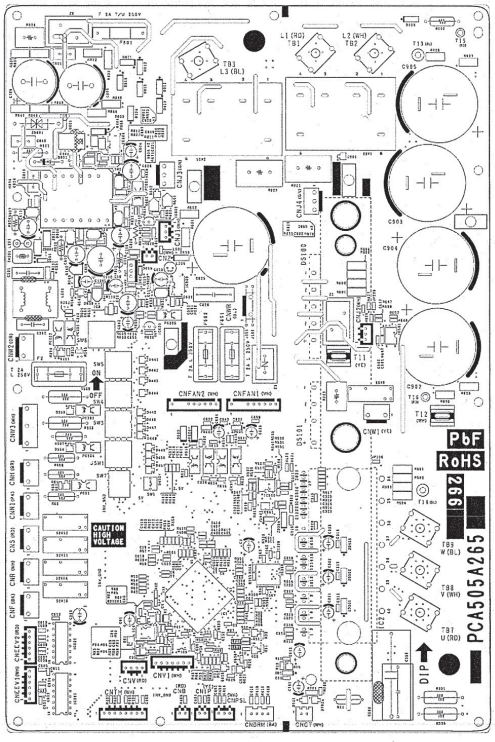


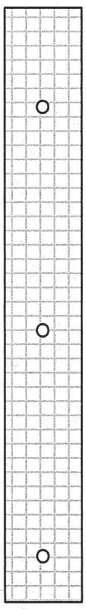
Fig.6 Installation of the main PCB

●Accessories

Check following accessories are packed in. (Except this manual)



Main PCB ×1



Heat conduction sheet ×1

PCA012D050

(v) Models FDC200VSA, 250VSA

Replace the control PCB according to the following procedure.

(i) Replace the PCB **after elapsing 3 minutes from power OFF.**

(ii) Measurement was done on both ends of connector (CNA1) during measurement, **the voltage(DC) might charged the electrolytic capacitor, be sure that the voltage is discharged sufficiently. (Refer to Fig.2)**

(iii) Disconnect the connectors from the control PCB.

(iv) Disconnect the white or blue wiring passing through CT1 on the PCB before replacing the PCB.

(v) Match the setting switches (SW3-5,7, JSW1) with the former PCB.

(vi) Tighten up a screw after passing white or blue wiring through CT1 of the changed.

(vii) Please connect the connectors with the same place. **(Confirm the connectors are not half inserted.)**

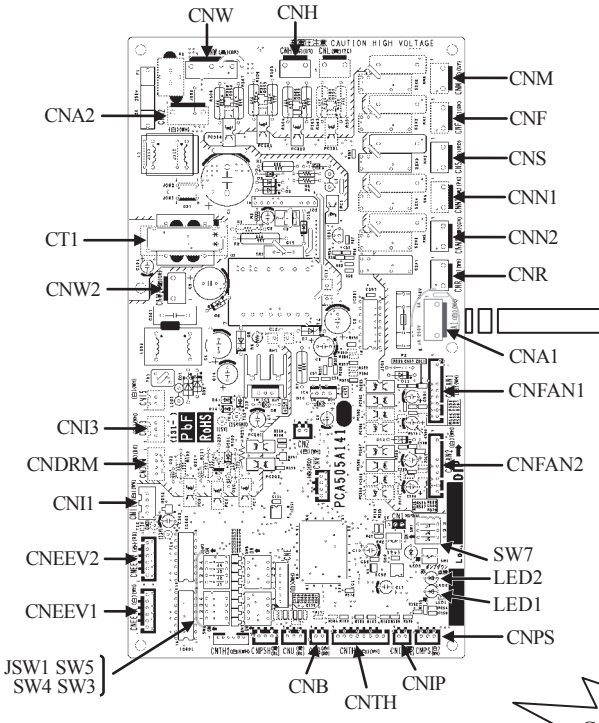


Fig.1 Parts arrangement view

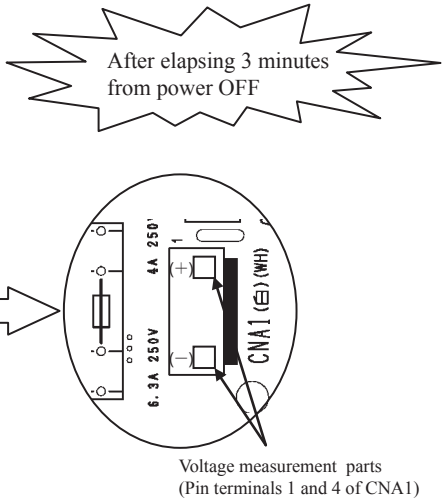
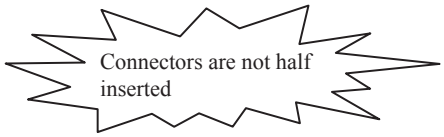


Fig.2 Enlarged figure of parts location



(c) Outdoor inverter PCB replacement procedure

Precautions for Safety

- Since the following precaution is the important contents for safety, be sure to observe them. WARNING and CAUTION are described as follows:

⚠ WARNING Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to.

⚠ CAUTION Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.

⚠ WARNING

- Securely replace the PCB according to this procedure. If the PCB is incorrectly replaced, it will cause an electric shock or fire.
- Be sure to check that the power source for the outdoor unit is turned OFF before replacing the PCB. The PCB replacement under current-carrying will cause an electric shock or fire.
- After finishing the PCB replacement, check that wiring is correctly connected with the PCB before power distribution. If the PCB is incorrectly replaced, it will cause an electric shock or fire.

⚠ CAUTION

- Band the wiring so as not to tense because it will cause an electric shock.

Replace the inverter PCB according to the following procedure.

(i) Model FDC71VNX

PCA012D067B

1) Replace the PCB **after elapsing 3 minutes from power OFF**.
(High voltage is retained on the capacitor after turning the power off. It is very dangerous to touch the PCB in this condition.)
In the situation that harnesses are connected to inverter PCB **be sure to measure voltage (DC)** between T26 and T27 on inverter PCB, and **check that the voltage is discharged sufficiently**. (Refer to Fig.2).
2) Disconnect the connectors and faston terminals from the inverter PCB as shown in Fig. 1.
3) Match the setting of switches (JSW10, 11) of new PCB with former PCB.
4) Remove the harness bands (3 places) from the control unit, then remove the fixing screws (4places) from the radiator. (Refer to Fig.3)
5) Remove the inverter PCB with radiator from the control unit, and exchange the inverter PCB with radiator. Be careful not to pinch the wiring at the time of exchanging.
6) Fix the radiator to the control unit by screws. After exchanging the inverter PCB, reconnect the connectors, faston terminals and the harnesses as before. (Confirm that the **connectors are not half inserted**.)
7) Attach the harness bands (3 places), then reconnect the harnesses as before.
8) Install the harness clip on the inverter PCB as shown in Fig.4, and fix the harness.

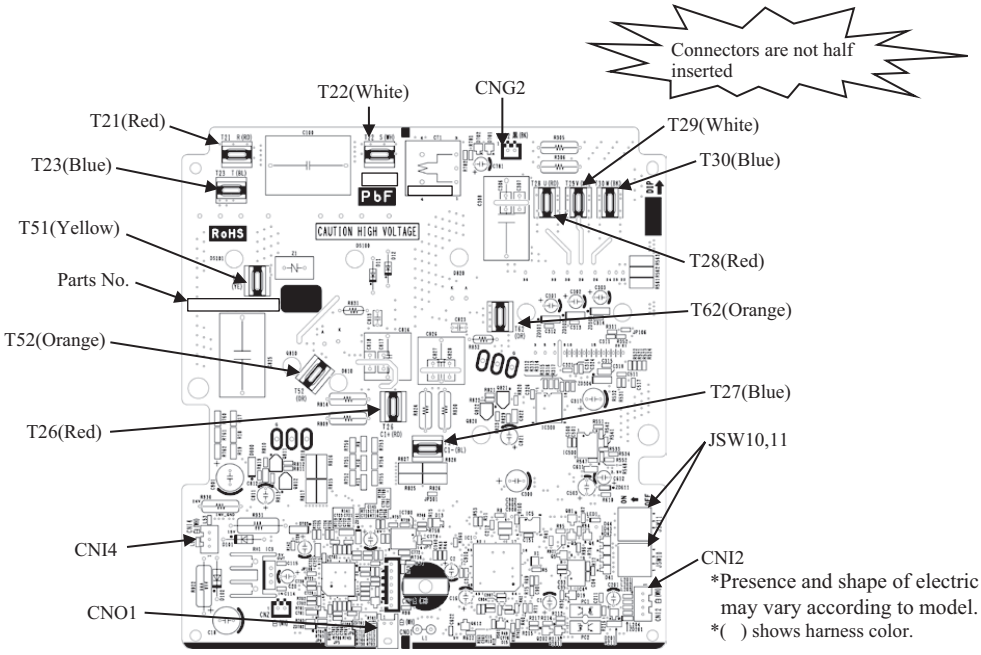


Fig.1 Parts arrangement view of inverter PCB

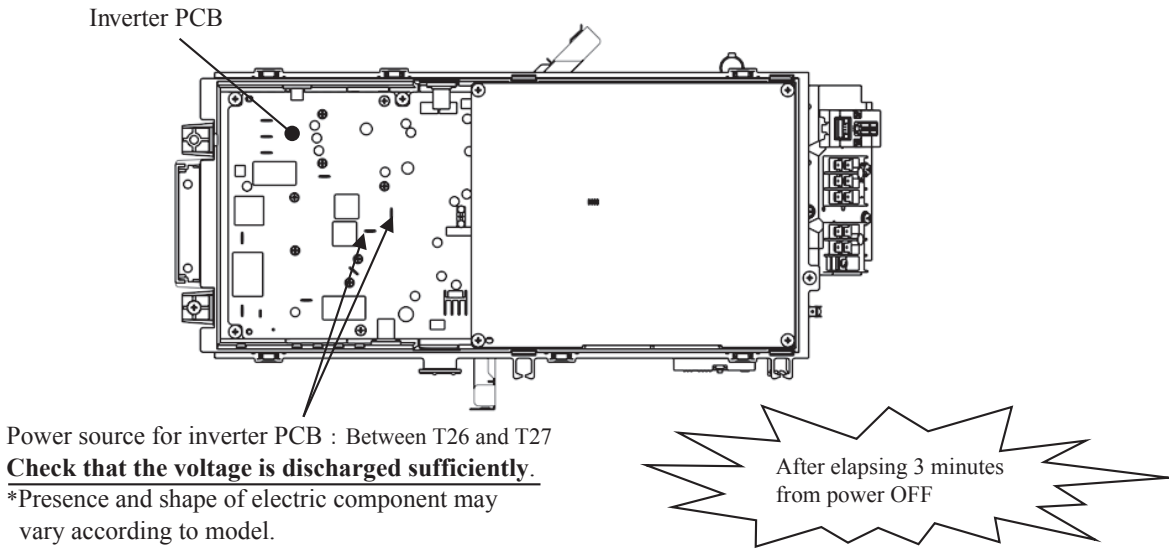


Fig.2 Voltage measurement points

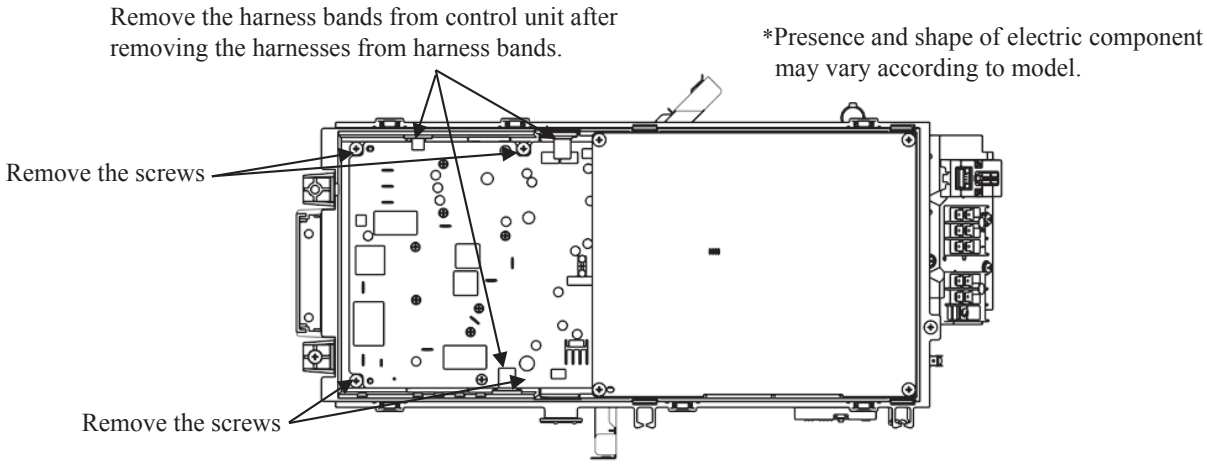


Fig.3 Target places where harness bands and screws are removed

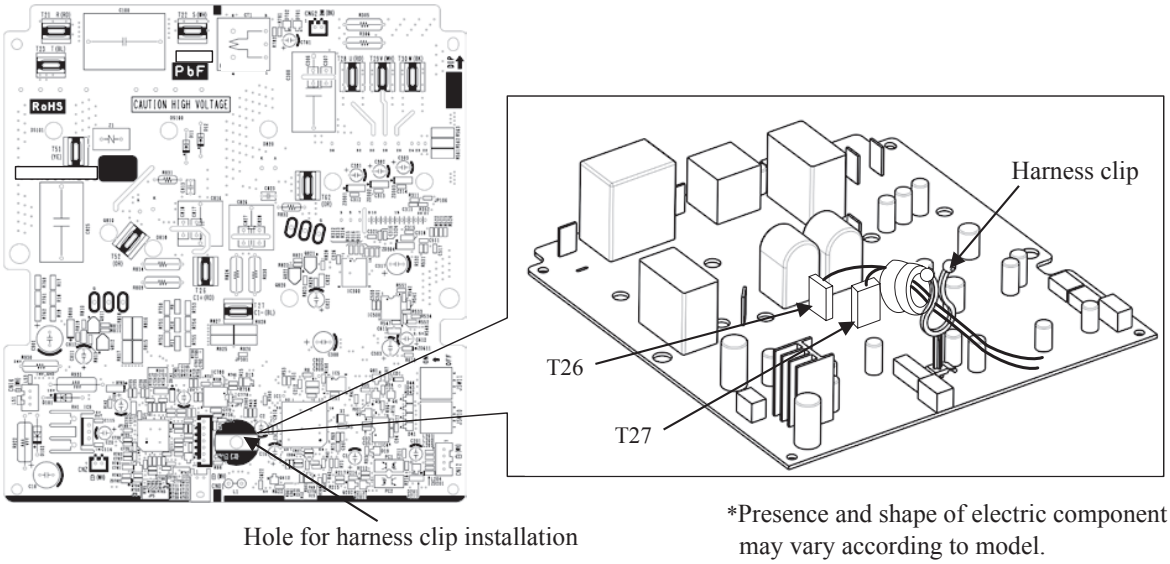
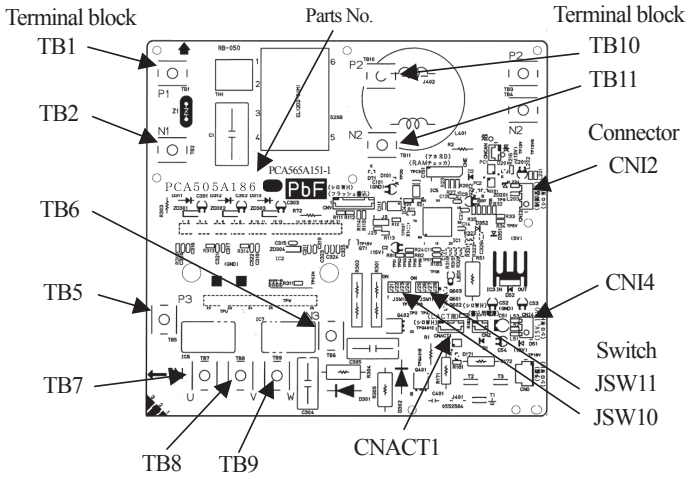


Fig.4 Fix the harness on the harness clip

PCA012D025D

(ii) Models FDC100VNX, 125VNX, 140VNX

1) Replace the PCB **after elapsing 3 minutes from power OFF.**
(**Be sure to measure voltage (DC)** on both capacitor terminals located in control back, and **check that the voltage is discharged sufficiently**.(Refer to Fig.1))
2) Take off the connection of inverter PCB terminal block connector and remove the screw of power transistor then remove the PCB. Wipe off the silicon grease neatly on the control's radiation heat fins.
3) Match the setting switches (JSW10,11) of new PCB with the former PCB.
4) Before installing the power transistor on the new PCB, apply uniformly a bundled of silicon grease first on the surface of power transistor.Make sure it is applied to prevent damage on power transistor.
5) Tighten the screw of power transistor on inverter PCB and connect the terminal block.Confirm the connection and don't use soldering in the connection.Tighten properly the power transistor with a screw and make sure there is no slack.Power transistor can be damage if not properly tighten.(Recommended power transistor tightening torque:0.98 – 1.47N·m)



Parts arrangement view

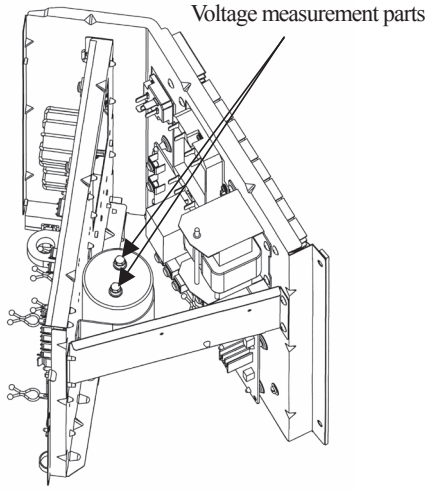


Fig.1 Position of capacitor

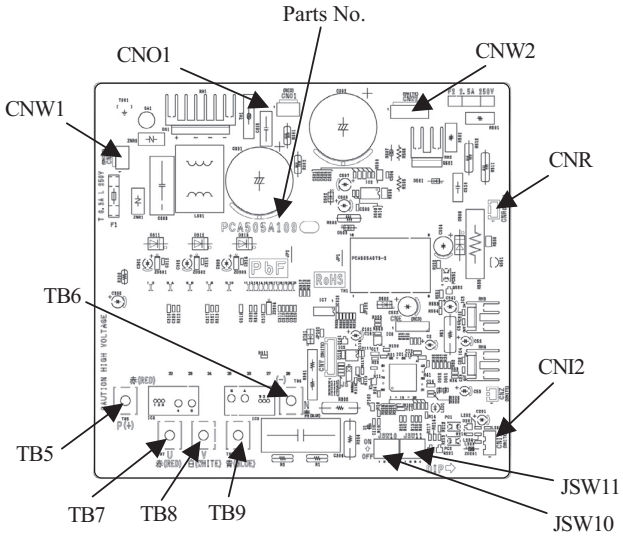
Table. 1 Switch setting
Models FDC100VNX, 125VNX, 140VNX

JSW10	-1	OFF	JSW11	-1	OFF
	-2	OFF		-2	OFF
	-3	OFF		-3	ON
	-4	OFF		-4	ON

PCA012D025F P

(iii) Models FDC100VSX, 125VSX, 140VSX

1) Replace the PCB **after elapsing 3 minutes from power OFF**.
(**Be sure to measure voltage (DC)** on both capacitor terminals located in control back, and **check that the voltage is discharged sufficiently**.(Refer to Fig.1))
2) Take off the connection of inverter PCB terminal block connector and remove the screw of power transistor then remove the PCB. Wipe off the silicon grease neatly on the control's radiation heat fins.
3) Match the setting switches (JSW10,11) of new PCB with the former PCB.
4) Before installing the power transistor on the new PCB, apply uniformly a bundled of silicon grease first on the surface of power transistor.Make sure it is applied to prevent damage on power transistor.
5) Tighten the screw of power transistor on inverter PCB and connect the terminal block.Confirm the connection and don't use soldering in the connection.Tighten properly the power transistor with a screw and make sure there is no slack.Power transistor can be damage if not properly tighten.(Recommended power transistor tightening torque:0.98 – 1.47N·m)



Parts arrangement view

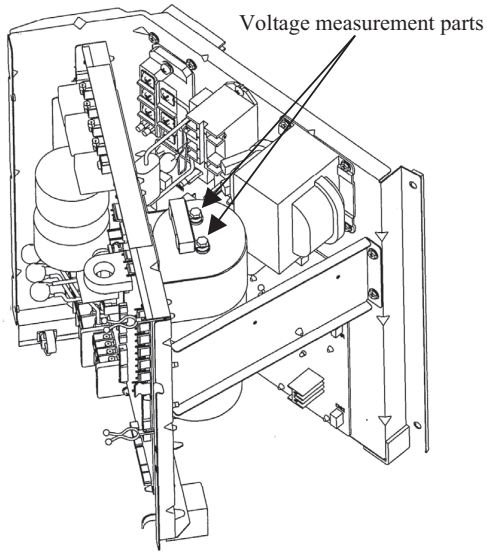


Fig.1 Position of capacitor

Table. 1 Switch setting

Models FDC100VSX, 125VSX, 140VSX

JSW10	-1	OFF	JSW11	-1	ON
	-2	OFF		-2	OFF
	-3	OFF		-3	ON
	-4	OFF		-4	ON

PCA012D063

(iv) Model FDC200VSA

Replace the inverter PCB (Fig.1) according to the following procedure.

1) Replace the inverter PCB **after elapsing 3 minutes from power OFF**.
(Be sure to measure **voltage (DC) of two places ((A) power source for fan motor (DC), (B) power source for inverter)**, and check that **the voltage is discharged sufficiently**.(Refer to Fig.2))

2) Take off the wirings and connectors of inverter PCB, the screws of power transistor. Then remove the PCB from the control. Wipe off the silicon grease neatly on the control's radiation fins.

3) Match the setting of switches (JSW10, 11) of new PCB with the former PCB.

4) Before installing the new PCB to the control, **apply the bundled silicon grease uniformly** on the surface of power transistor, and all use it up at that time. **The power transistor can be damaged**, if the silicon grease is not applied.

5) Tighten the screws of power transistor on inverter PCB and reconnect the wirings and connectors to inverter PCB. After connection, confirm **the screws are tightened and connectors are not half inserted**.
However, tighten the power transistor with the screws according to recommended tightening torque after tightening the screws temporarily once.
Power transistor can be damage if not tightened according to this procedure.
(Temporary tightening torque:0.20 − 0.44N・m, Recommended tightening torque:0.98 − 1.47 N・m)

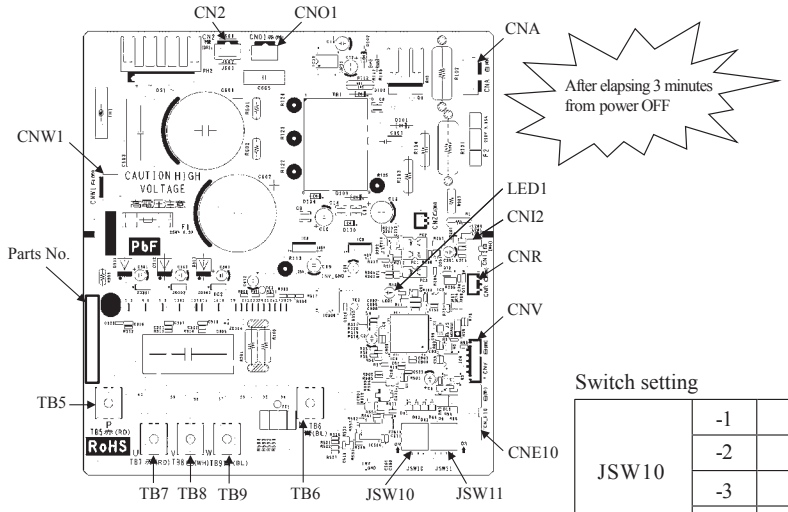


Fig.1 Parts arrangement view of inverter PCB

Switch setting

JSW10	-1	OFF	JSW11	-1	OFF
	-2	OFF		-2	OFF
	-3	OFF		-3	OFF
	-4	OFF		-4	OFF

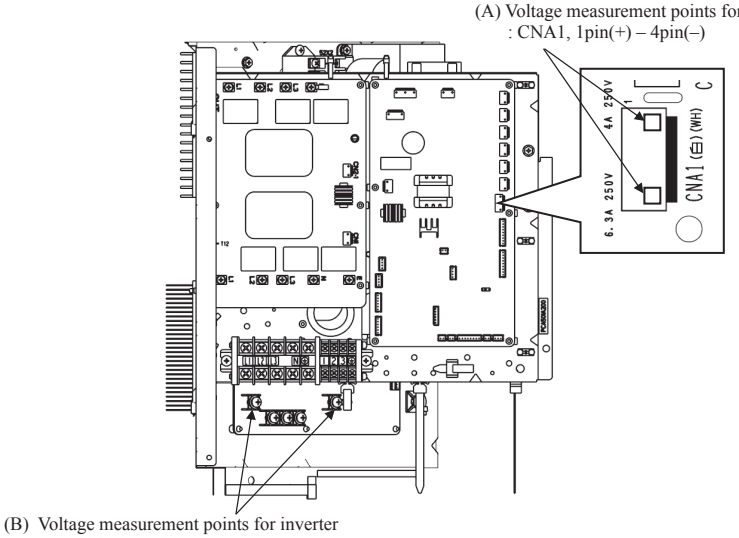


Fig.2 Voltage measurement points

PCB012D057A

(V) Model FDC250VSA

Replace the inverter PCB (Fig.1) according to the following procedure.

1) Replace the PCB **after elapsing 3 minutes from power OFF**.
2) In the situation that harnesses are connected to control PCB, **be sure to measure voltage (DC) of two places ((A), (B))** and check that **the voltage is discharged sufficiently**. (Refer to Fig.2)
3) Remove the harnesses from bands, clips and connectors on the control PCB. Then, remove the appointed screws (4 places) of a control. (Refer toFig.3)
4) Open main layer and **measure voltage (DC) of aplace (C)** and check that **the voltage is discharged sufficiently**. (Refer to Fig.4)
5) Disconnect connectors from the inverter PCB (Refer to Fig.1), remove a snubber capacitor (Refer to Fig.4) and harnesses ("P", "N" ,"U", "V" and "W"), and exchange the inverter PCB then. In the situation of being opening main layer, do not press the control from above. It will cause the product deformation or injury.
6) Match the setting of switches (JSW10, 11) of new PCB with former PCB.
7) After exchanging the inverter PCB, install the snubber capacitor to power transistor (Refer to Fig.5), and reconnect the connectors and the harnesses as before. (Confirm the **connectors are not half inserted**.)
   Be careful not to pinch the wiring at the time of closing main layer. The wiring is damaged, and it will cause a short circuit or fire.

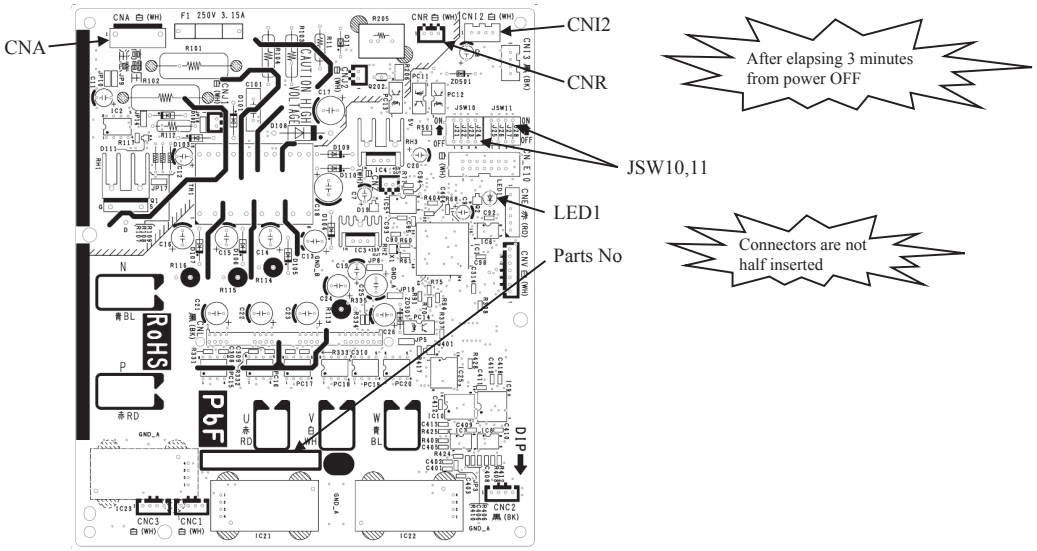


Fig.1 Parts arrangement view of inverter PCB

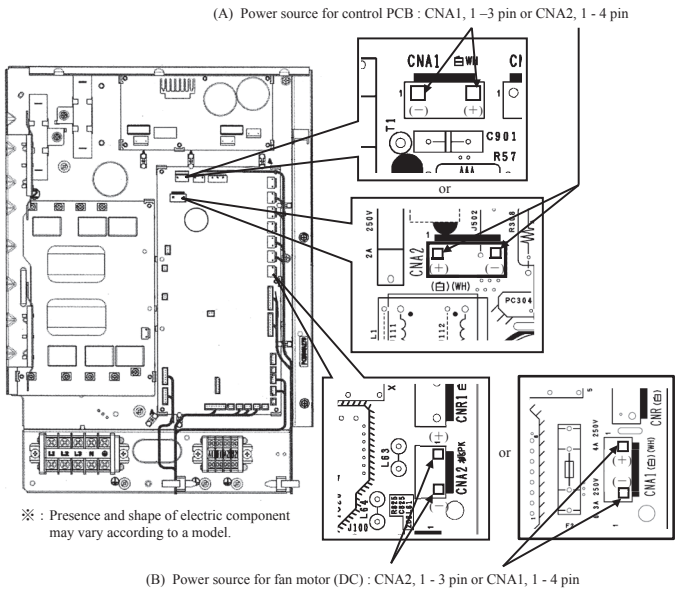


Fig.2 Voltage measurement points

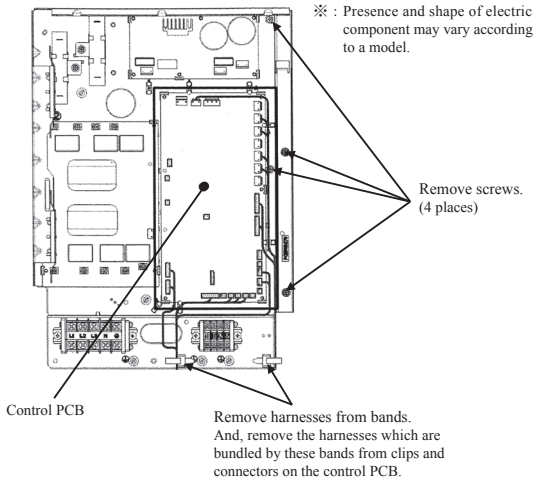


Fig.3 Target places which are removed harnesses and screws

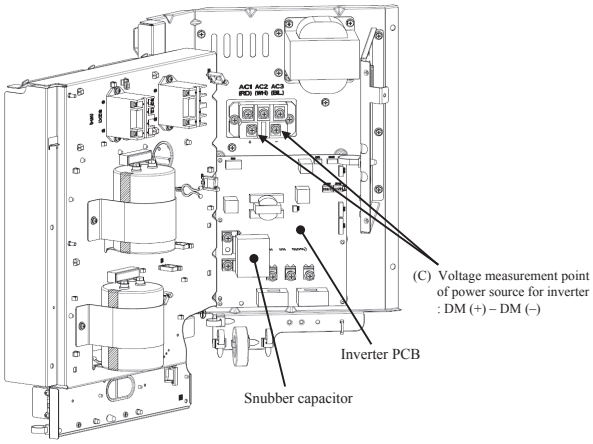
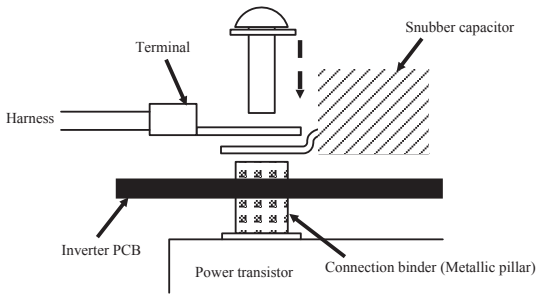


Fig.4 Installation place of inverter PCB



Procedure on tightening harness (Snubber capacitor) and power transistor with screw.
A metallic connection binder is set in each hole of the inverter PCB of "P", "N", "U", "V", and "W" beforehand.
Then tighten the harness (Snubber capacitor) and the power transistor with the screw together.
(Set the harness wires to be fixed to "U" and "W" with screws in respective holes after passing them through IC21 and 22.)
(Connect the snubber capacitor with "P" and "N".)

Fig.5 Installation method to power transistor

●DIP switch setting list (Outdoor unit)

Models FDC71, 100, 125, 140VNX, 100, 125, 140VSX

(1) Control PCB

(a) Model FDC71VNX

Switch	Description		Default setting		Remark
SW3-1	Defrost condition	Normal*/Cold region	OFF	Normal	
SW3-2	Snow protection control	Normal*/Snow protection	OFF	Normal	
SW3-3	Model selection	Cooling only/Heat pump*	OFF	Heat pump	Keep OFF
SW3-4	Defrost prohibition time	ON: 37min*/OFF: 45min	ON	37min.	
SW4-1	Model selection	Domestic/Overseas*	ON	Overseas	Keep ON
SW4-2	Model selection	3 phase/Single phase*	ON	Single phase	Keep ON
SW4-3	Reserved		OFF		Keep OFF
SW4-4	Reserved		OFF		Keep OFF
SW5-1	Model selection		OFF		Keep OFF
SW5-2	Model selection		OFF		Keep OFF
SW5-3	Test run SW	Normal*/Test run	OFF	Normal	
SW5-4	Test run mode	Cooling*/Heating	OFF	Cooling	
SW7-1	Reserved		OFF		Keep OFF
SW7-2	Reserved		OFF		Keep OFF
SW7-3	Reserved		OFF		Keep OFF
SW8-1	Reserved		OFF		Keep OFF
SW8-2	Reserved		OFF		Keep OFF
SW8-3	Reserved		OFF		Keep OFF
SW9	Pump down operation	Normal*/Pump down	OFF	Normal	

* Default setting

(b) Models FDC100, 125, 140VNX, 100, 125, 140VSX

Switch	Description		Default setting		Remark
SW1	Pump down operation	Normal*/Pump down	OFF	Normal	
JSW1-1 JSW1-2 JSW1-3 JSW1-4	Model selection		As per model		See table 1
SW3-1	Defrost condition	Normal*/Cold region	OFF	Normal	
SW3-2	Snow protection control	Normal*/Snow protection	OFF	Normal	
SW3-3	Test run SW	Normal*/Test run	OFF	Normal	
SW3-4	Test run mode	Cooling*/Heating	OFF	Cooling	
SW4-1	Model selection	Domestic/Overseas*	ON	Overseas	See table 1
SW4-2	Model selection	3 phase/Single phase	As per model		See table 1
SW4-3	Reserved		OFF		Keep OFF
SW4-4	Reserved		ON		Keep ON
SW5-1	Reserved		OFF		Keep OFF
SW5-2	Reserved		OFF		Keep OFF
SW5-3	Reserved		OFF		Keep OFF
SW5-4	Reserved		OFF		Keep OFF

* Default setting

Table 1: Outdoor unit model selection with JSW1-1-JSW1-4 and SW4-1-SW4-2

Switch	FDC100VNX	FDC100VSX	FDC125VNX	FDC125VSX	FDC140VNX	FDC140VSX
JSW1-1	OFF	OFF	ON	ON	OFF	OFF
JSW1-2	OFF	OFF	OFF	OFF	ON	ON
JSW1-3	OFF	OFF	OFF	OFF	OFF	OFF
JSW1-4	OFF	OFF	OFF	OFF	OFF	OFF
SW4-1	ON	ON	ON	ON	ON	ON
SW4-2*	ON	OFF	ON	OFF	ON	OFF

* 3 phase: OFF/Single phase: ON

(2) Inverter PCB

Switch	FDC71VNX	FDC100, 125, 140VNX	FDC100, 125, 140VSX
	Single phase models	Single phase models	3 phase models
JSW10-1	OFF	OFF	OFF
JSW10-2	OFF	OFF	OFF
JSW10-3	OFF	OFF	OFF
JSW10-4	OFF ∗	OFF ∗	OFF ∗
JSW11-1	ON	OFF	ON
JSW11-2	ON	OFF	OFF
JSW11-3	ON	ON	ON
JSW11-4	ON	ON	ON

∗ When checking inverter PCB of FDC71－140 models with inverter checker, turn JSW10-4 ON.
(Regarding the checking method of inverter PCB with inverter checker, refer to page 154, 156, 157 for details)

Moedls Fdc100, 125, 140VNA, 100, 125, 140VSA

Switch	Description		Default setting		Remarks
SW1	(See table 1)		OFF		
JSW1-1 JSW1-2 JSW1-3	Model selection		As per model		See table 2
JSW1-4	Reserved		OFF		Keep OFF
SW3-1	Defrost condition	Normal*/Cold region	OFF	Normal	Refer to page 329
SW3-2	Snow protection control	Normal*/Snow protection	OFF	Normal	Refer to page 328
SW3-3	Test run SW	Normal*/Test run	OFF	Normal	Refer to page 332
SW3-4	Test run mode	Cooling*/Heating	OFF	Cooling	Refer to page 332
SW4-1	Reserved		OFF		Keep OFF
SW4-2	Cancel measuring of refrigerant leak	Normal*/Cancel	OFF	Normal	Detection function of error in E57 refrigeration system protection (OFF: Detection / ON: Cancel to detect)
SW4-3	Reserved		OFF		Keep OFF
SW4-4	Reserved		OFF		Keep OFF
SW5-1	Utilization of existing piping control	Normal*/Existing piping control	OFF	Normal	See Note 1
SW5-2	Hight difference of IU and OU control	Normal*/High head control	OFF	Normal	When the outdoor unit is positioned higher than 30m (OFF : Normal / ON : high head)
SW5-3	Reserved		OFF		Keep OFF
SW5-4	Reserved		OFF		Keep OFF
SW6-1	Reserved		OFF		Keep OFF
SW6-2	Reserved		OFF		Keep OFF
SW6-3	Reserved		OFF		Keep OFF
SW6-4	Inverter checker mode	Normal*/Check INV	OFF	Normal	Refer to page 169
SW7-1	SW1 function selection		OFF		See table1
SW7-2	Frost protection by frequent external ON/OFF	Normal*/connected external device	OFF	Normal	In case external device switches ON/OFF frequently, switch to ON to start defrost operation even though short operation time.
SW7-3	Silent mode selection	Normal*/Silent mode	OFF	Normal	Refer to page 332

* Default setting

Table 1: SW1 fuction selection

0: OFF 1:ON

SW7-1	SW1 function	Remark
0	Pump down operation	Refer to page 333
1	Reset cumulative time of compressor operation	Reset of operation time after replacing a compressor

Table 2: Outdoor unit model selection with JSW1-1-JSW1-3

0: OFF 1:ON

	100VN	100VS	125VN	125VS	140VN	140VS
JSW1-1	0	0	1	1	0	0
JSW1-2	0	0	0	0	1	1
JSW1-3	0	0	0	0	0	0

Note 1: Utilization of existing pipe

1 In case of reusing annealed pipe ø19.05 × t1.0, be sure to turn the DIP switch on the outdoor PCB ON as shown in the table because of its insufficient strength. If its material is 1/2H or its thickness is 1.2mm or more it is no necessary.

2 If bendng radius of existing pipe is less than R70mm, be sure to turn the DIP switch on the outdoor PCB shown in the table due to its insufficient strength.

Models FDC200, 250VSA

(1) Control PCB

Switch	Description		Default setting		Remark
SW1	Pump down operation	Normal*/Pump down	OFF	Normal	
JSW1-1	Model selection		As per model		See table 1
JSW1-2					
JSW1-3					
JSW1-4					
SW3-1	Defrost condition	Normal*/Cold region	OFF	Normal	
SW3-2	Snow protection control	Normal*/Snow protection	OFF	Normal	
SW3-3	Test run SW	Normal*/Test run	OFF	Normal	
SW3-4	Test run mode	Cooling*/Heating	OFF	Cooling	
SW4-1	Model selection	Domestic/Overseas*	ON	Overseas	See table 1
SW4-2	Model selection	3 phase/Single phase	As per model		See table 1
SW4-3	Reserved		OFF		Keep OFF
SW4-4	Reserved		OFF		Keep OFF
SW5-1	Utilization of existing piping control	Normal*/Existing piping control	OFF		Keep OFF
SW5-2	Reserved		OFF		Keep OFF
SW5-3	Reserved		OFF		Keep OFF
SW5-4	Reserved		OFF		Keep OFF
SW7-1	Silent mode setting	Capacity priority/Silent priority	ON	Silent priority	
SW7-2	Reserved		ON		Keep ON
SW7-3	Anti frost control	Invalid/Valid	ON	Valid	

* Default setting

Table 1: Outdoor unit model selection with JSW1-1-JSW1-4 and SW4-1-SW4-2

Switch	FDC200	FDC250
JSW1-1	ON	OFF
JSW1-2	ON	OFF
JSW1-3	OFF	ON
JSW1-4	OFF	OFF
SW4-1	ON	ON
SW4-2	OFF	OFF

(2) Inverter PCB

Switch	FDC200	FDC250
JSW10-1	OFF	OFF
JSW10-2	OFF	ON
JSW10-3	OFF	OFF
JSW10-4	OFF ✻	OFF ✻
JSW11-1	OFF	OFF
JSW11-2	OFF	OFF
JSW11-3	OFF	OFF
JSW11-4	OFF	OFF

✻ When checking inverter PCB of FDC200, 250 models with inverter checker, turn JSW10-4 ON.
(Regarding the checking method of inverter PCB with inverter checker, refer to page 158, 159 for details)

(5) Check of anomalous operation data with the remote control

(a) In case of RC-EX3A remote control

[Operating procedure]

① On the TOP screen, touch the buttons in the order of "Menu" → "Service setting" → "Service & Maintenance" → "Service password" → "Set" → "Error display" → "Error history".

② When only one indoor unit is connected to the remote control, followings will be displayed.

1. When there is any anomaly: "Loading. Wait a while" is displayed, followed by the operation data at the occurrence of anomaly

Contents of display

・Error code

・Number and data item

2. When there is no anomaly: "No anomaly" is displayed, and this mode is terminated.

③ When two or more indoor units are connected to the remote control, followings will be displayed.

1. When there is any anomaly: If the unit having anomaly is selected on the "Select IU" screen, "Loading. Wait a while" is displayed, followed by the operation data at the occurrence of anomaly.

Contents of display

・Indoor unit No.

・Error code

・Number and data item

2. When there is no anomaly: "No anomaly" is displayed, ant this mode is terminated.

Note (1) When the number of connected units cannot be shown in a page, select "Next".

④ If you press [RUN/STOP] button, the display returns to the TOP screen.

◎ **If you touch "Back" button on the way of setting, the display returns to the last precious screen.**

Note (1) When two remote controls are used to control indoor units, the check of anomaly operation data can be made on the master remote control only. (It cannot be operated from the slave remote control.)

■ Anomaly operation data (Corresponding data may not be provided depending on models. Such items will not be displayed.)

Number		Data Item
01	✻	(Operation Mode)
02	SET TEMP	(Set Temperature)
03	RETURN AIR___℃	(Return Air Temperature)
04	SENSOR___℃	(Remote Control Temperature Sensor)
05	THI-R1___℃	(Indoor Heat Exchanger Temperature Sensor / U Bend)
06	THI-R2___℃	(Indoor Heat Exchanger Temperature Sensor /Capillary)
07	THI-R3___℃	(Indoor Heat Exchanger Temperature Sensor /Gas Header)
08	I/U FANSPEED___	(Indoor Unit Fan Speed)
09	DEMAND___Hz	(Frequency Requirements)
10	ANSWER___Hz	(Response Frequency)
11	I/U EEV____P	(Pulse of Indoor Unit Expansion Value)
12	TOTAL I/U RUN___H	(Total Running Hours of The Indoor Unit)
13	SUPPLY AIR___℃	(Supply Air Temperature)
21	OUTDOOR___℃	(Outdoor Air Temperature)
22	THO-R1___℃	(Outdoor Heat Exchanger Temperature Sensor)
23	THO-R2___℃	(Outdoor Heat Exchanger Temperature Sensor)
24	COMP___Hz	(Compressor Frequency)
25	HP___MPa	(High Pressure)
26	LP____MPa	(Low Pressure)
27	Td___℃	(Discharge Pipe Temperature)
28	COMP BOTTOM___℃	(Comp Bottom Temperature)
29	CT___AMP	(Current)
30	TARGET SH___℃	(Target Super Heat)
31	SH___℃	(Super Heat)
32	TDSH___℃	(Discharge Pipe Super Heat)
33	PROTECTION No.__	(Protection State No. of The Compressor)
34	O/U FANSPEED____	(Outdoor Unit Fan Speed)
35	63H1	(63H1 On/Off)
36	DEFROST	(Defrost Control On/Off)
37	TOTAL COMP RUN___H	(Total Running Hours of The Compressor)
38	O/U EEV1____P	(Pulse of The Outdoor Unit Expansion Valve EEVC)
39	O/U EEV2____P	(Pulse of The Outdoor Unit Expansion Valve EEVH)

●Details of compressor protection status No. 33
Models FDC71, 100, 125, 140VNX, 100, 125, 140VSX

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P.128, (6).(a).(i)
"2"	Discharge pipe temperature anomaly	P.128, (6).(a).(ii)
"3"	Current safe control of inverter primary current	P.130, (6).(g)
"4"	High pressure protection control	P.128, (6).(b).(i), P.39, (6).(c).(i)
"5"	High pressure anomaly	P.128, (6).(b).(ii)
"6"	Low pressure protection control	P.129, (6).(e).(i)
"7"	Low pressure anomaly	P.129, (6).(e).(ii)
"8"	Anti-frost prevention control	P.130, (6).(k)
"9"	Current cut	P.130, (6).(g)
"10"	Power transistor protection control	P.130, (6).(h)
"11"	Power transistor anomaly (Overheat)	P.130, (6).(i)
"12"	Compression ratio control	P.129, (6).(f)
"13"	Spare	
"14"	Dewing prevention control	P.131, (6).(l)
"15"	Current safe control of inverter secondary current	P.130, (6).(g)
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	P.131, (6).(p)
"18"	Active filter anomaly	

Note(1) Operation data display on the remote control.
・Data is dispalyed until canceling the protection control.
・In case of multiple protections controlled, only the younger No. is displayed.
Note(2) Common item.
① In heating mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "4" is displayed.
② In cooling and dehumidifying mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

Models FDC100, 125, 140VNA, 100, 125, 140VSA

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P.329, (6).(a).(i)
"2"	Discharge pipe temperature anomaly	P.329, (6).(a).(ii)
"3"	Current safe control of inverter primary current	P.330, (6).(f)
"4"	High pressure protection control	P.329, (6).(b).(i), (c).(i)
"5"	High pressure anomaly	P.329, (6).(b).(ii)
"8"	Anti-frost prevention control	P.331, (6).(j)
"9"	Current cut	P.330, (6).(f)
"11"	Power transistor anomaly (Overheat)	P.331, (6).(h)
"12"	Compression ratio control	P.330, (6).(e)
"13"	Spare	
"14"	Dewing prevention control	P.331, (6).(k)
"15"	Current safe control of inverter secondary current	P.330, (6).(f)
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	P.332, (6).(o)
"18"	Active filter anomaly	

Note(1) Operation data display on the remote control.
・Data is dispalyed until canceling the protection control.
・In case of multiple protections controlled, only the younger No. is displayed.
Note(2) Common item.
① In heating mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "4" is displayed.
② In cooling and dehumidifying mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

Models FDC200, 250VSA

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P.339, (6).(a).(i)
"2"	Discharge pipe temperature anomaly	P.339, (6).(a).(ii)
"3"	Current safe control of inverter primary current	P.341, (6).(g)
"4"	High pressure protection control	P.339, (6).(b).(i), P.199, (6).(c).(i)
"5"	High pressure anomaly	P.339, (6).(b).(ii)
"6"	Low pressure protection control	P.340, (6).(e).(i)
"7"	Low pressure anomaly	P.340, (6).(e).(ii)
"8"	Anti-frost prevention control	P.341, (6).(k)
"9"	Current cut	P.341, (6).(g)
"10"	Power transistor protection control	P.341, (6).(h)
"11"	Power transistor anomaly (Overheat)	P.341, (6).(i)
"12"	Compression ratio control	P.340, (6).(f)
"13"	Spare	
"14"	Dewing prevention control	P.342, (6).(1)
"15"	Current safe control of inverter secondary current	P.341, (6).(g)
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	P.342, (6).(p)
"18"	Active filter anomaly	

Note(1) Operation data display on the remote control.
・Data is dispalyed until canceling the protection control.
・In case of multiple protections controlled, only the younger No. is displayed.
Note(2) Common item.
① In heating mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "4" is displayed.
② In cooling and dehumidifying mode.
During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

(b) In case of RC-E5 remote control

Operation data can be checked with remote control unit operation.

① Press the [CHECK] button.
The display change " OPER DATA ▼"

② Press the ○ (SET) button while " OPER DATA ▼ " is displayed.

③ When only one indoor unit is connected to remote control, " DATA LOADING " is displayed (blinking indication during data loading).
Next, operation data of the indoor unit will be displayed. Skip to step ⑦.

④ When plural indoor units is connected, the smallest address number of indoor unit among all connected indoor unit is displayed.
[Example]:
" SELECT I/U " (blinking 1 seconds) → " I/U000 ▲ " blinking.

⑤ Select the indoor unit number you would like to have data displayed with the [▲] [▼] button.

⑥ Determine the indoor unit number with the ○ (SET) button.
(The indoor unit number changes from blinking indication to continuous indication)
" I/U000 " (The address of selected indoor unit is blinking for 2 seconds.)
↓
" DATA LOADING " (A blinking indication appears while data loaded.)
Next, the operation data of the indoor unit is indicated.

Number	Data Item	
01	※	(Operation Mode)
02	SET TEMP___℃	(Set Temperature)
03	RETURN AIR___℃	(Return Air Temperature)
04	SENSOR___℃	(Remote Control Temperature Sensor)
05	THI-R1___℃	(Indoor Heat Exchanger Temperature Sensor / U Bend)
06	THI-R2___℃	(Indoor Heat Exchanger Temperature Sensor /Capillary)
07	THI-R3___℃	(Indoor Heat Exchanger Temperature Sensor /Gas Header)
08	I/U FANSPEED___	(Indoor Unit Fan Speed)
09	DEMAND___Hz	(Frequency Requirements)
10	ANSWER___Hz	(Response Frequency)
11	I/U EEV____P	(Pulse of Indoor Unit Expansion Value)
12	TOTAL I/U RUN___H	(Total Running Hours of The Indoor Unit)
21	OUTDOOR___℃	(Outdoor Air Temperature)
22	THO-R1___℃	(Outdoor Heat Exchanger Temperature Sensor)
23	THO-R2___℃	(Outdoor Heat Exchanger Temperature Sensor)
24	COMP___Hz	(Compressor Frequency)
25	HP___MPa	(High Pressure)
26	LP____MPa	(Low Pressure)
27	Td___℃	(Discharge Pipe Temperature)
28	COMP BOTTOM___℃	(Compressor Bottom Temperature)
29	CT___AMP	(Current)
30	TARGET SH___℃	(Target Super Heat)
31	SH___℃	(Super Heat)
32	TDSH___℃	(Discharge Pipe Super Heat)
33	PROTECTION No.__	(Protection State No. of The Compressor)
34	O/U FANSPEED___	(Outdoor Unit Fan Speed)
35	63H1	(63H1 On/Off)
36	DEFROST	(Defrost Control On/Off)
37	TOTAL COMP RUN___H	(Total Running Hours of The Compressor)
38	O/U EEV1____P	(Pulse of The Outdoor Unit Expansion Valve EEVC)
39	O/U EEV2____P	(Pulse of The Outdoor Unit Expansion Valve EEVH)

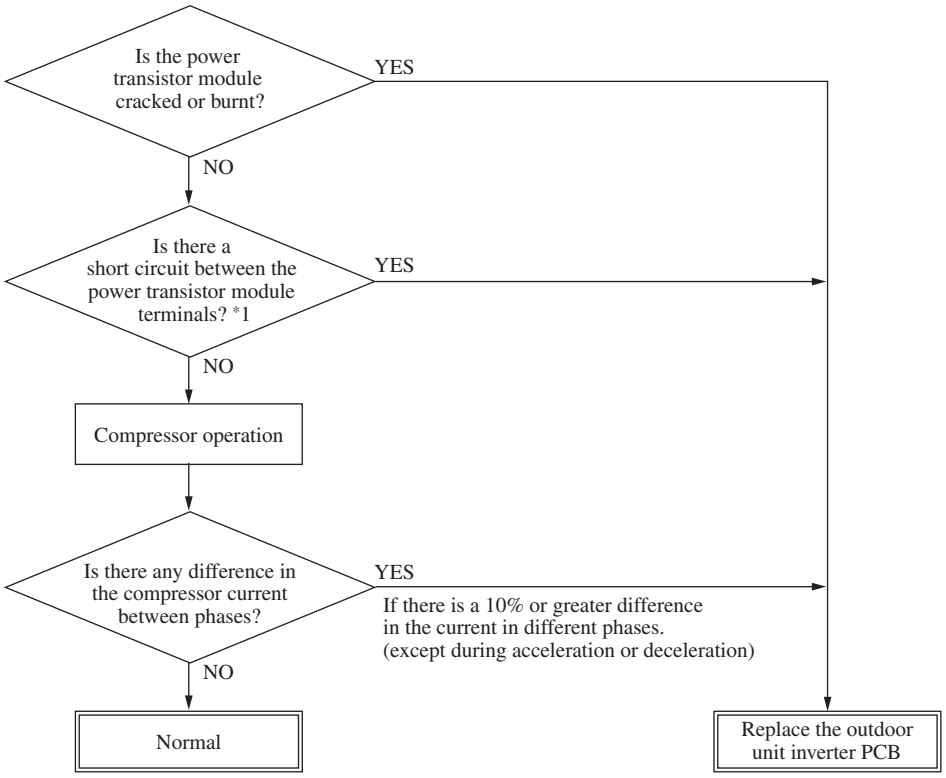
⑦ Upon operation of the [▲] [▼] button, the current operation data is displayed in order from data number 01.
The items displayed are in the above table.
*Depending on models, the items that do not have corresponding data are not displayed.

⑧ To display the data of a different indoor unit, press the [AIR CON No.] button, which allows you to go back to the indoor unit selection screen.

⑨ Pressing the [①ON/OFF] button will stop displaying data.
Pressing the // (RESET) button during remote control unit operation will undo your last operation and allow you to go back to the previous screen.
⊙If two (2) remote controls are connected to one (1) inside unit, only the master control is available for trial operation and confirmation of operation data. (The slave remote control is not available.)

●Details of compressor protection status No. 33
Refer to page 164 and 165.

(6) Power transistor module (Including the driver PCB) inspection procedure



*1 Power transistor module terminal short circuit check procedure

Disconnect the compressor wiring, then conduct a short circuit check.

P-U, P-V, P-W

N-U, N-V, N-W

Check between the P-N terminals.

Bring the tester probes in contact with the following places on each te rminal.

P: Power transistor P terminal,

N: Power transistor N terminal,

U: End of red harness to compressor

V: End of white harness to compressor

W: End of black or blue harness to compressor

Check for a power transistor short circuit.

- When you do not have a diagnostic checker for judging if the inverter is defective, measure between the terminals of the power transistor parts, judge whether the power transistor is defective or not.
- Disconnect the compressor, then measure with the control incorporated.

Models FDC71-140VNX, 100-140VSX

Tester		Normal value (Ω)	
Terminal (+)	Terminal (-)	Model FDC71	Model FDC100-140
P	N	0 - (Numerical value rises.)	Approx. 1 M Approx. 300-400
N	P		
P	U	Several M (Numerical value rises.)	0
P	V		
P	W		
N	U	Approx. 650 k	Approx. 1.2 M
N	V		
N	W		
U	P	Approx. 670 k	Approx. 1.3 M
V	P	Approx. 4.4 M	
W	P	Approx. 4.4 M	
U	N	Approx. 650 k	0
V	N	Approx. 4.8 M	
W	N	Approx. 4.9 M	

If the measured values range from 0 - several kW, there is a possibility that the elements are damaged, so replace the power transistor parts.

Models FDC200, 250VSA

Tester		Normal value (Ω)	
Terminal (+)	Terminal (-)	Model FDC200	Model FDC250
P	N	Scores of M	Scores of M
N	P	Approx. 4.5M	Approx. 8.9M
P	U	Scores of M	Scores of M
P	V		
P	W		
N	U	Approx. 130k	Approx. 4.6M
N	V		
N	W		
U	P	Approx. 4.5M	Approx. 4.8M
V	P		
W	P		
U	N	Approx. 6.7M	Scores of M
V	N	Approx. 6.0M	
W	N	Approx. 5.7M	

If the measured values range from 0 - several kW, there is a possibility that the elements are damaged, so replace the power transistor parts.

(7) Inverter checker for diagnosis of inverter output
Models SRC40, 50, 60ZMX-S, FDC71, 100, 125, 140VNX,100, 125, 140VSX
FDC100, 125, 140VNA, 100, 125, 140VSA, 200, 250VSA

●Checking method

(a) Models SRC40-60

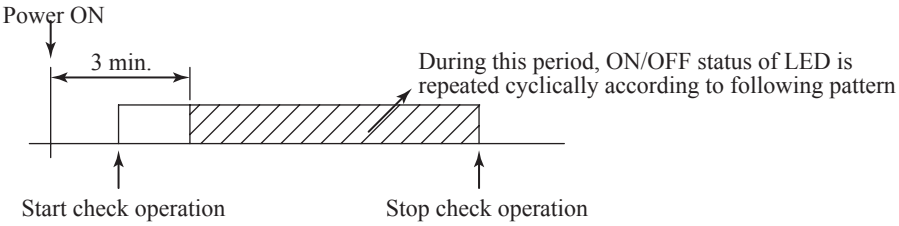
(i) Setup procedure of checker.

1) Power OFF (Turn off the breaker).
2) Remove the terminal cover of compressor and disconnect the wires (U, V, W) from compressor.
3) Connect the wires U (Red) , V (White) and W (Black) of the checker to the terminal of disconnected wires (U, V, W) from compressor respectively.

(ii) Operation for judgment.

1) Power ON and start check operation on cooling or heating mode.
2) Check ON/OFF status of 6 LED's on the checker.
3) Judge the PCB by ON/OFF status of 6 LED's on the checker.

ON/OFF status of LED	If all of LED are ON/OFF according to following pattern	If all of LED stay OFF or some of LED are ON/OFF
Control PCB	Normal	Anomalous



4) Stop check operation within about 2minutes after starting check operation.

(b) Models FDC71-250

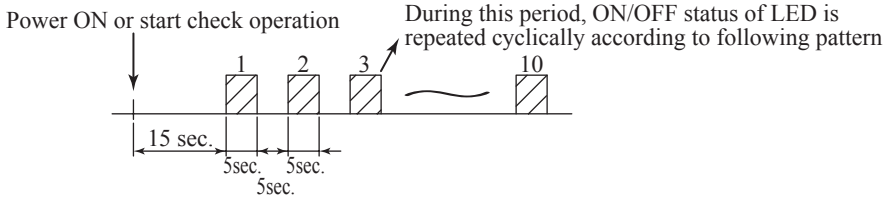
(i) Setup procedure of checker.

1) Power OFF (Turn off the breaker).
2) Remove the terminal cover of compressor and disconnect the wires (U, V, W) from compressor.
3) Connect the wires U (Red) , V (White) and W (Black) of checker to the terminal of disconnected wires (U, V, W) from compressor respectively.

(ii) Operation for judgment.

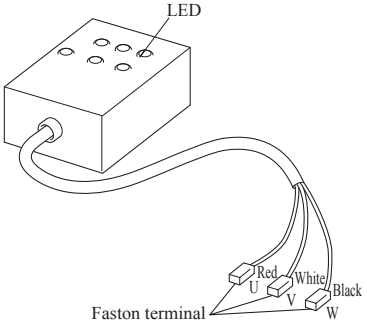
1) Power ON after JSW10-4 on outdoor inverter PCB was turned ON.
2) After 15 seconds since power has turned ON, LED start ON/OFF for 5 seconds cyclically and it repeats 10 times.
3) Check ON/OFF status of 6 LED's on the checker.
4) Judge the PCB by ON/OFF status of 6 LED's on the checker.

ON/OFF status of LED	If all of LED are ON/OFF according to following pattern	If all of LED stay OFF or some of LED are ON/OFF
Inverter PCB	Normal	Anomalous

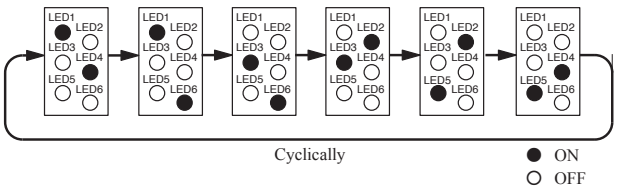


5) Be sure to turn off JSW10-4 on outdoor inverter PCB, after finishing the check operation.

〈**Inverter checker**〉



LED ON/OFF pattern



Connect to the terminal of the wires which are disconnected from compressor.

(8) Outdoor unit control failure diagnosis circuit diagram

Models SRC40ZSX-S, 50ZSX-S, 60ZSX-S

● **Outdoor unit check points**

⚠ CAUTION– HIGH VOLTAGE

High voltage is produced in the control box. Don't touch electrical parts in the control box for 5 minutes after the unit is stopped.

Color symbol

Mark	Color
BK	Black
BL	Blue
RD	Red
WH	White
YE	Yellow
Y／G	Yellow／Green

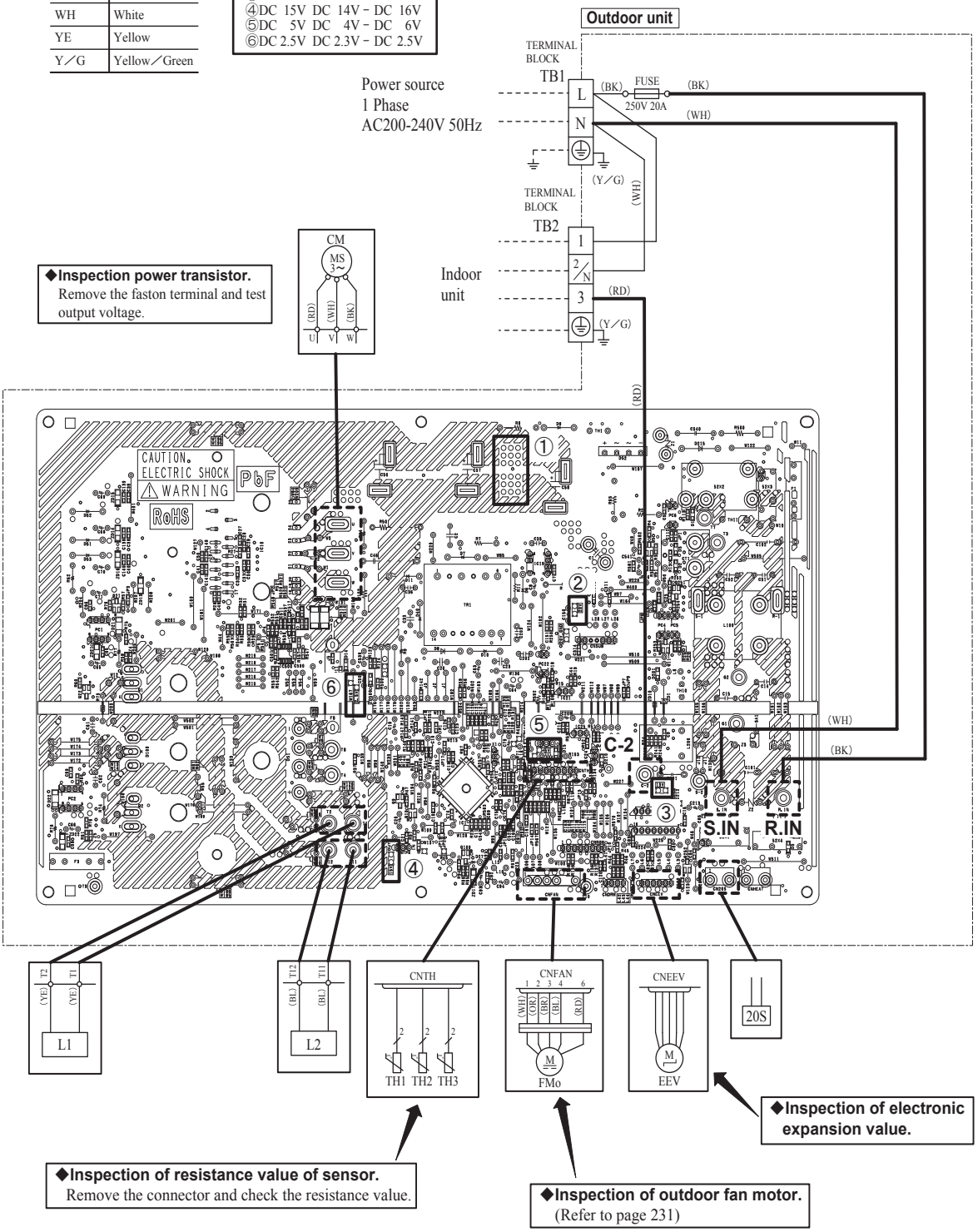
◆Voltage check in PCB.

The normal range is as follows.

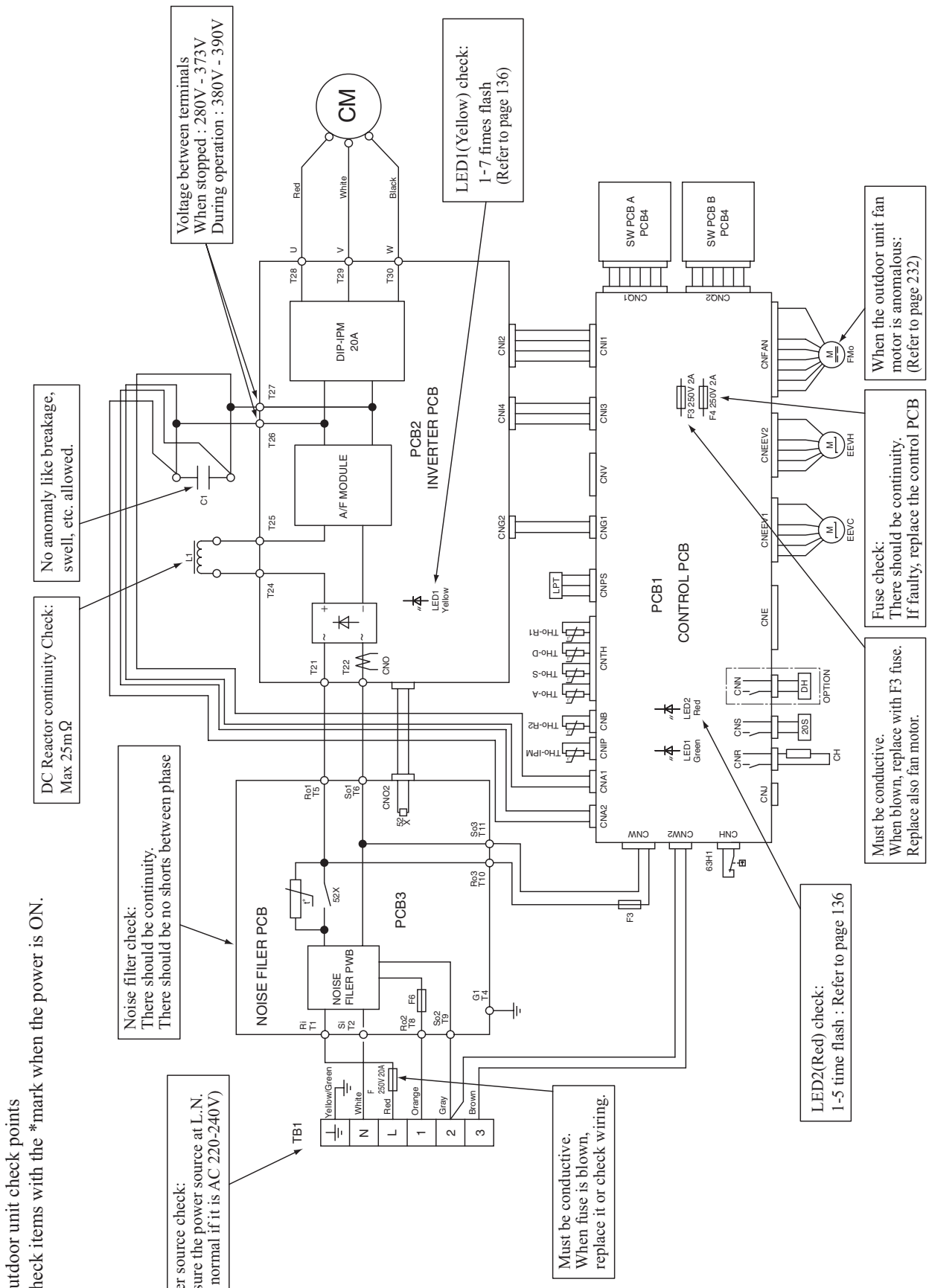
Display	Voltage range
①DC280V	DC230V – DC310V
②DC 20V	DC 18V – DC 22V
③DC 13V	DC 12V – DC 14V
④DC 15V	DC 14V – DC 16V
⑤DC 5V	DC 4V – DC 6V
⑥DC 2.5V	DC 2.3V – DC 2.5V

◆Power source and serial signal inspection.

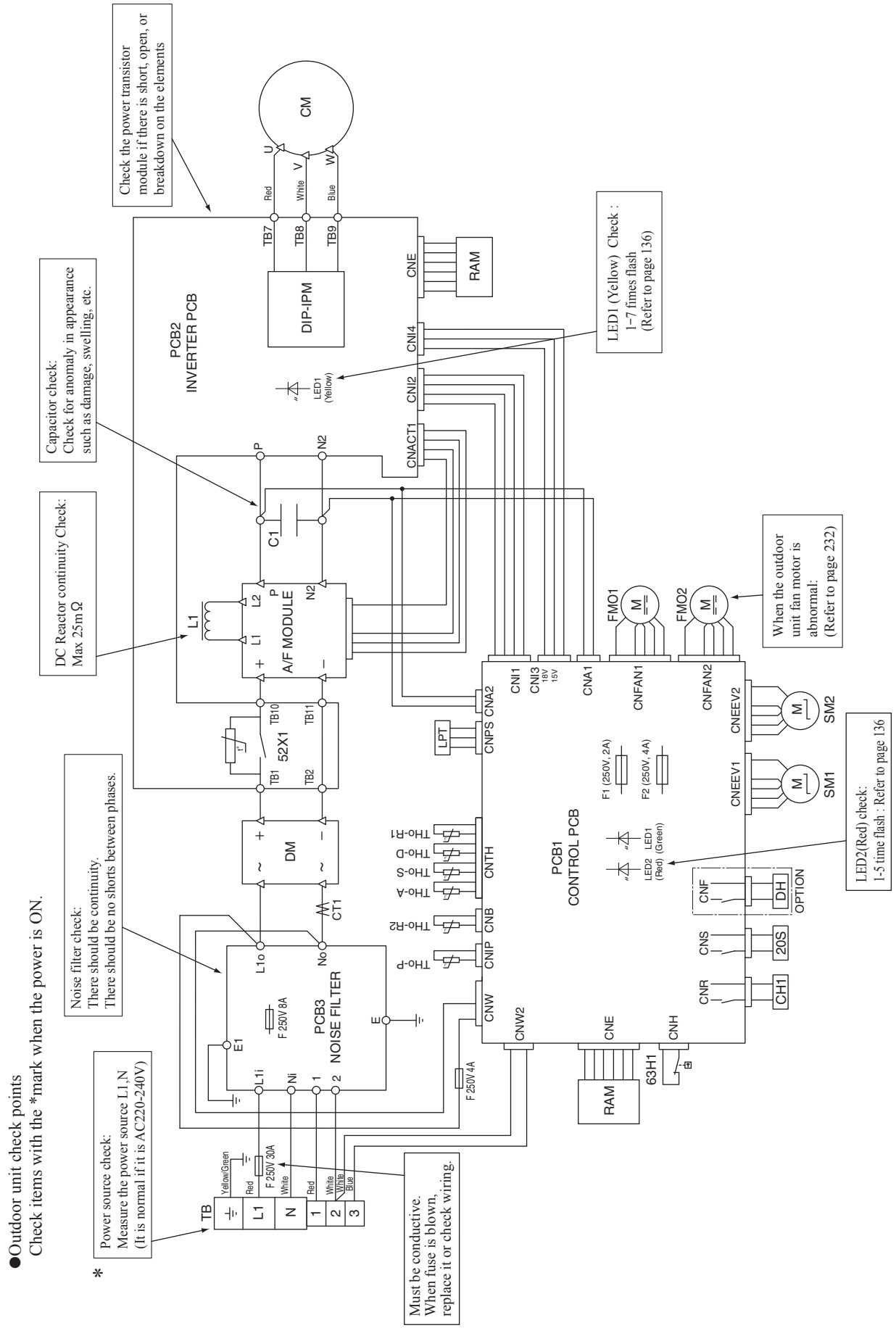
Ⓛ to Ⓝ : AC 220/230/240V
① to ②/N : AC 220/230/240V
②/N to ③ : Normal if the voltage oscillates between DC 0 and approx. 20V



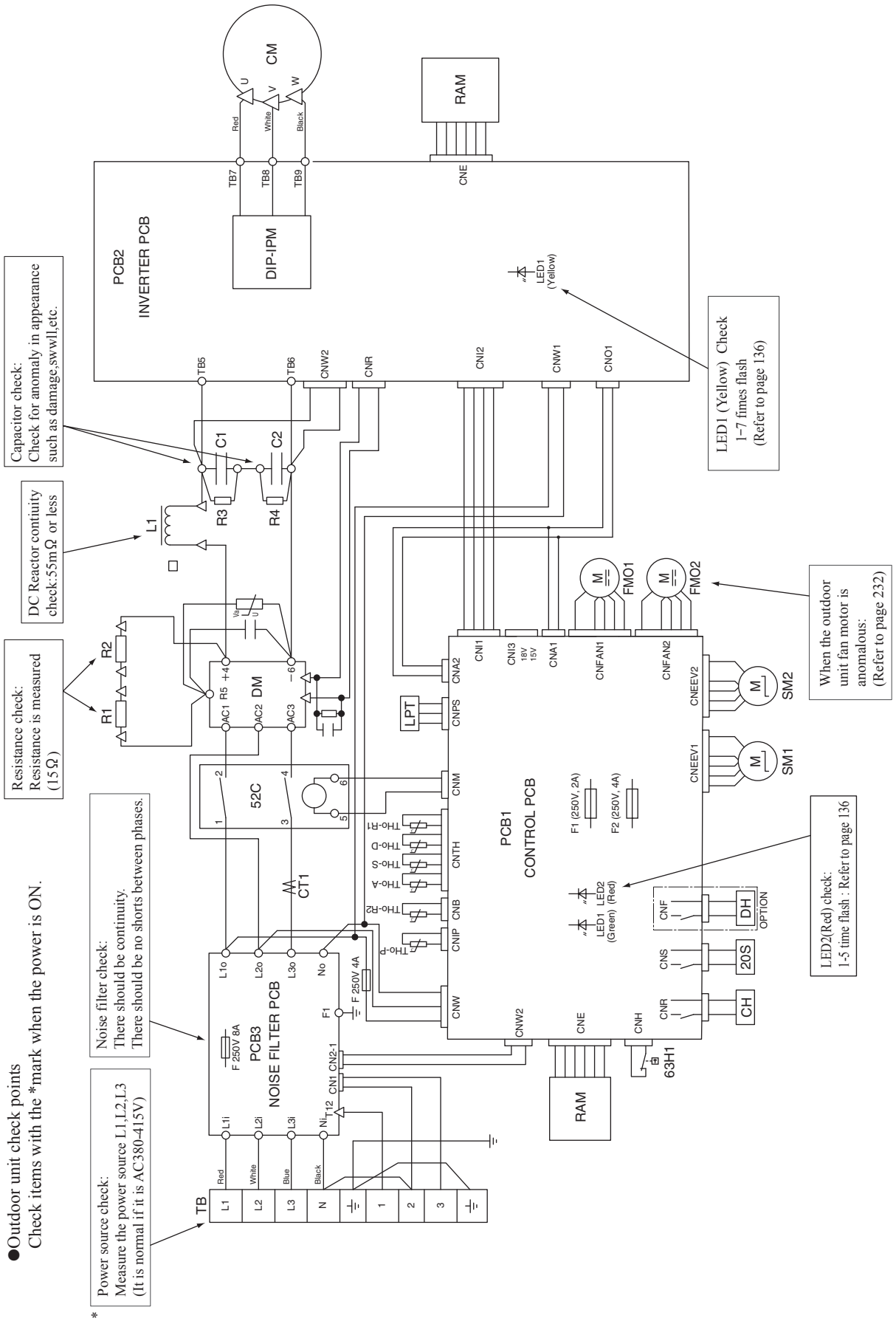
Model FDC71VNX



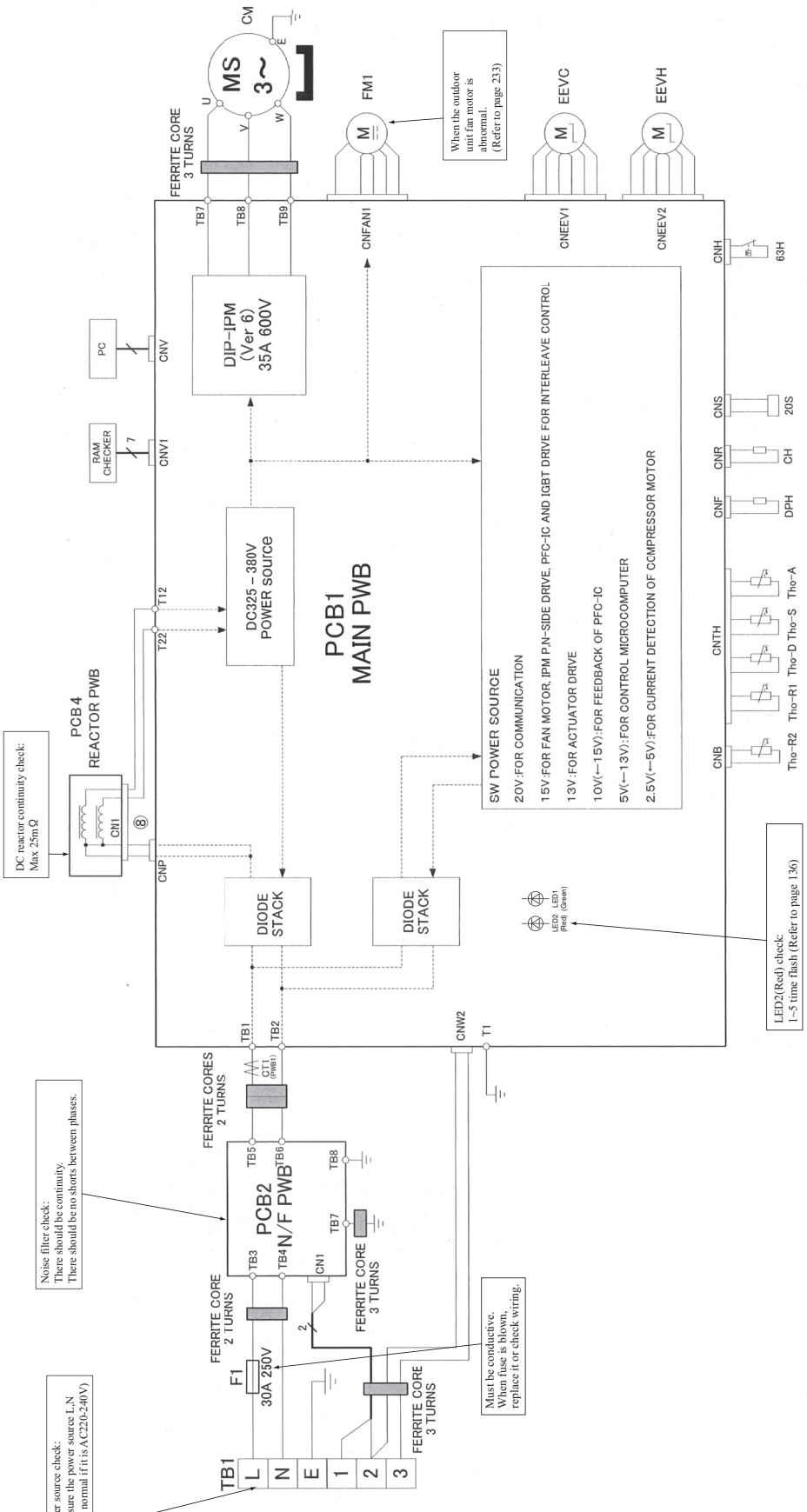
Models FDC100VNX, 125VNX, 140VNX



Models FDC100VSX, 125VSX, 140VSX



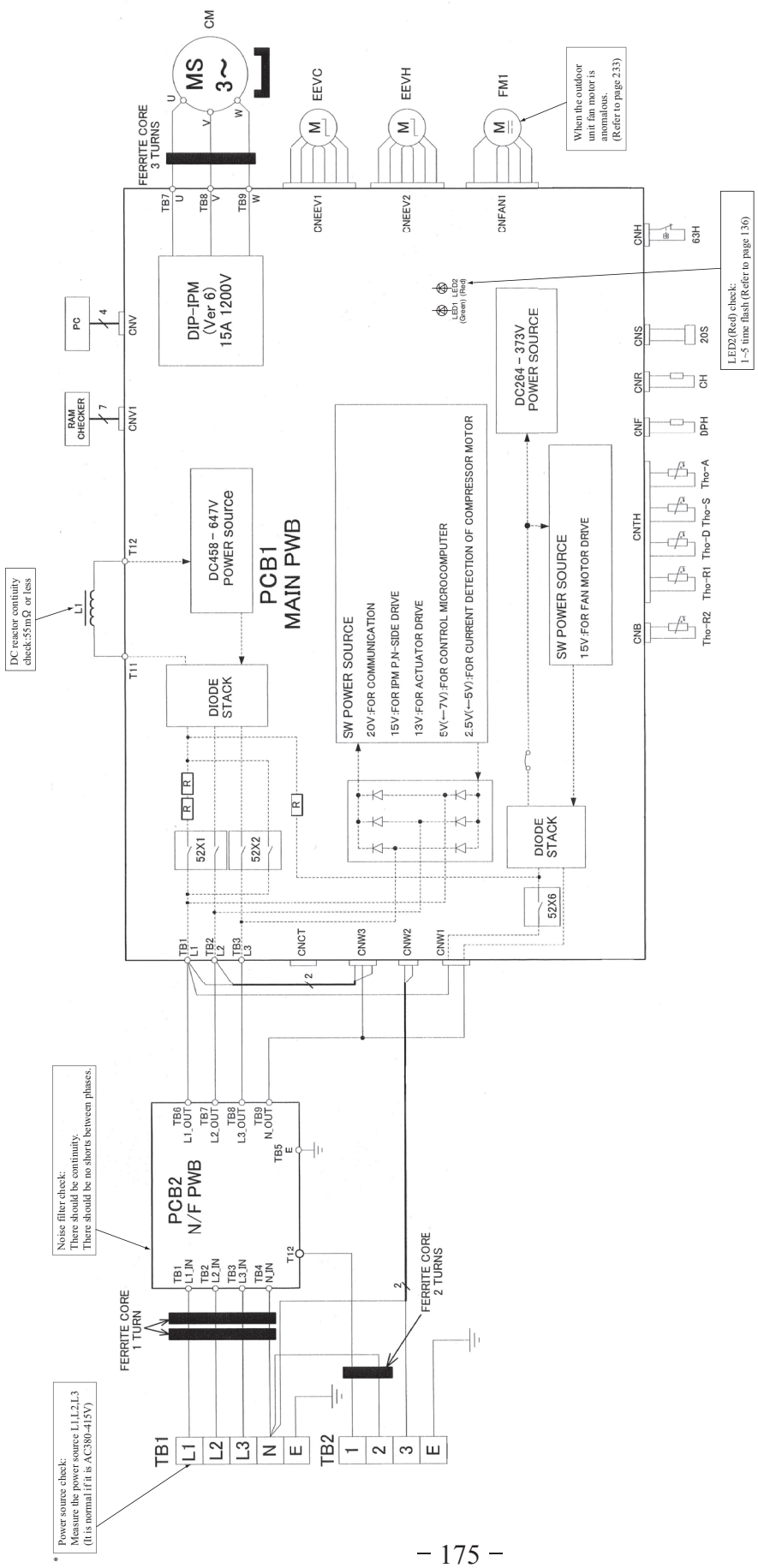
Models FDC100, 125, 140VNA



●Outdoor unit check points

Check items with the *mark when the power is ON.

FDC100,125,140VSA



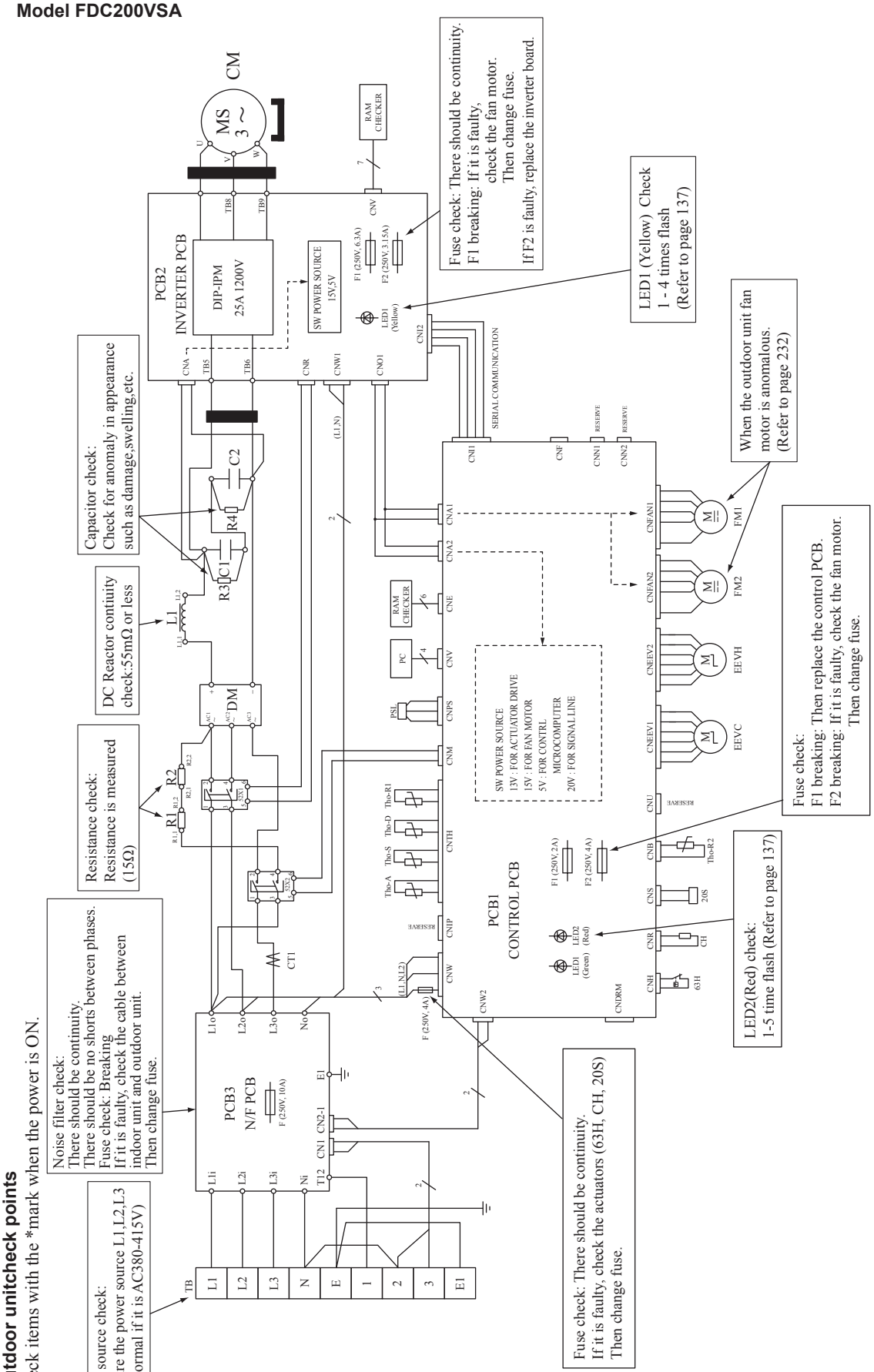
●Outdoor unit check points

Check items with the *mark when the power is ON.

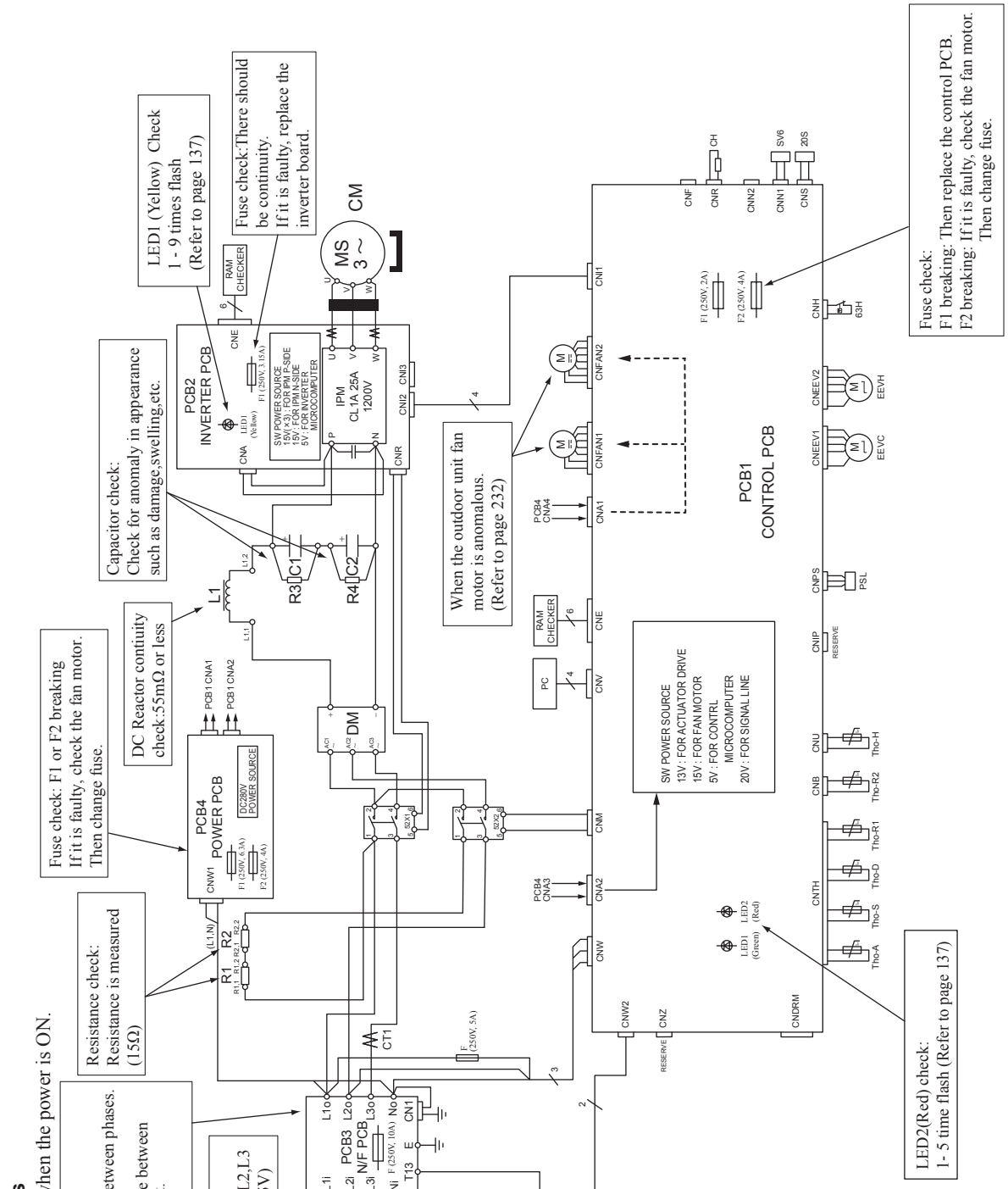
Model FDC200VSA

● Outdoor unitcheck points

Check items with the *mark when the power is ON.



Model FDC250VSA



1.11.2 Troubleshooting flow

(1) List of troubles

Models SRC40, 50, 60ZSX-S, FDC71, 100, 125, 140VNX, 100, 125, 140VSX
FDC100, 125, 140VNA, 100, 125, 140VSA

Remote control display	Description of trouble	Reference page
None	Operates but does not cool	180
None	Operates but does not heat	181
None	Earth leakage breaker activated	182
None	Excessive noise/vibration (1/3)	183
None	Excessive noise/vibration (2/3)	184
None	Excessive noise/vibration (3/3)	185
None	Louver motor failure	186
None	Power source system error (Power source to indoor unit control PCB)	187
None	Power source system error (Power source to remote control)	188
INSPECT I/U	INSPECT I/U (When 1 or 2 remote controls are connected)	189
INSPECT I/U	INSPECT I/U (Connection of 3 units or more remote controls)	190
WAIT	Communication error at initial operation (Models SRC40-60 only)	191-193
WAIT	Communication error at initial operation (Models FDC71-140 only)	194-196
None	No display	199
E1	Remote control communication circuit error	200
E5	Communication error during operation	201
E6	Indoor heat exchanger temperature sensor anomaly	202
E7	Return air temperature sensor anomaly	203
E8	Heating overload operation	204
E9	Drain trouble	205
E10	Excessive number of connected indoor units (more than 17 units) by controlling with one remote control	206
E11	Address setting error of indoor units	207
E14	Communication error between master and slave indoor units	208
E16	Indoor fan motor anomaly	209
E18	Address setting error of master and slave indoor units	210
E19	Indoor unit operation check, drain pump motor check setting error	211
E20	Indoor fan motor rotation speed anomaly	212
E21	Defective panel switch operation	213
E28	Remote control temperature sensor anomaly	214
E35	Cooling overload operation (Models SRC40-60 only)	215
E35	Cooling overload operation (Models FDC71-140 only)	216
E36	Discharge pipe temperature error	217
E37	Outdoor heat exchanger temperature sensor anomaly	218
E38	Outdoor air temperature sensor anomaly	219
E39	Discharge pipe temperature sensor anomaly	220
E40	Service valve (gas side) closing operation (Models SRC40-60 only)	221
E40	High pressure error (63H1 activated) (Models FDC71-140 only)	222
E41	Power transistor overheat (Models FDC71-140VNX, 100-140VSX only)	223
E42	Current cut	225 · 226
E45	Communication error between inverter PCB and outdoor unit control PCB (Models FDC71-140VNX, 100-140VSX only)	227
E47	Active filter voltage error (Models SRC40-60 only)	228
E47	Inverter PCB A/F module anomaly (Model FDC71VNX only)	229
E47	Active filter anomaly (Models FDC100-140VNA only)	230
E48	Outdoor fan motor anomaly (Models SRC40-60 only)	231
E48	Outdoor fan motor anomaly (Models FDC71-140VNX, 100-140VSX only)	232
E48	Outdoor fan motor anomaly (Models FDC100-140VNA / VSA only)	233
E49	Low pressure error or low pressure sensor anomaly (Models FDC71-140VNX, 100-140VSX only)	234 ·235
E51	Power transistor anomaly (Models SRC40-60 only)	236
E51	Inverter and fan motor anomaly (Models FDC71-140 only)	237
E53	Suction pipe temperature sensor anomaly (Models FDC71-140 only)	239
E54	Low pressure sensor anomaly (Models FDC71-140VNX, 100-140VSX only)	240
E57	Insufficient refrigerant amount or detection of service valve closure (Models SRC40-60 only)	242
E57	Insufficient refrigerant amount or detection of service valve closure (Models FDC71-140 only)	243

E58	Compressor startup (Models SRC40-60 only)	244
E59	Compressor startup failure (Models SRC40-60 only)	245
E59	Compressor startup failure (Models FDC71-140VNX, 100-140VSX only)	246 · 247
E59	Compressor startup failure (Models FDC100-140VNA / VSA only)	248 · 249
E60	Compressor rotor lock error (Models SRC40-60 only)	252

Models FDC200, 250VSA

Remote control display	Description of trouble	Reference page
None	Operates but does not cool	180
None	Operates but does not heat	181
None	Earth leakage breaker activated	182
None	Excessive noise/vibration (1/3)	183
None	Excessive noise/vibration (2/3)	184
None	Excessive noise/vibration (3/3)	185
None	Louver motor failure	186
None	Power source system error (Power source to indoor unit control PCB)	187
None	Power source system error (Power source to remote control)	188
INSPECT I/U	INSPECT I/U (When 1 or 2 remote controls are connected)	189
INSPECT I/U	INSPECT I/U (Connection of 3 units or more remote controls)	190
WAIT	Communication error at initial operation	197 · 198
None	No display	199
E1	Remote control communication circuit error	200
E5	Communication error during operation	201
E6	Indoor heat exchanger temperature sensor anomaly	202
E7	Return air temperature sensor anomaly	203
E8	Heating overload operation	204
E9	Drain trouble	205
E10	Excessive number of connected indoor units (more than 17 units) by controlling with one remote control	206
E11	Address setting error of indoor units	207
E14	Communication error between master and slave indoor units	208
E16	Indoor fan motor anomaly	209
E18	Address setting error of master and slave indoor units	210
E19	Indoor unit operation check, drain pump motor check setting error	211
E20	Indoor fan motor rotation speed anomaly	212
E21	Defective panel switch operation	213
E28	Remote control temperature sensor anomaly	214
E35	Cooling overload operation	216
E36	Discharge pipe temperature error	217
E37	Outdoor heat exchanger temperature sensor anomaly	218
E38	Outdoor air temperature sensor anomaly	219
E39	Discharge pipe temperature sensor anomaly	220
E40	High pressure error (63H1 activated)	222
E41	Power transistor overheat	224
E42	Current cut	225 · 226
E45	Communication error between inverter PCB and outdoor unit control PCB	227
E48	Outdoor fan motor anomaly	232
E49	Low pressure error or low pressure sensor anomaly	234 · 235
E51	Inverter or power transistor anomaly	238
E53	Suction pipe temperature sensor anomaly	239
E54	Low pressure sensor anomaly	240
E55	Compressor under dome temperature sensor anomaly (Model FDC250VSA only)	241
E57	Insufficient refrigerant amount or detection of service valve closure	243
E59	Compressor startup failure	250 · 251

(2) Troubleshooting

Error code	LED	Green	Red	Content
Remote control: None	Indoor	Keeps flashing	Stays OFF	Operates but does not cool
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

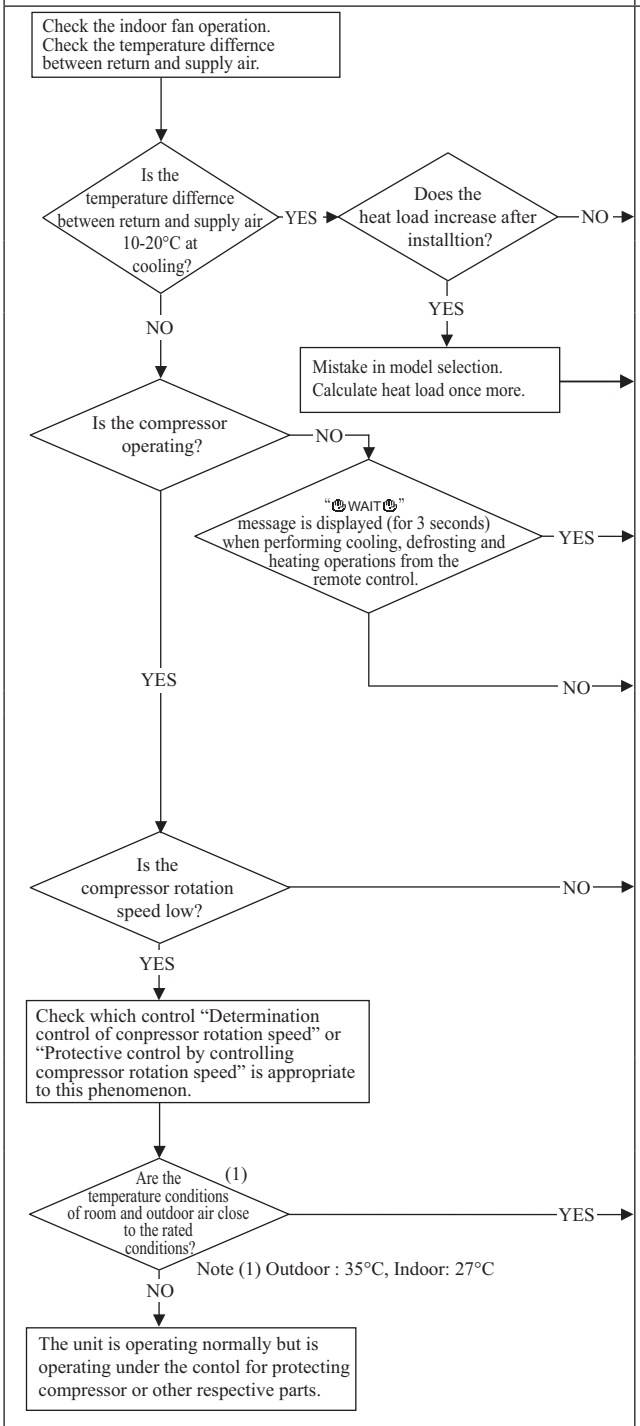
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Poor compression of compressor
- Faulty expansion valve operation

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: None	Indoor	Keeps flashing	Stays OFF	Operates but does not heat
	Outdoor	Keeps flashing	Stays OFF	

1.Applicable model

All models

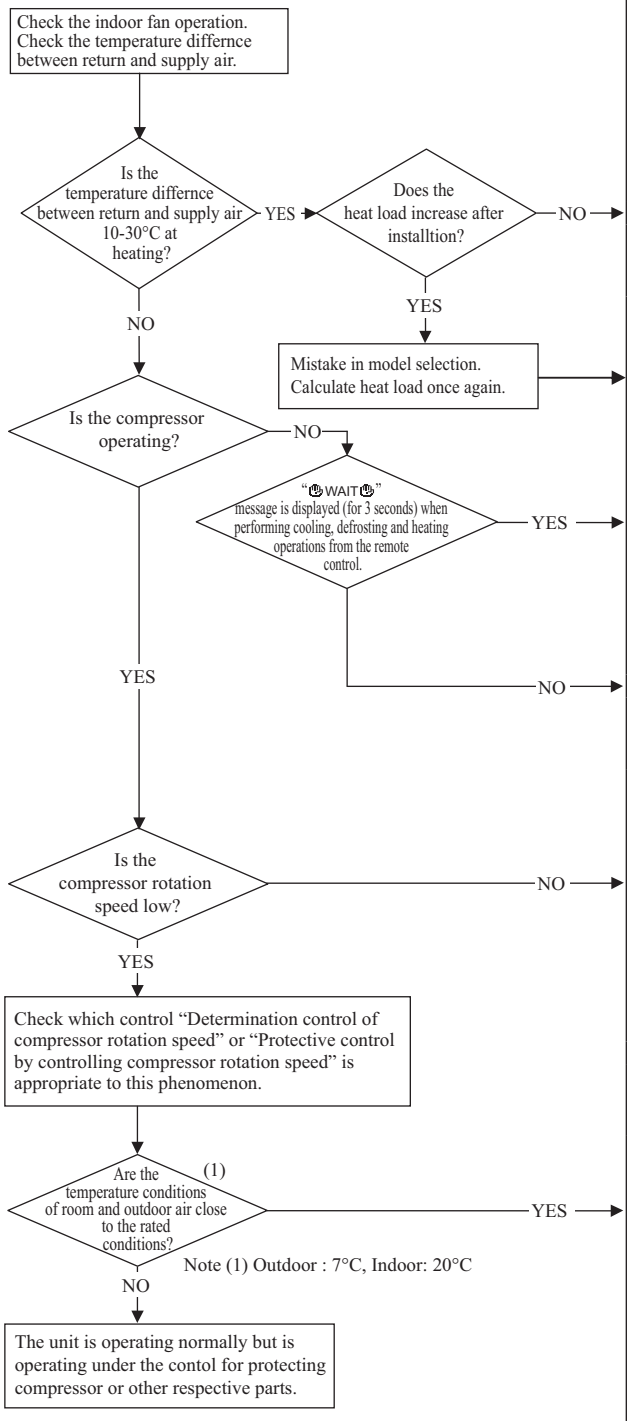
2.Error detection method

3. Condition of error displayed

4.Presumable cause

- Faulty 4-way valve operation
- Poor compression of compressor
- Faulty expansion valve operation

5.Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: None	Indoor	Stays OFF	Stays OFF	Earth leakage breaker activated
	Outdoor	Stays OFF	Stays OFF	

1. Applicable model

All models

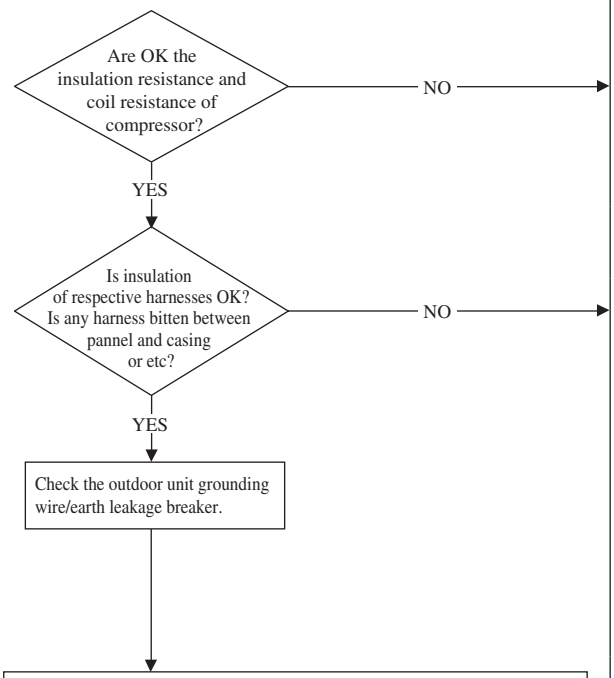
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Defective compressor
- Noise

5. Troubleshooting



Check of the outdoor unit grounding wire/earth leakage breaker

① Run an independent grounding wire from the grounding screw of outdoor unit to the grounding terminal on the distribution panel. (Do not connect to another grounding wire.)
② In order to prevent malfunction of the earth leakage breaker itself, confirm that it is conformed to higher harmonic regulation.

* Insulation resistance of compressor

- Immediately after installation or when the unit has been left for long time without power source, the insulation resistance may drop to a few MΩ because of refrigerant migrated in the compressor.
  When the earth breaker is activated at lower insulation resistance, check the following points.

① 6 hours after power ON, check if the insulation resistance recovers to normal. (FDC71-250 only)
When power ON, crankcase heater heat up compressor and evaporate the refrigerant migrated in the compressor.
② Check if the earth leakage breaker is conformed to higher harmonic regulation or not.
Since the unit is equipped with inverter, it is necessary to use components conformed to higher harmonic regulation in order to prevent malfunction of earth leakage breaker.

Note:

Error code	LED	Green	Red	Content
Remote control: None	Indoor	–	–	Excessive noise/vibration (1/3)
	Outdoor	–	–	

1.Applicable model

All models

2.Error detection method

3. Condition of error displayed

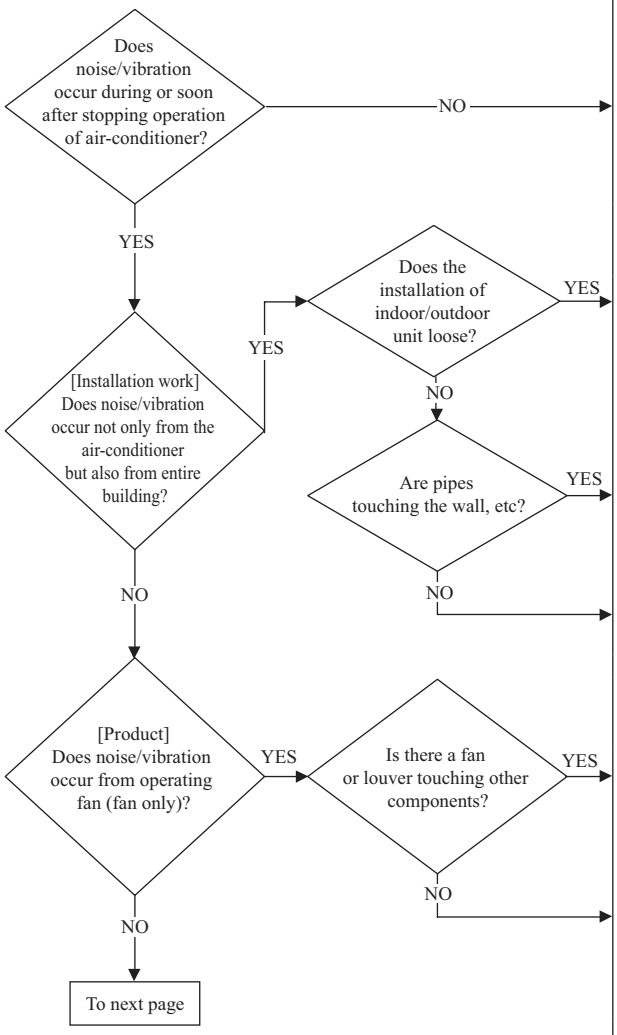
4.Presumable cause

① Improper installation work
- Improper anti-vibration work at instllation
- Insufficient strength of mounting face

② Defective product
- Before/after shipping from factory

③ Improper adjustment during commissioning
- Excess/shortage of refrigerant, etc.

5.Troubleshooting



Diagnosis	Countermeasure
	If excessive noise/vibration persists when sufficient time has elapsed after stopping the unit, it is considered that the air-conditioner is not the source. Check the installed condition carefully, and correct the position or insert rubber cushions or others into the gap, if necessary. Prevent the vibration from transmitting to wall and etc by fixing pipes on the wall or wrapping rubber cushion around the pipe which goes through the hole in the wall or applying other appropriate means. Strength of ceiling wall, floor, etc. may be insufficient. Review the installing position or reinforce it. Check for leaning of installed unit or anomalous mounting of fan, louver or motor and specify the contacting point and correct it. When the heat exchanger or filter is clogged, clean them. In case that the unit is installed at the site where background noise is very low, small noise from indoor unit can be heard, but it is normal. Before installation, check for background noise. If backgound nois is very low, convince client prior to installation.

Note:

Error code	LED	Green	Red	Content
Remote control: None	Indoor	–	–	Excessive noise/vibration (2/3)
	Outdoor	–	–	

1. Applicable model

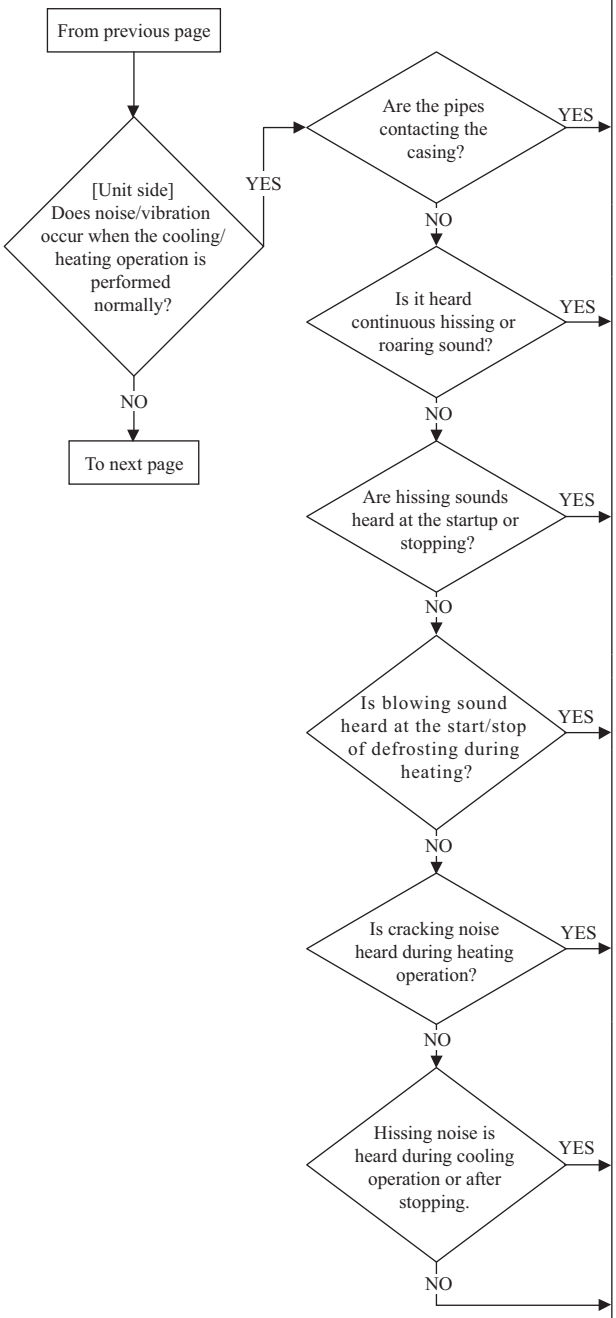
All models

2. Error detection method

3. Condition of error displayed

4. Presumable cause

5. Troubleshooting



Diagnosis	Countermeasure
Are the pipes contacting the casing? YES	Rearrange the piping to avoid contact with the casing.
Is it heard continuous hissing or roaring sound? YES	It is noise/vibration that is generated when the refrigerant gas or liquid flow through inside of piping of air-conditioner. It is likely to occur particularly during cooling or defrost operation in the heating mode. It is normal.
Are hissing sounds heard at the startup or stopping? YES	The noise/vibration occurs when the refrigerant starts or stops flowing. It is normal.
Is blowing sound heard at the start/stop of defrosting during heating? YES	When the defrost operation starts or stops during heating, the refrigerant flow is reversed due to switching 4-way valve. This causes a large change in pressure which produces a blowing sound. It may accompany also the hissing sounds as mentioned above. They are normal.
Is cracking noise heard during heating operation? YES	After the start or stop of heating operation or during defrost operation, abrupt changes in temperature cause resin parts to shrink or expand. This is normal.
Hissing noise is heard during cooling operation or after stopping. YES	It is the sound produced by the drain pump that discharges drain from the indoor unit. The pump continues to run for 5 minutes after stopping the cooling operation. This is normal.
NO	Apply the damper sealant at places considered to be the sources such as the pressure reducing mechanism (expansion valve), capillary, etc.

Note:

Error code	LED	Green	Red	Content
Remote control: None	Indoor	–	–	Excessive noise/vibration (3/3)
	Outdoor	–	–	

1.Applicable model

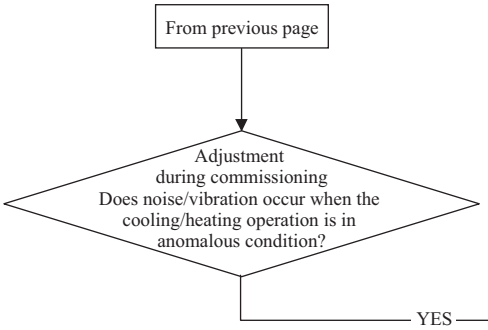
All models

2. Error detection method

3. Condition of error displayed

4. Presumable cause

5.Troubleshooting

Diagnosis	Countermeasure
	If insufficient cooling/ heating problem happens due to anomalous operating conditions at cooling/ heating, followings are suspicious. • Overcharge of refrigerant • Insufficient charge of refrigerant • Intrusion of air, nitrogen, etc. In such occasion, it is necessary to recover refrigerant, vacuum-dry and recharge refrigerant. * Since there could be many causes of noise/ vibration, the above do not cover all. In such case, check the conditions when, where, how the noise/vibration occurs according to following check point. • Indoor/outdoor unit • Cooling/heating/fan mode • Startup/stop/during operation • Operating condition (Indoor/outdoor temperatures, pressure) • Time it occurred • Operation data retained by the remote control such as compressor rotation speed, heat exchanger temperature, EEV opening degree, etc. • Tone (If available, record the noise) • Any other anomalies

Note:

Error code	LED	Green	Red	Content
Remote control: None	Indoor	Keeps flashing	Stays OFF	Louver motor failure
	Outdoor	Keeps flashing	Stays OFF	

1.Applicable model

All models

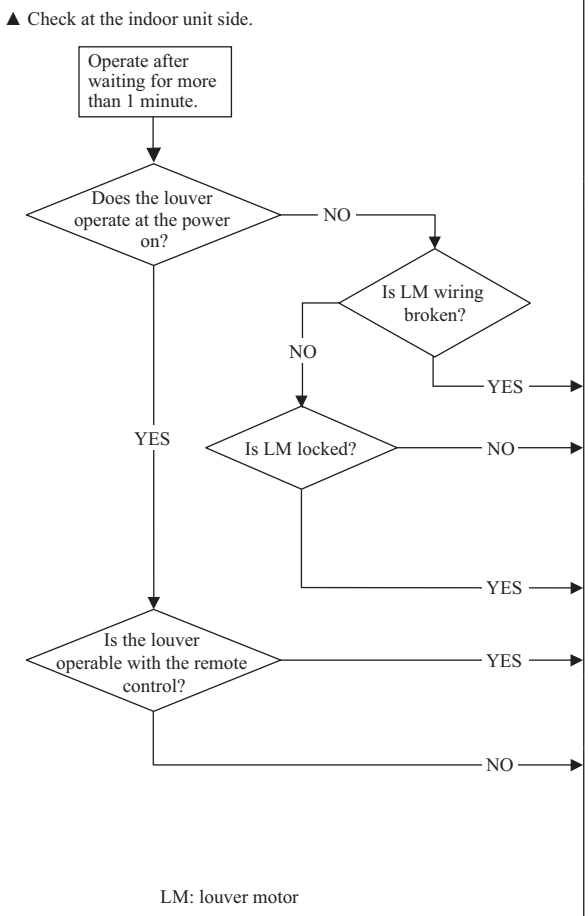
2.Error detection method

3. Condition of error displayed

4.Presumable cause

- Defective LM
- LM wire breakage
- Faulty indoor unit control PCB

5.Troubleshooting



Note:

Error code

Remote control: None

LED	Green	Red
Indoor	Stays OFF	Stays OFF
Outdoor	Keeps flashing	2-time flash

Content

Power source system error (Power source to indoor unit control PCB)

1.Applicable model

All models

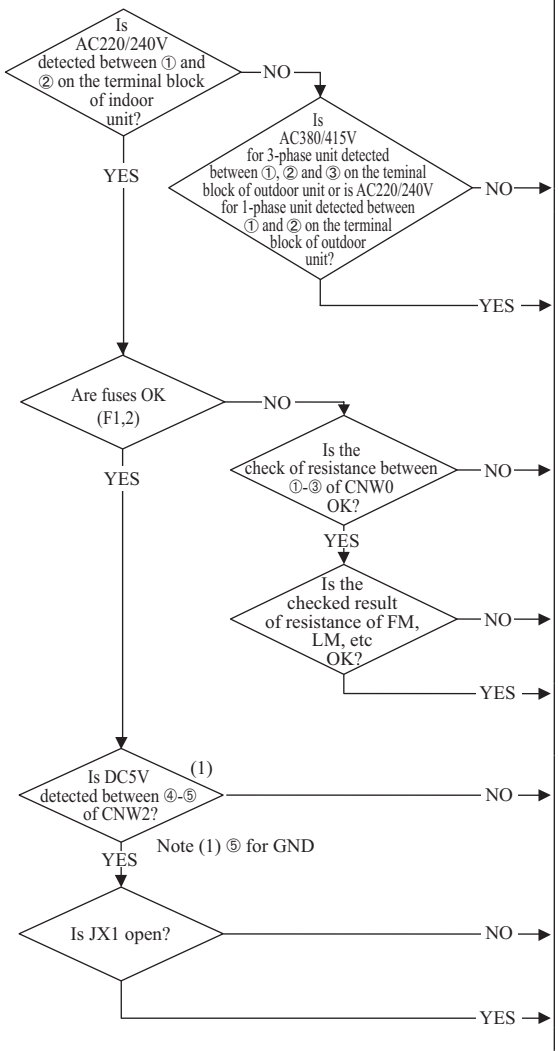
2.Error detection method

3. Condition of error displayed

4.Presumable cause

- Misconnection or breakage of connecting wires
- Blown fuse
- Faulty transformer
- Faulty indoor unit control PCB
- Broken harness
- Faulty outdoor unit control PCB (Noise filter)

5.Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: None	Indoor	Keeps flashing	Stays OFF	Power source system error (Power source to remote control)
	Outdoor	Keeps flashing	2-time flash	

1. Applicable model

All models

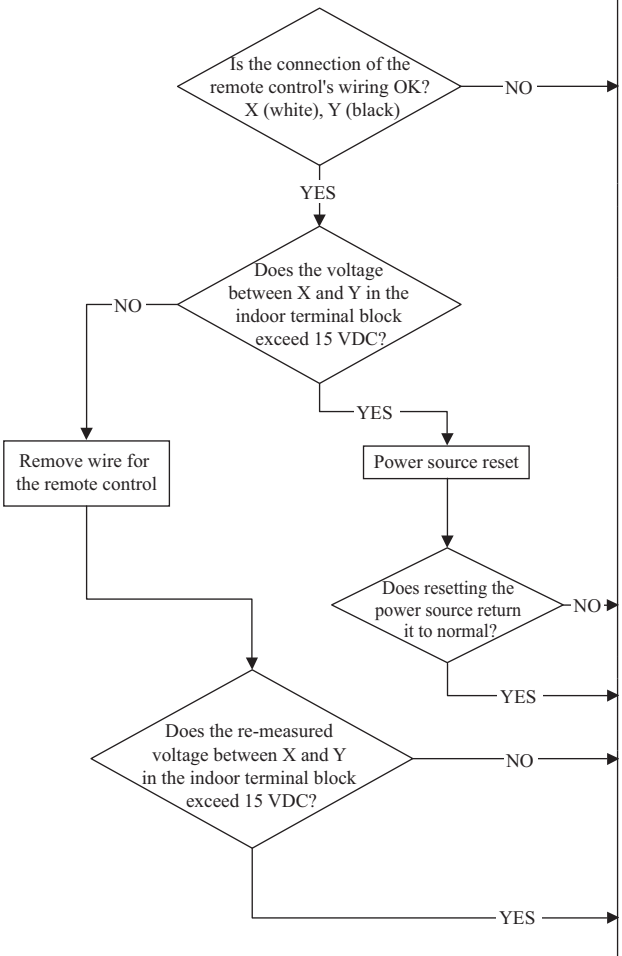
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Remote control wire breakage/short-circuit
- Defective remote control
- Malfunction by noise
- Broken harness
- Faulty indoor unit control PCB

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: INSPECT I/U	Indoor	Keeps flashing	Stays OFF	INSPECT I/U (When 1 or 2 remote controls are connected)
	Outdoor	Keeps flashing	2-time flash	

1. Applicable model

All models

2. Error detection method

Communication between indoor unit and remote control is disabled for more than 30 minutes after the power on.

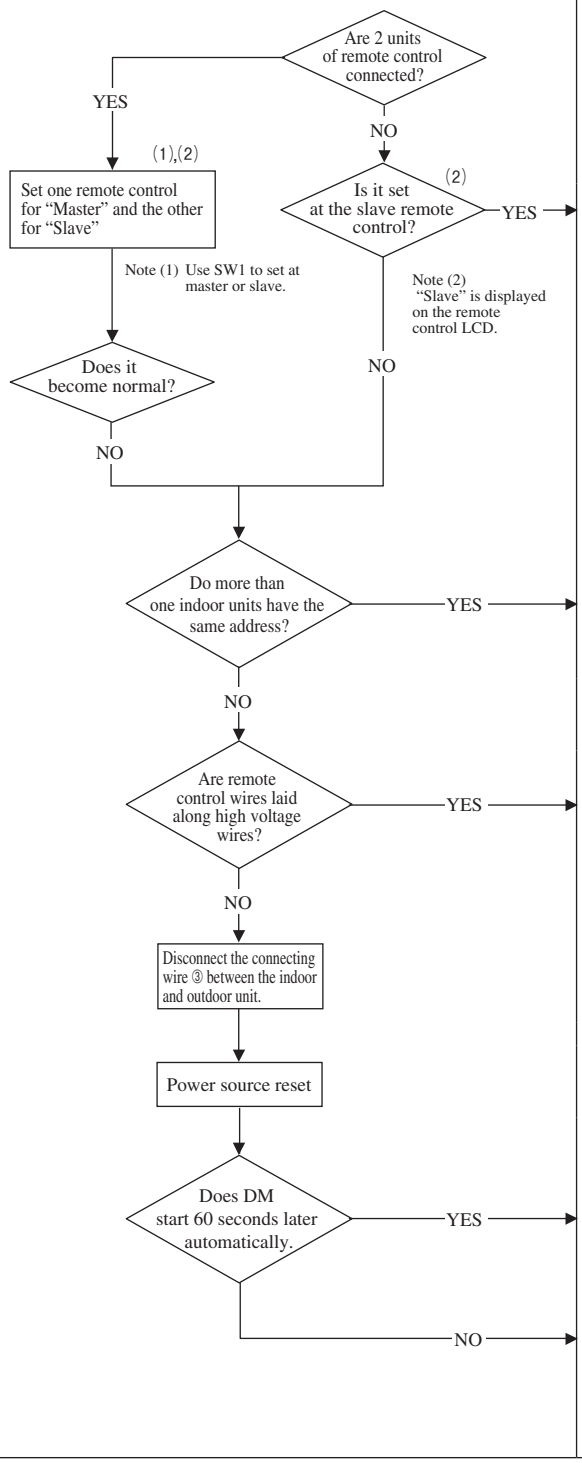
3. Condition of error displayed

Same as above

4. Presumable cause

- Improper setting
- Surrounding environment
- Defective remote control communication circuit
- Faulty indoor unit control PCB

5. Troubleshooting



Note: If any error is detected 30 minutes after displaying "WAIT" on the remote control, the display changes to "INSPECT I/U".

Error code	LED	Green	Red	Content
Remote control: INSPECT I/U	Indoor	Keeps flashing	Stays OFF	INSPECT I/U (Connection of 3 units or more remote controls)
	Outdoor	Keeps flashing	2-time flash	

1. Applicable model

All models

2. Error detection method

Indoor unit cannot communicate for more than 30 minutes after the power on with remote control.

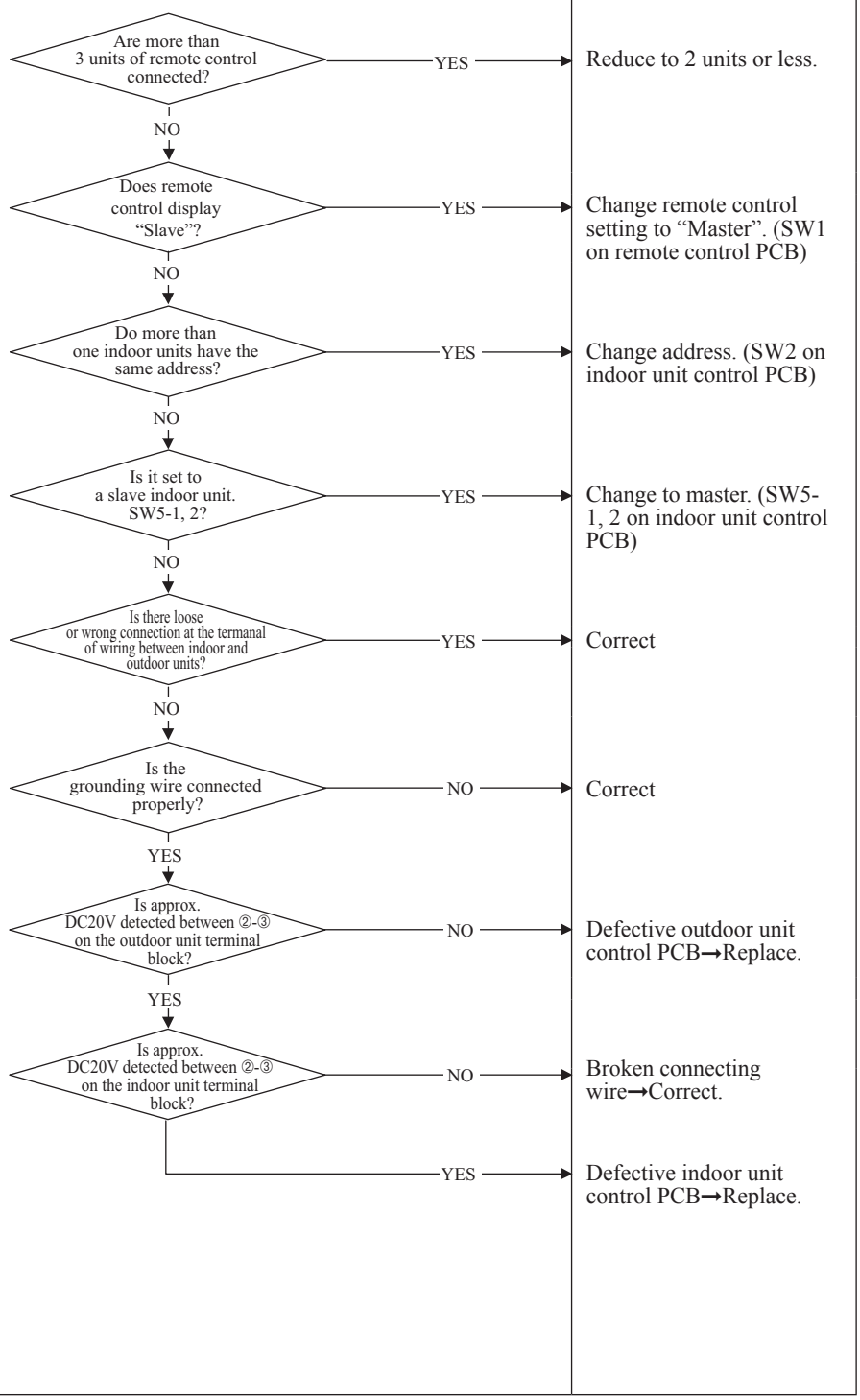
3. Condition of error displayed

Same as above

4. Presumable cause

- Improper setting
- Surrounding environment
- Defective remote control communication circuit
- Faulty indoor unit control PCB
- Faulty outdoor unit control PCB

5. Troubleshooting



Note: If any error is detected 30 minutes after displaying "WAIT" on the remote control, the display changes to "INSPECT I/U".

Error code	LED	Green	Red	Content
Remote control: WAIT	Indoor	Keeps flashing	Stays OFF	Communication error at initial operation (1/3) (Models SRC40-60)

1. Applicable model

Models SRC40-60

When the remote control LCD displays "WAIT" 2 minutes after the power on.

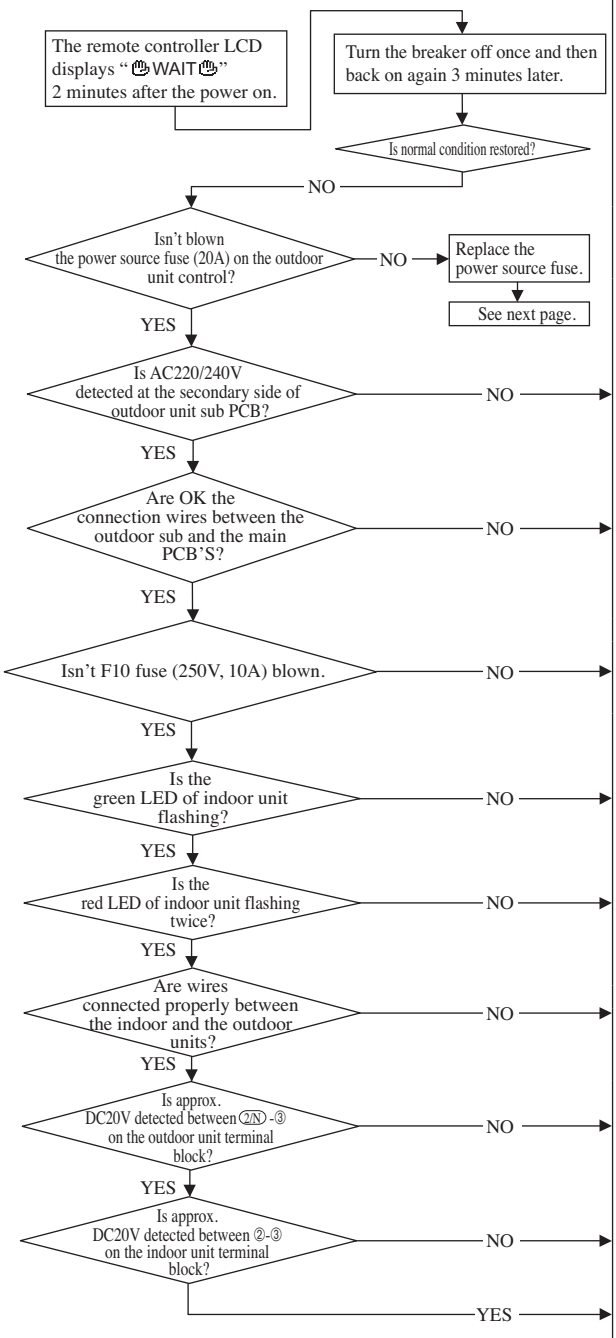
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Blown fuse
- Faulty outdoor unit PCB
- Connection between PCB's
- Blown fuse on single phase model
- Faulty indoor unit control PCB
- Defective remote control
- Broken remote control wire

5. Troubleshooting



Note: If any anomaly is detected during communication, the error code E5 is displayed. (Outdoor unit red LED flashes twice.) Inspection procedure is same as above. (Excluding matters related to connection) When the power source is reset after the occurrence of E5, the LED will display " WAIT " if the anomaly continues. If the breaker ON/OFF is repeated in a short period of time (within 1 minute), " WAIT " may be displayed. In such occasion, turn the breaker off and wait for 3 minutes.

Error code	LED	Green	Red	Content
Remote control: WAIT	Indoor	Keeps flashing	Stays OFF	Communication error at initial operation (2/3) (Models SRC40-60)

1. Applicable model

Models SRC40-60

When the fuse is blown, the method to inspect inverter before replacing the power source fuse

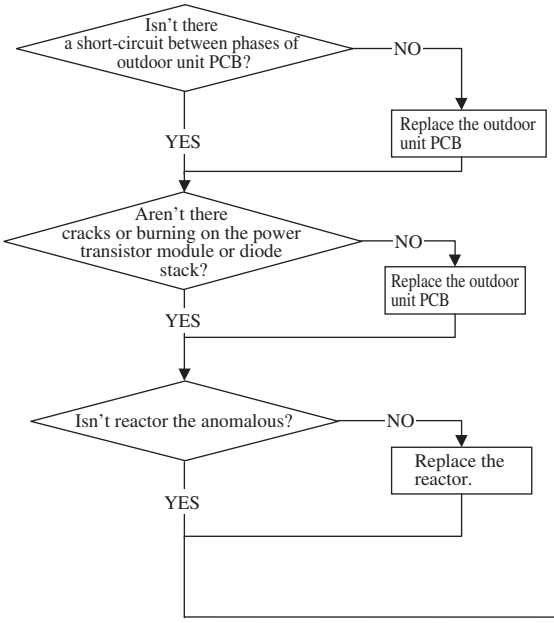
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Blown fuse
- Faulty outdoor unit PCB
- Faulty reactor

5. Troubleshooting

Diagnosis	Countermeasure
	Replace fuse.

Note:

Error code	LED	Green	Red	Content
Remote control: WAIT	Indoor	Keeps flashing	Stays OFF	Communication error at initial operation (3/3) (Models SRC40-60)

1. Applicable model

Models SRC40-60

When the remote control display is extinguished after the power on.

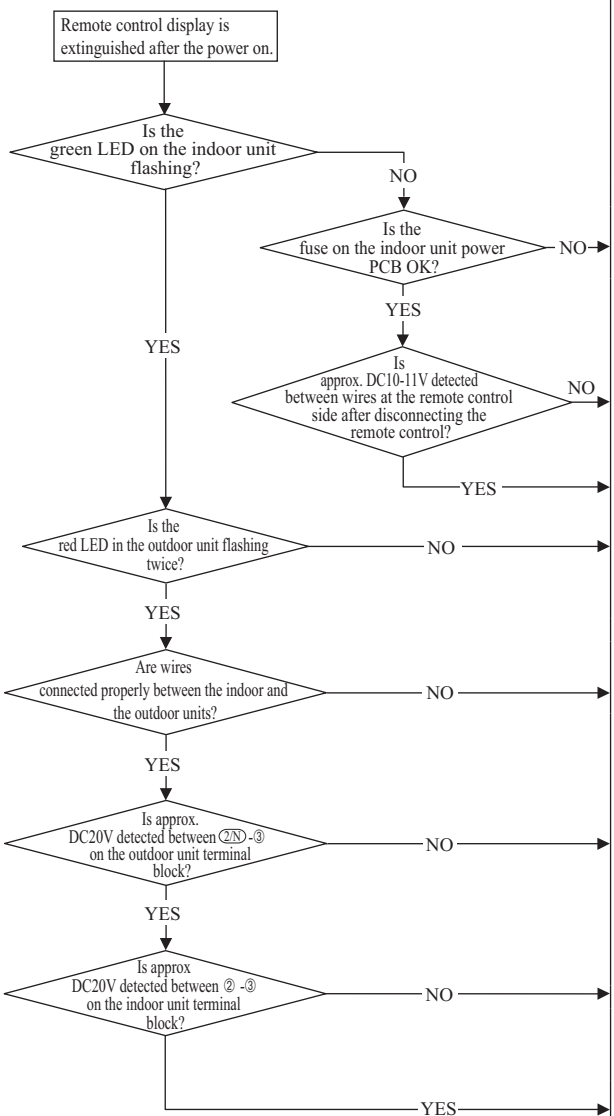
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Blown fuse
- Connection between PCB's
- Blown fuse
- Faulty indoor unit control PCB
- Defective remote control
- Wire breakage on remote control
- Faulty outdoor unit PCB

5. Troubleshooting



Note:

Error code

Remote control: WAIT

LED	Green	Red
Indoor	Keeps flashing	Stays OFF
Outdoor	Keeps flashing	2-time flash

Content

Communication error at initial operation (1/3)
(Models FDC71-140)

1. Applicable model

Models FDC71-140

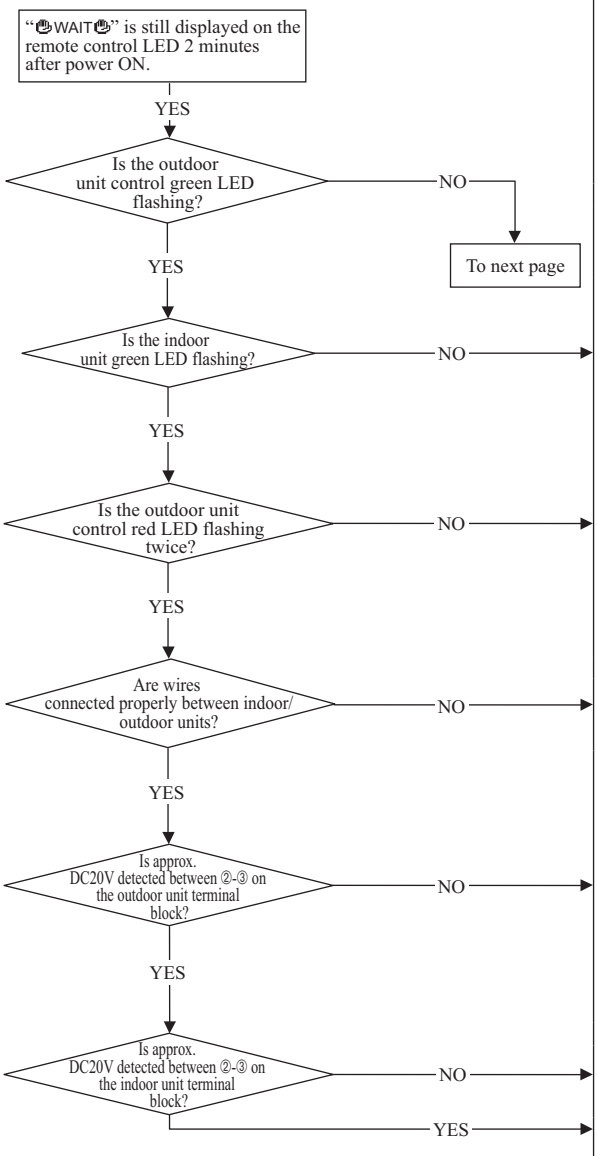
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty indoor unit control PCB
- Defective remote control
- Broken remote control wire
- Faulty outdoor unit control PCB
- Broken connection wires

5. Troubleshooting



Note:

Error code

Remote control: WAIT

LED	Green	Red
Indoor	Keeps flashing	Stays OFF
Outdoor	Keeps flashing	2-time flash

Content

Communication error at initial operation (2/3)

(Models FDC71-140)

1. Applicable model

Models FDC71-140

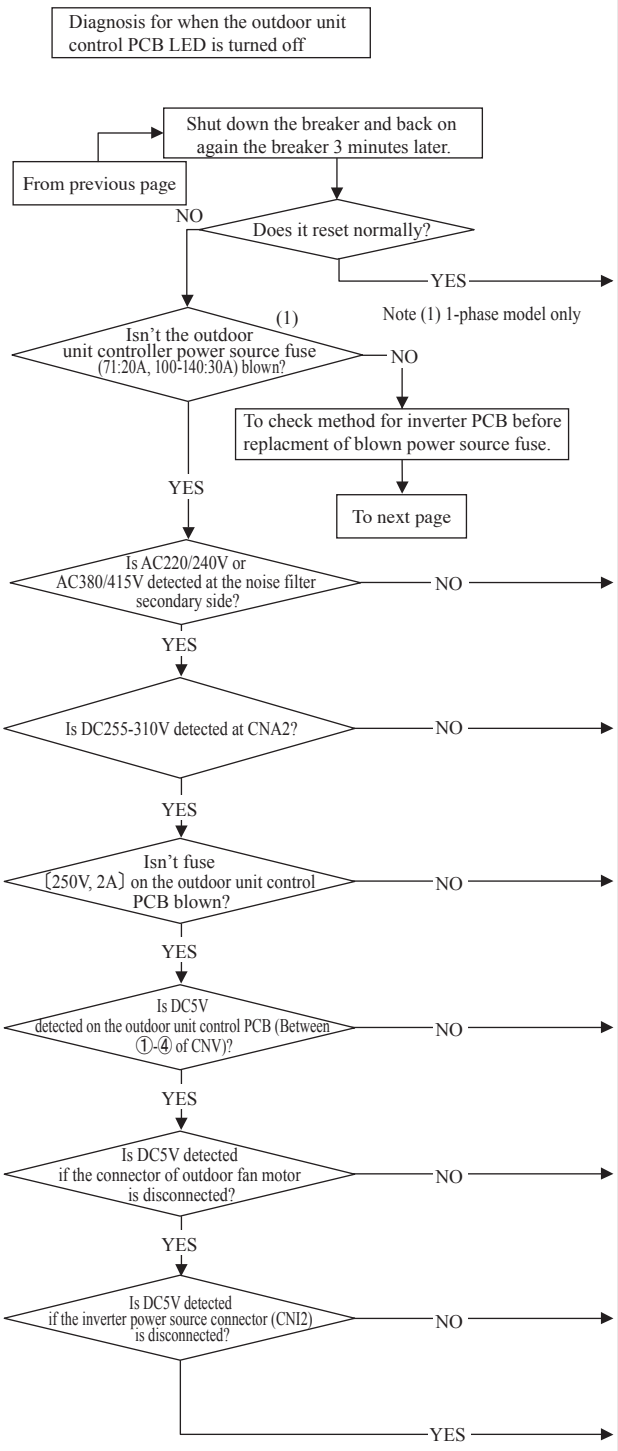
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty noise filter
- Faulty indoor unit control PCB
- Faulty outdoor unit control PCB
- Faulty inverter PCB
- Faulty fan motor

5. Troubleshooting



Note:

Error code

Remote control: WAIT

LED	Green	Red
Indoor	Keeps flashing	Stays OFF
Outdoor	Keeps flashing	2-time flash

Content

Communication error at initial operation (3/3)

(Models FDC71-140)

1. Applicable model

Models FDC71-140

2. Error detection method

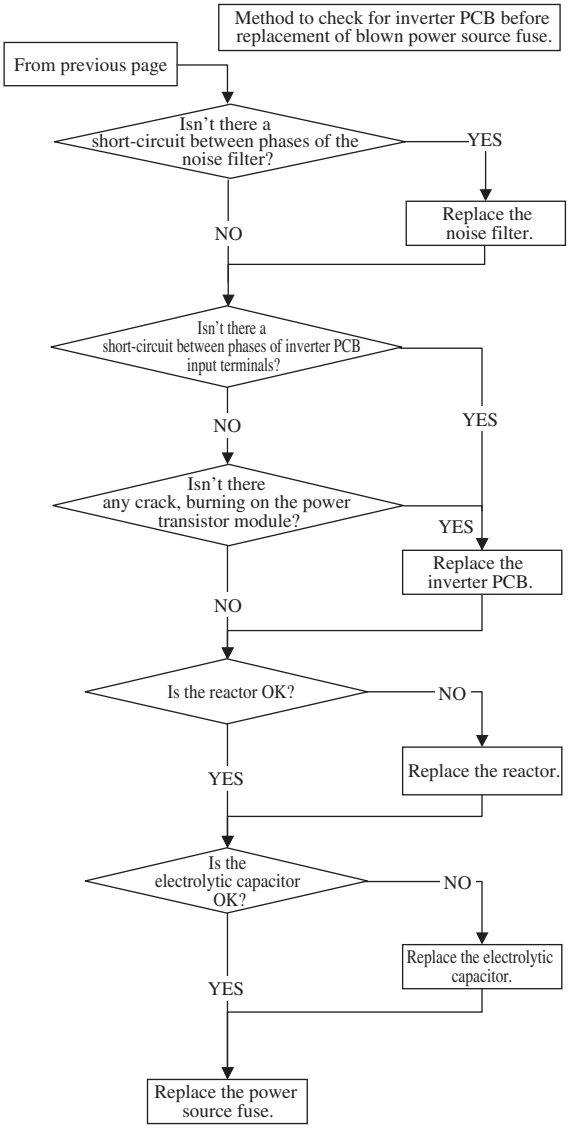
3. Condition of error displayed

4. Presumable cause

- Blown fuse
- Faulty noise filter
- Faulty inverter PCB
- Faulty reactor
- Faulty electrolytic capacitor

5. Troubleshooting

Diagnosis



Countermeasure

Note:

Error code

Remote control: ✋WAIT✋

LED	Green	Red
Indoor	Keeps flashing	Stays OFF
Outdoor	Keeps flashing	2-time flash

Content

Communication error at initial operation (1/2)

(Models FDC200, 250VSA only)

1. Applicable model

Models FDC200, 250VSA

2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty indoor unit control PCB
- Defective remote control
- Broken remote control wire
- Faulty outdoor unit control PCB
- Broken connection wires

5. Troubleshooting

Diagnosis	Countermeasure
"✋WAIT✋" is still displayed on the remote control LED 2 minutes after power ON.	
YES	
Is the outdoor unit green LED flashing? NO → To next page	
YES	
Is the indoor unit green LED flashing? NO	Defective indoor unit control PCB→Replace.
YES	
Is the outdoor unit red LED flashing twice? NO	Defective indoor unit control PCB→Replace. Defective remote control→Replace. Broken remote control wire Y→Replace.
YES	
Are wires connected properly between indoor/ outdoor units? NO	Correct connection wires between indoor and outdoor units.
YES	
Is approx. DC20V detected between ②-③ on the outdoor unit terminal block? NO	Defective outdoor unit control PCB→Replace.
YES	
Is approx. DC20V detected between ②-③ on the indoor unit terminal block? NO	Defective connection wire. (Broken) Noise.
YES	Defective indoor unit control PCB→Replace.

Note:

Error code

Remote control: ✋WAIT✋

LED	Green	Red
Indoor	Keeps flashing	Stays OFF
Outdoor	Keeps flashing	2-time flash

Content

Communication error at initial operation (2/2)

(Models FDC200, 250VSA only)

1. Applicable model

Models FDC200, 250VSA

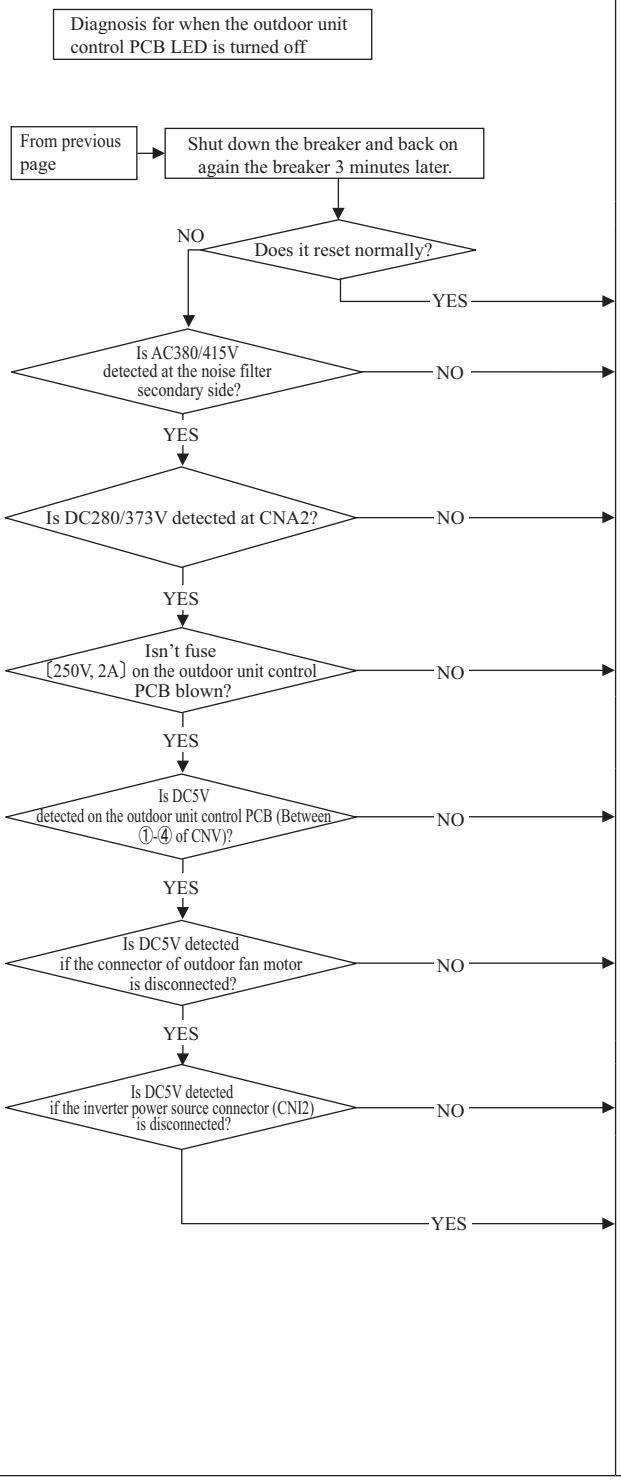
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty noise filter
- Faulty indoor unit control PCB
- Faulty outdoor unit control PCB
- Faulty inverter PCB
- Faulty fan motor

5. Troubleshooting



Note:

Error code

Remote control: None

LED	Green	Red
Indoor	Stays OFF	Stays OFF
Outdoor	Stays OFF	Stays OFF

Content

No display

1. Applicable model

All models

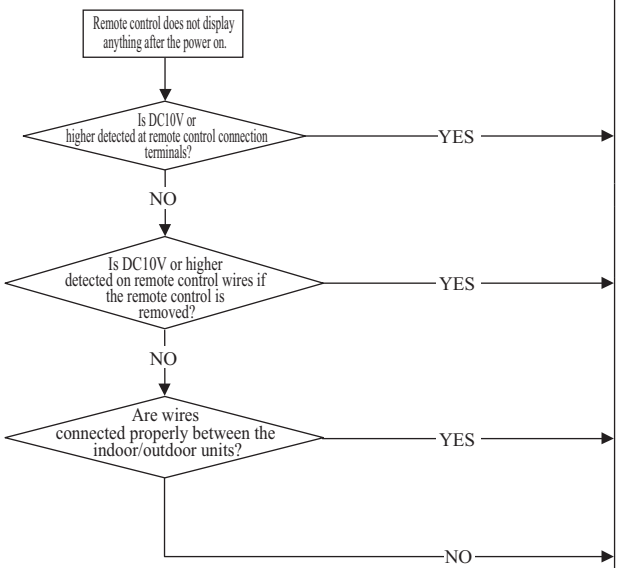
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty indoor unit control PCB
- Defective remote control
- Broken remote control wire

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E1	Indoor	Keeps flashing	Stays OFF	Remote control communication circuit error
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

When normal communication between the remote control and the indoor unit is interrupted for more than 2 minutes. (Detectable only with the remote control)

3. Condition of error displayed

Same as above

4. Presumable cause

- Defective communication circuit between remote control-indoor unit
- Noise
- Defective remote control
- Faulty indoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is it possible to reset normally by the power reset? — YES	Malfunction by noise Check peripheral environment.
NO → Turn SW7-1 to OFF. → ON Remove the wire ③ connecting between indoor/outdoor units. → Power source reset	
Does the drain pump restart automatically 1 minute later? (1) — YES	Defective indoor unit control PCB → Replace.
NO → Connect the wire ③ connecting between indoor/outdoor units.	Move to E5. (Communication error during operation) check.

Note (1) Only indoor unit with drain pump

Note: If the indoor unit cannot communicate normally with the remote control for 180 seconds, the indoor unit PCB starts to reset automatically.

Error code	LED	Green	Red	Content
Remote control: E5	Indoor	Keeps flashing	2-time flash	Communication error during operation
	Outdoor	Keeps flashing	See below	

1. Applicable model

All models

2. Error detection method

When normal communication between indoor and outdoor unit is interrupted for more than 2 minutes.

3. Condition of error displayed

Same as above is detected during operation.

4. Presumable cause

- Unit No. setting error
- Broken remote control wire
- Faulty remote control wire connection
- Faulty outdoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
●In case that the outdoor unit red LED flashes 2-time	
Note (1) Inspect faulty connections (disconnection, looseness) on the outdoor unit terminal block. Is the connection of signal wires at the outdoor unit side OK? NO	Repair signal wires.
YES Note (2) Check for faulty connection or breakage of signal wires between indoor-outdoor units. Is the connection of signal wires between indoor-outdoor units OK? NO	Repair signal wires.
YES Power source reset Has the remote control LCD returned to normal state? NO	To the diagnosis of "WAIT".
YES	Unit is normal. (Malfunction by temporary noise, etc.)
●In case that the outdoor unit red LED stays OFF	
Power source reset NO Has the remote control LCD returned to normal state? NO	Defective outdoor unit PCB (Defective network communication circuit) → Replace.
YES	Unit is normal. (Malfunction by temporary noise, etc.)

Note: Pressing the pump-down switch cancels communications between indoor and outdoor unit so that "communication error-E5" is displayed on indoor unit and remote control, but it is normal.

Error code	LED	Green	Red	Content
Remote control: E6	Indoor	Keeps flashing	1-time flash	Indoor heat exchanger temperature sensor anomaly
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

Anomalously low temperature or high temperature (resistance) is detected on the indoor heat exchanger temperature sensor (Thi-R1, R2 or R3).

3. Condition of error displayed

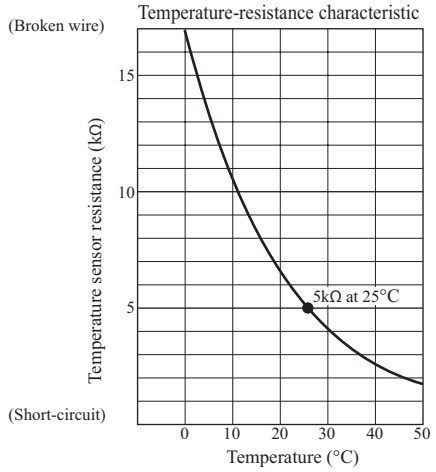
- When the temperature sensor detects -50°C or lower for 5 seconds continuously, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.
- Or if 70°C or higher is detected for 5 seconds continuously.

4. Presumable cause

- Defective indoor heat exchanger temperature sensor connector
- Indoor heat exchanger temperature sensor anomaly
- Faulty indoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is the connection of indoor heat exchanger temperature sensor connector OK? — NO	Correct. → Insert connector securely.
YES → Are characteristics of indoor heat exchanger temperature sensor OK? — NO	Defective indoor heat exchanger temperature sensor → Replace.
YES	Defective indoor unit control PCB → Replace. (Defective indoor heat exchanger temperature sensor input circuit)



Note:

Error code	LED	Green	Red	Content
Remote control: E7	Indoor	Keeps flashing	1-time flash	Return air temperature sensor anomaly
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

Anomalously low temperature or high temperature (resistance) is detected by indoor return air temperature sensor (Thi-A)

3. Condition of error displayed

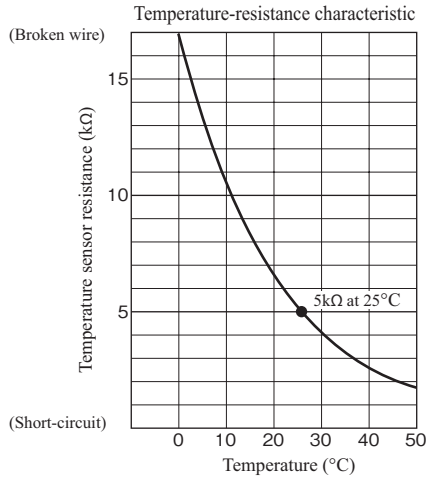
- When the temperature sensor detects -50°C or lower for 5 seconds continuously, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.

4. Presumable cause

- Defective return air temperature sensor connector
- Defective return air temperature sensor
- Faulty indoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is the connection of return air temperature sensor connector OK? — NO	Correct. → Connect connector.
YES → Are the characteristics of return air temperature sensor OK? — NO	Defective return air temperature sensor → Replace.
YES	Defective indoor unit control PCB → Replace. (Defective return air temperature sensor input circuit)



Note:

Error code	LED	Green	Red	Content
Remote control: E8	Indoor	Keeps flashing	1-time flash	Heating overload operation
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

Indoor heat exchanger temperature sensor (Thi-R1, R2, R3)

3. Condition of error displayed

When it is detected 5 times within 60 minutes from initial detection or when the overload condition is detected for 6 minutes continuously.

4. Presumable cause

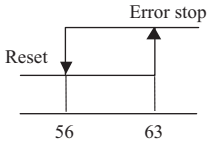
- Clogged air filter
- Defective indoor heat exchanger temperature sensor connector
- Defective indoor heat exchanger temperature sensor
- Anomalous refrigerant system

5. Troubleshooting

Diagnosis	Countermeasure
Is the air filter clogged? NO	
Is the air filter clogged? YES	Wash.
Is the indoor heat exchanger temperature sensor connection OK? NO	Defective indoor heat exchanger temperature sensor connector→Correct.
Are the characteristics of indoor heat exchanger temperature sensor OK? (2) NO	Defective indoor heat exchanger temperature sensor.
Check the error data with the remote control.	
Is the unit operating in the state of heating overload? NO	Check refrigerant system.
Is the unit operating in the state of heating overload? YES	Adjust.

Note (1) Judge if it is in the state of overload or not as follows.
- Is there any short-circuit of air?
- Isn't there any fouling or clogging on the indoor heat exchanger?
- Is the outdoor fan control normal?
- Isn't the room and outdoor air temperature too high?

Note (2) For characteristics of indoor heat exchanger temperature sensor, see the error display E6.



Note: During heating operation; After starting compressor, compressor rotation speed is decreased by detecting indoor heat exchanger temperature (Thi-R) in order to control high pressure.

Error code	LED	Green	Red	Content
Remote control: E9	Indoor	Keeps flashing	1-time flash	Drain trouble
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

Float switch is activated

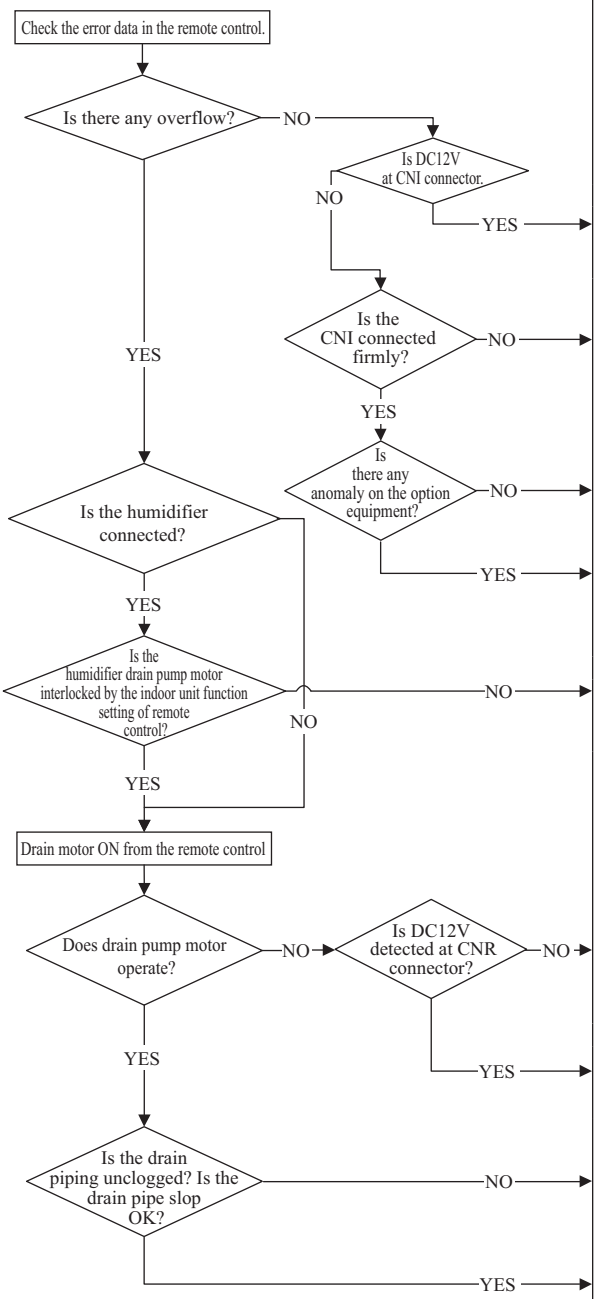
3. Condition of error displayed

If the float switch OPEN is detected for 3 seconds continuously or if float switch connector or wire is disconnected.

4. Presumable cause

- Defective indoor unit control PCB
- Float switch setting error
- Humidifier drain motor interlock setting error
- Option equipment setting error
- Drain piping error
- Defective drain pump motor
- Disconnection of drain pump motor wiring

5. Troubleshooting



Note: When this error occurred at power ON, disconnection of wire or connector of the float switch is suspected. Check and correct it (or replace it, if necessary).

Error code

Remote control: E10

LED	Green	Red
Indoor	Keeps flashing	Stays OFF
Outdoor	Keeps flashing	Stays OFF

Content: Excessive number of connected indoor units (more than 17 units) by controlling with one remote control

1. Applicable model

All models

2. Error detection method

When it detects more than 17 of indoor units connected to one remote contorl

3. Condition of error displayed

Same as above

4. Presumable cause

- Excessive number of indoor units connected
- Defective remote control

5. Troubleshooting

Diagnosis	Countermeasure
Aren't more than 17 indoor units connected to one remote control? → NO	Defective remote control → Replace.
YES	Reduce to 16 or less units.

Note:

Error code	LED	Green	Red	Content
Remote control: E11	Indoor	Keeps flashing	Keeps flashing	Address setting error of indoor units
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

IU address has been set using the "Master IU address set" function of remote control.

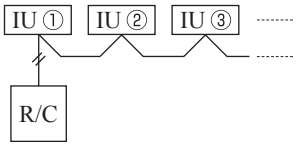
3. Condition of error displayed

Same as above

4. Presumable cause

Same as above

5. Troubleshooting

Diagnosis	Countermeasure
E11 occurs ↓ Is "Master IU address set" function of remote control used? YES →	• In cases of RC-EX3A Menu → Service setting → IU settings → Select IU • In cases of RC-E5 Return address No. to "IU …" using [▲] or [▼] button.
In case the wiring is below and "Mastar IU address set" is used, E11 is appeared. 	

Note:

Error code	LED	Green	Red	Content
Remote control: E14	Indoor	Keeps flashing	3-time flash	Communication error between master and slave indoor units
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

When communication error between master and slave indoor units occurs

3. Condition of error displayed

Same as above

4. Presumable cause

- Unit address setting error
- Broken remote control wire
- Defective remote control wire connection
- Defective indoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is it OK the unit address setting for master and slave indoor units? → NO	Correct unit address setting.
Isn't the remote control wiring between indoor units defective? → YES	Correct wiring.
Is it restored by resetting the power source? → NO	Defective indoor unit control PCB→Replace.
→ YES	• Malfunction by noise. • Check surrounding environment.

Note (1) Set DIP switches SW5-1 and SW5-2 as shown in the following table.
(Factory default setting – "Master")

		Indoor unit		
		Master	Slave-a	Slave-b
DIP switch	SW5-1	OFF	OFF	ON
	SW5-2	OFF	ON	OFF

Note:

Error code	LED	Green	Red	Content
Remote control: E16	Indoor	Keeps flashing	1-time flash	Indoor fan motor anomaly
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

Detected by rotation speed of indoor fan motor

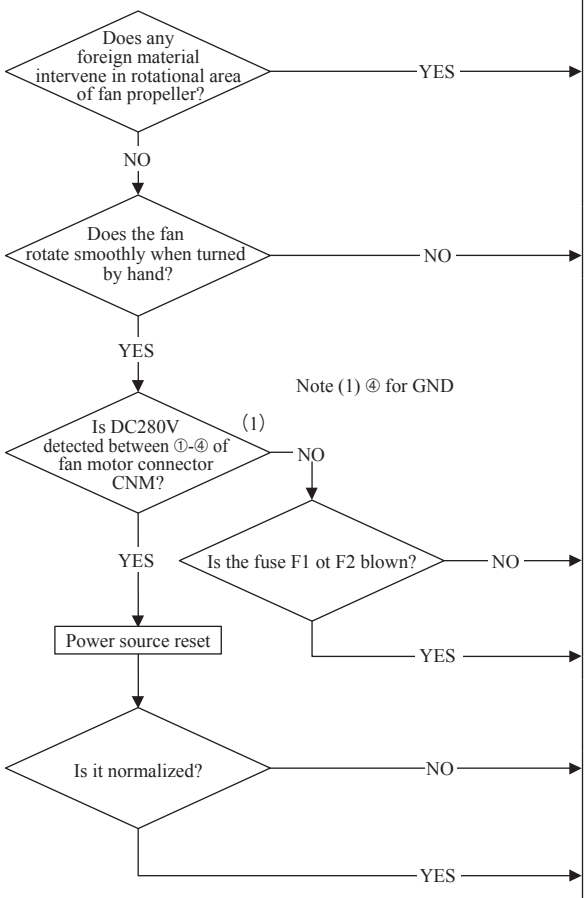
3. Condition of error displayed

- When actual rotation speed of indoor fan motor drops to lower than 200min^{-1} for 30 seconds continuously, the compressor and the indoor fan motor stop.
- After 2-seconds, it starts again automatically, but if this error occurs 4 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective indoor unit control PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on indoor unit control PCB
- Blown fuse
- External noise, surge

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E18	Indoor	Keeps flashing	1-time flash	Address setting error of master and slave indoor units
	Outdoor	Keeps flashing	Stays Off	

1. Applicable model

All models

2. Error detection method

IU address has been set using the "Master IU address set" function of remote control.

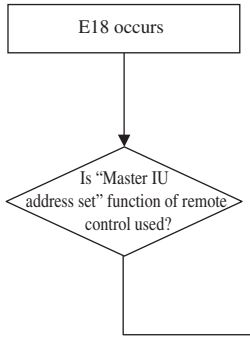
3. Condition of error displayed

Same as above

4. Presumable cause

Same as above

5. Troubleshooting

Diagnosis	Countermeasure
	• In cases of RC-EX3A Menu ➞ Service setting ➞ IU settings ➞ Select IU • In cases of RC-E5 Return address No. to "IU …" using [▲] or [▼] button.

Note:

Error code	LED	Green	Red	Content
Remote control: E19	Indoor	Keeps flashing	1-time flash	Indoor unit operation check, drain pump motor check setting error
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

After indoor operation check, when the communication between indoor and outdoor unit is established and SW7-1 is still kept ON.

3. Condition of error displayed

Same as above

4. Presumable cause

Mistake in SW7-1 setting
(Due to forgetting to turn OFF SW7-1 after indoor operation check)

5. Troubleshooting

Diagnosis	Countermeasure
E19 occurs when the power ON → Is SW7-1 on the indoor unit control PCB ON ?	
NO	Defective indoor unit control PCB (Defective SW7)→Replace.
YES	Turn SW7-1 on the indoor unit control PCB OFF and reset the power.

Note:

Error code	LED	Green	Red	Content
Remote control: E20	Indoor	Keeps flashing	1-time flash	Indoor fan motor rotation speed anomaly
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

Detected by rotation speed of indoor fan motor

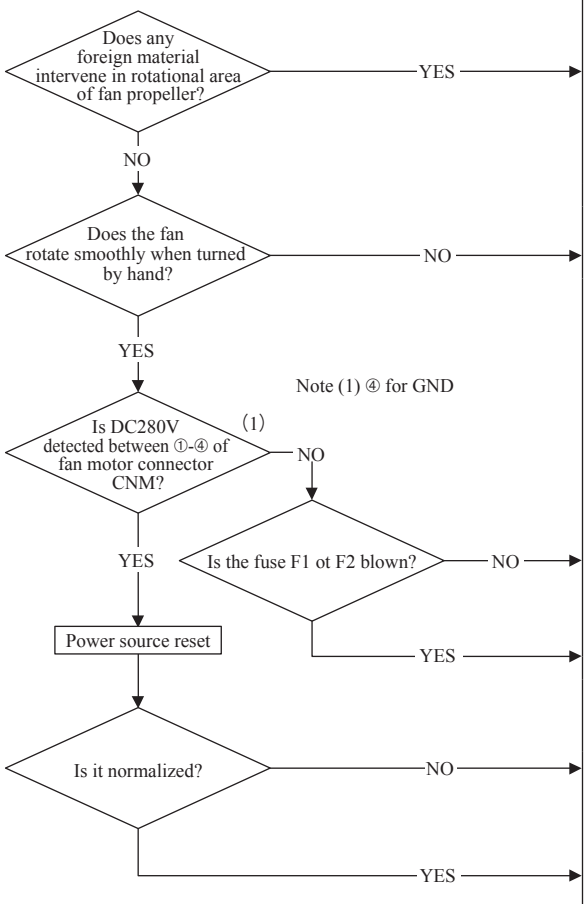
3. Condition of error displayed

When the actual fan rotation speed does not reach to the speed of [required speed -50 min^{-1}] after 2 minutes have been elapsed since the fan motor rotation speed command was output, the unit stops by detecting indoor fan motor anomaly.

4. Presumable cause

- Defective indoor unit control PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on indoor unit control PCB
- Blown fuse
- External noise, surge

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E21	Indoor	Keeps flashing	1-time flash	Defective panel switch operation

1.Applicable model

All models

2.Error detection method

Panel switch (PS) has detected Open for more than 1 second.

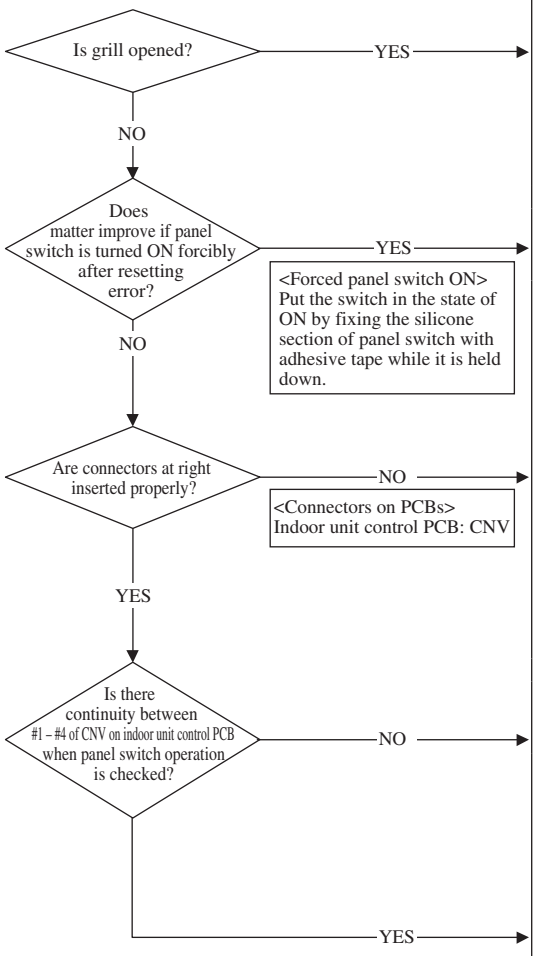
3.Condition of Error displayed

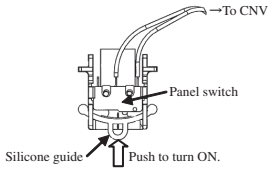
Same as above

4.Presumable cause

- Defective panel switch
- Disconnection of wiring
- Defective indoor unit control PCB

5.Troubleshooting





Note:

Error code	LED	Green	Red	Content
Remote control: E28	Indoor	Keeps flashing	Stays OFF	Remote control temperature sensor anomaly
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature (resistance) of remote control temperature sensor (Thc)

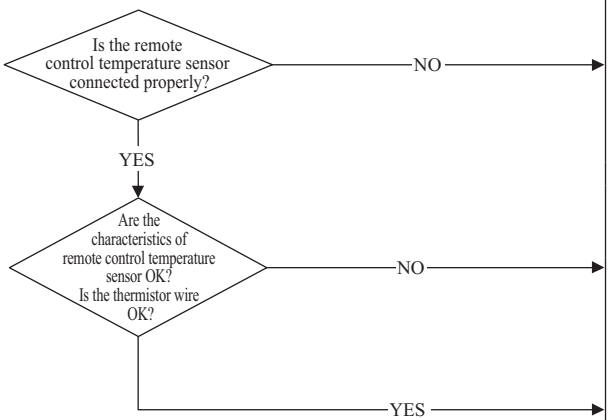
3. Condition of error displayed

When the temperature sensor detects -50°C or lower for 5 seconds continuously, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.

4. Presumable cause

- Faulty connection of remote control temperature sensor
- Defective remote control temperature sensor
- Defective remote control PCB

5. Troubleshooting



Resistance-temperature characteristics of remote control temperature sensor (Thc)

Temperature (°C)	Resistance value (kΩ)	Temperature (°C)	Resistance value (kΩ)
0	65	30	16
1	62	32	15
2	59	34	14
4	53	36	13
6	48	38	12
8	44	40	11
10	40	42	9.9
12	36	44	9.2
14	33	46	8.5
16	30	48	7.8
18	27	50	7.3
20	25	52	6.7
22	23	54	6.3
24	21	56	5.8
26	19	58	5.4
28	18	60	5.0

Note: After 10 seconds has passed since remote control temperature sensor was switched from valid to invalid, E28 will not be displayed even if the sensor harness is disconnected. At same time the sensor, which is effective, is switched from remote control temperature sensor to indoor return air temperature sensor. Even though the remote control temperature sensor is set to be Effective, the return air temperature displayed on remote control for checking still shows the value detected by indoor return air temperature sensor, not by remote control temperature sensor.

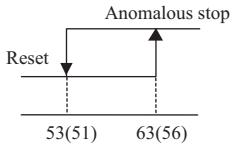
Error code	LED	Green	Red	Content
Remote control: E35	Indoor	Keeps flashing	Stays OFF	Cooling overload operation (Models SRC40-60 only)

Note (1) This LED isinstalled on models SRC40-60 only.

1. Applicable model

Models SRC40-60

2. Error detection method



Outdoor heat exchanger temperature (°C)

Note(1) Values in ( ) are applicable when outdoor temperature (TH2) is lower than 32°C

3. Condition of error displayed

When anomalous outdoor heat exchanger temperature occurs 5 times within 60 minutes or 63(56)°C or higher continues for 10 minutes, including the compressor stop.

4. Presumable cause

- Defective outdoor heat exchanger temperature sensor
- Defective outdoor unit PCB
- Indoor, outdoor unit installation spaces
- Short-circuit of air on indoor, outdoor units
- Fouling, clogging of heat exchanger
- Excessive refrigerant quantity

5. Troubleshooting

Diagnosis	Countermeasure
* For the characteristics of outdoor heat exchanger temperature sensor, refer to E37. Are normal the characteristics of outdoor heat exchanger temperature sensor normal? NO →	Replace outdoor heat exchanger temperature sensor.
YES Is the unit operating in the state of cooling overload? YES →	Check unit side. • Isn't the air circulation of outdoor unit short-circuited? • Are installation spaces adequate? • Isn't there any fouling or clogging on heat exchanger?
NO Is the high pressure control normal NO →	Control operation check*.
YES Is the temperature (measured actually) at direction of error correct? NO →	Defective outdoor unit PCB→Replace.
YES →	Excessive refrigerant amount: Recharge refrigerant by weighing proper amount on a scale.

* For the contents of control, refer to the protective control by controlling compressor rotation speed and cooling high pressure protective control of microcomputer control function for corresponding models.

Note:

Error code

Remote control: E35

LED	Green	Red
Indoor control PCB	Keeps flashing	Stays OFF
Outdoor control PCB	Keeps flashing	1-time flash
Outdoor inverter PCB	Yellow LED	
	Keeps flashing	

Content

Cooling overload operation
(Models FDC71-250 only)

1. Applicable model

Models FDC71-250

2. Error detection method

For the error detection method, refer to the protective control by controlling compressor rotation speed and cooling high pressure protective control of micro-computer control function for corresponding models.

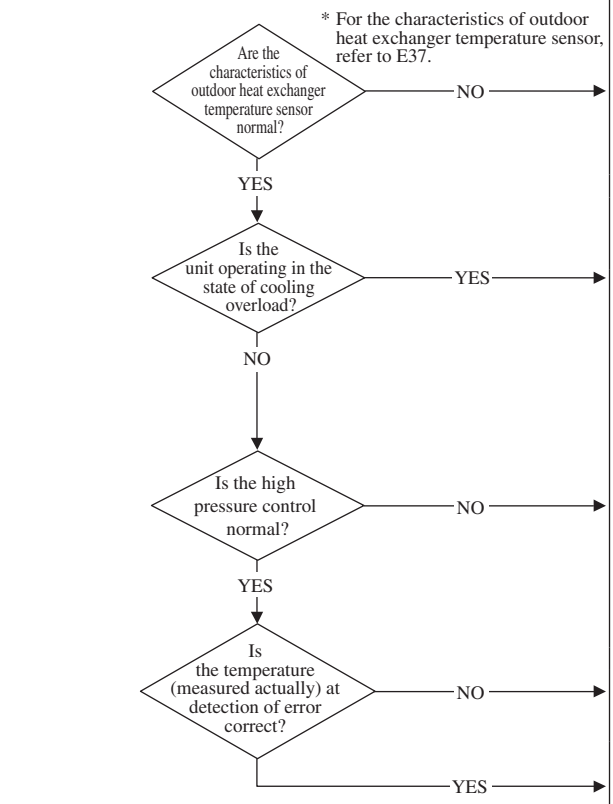
3. Condition of error displayed

When outdoor heat exchanger temperature anomaly is detected 5 times within 60 minutes or this anomalous state is detected 60 minutes continuously including compressor stop.

4. Presumable cause

- Defective outdoor heat exchanger temperature sensor
- Defective outdoor unit control (or main) PCB
- Indoor, outdoor unit installation spaces
- Short-circuit of air on indoor, outdoor units
- Fouling, clogging of heat exchanger
- Excessive refrigerant amount

5. Troubleshooting



* For the contents of control, refer to the protective control by controlling compressor rotation speed and cooling high pressure protective control of microcomputer control function for corresponding models.

Note:

Error code	LED	Green	Red	Content
Remote control: E36	Indoor control PCB	Keeps flashing	Stays OFF	Discharge pipe temperature error
	Outdoor control PCB	Keeps flashing	1〔5〕-time flash	
	Outdoor inverter PCB	Yellow LED		
		Keeps flashing		

Note (1) Value in〔 〕is for the models SRC40-60.

1. Applicable model

All models

2. Error detection method

For the error detection method, refer to the protective control by controlling compressor rotation speed and cooling high pressure protective control of micro-computer control function for corresponding models.

3. Condition of error displayed

When discharge pipe temperature anomaly is detected 2 times within 60 minutes or this anomalous state is detected 60 minutes continuously including compressor stop.

4. Presumable cause

- Defective outdoor unit control (or main) PCB
- Defective discharge pipe temperature sensor
- Clogged filter
- Indoor, outdoor unit installation spaces
- Short-circuit of air on indoor, outdoor units
- Fouling, clogging of heat exchanger

5. Troubleshooting

Diagnosis	Countermeasure
* For the characteristics of discharge pipe temperature, refer to E39. Are the characteristics of discharge pipe temperature sensor normal? — NO →	Replace discharge pipe temperature sensor.
YES ↓ Is the discharge pipe temperature error persisted during cooling operation? — YES →	Insufficient refrigerant amount : Recharge refrigerant by weighing proper amount on a scale.
NO ↓ Is the discharge pipe temperature control normal? — NO →	Control operation check *.
YES ↓ Is the temperature (measured actually) at detection of error correct? — NO →	Defective outdoor unit control (or main) PCB→Replace.
YES →	Check unit side: • Isn't filter clogged? • Are adequate indoor, outdoor unit installation spaces? • Isn't there any short-circuit of air? • Isn't there any fouling, clogging on indoor heat exchanger?

* For the contents of control, refer to the protective control by controlling compressor rotation speed and cooling high pressure protective control of microcomputer control function for corresponding models.

Note:

Error code	LED	Green	Red
Remote control: E37	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1(8)-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content: **Outdoor heat exchanger temperature sensor anomaly**

Note (1) Value in [ ] is for the models SRC40-60.

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature (resistance) on the outdoor heat exchanger temperature sensor

3. Condition of error displayed

- When the temperature sensor detects -50(-55)°C or lower for 20 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.
- When -50(-55)°C or lower is detected for 5 seconds continuously within 20 seconds after compressor ON.

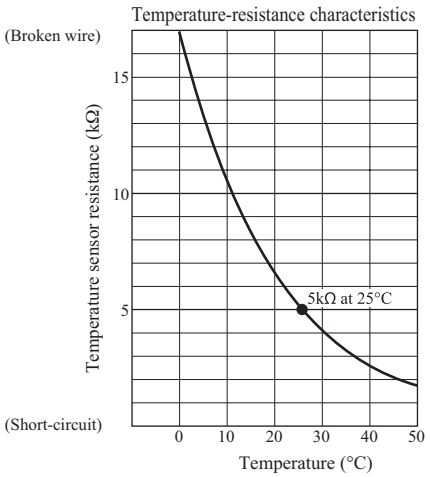
Note (1) Value in ( ) are for the models SRC40-60.

4. Presumable cause

- Defective outdoor unit control (or main) PCB
- Broken sensor harness or temperature sensing section
- Disconnected wire connection (connector)

5. Troubleshooting

Diagnosis	Countermeasure
Is the outdoor heat exchanger temperature sensor connector connected properly? → NO	Correct connector.
YES	
For the characteristics of outdoor heat exchanger temperature sensor, see the following graph.	
Are the characteristics of outdoor heat exchanger temperature sensor OK? → NO	Defective outdoor heat exchanger temperature sensor→Replace.
YES	Defective outdoor unit control (or main) PCB→Replace. (Defective outdoor heat exchanger temperature sensor input circuit)



Note:

Error code	LED	Green	Red
Remote control: E38	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content

Outdoor air temperature sensor anomaly

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature (resistance) on outdoor air temperature sensor

3. Condition of error displayed

- When the temperature sensor detects -45(-55)°C or lower for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.
- When -45(-55)°C or lower is detected for 5 seconds continuously within 20 seconds after compressor ON.

Note (1) Value in ( ) are for the models SRC40-60.

4. Presumable cause

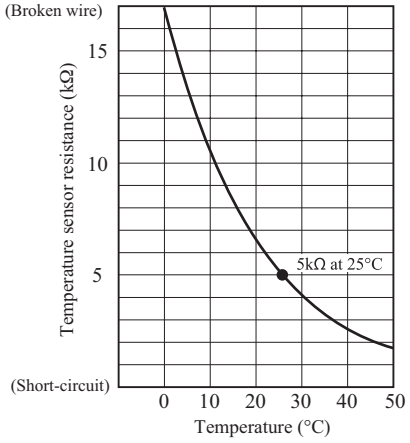
- Defective outdoor unit control (or main) PCB
- Broken sensor harness or temperature sensing section (Check molding.)
- Disconnected wire connection (connector)

5. Troubleshooting

Diagnosis	Countermeasure
Is the outdoor air temperature sensor connector connected properly? NO	Correct connector.
YES → Is the characteristics of the outdoor air temperature sensor OK? (For the characteristics of outdoor air temperature sensor, see the following graph.) NO	Defective outdoor air temperature sensor→Replace.
YES	Defective outdoor unit control (or main) PCB→Replace. (Defective outdoor air temperature sensor input circuit)

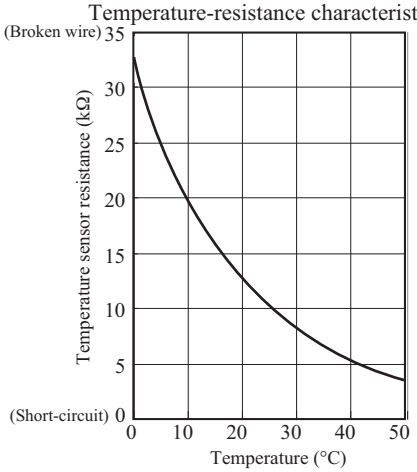
• Models SRC40-60

Temperature-resistance characteristics



• Models FDC71 - 250

Temperature-resistance characteristics



Note:

Error code	LED	Green	Red
Remote control: E39	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content

Discharge pipe temperature sensor anomaly

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature (resistance) on the discharge pipe temperature sensor

3. Condition of error displayed

When the temperature sensor detects -10(-25)°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.

Note (1) Value in ( ) is for the models SRC40-60.

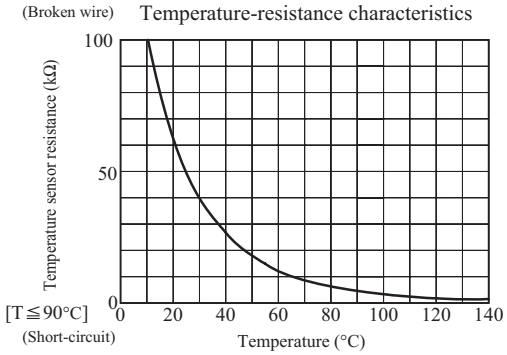
4. Presumable cause

- Defective outdoor unit control (or main) PCB
- Broken sensor harness or temperature sensing section (Check molding.)
- Disconnected wire connection (connector)

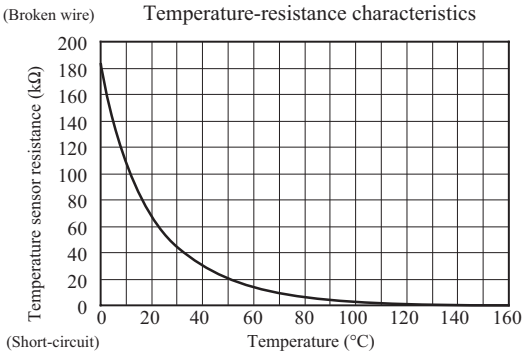
5. Troubleshooting

Diagnosis	Countermeasure
Is the discharge pipe temperature sensor connector connected properly? → NO	Correct connector.
YES → Are the characteristics of discharge pipe temperature sensor OK? (For the characteristics of discharge pipe temperature sensor, see the following graph.) → NO	Defective discharge pipe temperature sensor→ Replace.
YES	Defective outdoor unit control (or main) PCB→Replace. (Defective temperature sensor input circuit)

• Models SRC40-60



• Models FDC71-250



Note:

Error code	LED	Green	Red	Content
Remote control: E40	Indoor	Keeps flashing	Stays OFF	Service valve (gas side) closing operation (Models SRC40-60 only)

1. Applicable model

Models SRC40-60

2. Error detection method

If the inverter output current value exceeds the setting value within 80 seconds after the compressor ON in the heating mode, the compressor stops.

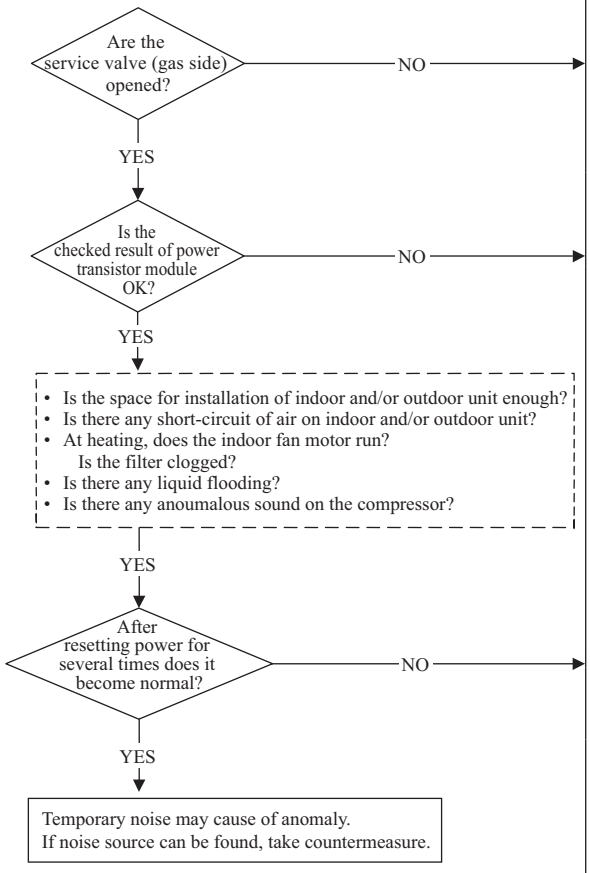
3. Condition of error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping. (In heating mode)
- After 3-minute delay, the compressor restarts, but if this anomaly occurs 2 times within 20 minutes after the intial detection.

4. Presumable cause

- Service valve (gas side) closing
- Defective outdoor unit PCB

5. Troubleshooting



Note:

Error code	LED	Green	Red
Remote control: E40	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content

High pressure error (63H1 activated)

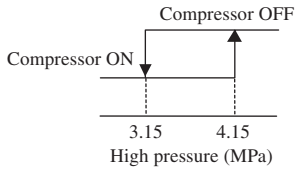
(Models FDC71-250 only)

1. Applicable model

Models FDC71-250

2. Error detection method

When the high pressure switch 63H1 is activated.



3. Condition of error displayed

If 63H1 turns OFF (opened), the compressor stops. After 3-minute delay, the compressor restarts. If this anomaly occurs 5 times within 60 minutes or continues for 60 minutes continuously.

4. Presumable cause

- Short-circuit of air flow, disturbance of air flow and clogging filter at outdoor heat exchanger/Breakdown of fan motor
- Defective outdoor unit control (or main) PCB
- Defective 63H1 connector
- Defective electronic expansion valve connector
- Closed service valve
- Mixing of non-condensing gas (nitrogen, etc.)

5. Troubleshooting

Diagnosis	Countermeasure
If the power source breaker is turned OFF and ON too quickly, E40 may be displayed. (This is normal.)	
Is the service valve fully opened? — NO	Open the service valve.
YES	
Has 63H1 activated? — NO	
On operation of 63H1 — YES	
1. During cooling ・ Is the outdoor fan motor running? ・ Isn't any short-circuit of air on the outdoor unit? ・ Are sufficient return air/supply air space secured? 2. During heating ・ Isn't the indoor heat exchanger temperature sensor disconnected from the sensor casing? ・ Isn't the filter clogged? * Under the condition of overcharging refrigerant, 63H1 may activate due to delay of starting the preventive control by compressor speed control, because detected heat exhanger temperature, which conducts compressor speed control, becomes lower than normal condition due to excess sub-cooling degree.	
Is 63H1 connector connected properly? — NO	Correct 63H1 connector.
YES	
Is the electronic expansion valve connector connection OK? — NO	Correct electronic expansion valve connector.
If any anomaly exists on the electronic expansion valve connector connection, the power source must be reset.	
YES	Defective outdoor unit control (or main) PCB→Replace. (Defective 63H1 input circuit)

Note: In the protective control range for compressor startup (initial startup after power ON), even if 63H1 is activated only once (63H1turns OFF), immediately the error is displayed.

Error code	LED	Green	Red
Remote control: E41	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		6-time flash	

Content

Power transistor overheat
(Models FDC71-140VNX, 100-140VSX only)

1. Applicable model

Models FDC71-140VNX, 100-140VSX

2. Error detection method

When less than DC14V of the output voltage is detected between ② and ③ on CNI3, E41 is displayed.
(See "Note" mentioned below)

3. Condition of error displayed

Seme as above.

4. Presumable cause

- Inverter PCB anomaly
- Outdoor fan motor anomaly
- Outdoor unit control PCB anomaly
- Noise filter PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
• **Single phase models (FDC71-140VNX)**	
(1) (2) Is DC15V detected between ② and ③ on CNI3? — YES	Replace inverter PCB . If not solved, replace noise filter PCB as well.
NO — Note(1) Under anomalous conditions, the voltage becomes less than DC14V.	
(1) Is DC15V detected after disconnecting outdoor fan motor? — YES	Replace outdoor fan motor.
NO	Replace outdoor unit control PCB . If not solved, replace inverter PCB as well.
Note(2) How to check the voltage between ② and ③ of CNI3? ⇒See E51	
• **3-phase models (FDC100-140VSX)** E41⇒Replace inverter PCB.	

Note: The "Single phase models" of inverter PAC have no function to output the signal for the power transistor overheat. However since the power source for the power transistor and the outdoor fan motor is in the same line, when the anomaly of the outdoor fan motor occurs, E41 is displayed.

Error code	LED	Green	Red
Remote control: E41	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		2-time flash or 8-time flash(1)	

Content

Power transistor overheat
(Models FDC200, 250VSA only)

Note (1) 8-time flash FDC250 model only.

1. Applicable model

Models FDC200, 250VSA

2. Error detection method

When anomalously high temperature is detected by power transistor.

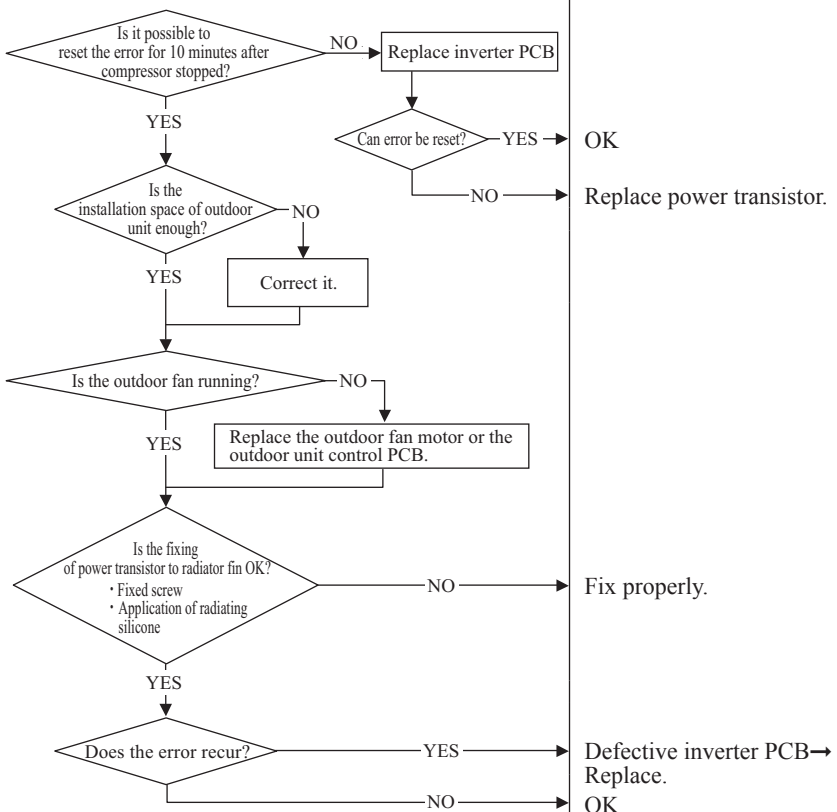
3. Condition of error displayed

Anomalously high temperature of power transistor is detected 5 times within 60 minutes.

4. Presumable cause

- Inverter PCB anomaly
- Outdoor fan motor anomaly
- Improperly fixing of power transistor to radiator fin
- Inadequate installation space of outdoor unit

5. Troubleshooting



Note:

Error code	LED	Green	Red
Remote control: E42	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		1-time flash or 9-time flash(1)	

Content

Current cut (1/2)

Note (1) 9-time flash is for the FDC250 model only.

1. Applicable model

All models

2. Error detection method

In order to prevent from overcurrent of inverter, if the current exceeds the specifications, it makes the compressor stopping.

3. Condition of error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minutes after the intial detection. (FDC71-250 only)

4. Presumable cause

- The service valves closed
- Faulty power source
- Insufficient refrigerant amount
- Faulty compressor
- Faulty power transistor module

5. Troubleshooting

Diagnosis	Countermeasure
Is the power source voltage OK? — NO	Check power source.
YES → Are the service valves opened? — NO	Open the service valves.
YES → Is the high pressure during operation OK? — NO	Check refrigerant amount and refregerant circuit. *In case of transitional increase of high pressure and/or test run, several times restarting may recover it, because liquid refrigerant (migrated) in the compresser is discharged from the compressor.
YES → Is the checked result of insulation resistance and resistance between terminals (1) of compressor motor OK? — NO	Replace compressor.
YES → To next page.	

(1) 0.864Ω or more at 20°C (Model SRC40-60ZSX-S)
1.154Ω or more at 20°C (Model FDC71VNX)
0.293Ω or more at 20°C (Models FDC100-140VNX)
1.172Ω or more at 20°C (Models FDC100-140VSX)
0.448Ω or more at 20°C (Models FDC100-140VNA)
1.044Ω or more at 20°C (Models FDC100-140VSA)
1.172Ω or more at 20°C (Model FDC200VSA)
0.309Ω or more at 20°C (Model FDC250VSA)

Note:

Error code	LED	Green	Red
Remote control: E42	Indoor	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		1-time flash or 9-time flash(1)	

Content

Current cut (2/2)

Note (1) 9-time flash is for the FDC250 model only.

1. Applicable model

All models

2. Error detection method

In order to prevent from overcurrent of inverter, if the current exceeds the specifications, it makes the compressor stopping.

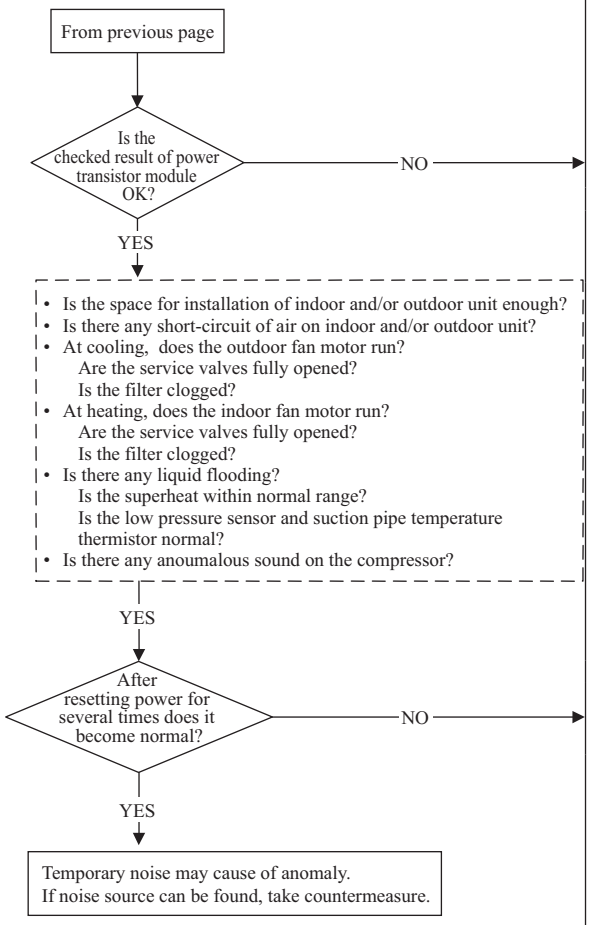
3. Condition of error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minutes after the intial detection. (FDC71-250only)

4. Presumable cause

- Defective inverter (or outdoor unit main) PCB
- Faulty power source
- Insufficient refrigerant amount
- Faulty compressor
- Faulty power transistor module

5. Troubleshooting

Diagnosis	Countermeasure
	Defective inverter (or outdoor unit main) PCB→Replace. *Replace also the power transistor module. (FDC250 only) Defective inverter (or outdoor unit main) PCB→Replace. *Replace also the power transistor module. (FDC250 only)

Note:

Error code

Remote control: E45

LED	Green	Red
Indoor control PCB	Keeps flashing	Stays OFF
Outdoor control PCB	Keeps flashing	1-time flash
Outdoor inverter PCB	Yellow LED	
	Keeps flashing	

Content

Communication error between inverter PCB and outdoor unit control PCB

(Models FDC71-140VNX, 100-140VSX, 200, 250VSA only)

1. Applicable model

Models FDC71-140VNX, 100-140VSX, 200, 250VSA

2. Error detection method

When the communication between inverter PCB and outdoor unit control PCB is not established.

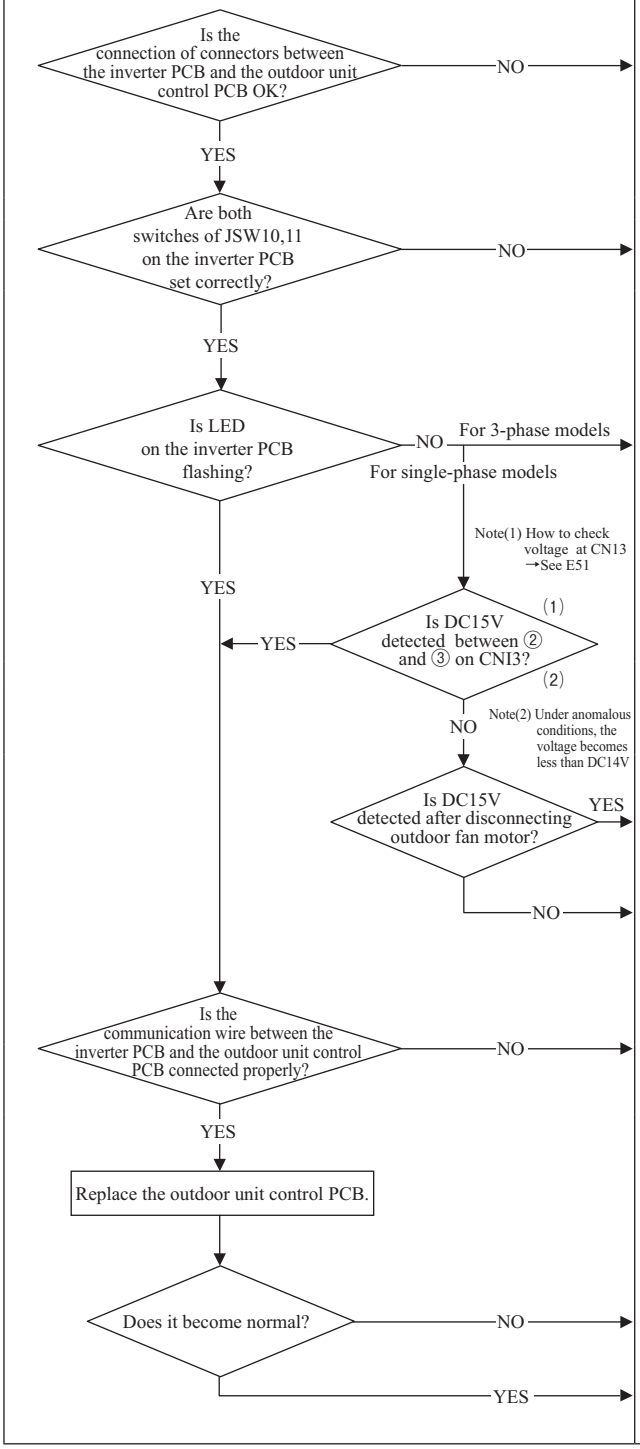
3. Condition of error displayed

Same as above.

4. Presumable cause

- Inverter PCB anomaly
- Anomalous connection of connector between the outdoor unit control PCB and inverter PCB
- Outdoor unit control PCB anomaly
- Outdoor fan motor anomaly

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E47	Indoor	Keeps flashing	Stays OFF	Active filter voltage error (Models SRC40-60 only)

1. Applicable model

Models SRC40-60

2. Error detection method

Error is displayed if the converter voltage exceeds target voltage (3 times within 20 minutes). Remote control may be set after 3-minute delay.
Error is displayed if the converter voltage is lower than DC210V (1-time within 5 seconds after power ON)

3. Condition of error displayed

Same as above

4. Presumable cause

- Defective outdoor unit PCB
- Dust on outdoor unit PCB
- Anomalous power source

5. Troubleshooting

Diagnosis	Countermeasure
Is the power source normal? — NO	Restore normal condition.
YES → Is voltage within the specified range? — NO	Restore normal condition.
YES → Check soldered surfaces on the outdoor unit PCB for foreign matter like dust, fouling, etc. — NO	Remove foreign matter like dust, fouling, etc.
YES	Defective outdoor unit PCB→Replace.

• If the overvoltage (DC voltage is higher than 400V) occurs, Red LED flashes 1-time.

Note:

Error code	LED	Green	Red
Remote control: E47	Indoor	Keeps flashing	Stays off
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor Inverter PCB	Yellow LED	
		7-time flashing	

Content

Inverter PCB A/F module anomaly
(Model FDC71VNX only)

1. Applicable model

Model FDC71VNX only

2. Error detection method

In order to prevent from overcurrent of A/F, if the current exceeds the specifications, it makes the compressor stopping.

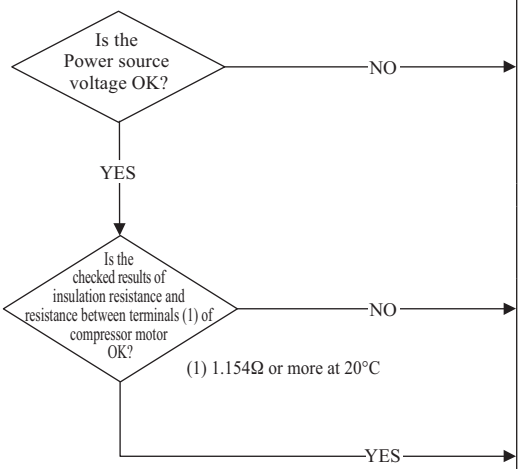
3. Condition of error displayed

- If the output current of A/F exceeds the specifications, it makes the compressor stopping.

4. Presumable cause

- Defective inverter PCB

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E47	Indoor	Keeps flashing	Stays OFF	Control PCB A/F module anomaly (Models FDC100-140VNA only)
	Outdoor control PCB	Keeps flashing	1-time flash	

1. Applicable model

Models FDC100-140VNA

2. Error detection method

In order to avoid an unexpected trouble, if the protective circuit defect unexpected voltage, current and movement of the power element, it makes the compressor stopping.

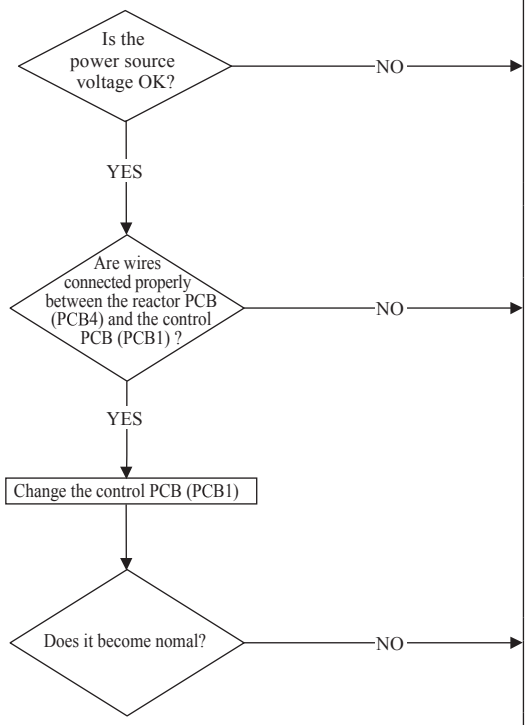
3. Condition of error displayed

- If the A/F anomaly occurs, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts if this anomaly occurs 4 times within 30 minutes or continues for 15 minutes continuously.

4. Presumable cause

- Defective control PCB
- Defective reactor PCB

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E48	Indoor	Keeps flashing	Stays OFF	Outdoor fan motor anomaly (Models SRC40-60 only)

Note (1) This LED isinstalled on models SRC40-60 only.

1. Applicable model

Models SRC40-60

2. Error detection method

Detected by rotation speed of outdoor fan motor

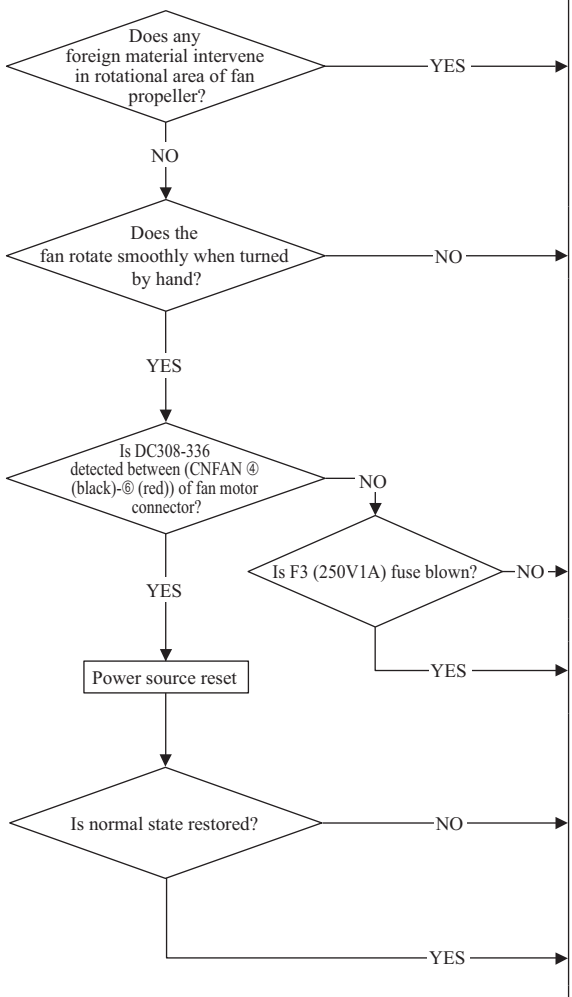
3. Condition of error displayed

When actual rotation speed of outdoor fan motor drops to 75min^{-1} or lower for 30 minutes continuously, the compressor and the outdoor fan motor stop. After 3-minute delay, it starts again automatically, but if this anomaly occurs 3 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective outdoor unit PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on outdoor unit PCB
- Blown F3 fuse

5. Troubleshooting



Note: When E48 error occurs, in almost cases F3 fuse (1A) on the outdoor unit PCB is blown. There are a lot of cases that fuse is blown and E48 occurs due to defective fan motor. And even though only the outdoor unit PCB (or fuse) is replaced,, another trouble could occur. Therefore when fuse is blown, check whether the fan motor is OK or not.
After confirming the fan motor normal, check by power ON. (Don't power ON without confirming the fan motor normal.)

Error code	LED	Green	Red
Remote control: E48	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content

Outdoor fan motor anomaly

(Models FDC71-140VNX, 100-140VSX, 200, 250VSA only)

1. Applicable model

Models FDC71-140VNX, 100-140VSX, 200, 250VSA

2. Error detection method

Detected by rotation speed of outdoor fan motor

3. Condition of error displayed

When actual rotation speed of outdoor fan motor (FMo1) drops to 100min^{-1} or lower for 30 minutes continuously, the compressor and the outdoor fan motor stop. After 3-minute delay, it starts again automatically, but if this anomaly occurs 5 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective outdoor unit control PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on outdoor unit control PCB
- Blow fuse
- External noise, surge

5. Troubleshooting

Diagnosis	Countermeasure
Does any foreign material intervene in rotational area of fan propeller? YES	Remove foreign material.
NO → Does the fan rotate smoothly when turned by hand? NO	Replace fan motor. If resistance between ①(Vm):red -④(GND):blue is detected 1kΩ or lower, it is faulty.
YES → Is DC280V detected between (CNFAN ① (red)-④ (blue)) of fan motor connector? NO → (2) Is F2 fuse blown? NO	Check power source voltage.
YES → Power source reset → Is normal state restored? NO	Replace fan motor. (If anomaly persists after replacing fan motor, replace outdoor unit control PCB.)
YES (Is F2 fuse blown?)	Replace faulty fan motor and outdoor unit control PCB.
YES (Is normal state restored?)	Malfunction by temporary noise.

Note (2) Fuse of model FDC71 is F3.

Note: When E48 error occurs, in almost cases F2 fuse (4A) [Model FDC71:F3 fuse (2A)]on the outdoor unit control PCB is blown. There are a lot of cases that fuse is blown and E48 occurs due to defective fan motor. And even though only the outdoor unit control PCB (or fuse) is replaced,, another trouble (*1) could occur. Therefore when fuse is blown, check whether the fan motor is OK or not.
After confirming the fan motor normal, check by power ON. (Don't power ON without confirming the fan motor normal.)
*1 The error which does not seem to relate E48 may occur like as "WAIT", Stay OFF of LED on outdoor unit control PCB, inverter communication error (E45) and etc.

Error code	Indoor display	RUN light	TIMER light
Remote control: E48		ON	7-time flash
	Outdoor unit control PCB	Green LED	Red LED
		Keeps flashing	1-time flash
	Outdoor unit inverter PCB	Yellow LED	
		Keeps flashing	

Content

Outdoor fan motor anomaly
(Models FDC100-140VNA / VSA only)

1. Applicable model

Models FDC100-140VNA / VSA

2. Error detection method

Detected by rotation speed of outdoor fan motor

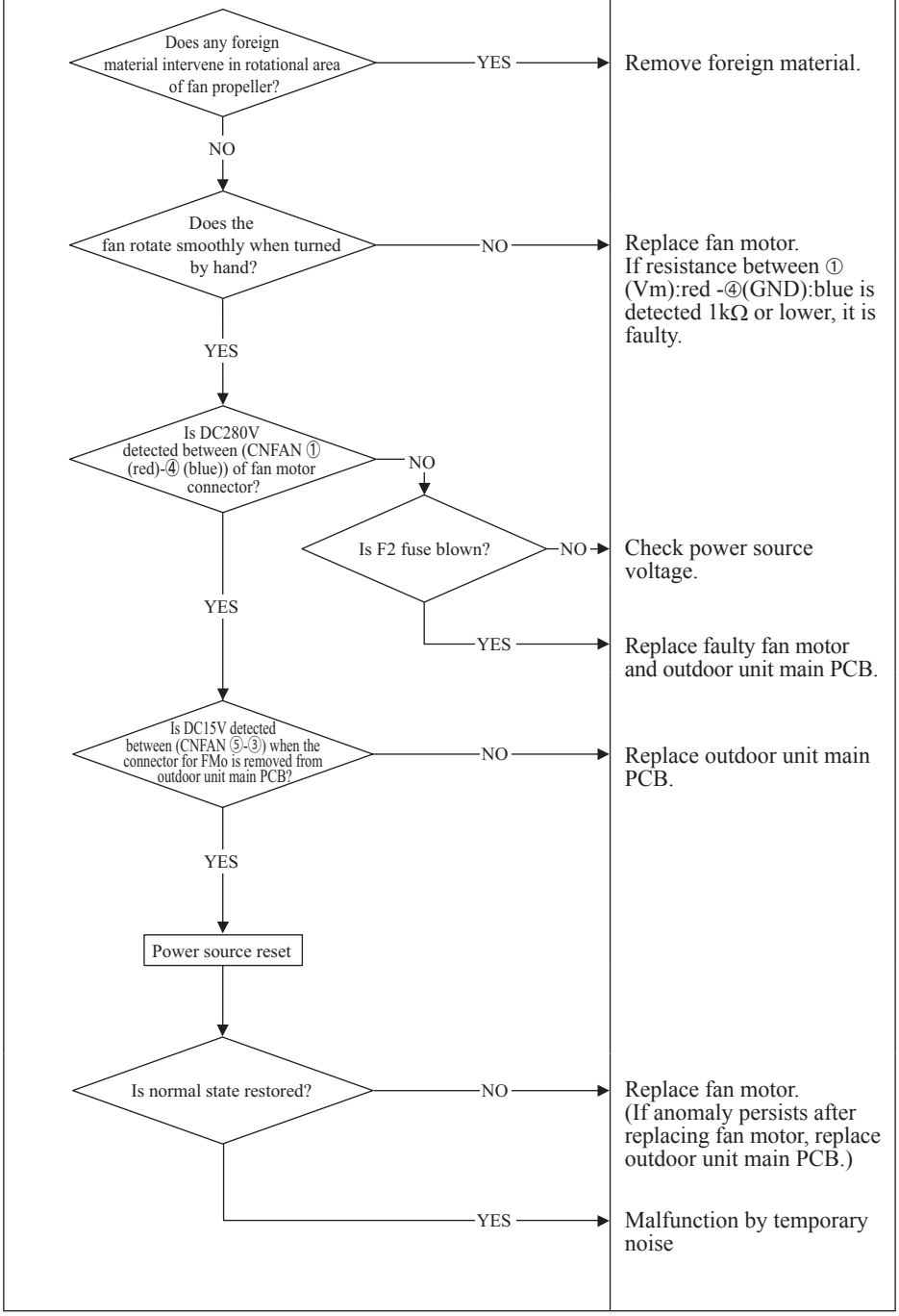
3. Condition of error displayed

When actual rotation speed of outdoor fan motor (FMo1) drops to 100min^{-1} or lower for 30 minutes continuously, the compressor and the outdoor fan motor stop. After 3-minute delay, it starts again automatically, but if this anomaly occurs 5 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective outdoor unit main PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on outdoor unit main PCB
- Blow fuse
- External noise, surge

5. Troubleshooting



Note: When E48 error occurs, in almost cases F2 fuse (4A) on the outdoor unit main PCB is blown. There are a lot of cases that fuse is blown and E48 occurs due to defective fan motor. And even though only the outdoor unit main PCB (or fuse) is replaced,, another trouble (*1) could occur. Therefore when fuse is blown, check whether the fan motor is OK or not.
After confirming the fan motor normal, check by power ON. (Don't power ON without confirming the fan motor normal.)
*1 The error which does not seem to relate E48 may occur like as "WAIT", Stay OFF of LED on outdoor unit control PCB, inverter communication error (E45) and etc.

Error code	LED	Green	Red
Remote control: E49	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content

Low pressure error or low pressure sensor anomaly (1/2)

(Models FDC71-140VNX, 100-140VSX, 200, 250VSA only)

1. Applicable model

Models FDC71-140VNX, 100-140VSX, 200, 250VSA

2. Error detection method

Detected by low pressure drop and suction superheat

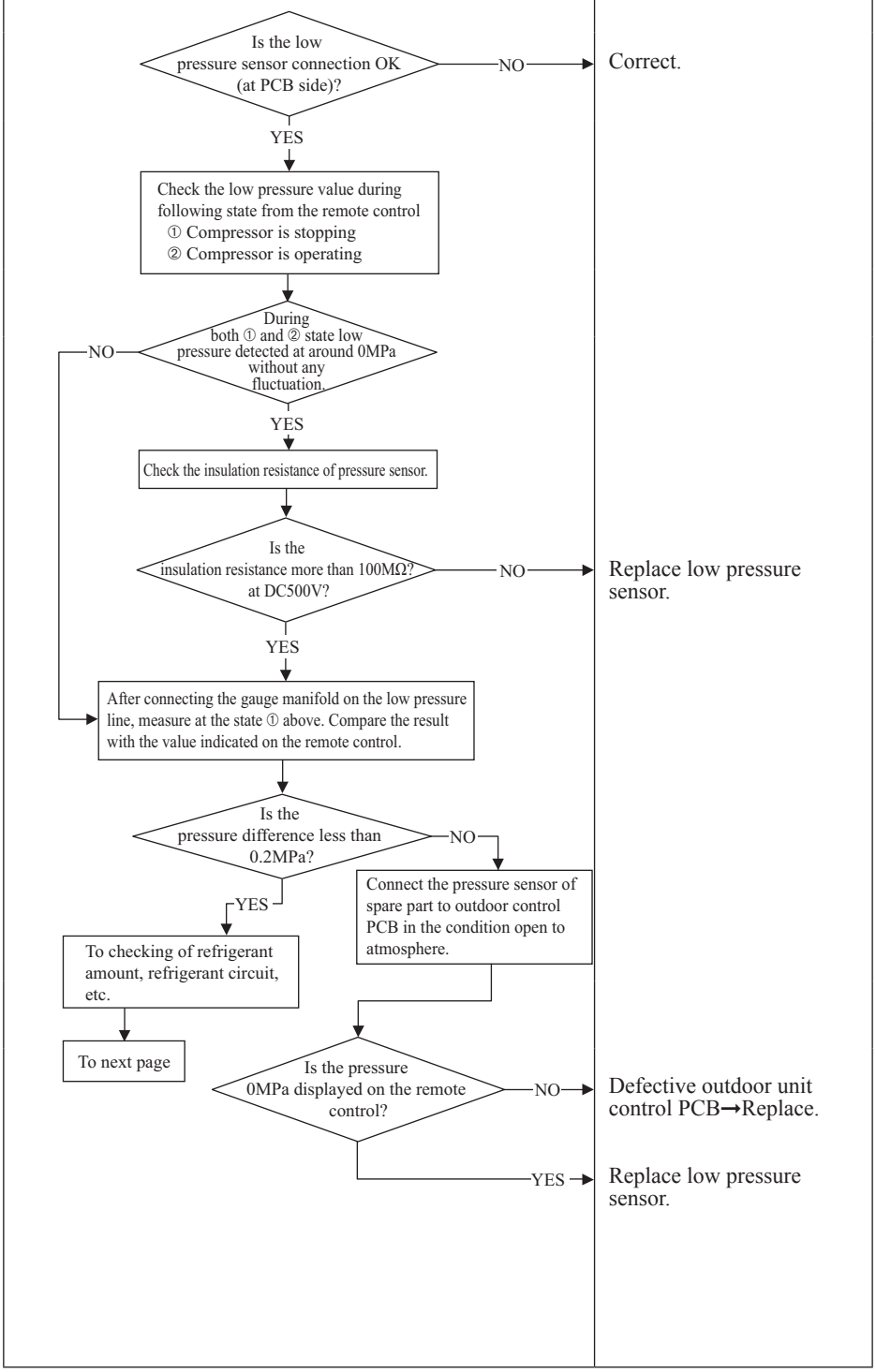
3. Condition of error displayed

① When the low pressure sensor detects 0.079MPa or lower for 15 seconds continuously, compressor stops and it restarts automatically after 3-minute delay. And if this anomaly occurs 3 times within 60 minutes.
② 10 minutes after the compressor starts, if the low pressure sensor detects 0.15MPa or lower for 60 minutes continuously and compressor suction superheat is detected 30degC or higher for 60 minutes continuously. And if this anomaly occurs 3 times within 60 minutes.
③ If low pressure sensor detects 0.079MPa or lower for 5 minutes continuously (including the compressor stop status).

4. Presumable cause

- Defective outdoor unit control PCB
- Defective low pressure sensor connector
- Defective low pressure sensor
- Defective suction pipe temperature sensor connector
- Defective suction pipe temperature sensor

5. Troubleshooting



Note: * Connect the gauge manifold to the service valve check joint during cooling, or connect it to the check joint at internal piping of outdoor unit during heating.

Error code	LED	Green	Red
Remote control: E49	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content

Low pressure error or low pressure sensor anomaly (2/2)

(Models FDC71-140VNX, 100-140VSX, 200, 250VSA only)

1. Applicable model

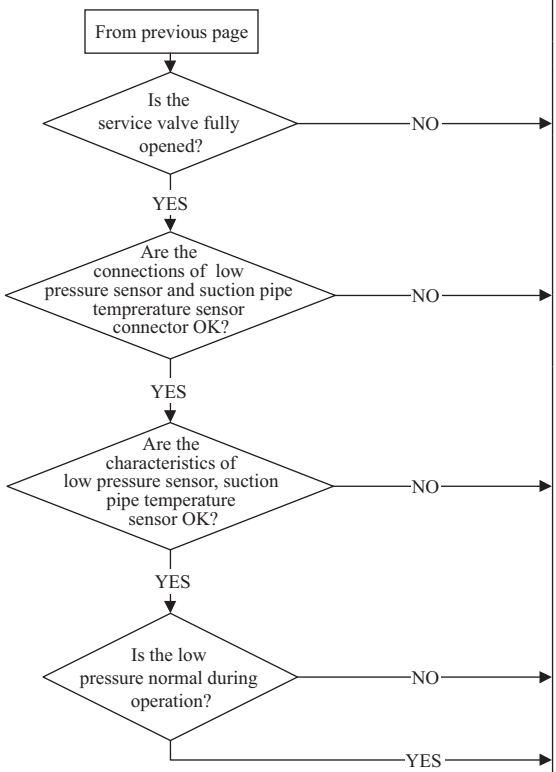
Models FDC71-140VNX, 100-140VSX, 200, 250VSA

2. Error detection method

3. Condition of error displayed

4. Presumable cause

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E51	Indoor	Keeps flashing	Stays OFF	Power transistor anomaly (Models SRC40-60 only)

1. Applicable model

Models SRC40-60

2. Error detection method

Power transistor primary current

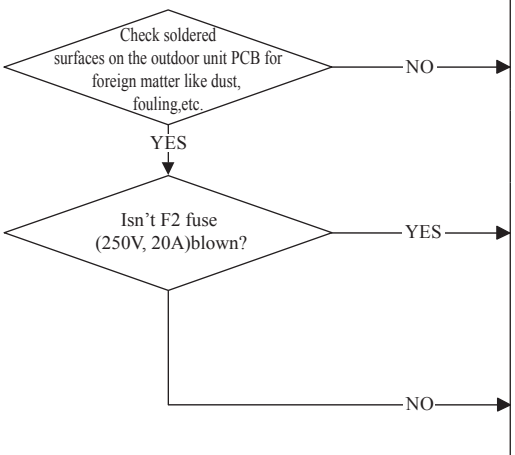
3. Condition of error displayed

If the power transistor primary current exceeds the setting value for 3 seconds, the compressor stops.

4. Presumable cause

- Outdoor unit PCB anomaly
- Dust on outdoor unit PCB
- Blown F2 fuse

5. Troubleshooting



Note:

Error code	LED	Green	Red
Remote control: E51	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		6-time flash	

Content

Inverter and fan motor anomaly
(Models FDC71-140 only)

1. Applicable model

Models FDC71-140

2. Error detection method

When power transistor anomaly is detected for 15 minutes continuously

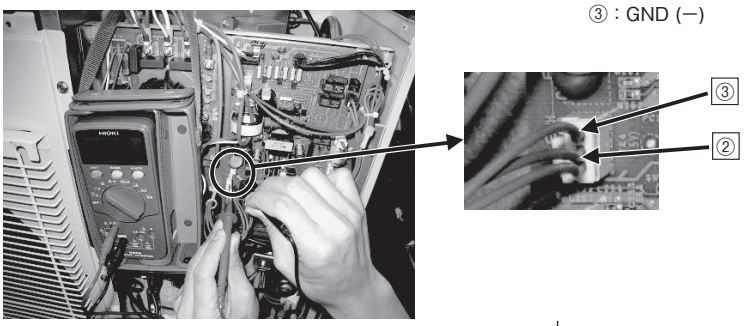
3. Condition of error displayed

Same as above

4. Presumable cause

- Outdoor fan motor anomaly
- Inverter PCB anomaly
- Outdoor unit control (or main) PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
• Models FDC71-140VNX (1) (2) Is DC15V detected between ② and ③ on CNI3? — YES → Replace inverter PCB. If not solved, replace noise filter PCB as well. Note(1) Under anomalous conditions, the voltage becomes less than DC14V. NO ↓ (1) Is DC15V detected after disconnecting outdoor fan motor? — YES → Replace outdoor fan motor. NO → Replace outdoor unit control PCB. If not solved, replace inverter PCB as well.	
• Models FDC100-140VSX Replace immediately the inverter PCB and the power transistor.	
Note(2) How to check the voltage between ② and ③ of CNI3?	
② : DC15V (+) ③ : GND (−)	
	
• Models FDC100-140VNA/VSA Replace immediately the main PCB.	

Note:

Error code	LED	Green	Red
Remote control:E51	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		2-time flash or 8-time flash(1)	

Content

Inverter or power transistor anomaly
(Models FDC200, 250VSA only)

Note (1) 8-time flash FDC250 model only.

1. Applicable model

Models FDC200, 250VSA

2. Error detection method

When power transistor anomaly is detected for 15 minutes continuously

3. Condition of error displayed

Same as above

4. Presumable cause

- Inverter PCB anomaly
- Power transistor anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Replace inverter PCB.	
Did it return? — YES	OK
Did it return? — NO	Replace power transistor. (FDC250 model)

Note:

Error code	LED	Green	Red
Remote control: E53	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content

Suction pipe temperature sensor anomaly
(Models FDC71-250 only)

1. Applicable model

Models FDC71-250

2. Error detection method

When the suction pipe temperature sensor detects anomalously low temperature

3. Condition of error displayed

If the temperature sensor detects -50°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after compressor ON, the compressor stops. When the compressor is restarted automatically after 3-minute delay, if this anomaly ocuurs 3 times within 40 minutes.

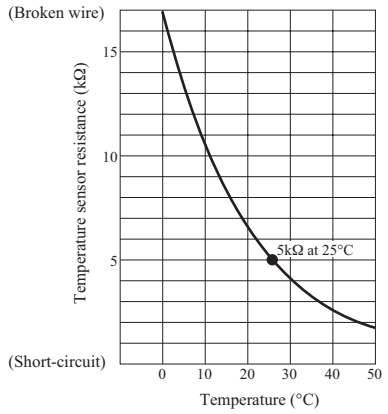
4. Presumable cause

- Defective suction pipe temperature sensor connection
- Defective suction pipe temperature sensor
- Defective outdoor unit control (or main) PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is the connection of suction pipe temperature sensor connector OK? — NO	Correct connection of suction pipe temperature sensor connector.
YES → Are the characteristics of suction pipe temperature sensor OK? — NO	Defective suction pipe temperature sensor→Replace.
YES	Defective outdoor unit control (or main) PCB→Replace. (Defective suction pipe temperature sensor input circuit)

Temperature-resistance characteristics



Note:

Error code	LED	Green	Red
Remote control: E54	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content

Low pressure sensor anomaly

(Models FDC71-140VNX, 100-140VSX, 200, 250VSA only)

1. Applicable model

Models FDC71-140VNX, 100-140VSX, 200, 250VSA

2. Error detection method

When anomalous voltage (pressure) is detected

3. Condition of error displayed

If the pressure sensor detects DC0V or lower and DC4.0V or higher for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after compressor ON, the compressor stops. When the compressor is restarted automatically after 3-minute delay, if this anomaly occurs 3 times within 40 minutes.

4. Presumable cause

- Defective low pressure sensor connection
- Defective low pressure sensor
- Defective outdoor unit control PCB
- Improper amount of refrigerant
- Anomalous refrigeration circuit

5. Troubleshooting

Diagnosis	Countermeasure
Are the connection of low pressure sensor connectors (at sensor side and PCB side) OK? — NO	Correct low pressure sensor connector connection.
YES → Are the pressure (actual measurement) matched with the value indicated on the remote control? — YES	Is refrigerant amount charged properly? Is there any anomaly on the refrigeration circuit?
NO → Replace the low pressure sensor. → Is normal condition restored? — NO	Defective outdoor unit control PCB→Replace. (Defective low pressure sensor input circuit)
YES	OK

Note:

Error code	LED	Green	Red
Remote control:E55	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keep flashing	

Content

Compressor under dome temperature sensor anomaly (Model FDC250VSA only)

1. Applicable model

Model FDC250VSA

2. Error detection method

When anoumalous low temperature (resistance) is detected by the compressor under dome temperature sensor

3. Condition of error displayed

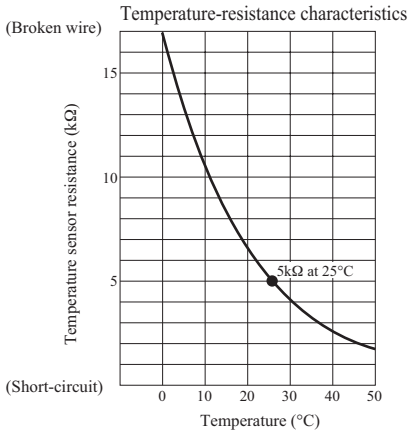
If the temperature sensor detcts -50°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after compressor ON, the compressor stops. When the compressor is restarted automatically after 3-minute delay, if this anomaly ocuurs 3 times within 40 minutes.

4. Presumable cause

- Defective under dome temperature sensor connection
- Defective under dome temperature sensor
- Defective outdoor unit control PCB

5. Troubleshooting

Diagnosis	Countermeasure
Is the connection of under dome temperature sensor connector OK? → NO	Correct connection of under dome temperature sensor connector.
YES → Are the characteristics of under dome temperature sensor OK? → NO	Defective under dome temperature sensor→Replace.
YES	Replace outdoor unit control PCB. (Defective under dome temperature sensor input circuit)



Note:

Error code	LED	Green	Red	Content
Remote control: E57	Indoor	Keeps flashing	Stays OFF	Insufficient refrigerant amount or detection of service valve closure (Models SRC40-60 only)

1. Applicable model

Models SRC40-60

2. Error detection method

- Judge insufficient refrigerant amount by detecting the temperature differnce between indoor heat exchanger (Thi-R) and indoor return air (Thi-A).

3. Condition of error displayed

When the insufficient refrigerant amount is detected 3 times within 60 minutes.

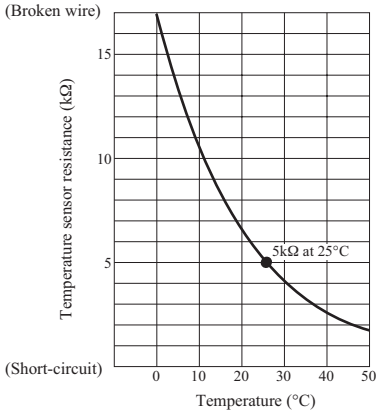
4. Presumable cause

- Defective indoor heat exchanger temperature sensor
- Defective indoor return air temperature sensor
- Defective indoor unit control PCB
- Insufficient refregerant amount

5. Troubleshooting

Diagnosis	Countermeasure
Is the service valve fully opened? NO	Open fully.
YES → Are the connections of indoor heat exchanger and/or return air temperature sensor connectors OK? NO	Correct indoor heat exchanger, return air temperature sensor connector connections.
YES → Are the characteristics of indoor heat exchanger and/or return air temperature sensor OK? NO	Defective indoor heat exchanger, return air temperature sensor →Replace.
YES → Is the low pressure during operation normal? NO	Charge refrigerant.
YES	Defective indoor unit control PCB→Replace. (Defective indoor heat exchanger, return air temperature sensor input circuits)

Indoor heat exchanger, return air temperature sensor
Temperature-resistance characteristics



Note: When the compressor speed is 50 rps or under at 5 minutes after the start of compressor or the completion of defrost operation, the low refrigerant protection control judges, by detecting the difference between the indoor heat exchanger temperature (Thi-R) and the indoor return air temperature (Thi-A), that it is in the state of gas leakage, and stops the compressor.
Cooling: Indoor return air temperature (Thi-A) – Indoor heat exchanger temperature (Thi-R) ≧ 4 degC
Heating: Indoor heat exchanger temperature (Thi-R) – Indoor return air temperature (Thi-A) ≦ 6 degC

Error code	LED	Green	Red
Remote control: E57	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		Keeps flashing	

Content

Insufficient refrigerant amount or detection of service valve closure (Models FDC71-250 only)

1. Applicable model

Models FDC71-250

2. Error detection method

- Judge insufficient refrigerant amount by detecting the temperature differnce between indoor heat exchanger (Thi-R) and indoor return air (Thi-A).
- It detects at initial startup in cooling or dehumidifying mode after power ON. (In case of model FDC71 it cannot detect)

3. Condition of error displayed

Anomalous stop at initial detection

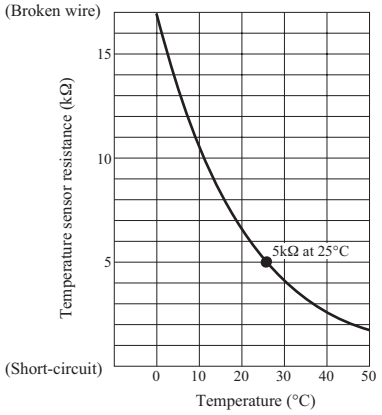
4. Presumable cause

- Defective indoor heat exchanger temperature sensor
- Defective indoor return air temperature sensor
- Defective indoor unit control (or main) PCB
- Insufficient refregerant amount

5. Troubleshooting

Diagnosis	Countermeasure
Is the service valve fully opened? NO	Open fully.
YES → Are the connections of indoor heat exchanger and/or return air temperature sensor connectors OK? NO	Correct indoor heat exchanger, return air temperature sensor connector connections.
YES → Are the characteristics of indoor heat exchanger and/or return air temperature sensor OK? NO	Defective indoor heat exchanger, return air temperature sensor →Replace.
YES → Is the low pressure during operation normal? NO	Charge refrigerant.
YES	Defective indoor unit control (or main) PCB→Replace. (Defective indoor heat exchanger, return air temperature sensor input circuits)

Indoor heat exchanger, return air temperature sensor
Temperature-resistance characteristics



Note: Insufficient refrigerant amount preventive control makes compressor stopped, if it judges insufficient refrigerant amount by detecting the temperature difference between indoor heat exchanger (Thi-R) and return air temperature (Thi-A) for 1 minute after compressor ON in cooling or dehumidifying mode and for 9 minutes after compressor ON in heating mode. [in cooling mode: (Thi-A)-(Thi-R)>4degC, in heating mode: (Thi-R)-(Thi-A)<4degC]

Error code	LED	Green	Red	Content
Remote control: E58	Indoor	Keeps flashing	Stays OFF	Current safe stop (Models SRC40-60 only)

1. Applicable model

Models SRC40-60

2. Error detection method

When the current safe control has operated at the compressor speed of 30 rps or under:

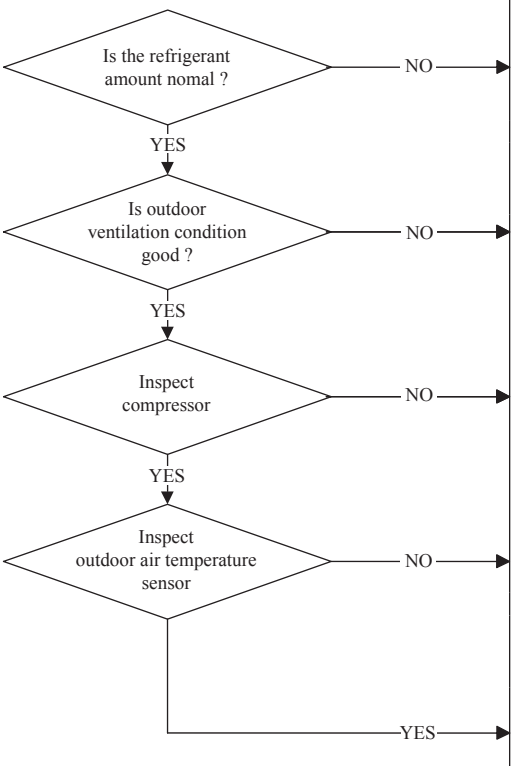
3. Condition of error displayed

Same as above

4. Presumable cause

- Excessive refrigerant amount
- Indoor,outdoor unit installation spaces
- Faulty compressor
- Defective outdor air temperature sensor
- Defective outdoor unit PCB

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E59	Indoor	Keeps flashing	Stays OFF	Compressor startup failure (Models SRC40-60 only)

Note (1) This LED isinstalled on models SRC40-60 only.

1. Applicable model

Models SRC40-60

2. Error detection method

If it fails to change over to the rotor detection operation of compressor motor

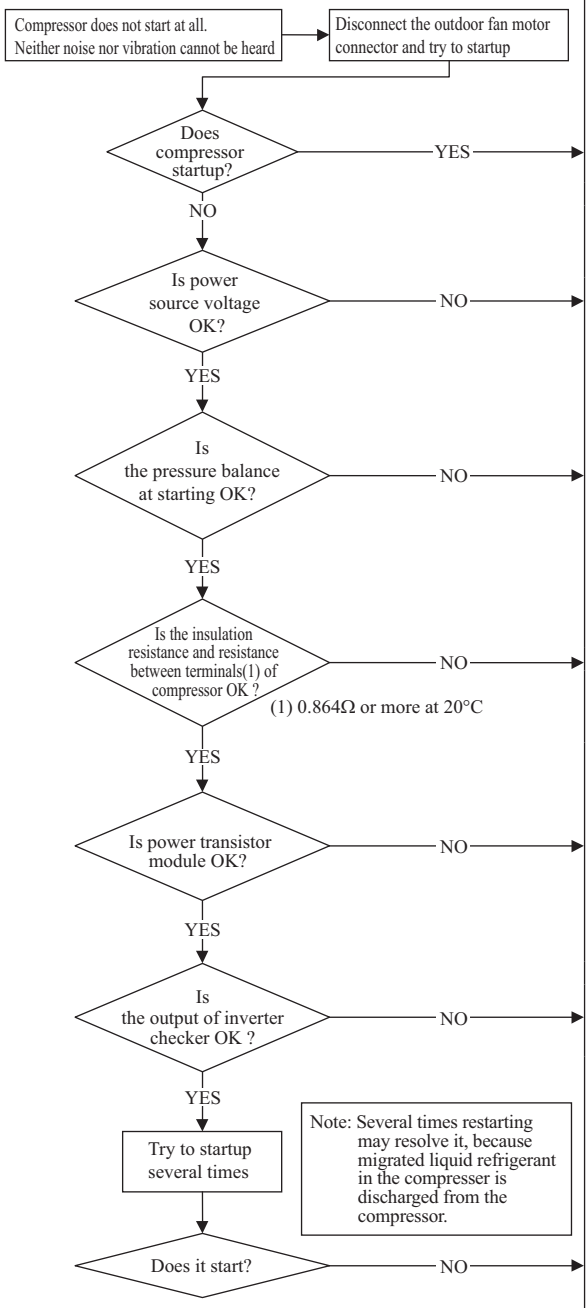
3. Condition of error displayed

If compressor fails to startup for 42 times

4. Presumable cause

- Outdoor fan motor anomaly
- Outdoor unit PCB anomaly
- Anomalous power source voltage
- Improper refrigerant amount and refrigerant circuit
- Faulty compressor (Motor bearing)

5. Troubleshooting



Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, migrated liquid refrigerant may dissolve in the refrigerant oil in the compressor. In such case insulation resistance decreases upto several MΩ or lower. If the electric leakage breaker is activated due to low insulation resistance, check followings.
  ① Check whehter the insulation resistance can recover or not, ater 6 hours has passed since power ON. (By energize the crankcase heater, migrated liquid refrigerant in the refrigerant oil in compressor can be evaporated)
  ② Check whether the electric leakage breake conforms to high-hermonic specifications (As units has inverter, in order to prevent from improper operation, be sure to use high-hermonic one.)

Error code

Remote control: E59

LED	Green	Red
Indoor control PCB	Keeps flashing	Stays OFF
Outdoor control PCB	Keeps flashing	5-time flash
Outdoor inverter PCB	Yellow LED	
	Stays OFF	

Content

Compressor startup failure (1/2)
(Models FDC71-140VNX, 100-140VSX only)

1. Applicable model

Models FDC71-140VNX, 100-140VSX

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor

3. Condition of error displayed

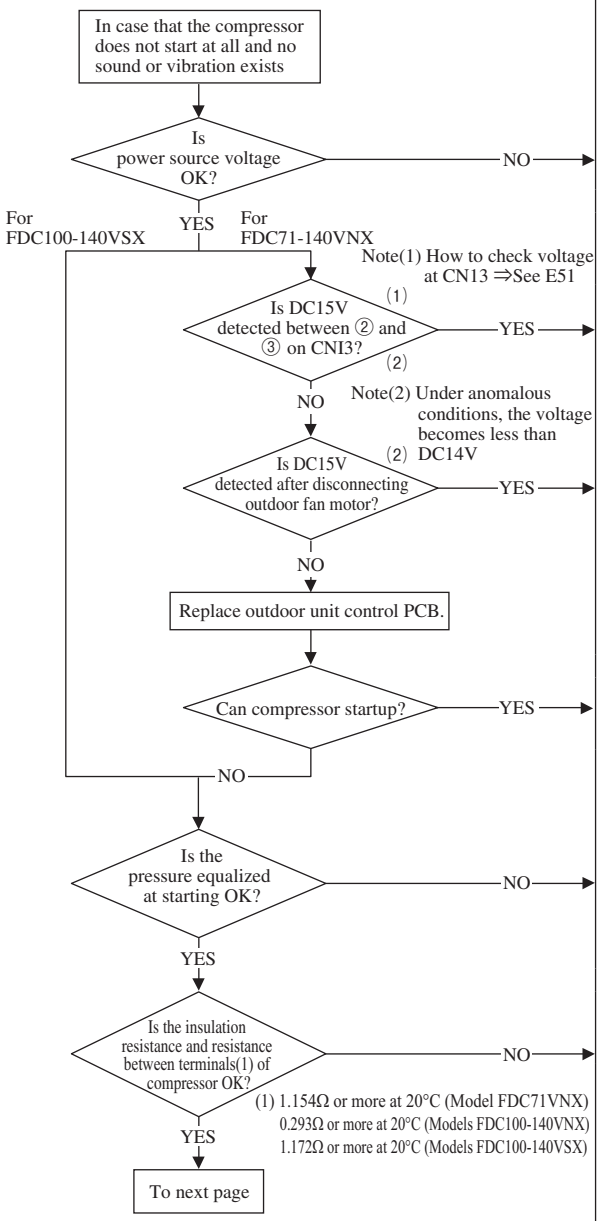
If the compressor fails to startup for 20 times (10 patterns x2 times) continuously.

4. Presumable cause

- Outdoor fan motor anomaly
- Outdoor unit control PCB anomaly
- Inverter PCB anomaly
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting

Diagnosis	Countermeasure



Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, insulation resistance may decrease to several MΩ or lower due to the liquid refrigerant migrated in the refrigerant oil in compressor. If the electric leakage breaker is activated due to low insulation resistance, check followings.
  ① Check whether the insulation resistance can recover or not, after 6 hours has passed since power ON.
  (By energize the crankcase heater, liquid refrigerant migrated in the refrigerant oil in compressor can be evaporated)
  ② Check whether the electric leakage breaker conforms to high-harmonic specifications.
  (As inverter PAC units has inverter, in order to prevent from improper operation, be sure to use the breaker of high-harmonic type)

Error code	LED	Green	Red
Remote control: E59	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	5-time flash
	Outdoor inverter PCB	Yellow LED	
		Stays OFF	

Content

Compressor startup failure (2/2)
(Models FDC71-140VNX, 100-140VSX only)

1. Applicable model

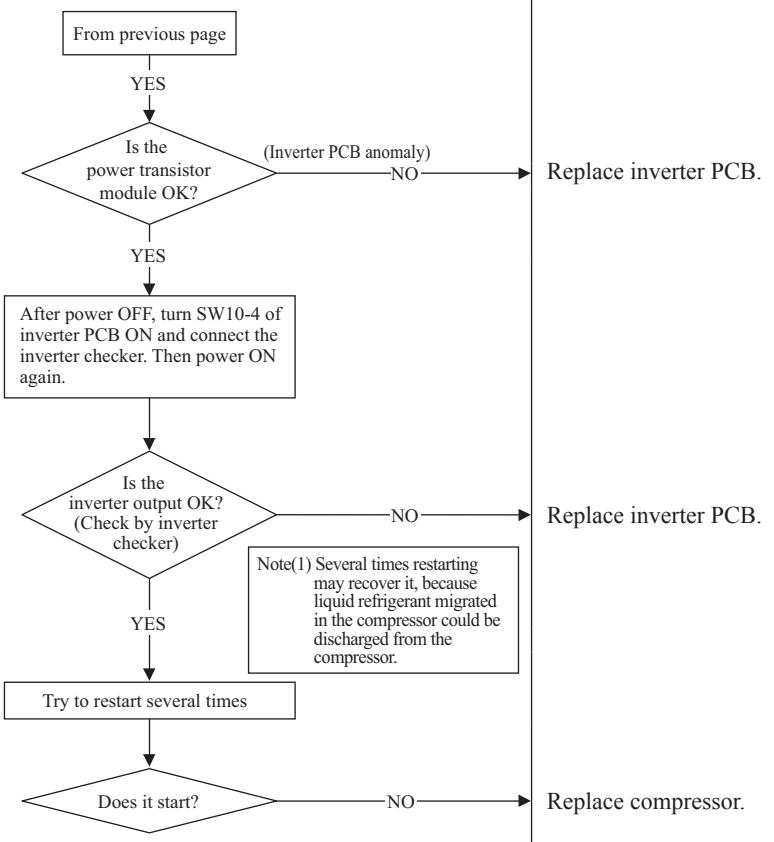
Models FDC71-140VNX, 100-140VSX

2. Error detection method

3. Condition of error displayed

4. Presumable cause

5. Troubleshooting



Note:

Error code	Indoor display	RUN light	TIMER light
Remote control: E59		–	–
	Outdoor unit control PCB	Green LED	Red LED
		Keeps flashing	5-time flash
	Outdoor unit inverter PCB	Yellow LED	
		Stays OFF	

Content

Compressor startup failure (1/2)
(Models FDC100-140VNA/VSA only)

1. Applicable model

Models FDC100-140VNA/VSA

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor

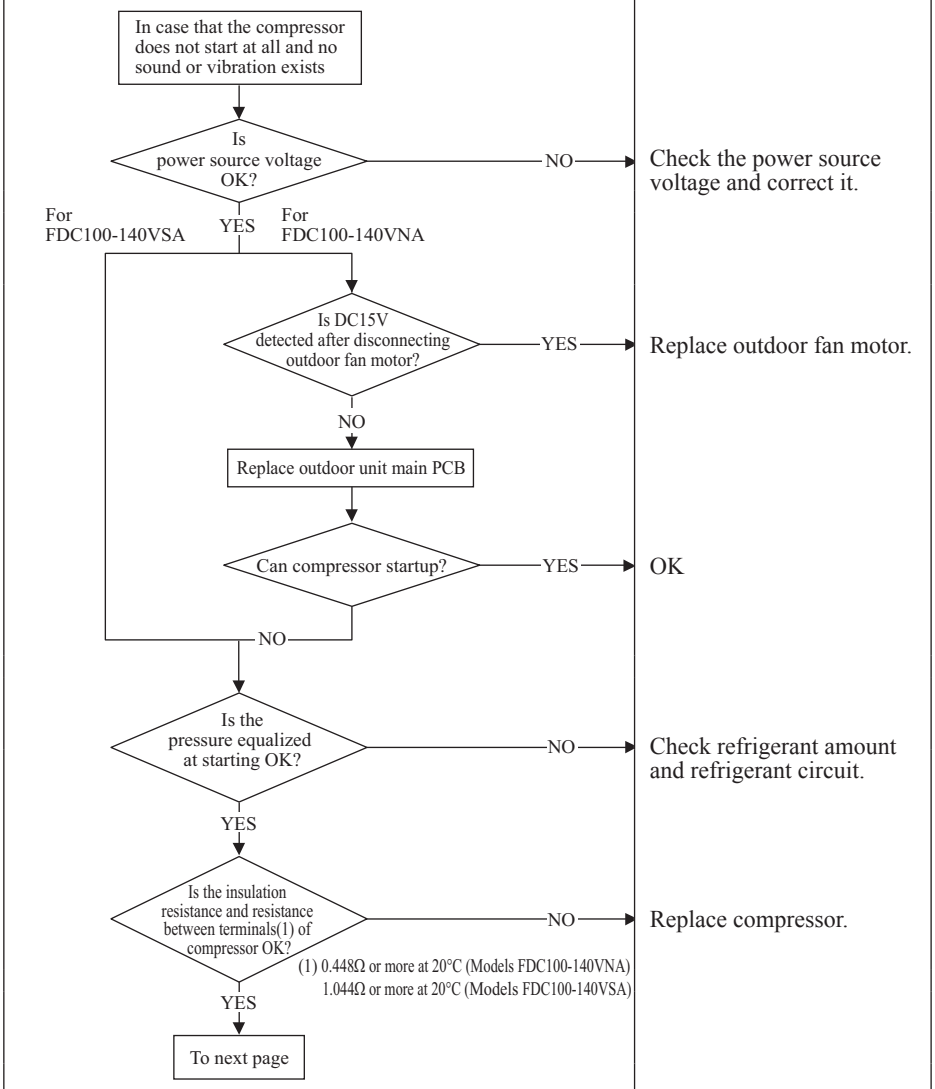
3. Condition of error displayed

If the compressor fails to startup for 20 times (10 patterns x2 times) continuously.

4. Presumable cause

- Faulty outdoor fan motor
- Faulty outdoor unit main PCB
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting



Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, insulation resistance may decrease to several MΩ or lower due to the liquid refrigerant migrated in the refrigerant oil in compressor. If the electric leakage breaker is activated due to low insulation resistance, check followings.
  ① Check whether the insulation resistance can recover or not, after 6 hours has passed since power ON.
  (By energize the crankcase heater, liquid refrigerant migrated in the refrigerant oil in compressor can be evaporated.)
  ② Check whether the electric leakage breaker conforms to high-harmonic specifications.
  (As INVERTER PAC units has inverter, in order to prevent from improper operation, be sure to use the breaker of high-harmonic type.)

Error code	Indoor display	RUN light	TIMER light	Content
Remote control: E59		–	–	Compressor startup failure (2/2) (Models FDC100-140VNA/VSA only)
	Outdoor unit control PCB	Green LED	Red LED	
		Keeps flashing	5-time flash	
	Outdoor unit inverter PCB	Yellow LED		
		Stays OFF		

1. Applicable model

Models FDC100-140VNA/VSA

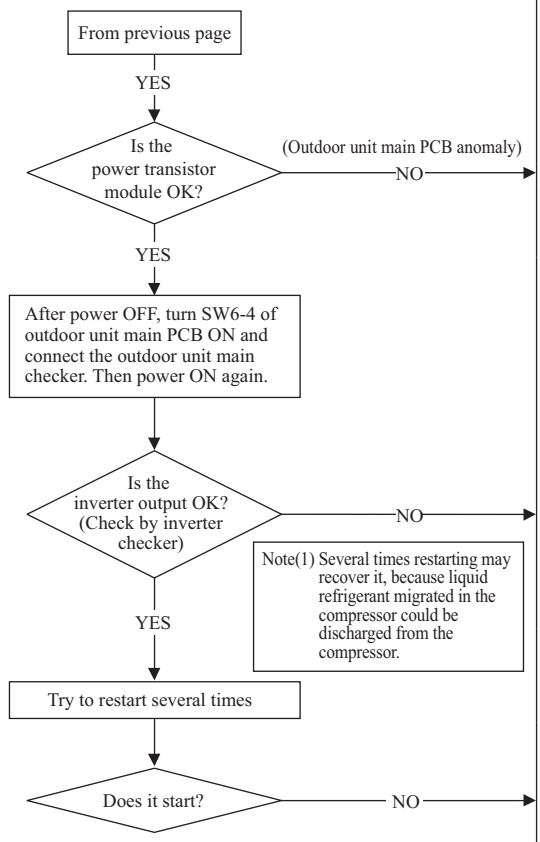
2. Error detection method

3. Condition of error displayed

4. Presumable cause

- Faulty outdoor fan motor
- Faulty outdoor unit main PCB
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting



Note:

Error code	LED	Green	Red
Remote control: E59	Indoor control PCB	Keeps flashing	Stays OFF
	Outdoor control PCB	Keeps flashing	1-time flash
	Outdoor inverter PCB	Yellow LED	
		4-time flash	

Content

Compressor startup failure (1/2)
(Models FDC200, 250VSA only)

1. Applicable model

Models FDC200, 250VSA

2. Error detection method

When it fails to change over to the operation for rotor position detection of compressor motor

3. Condition of error displayed

If the compressor fails to startup for 20 times (10 patterns x2 times) continuously.

4. Presumable cause

- Outdoor fan motor anomaly
- Outdoor unit control PCB anomaly
- Inverter PCB anomaly
- Anomalous power source voltage
- Insufficient or excessive refrigerant amount
- Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)

5. Troubleshooting

Diagnosis	Countermeasure
In case that the compressor does not start at all and no sound or vibration exists	
Is power source voltage OK? — NO	Check the power source voltage and correct it.
YES	
Is the pressure equalized at starting OK? — NO	Check refrigerant amount and refrigerant circuit.
YES	
Is the insulation resistance and resistance between terminals(1) of compressor OK? — NO (1) 1.172Ω or more at 20°C (Model FDC200VSA) 0.309Ω or more at 20°C (Model FDC250VSA)	Replace compressor.
YES	
To next page	

Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, insulation resistance may decrease to several MΩ or lower due to the liquid refrigerant migrated in the refrigerant oil in compressor. If the electric leakage breaker is activated due to low insulation resistance, check followings.
  ① Check whether the insulation resistance can recover or not, after 6 hours has passed since power ON.
  (By energize the crankcase heater, liquid refrigerant migrated in the refrigerant oil in compressor can be evaporated.)
  ② Check whether the electric leakage breaker conforms to high-harmonic specifications.
  (As INV PAC units has inverter, in order to prevent from improper operation, be sure to use the breaker of high-harmonic type.)

Error code

Remote control: E59

LED	Green	Red
Indoor control PCB	Keeps flashing	Stays OFF
Outdoor control PCB	Keeps flashing	5-time flash
Outdoor inverter PCB	Yellow LED	
	4-time flash	

Content

Compressor startup failure (2/2)

(Models FDC200, 250VSA only)

1. Applicable model

Models FDC200, 250VSA

2. Error detection method

3. Condition of error displayed

4. Presumable cause

5. Troubleshooting

Diagnosis	Countermeasure
From previous page	
YES	
Is the power transistor module OK? (Inverter PCB anomaly) NO	Replace inverter PCB. *Replace power transistor as well.
YES	
After power OFF, turn JSW10-4 of inverter PCB ON and connect the inverter checker. Then power ON again	
YES	
Is the inverter output OK? (Check by inverter checker.) NO	Replace inverter PCB. *Replace power transistor as well.
Note(1) Several times restarting may recover it, because liquid refrigerant migrated in the compressor could be discharged from the compressor.	
YES	
Try to restart several times	
Does it start? NO	Replace compressor.

Note:

Error code	LED	Green	Red	Content
Remote control: E60	Indoor	Keeps flashing	Stays OFF	Compressor rotor lock error (Models SRC40-60 only)

1. Applicable model

Models SRC40-60

2. Error detection method

Compressor rotor position

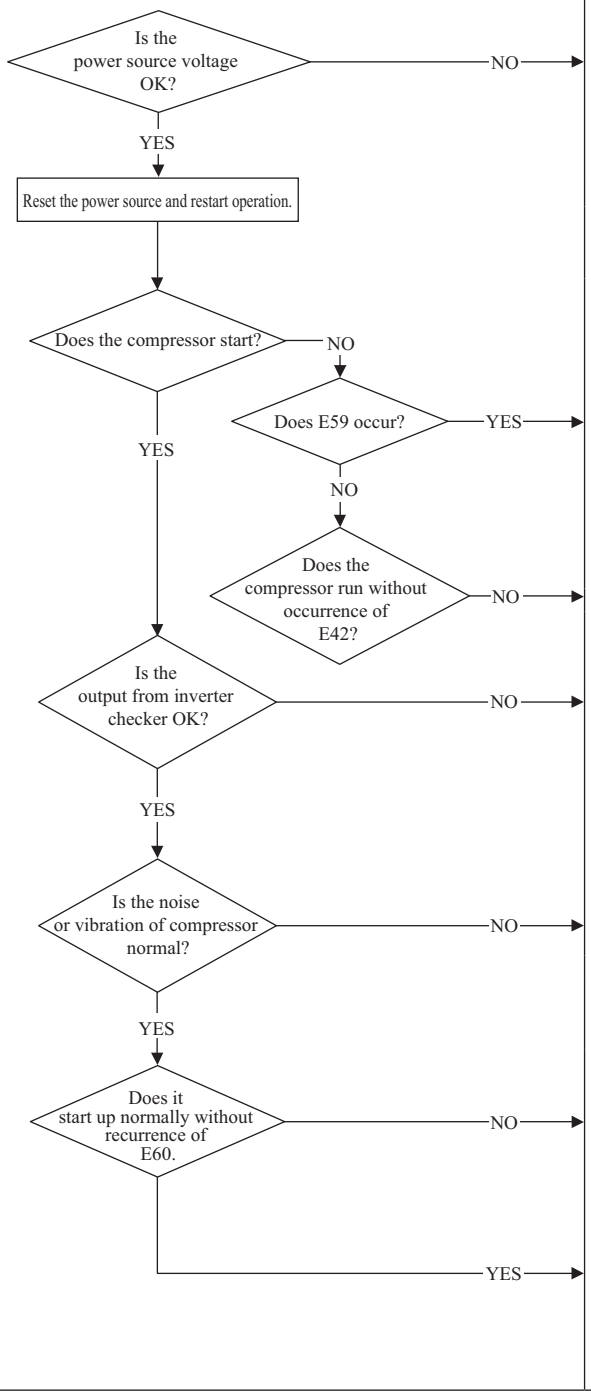
3. Condition of error displayed

If it fails again to detect the rotor position after shifting to the compressor rotor position detection operation, the compressor stops.

4. Presumable cause

- Defective outdoor fan motor
- Defective outdoor unit PCB
- Anomalous power source voltage
- Improper refrigerant amount and refrigerant circuit
- Defective compressor (motor, bearing)

5. Troubleshooting



Note: Insulation resistance
- The unit is left for long period without power source or soon after installation, migrated liquid refrigerant may dissolve in the refrigerant oil in the compressor. In such case insulation resistance decreases upto several MΩ or lower. If the electric leakage breaker is activated due to low insulation resistance, check followings.
  ① Check whehter the insulation resistance can recover or not, ater 6 hours has passed since power ON. (By energize the crankcase heater, migrated liquid refrigerant in the refrigerant oil in compressor can be evaporated.)
  ② Check whether the electric leakage breake conforms to high-hermonic specifications. (As units has inverter, in order to prevent from improper operation, be sure to use high-hermonic one.)

1.12 TECHNICAL INFORMATION

Model FDT40ZSXVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDT40VH**
Outdoor unit model name	**SRC40ZSX-S**

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Average(mandatory)	**Yes**
Warmer(if designated)	**Yes**
Colder(if designated)	**Yes**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**4.0**	kW
heating / Average	Pdesignh	**3.8**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**8.51**	A+++
heating / Average	SCOP/A	**4.47**	A+
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**3.8**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**4.00**	kW
Tj=30℃	Pdc	**2.95**	kW
Tj=25℃	Pdc	**1.90**	kW
Tj=20℃	Pdc	**1.40**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**4.30**	-
Tj=30℃	EERd	**6.41**	-
Tj=25℃	EERd	**11.52**	-
Tj=20℃	EERd	**17.80**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**3.34**	kW
Tj=2℃	Pdh	**2.04**	kW
Tj=7℃	Pdh	**1.32**	kW
Tj=12℃	Pdh	**1.09**	kW
Tj=bivalent temperature	Pdh	**3.80**	kW
Tj=operating limit	Pdh	**2.20**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**2.98**	-
Tj=2℃	COPd	**4.30**	-
Tj=7℃	COPd	**5.82**	-
Tj=12℃	COPd	**7.45**	-
Tj=bivalent temperature	COPd	**2.38**	-
Tj=operating limit	COPd	**1.99**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-15**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**7**	W
standby mode	Psb	**7**	W
thermostat-off mode	Pto(cooling)	**10**	W
	Pto(heating)	**20**	W
crankcase heater mode	Pck	**0**	W

Annual electricity consumption			
cooling	Qce	**165**	kWh/a
heating / Average	Qhe	**1192**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**53**	dB(A)
Sound power level(outdoor)	Lwa	**63**	dB(A)
Global warming potential	GWP	**2088**	kgCO2eq.
Rated air flow(indoor)	-	**1140**	m3/h
Rated air flow(outdoor)	-	**2160**	m3/h

Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United kingdom

PJF000Z551 A

Model FDT50ZSXVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDT50VH**
Outdoor unit model name	**SRC50ZSX-S**

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Average(mandatory)	**Yes**
Warmer(if designated)	**Yes**
Colder(if designated)	**Yes**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**5.0**	kW
heating / Average	Pdesignh	**4.1**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**7.82**	A++
heating / Average	SCOP/A	**4.61**	A++
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**4.1**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**5.00**	kW
Tj=30℃	Pdc	**3.69**	kW
Tj=25℃	Pdc	**2.37**	kW
Tj=20℃	Pdc	**1.40**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.88**	-
Tj=30℃	EERd	**5.70**	-
Tj=25℃	EERd	**9.67**	-
Tj=20℃	EERd	**17.28**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**3.60**	kW
Tj=2℃	Pdh	**2.20**	kW
Tj=7℃	Pdh	**1.40**	kW
Tj=12℃	Pdh	**1.12**	kW
Tj=bivalent temperature	Pdh	**4.10**	kW
Tj=operating limit	Pdh	**2.95**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**3.14**	-
Tj=2℃	COPd	**4.40**	-
Tj=7℃	COPd	**6.03**	-
Tj=12℃	COPd	**7.61**	-
Tj=bivalent temperature	COPd	**2.37**	-
Tj=operating limit	COPd	**2.22**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-15**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**7**	W
standby mode	Psb	**7**	W
thermostat-off mode	Pto(cooling)	**10**	W
	Pto(heating)	**20**	W
crankcase heater mode	Pck	**0**	W

Annual electricity consumption			
cooling	Qce	**224**	kWh/a
heating / Average	Qhe	**1246**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**54**	dB(A)
Sound power level(outdoor)	Lwa	**63**	dB(A)
Global warming potential	GWP	**2088**	kgCO2eq.
Rated air flow(indoor)	-	**1200**	m3/h
Rated air flow(outdoor)	-	**2400**	m3/h

Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United kingdom

PJF000Z551 A

Model FDT60ZSXVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDT60VH**
Outdoor unit model name	**SRC60ZSX-S**

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Average(mandatory)	**Yes**
Warmer(if designated)	**Yes**
Colder(if designated)	**Yes**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**5.6**	kW
heating / Average	Pdesignh	**4.7**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**8.26**	A++
heating / Average	SCOP/A	**5.00**	A++
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**4.7**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**5.60**	kW
Tj=30℃	Pdc	**4.05**	kW
Tj=25℃	Pdc	**2.65**	kW
Tj=20℃	Pdc	**1.30**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.68**	-
Tj=30℃	EERd	**6.29**	-
Tj=25℃	EERd	**10.43**	-
Tj=20℃	EERd	**16.46**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**4.16**	kW
Tj=2℃	Pdh	**2.53**	kW
Tj=7℃	Pdh	**1.63**	kW
Tj=12℃	Pdh	**1.12**	kW
Tj=bivalent temperature	Pdh	**4.70**	kW
Tj=operating limit	Pdh	**3.80**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**3.41**	-
Tj=2℃	COPd	**4.83**	-
Tj=7℃	COPd	**6.45**	-
Tj=12℃	COPd	**7.61**	-
Tj=bivalent temperature	COPd	**2.85**	-
Tj=operating limit	COPd	**2.47**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-15**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**7**	W
standby mode	Psb	**7**	W
thermostat-off mode	Pto(cooling)	**10**	W
	Pto(heating)	**20**	W
crankcase heater mode	Pck	**0**	W

Annual electricity consumption			
cooling	Qce	**238**	kWh/a
heating / Average	Qhe	**1316**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**60**	dB(A)
Sound power level(outdoor)	Lwa	**64**	dB(A)
Global warming potential	GWP	**2088**	kgCO2eq.
Rated air flow(indoor)	-	**1560**	m3/h
Rated air flow(outdoor)	-	**2490**	m3/h

Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United kingdom

PJF000Z551 A

Model FDT71VNXPVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDT40VH x 2**
Outdoor unit model name	**FDC71VNX**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

Average(mandatory)	**Yes**
Warmer(if designated)	**Yes**
Colder(if designated)	**Yes**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**7.1**	kW
heating / Average	Pdesignh	**5.8**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**5.77**	A+
heating / Average	SCOP/A	**4.34**	A+
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**5.8**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**7.10**	kW
Tj=30℃	Pdc	**5.23**	kW
Tj=25℃	Pdc	**3.38**	kW
Tj=20℃	Pdc	**3.30**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.84**	-
Tj=30℃	EERd	**5.81**	-
Tj=25℃	EERd	**9.01**	-
Tj=20℃	EERd	**12.05**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**5.10**	kW
Tj=2℃	Pdh	**3.10**	kW
Tj=7℃	Pdh	**2.00**	kW
Tj=12℃	Pdh	**2.25**	kW
Tj=bivalent temperature	Pdh	**5.80**	kW
Tj=operating limit	Pdh	**5.00**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**3.05**	-
Tj=2℃	COPd	**4.25**	-
Tj=7℃	COPd	**5.41**	-
Tj=12℃	COPd	**6.95**	-
Tj=bivalent temperature	COPd	**2.66**	-
Tj=operating limit	COPd	**2.56**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-20**	℃
heating / Warmer	Tol	**-20**	℃
heating / Colder	Tol	**-20**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**18**	W
standby mode	Psb	**18**	W
thermostat-off mode	Pto(cooling)	**20**	W
	Pto(heating)	**56**	W
crankcase heater mode	Pck	**23**	W

Annual electricity consumption			
cooling	Qce	**431**	kWh/a
heating / Average	Qhe	**1873**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**53**	dB(A)
Sound power level(outdoor)	Lwa	**66**	dB(A)
Global warming potential	GWP	**2088**	kgCO2eq.
Rated air flow(indoor)	-	**1140**	m3/h
Rated air flow(outdoor)	-	**3600**	m3/h

Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United kingdom

PJF000Z551 A

Model FDT100VNXPVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDT50VH x 2**
Outdoor unit model name	**FDC100VNX**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

Average(mandatory)	**Yes**
Warmer(if designated)	**Yes**
Colder(if designated)	**Yes**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**10.0**	kW
heating / Average	Pdesignh	**11.2**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**5.92**	A+
heating / Average	SCOP/A	**4.16**	A+
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**11.2**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**10.00**	kW
Tj=30℃	Pdc	**7.37**	kW
Tj=25℃	Pdc	**5.30**	kW
Tj=20℃	Pdc	**5.30**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.91**	-
Tj=30℃	EERd	**5.80**	-
Tj=25℃	EERd	**8.70**	-
Tj=20℃	EERd	**10.40**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**9.70**	kW
Tj=2℃	Pdh	**5.80**	kW
Tj=7℃	Pdh	**4.10**	kW
Tj=12℃	Pdh	**4.70**	kW
Tj=bivalent temperature	Pdh	**11.20**	kW
Tj=operating limit	Pdh	**8.10**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**2.60**	-
Tj=2℃	COPd	**4.10**	-
Tj=7℃	COPd	**5.65**	-
Tj=12℃	COPd	**6.20**	-
Tj=bivalent temperature	COPd	**2.45**	-
Tj=operating limit	COPd	**2.22**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-20**	℃
heating / Warmer	Tol	**-20**	℃
heating / Colder	Tol	**-20**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**18**	W
standby mode	Psb	**18**	W
thermostat-off mode	Pto(cooling)	**20**	W
	Pto(heating)	**56**	W
crankcase heater mode	Pck	**23**	W

Annual electricity consumption			
cooling	Qce	**592**	kWh/a
heating / Average	Qhe	**3772**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**54**	dB(A)
Sound power level(outdoor)	Lwa	**70**	dB(A)
Global warming potential	GWP	**2088**	kgCO2eq.
Rated air flow(indoor)	-	**1200**	m3/h
Rated air flow(outdoor)	-	**6000**	m3/h

Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United kingdom

PJF000Z551 A

Model FDT100VSXPVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDT50VH x 2**
Outdoor unit model name	**FDC100VSX**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

Average(mandatory)	**Yes**
Warmer(if designated)	**Yes**
Colder(if designated)	**Yes**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**10.0**	kW
heating / Average	Pdesignh	**11.2**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**5.92**	A+
heating / Average	SCOP/A	**4.16**	A+
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**11.2**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**10.00**	kW
Tj=30℃	Pdc	**7.37**	kW
Tj=25℃	Pdc	**5.30**	kW
Tj=20℃	Pdc	**5.30**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.91**	-
Tj=30℃	EERd	**5.80**	-
Tj=25℃	EERd	**8.70**	-
Tj=20℃	EERd	**10.40**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**9.70**	kW
Tj=2℃	Pdh	**5.80**	kW
Tj=7℃	Pdh	**4.10**	kW
Tj=12℃	Pdh	**4.70**	kW
Tj=bivalent temperature	Pdh	**11.20**	kW
Tj=operating limit	Pdh	**8.10**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**2.60**	-
Tj=2℃	COPd	**4.10**	-
Tj=7℃	COPd	**5.65**	-
Tj=12℃	COPd	**6.20**	-
Tj=bivalent temperature	COPd	**2.45**	-
Tj=operating limit	COPd	**2.22**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-20**	℃
heating / Warmer	Tol	**-20**	℃
heating / Colder	Tol	**-20**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**18**	W
standby mode	Psb	**18**	W
thermostat-off mode	Pto(cooling)	**20**	W
	Pto(heating)	**56**	W
crankcase heater mode	Pck	**23**	W

Annual electricity consumption			
cooling	Qce	**592**	kWh/a
heating / Average	Qhe	**3772**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**54**	dB(A)
Sound power level(outdoor)	Lwa	**70**	dB(A)
Global warming potential	GWP	**2088**	kgCO2eq.
Rated air flow(indoor)	-	**1200**	m3/h
Rated air flow(outdoor)	-	**6000**	m3/h

Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United kingdom

PJF000Z551 A

Model FDT125VNXPVH

Model(s) : FDC125VNX / FDT60VH (x2 units)							
Outdoor side heat exchanger of air conditioner : air							
Indoor side heat exchanger of air conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**12.5**	kW	Seasonal space cooling energy efficiency	η s, c	**269.9**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**12.5**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**394.0**	%
Tj=+30℃	Pdc	**9.2**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**629.0**	%
Tj=+25℃	Pdc	**5.9**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**876.0**	%
Tj=+20℃	Pdc	**5.7**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1246.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.040**	kW	Crankcase heater mode	P_{CK}	**0.040**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.040**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m3/h
Sound power level, outdoor	L_{WA}	**70.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Information to identify the model(s) to which the information relates :				FDC125VNX / FDT60VH (x2 units)			
Outdoor side heat exchanger of heat pump :				air			
Indoor side heat exchanger of heat pump :				air			
Indication if the heater is equipped with a supplementary heater :				No			
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**14.0**	kW	Seasonal space heating energy efficiency	η s, h	**175.4**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**10.1**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**291.0**	%
T_j=+2℃	Pdh	**6.1**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**421.0**	%
T_j=+7℃	Pdh	**4.3**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**616.0**	%
T_j=+12℃	Pdh	**4.5**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**750.0**	%
T_{biv}=bivalent temperature	Pdh	**11.4**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**299.0**	%
T_{OL}=operation limit	Pdh	**9.0**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**247.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumpiton in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.040**	kW	Type of energy input Standby mode	P_{SB}	**0.040**	kW
Thermostat-off mode	P_{TO}	**0.045**	kW				
Crankcase heater mode	P_{CK}	**0.040**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m3/h
Sound power level, outdoor measured	L_{WA}	**70.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger		**-**	m3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Model FDT140VNXTVH

Model(s) :	FDC140VNX / FDT50VH (x3 units)						
Outdoor side heat exchanger of air conditioner :	air						
Indoor side heat exchanger of air conditioner :	air						
Type :	vapour compression						
if applicable :	electric motor						
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**14.0**	kW	Seasonal space cooling energy efficiency $\eta_{s,c}$		**263.5**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**14.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**371.0**	%
Tj=+30℃	Pdc	**10.3**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**588.0**	%
Tj=+25℃	Pdc	**6.6**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**825.0**	%
Tj=+20℃	Pdc	**6.0**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1285.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.040**	kW	Crankcase heater mode	P_{CK}	**0.040**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.040**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m3/h
Sound power level, outdoor	L_{WA}	**72.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Information to identify the model(s) to which the information relates :	FDC140VNX / FDT50VH (x3 units)						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**16.0**	kW	Seasonal space heating energy efficiency η s, h		**170.8**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**11.5**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**273.0**	%
T_j=+2℃	Pdh	**7.0**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**419.0**	%
T_j=+7℃	Pdh	**4.5**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**583.0**	%
T_j=+12℃	Pdh	**4.5**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**744.0**	%
T_{biv}=bivalent temperature	Pdh	**13.0**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**289.0**	%
T_{OL}=operation limit	Pdh	**10.3**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**248.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumpiton in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.040**	kW	Type of energy input Standby mode	P_{SB}	**0.040**	kW
Thermostat-off mode	P_{TO}	**0.045**	kW				
Crankcase heater mode	P_{CK}	**0.040**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m3/h
Sound power level, outdoor measured	L_{WA}	**72.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger		**-**	m3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Model FDT125VSXPVH

Model(s) :	FDC125VSX / FDT60VH (x2 units)						
Outdoor side heat exchanger of air conditioner :	air						
Indoor side heat exchanger of air conditioner :	air						
Type :	vapour compression						
if applicable :	electric motor						
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**12.5**	kW	Seasonal space cooling energy efficiency	η s, c	**278.6**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**12.5**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**394.0**	%
Tj=+30℃	Pdc	**9.2**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**642.0**	%
Tj=+25℃	Pdc	**5.9**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**894.0**	%
Tj=+20℃	Pdc	**5.7**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1271.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.035**	kW	Crankcase heater mode	P_{CK}	**0.035**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.035**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m3/h
Sound power level, outdoor	L_{WA}	**70.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Information to identify the model(s) to which the information relates :	FDC125VSX / FDT60VH (x2 units)						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**14.0**	kW	Seasonal space heating energy efficiency	η s, h	**174.5**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**12.4**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**268.0**	%
T_j=+2℃	Pdh	**7.5**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**434.0**	%
T_j=+7℃	Pdh	**4.9**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**595.0**	%
T_j=+12℃	Pdh	**4.5**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**766.0**	%
T_{biv}=bivalent temperature	Pdh	**14.0**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**261.0**	%
T_{OL}=operation limit	Pdh	**10.9**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**230.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumpiton in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.035**	kW	Type of energy input Standby mode	P_{SB}	**0.035**	kW
Thermostat-off mode	P_{TO}	**0.040**	kW				
Crankcase heater mode	P_{CK}	**0.035**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m3/h
Sound power level, outdoor measured	L_{WA}	**70.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger		**-**	m3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Model FDT140VSXTVH

Model(s) :	FDC140VSX / FDT50VH (x3 units)						
Outdoor side heat exchanger of air conditioner :	air						
Indoor side heat exchanger of air conditioner :	air						
Type :	vapour compression						
if applicable :	electric motor						
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**14.0**	kW	Seasonal space cooling energy efficiency	η s, c	**271.5**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**14.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**371.0**	%
Tj=+30℃	Pdc	**10.3**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**600.0**	%
Tj=+25℃	Pdc	**6.6**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**842.0**	%
Tj=+20℃	Pdc	**6.0**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1311.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.035**	kW	Crankcase heater mode	P_{CK}	**0.035**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.035**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m3/h
Sound power level, outdoor	L_{WA}	**72.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Information to identify the model(s) to which the information relates :		FDC140VSX / FDT50VH (x3 units)					
Outdoor side heat exchanger of heat pump :		air					
Indoor side heat exchanger of heat pump :		air					
Indication if the heater is equipped with a supplementary heater :		No					
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**16.0**	kW	Seasonal space heating energy efficiency	η s, h	**170.3**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**13.7**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**257.0**	%
T_j=+2℃	Pdh	**8.4**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**430.0**	%
T_j=+7℃	Pdh	**5.4**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**565.0**	%
T_j=+12℃	Pdh	**4.5**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**760.0**	%
T_{biv}=bivalent temperature	Pdh	**15.5**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**250.0**	%
T_{OL}=operation limit	Pdh	**11.9**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**224.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumpiton in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.035**	kW	Type of energy input Standby mode	P_{SB}	**0.035**	kW
Thermostat-off mode	P_{TO}	**0.040**	kW				
Crankcase heater mode	P_{CK}	**0.035**	kW				
Other items				For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m3/h
Capacity control		**variable**		For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger		**-**	m3/h
Sound power level, outdoor measured	L_{WA}	**72.0**	dB				
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Models FDT40VH, 50VH, 60VH

Model(s) : FDT40VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	3.9	kW	Total electric power input	P_{elec}	0.030	kW
Cooling capacity (latent)	$P_{rated,c}$	0.1	kW	Sound power level (per speed setting,if applicable)	L_{WA}	50.0	dB
Heating capacity	$P_{rated,h}$	4.5	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

Model(s) : FDT50VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	4.4	kW	Total electric power input	P_{elec}	0.040	kW
Cooling capacity (latent)	$P_{rated,c}$	0.6	kW	Sound power level (per speed setting,if applicable)	L_{WA}	55.0	dB
Heating capacity	$P_{rated,h}$	5.4	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

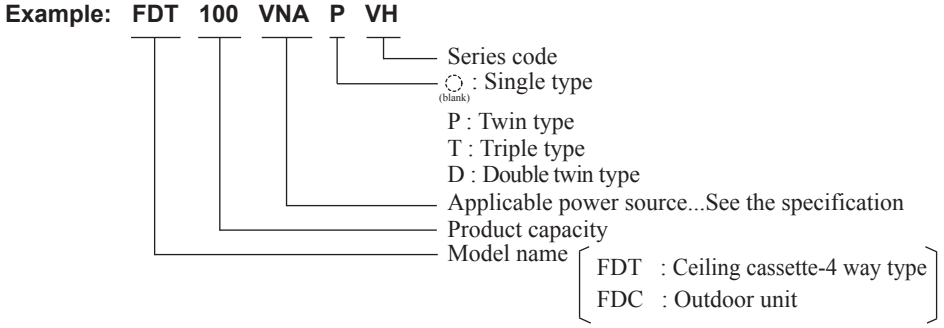
Model(s) : FDT60VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	5.5	kW	Total electric power input	P_{elec}	0.070	kW
Cooling capacity (latent)	$P_{rated,c}$	0.1	kW	Sound power level (per speed setting,if applicable)	L_{WA}	58.0	dB
Heating capacity	$P_{rated,h}$	6.7	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

2. MICRO INVERTER PACKAGED AIR-CONDITIONERS

CONTENTS

2.1 SPECIFICATIONS 270
2.2 EXTERIOR DIMENSIONS 278
(1) Indoor units 278
(2) Outdoor units 278
(3) Remote control (Option parts) 280
2.3 ELECTRICAL WIRING 281
(1) Indoor units 281
(2) Outdoor units 281
2.4 NOISE LEVEL 285
2.5 TEMPERATURE AND VELOCITY DISTRIBUTION 286
2.6 PIPING SYSTEM 287
2.7 RANGE OF USAGE & LIMITATIONS 291
2.8 SELECTION CHART 295
2.8.1 Capacity tables 295
2.8.2 Correction of cooling and heating capacity in relation to air flow rate control (Fan speed) 302
2.8.3 Correction of cooling and heating capacity in relation to one way length of refrigerant piping 302
2.8.4 Height difference between the indoor unit and outdoor unit 302
2.9 APPLICATION DATA 304
2.9.1 Installation of indoor unit 304
2.9.2 Electric wiring work installation 304
2.9.3 Installation of wired remote control (Option parts) 304
2.9.4 Installation of outdoor unit 304
(1) Models FDC100－140VNA, 100－140VSA 304
(2) Models FDC200, 250VSA 313
2.9.5 Method for connecting the accessory pipe 321
2.9.6 Instructions for branching pipe set (DIS-WA1,WB1,TA1,TB1) 324
2.10 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER 325
2.10.1 Remote control (Option parts) 325
2.10.2 Operation control function by the wired remote control 325
2.10.3 Operation control function by the indoor control 325
2.10.4 Operation control function by the outdoor control 325
(Ⅰ) Models FDC100－140VNA,100－140VSA 325
(1) Determination of comressor speed (Frequency) 325
(2) Compressor start control 326
(3) Compressor soft start control 326
(4) Outdoor fan control 327
(5) Defrost operation 328
(6) Protective control/anomalous stop control by compressor's number of revolutions 329
(7) Silent mode 332
(8) Test run 332

(9) Pump-down control 333
(10) Base heater ON/OFF output control (Option) 333
(II) **Models FDC200, 250VSA 335**
(1) Determination of comressor speed (Frequency) 335
(2) Compressor start control 335
(3) Compressor soft start control 336
(4) Outdoor fan control 336
(5) Defrost operation 338
(6) Protective control/anomalous stop control by compressor's number of revolutions 339
(7) Silent mode 343
(8) Test run 343
(9) Pump-down control 343
(10) Base heater ON/OFF output control (Option) 344
2.11 MAINTENANCE DATA 344
2.12 TECHNICAL INFORMATION 345



2.1 SPECIFICATIONS

(1) Twin type

Item			Model	FDT100VNAPVH	
				Indoor unit FDT50VH (2 units)	Outdoor unit FDC100VNA
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	10.0 [4.0(Min.) - 11.2(Max.)]	
	Nominal heating capacity (range)		kW	11.2 [4.0(Min.) - 12.5(Max.)]	
	Power consumption	Cooling	kW	2.82	
		Heating		2.90	
	Max power consumption			6.40	
	Running current	Cooling	A	12.4 / 12.9	
		Heating		12.7 / 13.3	
	Inrush current, max current			5, 24	
	Power factor	Cooling	%	99	
		Heating		99	
	EER	Cooling		3.55	
	COP	Heating		3.86	
	Sound power level	Cooling	dB(A)	55	70
		Heating		56	
	Sound pressure level	Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	54
		Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	56
	Silent mode sound pressure level			—	50 / 44 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	845 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 19 Panel 5	80
Compressor type & Q'ty				—	RMT5126MCE3 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg (Pre-charged up to the piping length of 30m) Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 1
Fan motor (Starting method)			W	50 < Direct line start >	86 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	75
		Heating			73
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8")x0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2")x0.8 ①ϕ 15.88(5/8")x1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.50m	
	Vertical height diff. between O/U and I/U		m	Max.50m (Outdoor unit is higher)	Max.15m (Outdoor unit is lower)
	Drain hose			Hose connectable with VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	—
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item			Model	FDT100VSAPVH	
				Indoor unit FDT50VH (2 units)	Outdoor unit FDC100VSA
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	10.0 [4.0(Min.) - 11.2(Max.)]	
	Nominal heating capacity (range)		kW	11.2 [4.0(Min.) - 12.5(Max.)]	
	Power consumption	Cooling	kW	2.82	
		Heating		2.90	
	Max power consumption			10.20	
	Running current	Cooling	A	4.1 / 4.4	
		Heating		4.3 / 4.5	
	Inrush current, max current			5, 15	
	Power factor	Cooling	%	99 / 97	
		Heating		97 / 98	
	EER	Cooling		3.55	
	COP	Heating		3.86	
	Sound power level	Cooling	dB(A)	55	70
		Heating		56	
	Sound pressure level	Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	54
		Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	56
	Silent mode sound pressure level			—	50 / 44 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 × 840 × 840 Panel 35 × 950 × 950	845×970×370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 19 Panel 5	82
Compressor type & Q'ty				—	RMT5126MCE 4×1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg (Pre-charged up to the piping length of 30m) Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan ×1	Propeller fan ×1
Fan motor (Starting method)			W	50 < Direct line start >	86 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	75
		Heating			73
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net ×1(Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8")x0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2")x0.8 ①ϕ 15.88(5/8")x1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.50m	
	Vertical height diff. between O/U and I/U		m	Max.50m (Outdoor unit is higher)	Max.15m (Outdoor unit is lower)
	Drain hose			Hose connectable with VP25 (O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	—
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item			Model	FDT125VNAPVH	
				Indoor unit FDT60VH (2 units)	Outdoor unit FDC125VNA
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	12.5 [5.0(Min.) - 14.0(Max.)]	
	Nominal heating capacity (range)		kW	14.0 [4.0(Min.) - 16.0(Max.)]	
	Power consumption	Cooling	kW	3.79	
		Heating		3.31	
	Max power consumption			6.40	
	Running current	Cooling	A	16.6 / 17.4	
		Heating		14.5 / 15.2	
	Inrush current, max current			5, 24	
	Power factor	Cooling	%	99	
		Heating		99	
	EER	Cooling		3.30	
	COP	Heating		4.23	
	Sound power level	Cooling	dB(A)	58	71
		Heating		59	
	Sound pressure level	Cooling		P-Hi: 44 Hi: 34 Me: 30 Lo: 27	55
		Heating		P-Hi: 44 Hi: 34 Me: 30 Lo: 23	57
	Silent mode sound pressure level			—	51 / 45 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	845 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 21 Panel 5	80
Compressor type & Q'ty				—	RMT5126MCE3 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg (Pre-charged up to the piping length of 30m) Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 1
Fan motor (Starting method)			W	50 < Direct line start >	86 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 26 Hi: 17 Me: 14 Lo: 11	75
		Heating			73
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater			W	—	20(Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8")x0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2")x0.8 ①ϕ 15.88(5/8")x1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.50m	
	Vertical height diff. between O/U and I/U		m	Max.50m (Outdoor unit is higher)	Max.15m (Outdoor unit is lower)
	Drain hose			Hose connectable with VP25 (O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	—
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item			Model	FDT125VSAPVH	
				Indoor unit FDT60VH (2 units)	Outdoor unit FDC125VSA
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	12.5 [5.0(Min.) - 14.0(Max.)]	
	Nominal heating capacity (range)		kW	14.0 [4.0(Min.) - 16.0(Max.)]	
	Power consumption	Cooling	kW	3.79	
		Heating		3.31	
	Max power consumption			10.20	
	Running current	Cooling	A	5.5 / 5.8	
		Heating		4.9 / 5.1	
	Inrush current, max current			5, 15	
	Power factor	Cooling	%	99	
		Heating		98 / 99	
	EER	Cooling		3.30	
	COP	Heating		4.23	
	Sound power level	Cooling	dB(A)	58	71
		Heating		59	
	Sound pressure level	Cooling		P-Hi: 44 Hi: 34 Me: 30 Lo: 27	55
		Heating		P-Hi: 44 Hi: 34 Me: 30 Lo: 23	57
	Silent mode sound pressure level			—	51 / 45 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	845 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 21 Panel 5	82
Compressor type & Q'ty				—	RMT5126MCE4 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg (Pre-charged up to the piping length of 30m) Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 1
Fan motor (Starting method)			W	50 < Direct line start >	86 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 26 Hi: 17 Me: 14 Lo: 11	75
		Heating			73
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater			W	—	20(Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8")x0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2")x0.8 ①ϕ 15.88(5/8")x1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.50m	
	Vertical height diff. between O/U and I/U		m	Max.50m(Outdoor unit is higher)	Max.15m(Outdoor unit is lower)
	Drain hose			Hose connectable with VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	—
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

(2) Triple type

Item				Model	FDT140VNATVH	
					Indoor unit FDT50VH (3 units)	Outdoor unit FDC140VNA
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	13.6 [5.0(Min.) - 14.5(Max.)]	
	Nominal heating capacity (range)			kW	15.5 [4.0(Min.) - 16.5(Max.)]	
	Power consumption		Cooling	kW	4.22	
			Heating		3.29	
	Max power consumption				6.40	
	Running current		Cooling	A	18.5 / 19.4	
			Heating		14.4 / 15.1	
	Inrush current, max current				5, 24	
	Power factor		Cooling	%	99	
			Heating		99	
	EER		Cooling		3.22	
	COP		Heating		4.71	
	Sound power level		Cooling	dB(A)	55	73
			Heating		56	
	Sound pressure level		Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	57
			Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	59
	Silent mode sound pressure level				—	53 / 47 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)				mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	845 x 970 x 370
Exterior appearance (Munsell color)					Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight				kg	Unit 19 Panel 5	80
Compressor type & Q'ty					—	RMT5126MCE3 x 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)				kg	R410A 3.8kg(Pre-charged up to the piping length of 30m)Outdoor unit	
Heat exchanger					Louver fin & inner grooved tubing	Straight fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Turbo fan x 1	Propeller fan x 1
Fan motor (Starting method)				W	50 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	75
			Heating			73
Available external static pressure				Pa	0	—
Outside air intake					Possible	—
Air filter, Quality / Quantity					Pocket plastic net x 1(Washable)	—
Shock & vibration absorber					Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater				W	—	20(Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)			mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8")x0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
					Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2")x0.8 ①ϕ 15.88(5/8")x1.0 O/U ϕ 15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.50m	
	Vertical height diff. between O/U and I/U			m	Max.50m(Outdoor unit is higher)	Max.15m(Outdoor unit is lower)
	Drain hose				Hose connectable with VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height				mm	Built-in drain pump , 850	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size x Core number				ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit, Drain hose	—
Option parts					—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item			Model	FDT140VSATVH	
				Indoor unit FDT50VH (3 units)	Outdoor unit FDC140VSA
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	13.6 [5.0(Min.) - 14.5(Max.)]	
	Nominal heating capacity (range)		kW	15.5 [4.0(Min.) - 16.5(Max.)]	
	Power consumption	Cooling	kW	4.22	
		Heating		3.29	
	Max power consumption			10.20	
	Running current	Cooling	A	6.2 / 6.5	
		Heating		4.8 / 5.1	
	Inrush current, max current			5, 15	
	Power factor	Cooling	%	98 / 99	
		Heating		99 / 98	
	EER	Cooling		3.22	
	COP	Heating		4.71	
	Sound power level	Cooling	dB(A)	55	73
		Heating		56	
	Sound pressure level	Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	57
		Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	59
	Silent mode sound pressure level			—	53 / 47 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	845 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 19 Panel 5	82
Compressor type & Q'ty				—	RMT5126MCE4 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg (Pre-charged up to the piping length of 30m) Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 1
Fan motor (Starting method)			W	50 < Direct line start >	86 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	75
		Heating			73
Available external static pressure			Pa	0	—
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater			W	—	20(Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 6.35 (1/4") ②ϕ 9.52(3/8")x0.8 ①ϕ 9.52(3/8")x0.8 O/U ϕ 9.52 (3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ②ϕ 12.7(1/2")x0.8 ①ϕ 15.88(5/8")x1.0 O/U ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.50m	
	Vertical height diff. between O/U and I/U		m	Max.50m(Outdoor unit is higher)	Max.15m(Outdoor unit is lower)
	Drain hose			Hose connectable with VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	5.0	
L.R.A. (Locked rotor ampere)			A	ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
Interconnecting wires	Size x Core number			IPX0	IP24
IP number				Mounting kit, Drain hose	—
Standard accessories				—	
Option parts					

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G" x 1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

(3) Double twin type

Item			Model	FDT200VSADVH	
				Indoor unit FDT50VH (4 units)	Outdoor unitFDC200VSA
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	19.0 [5.2(Min.) - 22.4(Max.)]	
	Nominal heating capacity (range)		kW	22.4 [3.3(Min.) - 25.0(Max.)]	
	Power consumption	Cooling	kW	6.26	
		Heating		6.15	
	Max power consumption			12.0	
	Running current	Cooling	A	9.8 / 10.2	
		Heating		9.6 / 10.0	
	Inrush current, max current			5, 20	
	Power factor	Cooling	%	92 / 93	
		Heating		92 / 93	
	EER	Cooling		3.04	
	COP	Heating		3.64	
	Sound power level	Cooling	dB(A)	55	72
		Heating		56	74
	Sound pressure level	Cooling		P-Hi: 41 Hi: 33 Me: 30 Lo: 26	58
		Heating		P-Hi: 42 Hi: 33 Me: 28 Lo: 20	59
	Silent mode sound pressure level			—	52
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	1,300 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 19 Panel 5	115
Compressor type & Q'ty				—	RMT5134MDE3 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	0.9(compressor) + 0.6(unit) (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 5.6kg(Pre-charged up to the piping length of 30m)Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 2
Fan motor (Starting method)			W	50 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 22 Hi: 16 Me: 13 Lo: 10	135
		Heating			
Available external static pressure			Pa	0	0
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater			W	—	20(Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/U ϕ 9.52 (3/8") ③② ϕ 9.52(3/8") x 0.8 ① ϕ 9.52(3/8") x 0.8 or ϕ 12.7(1/2") x 0.8 O/U ϕ 9.52(3/8")	
				Gas line : I/U ϕ 12.7 (1/2") ③ ϕ 12.7x0.8 ② ϕ 15.88x1.0 ① ϕ 22.22(7/8")x1.0 or ϕ 25.4(1")x1.0 or ϕ 28.58(1 1/8") x 1.0 O/U ϕ 22.22 (7/8")	
	Connecting method			Flare piping	Liquid : Flare / Gas : Brazing
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.70m(Liquid piping : ϕ 12.7, Gas piping : ϕ 25.4 or ϕ 28.58),Max.40m(Liquid piping : ϕ 9.52), Max.35m(Gas piping : ϕ 22.22)	
	Vertical height diff. between O/U and I/U		m	Max.30m(Outdoor unit is higher)	Max.15m(Outdoor unit is lower)
	Drain hose			Hose connectable with VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5/5	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	Connecting pipe, Edging
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) (5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WB1G"×1,"DIS-WA1G"×2 (Option). Pipe ① : O/U-Branch, ② : Branch-Branch, ③ : Branch-I/U
(8) Use 1/2H pipes having a 1.0mm or thicker wall for ϕ 19.05 or larger pipes.

Item			Model	FDT250VSADVH	
				Indoor unit FDT60VH (4 units)	Outdoor unit FDC250VSA
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	24.0 [6.9(Min.) - 28.0(Max.)]	
	Nominal heating capacity (range)		kW	27.0 [5.5(Min.) - 31.5(Max.)]	
	Power consumption	Cooling	kW	7.43	
		Heating		6.83	
	Max power consumption			13.7	
	Running current	Cooling	A	11.9 / 12.5	
		Heating		11.0 / 11.4	
	Inrush current, max current			5, 21	
	Power factor	Cooling	%	90	
		Heating		90 / 91	
	EER	Cooling		3.23	
	COP	Heating		3.95	
	Sound power level	Cooling	dB(A)	58	73
		Heating		59	75
	Sound pressure level	Cooling		P-Hi: 44 Hi: 34 Me: 30 Lo: 27	59
		Heating		P-Hi: 44 Hi: 34 Me: 30 Lo: 23	62
	Silent mode sound pressure level			—	54
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 x 840 x 840 Panel 35 x 950 x 950	1,505 x 970 x 370
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	Unit 21 Panel 5	143
Compressor type & Q'ty				—	GTC5150NC40KF x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			ℓ	—	1.45(M-MA32R)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 7.2kg (Pre-charged up to the piping length of 30m) Outdoor unit	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Turbo fan x 1	Propeller fan x 2
Fan motor (Starting method)			W	50 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi: 26 Hi: 17 Me: 14 Lo: 11	143
		Heating			151
Available external static pressure			Pa	0	0
Outside air intake				Possible	—
Air filter, Quality / Quantity				Pocket plastic net x 1(Washable)	—
Shock & vibration absorber				Rubber sleeve(for fan motor)	Rubber sleeve(for compressor)
Electric heater			W	—	20(Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat Internal thermostat for fan motor Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line : I/O ϕ 6.35 (1/4") ③② ϕ 9.52(3/8") x 0.8 ① ϕ 12.7(1/2") x 0.8 O/U ϕ 12.7 (1/2")	
				Gas line : I/U ϕ 12.7 (1/2") ③ ϕ 12.7 x 0.8 ② ϕ 15.88 x 1.0 ① ϕ 22.22(7/8") x 1.0 or ϕ 25.4(1") x 1.0 or ϕ 28.58(1 1/8") x 1.0 O/U ϕ 22.22 (7/8")	
	Connecting method			Flare piping	Liquid : Flare / Gas : Brazing
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.70m	
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher)	Max.15m (Outdoor unit is lower)
	Drain hose			Hose connectable with VP25(O.D.32)	Hole size ϕ 20 x 3pcs
Drain pump, max lift height			mm	Built-in drain pump , 850	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5/5	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Termainal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit, Drain hose	Connecting pipe, Edging
Option parts				—	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) (5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WB1G"×1,"DIS-WA1G"×2 (Option). Pipe ① : O/U-Branch, ② : Branch-Branch, ③ : Branch-I/U
(8) Use 1/2H pipes having a 1.0mm or thicker wall for ϕ 19.05 or larger pipes.

PJF000Z551 A

2.2 EXTERIOR DIMENSIONS

(1) Indoor units ..... See page 15.

(2) Outdoor units

Models FDC100VNA, 125VNA, 140VNA
100VSA, 125VSA, 140VSA

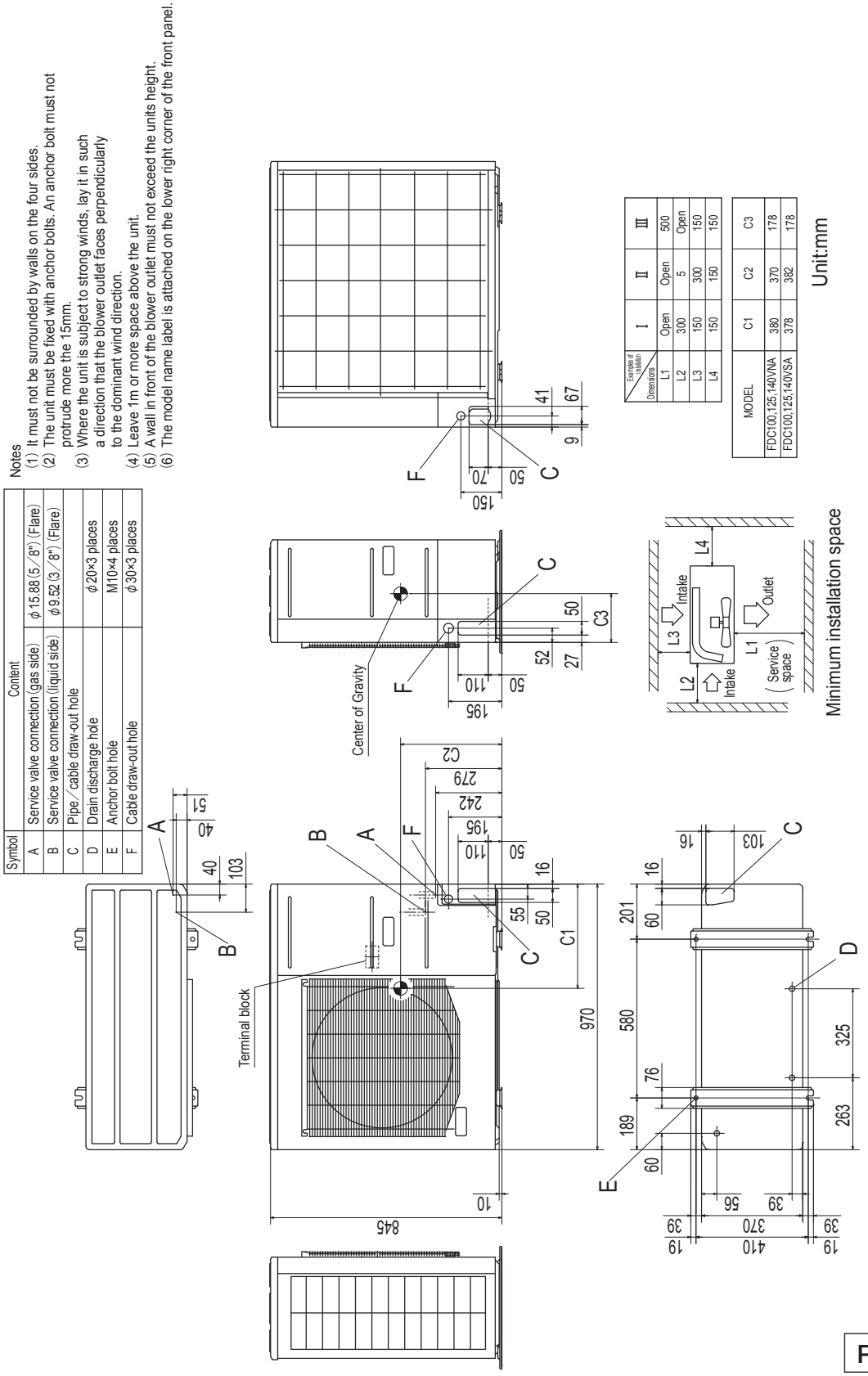
Notes
(1) It must not be surrounded by walls on the four sides.
(2) The unit must be fixed with anchor bolts. An anchor bolt must not protrude more the 15mm.
(3) Where the unit is subject to strong winds, lay it in such a direction that the blower outlet faces perpendicularly to the dominant wind direction.
(4) Leave 1m or more space above the unit.
(5) A wall in front of the blower outlet must not exceed the units height.
(6) The model name label is attached on the lower right corner of the front panel.

Symbol	Content	
A	Service valve connection (gas side)	φ15.88 (5/8") (Flare)
B	Service valve connection (liquid side)	φ9.52 (3/8") (Flare)
C	Pipe/cable draw-out hole	φ20×3 places
D	Drain discharge hole	
E	Anchor bolt hole	M10×4 places
F	Cable draw-out hole	φ30×3 places

Example of installation / Dimensions	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4	150	150	150

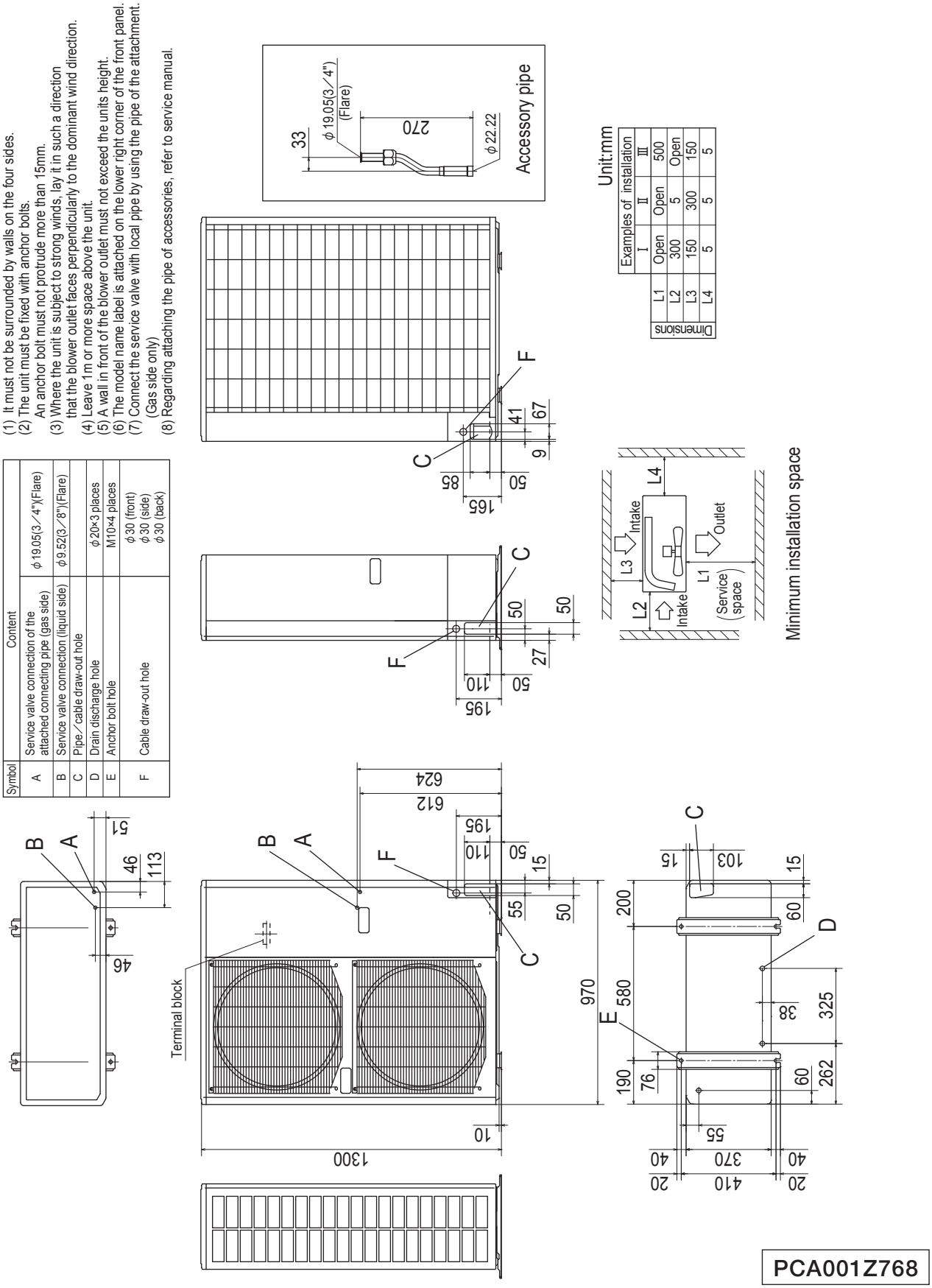
MODEL	C1	C2	C3
FDC100,125,140VNA	380	370	178
FDC100,125,140VSA	378	382	178

Unit:mm



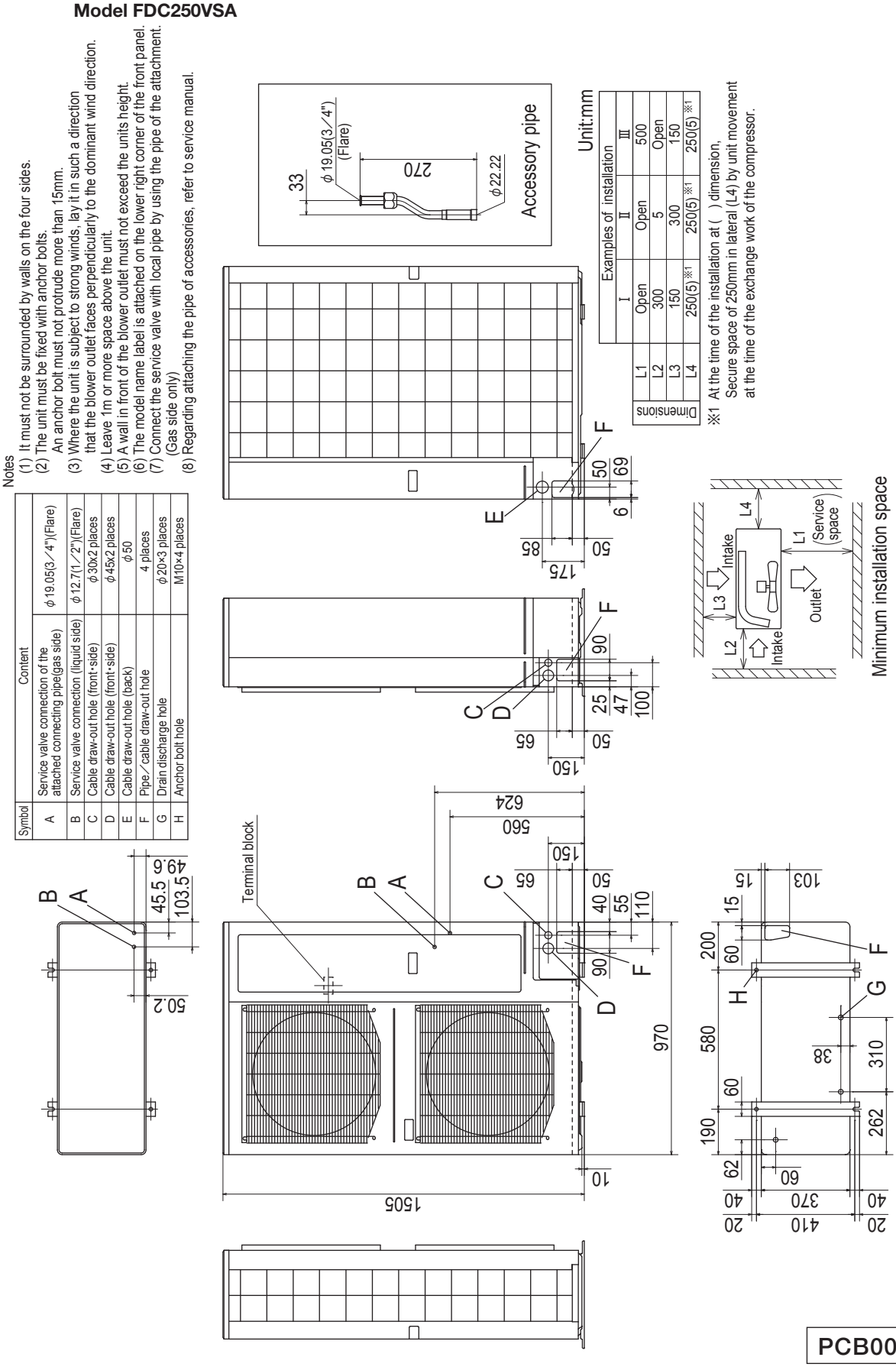
PCA001Z816

Model FDC200VSA



PCA001Z768

Model FDC250VSA



PCB003Z865

(3) Remote control (Option parts) ..... See page 19.

2.3 ELECTRICAL WIRING

(1) Indoor units ..... See page 22.

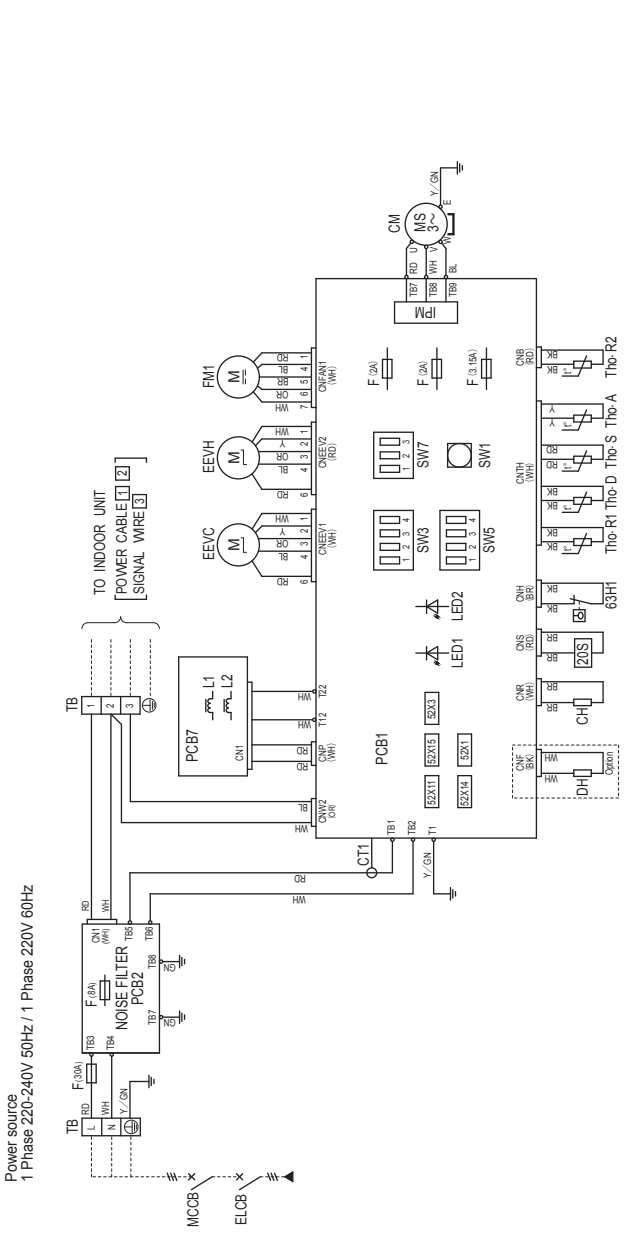
(2) Outdoor units
Models FDC100VNA, 125VNA, 140VNA

Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CN	Connector
CT1	Current sensor
DH	Drain pan heater
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
F	Fuse
FM1	Fan motor
IPM	Intelligent power module
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
L1,2	Reactor
SW1	Switch
SW3,5,7	Local setting switch
TB	Terminal block
THo-A	Sensor (Outdoor air temperature.)
THo-D	Sensor (Discharge pipe temperature.)
THo-R1,R2	Sensor (Heat exchanger temperature.)
THo-S	Sensor (Suction pipe temperature.)
20S	Solenoid valve for 4-way valve
52X1	Auxiliary relay
52X3	Auxiliary relay
52X11	Auxiliary relay (for 20S)
52X14	Auxiliary relay (for CH)
52X15	Auxiliary relay (for DH)
63H1	High pressure switch

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
OR	Orange
RD	Red
WH	White
Y	Yellow
Y/GN	Yellow/Green



Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size (mm)
100	24	5.5	22	Ø1.6mm x 3	Ø1.6
125					
140					

※At the connection with the duct type indoor unit.

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size (mm)
100	26	5.5	20	Ø1.6mm x 3	Ø1.6
125					
140	27				

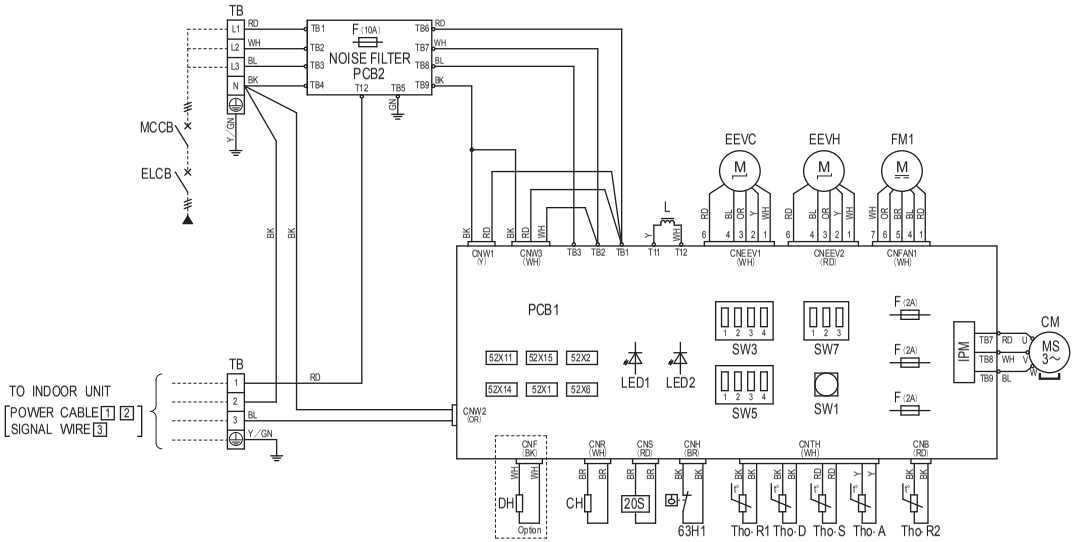
- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of Circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

Local setting switch SW3,5,7 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrosting operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④Be sure to turn OFF SW3-3 after the trial operation is finished.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.
SW7-2	Defrost control change	Set this switch to ON when managing unit operation by remote control connected external equipment.
SW7-3	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.

PCA001Z817

Power source
3 Phase 380-415V 50Hz



Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size (mm)
100	15	3.5	46	Ø1.6mm x 3	Ø1.6
125					
140					

※At the connection with the duct type indoor unit.

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size (mm)
100	17	3.5	40	Ø1.6mm x 3	Ø1.6
125					
140	18		38		

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of Circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

Local setting switch SW3,5,7 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrosting operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ① Trial operation can be performed by using SW3-3,4. ② Compressor will be in the operation when SW3-3 is ON. ③ Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④ Be sure to turn OFF SW3-3 after the trial operation is finished.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.
SW7-2	Defrost control change	Set this switch to ON when managing unit operation by remote control connected external equipment.
SW7-3	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.

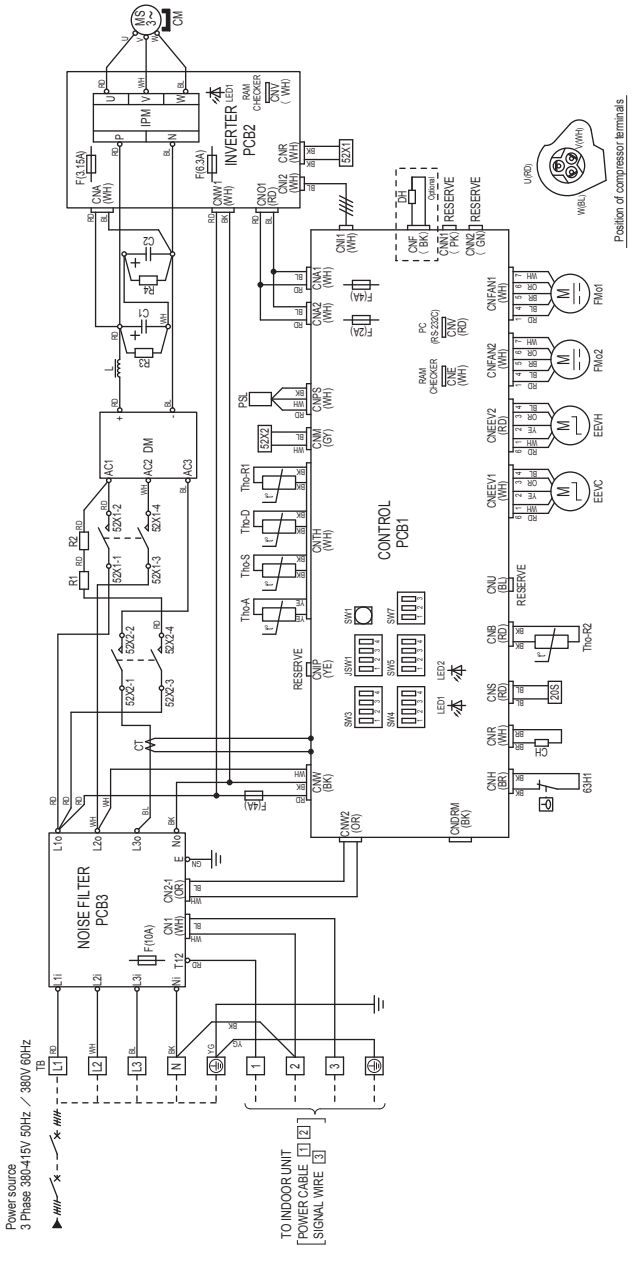
Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CN	Connector
DH	Drain pan heater
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
F	Fuse
FM1	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
SW1	Switch
SW3,5,7	Local setting switch
TB	Terminal block
THo-A	Sensor (Outdoor air temperature.)
THo-D	Sensor (Discharge pipe temperature.)
THo-R1,R2	Sensor (Heat exchanger temperature.)
THo-S	Sensor (Suction pipe temperature.)
20S	Solenoid valve for 4-way valve
52X1	Auxilliary relay
52X2	Auxilliary relay
52X6	Auxiliary relay (for FM1)
52X11	Auxilliary relay (for 20S)
52X14	Auxilliary relay (for CH)
52X15	Auxilliary relay (for DH)
63H1	High pressure switch

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
OR	Orange
RD	Red
WH	White
Y	Yellow
Y/GN	Yellow/Green

Model FDC200VSA



Meaning of marks

Mark	Parts name
CH	Crankcase heater
CM	Compressor motor
CNA – Z	Connector
CT	Current sensor
DH	Drain pan heater
DM	Diode module
F	Fuse
FMo1,2	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
PSL	Low pressure sensor
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
SW1	Pump down switch
SW3-5, 7	Local setting switch
TB	Terminal block
Tho-A	Sensor (Outdoor air temperature.)
Tho- D	Sensor (Discharge pipe temperature.)
Tho- R1, R2	Sensor (Heat exchanger temperature.)
Tho- S	Sensor (Suction pipe temperature.)
20S	Solenoid coil for 4-way valve
52X1, 2	Relay
63H1	High pressure switch

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
OR	Orange
RD	Red
WH	White
YE	Yellow
YG	Yellow/Green
GY	Gray
PK	Pink

Local setting switch SW3 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrosting operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ① Trial operation can be performed by using SW3-3,4. ② Compressor will be in the operation when SW3-3 is ON. ③ Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④ Be sure to turn OFF SW3-3 after the trial operation is finished.

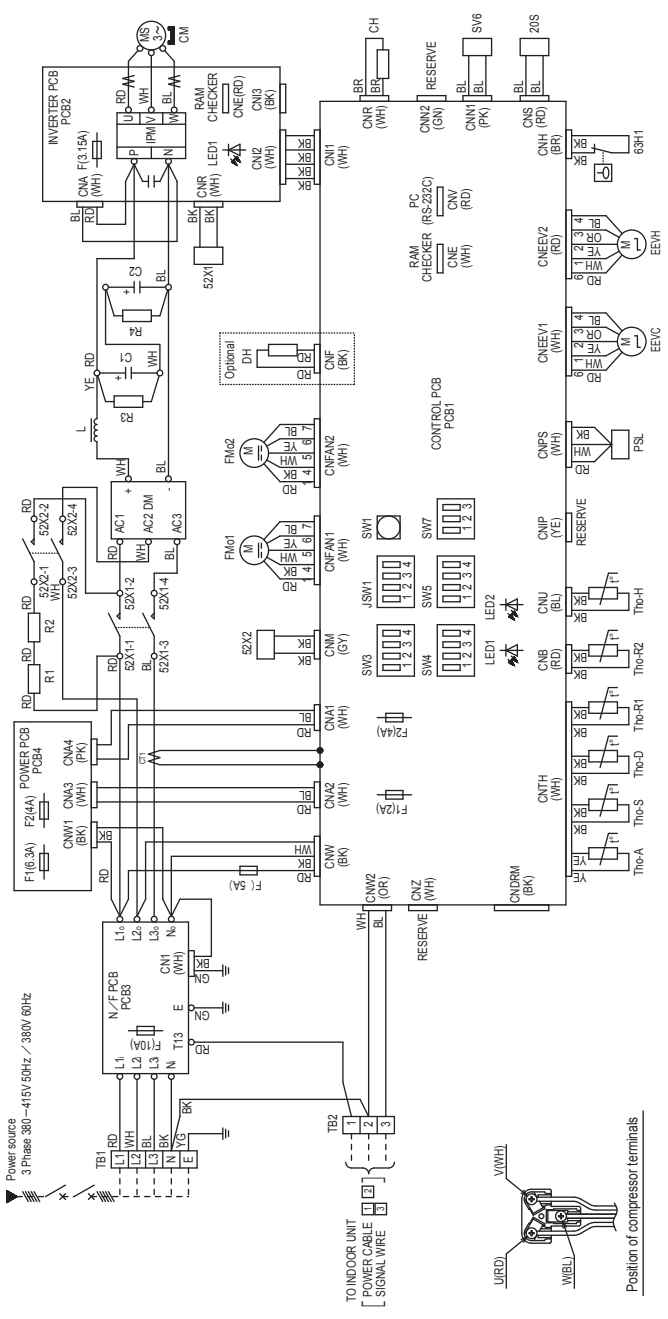
Power cable, indoor-outdoor connecting wires

MAX over current (A)	Power cable size (mm²)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size
25	5.5	43	φ1.6mm x 3	φ1.6mm

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

PCA001Z769

Model FDC250VSA



Meaning of marks

Mark	Parts name
CH	Crankcase heater
CM	Compressor motor
CNA～Z	Connector
CT	Current sensor
DH	Drain pan heater
DM	Diode module
F	Fuse
FMo1,2	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
PSL	Low pressure sensor
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
SW1	Pump down switch
SW3-5, 7	Local setting switch
TB	Terminal block
Tho-A	Sensor (Outdoor air temperature.)
Tho- D	Sensor (Discharge pipe temperature.)
Tho- R 1,R2	Sensor (Heat exchanger temperature.)
Tho-H	Sensor (Comp. under dome temperature.)
Tho-S	Sensor (Suction pipe temperature.)
20S	Solenoid coil for 4-way valve
SV6	Solenoid coil for 2-way valve
52X1, 2	Relay
63H1	High pressure switch

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
OR	Orange
RD	Red
WH	White
YE	Yellow
YG	Yellow／Green
GY	Gray
PK	Pink

Local setting switch SW3（Set up at shipment OFF）

SW3-1	Defrost control change	The defrosting operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ① Trial operation can be performed by using SW3-3,4. ② Compressor will be in the operation when SW3-3 is ON. ③ Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④ Be sure to turn OFF SW3-3 after the trial operation is finished.

Power cable, indoor-outdoor connecting wires

MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size
27	5.5	40	ϕ 1.6mm x 3	ϕ 1.6mm

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

PCB003Z866

2.4 NOISE LEVEL

Notes(1) The data are based on the following conditions.
Ambient air temperature: Indoor unit 27℃WB. Outdoor unit 35℃DB.
(2) The data in the chart are measured in an anechoic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

(1) Indoor units ..... See page 27.

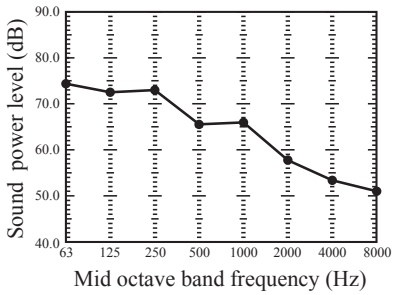
(2) Outdoor units

Measured based on JIS B 8616
Mike position: at highest noise level in position as mentioned below
Distance from front side 1m
Height 1m

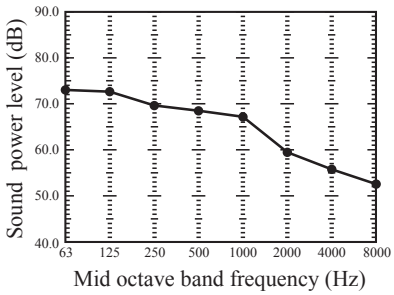
(a) FDC100-140

(i) Sound power level

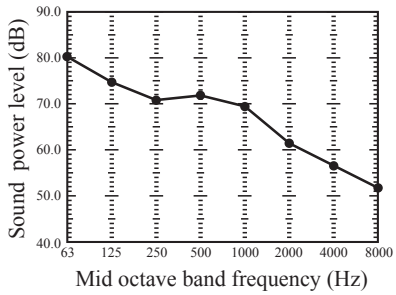
Models FDC100VNA,100VSA
Noise level 70 dB (A)



Models FDC125VNA,125VSA
Noise level 71 dB (A)



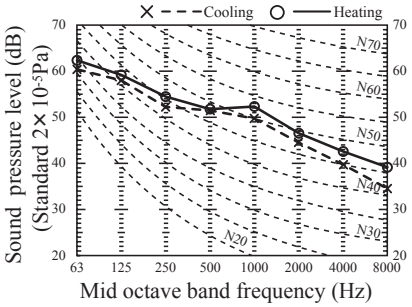
Models FDC140VNA,140VSA
Noise level 73 dB (A)



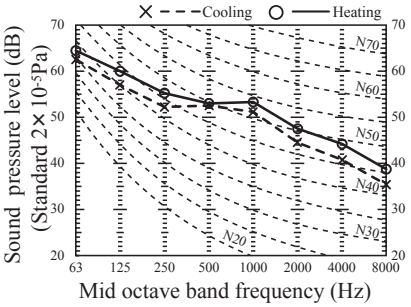
(ii) Sound pressure level

1) Rating mode

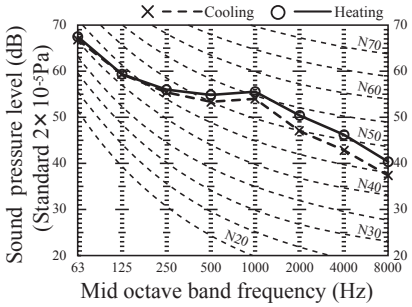
Models FDC100VNA,100VSA
Cooling noise level Hi : 54 dB (A)
Heating noise level Hi : 56 dB (A)



Models FDC125VNA,125VSA
Cooling noise level Hi : 55 dB (A)
Heating noise level Hi : 57 dB (A)

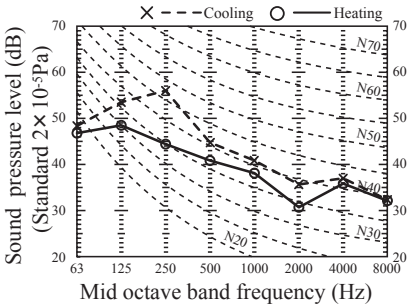


Models FDC140VNA,140VSA
Cooling noise level Hi : 57 dB (A)
Heating noise level Hi : 59 dB (A)

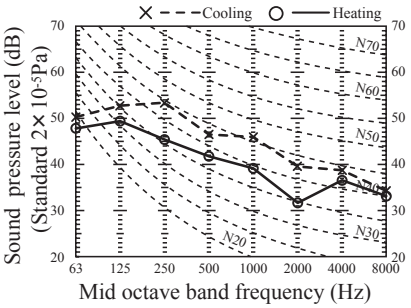


2) Silent mode

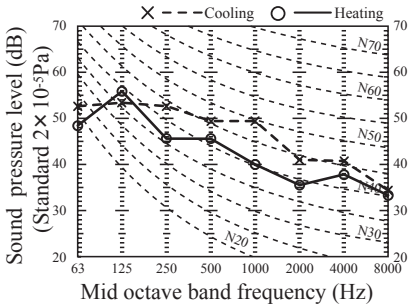
Models FDC100VNA,100VSA
Cooling noise level Hi : 50 dB (A)
Heating noise level Hi : 44 dB (A)



Models FDC125VNA,125VSA
Cooling noise level Hi : 51 dB (A)
Heating noise level Hi : 45 dB (A)



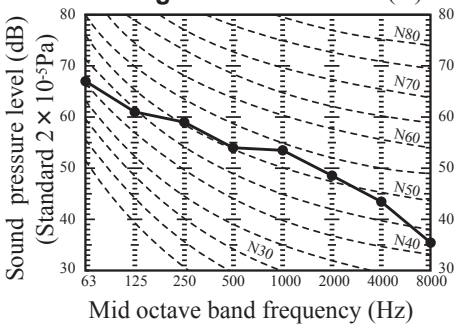
Models FDC140VNA,140VSA
Cooling noise level Hi : 53 dB (A)
Heating noise level Hi : 47 dB (A)



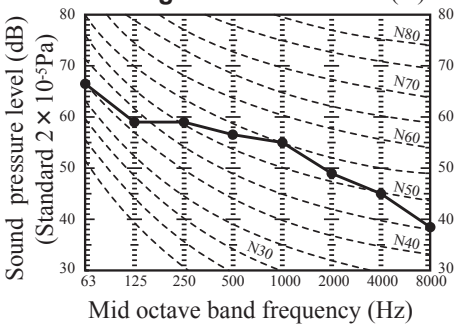
(b) FDC200, 250

Model FDC200VSA

Cooling noise level 58dB (A)

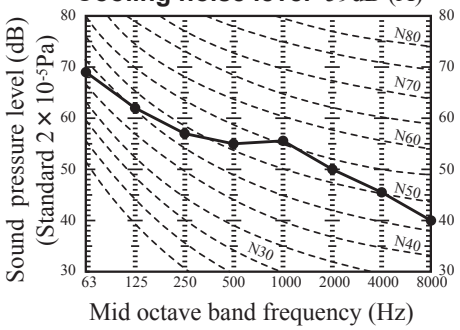


Heating noise level 59dB (A)

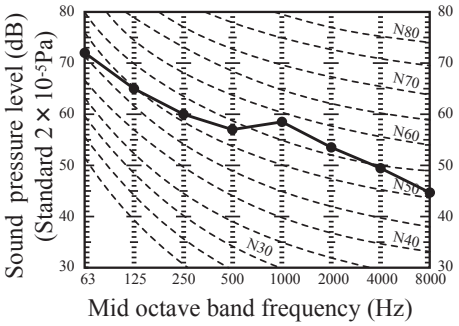


Model FDC250VSA

Cooling noise level 59dB (A)



Heating noise level 62dB (A)



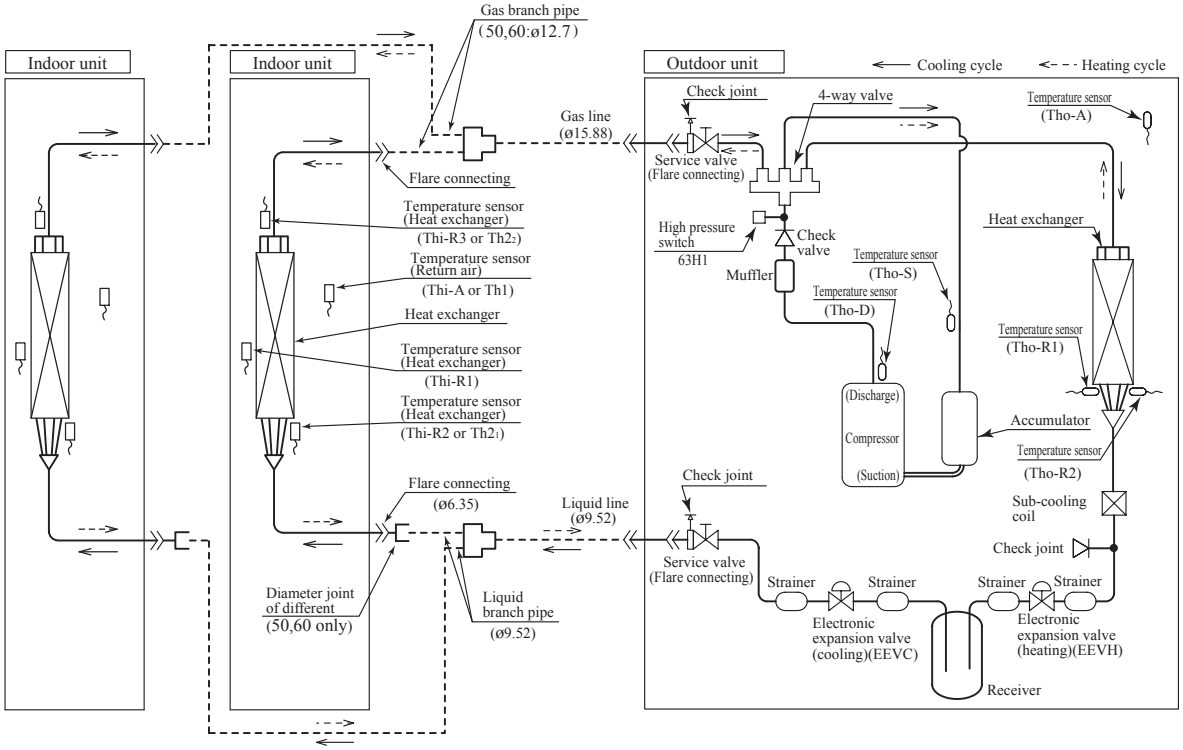
2.5 TEMPERATURE AND VELOCITY DISTRIBUTION

See page 30 of chapter 1.5.

2.6 PIPING SYSTEM

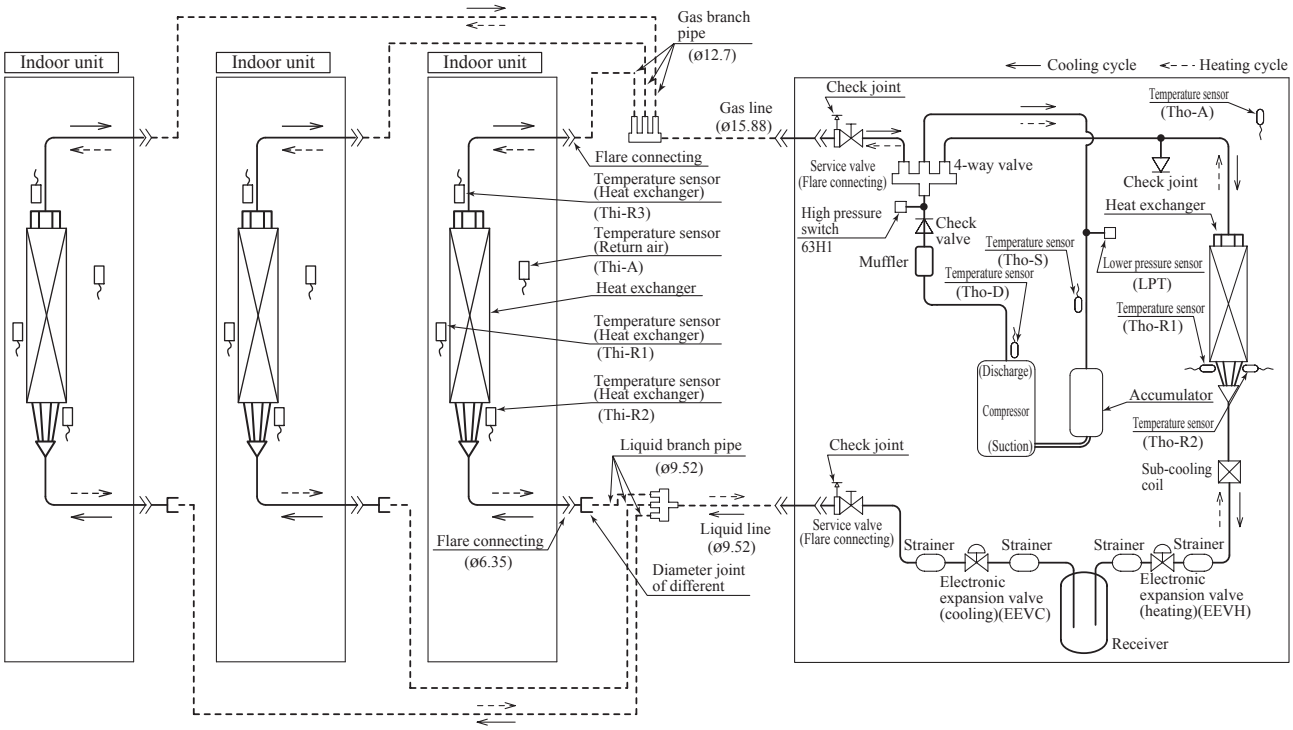
(1) Twin type

Models 100, 125



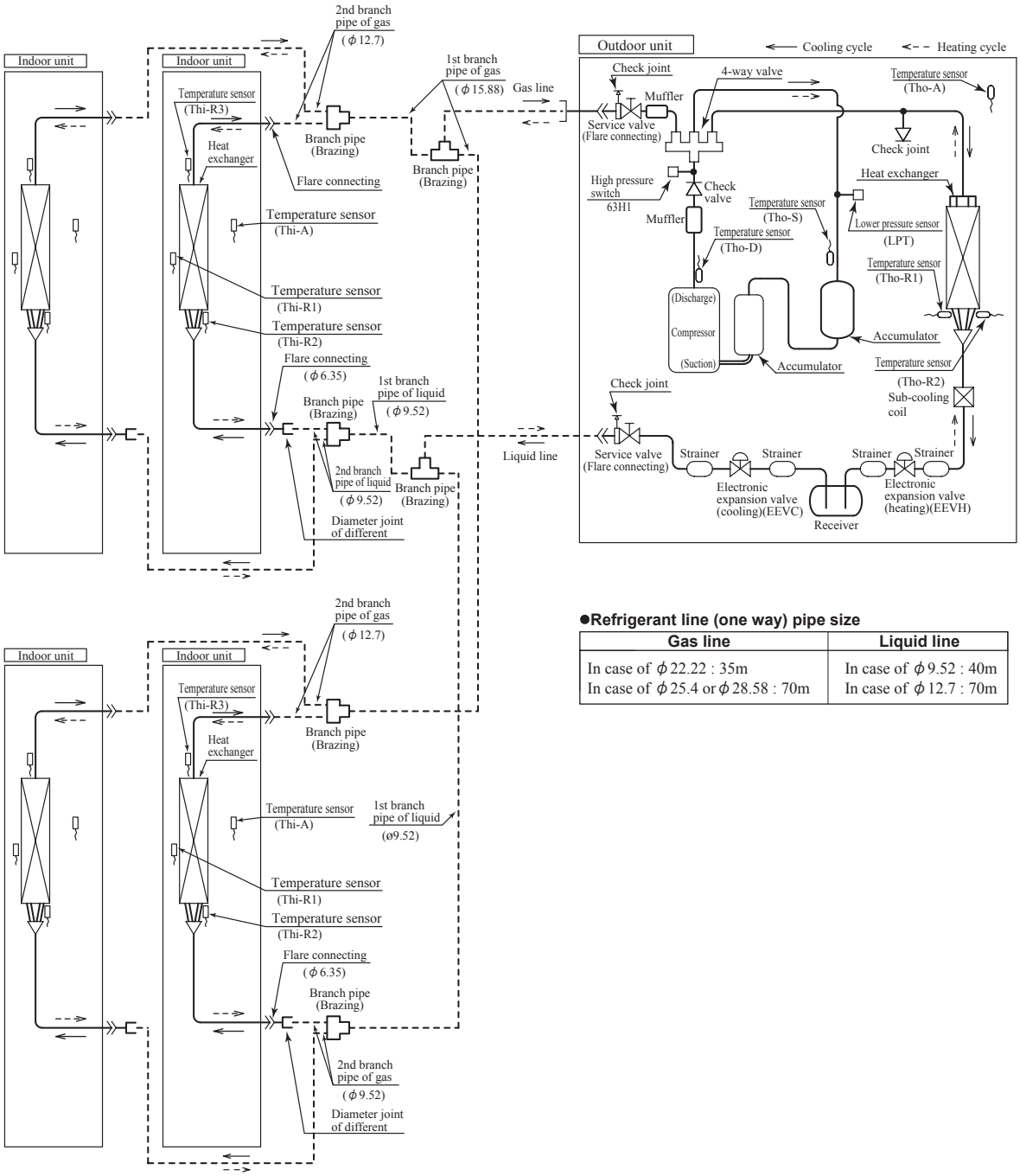
(2) Triple type

Model 140



(3) Double twin type

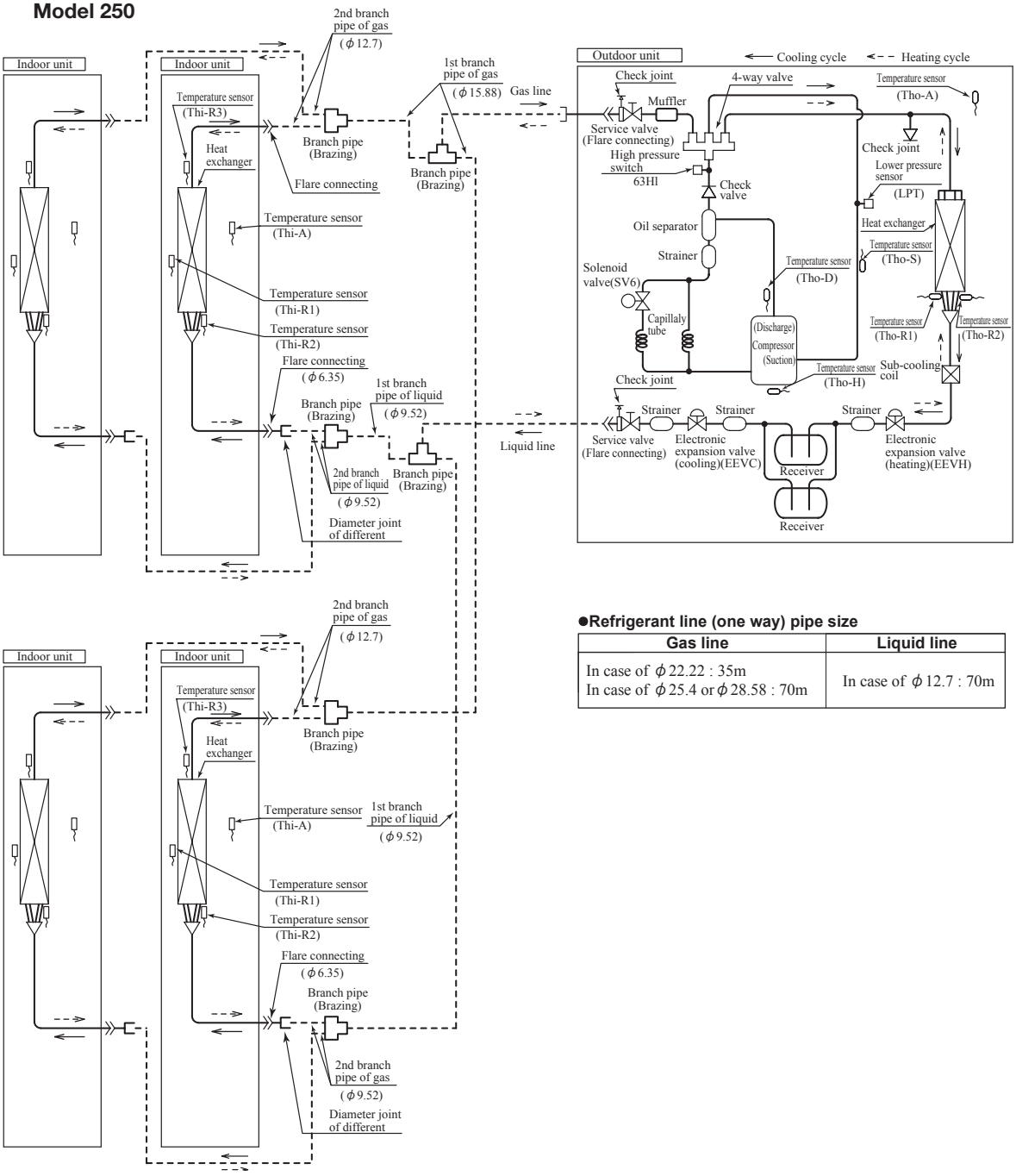
Model 200



●**Refrigerant line (one way) pipe size**

Gas line	Liquid line
In case of φ22.22 : 35m In case of φ25.4 or φ28.58 : 70m	In case of φ9.52 : 40m In case of φ12.7 : 70m

Model 250



●**Refrigerant line (one way) pipe size**

Gas line	Liquid line
In case of φ22.22 : 35m In case of φ25.4 or φ28.58 : 70m	In case of φ12.7 : 70m

Preset point of the protective devices

Parts name	Mark	Equipped unit	FDT100, 125, 140 model	FDT200, 250 model
Temperature sensor (for protection over-loading in heating)	Thi-R	Indoor unit	OFF 63˚C ON 56˚C	
Temperature sensor (for frost prevention)	Thi-R		OFF 1.0˚C ON 10˚C	
Temperature sensor (for protection high pressure in cooling.)	Tho-R	Outdoor unit	OFF 51˚C ON 65˚C	
Temperature sensor (for detecting dis-charge pipe temp.)	Tho-D	Outdoor unit	OFF 115˚C ON 85˚C	OFF 135˚C ON 90˚C
High pressure switch (for protection)	63H1	Outdoor unit	OFF 4.15MPa ON 3.15MPa	
Low pressure sensor (for protection)	LPT	Outdoor unit	OFF 0.227MPa ON 0.079MPa	

2.7 RANGE OF USAGE & LIMITATIONS

Operating temperature range		See next page.
		When used below -5˚C, install a snow hood.
Recommendable area to install		Considering to get sufficient heating capacity, the area where the averaged lowest ambient air temperature in day time during winter is above 0˚C, and it has no accumulation of snow.
Installation site		The limitations of installation space are shown in the page for exterior dimensions. Install the indoor unit at least 2.5m higher than the floor surface.
Temperature and humidity conditions surrounding the indoor unit in the ceiling (Note 2)		Dew point temperature : 28˚C or less, relative hummdity : 80% or less
Limitations on unit and piping installation		See pages 293 and 294.
Compressor ON-OFF cycling	Cycle time	7 minutes or more (from OFF to OFF) or (from ON to ON)
	Stop time	3 minutes or more
Power source	Voltage range	Rating ±10%
	Voltage drop at start-up	Min.85% of rating
	Phase-to-phase umbalance	3% or less

Note 1. Do not install the unit in places which :
1) Flammable gas may leak.
2) Carbon fiber, metal particles, powder, etc. are floating.
3) Cosmetic or special sprays are used frequently.
4) Exposed to oil splashes or steam (e.g. kitchen and machine plant).
5) Exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent).
6) Exposed to ammonia substance (e.g. organic fertilizer).
7) Matters affecting devices, such as sulfuric gas, chlorine gas, acid, alkali, etc. may generate or accumulate.
8) Chimney smoke is hanging.
9) Sucking the exhaust gas from heat exchanger.
10) Adjacent to equipment generating electromagnetic waves or high frequency waves.
11) There is light beams that affect the receiving device of indoor unit in case of the wireless specification.
12) Snow falls heavily.
13) At an elevation of 1000 meters or higher.
14) On mobile machine (e.g. vehicle, ship, etc.)
15) Splashed with water to indoor unit (e.g. laundry room).
16) Indoor units of twin, triple and double-twin specifications separately in a room with partition.

Note 2. If ambient temperature and humidity exceed the above values, add polyurethane foam insulation on the outer plate (10mm or thicker) of indoor unit.

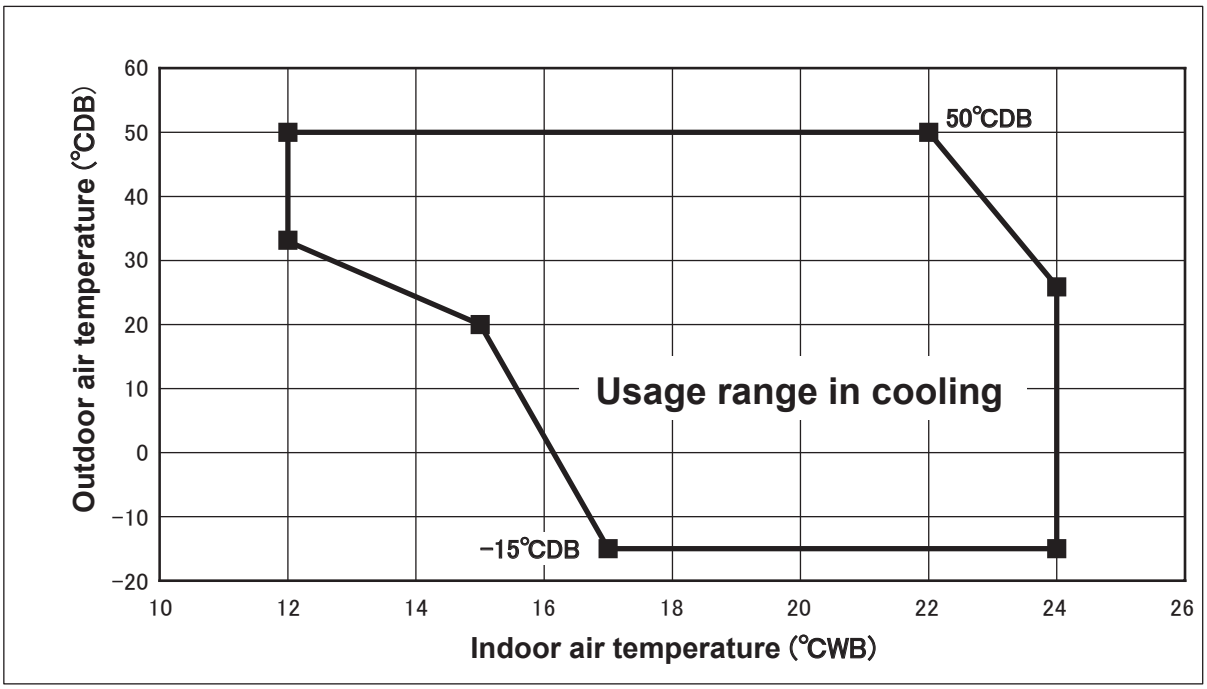
Note 3. Both gas and liquid pipes need to be coverd with 20mm or thicker heat insulation materials at the place where humidity exceeds 70%.

PCA001Z831

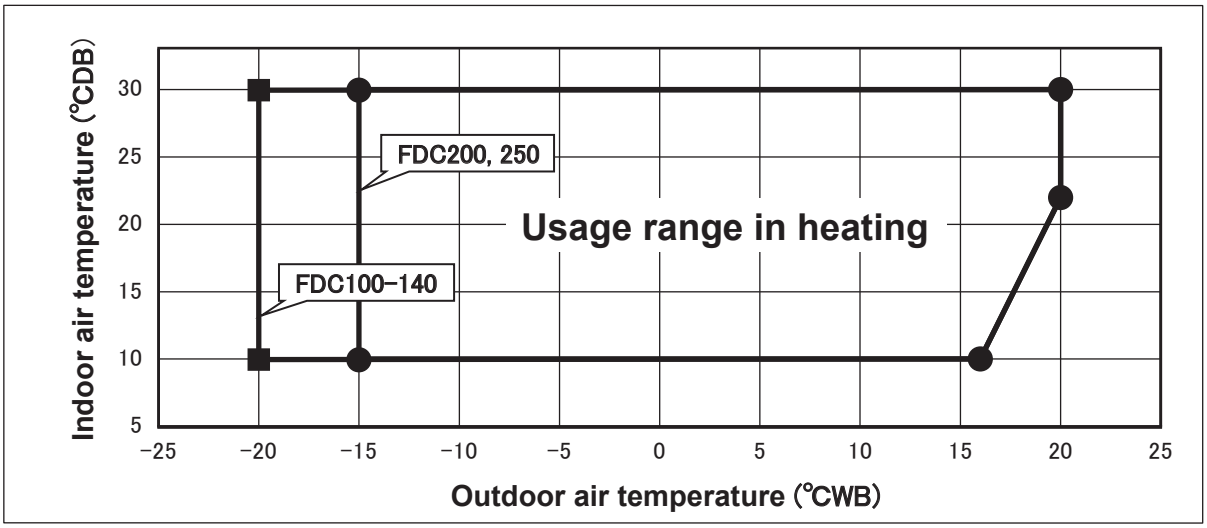
PCA001Z779

Operating temperature range

■ Cooling



■ Heating



Decline in cooling and heating capacity or operation stop may occur when the outdoor unit is installed in places where natural wind can increase or decrease its design air flow rate.

"CAUTION" Cooling operation under low outdoor air temperature conditions

PAC models can be operated in cooling mode at low outdoor air temperature condition within above temperature range. However in case of severely low temperature conditions if the following precaution is not observed, it may not be operated in spite of operable temperature range mentioned above and cooling capacity may not be established under certain conditions.

[Precaution]

In case of severely low temperature condition

1) Install the outdoor unit at the place where strong wind cannot blow directly into the outdoor unit.
2) If there is no installation place where can prevent strong wind from directly blowing into the outdoor unit, mount the flex flow adapter (prepared as optional part) or like such devices onto the outdoor unit in order to divert the strong wind.

[Reason]

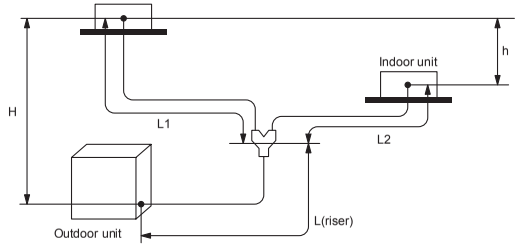
Under the low outdoor air temperature conditions of -5℃ or lower, the outdoor fan is controlled at lower or lowest speed by outdoor fan control, but if strong wind directly blow into the outdoor unit, the outdoor heat exchanger temperature will drop more.

This makes high and low pressures to drop as well. This low pressure drop makes the indoor heat exchanger temperature to drop and will activate anti-frost control at indoor heat exchanger at frequent intervals, that cooling operation may not be established for any given time.

Limitation on unit and piping installation - twin,Double twin.

Descriptions	Model for outdoor units			Dimensional limitations	Marks appearing in the drawing		
					Single type	Twin type	Double twin type
One-way pipe length	FDC100・125			≦ 50m	L	L+L1+L2	
	FDC200	Liquid piping	ϕ9.52	≦ 40m		L+L1 L+L2	L+La+L1 L+La+L2 L+Lb+L3 L+Lb+L4
			ϕ12.7	40m≦, ≦70m			
	FDC250		ϕ12.7	≦ 70m			
	FDC200・250	Gas piping	ϕ22.22	≦ 35m			
			ϕ25.4 or ϕ28.58	35m≦, ≦70m			
Main pipe length	FDC100・125			≦ 50m		L	
	FDC200	Liquid piping	ϕ9.52	≦ 40m			L
			ϕ12.7	40m≦, ≦70m			
	FDC250		ϕ12.7	≦ 70m			
	FDC200・250	Gas piping	ϕ22.22	≦ 35m			
			ϕ25.4 or ϕ28.58	35m≦, ≦70m			
One-way pipe length after the first branching point	FDC100・125			≦ 30m		L1, L2	
	FDC200・250						La+L1, La+L2, Lb+L3, Lb+L4
Difference of pipe length after the first branching point				≦ 10m		L1-L2 L2-L1	L1-L2, L2-L1, L3-L4, L4-L3 (L1+La)-(L3+Lb), (L1+La)-(L4+Lb) (L2+La)-(L3+Lb), (L2+La)-(L4+Lb)
Total pipe length after the second branching point				≦ 15m			L1+L2, L3+L4
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher		FDC100・125	≦ 30m, (≦ 50m)＊	H	H	H
			FDC200・250	≦ 30m			
	When the outdoor unit is positioned lower		FDC100 - 250	≦ 15m			
Elevation difference among indoor units				≦0.5m		h	h1, h2, h3, h4, h5, h6

Twin type



Twin type

Model for outdoor units	Branch piping set(option)
FDC100・125	DIS-WA1G

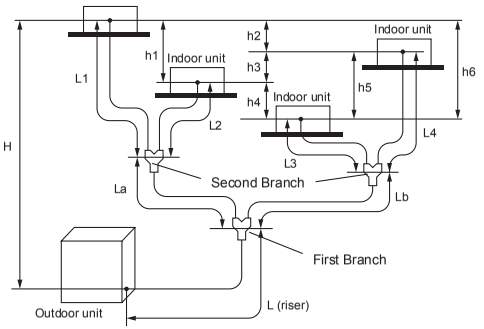
(1) A riser pipe must be part of the main.
A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.

(2) Reduce refrigerant amount by according to table below from factory charge when refrigerant piping is shorter than 3m.

Model for outdoor units	Refrigerant to be reduced
FDC100・125 ・200・250	-1.0kg

(3) In case of the outdoor unit is positioned higher, dimensional limitation change from 30m to 50m by changing SW5-2 of outdoor unit control PCB to ON. (＊mark)

Double twin type



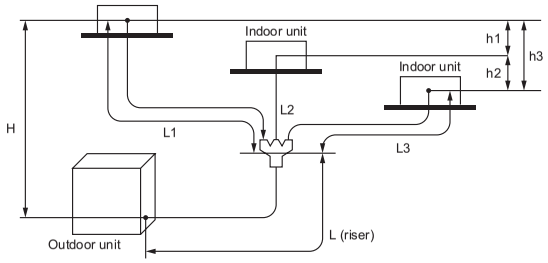
Double twin type

Model for outdoor units	Branch piping set(option)	
	First branch	Second branch
FDC200・250	DIS-WB1G	DIS-WA1G×2

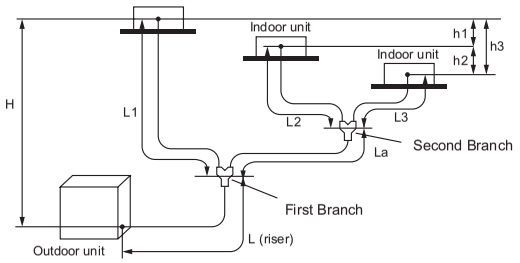
Limitation on unit and piping installation - triple.

Triple type (In case of FDC140)	One-way pipe length difference from the first branching point to the indoor unit		Marks appearing in the drawing	
			< 3m	≧ 3m
Descriptions	Model for outdoor units	Dimensional limitations	Triple type A	Triple type B
One-way pipe length	FDC140	≦ 50m	L+L1+L2+L3	L+La+L1+L2+L3 ※ 1
Main pipe length	FDC140	≦ 50m	L	L
Piping length between the first branching point and the second branching point		≦ 5m		La
One-way pipe length between the first branching point and indoor units		≦ 30m	L1, L2, L3	L1 ※ 1
One-way pipe length from the first branching point to indoor units through the second branching point		≦ 27m		La+L2, La+L3 ※ 1
Piping length difference from the first branching point to indoor unit		< 3m	| L1-L2 |, | L1-L3 |, | L2-L3 |	
		3m ≦ , ≦ 10m		L1-(La+L2), L1-(La+L3) ※ 1
One-way pipe length difference from the second branching point to indoor unit		≦ 10m		L2-L3, L3-L2
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher	≦ 30m, (50m) *	H	H
	When the outdoor unit is positioned lower	≦ 15m		
Elevation difference among indoor units		≦ 0.5m	h1, h2, h3	h1, h2, h3

Triple type A



Triple type B



※ 1 Install the indoor units so that L+L1 becomes the longest one-way pipe. Keep the pipe length difference between L1 and (La+L2) or (La+L3) within 10m.

(1) A riser pipe must be part of the main.
A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.
(2) Reduce refrigerant amount by 1.0kg from the factory charge when refrigerant piping is shorter than 3m.
(3) In case of the outdoor unit is positioned higher, dimensional limitation change from 30m to 50m by changing SW5-2 of outdoor unit control PCB to ON. (*mark)

Triple type

Model for outdoor units	Branch piping set(option)		
	Type A	Type B	
	Branch pipe	First branch	Second branch
FDC140	DIS-TA1G	DIS-WA1G	DIS-WA1G

2.8 SELECTION CHART

Correct the cooling and heating capacity in accordance with the operating conditions. The net cooling and heating capacity can be obtained in the following way.

Net capacity = Capacity shown in the capacity tables (2.8.1) × Correction factors shown in the table (2.8.2) (2.8.3) (2.8.4).

Caution: In case that the cooling operation during low outdoor air temperature below -5°C is expected, install the outdoor unit where it is not influenced by natural wind. Otherwise protection control by low pressure will be activated much more frequently and it will cause insufficient capacity or breakdown of the compressor in worst case.

2.8.1 Capacity tables

(1) Twin type

Model FDT100VNAPVH Indoor unit FDT50VH (2 units) Outdoor unit FDC100VNA

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃CDB		21 ℃CDB		23 ℃CDB		26 ℃CDB		27 ℃CDB		28 ℃CDB		31 ℃CDB		33 ℃CDB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					8.12	7.88	8.59	8.42	8.82	8.55	9.07	8.42	9.56	9.00	10.06	8.71
13					8.50	7.98	9.00	8.77	9.26	8.64	9.52	8.51	10.06	9.08	10.60	8.78
15					8.88	8.08	9.42	8.87	9.69	8.73	9.98	8.60	10.56	9.16	11.14	8.85
17					9.26	8.18	9.84	8.96	10.12	8.82	10.43	8.69	11.05	9.24	11.67	8.91
19					9.46	8.24	10.05	9.01	10.34	8.87	10.65	8.73	11.29	9.28	11.92	8.95
21					9.65	8.29	10.25	9.06	10.56	8.92	10.88	8.78	11.52	9.32	12.16	8.98
23					9.65	8.29	10.28	9.07	10.59	8.93	10.91	8.78	11.56	9.32	12.21	8.99
25			8.93	8.64	9.64	8.29	10.31	9.08	10.62	8.93	10.95	8.79	11.61	9.33	12.27	8.99
27			8.86	8.62	9.64	8.29	10.34	9.08	10.65	8.94	10.96	8.79	11.57	9.32		
29			8.80	8.60	9.50	8.25	10.17	9.04	10.49	8.91	10.81	8.76	11.45	9.30		
31			8.73	8.56	9.35	8.21	9.99	9.00	10.32	8.87	10.66	8.73	11.32	9.28		
33	8.22	7.91	8.58	8.41	9.21	8.17	9.82	8.96	10.16	8.83	10.51	8.70	11.19	9.26		
35	8.05	7.85	8.44	8.27	9.06	8.13	9.64	8.92	10.00	8.80	10.36	8.67	11.07	9.24		
37	7.92	7.76	8.30	8.13	8.91	8.09	9.46	8.88	9.79	8.75	10.13	8.63	10.80	9.20		
39	7.78	7.62	8.16	8.00	8.75	8.04	9.28	8.83	9.59	8.71	9.90	8.58	10.53	9.15		
41	7.64	7.49	8.02	7.86	8.60	8.00	9.09	8.79	9.38	8.67	9.68	8.54	10.26	9.11		
43	7.50	7.35	7.88	7.72	8.45	7.96	8.91	8.73	9.18	8.62	9.45	8.49	9.99	9.07		
46	7.33	7.18	7.67	7.52	8.22	7.90	8.58	8.41	8.83	8.55	9.07	8.42	9.57	9.00		
50	7.09	6.95	7.39	7.24	7.91	7.75	8.19	8.03	8.35	8.18	8.51	8.32	8.83	8.65		

Heating mode:HC (kW)

Outdoor air temp.		Indoor air temperature ℃CDB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20	6.82	6.79	6.77	6.75	6.72
-17.7	-18	7.16	7.14	7.10	7.08	7.04
-15.7	-16	7.50	7.46	7.44	7.40	7.37
-13.5	-14	7.86	7.83	7.79	7.76	7.72
-11.5	-12	8.23	8.19	8.15	8.12	8.08
-9.5	-10	8.58	8.55	8.50	8.47	8.42
-7.5	-8	8.93	8.89	8.85	8.80	8.75
-5.5	-6	9.05	9.00	8.97	8.91	8.86
-3.0	-4	9.17	9.12	9.07	9.03	8.97
-1.0	-2	9.29	9.23	9.19	9.13	9.07
1.0	0	9.40	9.34	9.29	9.23	9.18
2.0	1	9.45	9.39	9.34	9.28	9.22
3.0	2	9.82	9.77	9.71	9.67	9.63
5.0	4	10.21	10.15	10.09	10.08	10.07
7.0	6	11.33	11.27	11.20	11.22	11.23
9.0	8	11.78	11.71	11.64	11.62	11.59
11.5	10	12.23	12.16	12.09	12.02	11.94
13.5	12	12.91	12.83	12.75	12.65	12.60
15.5	14	13.59	13.50	13.42	13.29	13.26
16.5	16	13.93	13.84	13.75	13.61	13.59

PJF000Z587

Model FDT100VSAPVH Indoor unit FDT50VH (2 units) Outdoor unit FDC100VSA

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃CDB		21 ℃CDB		23 ℃CDB		26 ℃CDB		27 ℃CDB		28 ℃CDB		31 ℃CDB		33 ℃CDB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					8.12	7.88	8.59	8.42	8.82	8.55	9.07	8.42	9.56	9.00	10.06	8.71
13					8.50	7.98	9.00	8.77	9.26	8.64	9.52	8.51	10.06	9.08	10.60	8.78
15					8.88	8.08	9.42	8.87	9.69	8.73	9.98	8.60	10.56	9.16	11.14	8.85
17					9.26	8.18	9.84	8.96	10.12	8.82	10.43	8.69	11.05	9.24	11.67	8.91
19					9.46	8.24	10.05	9.01	10.34	8.87	10.65	8.73	11.29	9.28	11.92	8.95
21					9.65	8.29	10.25	9.06	10.56	8.92	10.88	8.78	11.52	9.32	12.16	8.98
23					9.65	8.29	10.28	9.07	10.59	8.93	10.91	8.78	11.56	9.32	12.21	8.99
25			8.93	8.64	9.64	8.29	10.31	9.08	10.62	8.93	10.95	8.79	11.61	9.33	12.27	8.99
27			8.86	8.62	9.64	8.29	10.34	9.08	10.65	8.94	10.96	8.79	11.57	9.32		
29			8.80	8.60	9.50	8.25	10.17	9.04	10.49	8.91	10.81	8.76	11.45	9.30		
31			8.73	8.56	9.35	8.21	9.99	9.00	10.32	8.87	10.66	8.73	11.32	9.28		
33	8.22	7.91	8.58	8.41	9.21	8.17	9.82	8.96	10.16	8.83	10.51	8.70	11.19	9.26		
35	8.05	7.85	8.44	8.27	9.06	8.13	9.64	8.92	10.00	8.80	10.36	8.67	11.07	9.24		
37	7.92	7.76	8.30	8.13	8.91	8.09	9.46	8.88	9.79	8.75	10.13	8.63	10.80	9.20		
39	7.78	7.62	8.16	8.00	8.75	8.04	9.28	8.83	9.59	8.71	9.90	8.58	10.53	9.15		
41	7.64	7.49	8.02	7.86	8.60	8.00	9.09	8.79	9.38	8.67	9.68	8.54	10.26	9.11		
43	7.50	7.35	7.88	7.72	8.45	7.96	8.91	8.73	9.18	8.62	9.45	8.49	9.99	9.07		
46	7.33	7.18	7.67	7.52	8.22	7.90	8.58	8.41	8.83	8.55	9.07	8.42	9.57	9.00		
50	7.09	6.95	7.39	7.24	7.91	7.75	8.19	8.03	8.35	8.18	8.51	8.32	8.83	8.65		

Heating mode:HC (kW)

Outdoor air temp.		Indoor air temperature ℃CDB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20	6.82	6.79	6.77	6.75	6.72
-17.7	-18	7.16	7.14	7.10	7.08	7.04
-15.7	-16	7.50	7.46	7.44	7.40	7.37
-13.5	-14	7.86	7.83	7.79	7.76	7.72
-11.5	-12	8.23	8.19	8.15	8.12	8.08
-9.5	-10	8.58	8.55	8.50	8.47	8.42
-7.5	-8	8.93	8.89	8.85	8.80	8.75
-5.5	-6	9.05	9.00	8.97	8.91	8.86
-3.0	-4	9.17	9.12	9.07	9.03	8.97
-1.0	-2	9.29	9.23	9.19	9.13	9.07
1.0	0	9.40	9.34	9.29	9.23	9.18
2.0	1	9.45	9.39	9.34	9.28	9.22
3.0	2	9.82	9.77	9.71	9.67	9.63
5.0	4	10.21	10.15	10.09	10.08	10.07
7.0	6	11.33	11.27	11.20	11.22	11.23
9.0	8	11.78	11.71	11.64	11.62	11.59
11.5	10	12.23	12.16	12.09	12.02	11.94
13.5	12	12.91	12.83	12.75	12.65	12.60
15.5	14	13.59	13.50	13.42	13.29	13.26
16.5	16	13.93	13.84	13.75	13.61	13.59

PJF000Z587

Notes (1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed. (Cooling only)
In the heating mode in which the outside air temperature is 0℃DB or less, the compressor operates at maximum frequency.
(2) Capacities are based on the following conditions. Corresponding refrigerant piping length : 7.5m Level difference of Zero.
(3) Symbols are as follows
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)
HC : Heating capacity (kW)

Model FDT125VNAPVH Indoor unit FDT60VH (2 units) Outdoor unit FDC125VNA

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃DB		21 ℃DB		23 ℃DB		26 ℃DB		27 ℃DB		28 ℃DB		31 ℃DB		33 ℃DB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					10.15	9.95	10.74	10.53	11.03	10.81	11.34	11.04	11.96	11.72	12.57	11.54
13					10.63	10.40	11.26	11.03	11.57	11.30	11.91	11.19	12.58	11.95	13.25	11.68
15					11.10	10.56	11.78	11.54	12.11	11.46	12.47	11.34	13.20	12.10	13.92	11.82
17					11.58	10.73	12.29	11.74	12.65	11.62	13.04	11.50	13.82	12.25	14.59	11.97
19					11.82	10.81	12.56	11.82	12.92	11.70	13.32	11.58	14.11	12.33	14.90	12.04
21					12.06	10.89	12.82	11.90	13.19	11.78	13.60	11.66	14.40	12.40	15.20	12.10
23					12.06	10.89	12.85	11.91	13.23	11.79	13.64	11.67	14.45	12.41	15.27	12.12
25			11.16	10.94	12.06	10.89	12.89	11.92	13.27	11.80	13.68	11.68	14.51	12.43	15.34	12.13
27			11.08	10.86	12.05	10.89	12.92	11.93	13.31	11.81	13.69	11.68	14.47	12.42		
29			11.00	10.78	11.87	10.83	12.71	11.87	13.11	11.75	13.51	11.63	14.31	12.38		
31			10.92	10.70	11.69	10.76	12.49	11.80	12.90	11.69	13.32	11.58	14.15	12.34		
33	10.27	10.06	10.72	10.51	11.51	10.70	12.27	11.73	12.70	11.63	13.13	11.53	13.99	12.30		
35	10.07	9.87	10.55	10.34	11.33	10.64	12.06	11.66	12.50	11.57	12.94	11.47	13.83	12.26		
37	9.90	9.70	10.38	10.17	11.13	10.57	11.83	11.59	12.24	11.50	12.66	11.40	13.50	12.17		
39	9.72	9.53	10.20	10.00	10.94	10.51	11.60	11.37	11.99	11.42	12.38	11.32	13.16	12.09		
41	9.55	9.36	10.02	9.82	10.75	10.44	11.37	11.14	11.73	11.35	12.09	11.24	12.82	12.01		
43	9.38	9.19	9.85	9.65	10.56	10.35	11.14	10.92	11.47	11.24	11.81	11.16	12.48	11.93		
46	9.21	9.03	9.53	9.34	10.28	10.07	10.88	10.66	11.12	10.90	11.28	11.02	11.96	11.72		
50	7.43	7.28	7.63	7.48	8.25	8.09	8.67	8.50	8.78	8.60	8.80	8.62	9.05	8.87		

Heating mode:HC (kW)

Outdoor air temp.		Indoor air temperature ℃DB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20	7.77	7.73	7.70	7.67	7.65
-17.7	-18	8.16	8.13	8.11	8.06	8.03
-15.7	-16	8.57	8.53	8.50	8.46	8.42
-13.5	-14	9.02	8.98	8.94	8.90	8.86
-11.5	-12	9.46	9.41	9.37	9.33	9.28
-9.5	-10	9.90	9.84	9.80	9.76	9.70
-7.5	-8	10.32	10.28	10.23	10.17	10.12
-5.5	-6	10.50	10.45	10.39	10.33	10.28
-3.0	-4	10.66	10.61	10.55	10.49	10.43
-1.0	-2	10.82	10.77	10.71	10.65	10.58
1.0	0	10.99	10.93	10.87	10.80	10.73
2.0	1	11.07	11.01	10.94	10.88	10.81
3.0	2	11.92	11.85	11.78	11.73	11.68
5.0	4	12.76	12.69	12.61	12.60	12.58
7.0	6	14.16	14.08	14.00	14.02	14.04
9.0	8	14.72	14.64	14.56	14.52	14.49
11.5	10	15.28	15.20	15.11	15.02	14.93
13.5	12	16.13	16.04	15.94	15.82	15.75
15.5	14	16.98	16.88	16.77	16.62	16.58
16.5	16	17.41	17.30	17.19	17.02	16.99

PJF000Z587

Model FDT125VSAPVH Indoor unit FDT60VH (2 units) Outdoor unit FDC125VSA

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃DB		21 ℃DB		23 ℃DB		26 ℃DB		27 ℃DB		28 ℃DB		31 ℃DB		33 ℃DB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					10.15	9.95	10.74	10.53	11.03	10.81	11.34	11.04	11.96	11.72	12.57	11.54
13					10.63	10.40	11.26	11.03	11.57	11.30	11.91	11.19	12.58	11.95	13.25	11.68
15					11.10	10.56	11.78	11.54	12.11	11.46	12.47	11.34	13.20	12.10	13.92	11.82
17					11.58	10.73	12.29	11.74	12.65	11.62	13.04	11.50	13.82	12.25	14.59	11.97
19					11.82	10.81	12.56	11.82	12.92	11.70	13.32	11.58	14.11	12.33	14.90	12.04
21					12.06	10.89	12.82	11.90	13.19	11.78	13.60	11.66	14.40	12.40	15.20	12.10
23					12.06	10.89	12.85	11.91	13.23	11.79	13.64	11.67	14.45	12.41	15.27	12.12
25			11.16	10.94	12.06	10.89	12.89	11.92	13.27	11.80	13.68	11.68	14.51	12.43	15.34	12.13
27			11.08	10.86	12.05	10.89	12.92	11.93	13.31	11.81	13.69	11.68	14.47	12.42		
29			11.00	10.78	11.87	10.83	12.71	11.87	13.11	11.75	13.51	11.63	14.31	12.38		
31			10.92	10.70	11.69	10.76	12.49	11.80	12.90	11.69	13.32	11.58	14.15	12.34		
33	10.27	10.06	10.72	10.51	11.51	10.70	12.27	11.73	12.70	11.63	13.13	11.53	13.99	12.30		
35	10.07	9.87	10.55	10.34	11.33	10.64	12.06	11.66	12.50	11.57	12.94	11.47	13.83	12.26		
37	9.90	9.70	10.38	10.17	11.13	10.57	11.83	11.59	12.24	11.50	12.66	11.40	13.50	12.17		
39	9.72	9.53	10.20	10.00	10.94	10.51	11.60	11.37	11.99	11.42	12.38	11.32	13.16	12.09		
41	9.55	9.36	10.02	9.82	10.75	10.44	11.37	11.14	11.73	11.35	12.09	11.24	12.82	12.01		
43	9.38	9.19	9.85	9.65	10.56	10.35	11.14	10.92	11.47	11.24	11.81	11.16	12.48	11.93		
46	9.21	9.03	9.53	9.34	10.28	10.07	10.88	10.66	11.12	10.90	11.28	11.02	11.96	11.72		
50	7.43	7.28	7.63	7.48	8.25	8.09	8.67	8.50	8.78	8.60	8.80	8.62	9.05	8.87		

Heating mode:HC (kW)

Outdoor air temp.		Indoor air temperature ℃DB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20	7.77	7.73	7.70	7.67	7.65
-17.7	-18	8.16	8.13	8.11	8.06	8.03
-15.7	-16	8.57	8.53	8.50	8.46	8.42
-13.5	-14	9.02	8.98	8.94	8.90	8.86
-11.5	-12	9.46	9.41	9.37	9.33	9.28
-9.5	-10	9.90	9.84	9.80	9.76	9.70
-7.5	-8	10.32	10.28	10.23	10.17	10.12
-5.5	-6	10.50	10.45	10.39	10.33	10.28
-3.0	-4	10.66	10.61	10.55	10.49	10.43
-1.0	-2	10.82	10.77	10.71	10.65	10.58
1.0	0	10.99	10.93	10.87	10.80	10.73
2.0	1	11.07	11.01	10.94	10.88	10.81
3.0	2	11.92	11.85	11.78	11.73	11.68
5.0	4	12.76	12.69	12.61	12.60	12.58
7.0	6	14.16	14.08	14.00	14.02	14.04
9.0	8	14.72	14.64	14.56	14.52	14.49
11.5	10	15.28	15.20	15.11	15.02	14.93
13.5	12	16.13	16.04	15.94	15.82	15.75
15.5	14	16.98	16.88	16.77	16.62	16.58
16.5	16	17.41	17.30	17.19	17.02	16.99

PJF000Z587

Notes (1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed. (Cooling only)
In the heating mode in which the outside air temperature is 0℃DB or less, the compressor operates at maximum frequency.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length : 7.5m
Level difference of Zero.
(3) Symbols are as follows
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)
HC : Heating capacity (kW)

(2) Triple type

Model FDT140VNATVH Indoor unit FDT50VH (3 units) Outdoor unit FDC140VNA

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃CDB		21 ℃CDB		23 ℃CDB		26 ℃CDB		27 ℃CDB		28 ℃CDB		31 ℃CDB		33 ℃CDB	
	12 ℃CWB		14 ℃CWB		16 ℃CWB		18 ℃CWB		19 ℃CWB		20 ℃CWB		22 ℃CWB		24 ℃CWB	
℃CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					11.05	10.82	11.68	11.44	12.00	11.76	12.34	12.09	13.01	12.75	13.68	12.90
13					11.56	11.33	12.25	12.00	12.59	12.34	12.95	12.51	13.69	13.40	14.42	12.99
15					12.07	11.79	12.81	12.56	13.18	12.82	13.57	12.63	14.36	13.50	15.14	13.07
17					12.59	11.92	13.38	13.11	13.77	12.94	14.19	12.74	15.04	13.61	15.87	13.16
19					12.86	11.99	13.66	13.19	14.07	13.00	14.49	12.80	15.35	13.66	16.20	13.20
21					13.12	12.06	13.95	13.26	14.36	13.06	14.79	12.86	15.66	13.71	16.53	13.25
23					13.12	12.06	13.99	13.27	14.40	13.07	14.84	12.87	15.73	13.72	16.61	13.26
25			12.14	11.90	13.11	12.06	14.02	13.27	14.44	13.08	14.89	12.88	15.79	13.73	16.69	13.27
27			12.06	11.81	13.11	12.06	14.06	13.28	14.48	13.09	14.90	12.88	15.74	13.72		
29			11.97	11.73	12.91	12.01	13.82	13.23	14.26	13.04	14.70	12.84	15.56	13.69		
31			11.88	11.64	12.72	11.96	13.59	13.18	14.04	12.99	14.49	12.80	15.40	13.67		
33	11.18	10.96	11.67	11.43	12.52	11.90	13.36	13.09	13.82	12.95	14.29	12.76	15.22	13.64		
35	10.96	10.74	11.48	11.25	12.32	11.85	13.11	12.85	13.60	12.90	14.09	12.72	15.05	13.61		
37	10.76	10.55	11.29	11.06	12.11	11.80	12.87	12.61	13.32	12.84	13.77	12.67	14.69	13.56		
39	10.58	10.37	11.10	10.88	11.91	11.67	12.62	12.37	13.05	12.79	13.46	12.61	14.32	13.50		
41	10.39	10.19	10.91	10.69	11.70	11.46	12.37	12.12	12.76	12.51	13.16	12.55	13.95	13.44		
43	10.21	10.01	10.71	10.50	11.49	11.26	12.11	11.87	12.48	12.23	12.85	12.49	13.58	13.31		
46	10.03	9.82	10.47	10.26	11.13	10.91	11.73	11.49	12.10	11.86	12.27	12.02	13.01	12.75		
50	7.61	7.45	7.88	7.72	8.35	8.19	8.75	8.58	8.97	8.79	8.98	8.80	9.33	9.14		

Heating mode:HC (kW)

Outdoor air temp.		Indoor air temperature ℃CDB				
℃CDB	℃CWB	16	18	20	22	24
-19.8	-20	7.94	7.91	7.88	7.85	7.82
-17.7	-18	8.44	8.41	8.37	8.34	8.30
-15.7	-16	8.94	8.90	8.86	8.82	8.79
-13.5	-14	9.50	9.46	9.41	9.37	9.33
-11.5	-12	10.07	10.02	9.98	9.93	9.88
-9.5	-10	10.64	10.59	10.54	10.49	10.44
-7.5	-8	11.21	11.15	11.10	11.04	10.99
-5.5	-6	11.51	11.45	11.39	11.33	11.27
-3.0	-4	11.80	11.74	11.68	11.62	11.55
-1.0	-2	12.11	12.05	11.98	11.91	11.84
1.0	0	12.42	12.35	12.28	12.20	12.13
2.0	1	12.58	12.50	12.43	12.35	12.28
3.0	2	13.35	13.27	13.20	13.13	13.08
5.0	4	14.12	14.05	13.96	13.95	13.93
7.0	6	15.68	15.59	15.50	15.52	15.55
9.0	8	16.30	16.21	16.11	16.07	16.03
11.5	10	16.91	16.83	16.73	16.63	16.53
13.5	12	17.86	17.76	17.65	17.52	17.44
15.5	14	18.80	18.69	18.57	18.40	18.36
16.5	16	19.28	19.15	19.03	18.84	18.81

PJF000Z587

Model FDT140VSATVH Indoor unit FDT50VH (3 units) Outdoor unit FDC140VSA

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃CDB		21 ℃CDB		23 ℃CDB		26 ℃CDB		27 ℃CDB		28 ℃CDB		31 ℃CDB		33 ℃CDB	
	12 ℃CWB		14 ℃CWB		16 ℃CWB		18 ℃CWB		19 ℃CWB		20 ℃CWB		22 ℃CWB		24 ℃CWB	
℃CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					11.05	10.82	11.68	11.44	12.00	11.76	12.34	12.09	13.01	12.75	13.68	12.90
13					11.56	11.33	12.25	12.00	12.59	12.34	12.95	12.51	13.69	13.40	14.42	12.99
15					12.07	11.79	12.81	12.56	13.18	12.82	13.57	12.63	14.36	13.50	15.14	13.07
17					12.59	11.92	13.38	13.11	13.77	12.94	14.19	12.74	15.04	13.61	15.87	13.16
19					12.86	11.99	13.66	13.19	14.07	13.00	14.49	12.80	15.35	13.66	16.20	13.20
21					13.12	12.06	13.95	13.26	14.36	13.06	14.79	12.86	15.66	13.71	16.53	13.25
23					13.12	12.06	13.99	13.27	14.40	13.07	14.84	12.87	15.73	13.72	16.61	13.26
25			12.14	11.90	13.11	12.06	14.02	13.27	14.44	13.08	14.89	12.88	15.79	13.73	16.69	13.27
27			12.06	11.81	13.11	12.06	14.06	13.28	14.48	13.09	14.90	12.88	15.74	13.72		
29			11.97	11.73	12.91	12.01	13.82	13.23	14.26	13.04	14.70	12.84	15.56	13.69		
31			11.88	11.64	12.72	11.96	13.59	13.18	14.04	12.99	14.49	12.80	15.40	13.67		
33	11.18	10.96	11.67	11.43	12.52	11.90	13.36	13.09	13.82	12.95	14.29	12.76	15.22	13.64		
35	10.96	10.74	11.48	11.25	12.32	11.85	13.11	12.85	13.60	12.90	14.09	12.72	15.05	13.61		
37	10.76	10.55	11.29	11.06	12.11	11.80	12.87	12.61	13.32	12.84	13.77	12.67	14.69	13.56		
39	10.58	10.37	11.10	10.88	11.91	11.67	12.62	12.37	13.05	12.79	13.46	12.61	14.32	13.50		
41	10.39	10.19	10.91	10.69	11.70	11.46	12.37	12.12	12.76	12.51	13.16	12.55	13.95	13.44		
43	10.21	10.01	10.71	10.50	11.49	11.26	12.11	11.87	12.48	12.23	12.85	12.49	13.58	13.31		
46	10.03	9.82	10.47	10.26	11.13	10.91	11.73	11.49	12.10	11.86	12.27	12.02	13.01	12.75		
50	7.61	7.45	7.88	7.72	8.35	8.19	8.75	8.58	8.97	8.79	8.98	8.80	9.33	9.14		

Heating mode:HC (kW)

Outdoor air temp.		Indoor air temperature ℃CDB				
℃CDB	℃CWB	16	18	20	22	24
-19.8	-20	7.94	7.91	7.88	7.85	7.82
-17.7	-18	8.44	8.41	8.37	8.34	8.30
-15.7	-16	8.94	8.90	8.86	8.82	8.79
-13.5	-14	9.50	9.46	9.41	9.37	9.33
-11.5	-12	10.07	10.02	9.98	9.93	9.88
-9.5	-10	10.64	10.59	10.54	10.49	10.44
-7.5	-8	11.21	11.15	11.10	11.04	10.99
-5.5	-6	11.51	11.45	11.39	11.33	11.27
-3.0	-4	11.80	11.74	11.68	11.62	11.55
-1.0	-2	12.11	12.05	11.98	11.91	11.84
1.0	0	12.42	12.35	12.28	12.20	12.13
2.0	1	12.58	12.50	12.43	12.35	12.28
3.0	2	13.35	13.27	13.20	13.13	13.08
5.0	4	14.12	14.05	13.96	13.95	13.93
7.0	6	15.68	15.59	15.50	15.52	15.55
9.0	8	16.30	16.21	16.11	16.07	16.03
11.5	10	16.91	16.83	16.73	16.63	16.53
13.5	12	17.86	17.76	17.65	17.52	17.44
15.5	14	18.80	18.69	18.57	18.40	18.36
16.5	16	19.28	19.15	19.03	18.84	18.81

PJF000Z587

Notes (1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed. (Cooling only)
In the heating mode in which the outside air temperature is 0℃DB or less, the compressor operates at maximum frequency.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length : 7.5m
Level difference of Zero.
(3) Symbols are as follows
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)
HC : Heating capacity (kW)

(3) Double twin type

Model FDT200VSADVH Indoor unit FDT50VH (4 units) Outdoor unit FDC200VSA

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃DB		21 ℃DB		23 ℃DB		26 ℃DB		27 ℃DB		28 ℃DB		31 ℃DB		33 ℃DB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					19.36	16.59	20.45	18.11	20.99	17.81	21.67	17.53	23.02	18.63	24.37	17.96
13					19.46	16.62	20.57	18.14	21.13	17.84	21.78	17.56	23.09	18.64	24.40	17.97
15					19.55	16.64	20.69	18.17	21.26	17.87	21.90	17.58	23.16	18.65	24.43	17.97
17					19.56	16.65	20.77	18.19	21.37	17.90	21.99	17.60	23.23	18.66	24.47	17.98
19					19.64	16.67	20.84	18.21	21.48	17.92	22.09	17.62	23.30	18.68	24.51	17.98
21					19.34	16.59	20.50	18.12	21.11	17.84	21.72	17.54	22.92	18.61	24.13	17.93
23					19.04	16.50	20.16	18.04	20.74	17.76	21.35	17.47	22.55	18.55	23.76	17.88
25			17.82	17.28	18.89	16.46	19.99	18.00	20.56	17.72	21.16	17.43	22.37	18.52	23.57	17.86
27			17.68	17.23	18.74	16.42	19.82	17.96	20.38	17.68	21.25	17.45	22.13	18.48		
29			17.40	17.05	18.43	16.34	19.49	17.88	20.03	17.60	20.93	17.38	21.83	18.43		
31			17.11	16.77	18.11	16.25	19.15	17.81	19.69	17.53	20.60	17.32	21.52	18.38		
33	15.84	15.53	16.58	16.25	17.80	16.17	18.82	17.73	19.34	17.46	20.28	17.26	21.21	18.33		
35	15.73	15.42	16.37	16.05	17.49	16.08	18.49	17.65	19.00	17.38	19.95	17.19	20.91	18.28		
37	15.52	15.21	16.13	15.81	17.14	15.99	18.05	17.55	18.57	17.29	19.48	17.10	20.39	18.20		
39	15.31	15.00	15.89	15.57	16.78	15.90	17.61	17.26	18.13	17.20	19.00	17.01	19.87	18.12		
41	15.10	14.80	15.65	15.34	16.43	15.80	17.18	16.83	17.70	17.11	18.53	16.92	19.36	18.04		
43	14.89	14.59	15.41	15.10	16.07	15.71	16.74	16.41	17.26	16.92	18.05	16.83	18.84	17.96		
46	14.58	14.29	15.05	14.75	15.54	15.23	16.09	15.76	16.61	16.28	17.34	16.70	18.06	17.70		
50	11.25	11.02	11.78	11.54	12.39	12.14	12.68	12.42	12.88	12.62	13.08	12.82	13.28	13.01		

Heating mode:HC (kW)

Outdoor air temp.		Indoor air temperature ℃DB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20					
-17.7	-18					
-15.7	-16					
-13.5	-14	11.10	10.98	10.86	10.73	10.60
-11.5	-12	11.93	11.80	11.67	11.54	11.40
-9.5	-10	12.75	12.61	12.48	12.34	12.20
-7.5	-8	13.57	13.43	13.29	13.14	13.00
-5.5	-6	13.78	13.64	13.51	13.37	13.24
-3.0	-4	13.99	13.86	13.73	13.60	13.47
-1.0	-2	14.20	14.08	13.95	13.83	13.71
1.0	0	14.41	14.29	14.18	14.06	13.94
2.0	1	14.51	14.40	14.29	14.17	14.06
3.0	2	16.19	16.05	15.91	15.79	15.67
5.0	4	19.54	19.35	19.15	19.02	18.89
7.0	6	22.89	22.64	22.40	22.25	22.11
9.0	8	23.99	23.78	23.58	23.42	23.25
11.5	10	25.09	24.92	24.75	24.58	24.40
13.5	12	25.95	25.79	25.63	25.45	25.27
15.5	14	26.82	26.66	26.50	26.32	26.14
16.5	16	27.25	27.10	26.94	26.76	26.57

PJF000Z587

Model FDT250VSADVH Indoor unit FDT60VH (4 units) Outdoor unit FDC250VSA

Cooling mode (kW)

Outdoor air temp.	Indoor air temperature															
	18 ℃DB		21 ℃DB		23 ℃DB		26 ℃DB		27 ℃DB		28 ℃DB		31 ℃DB		33 ℃DB	
	12 ℃WB		14 ℃WB		16 ℃WB		18 ℃WB		19 ℃WB		20 ℃WB		22 ℃WB		24 ℃WB	
℃DB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					24.64	21.96	26.08	23.94	26.80	23.68	27.60	23.43	29.20	24.90	30.80	24.29
13					24.67	21.97	26.11	23.95	26.83	23.69	27.63	23.44	29.23	24.90	30.83	24.30
15					24.69	21.98	26.14	23.96	26.86	23.70	27.66	23.45	29.26	24.91	30.86	24.31
17					24.70	21.99	26.23	23.99	26.99	23.74	27.78	23.48	29.34	24.93	30.91	24.32
19					24.81	22.02	26.33	24.02	27.13	23.78	27.90	23.51	29.43	24.95	30.96	24.33
21					24.43	21.89	25.90	23.88	26.67	23.64	27.43	23.38	28.96	24.84	30.48	24.22
23					24.05	21.76	25.47	23.75	26.20	23.50	26.96	23.25	28.49	24.72	30.01	24.12
25			22.51	22.06	23.86	21.69	25.25	23.68	25.97	23.43	26.73	23.18	28.25	24.66	29.77	24.07
27			22.33	21.89	23.67	21.62	25.04	23.61	25.74	23.36	26.85	23.22	27.96	24.58		
29			21.97	21.53	23.27	21.49	24.61	23.48	25.30	23.24	26.44	23.10	27.57	24.49		
31			21.61	21.18	22.88	21.35	24.19	23.35	24.87	23.11	26.03	22.99	27.18	24.39		
33	20.01	19.61	20.94	20.52	22.49	21.22	23.77	23.22	24.44	22.98	25.62	22.87	26.80	24.30		
35	19.87	19.47	20.68	20.27	22.10	21.09	23.35	22.88	24.00	22.86	25.21	22.76	26.41	24.20		
37	19.61	19.22	20.42	20.01	21.78	20.98	22.94	22.48	23.56	22.73	24.66	22.61	25.76	24.04		
39	19.51	19.12	20.33	19.92	21.65	20.93	22.72	22.26	23.30	22.65	24.30	22.51	25.30	23.93		
41	20.09	19.68	20.57	20.16	21.47	20.87	22.44	22.00	22.98	22.52	23.88	22.40	24.77	23.81		
43	19.02	18.64	19.85	19.45	21.05	20.63	21.92	21.48	22.41	21.96	23.19	22.21	23.96	23.48		
46	17.16	16.81	17.71	17.36	18.29	17.93	18.93	18.56	19.55	19.16	20.41	20.00	21.26	20.84		
50	11.31	11.08	11.84	11.60	12.45	12.20	12.74	12.49	12.94	12.69	13.14	12.88	13.35	13.08		

Heating mode:HC (kW)

Outdoor air temp.		Indoor air temperature ℃DB				
℃DB	℃WB	16	18	20	22	24
-19.8	-20					
-17.7	-18					
-15.7	-16					
-13.5	-14	13.22	13.07	12.93	12.78	12.63
-11.5	-12	13.88	13.73	13.58	13.43	13.28
-9.5	-10	14.55	14.39	14.24	14.08	13.93
-7.5	-8	15.21	15.05	14.89	14.73	14.58
-5.5	-6	15.48	15.32	15.17	15.02	14.87
-3.0	-4	15.74	15.59	15.45	15.30	15.16
-1.0	-2	16.00	15.87	15.73	15.59	15.45
1.0	0	16.27	16.14	16.01	15.87	15.74
2.0	1	16.40	16.27	16.14	16.01	15.88
3.0	2	18.64	18.48	18.32	18.18	18.04
5.0	4	23.11	22.89	22.66	22.50	22.34
7.0	6	27.59	27.29	27.00	26.82	26.65
9.0	8	28.92	28.67	28.42	28.22	28.03
11.5	10	30.24	30.04	29.84	29.63	29.41
13.5	12	31.28	31.09	30.89	30.68	30.46
15.5	14	32.32	32.14	31.95	31.73	31.51
16.5	16	32.85	32.66	32.47	32.25	32.03

PJF000Z587

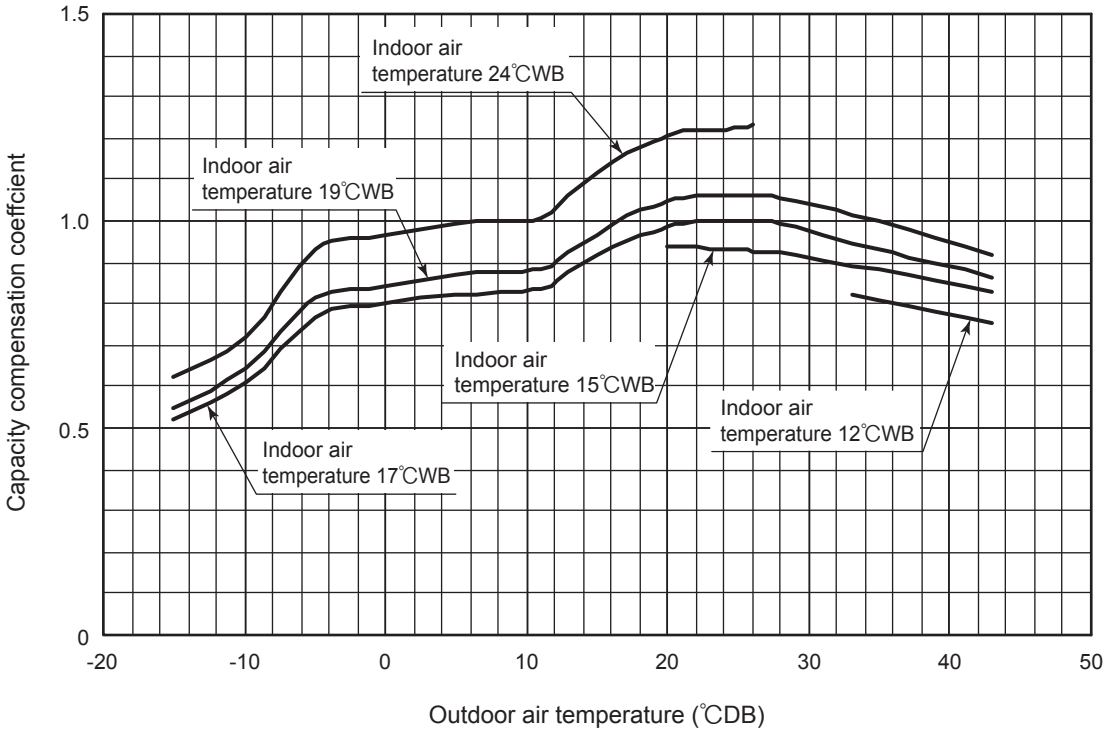
Notes (1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed. (Cooling only)
In the heating mode in which the outside air temperature is 0℃DB or less, the compressor operates at maximum frequency.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length : 7.5m
Level difference of Zero.
(3) Symbols are as follows
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)
HC : Heating capacity (kW)

[References data]

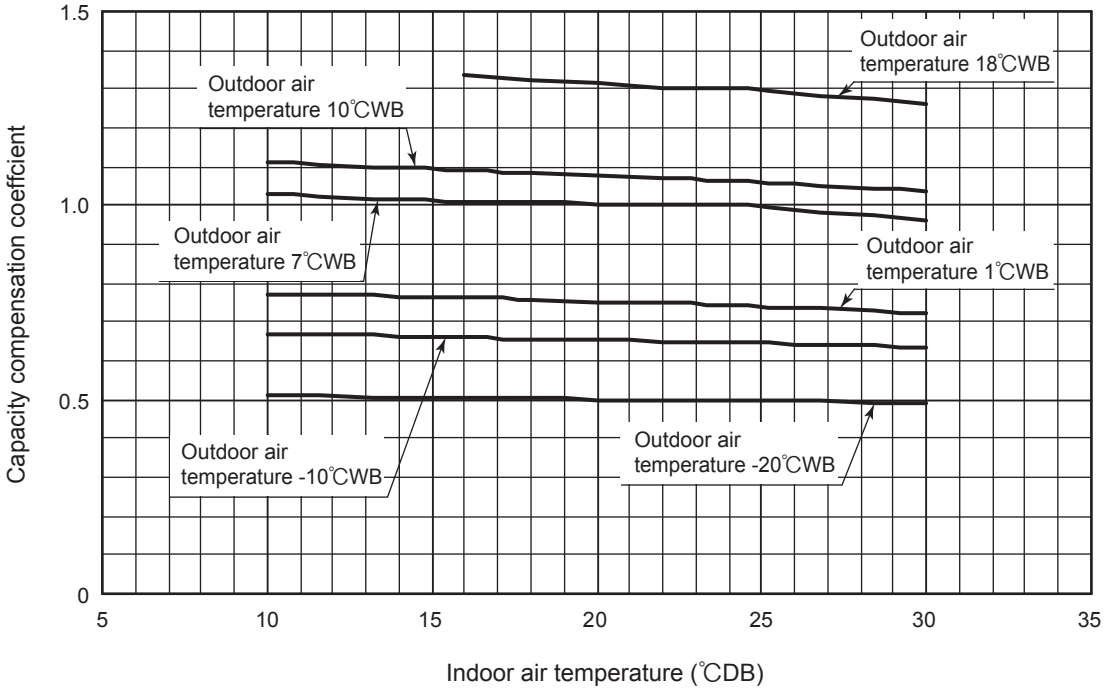
Capacity variation against outdoor and indoor temperature at rated capacity condition.t

(I) **Models FDC100, 125, 140VNA, 100, 125, 140VSA**

① **Cooling**

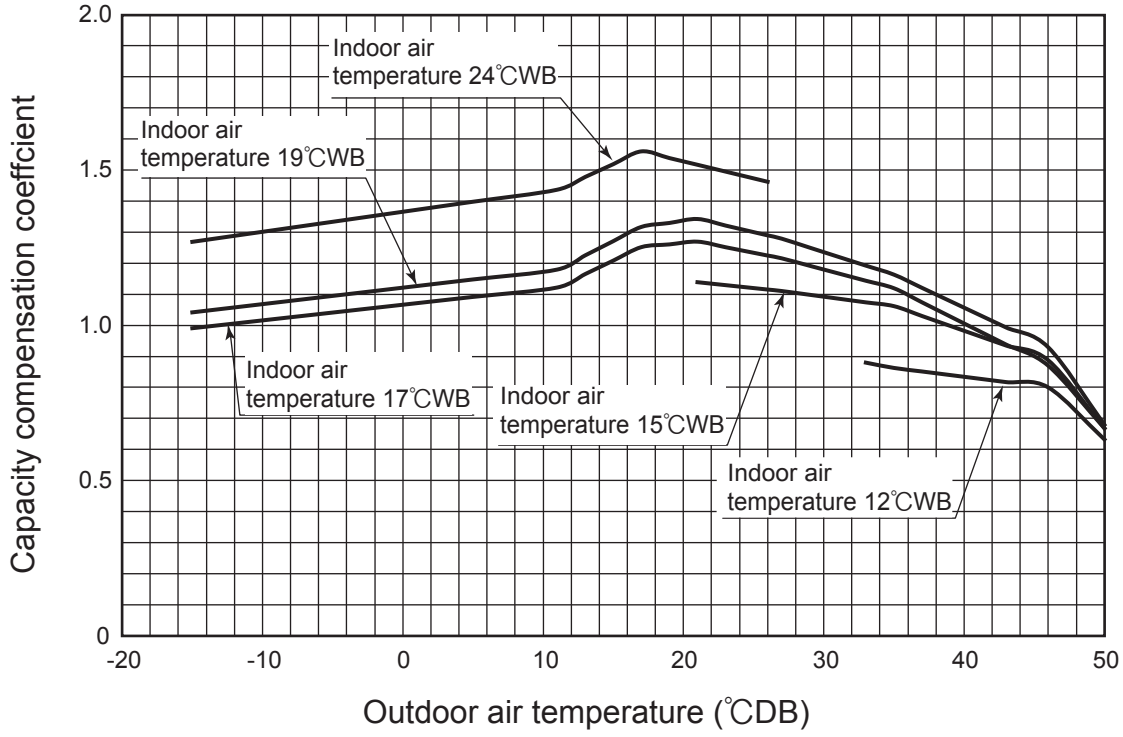


② **Heating**

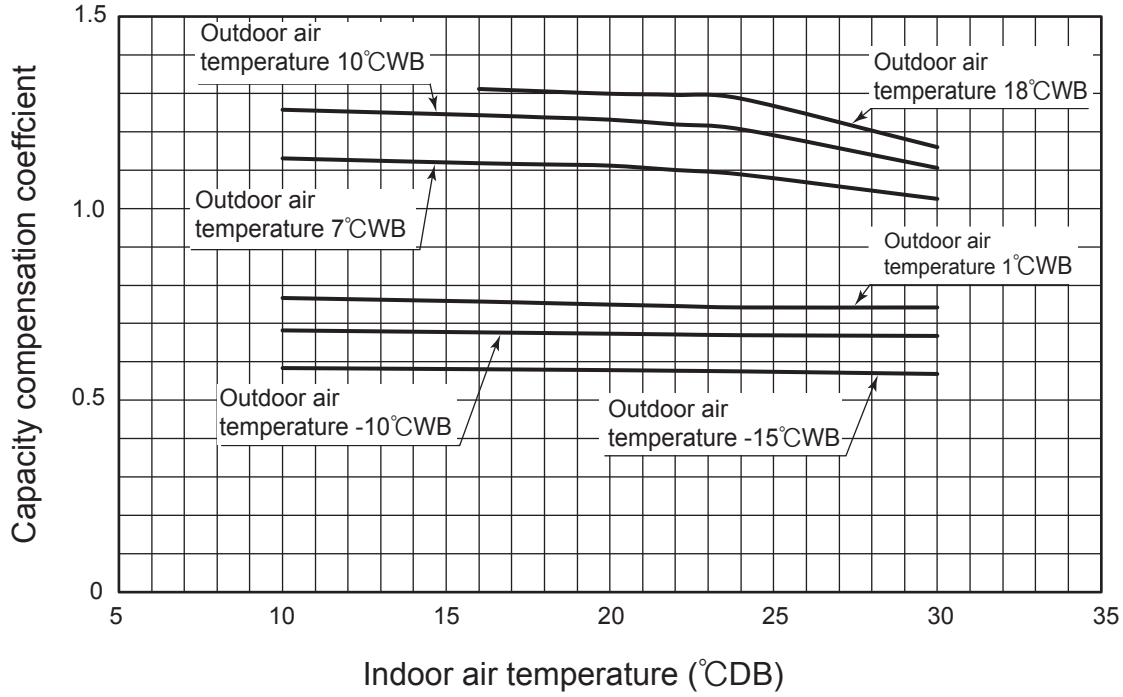


(II) Model FDC200VSA

① Cooling

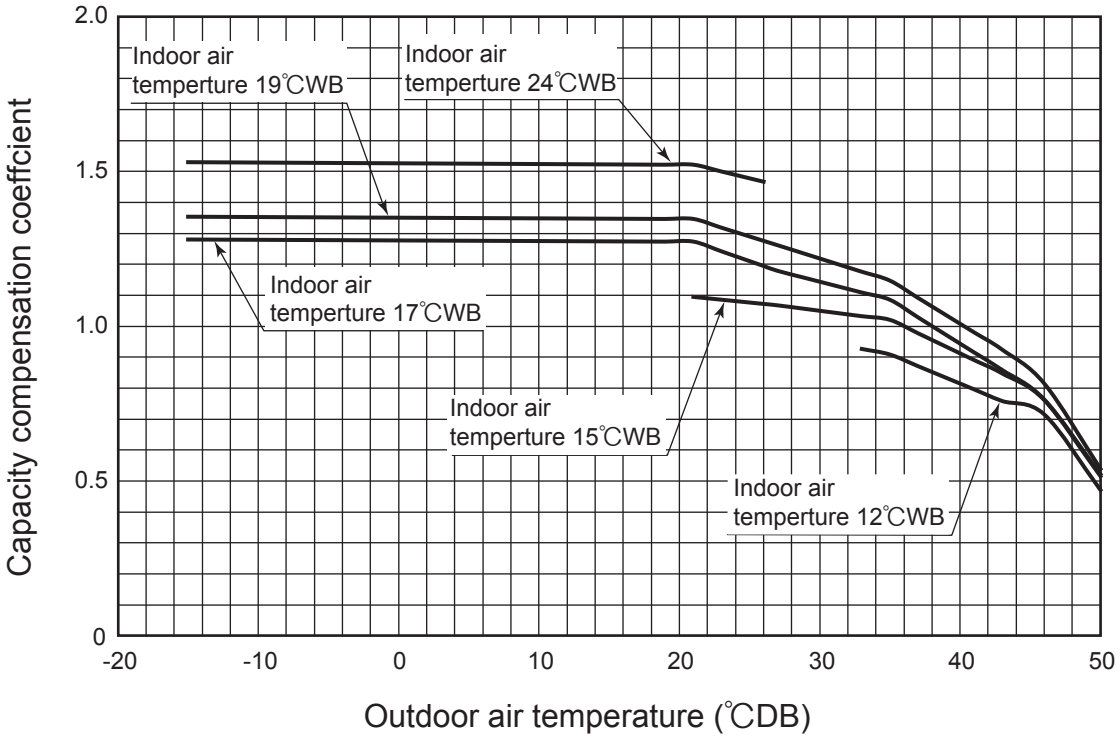


② Heating

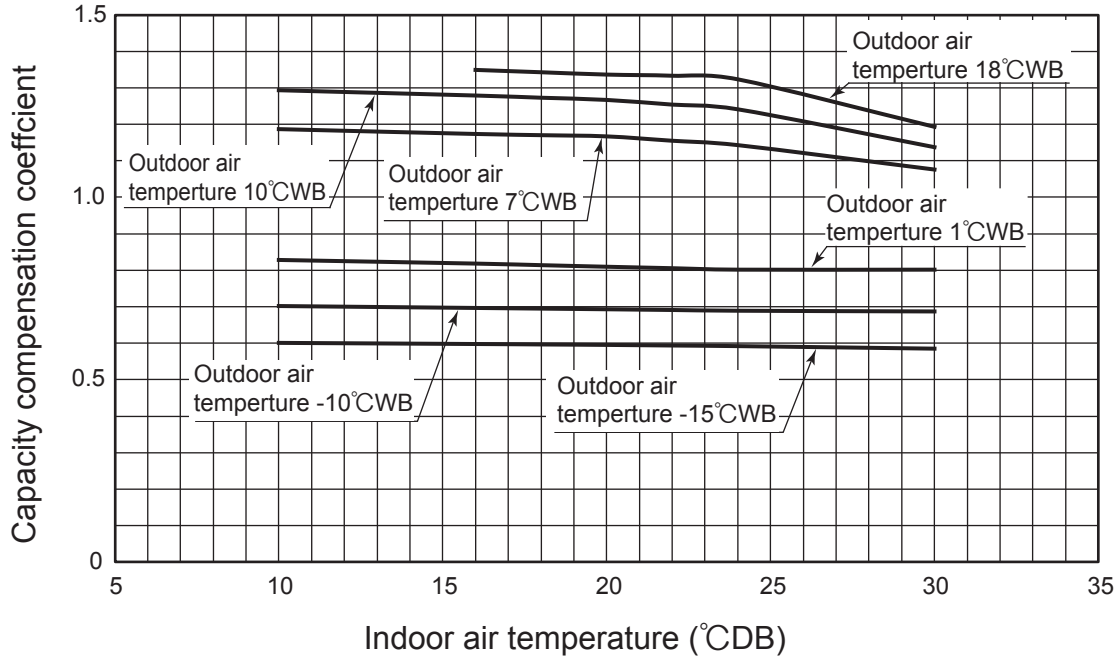


(III) Model FDC250VSA

① Cooling



② Heating



2.8.2 Correction of cooling and heating capacity in relation to air flow rate control (Fan speed)

Fan speed	P-Hi or Hi	Me	Lo
Coefficient	1.00	0.97	0.95

2.8.3 Correction of cooling and heating capacity in relation to one way length of refrigerant piping

It is necessary to correct the cooling and heating capacity in relation to the one way equivalent piping length between the indoor and outdoor units.

(1) Models FDC100 - 140

Equivalent piping length (1)(m)			7.5	10	15	20	25	30	35	40	45	50	55
Heating			1	1	1	1	1	0.998	0.998	0.993	0.993	0.988	0.988
Cooling	FDC100 model	ϕ15.88	1	0.991	0.978	0.964	0.951	0.937	0.924	0.910	0.897	0.883	0.870
	FDC125 model		1	0.986	0.968	0.950	0.932	0.914	0.896	0.878	0.860	0.842	0.824
	FDC140 model		1	0.985	0.966	0.946	0.927	0.907	0.888	0.868	0.849	0.829	0.810
	FDC100 model	ϕ19.05	1.016	1.013	1.007	1.002	0.996	0.991	0.985	0.980	0.974	0.969	0.963
	FDC125 model		1.022	1.018	1.009	1.001	0.992	0.984	0.975	0.967	0.958	0.950	0.941
	FDC140 model		1.026	1.021	1.011	1.002	0.992	0.983	0.973	0.964	0.954	0.945	0.935

Note (1) Calculate the equivalent length using the following formula.
However, install the piping so that the piping length is within +5 m of the limit length (actual length) for the respective types.

(2) Models FDC200, 250

Equivalent piping length (1) (m)			7.5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
Heating			1	0.998	0.995	0.991	0.988	0.984	0.981	0.977	0.974	0.970	0.967	0.963	0.960	0.956	0.953
Cooling	FDC200 model	ϕ22.22	1	0.997	0.991	0.984	0.978	0.971	0.965	–	–	–	–	–	–	–	–
	FDC250 model		1	0.995	0.985	0.975	0.965	0.954	0.944	–	–	–	–	–	–	–	–
	FDC200 model	ϕ25.4	–	–	–	–	–	–	0.988	0.984	0.981	0.977	0.974	0.970	0.967	0.963	0.960
	FDC250 model		–	–	–	–	–	–	0.978	0.972	0.966	0.960	0.953	0.947	0.941	0.935	0.929
	FDC200 model	ϕ28.58	–	–	–	–	–	–	0.999	0.997	0.995	0.993	0.991	0.989	0.987	0.985	0.983
	FDC250 model		–	–	–	–	–	–	0.997	0.994	0.990	0.987	0.983	0.980	0.976	0.973	0.969

Note (1) Calculate the equivalent length using the following formula.
However, install the piping so that the piping length is within +5 m of the limit length (actual length) for the respective types.

• Equivalent Length =Actual Length + (Equivalent bend length x number of bends in the piping.)
Equivalent length per bend.

Gas pipe diameter (mm)	ϕ12.7	ϕ15.88	ϕ19.05	ϕ22.22	ϕ25.4	ϕ28.58
Equivalent bend length	0.20	0.25	0.30	0.35	0.40	0.45

2.8.4 Height difference between the indoor unit and outdoor unit

When the outdoor unit is located below indoor units in cooling mode, or when the outdoor unit is located above indoor units in heating mode, the correction coefficient mentioned in the below table should be subtracted from the value in the above table.

Height difference between the indoor unit and outdoor unit in the vertical height difference	5m	10m	15m	20m	25m	30m
Adjustment coefficient	0.99	0.98	0.97	0.96	0.95	0.94

Piping length limitations

Item \ Model	FDC100 - 140	FDC200, 250
Max. one way piping length	50m	70m
Max. vertical height difference	Outdoor unit is higher 30m Outdoor unit is lower 15m	

Note (1) Values in the table indicate the one way piping length between the indoor and outdoor units.

How to obtain the cooling and heating capacity

Example : The net cooling capacity of the model FDT200VSADVH with the air flow “P-Hi”, the piping length of 15m, the outdoor unit located 5m lower than the indoor unit, indoor wet-bulbtemperature at 19.0℃ and outdoor dry-bulb temperature 35℃ is

Net cooling capacity = 19.0 × 1.00 × 0.991 × 0.99 ≒ 18.6kW

- 19.0 : Net cooling total capacity of FDT200VSADVH (Outdoor temp. : 35℃DB Indoor temp. : 19℃WB) shown in 2.8.1
- 1.00 : Air flow : P-Hi shown in 2.8.2
- 0.991 : Piping length :15m (Gas pipe size is ϕ 22.22) shown in 2.8.3
- 0.99 : Height diff. : 5m (Outdoor unit : below) shown in 2.8.4

2.9 APPLICATION DATA

2.9.1 Installation of indoor unit ..... **See page 48.**

2.9.2 Electric wiring work installation ..... **See page 54.**

2.9.3 Installation of wired remote control (Option parts) ..... **See page 58.**

2.9.4 Installation of outdoor unit

(1) Models FDC100-140VNA, 100-140VSA

PSC012D106A

Inverter driven split PAC

100VNA–140VNA,100VSA–140VSA

Designed for R410A refrigerant

◎This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to Page 48.
◎When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces.

SAFETY PRECAUTIONS

- We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into ⚠WARNING and ⚠CAUTION. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠CAUTION. **These are very important precautions for safety. Be sure to observe all of them without fail.**
- The meaning of "Marks" used here are as shown below.

⊘	Never do it under any circumstance.	❗ Always do it according to the instruction

- For 3 phase power source outdoor unit,EN61000-3-2 is not applicable if consent by the utility company or notification to the utility company is given before usage.
- 3 phase power source unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a house-hold appliance it could cause electromagnetic interference.
- 5 and 6 HP units of single phase power source are equipment complying with IEC 61000-3-12.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user.

Check before installation work

- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

⚠ WARNING

❗
- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.
- **Install the system in full accordance with the instruction manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, it may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substandard performance, control failure and personal injury.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.**
  Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire.
- **Be sure to shut off the power before starting electrical work.**
  Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.
- **Do not perform brazing work in the airtight room**
  It can cause lack of oxygen.
- **Use the prescribed pipes, flare nuts and tools for R410A.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.

❗
- **Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.**
  Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant.
- **Only use prescribed optional parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not perform any change of protective device itself or its setup condition.**
  The forced operation by short-circuiting protective device of pressure switch and temperature control or the use of non specified component can cause fire or burst.
- **Be sure to switch off the power source in the event of installation, inspection or servicing.**
  If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.**
  If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit.
- **Be sure to wear protective goggles and gloves while at work.**
- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.

⊘
- **Do not run the unit with removed panels or protections.**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.
- **Do not process or splice the power cord, or share the socket with other power plugs.**
  This may cause fire or electric shock due to defecting contact, defecting insulation and over-current etc.
- **Do not bundle or wind or process the power cord. Do not deform the power cord by treading it.**
  This may cause fire or heating.

⚠ CAUTION

- **Carry out the electrical work for ground lead with care.**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks,it could cause explosion or ignition.
- **Use the circuit breaker for all pole with correct capacity.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations.**
  The isolator should be locked in accordanced with EN60204-1.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.**
  If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **Perform installation work properly according to this installation manual.**
  Improper installation can cause abnormal vibrations or increased noise generation.
- **After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.**
- **Earth leakage breaker must be installed.**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place..
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.**
  If safety facilities are not provided, it can cause personal injury due to falling from the installation place.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base flame can cause the unit falling down and cause personal injury.

- **Do not install the unit in the locations listed below.**
  ·Locations where carbon fiber, metal powder or any powder is floating.
  ·Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  ·Vehicles and ships
  ·Locations where cosmetic or special sprays are often used.
  ·Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  ·Locations where any machines which generate high frequency harmonics are used.
  ·Locations with salty atmospheres such as coastlines
  ·Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
  ·Locations where the unit is exposed to chimney smoke
  ·Locations at high altitude (more than 1000m high)
  ·Locations with ammonic atmospheres (e.g. organic fertilizer).
  ·Locations with calcium chloride (e.g. snow melting agent).
  ·Locations where heat radiation from other heat source can affect the unit
  ·Locations without good air circulation.
  ·Locations with any obstacles which can prevent inlet and outlet air of the unit
  ·Locations where short circuit of air can occur (in case of multiple units installation)
  ·Locations where strong air blows against the air outlet of outdoor unit
  ·Locations where something located above the unit could fall.
  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  ·Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  ·Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  ·Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  ·Locations where vibration and operation sound generated by the outdoor unit can affect seriously. (on the wall or at the place near bed room)
  ·Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  ·Locations where drainage cannot run off safely.
  It can affect surrounding environment and cause a claim.
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
  It can cause the damage of the items.
- **Do not touch any buttons with wet hands.**
  It can cause electric shocks.
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not clean up the unit with water.**
  It can cause electric shocks.
- **Do not operate the outdoor unit with any article placed on it.**
  You may incur property damage or personal injure from a fall of the article.
- **Do not step onto the outdoor unit.**
  You may incur injury from a drop or fall.
- **Do not touch the suction or aluminum fin on the outdoor unit.**
  This may cause injury.
- **Do not put anything on the outdoor unit and operating unit.**
  This may cause damage the objects or injury due to falling to the object.

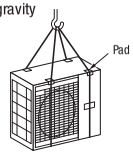
Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A has adopted a different size indoor unit operation valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R410A tools listed in the table on the right before installing or servicing this unit.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, which results in performance degradation.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

	Dedicated R410A tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position.
If not properly balanced, the unit can be thrown off-balance and fall.

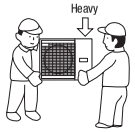


1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When some compelling reason necessitates the unpacking of the unit before it is carried in, use nylon slings or protective wood pieces so as not to damage the unit by ropes lifting it.

2) Portage

- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

- ○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- ○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
- ○ A place where the unit is not exposed to oil splashes.
- ○ A place where it can be free from danger of flammable gas leakage.
- ○ A place where drain water can be disposed without any trouble.
- ○ A place where the unit will not be affected by heat radiation from other heat source.
- ○ A place where snow will not accumulate.
- ○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- ○ A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- ○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- ○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
- ○ A place where strong wind will not blow against the outlet air blow of the unit.

Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

4) Caution about selection of installation location

(1) If the unit is installed in the area where the snow will accumulate, following measures are required.
The bottom plate of unit and intake, outlet may be blocked by snow.

1.Install the unit on the base so that the bottom is higher than snow cover surface.



2.Provide a snow hood to the outdoor unit on site.
Regarding outline of a snow hood, refer to our technical manual.



3.Install the unit under eaves or providen the roof on site.

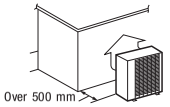


Since drain water generated by defrost control may freeze, following measures are required.

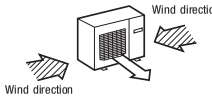
- Don't execute drain piping work by using a drain elbow and drain grommets (optional parts). [Refer to Drain piping work.]
- Recommend setting Defrost Control (SW3-1) and Snow Guard Fan Control (SW3-2). [Refer to Setting SW3-1, SW3-2.]
- Attach heater on a base plate on site, if there is possibility to freeze drain water.
  In case that the product has a corrective drainage system, the drainage paths should have suitable measure against freezing but be sure not to melt the material of drainage paths with heat.

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

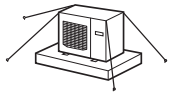
1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



3.The unit should be installed on the stable and level foundation. If the foundation is not level, tie down the unit with wires.

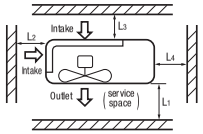


5) Installation space

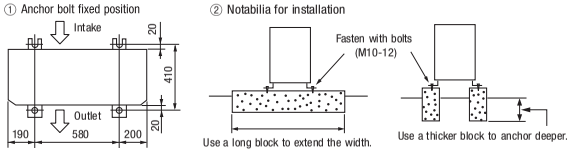
- Walls surrounding the unit in the four sides are not acceptable.
- There must be a 1-meter or larger space in the above.
- Where a danger of short-circuiting exists, install guide louvers.
- When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- Where piling snow can bury the outdoor unit, provide proper snow guards.
- A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.

(mm)

Size \ Example installation	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4	150	150	150



6) Installation



- In installing the unit, fix the unit's legs with bolts specified on the left.
- The protrusion of an anchor bolt on the front side must be kept within 15 mm.
- Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- Refer to the left illustrations for information regarding concrete foundations.
- Install the unit in a level area. (With a gradient of 5 mm or less.)
  Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

- When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site.
  So that strong wind will not blow against the outdoor heat exchanger directly. Regarding outline of a snow hood, refer to our technical manual.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

- Check the following points in light of the indoor unit specifications and the installation site.
- Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Resitrictions	One-way pipe length difference from the first branching point to the indoor unit		Marks appearing in the drawing				
						< 3m	≧ 3m
	Model for outdoor units		Dimensional restrictions	Single type	Twin type	Triple type A	Triple type B
One-way pipe length of refrigerant piping	100VNA,125VNA,100VSA,125VSA		≦ 50m	L	L+L1+L2	L+L1+L2+L3	L+L1+L2+L3
	140VNA, 140VSA						
Main pipe length	100VNA,125VNA,100VSA,125VSA		≦ 50m	—	L	—	—
	140VNA, 140VSA					L	L
One-way pipe length between the first branching point from to the second branching point	Triple type	140VNA, 140VSA	≦ 5m	—	—	—	La
One-way pipe length after the first branching point	Twin type	All Models	≦ 30m	—	L1,L2	—	—
	Triple type	140VNA, 140VSA			—	L1, L2, L3	L1 (1)
One-way pipe length from the first branching point to indoor units through the second branching point	Triple type	140VNA, 140VSA	≦ 27m	—	—	—	La+L2, La+L3 (1)
One-way pipe length difference from the first branching point to the indoor unit	Twin type	All Models	≦ 10m	—	|L1-L2|	—	—
	Triple type	140VNA, 140VSA	≦ 3m		—	| L1-L2 | , | L2-L3 | , | L3-L1 |	
			≦ 10m		—	—	L1-(La+L2),L1-(La+L3) (1)
One way pipe length difference from the second branching point to the indoor unit	Triple type	140VNA, 140VSA	≦ 10m	—	—	—	| L2-L3 |
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher,		≦ 50m (2)	H	H	H	H
	When the outdoor unit is positioned lower,		≦ 15m				
Elevation difference between indoor units			≦ 0.5m	—	h	h1,h2,h3	h1,h2,h3

⚠CAUTION

- The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, see " 6. UTILIZATION OF EXISTING PIPING."
- With the triple pipe connection, the way of use is different when the difference of one-way pipe length after the first branching point is 3m to 10m. For details, refer to the above table and right figure.

Note (1) Install the indoor units so that L + L1 becomes the longest one-way pipe.
Keep the pipe length difference between L1 and (La + L2) or (La + L3) within 10m.
(2) When the outdoor unit is installed at a position higher than the indoor unit by 30m or more, set SW5-2 on the control PCB to ON.

2) Determination of pipe size

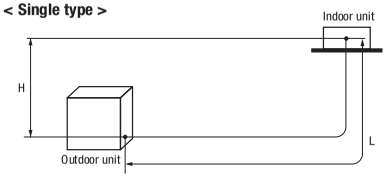
- Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

		Model 100V		Model 125V		Model 140V	
		Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
Outdoor unit connected		ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
		Flare	Flare	Flare	Flare	Flare	Flare
Refrigerant piping (Main pipe L)		ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
In the case of a single type	Indoor unit connected	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 100V		Model 125V		Model 140V	
In the case of a twin type	Branching pipe set	DIS-WA1G		DIS-WA1G		DIS-WA1G	
	Refrigerant piping (branch pipe L1,L2)	ϕ12.7	ϕ9.52	ϕ12.7	ϕ9.52	ϕ15.88	ϕ9.52
	Indoor unit connected	ϕ12.7	ϕ6.35	ϕ12.7	ϕ6.35	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 50V×2		Model 60V×2		Model 71V×2	
In the case of a triple type A	Branching pipe set	—		—		DIS-TA1G	
	Refrigerant piping (branch pipe L1,L2,L3)					ϕ12.7	ϕ9.52
	Indoor unit connected					ϕ12.7	ϕ6.35
	Capacity of indoor unit					Model 50Vx3	
In the case of a triple type B	Branching pipe set	—		—		DIS-WA1G	
	Refrigerant piping (branch pipe La)					ϕ15.88	ϕ9.52
	Refrigerant piping (branch pipe L1)					ϕ12.7	ϕ9.52
	Branching pipe set (After branch pipe La)					DIS-WA1G	
	Refrigerant piping (branch pipe L2,L3)					ϕ12.7	ϕ9.52
	Indoor unit connected					ϕ12.7	ϕ6.35
	Capacity of indoor unit					Model 50V×3	

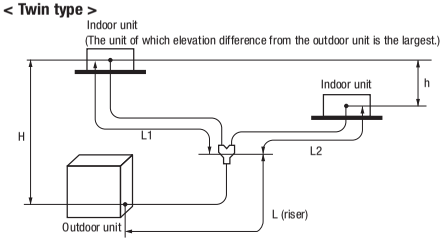
⚠CAUTION

- When the 50V or 60V model is connected as an indoor unit, always use a ϕ9.52 liquid pipe for the branch (branching pipe – indoor unit) and a different diameter joint supplied with the branching pipe set for connection with the indoor unit (ϕ6.35 on the liquid pipe side).
  If a ϕ6.35 pipe is used for connection with a branching pipe, a refrigerant distribution disorder may occur, causing one of the indoor units to fall short of the rated capacity.
- A riser pipe must be a part of the main. A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.
  A branching part must be dressed with a heat-insulation material supplied as an accessory.
- For the details of installation work required at and near a branching area, see the installation manual supplied with your branching pipe set.

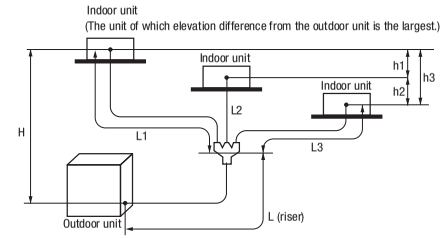
< Single type >



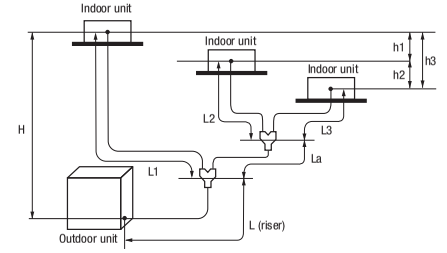
< Twin type >



< Triple type A >



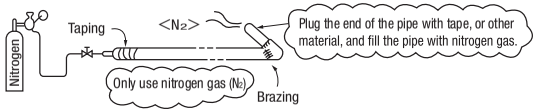
< Triple type B >

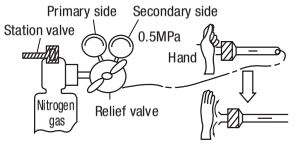


About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.





3) Refrigerant pipe wall thickness and material

- Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.
- This unit uses R410A. Always use 1/2H pipes having a 1.0mm or thicker wall for φ19.05 or larger pipes, because O-type pipes do not meet the pressure resistance requirement.

Pipe diameter [mm]	6.35	9.52	12.7	15.88	22.22	25.4	28.58
Minimum pipe wall thickness [mm]	0.8	0.8	0.8	1.0	1.0	1.0	1.0
Pipe material*	O-type pipe	O-type pipe	O-type pipe	O-type pipe	1/2H-type pipe	1/2H-type pipe	1/2H-type pipe

*Phosphorus deoxidized seamless copper pipe C1220T, JIS H 3300

NOTE

- Select pipes having a wall thickness larger than the specified minimum pipe thickness.

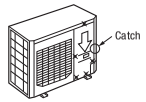
4) On-site piping work

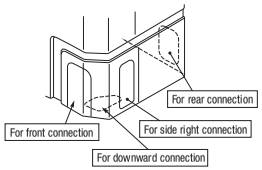
⚠IMPORTANT

- Take care so that installed pipes may not touch components within a unit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

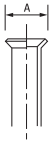
How to remove the service panel

First remove the five screws (✕mark) of the service panel and push it down into the direction of the arrow mark and then remove it by pulling it toward you.



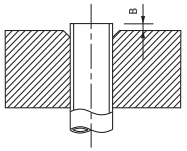


- The pipe can be laid in any of the following directions: side right, front, rear and downward.
- Remove a knock-out plate provided on the pipe penetration to open a minimum necessary area and attach an edging material supplied as an accessory by cutting it to an appropriate length before laying a pipe.
- Carry out the on site piping work with the operation valve fully closed.
- Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
- Bend a pipe to a radius as large as practical.(R100–R150) Do not bend a pipe repeatedly to correct its form.
- Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- The pipe should be anchored every 1.5m or less to isolate the vibration.
- Tighten a flare joint securely with a double spanner.



Flared pipe end: A (mm)

Copper pipe outer diameter	A 0 −0.4
φ6.35	9.1
φ9.52	13.2
φ12.7	16.6
φ15.88	19.7



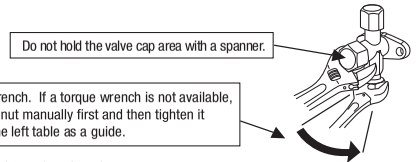
Copper pipe protrusion for flaring: B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R410A tool	With a conventional tool
φ6.35	0–0.5	0.7–1.3
φ9.52		
φ12.7		
φ15.88		

⚠ CAUTION **Do not apply force beyond proper fastening torque in tightening the flare nut.**

Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.

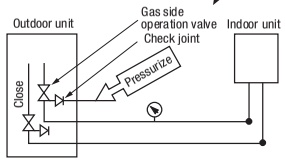
Operation valve size (mm)	Tightening torque (N·m)	Tightening angle (°)	Recommended length of a tool handle (mm)
φ6.35 (1/4")	14–18	45–60	150
φ9.52 (3/8")	34–42	30–45	200
φ12.7 (1/2")	49–61	30–45	250
φ15.88 (5/8")	68–82	15–20	300



5) Air tightness test

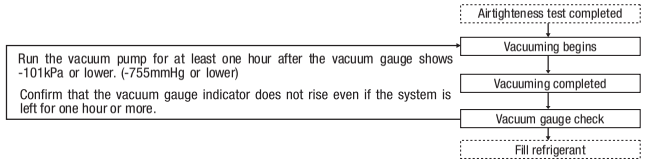
① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the operation valve's check joint equipped on the outdoor unit side. While conducting a test, keep the operation valve shut all the time.
- a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
- b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
- c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
- d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient temperature fall 1℃, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
- e) If a pressure drop is observed in checking e) and a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.

② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.



6) Evacuation

<Work flow> When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.



Pay attention to the following points in addition to the above for the R410A and compatible machines.

- ○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
- ○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

<Single type>

Item / Capacity	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
100VNA–140VNA 100VSA–140VSA	2.0	0	0.06	3.8	30

<Twin, triple type>

Item / Capacity	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)		Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
			Main pipe	Branch pipe		
100VNA–140VNA 100VSA–140VSA	2.0	0	0.06		3.8	30

- A standard refrigerant charge volume means a refrigerant charge volume for an installation with 0m long refrigerant piping.
- This unit contains factory charged refrigerant covering 30m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 30m refrigerant piping. When refrigerant piping exceeds 30m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 30m.
- When refrigerant piping is shorter than 3m, reduce refrigerant by 1kg from the factory charged volume and adjust to 2.8kg.
- If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, see "6. UTILIZATION OF EXISTING PIPING."

Formula to calculate the volume of additional refrigerant required

Additional charge volume (kg) = { Main pipe length (m) – Length covered without additional charge 30 (m) } x 0.06 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)

*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

- **To charge refrigerant again, recover refrigerant from the system first and then charge the volume calculated from the above table (Standard refrigerant charge volume + additional charge volume for total pipe length.)**

(2) Charging refrigerant

- Since R410A refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- Charge refrigerant always from the liquid side service port with the operation valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

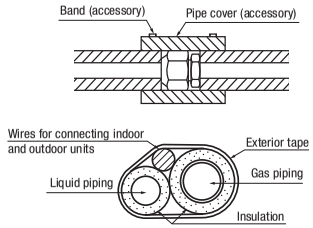
NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.

8) Heating and condensation prevention

(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.

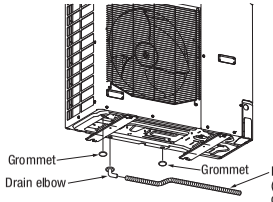
(2) Use a heat insulating material that can withstand 120°C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.

- Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
- Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
- Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
- Although it is verified in a test that this air-conditioner unit shows satisfactory performance under JIS condensation test conditions, **both gas and liquid pipes need to be dressed with 20 mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**

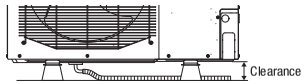


3. DRAIN PIPING WORK

- Execute drain piping by using a drain elbow and drain grommets supplied separately as optional parts, where water drained from the outdoor unit is a problem.
- Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
- Condensed water may flow out from vicinity of operation valve or connected pipes.
- Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)
- Do not use drain elbow and grommet made of plastic for drain piping when base heater for outdoor unit is used. Plastic grommet and elbow will be damaged and burnt in worst case.
- Prepare another drain tray made of metallic material for collecting drain when base heater is used.



- When condensed water needs to be led to a drain, etc., install the unit on a flat base (supplied separately as an optional part) or concrete blocks.
  Then, please secure space for the drain elbow and the drain hose.

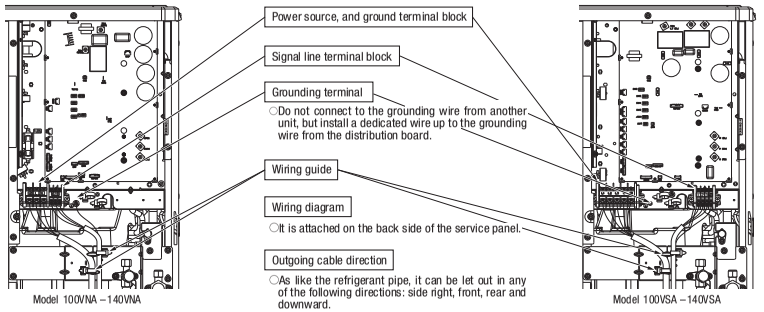


4. ELECTRICAL WIRING WORK For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- Do not use any supply cord lighter than one specified in parentheses for each type below.
  - braided cord (code designation 60245 IEC 51),
  - ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
  - flat twin tinsel cord (code designation 60227 IEC 41);

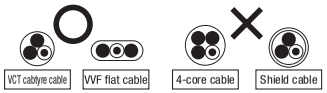
  Do not use anything lighter than polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If impropery grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
- The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an acccident such as an electric shock or a fire.



Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
100VNA – 140VNA	Single phase 3 wire 220-240V 50Hz 220V 60Hz	5.5	24	22	φ1.6mm	φ1.6mm x 3
100VSA – 140VSA	3 phase 4 wire 380-415V 50Hz 380V 60Hz	3.5	15	46		

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear or Circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation failing outside of these conditions, follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

- Do not turn on the power until the electrical work is completeted .
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident.)
- For power source cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.
- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.



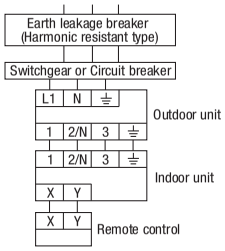
Main fuse specification

Model	Specification	Part No.
100VNA~140VNA	250V 30A	PCA006A092
100VSA~140VSA	—	—

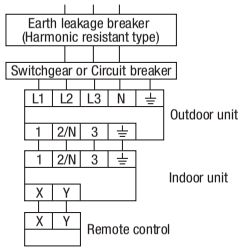
Power cable, indoor-outdoor connecting wires

- Always perform grounding system installation work with the power cord unplugged.

⚠ CAUTION Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.



Model 100VNA – 140VNA



Model 100VSA – 140VSA

※At the connection with the duct type indoor unit.

Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
100VNA,125VNA	Single phase 3 wire 220-240V 50Hz 220V 60Hz	5.5	26	20	φ1.6mm	φ1.6mm x 3
140VNA			27			
100VNS,125VSA	3 phase 4 wire 380-415V 50Hz 380V 60Hz	3.5	17	40		
140VSA			18	38		

5. TEST RUN

⚠ WARNING

- Before conduct a test run, make sure that the operation valves are open.
- Turn on power 6 hours prior to a test run to energize the crankcase heater.
- In case of the first operation after turning on power, even if the unit does not move for 30 minutes, it is not a breakdown.
- Always give a 3-minute or longer interval before you start the unit again whenever it is stopped.
- Removing the service panel will expose high-voltage live parts and high-temperature parts, which are quite dangerous. Take utmost care not to incur an electric shock or burns. Do not leave the unit with the service panel open.

} A failure to observe these instructions can result in a compressor breakdown.

⚠ CAUTION

- When you operate switches (SW3, SW5) for on-site setting, be careful not to touch a live part.
- You cannot check discharge pressure from the liquid operation valve charge port.
- The 4-way valve (20S) is energized during a heating operation.
- When power source is cut off to reset the unit, give 3 or more minutes before you turn on power again after power is cut off. If this procedure is not observed in turning on power again, "Communication error between outdoor and indoor unit" may occur.

1) Test run method

(1) A test run can be initiated from an outdoor unit by using SW3-3 and SW3-4 for on-site setting.
(2) Switching SW3-3 to ON will start the compressor.
(3) The unit will start a cooling operation, when SW3-4 is OFF, or a heating operation, when SW3-4 is ON.
(4) **Do not fail to switch SW3-3 to OFF when a test run is completed.**

SW-3-3	SW-3-4	
ON	OFF	Cooling during a test run
	ON	Heating during a test run
OFF	—	Normal or after the test operation

2) Checking the state of the unit in operation

Use check joints provided on the piping before and after the four-way valve installed inside the outdoor unit for checking discharge pressure and suction pressure.
As indicated in the table shown on the right, pressure detected at each point will vary depending on whether a cooling or heating operation has been selected.

	Check joint of the pipe	Charge port of the gas operation valve
Cooling operation	Discharge pressure (High pressure)	Suction pressure (Low pressure)
Heating operation	Suction pressure (Low pressure)	Discharge pressure (High pressure)

3) Setting SW3-1, SW3-2, SW5-2, SW7-3, on-site

(1) Defrost control switching (SW3-1)
・When this switch is turned ON, the unit will run in the defrost mode more frequently.
・Set this switch to ON, when installed in a region where outdoor temperature falls below zero during the season the unit is run for a heating operation.
(2) Snow guard fan control (SW3-2)
・When this switch is turned ON, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3℃ or lower and the compressor is not running.
・When the unit is used in a very snowy country, set this switch to ON.
(3) High height difference operation control (SW5-2)
・Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.
(4) Lower noise silent mode (SW7-3)
・Upper limit of compressor speed and fan speed becomes lower in silent mode

4) Failure diagnosis in a test run

Error indicated on the remote control unit	Printed circuit board LED(The cycles of 5 seconds)		Failure event	Action
	Red LED	Green LED		
E34	Blinking once	Blinking continuously	Open phase	Check power cables for loose contact or disconnection.
E40	Blinking once	Blinking continuously	63H1 actuation or operation with operation valves shut (occurs mainly during a heating operation)	1. Check whether the operation valves are open. 2. If an error has been canceled when 3 minutes have elapsed since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.
E57	Blinking once	Blinking continuously	Short of refrigerant error or operation with operation valves shut (occurs mainly during a cooling operation)	

- If an error code other than those listed above is indicated, refer to the wiring diagram of the outdoor unit and the indoor unit.

5) The state of the electronic expansion valve.

The following table illustrates the steady states of the electronic expansion valve.

	When power is turned on	When the unit comes to a normal stop		When the unit comes to an abnormal stop	
		During a cooling operation	During a heating operation	During a cooling operation	During a heating operation
Valve for a cooling operation	Complete shut position	Complete shut position	Full open position	Full open position	Full open position
Valve for a heating operation	Full open position	Full open position	Complete shut position	Full open position	Full open position

6) Heed the following on the first operation after turning on the circuit breaker.

This outdoor unit may start in the standby mode (waiting for a compressor startup), which can continue up to 30 minutes, to prevent the oil level in the compressor from lowering on the first operation after turning on the circuit breaker. If that is the case, do not suspect a unit failure.

Items to check before a test run

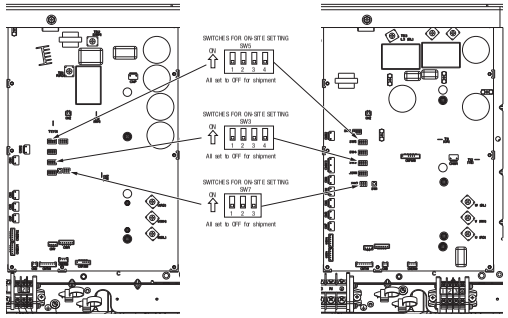
- When you leave the outdoor unit with power supplied to it, be sure to close the panel.

Item No.used in the installation manual	Item	Check item	Check
2	Refrigerant plumbing	If brazed, was it brazed under a nitrogen gas flow?	
		Were air-tightness test and vacuum extraction surely performed?	
		Are heat insulation materials installed on both liquid and gas pipes?	
		Are operation valves surely opened for both liquid and gas systems?	
		Have you recorded the additional refrigerant charge volume and refrigerant pipe length on the panel's label?	
4	Electric wiring	Is the unit free of cabling errors such as uncompleted connection, an absent or reversed phase?	
		Are properly rated electrical equipments used for circuit breakers and cables?	
		Doesn't cabling cross-connect between units, where more than one unit are installed?	
		Aren't indoor-outdoor signal wires connected to remote control wires?	
		Do indoor-outdoor connecting cables connect between the same terminal numbers?	
		Are either VCT cabtyre cables or WF flat cables used for indoor-outdoor connecting cables?	
		Does grounding satisfy the D type grounding (type III grounding) requirements?	
		Is the unit grounded with a dedicated grounding wire not connected to another unit's grounding wire?	
		Are cables free of loose screws at their connection points?	
		Are cables held down with cable clamps so that no external force works onto terminal connections?	
—	Indoor unit	Is indoor unit installation work completed?	
		Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

Test run procedure

- Always carry out a test run and check the following in order as listed.

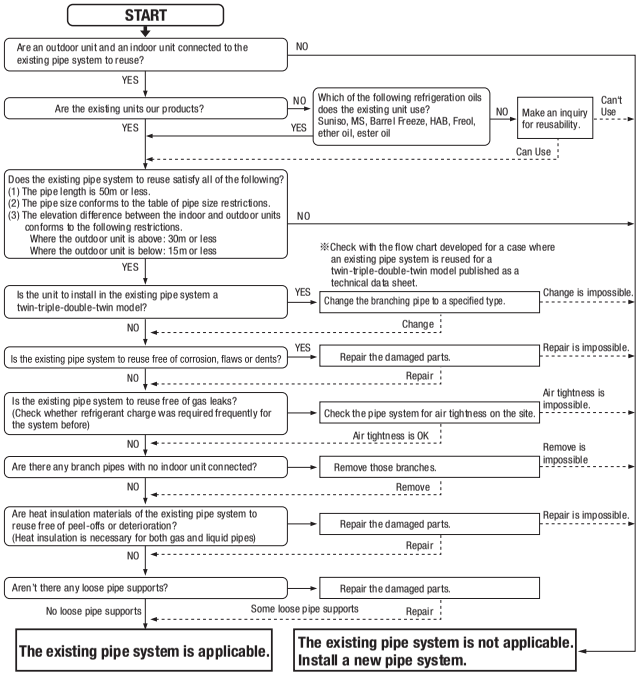
Turn	The contents of operation	Check
①	Open the gas side operation valve fully.	
②	Open the liquid side operation valve fully.	
③	Close the panel.	
④	Where a remote control unit is used for unit setup on the installation site, follow instructions for unit setup on the installation site with a remote control unit.	
⑤	SW3-3 ON / SW3-4 OFF: the unit will start a cooling operation.	
	SW3-3 ON / SW3-4 ON: the unit will start a heating operation.	
⑥	When the unit starts operation, press the wind direction button provided on the remote control unit to check its operation.	
⑦	Place your hand before the indoor unit's diffuser to check whether cold (warm) winds come out in a cooling (heating) operation.	
⑧	Make sure that a red LED is not blinking.	
⑨	When you complete the test run, do not forget to turn SW3-3 to the OFF position.	
⑩	Where options are used, check their operation according to the respective instruction manuals.	



Model 100VNA–140VNA　　Model 100VSA–140VSA

6. UTILIZATION OF EXISTING PIPING

Check whether an existing pipe system is reusable or not by using the following flow chart.



⚠ WARNING <Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the existing unit (in the order of (1), (2), (3) and (4))

(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side operation valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.
- For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R410A.
- **Turn on-site setting switch SW5-1** to the ON position. (Where the gas pipe size is ϕ19.05)

<Where the existing unit cannot be run for a cooling operation.>

Wash the pipe system or install a new pipe system.
- If you choose to wash the pipe system, contact our distributor in the area.

<Table of pipe size restrictions>

◎:Standard pipe size ○:Applicable
△:Restricted to shorter pipe length limits ×:Not applicable

Additional charging amount of refrigerant per 1m		0.06kg/m		0.08kg/m	
Pipe size	Liquid pipe	ϕ9.52	ϕ9.52	ϕ12.7	ϕ12.7
	Gas pipe	ϕ15.88	ϕ19.05	ϕ15.88	ϕ19.05
100V	Usability	◎	○※1	△	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15
125V	Usability	◎	○※1	△	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15
140V	Usability	◎	○※1	△	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15

<Pipe system after the branching pipe>

			After 1st branch ※4			After 2nd branch		
Additional charging amount of refrigerant per 1m			0.06kg/m			0.06kg/m		
Pipe size	Liquid pipe		ϕ9.52			ϕ9.52		
	Gas pipe		ϕ12.7	ϕ15.88	ϕ19.05※1	ϕ12.7	ϕ15.88	ϕ19.05※1
Model	Combination type	Combination of capacity						
100V	Twin	50+50	◎	○	×	–	–	–
125V	Twin	60+60	◎	○	×	–	–	–
140V	Twin	71+71	×	◎	○	–	–	–
	Triple A	50+50+50	◎	○	×	–	–	–
	Triple B	50+50+50	×	◎※5	○※5	◎	○	×

※1 Because of its insufficient pressure resistance, **turn the dip switch SW5-1** provided on the outdoor unit board to the ON position for ϕ19.05 × t1.0. (In the case of a twin-triple-double-twin model, this also applies to the case where ϕ19.05 × t1.0 is used in a pipe system after the first branching point.) However, you need not turn the dip switch SW5-1 to the ON position, if 1/2H pipes or pipes having 1.2 or thicker walls are used.
※2 When the main pipe length exceeds 40m, a significant capacity drop may be experienced due to pressure loss in the liquid pipe system. Use ϕ12.7 for the liquid main.
※3 Keep the total pipe length, not one-way pipe length, below the specified maximum pipe length.
※4 Piping size after branch should be equal or smaller than main pipe size.
※5 Piping size from first branch to indoor unit should be ϕ9.52 (Liquid) /ϕ12.7 (Gas).
- When refrigerant piping is shoter than 3m, reduce refrigerant by 1kg from factory charged volume.
- Any combinations of pipe sizes not listed in the table or marked with × in the table are not usable.

<The model types of existing units of which branching pipes are reusable.>

Models later than Type 8.
- FDC＊＊＊8□□□
- FDCP＊＊＊8□□□

The branching pipes used with models other than those listed above are not reusable because of their insufficient pressure resistance. Please use our genuine branching pipes for R410A.

- ＊＊＊ are numbers representing horsepower. □□□ is an alphanumeric letter.

Formula to calculate additional charge volume

Additional charge volume (kg) = {Main pipe length (m) − Length covered without additional charge shown in the table (m)} × Additional charge volume per meter of pipe shown in the table (kg/m) + Total length of branch pipes (m) × Additional charge volume per meter of pipe shown in the table (kg/m)

※ If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.
Example) When an 140V (single installation) is installed in a 20m long existing pipe system (liquid ϕ12.7, gas ϕ19.05), the quantity of refrigerant to charge additionally should be (20m-15m) x 0.08kg/m = 0.4 kg.

PSC012D066D D

Inverter driven split PAC
FDC200VSA, 250VSA (200V, 250V)
FDCA160VSA, 200VSA (A160V, A200V)
Designed for R410A refrigerant

◎This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 48.
◎When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces

SAFETY PRECAUTIONS

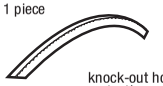
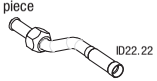
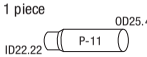
- We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into ⚠WARNING and ⚠CAUTION. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠CAUTION. **These are very important precautions for safety. Be sure to observe all of them without fail.**
- The meaning of "Marks" used here are as shown below.

⃠	Never do it under any circumstance.	❗	Always do it according to the instruction

- For 3 phase power source outdoor unit,EN61000-3-2 is not applicable if consent by the utility company or nortification to the utility company is given before usage.
- 3 phase power source unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a house-hold appliance it could cause electromagnetic interference.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user.

Check before installation work

[Accessory]

Edging	Accessory pipe	
1 piece	1 piece	1 piece
 knock-out hole protection	 Accessory pipe A	 Accessory pipe B

- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

⚠ WARNING

❗
- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.
- **Install the system in full accordance with the instruction manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, It may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substandard performance, control failure and personal injury.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.**
  Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire,
- **Be sure to shut off the power before starting electrical work.**
  Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.

❗
- **Do not perform brazing work in the airtight room**
  It can cause lack of oxygen.
- **Use the prescribed pipes, flare nuts and tools for R410A.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- **Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.**
  Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant
- **Only use prescribed option parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not perform any change of protective device itself or its setup condition**
  The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.
- **Be sure to switch off the power source in the event of installation, inspection or servicing.**
  If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.**
  If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit

⃠
- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
- **Do not run the unit with removed panels or protections**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.

⚠ CAUTION

- **Carry out the electrical work for ground lead with care**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks,it could cause explosion or ignition.
- **Use the circuit breaker for all pole with correct capacity.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations.**
  The isolator should be locked in accordanced with EN60204-1.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.**
  If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **Perform installation work properly according to this installation manual.**
  Improper installation can cause abnormal vibrations or increased noise generation.
- **Earth leakage breaker must be installed**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.**
  If safety facilities are not provided, it can cause personal injury due to falling from the installation place.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base flame can cause the unit falling down and cause personal injury.
- **Do not install the unit in the locations listed below**
  ·Locations where carbon fiber, metal powder or any powder is floating.
  ·Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  ·Vehicles and ships
  ·Locations where cosmetic or special sprays are often used.
  ·Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  ·Locations where any machines which generate high frequency harmonics are used.
  ·Locations with salty atmospheres such as coastlines
  ·Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
  ·Locations where the unit is exposed to chimney smoke
  ·Locations at high altitude (more than 1000m high)
  ·Locations with ammonic atmospheres (e.g. organic fertilizer).
  ·Locations with calcium chloride (e.g. snow melting agent).
  ·Locations where heat radiation from other heat source can affect the unit
  ·Locations without good air circulation.
  ·Locations with any obstacles which can prevent inlet and outlet air of the unit
  ·Locations where short circuit of air can occur (in case of multiple units installation)
  ·Locations where strong air blows against the air outlet of outdoor unit
  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  ·Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  ·Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  ·Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  ·Locations where vibration and operation sound generated by the outdoor unit can affect seriously. (on the wall or at the place near bed room)
  ·Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  ·Locations where drainage cannot run off safely.
  It can affect surrounding environment and cause a claim
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
  It can cause the damage of the items.
- **Do not touch any buttons with wet hands**
  It can cause electric shocks
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not clean up the unit with water**
  It can cause electric shocks
- **Do not operate the outdoor unit with any article placed on it.**
  You may incur property damage or personal injure from a fall of the article.
- **Do not step onto the outdoor unit.**
  You may incur injury from a drop or fall.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A has adopted a different size indoor unit service valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R410A tools listed in the table on the right before installing or servicing this unit.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, which results in performance degradation.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

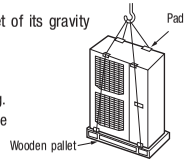
	Dedicated R410A tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position.
If not properly balanced, the unit can be thrown off-balance and fall.

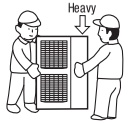
1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When some compelling reason necessitates the unpacking of the unit before it is carried in, use nylon slings or protective wood pieces so as not to damage the unit by ropes lifting it.



2) Portage

- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

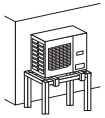
Be sure to select a suitable installation place in consideration of following conditions.

- ○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- ○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
- ○ A place where the unit is not exposed to oil splashes.
- ○ A place where it can be free from danger of flammable gas leakage.
- ○ A place where drain water can be disposed without any trouble.
- ○ A place where the unit will not be affected by heat radiation from other heat source.
- ○ A place where snow will not accumulate.
- ○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- ○ A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- ○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- ○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
- ○ A place where strong wind will not blow against the outlet air blow of the unit.
  Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

4) Caution about selection of installation location

(1) If the unit is installed in the area where the snow will accumulate, following measures are required.
The bottom plate of unit and intake, outlet may be blocked by snow.

1.Install the unit on the base so that the bottom is higher than snow cover surface.



2.Provide a snow hood to the outdoor unit on site.
Regarding outline of a snow hood, refer to our technical manual.



3.Install the unit under eaves or providen the roof on site.

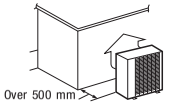


Since drain water generated by defrost control may freeze, following measures are required.

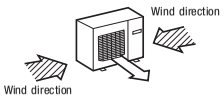
- ● Don't execute drain piping work by using a drain elbow and drain grommets (option parts). [Refer to Drain piping work.]
- ● Recommend setting Defrost Control (SW3-1) and Snow Guard Fan Control (SW3-2). [Refer to Setting SW3-1, SW3-2.]
- ● Attach heater on a base plate on site, if there is possibility to freeze drain water.
  In case that the product has a corrective drainage system, the drainage paths should have suitable measure against freezing but be sure not to melt the material of drainage paths with heat.

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

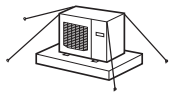
1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



3.The unit should be installed on the stable and level foundation.
If the foundation is not level, tie down the unit with wires.

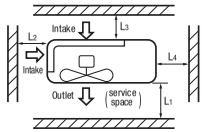


5) Installation space

- ● Walls surrounding the unit in the four sides are not acceptable.
- ● There must be a 1-meter or larger space in the above.
- ● Where a danger of short-circuiting exists, install guide louvers.
- ● When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- ● Where piling snow can bury the outdoor unit, provide proper snow guards.
- ● A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.

(mm)

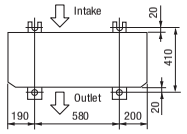
Size \ Example installation	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4 ※1	5	5	5
L4 ※2	250 (5)	250 (5)	250 (5)



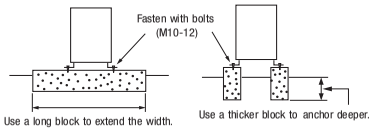
※1 In case of 200V model
※2 In case of 250V, A160V, A200V model. If unit is installed in L4 space with ( )'s condition, secure space of 250mm in lateral (L4) by unit movement at the time of exchange work of compressor.

6) Installation

① Anchor bolt fixed position



② Notabilia for installation



- ● In installing the unit, fix the unit's legs with bolts specified on the left.
- ● The protrusion of an anchor bolt on the front side must be kept within 15 mm.
- ● Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- ● Refer to the left illustrations for information regarding concrete foundations.
- ● Install the unit in a level area. (With a gradient of 5 mm or less.)
  Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

- ● When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site.
  So that strong wind will not blow against the outdoor heat exchanger directly. Regarding outline of a snow hood, refer to our technical manual.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

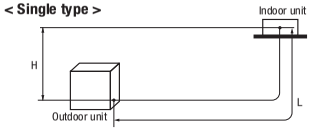
- ● Check the following points in light of the indoor unit specifications and the installation site.
- ● Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Resitrictions	One-way pipe length difference from the first branching point to the indoor unit			Marks appearing in the drawing				
						< 3m	≧ 3m	
	Model for outdoor units		Dimensional restrictions	Single type	Twin type	Triple type A	Triple type B	W-twin type
One-way pipe length of refrigerant piping	200V	Liquid Piping	φ 9.52 ≦ 40m	L	L+L1 L+L2	200V:L+L1,L+L2,L+L3 250V:L+L1,L+La+L2,L+La+L3 (2) (type B)	200V:L+L1 (1) 250V:Prohibitation of the use	L+La+L1,L+La+L2 L+La+L3,L+La+L4
			φ 12.7 40 ~ 70m					
	250V, A160V, A200V		φ 12.7 ≦ 70m					
	200V 250V, A160V, A200V	Gas Piping	φ 22.22 ≦ 35m					
			φ 25.4 or φ 28.58 35 ~ 70m					
Main pipe length	200V	Liquid Piping	φ 9.52 ≦ 40m	—	L	200V:L 250V:L (2) (type B)	200V:L 250V:Prohibitation of the use	L
			φ 12.7 40 ~ 70m					
	250V		φ 12.7 ≦ 70m					
	200V 250V	Gas Piping	φ 22.22 ≦ 35m					
			φ 25.4 or φ 28.58 35 ~ 70m					
One-way pipe length between the first branching point from to the second branching point	200V		≦ 5m	—	—	—	La	—
	250V					La (type B)	Prohibitation of the use	
One-way pipe length after the first branching point	200V		≦ 30m	—	L1,L2	L1,L2,L3	L1 (1)	La+L1,La+L2 La+L3,La+L4
	250V					L1,La+L2,La+L3 (2) (type B)	Prohibitation of the use	
One-way pipe length from the first branching point to indoor units through the second branching point	200V		≦ 27m	—	—	—	La+L2,La+L3 (1)	—
One-way pipe length difference from the first branching point to the indoor unit	Twin type		≦ 10m	—	ℓL1-L2ℓ	—	—	—
	Triple type	200V	≦ 3m			ℓ L1-L2 ℓ , ℓ L2-L3 ℓ , ℓ L3-L1 ℓ		
			≦ 10m			—	L1-(La+L2),L1-(La+L3) (1)	
		250V	≦ 3m			ℓ L1-(La+L2) ℓ , ℓ L1-(La+L3) ℓ , ℓ L2-L3 ℓ	Prohibitation of the use	
	W-twin type	200V, 250V	≦ 10m			—	—	ℓ (L1+La) - (L3+Lb) ℓ , ℓ (L1+La) - (L4+Lb) ℓ ℓ (L2+La) - (L3+Lb) ℓ , ℓ (L2+La) - (L4+Lb) ℓ
One way pipe length difference from the second branching point to the indoor unit	200V, 250V		≦ 10m	—	—	—	ℓ L2-L3 ℓ	ℓ L1-L2 ℓ , ℓ L3-L4 ℓ
Total pipe length after the second branching point			≦ 15m	—	—	—	—	L1+L2,L3+L4
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher,		≦ 30m	H	H	H	H	H
	When the outdoor unit is positioned lower,		≦ 15m					
Elevation difference between indoor units			≦ 0.5m	—	h	h1, h2, h3	h1,h2,h3	h1, h2, h3, h4, h5, h6

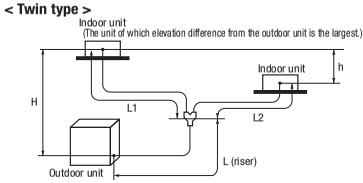
⚠CAUTION

- ● For model 200V, **always use φ12.7mm liquid main pipe** when the one way piping length exceeds 40m. If φ 9.52mm pipes are used in an installation having over 40m piping, they can cause performance degradation and/or water leaks from an indoor unit. Use φ9.52mm liquid main pipe when the one way piping length is less than 40m.
- ● Always use φ25.4mm or φ28.58mm gas pipes when the length of the main "L" exceeds 35m.
  If the φ22.22mm pipes are used in an installation having over 35m piping, they can cause performance degradation and/or water leaks from an indoor unit.

< Single type >

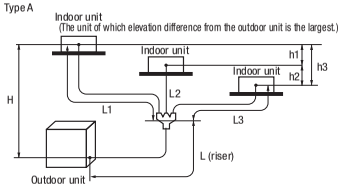


< Twin type >



< Triple type >

Type A



⚠CAUTION

- For model 200V, **always use ϕ12.7mm liquid main pipe** when the one way piping length exceeds 40m. If ϕ 9.52mm pipes are used in an installation having over 40m piping, they can cause performance degradation and/or water leaks from an indoor unit. Use ϕ9.52mm liquid main pipe when the one way piping length is less than 40m.
- Always use ϕ25.4mm or ϕ28.58mm gas pipes when the length of the main "L" exceeds 35m. If the ϕ22.22mm pipes are used in an installation having over 35m piping, they can cause performance degradation and/or water leaks from an indoor unit.
- Triple type B is not allowed to use in case of 250V.

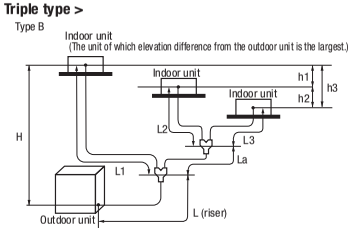
Note (1) Install the indoor units so that L + L1 becomes the longest one-way pipe. Keep the pipe length difference between L1 and (La + L2) or (La + L3) within 10m.
Note (2) Connect the unit that is the maximum capacity with L1.

2) Determination of pipe size

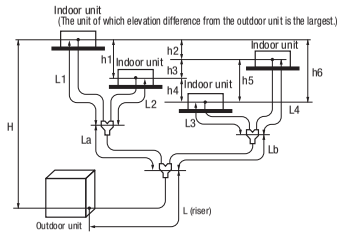
- Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

		Model 200V		Model 250V				Model A160V, A200V	
		Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
Outdoor unit connected		ϕ 22.22	ϕ 9.52	ϕ 22.22	ϕ 12.7	ϕ 22.22	ϕ 12.7	ϕ 22.22	ϕ 12.7
		Brazing	Flare	Brazing	Flare	Brazing	Flare	Brazing	Flare
Refrigerant piping (branch pipe L)		ϕ 22.22 or ϕ 25.4 or ϕ 28.58	ϕ 9.52 or ϕ 12.7	ϕ 22.22 or ϕ 25.4 or ϕ 28.58	ϕ12.7	ϕ 22.22 or ϕ 25.4 or ϕ 28.58	ϕ 12.7	ϕ 22.22 or ϕ 25.4 or ϕ28.58	ϕ 12.7
In the case of a single type	Indoor unit connected	ϕ 25.4	ϕ 9.52	ϕ 25.4	ϕ 12.7	–		ϕ 22.22 / ϕ 25.4	ϕ 12.7
	Capacity of indoor unit	Model 200V		Model 250V				Model A160V / Model A200V	Model A160V, A200V
In the case of a twin type	Branching pipe set	DIS-WB1G		DIS-WB1G		–		–	
	Refrigerant piping (branch pipe L1,L2)	ϕ 15.88	ϕ 9.52	ϕ15.88	ϕ 9.52				
	Indoor unit connected	ϕ 15.88	ϕ 9.52	ϕ15.88	ϕ 9.52				
	Capacity of indoor unit	Model 100V×2		Model 125V×2					
In the case of a triple type A	Branching pipe set	DIS-TB1G							
	Refrigerant piping (branch pipe L1,L2,L3)	ϕ 15.88	ϕ 9.52	–		–		–	
	Indoor unit connected	ϕ 15.88	ϕ 9.52						
	Capacity of indoor unit	Model 71V×3							
In the case of a triple type B	Branching pipe set	DIS-WB1G		DIS-WB1G		DIS-WB1G		–	
	Refrigerant piping (branch pipe La,L1)	ϕ 15.88	ϕ 9.52	ϕ 15.88	ϕ 9.52	ϕ 15.88	ϕ 9.52		
	Branching pipe set	DIS-WA1G		DIS-WA1G		DIS-WA1G			
	Refrigerant piping (branch pipe L2,L3)	ϕ 15.88	ϕ 9.52	ϕ 12.7	ϕ 9.52	ϕ 15.88	ϕ 9.52		
	Indoor unit connected	ϕ 15.88	ϕ 9.52	ϕ 12.7	ϕ 6.35	ϕ 15.88	ϕ 9.52		
	Capacity of indoor unit	Model 71V×3		Model 60V×2+ Model 125V		Model 71V×2+ Model 100V			
In the case of a W-twin type	Branching pipe set	DIS-WB1G		DIS-WB1G				–	
	Refrigerant piping (branch pipe La,Lb)	ϕ 15.88	ϕ 9.52	ϕ15.88	ϕ 9.52				
	Branching pipe set	DIS-WA1G × 2		DIS-WA1G × 2		–			
	Refrigerant piping (branch pipe L1,L2,L3,L4)	ϕ 12.7	ϕ 9.52	ϕ 12.7	ϕ 9.52				
	Indoor unit connected	ϕ 12.7	ϕ 6.35	ϕ 12.7	ϕ 6.35				
	Capacity of indoor unit	Model 50V×4		Model 60V×4					

< Triple type >



< Double twin type >

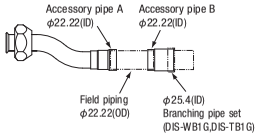


⚠CAUTION

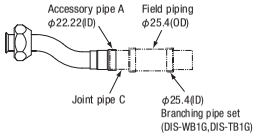
- When the model 50V or model 60V model is connected as an indoor unit, always use a ϕ 9.52 liquid pipe for the branch (branching pipe – indoor unit) and a different diameter joint supplied with the branching pipe set for connection with the indoor unit (ϕ 6.35 on the liquid pipe side). If a ϕ 6.35 pipe is used for connection with a branching pipe, a refrigerant distribution disorder may occur, causing one of the indoor units to fall short of the rated capacity.
- A riser pipe must be a part of the main. A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible. A branching part must be dressed with a heat-insulation material supplied as an accessory.
- For the details of installation work required at and near a branching area, see the installation manual supplied with your branching pipe set.

3) How to use pipe reducer

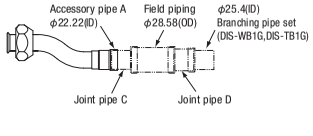
- ϕ22.22(OD) size of the refrigerant gas pipe can be used by using accessory pipe A,B.



- ϕ25.4(OD) size of the refrigerant gas pipe can be used by using accessory pipe A and joint pipe C. Ready joint C yourself. Need not accessory pipe B.



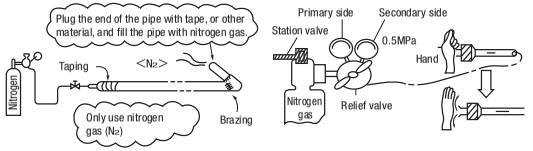
- ϕ28.58(OD) size of the refrigerant gas pipe can be used by using accessory pipe A and joint pipe C,D. Ready joint C and D yourself.



About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.



4) Refrigerant pipe wall thickness and material

- Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.
- This unit uses R410A. Always use 1/2H pipes having a 1.0mm or thicker wall for ϕ19.05 or larger pipes, because O-type pipes do not meet the pressure resistance requirement.

Pipe diameter [mm]	ϕ6.35	ϕ 9.52	ϕ 12.7	ϕ 15.88	ϕ 22.22	ϕ 25.4	ϕ 28.58
Minimum pipe wall thickness [mm]	0.8	0.8	0.8	1.0	1.0	1.0	1.0
Pipe material*	O-type pipe	O-type pipe	O-type pipe	O-type pipe	1/2H-type pipe	1/2H-type pipe	1/2H-type pipe

*Phosphorus deoxidized seamless copper pipe C1220T, JIS H3300

NOTE

- Select pipes having a wall thickness larger than the specified minimum pipe thickness.

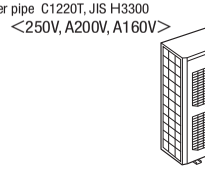
5) On-site piping work

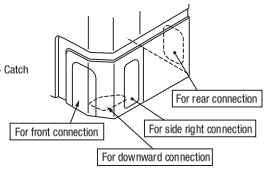
⚠IMPORTANT

- Take care so that installed pipes may not touch components within a unit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

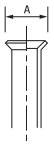
How to remove the service panel

First remove screws (× mark) of the service panel and push it down into the direction of the arrow mark and then remove it by pulling it toward you.



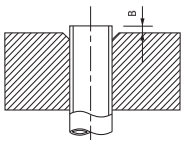


- The pipe can be laid in any of the following directions: side right, front, rear and downward.
- Remove a knock-out plate provided on the pipe penetration to open a minimum necessary area and attach an edging material supplied as an accessory by cutting it to an appropriate length before laying a pipe.
- Carry out the on site piping work with the service valve fully closed.
- Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
- Bend a pipe to a radius as large as practical.(R100–R150) Do not bend a pipe repeatedly to correct its form.
- Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- The pipe should be anchored every 1.5m or less to isolate the vibration.
- Tighten a flare joint securely with a double spanner.



Flared pipe end: A (mm)

Copper pipe outer diameter	A $^{0}_{-0.4}$
ϕ 6.35	9.1
ϕ 9.52	13.2
ϕ 12.7	16.6
ϕ 15.88	19.7



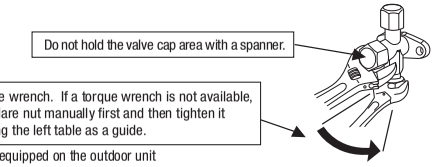
Copper pipe protrusion for flaring: B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R410A tool	With a conventional tool
ϕ 6.35	0–0.5	0.7–1.3
ϕ 9.52		
ϕ 12.7		
ϕ 15.88		

⚠ CAUTION **Do not apply force beyond proper fastening torque in tightening the flare nut.**

Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.

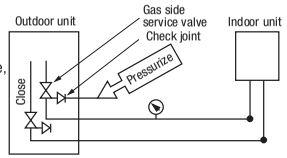
Service valve size (mm)	Tightening torque (N-m)	Tightening angle (°)	Recommended length of a tool handle (mm)
φ6.35 (1/4")	14–18	45–60	150
φ9.52 (3/8")	34–42	30–45	200
φ12.7 (1/2")	49–61	30–45	250
φ15.88 (5/8")	68–82	15–20	300
φ19.05 (3/4")	100–120	15–20	450



6) Air tightness test

① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the service valve's check joint equipped on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient Temperature fall 1℃, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
e) If a pressure drop is observed in checking e) and a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.

② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.



7) Evacuation

<Work flow> When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.

Airtighteness test completed
↓
Vacuuming begins
Run the vacuum pump for at least one hour after the vacuum gauge shows -101kPa or lower. (-755mmHg or lower)
↓
Vacuuming completed
Confirm that the vacuum gauge indicator does not rise even if the system is left for one hour or more.
↓
Vacuum gauge check
↓
Fill refrigerant

Pay attention to the following points in addition to the above for the R410A and compatible machines.

○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

8) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

<Single type>

Item / Capacity	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
200V	3.8	0	0.06 (Liquid piping φ9.52)	5.6	30
			0.145 (Liquid piping φ12.7)		
250V A160V, A200V	3.6		0.12	7.2	

<Twin, triple type>

Item / Capacity	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)		Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
			Main pipe	Branch pipe		
200V	3.8	0	0.06 (Liquid piping φ9.52)	0.06	5.6	30
			0.145 (Liquid piping φ12.7)			
250V A160V, A200V	3.6		0.12	0.06	7.2	

- A standard refrigerant charge volume means a refrigerant charge volume for an installation with 0m long refrigerant piping.
- This unit contains factory charged refrigerant covering 30m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 30m refrigerant piping. When refrigerant piping exceeds 30m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 30m.
- When refrigerant piping is shorter than 3m, reduce refrigerant by 1kg from the factory charged volume and adjust to 4.6kg or 6.2kg.
- If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, see "6. UTILIZATION OF EXISTING PIPING."

Formula to calculate the volume of additional refrigerant required

Model 200V	In the case of φ9.52mm main liquid piping	Additional charge volume (kg) = { Main pipe length (m) – 30 (m) } x 0.06 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)
	In the case of φ12.7mm main liquid piping	Additional charge volume (kg) = { Main pipe length (m) – 30 (m) } x 0.145 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)
Model 250V, A160V, A200V		Additional charge volume (kg) = { Main pipe length (m) – 30 (m) } x 0.12 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)

*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

- **To charge refrigerant again, recover refrigerant from the system first and then charge the volume calculated from the above table (Standard refrigerant charge volume + additional charge volume for total pipe length.)**

In case of 200V and using φ12.7 at main liquid piping, calculate the amount as follows
Total charge volume(kg) = Refrigerant volume charged for shipment at the factory + (Main piping length(m)-30(m))x0.145(kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)

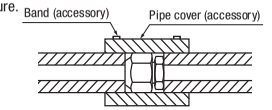
(2) Charging refrigerant

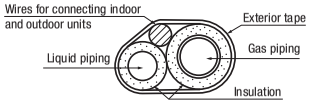
- Since R410A refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- Charge refrigerant always from the liquid side service port with the service valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

NOTE Put down the refrigerant volume calculated from the pipe length onto the label attached on the back side of the service panel.

9) Heating and condensation prevention

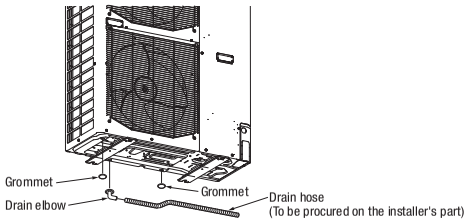
(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
(2) Use a heat insulating material that can withstand 120℃ or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
- Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
- Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
- Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
- **Both gas and liquid pipes need to be dressed with 20 mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**



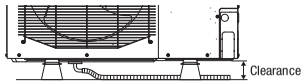


3. DRAIN PIPING WORK

- Execute drain piping by using a drain elbow and drain grommets supplied separately as option parts, where water drained from the outdoor unit is a problem.
- Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
- Condensed water may flow out from vicinity of service valve or connected pipes.
- Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)
- Do not use drain elbow and grommet made of plastic for drain piping when base heater for outdoor unit is used. Plastic grommet and elbow will be damaged and burnt in worst case.
- Prepare another drain tray made of metallic material for collecting drain when base heater is used.



- When condensed water needs to be led to a drain, etc., install the unit on a flat base (supplied separately as an option part) or concrete blocks. Then, please secure space for the drain elbow and the drain hose.

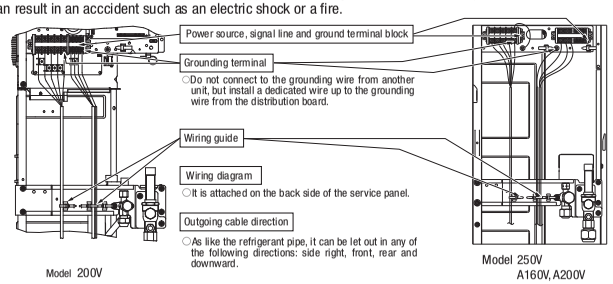


4. ELECTRICAL WIRING WORK For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- Do not use any supply cord lighter than one specified in parentheses for each type below.
  - braided cord (code designation 60245 IEC 51),
  - ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
  - flat twin tinsel cord (code designation 60227 IEC 41);

  Do not use anything lighter than polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If impropery grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
- The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an acccident such as an electric shock or a fire.



Model 200V

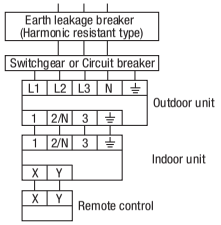
Model 250V
A160V, A200V

- Do not turn on the power until the electrical work is completeted .
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident)
- For power source cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable. Separate grounding wire from indoor - outdoor connecting wire.
- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.

Power cable, indoor-outdoor connecting wires

- Always perform grounding system installation work with the power cord unplugged.

⚠ **CAUTION** Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.



Model 200V, 250V
A160V, A200V

Model	Power source	Power cable thickness (mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
200V	3 phase 4 wire 380-415V 50Hz 380V 60Hz	5.5	20	54	ϕ1.6mm	ϕ1.6mm x 3
250V, A160V, A200V			21	51		

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear or Circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

※At the connection with FDU indoor unit.

Model	Power source	Power cable thickness (mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
200V	3 phase 4 wire 380-415V 50Hz 380V 60Hz	5.5	25	43	ϕ1.6mm	ϕ1.6mm x 3
250V, A160V, A200V			27	40		

※At the connection with FDUM indoor unit.

Model	Power source	Power cable thickness (mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
200V	3 phase 4 wire 380-415V 50Hz 380V 60Hz	5.5	22	49	ϕ1.6mm	ϕ1.6mm x 3
250V, A160V, A200V			24	45		

5. TEST RUN

⚠ WARNING

- Before conduct a test run, make sure that the service valves are opened.
- Turn on power 6 hours prior to a test run to energize the crank case heater.
- In case of the first operation after turning on power, even if the unit does not move for 30 minutes, it is not a breakdown.
- Always give a 3-minute or longer interval before you start the unit again whenever it is stopped.
- Removing the service panel will expose high-voltage live parts and high-temperature parts, which are quite dangerous. Take utmost care not to incur an electric shock or burns. Do not leave the unit with the service panel open.

} A failure to observe these instructions can result in a compressor breakdown.

⚠ CAUTION

- When you operate switches (SW3, SW5) for on-site setting, be careful not to touch a live part.
- You cannot check discharge pressure from the liquid service valve charge port.
- The 4-way valve (20S) is energized during a heating operation.
- When power source is cut off to reset the unit, give 3 or more minutes before you turn on power again after power is cut off. If this procedure is not observed in turning on power again, "Communication error between outdoor and indoor unit" may occur.

1) Test run method

(1) A test run can be initiated from an outdoor unit by using SW3-3 and SW3-4 for on-site setting.
(2) Switching SW3-3 to ON will start the compressor.
(3) The unit will start a cooling operation, when SW3-4 is OFF, or a heating operation, when SW3-4 is ON.
(4) **Do not fail to switch SW3-3 to OFF when a test run is completed.**

SW-3-3	SW-3-4	
ON	OFF	Cooling during a test run
	ON	Heating during a test run
OFF	—	Normal or After the test operation

2) Checking the state of the unit in operation

Use check joints provided on the piping before and after the four-way valve installed inside the outdoor unit for checking discharge pressure and suction pressure.
As indicated in the table shown on the right, pressure detected at each point will vary depending on whether a cooling or heating operation has been selected.

	Check joint of the pipe	Charge port of the gas operation valve
Cooling operation	Discharge pressure (High pressure)	Suction pressure (Low pressure)
Heating operation	Suction pressure (Low pressure)	Discharge pressure (High pressure)

3) Setting SW3-1, SW3-2, on-site

(1) Defrost control switching (SW3-1)
- ·When this switch is turned ON, the unit will run in the defrost mode more frequently.
- ·Set this switch to ON, when installed in a region where outdoor temperature falls below zero during the season the unit is run for a heating operation.

(2) Snow guard fan control (SW3-2)
- ·When this switch is turned on, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3℃ or lower and the compressor is not running.
- ·When the unit is used in a very snowy country, set this switch to ON.

4) Failure diagnosis in a test run

Error indicated on the remote control unit	Printed circuit board LED(The cycles of 5 seconds)		Failure event	Action
	Red LED	Green LED		
E40	Blinking once	Blinking continuously	63H1 actuation or operation with service valves shut (occurs mainly during a heating operation)	1. Check whether the service valves are open. 2. If an error has been canceled when 3 minutes have elapsed since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.
E49	Blinking once	Blinking continuously	Low pressure error or operation with service valves shut (occurs mainly during a cooling operation)	

- If an error code other than those listed above is indicated, refer to the wiring diagram of the outdoor unit and the indoor unit.

5) The state of the electronic expansion valve.

The following table illustrates the steady states of the electronic expansion valve.

	When power is turned on	When the unit comes to a normal stop		When the unit comes to an abnormal stop	
		During a cooling operation	During a heating operation	During a cooling operation	During a heating operation
Valve for a cooling operation	Complete shut position	Complete shut position	Full open position	Full open position	Full open position
Valve for a heating operation	Full open position	Full open position	Complete shut position	Full open position	Full open position

6) Heed the following on the first operation after turning on the circuit breaker.

- ·This outdoor unit may start in the standby mode (waiting for a compressor startup), which can continue up to 30 minutes, to prevent the oil level in the compressor from lowering on the first operation after turning on the circuit breaker. If that is the case, do not suspect a unit failure.
- ·At the first operation of heating mode after turning on the circuit breaker, the outdoor unit may start in cooling mode a while to prevent from liquid refrigerant back to compressor. If that is the case, do not suspect a unit failure.

Items to check before a test run

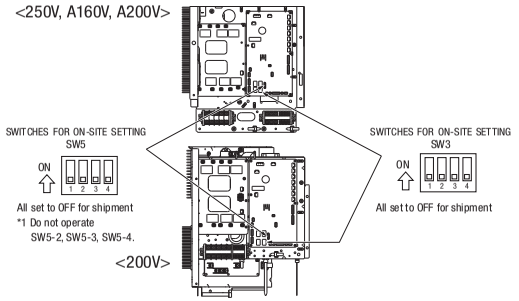
- When you leave the outdoor unit with power supplied to it, be sure to close the panel.

Item No.used in the installation manual	Item	Check item	Check
2	Refrigerant plumbing	If brazed, was it brazed under a nitrogen gas flow?	
		Were air-tightness test and vacuum extraction surely performed?	
		Are heat insulation materials installed on both liquid and gas pipes?	
		Are service valves surely opened for both liquid and gas systems?	
		Have you recorded the additional refrigerant charge volume and refrigerant pipe length on the panel's label?	
4	Electric wiring	Is the unit free of cabling errors such as uncompleted connection, an absent or reversed phase?	
		Are properly rated electrical equipments used for circuit breakers and cables?	
		Doesn't cabling cross-connect between units, where more than one unit are installed?	
		Aren't indoor-outdoor signal wires connected to remote control wires?	
		Do indoor-outdoor connecting cables connect between the same terminal numbers?	
		Are either VCT cabtyre cables or WF flat cables used for indoor-outdoor connecting cables?	
		Does grounding satisfy the D type grounding (type III grounding) requirements?	
		Is the unit grounded with a dedicated grounding wire not connected to another unit's grounding wire?	
		Are cables free of loose screws at their connection points?	
		Are cables held down with cable clamps so that no external force works onto terminal connections?	
—	Indoor unit	Is indoor unit installation work completed?	
		Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

Test run procedure

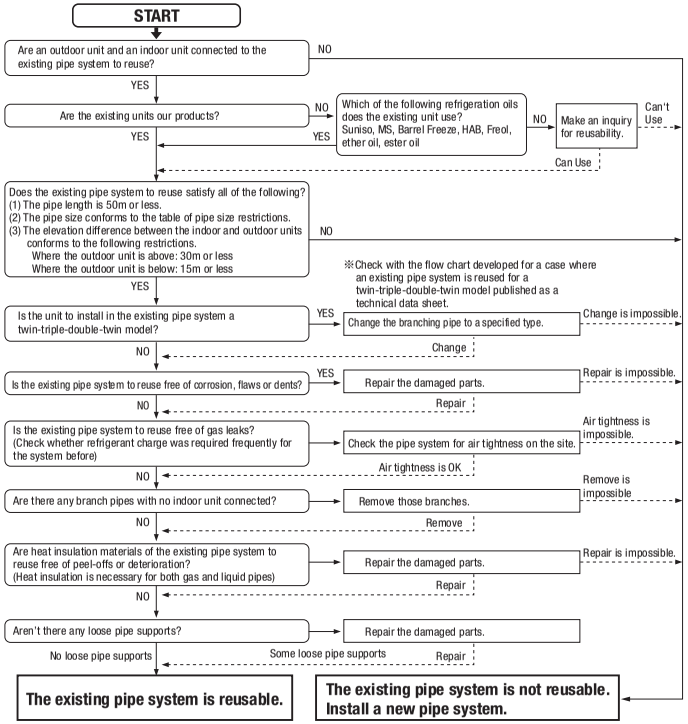
- Always carry out a test run and check the following in order as listed.

Turn	The contents of operation	Check
①	Open the gas side service valve fully.	
②	Open the liquid side service valve fully.	
③	Close the panel.	
④	Where a remote control unit is used for unit setup on the installation site, follow instructions for unit setup on the installation site with a remote control unit.	
⑤	SW3-3 ON / SW3-4 OFF: the unit will start a cooling operation.	
	SW3-3 ON / SW3-4 ON: the unit will start a heating operation.	
⑥	When the unit starts operation, press the wind direction button provided on the remote control unit to check its operation.	
⑦	Place your hand before the indoor unit's diffuser to check whether cold (warm) winds come out in a cooling (heating) operation.	
⑧	Make sure that a red LED is not blinking.	
⑨	When you complete the test run, do not forget to turn SW3-3 to the OFF position.	
⑩	Where options are used, check their operation according to the respective instruction manuals.	



6. UTILIZATION OF EXISTING PIPING.

Check whether an existing pipe system is reusable or not by using the following flow chart.



⚠ WARNING <Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the excising unit (in the order of (1), (2), (3) and (4))

(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side service valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.
- For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R410A.
- **Turn on-site setting switch SW5-1** to the ON position. (Where the gas pipe size is ϕ19.05)

<Where the existing unit cannot be run for a cooling operation.>

Wash the pipe system or install a new pipe system.
- If you choose to wash the pipe system, contact our distributor in the area.

<Table of pipe size restrictions>

◎:Standard pipe size ○:Usable
△:Restricted to shorter pipe length limits ×:Not usable

Additional charging amount of refrigerant per 1m		0.06kg/m			0.12kg/m ※5			0.2kg/m		
Pipe size	Liquid pipe	ϕ9.52	ϕ9.52	ϕ9.52	ϕ12.7	ϕ12.7	ϕ12.7	ϕ15.88	ϕ15.88	ϕ15.88
	Gas pipe	ϕ22.22	ϕ25.4	ϕ28.58	ϕ22.22	ϕ25.4	ϕ28.58	ϕ22.22	ϕ25.4	ϕ28.58
200V	Usability	◎	○※2	○※2	△	◎	◎	△	△	×
	Maximum one-way pipe length	35	70	70	35	70	70	30m	30m	×
	Length covered without additional charge	30	30	30	16.5	16.5	16.5	9	9	×
250V A160V A200V	Usability	×	×	×	◎	◎	◎	△	△	△
	Maximum one-way pipe length	×	×	×	35	70	70	35	40	40
	Length covered without additional charge	×	×	×	30	30	25	18	18	18

<Pipe system after the branching pipe>

			After 1st branch ※3			After 2nd branch		
Additional charging amount of refrigerant per 1m			0.06kg/m			0.06kg/m		
Pipe size	Liquid pipe		ϕ9.52			ϕ9.52		
	Gas pipe		ϕ12.7	ϕ15.88	ϕ19.05※1	ϕ12.7	ϕ15.88	ϕ19.05※1
Model	Combination type	Combination of capacity						
200V	Twin	100+100	×	◎	○	–	–	–
	Triple A	71+71+71	×	◎	○	–	–	–
	Triple B	71+71+71	×	◎	○ ※4	×	◎	○
	Double twin	50+50+50+50	×	◎	○	◎	○	×
250V A160V A200V	Twin	125+125	×	◎	○	–	–	–
	Triple A	–	–	–	–	–	–	–
	Triple B	60+60+125	×	◎	○ ※4	◎	×	×
	Triple B	71+71+100	×	◎	○ ※4	×	◎	×
	Double twin	60+60+60+60	×	◎	○	◎	○	×

※1 Because of its insufficient pressure resistance, **turn the dip switch SW5-1** provided on the outdoor unit board to the ON position for ϕ19.05 × t1.0. (In the case of a twin-triple-double-twin model, this also applies to the case where ϕ19.05 × t1.0 is used in a pipe system after the first branching point.) However, you need not turn the dip switch SW5-1 to the ON position, if 1/2H pipes or pipes having 1.2 or thicker walls are used.
※2 When the main pipe length exceeds 40m, a significant capacity drop may be experienced due to pressure loss in the liquid pipe system. Use ϕ12.7 for the liquid main.
※3 Piping size after branch should be equal or smaller than main pipe size.
※4 Piping size from first branch to indoor unit should be ϕ9.52 (Liquid) / ϕ15.88 (Gas).
※5 In case of 200V, change 0.145 kg/m.
- When refrigerant piping is shoter than 3m, reduce refrigerant by 1kg from factory charged volume.
- Any combinations of pipe sizes not listed in the table or marked with × in the table are not usable.

<The model types of existing units of which branching pipes are reusable.>

Models later than Type 8.

●FDC＊＊＊8□□□　●FDCP＊＊＊8□□□

The branching pipes used with models other than those listed above are not reusable because of their insufficient pressure resistance. Please use our genuine branching pipes for R410A.

●＊＊＊ are numbers representing horsepower. □□□ is an alphanumeric letter.

Formula to calculate additional charge volume

Additional charge volume (kg) = {Main pipe length (m) − Length covered without additional charge shown in the table (m)} × Additional charge volume per meter of pipe shown in the table (kg/m) + Total length of branch pipes (m) × Additional charge volume per meter of pipe shown in the table (kg/m)

※ If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.

Example) When an 250V (twin installation) is installed in a 40m long existing pipe system (main pipe length 30m, liquid ϕ15.88, gas ϕ25.4; pipe length after branching pipe 5m x 2, liquid ϕ9.52, gas ϕ15.88), the quantity of refrigerant to charge additionally should be (30m-18m) x 0.2kg/m + 5m x 2 x 0.06kg/m = 3.0 kg.

2.9.5 Method for connecting the accessory pipe

Model FDC200VSA

PSC012D028A Ⓓ

- Be sure to use the accessory pipe to connect the service valve on the gas side with the field pipe.
- Be sure to use the straight pipe（Procured at the field） shown in the table 1 applicable.
- When tightening the flare, connect the pipe securely by pressing the flared face of pipe against the service valve.
- When brazing between the pipe in place and the attached pipe, confirm that no excessive force is applied to the flare joint. Otherwise gas could leak from the flare joint.
- Connect the attached pipe according to the following steps ① – ⑤.

① Referring to Table 2 and Table 3, prepare the straight pipe and the elbow in the field, which are used in the construction examples Ⓐ – Ⓓ applicable to the connecting direction.

② Firstly, use the accessory pipe to assemble the connecting pipe assembly outside the outdoor unit.（As shown in the figure of connecting examples Ⓐ – Ⓓ.）

③ After assembling the connecting pipe, connect it to the service valve on the gas side inside the outdoor unit. Tighten the flare nut with appropriate torque.

Proper torque	
φ19.05	100 – 120N・m

④ After connection of the connecting pipe assembly to the service valve on the gas side, braze the connecting pipe assembly and the field pipe.

⑤ When connecting pipe contacts wiring, attach heat insulating material to the pipe in order to prevent from contacting of the pipe and wiring.（ If the wiring is rubbed with the pipe and the cover of wiring is teared, there is a risk of a short circuit or an electric shock.）

About brazing

- Be sure to braze while supplying nitrogen gas.
  If no nitrogen gas is supplied, a large amount of impurity（oxidized film） will be generated, which may clog the capillary tube and the expansion valve, resulting in fatal malfunction.

Table 1 Pipe specification

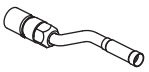
Refrigerant line（one way） length（m）	
≦35（m）	φ22.22 x T1.0
≦70（m）	φ25.4 x T1.0 or φ28.58 x T1.0

- Be sure to use pipes of 1／2H material, and wall thickness above 1mm.（Pressure resistance of O-type pipe is not enough）

Table 2 Parts used for the connecting pipe assembly

No.	Name	Quantity	Remark
1	Accessory pipe A	1	Accessory
2	Straight pipe ①	1	Procured at the field
3	Straight pipe ②	1 or 0	Procured at the field（Not required for downward direction）
4	Elbow	1 or 0	Procured at the field（Not required for downward direction）

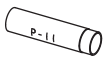
A



Accessory pipe A x 1 pc

Heat insulating material is attached to the accessory pipe with band. When installing the heat insulating material, cut the band and retrieve it.

B

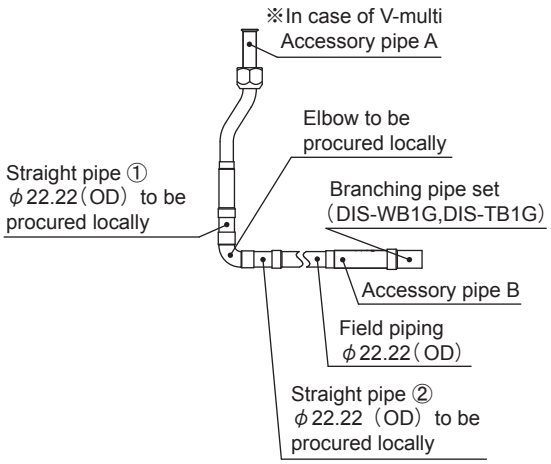


Accessory pipe B x 1 pc

- Branching pipe set can be used by using the accessory pipe B. When φ22.22（OD） size of the indoor unit gas pipe is used, the accessory pipe B is unnecessary.

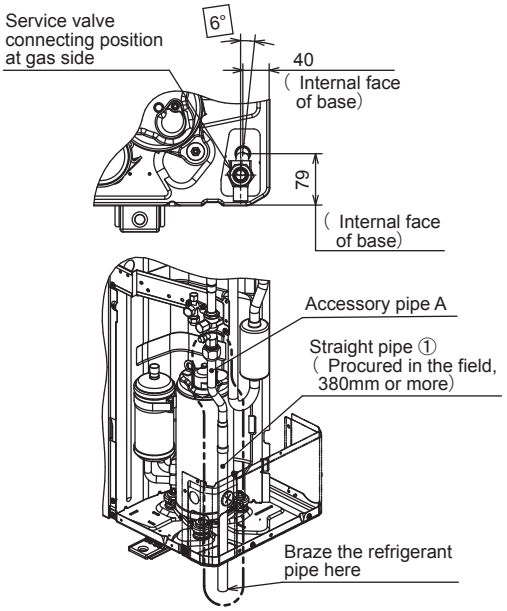
Table 3 Length and specification of straight pipe（Procured in the field）

	ⒶDownward	ⒷForward	ⒸRightward	ⒹBackward
Straight pipe ①	380mm or more	200mm	155mm	215mm
Straight pipe ②	—	160mm or more	160mm or more	370mm or more

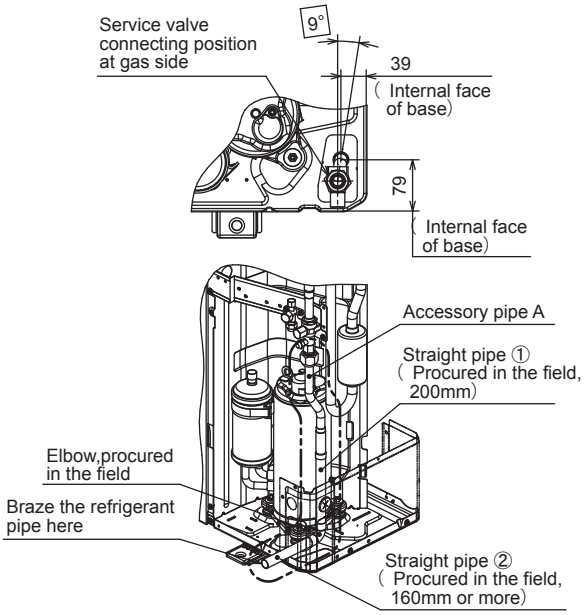


【 Connection example Ⓐ – Ⓓ applicable to the connecting direction.】

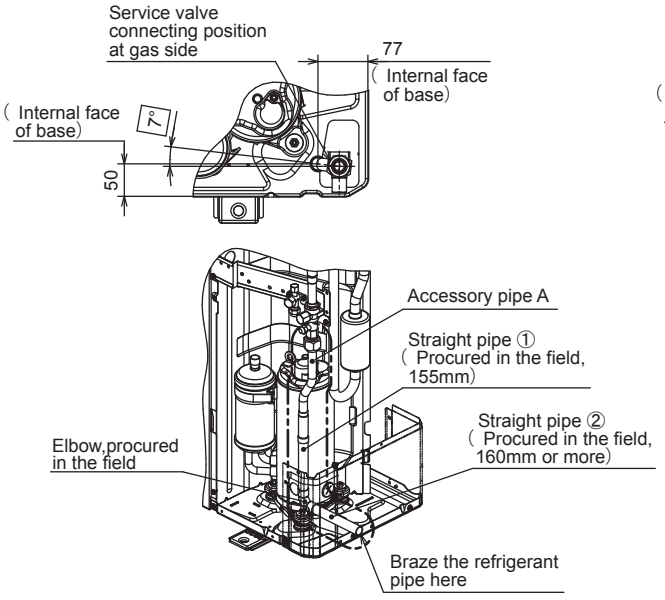
- The piping angle shown below is an example in case of 15mm of heat insulating material.
  Adjust an angle, according to the thickness of heat insulating material.
  Pass the connecting pipe in a hole after angle adjustment.



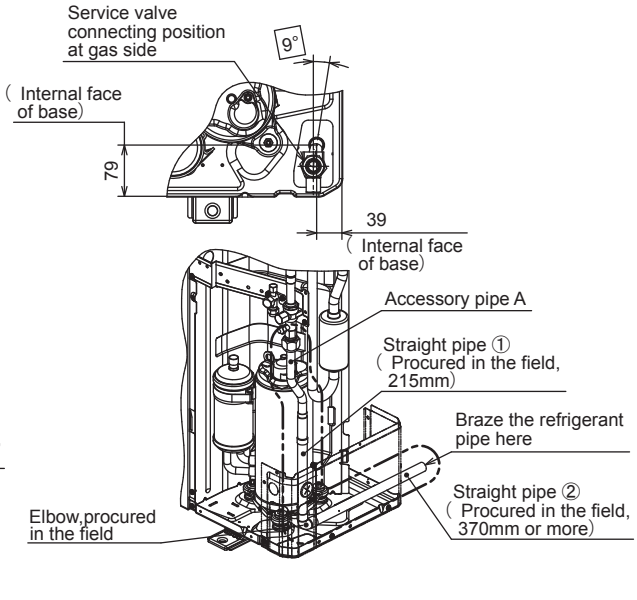
Connection example of refrigerant pipe-Ⓐ
(Downward connection)



Connection example of refrigerant pipe-Ⓑ
(Forward connection)



Connection example of refrigerant pipe-Ⓒ
(Rightward connection)



Connection example of refrigerant pipe-Ⓓ
(Backward connection)

Model FDC250VSA

PSC012D028C Ⓓ

- Be sure to use the accessory pipe to connect the service valve on the gas side with the field pipe.
- Be sure to use the straight pipe （Procured at the field） shown in the table 1 applicable to the model of outdoor unit.
- When tightening the flare, connect the pipe securely by pressing the flared face of pipe against the service valve.
- When brazing between the pipe in place and the attached pipe, confirm that no excessive force is applied to the flare joint. Otherwise gas could leak from the flare joint.
- Connect the attached pipe according to the following steps ① – ⑤.
  ① Referring to Table 2 and Table 3, prepare the straight pipe and the elbow in the field, which are used in the construction examples Ⓐ – Ⓓ applicable to the connecting direction.
  ② Firstly, use the accessory pipe to assemble the connecting pipe assembly outside the outdoor unit. （As shown in the figure of connecting examples Ⓐ – Ⓓ.）
  ③ After assembling the connecting pipe, connect it to the service valve on the gas side inside the outdoor unit. Tighten the flare nut with appropriate torque.

Proper torque	
ϕ19.05	100 – 120N・m

  ④ After connection of the connecting pipe assembly to the service valve on the gas side, braze the connecting pipe assembly and the field pipe.
  ⑤ When connecting pipe contacts wiring, attach heat insulating material to the pipe in order to prevent from contacting of the pipe and wiring. （If the wiring is rubbed with the pipe and the cover of wiring is teared, there is a risk of a short circuit or an electric shock.）

About brazing

- Be sure to braze while supplying nitrogen gas.
  If no nitrogen gas is supplied, a large amount of impurity （oxidized film） will be generated, which may clog the capillary tube and the expansion valve, resulting in fatal malfunction.

※In case of V-multi （In case of FDC250V）

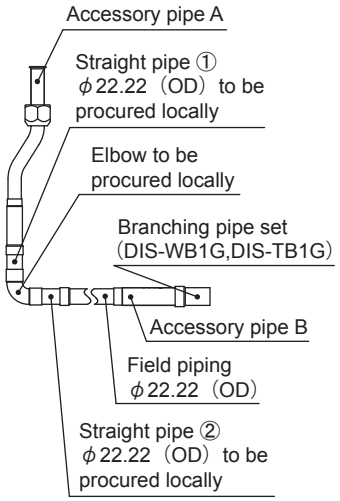


Table 1 Pipe specification

		Refrigerant line （one way） length （m）	
Single type	FDC250V	≦35 （m）	ϕ22.22 x T1.0
		≦70 （m）	ϕ25.4 x T1.0 or ϕ28.58 x T1.0
Multi type	FDC224KXZPE1	≦90 （m）	ϕ19.05 x T1.0
		≦120 （m）	ϕ22.22 x T1.0
	FDC280KXZPE1	≦90 （m）	ϕ22.22 x T1.0
		≦120 （m）	ϕ25.4 x T1.0 or ϕ28.58 x T1.0

- Be sure to use pipes of 1／2H material, and wall thickness above 1mm. （Pressure resistance of O-type pipe is not enough）

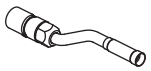
Table 2 Parts used for the connecting pipe assembly

No.	Name	Quantity	Remark
1	Accessory pipe A	1	Accessory
2	Straight pipe ①	1	Procured at the field
3	Straight pipe ②	1 or 0	Procured at the field （Not required for downward direction）
4	Elbow	1 or 0	Procured at the field （Not required for downward direction）

Table 3 Length and specification of straight pipe （Procured in the field）

	Ⓐ Downward	Ⓑ Forward	Ⓒ Rightward	Ⓓ Backward
Straight pipe ①	400mm or more	192.5 – 202.5mm	192.5 – 202.5mm	210mm
Straight pipe ②	—	105mm or more	155mm or more	370mm or more

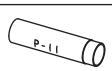
A



Accessory pipe A x 1 pc （Except FDC224KXZPE1）

Heat insulating material is attached to the accessory pipe with band. When installing the heat insulating material, cut the band and retrieve it.

B

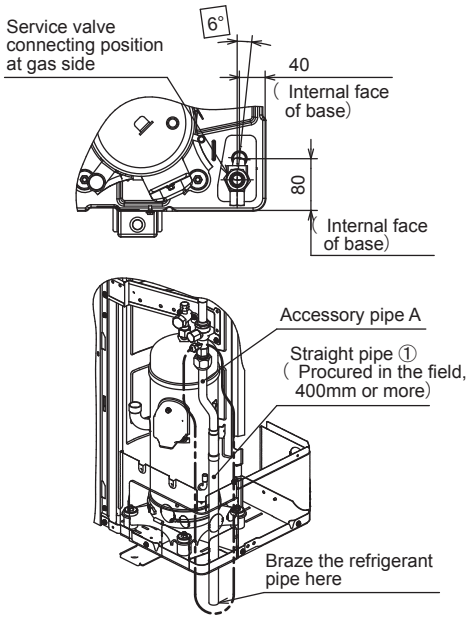


Accessory pipe B x 1 pc （Only use for FDC250V）

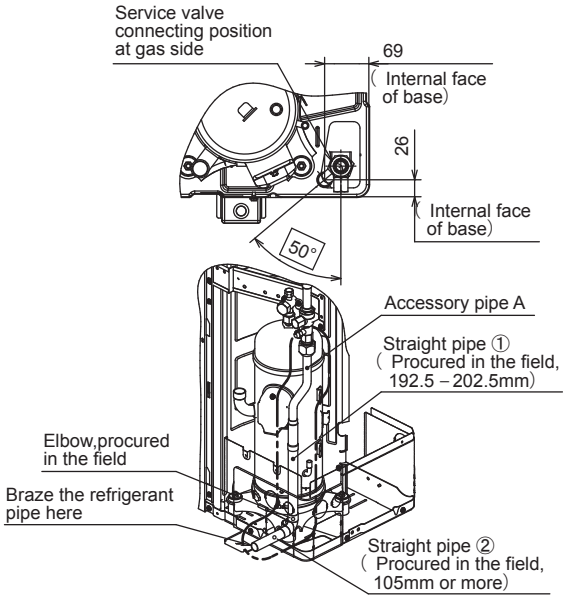
- Branching pipe set can be used by using the accessory pipe B. When ϕ22.22 （OD） size of the indoor unit gas pipe is used, the accessory pipe B is unnecessary.

【 Connection example Ⓐ – Ⓓ applicable to the connecting direction.】

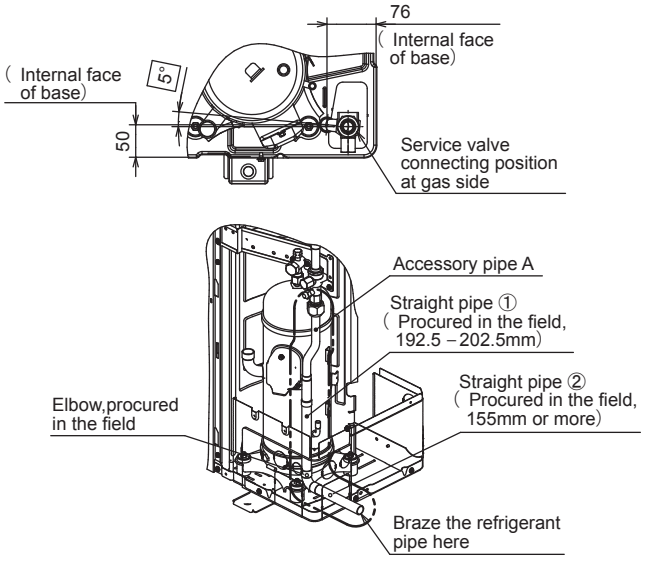
- The piping angle shown below is an example in case of 15mm of heat insulating material.
  Adjust an angle, according to the thickness of heat insulating material.
  Pass the connecting pipe in a hole after angle adjustment.



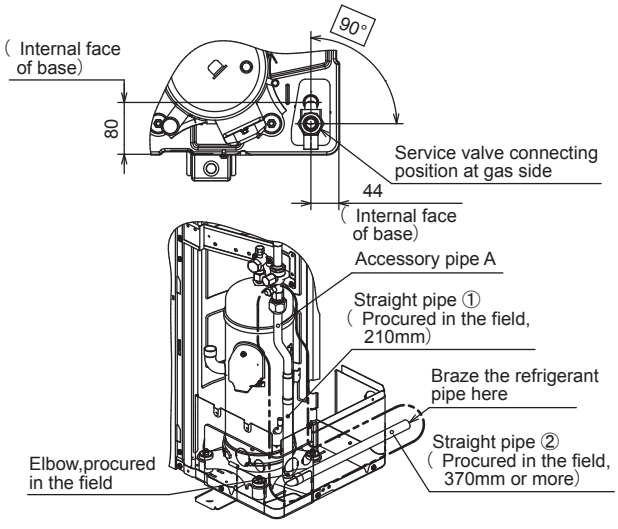
Connection example
of refrigerant pipe-Ⓐ
(Downward connection)



Connection example
of refrigerant pipe-Ⓑ
(Forward connection)



Connection example
of refrigerant pipe-Ⓒ
(Rightward connection)



Connection example
of refrigerant pipe-Ⓓ
(Backward connection)

2.9.6 Instructions for branching pipe set (DIS-WA1, WB1, TA1, TB1)

See page 90.

2.10 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

2.10.1 Remote control (Option parts) ..... See page 93.
2.10.2 Operation control function by the wired remote control ..... See page 96.
2.10.3 Operation control function by the indoor control ..... See page 99.
2.10.4 Operation control function by the outdoor control

(I) Models FDC100-140VNA, 100-140VSA

(1) Determination of compressor speed (Frequency)

Required frequency

(a) Cooling/dehumidifying operation

Unit: rps

Model			100	125	140
Max. required frequency	Usual operation		90	105	105
	Silent mode, outdoor temperature ≦ 15°C	SW7-3 OFF	60	80	85
		SW7-3 ON	47	50	53
Min. required frequency			15	15	15

(b) Heating operation

Unit: rps

Model			100	125	140
Max. required frequency	Usual operation		90	105	110
	Silent mode	SW7-3 OFF	60	80	85
		SW7-3 ON	47	50	53
Min. required frequency			15	15	15

(c) If the indoor unit fan speed becomes “Me” or “Lo”, Max required frequentcy goes down accordingly depending on indoor unit model.

(d) Max. required frequency under high outdoor air temperature in cooling mode
Maximum required frequency is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		100	125	140
Max. required frequency	Outdoor air temperature is 40°C or higher	75	90	96
	Outdoor air temperature is 46°C or higher	75	75	75

(e) Max. required frequency under outdoor air temperature in heating mode
Maximum required frequency is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		100	125	140
Max. required frequency	Outdoor air temperature is 18°C or higher	60	80	85

(f) Selection of max. required frequency by heat exchanger temperature
1) Maximum required frequency is selected according to the outdoor unit heat exchanger temperature (Tho-R) during cooling/dehumidifying or according to the indoor unit heat exchanger temperature (Thi-R) during heating mode.
2) When there are 3 indoor unit heat exchanger temperatures (Thi-R), whichever the highest applies.

Unit: rps

Model			100	125	140
Max. required frequency	Cooling/ dehumidifying	Outdoor unit heat exchanger temperature is 56°C or higher	90	100	100
	Heating	Indoor unit heat exchanger temperature is 56°C or higher	90	100	100

(g) When any of the controls from (a) to (f) above may duplicate, whichever the smallest value among duplicated controls is taken as the maximum required frequency.

(h) During heating, it is operated with the maximum required frequency until the indoor unit heat exchanger temperature becomes 40°C or higher.

(2) Compressor start control

(a) Compressor starts upon receipt of the thermostat ON signal from the indoor unit.

(b) However, at initial start after turning the power source breaker, it may enter the standby state for maximum 30 minutes (" PREPARATION" is displayed on the remote control) in order to prevent the oil loss in the compressor.
If the cooling/dehumidifying/heating operation is selected from the remote control when the outdoor unit is in the standby state, " PREPARATION" is displayed for 3 seconds on the remote control.

(3) Compressor soft start control

(a) Compressor protection start I

[Control condition]
Normally, the compressor operation frequency is raised in this start pattern.
[Control contents]
a) Starts with the compressor's target frequency at **A** rps.
However, when the ambient air temperature (Tho-A) is 35°C or higher during cooling/dehumidifying or the indoor return air temperature (Thi-A) is 25°C or higher during heating, it starts at **C** rps.
b) At 30 seconds after the start of compressor, its target frequency changes to **B** rps and the compressor is operated for 2 - 4 minutes with its operation frequency fixed at **B** rps.

Model	Operation mode	A rps	B rps	C rps
100-140	Cooling/Dehumidifying	55	55	30
	Heating	55	55	30

(b) Compressor protection start III

[Control condition]
Number of compressor starts is only 1 counted after the power source breaker ON.
[Control contents]
Operates by selecting one of following start patterns according to the operation mode and the outdoor air temperature (Tho-A).

i) Low frequency operation control during cooling/dehumidifying
[Control condition]
Upon establishing the conditions of compressor protection start III, the low frequency operation control is performed during cooling/dehumidifying.
[Control contents]
① Starts with the compressor's target frequency at **A** rps. When the outdoor air temperature (Tho-A) is 35°C or higher, it starts at **C** rps.
② At 30 seconds after the compressor start, the compressor's target frequency is changed to **B** rps and the compressor's operation frequency is fixed for 10 minutes.

Model	Operation mode	A rps	B rps	C rps
100-140	Cooling/Dehumidifying	55	55	30

ii) Low frequency operation control during heating
[Control condition]
When the conditions of compressor protection start III are established and the following condition is satisfied, the low number of revolutions operation control is performed during heating.
① At 30 minutes or more after turning the power source breaker on
[Control contents]
① Starts the compressor with its target frequency at **A** rps. However, when the indoor unit return air temperature (Thi-A) is 25°C or higher, it start at **C** rps.
② At 30 seconds after the start of compressor, the compressor's target frequency is changed to **B** rps and the compressor's operation frequency is fixed for 10 minutes.

Model	Operation mode	A rps	B rps	C rps
100-140	Heating	55	55	30

(4) Outdoor fan control

(a) Outdoor unit fan tap and fan motor speed

Unit: min^{-1}

Model	Mode	Fan motor tap						
		① speed	② speed	③ speed	④ speed	⑤ speed	⑥ speed	⑦ speed
100-140	Cooling/Dehumidifying	200	350	600(1)	740	820	870	950
	Heating	200	350	600(1)	740	820	870	950

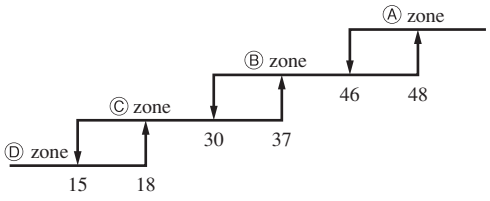
Note (1) If the "silent mode start" signal is received from the remote control, the speed changes from 600 to 500.

(b) Fan tap control during Cooling/Defumidifying operation

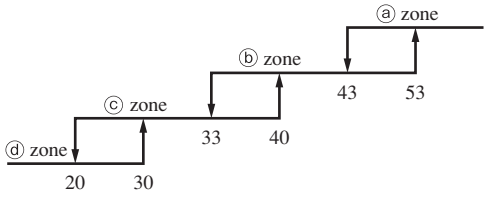
Fan taps are selected depending on the outdoor unit heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).
Note (1) It is detected by Tho-R1 or R2, whichever the higher.

	Ⓐ zone	Ⓑ zone	Ⓒ zone	Ⓓ zone
ⓐ zone	Tap 5	Tap 5	Tap 5	Tap 4
ⓑ zone	Tap 5	Tap 5	Tap 4(1)	Tap 3
ⓒ zone	Tap 4	Tap 4(1)	Tap 3	Tap 2
ⓓ zone	Tap 3	Tap 3	Tap 2	Tap 1

Note (1) If the "silent mode start" signal is received from the remote control, the speed changes from Tap 4 to Tap 3.



Outdoor air temperature (˚C)



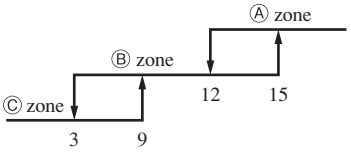
Outdoor unit heat exchanger temperature (˚C)

(c) Fan tap control during heating operation

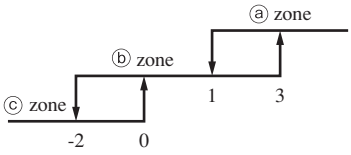
Fan taps are selected depending on the outdoor unit heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).
Note (1) It is detected by Tho-R1 or R2, whichever the lower.

	Ⓐ zone	Ⓑ zone	Ⓒ zone
ⓐ zone	Tap 3	Tap 3	Tap 4
ⓑ zone	Tap 3	Tap 4(1)	Tap 5
ⓒ zone	Tap 4	Tap 5	Tap 6

Note (1) If the "silent mode start" signal is received from the remote control, the speed changes from Tap 4 to Tap 3.



Outdoor air temperature (˚C)



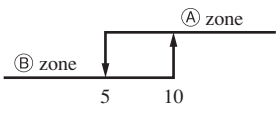
Outdoor unit heat exchanger temperature (˚C)

(d) Outdoor fan control at cooling low outdoor air

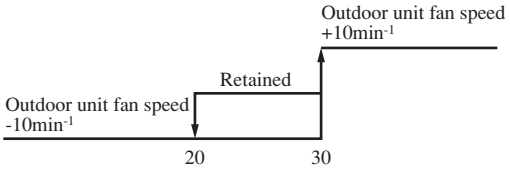
i) When all the following conditions are established after the start of compressor, the following control is implemented.

If the outdoor air temperature (Tho-A) is in the zone Ⓑ in the cooling/dehumidifying mode, it has elapsed 20 seconds from the start of outdoor unit fan and the outdoor unit fan is at the tap 1 speed, the outdoor unit fan speed is controlled according to the outdoor unit heat exchanger temperature (Tho-R1, R2).

Note (1) It is detected with Tho-R1 or R2, whichever the higher.



Outdoor air temperature (˚C)



Outdoor unit heat exchanger temperature (˚C)

ii) The outdoor unit heat exchanger temperature is detected always and, when the number of revolutions of the outdoor fan speed has been increased or decreased, there is no change of fan speed for 20 seconds.

iii) Rage of the outdoor unit fan speed under this control is as follows.
   a) Lower limit: 130min^{-1}
   b) Upper limit: 500min^{-1}

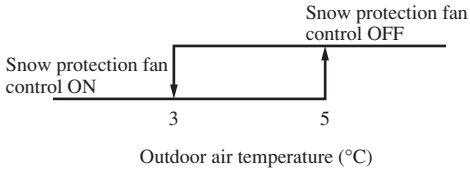
iv) As any of the following conditions is established, this control terminates.
   a) When the outdoor air temperature is in the zone Ⓐ and the outdoor unit heat exchanger temperature at 30°C or higher is established for 40 seconds or more continuously.
   b) When the outdoor fan speed is 500rpm and the outdoor unit heat exchanger temperature at 30°C or higher is established for 40 seconds or more continuously.
   c) When the outdoor unit heat changer temperature at 45°C or higher is established for 40 seconds or more.

(e) Caution at the outdoor unit fan start control (3 phase models only)

When the outdoor unit fan is running at 400min^{-1} before operating the compressor, it may operate with the compressor only, without starting up the outdoor fan. This is normal.

(f) Snow protection fan control

If the dip switch (SW3-2) on the outdoor unit control PCB is turned ON, the outdoor unit fan is operated for 30 seconds at 4 tap speed once in every 10 minutes depending on the outdoor air temperature (detected with Tho-A) in the stop mode or anomalous stop mode.

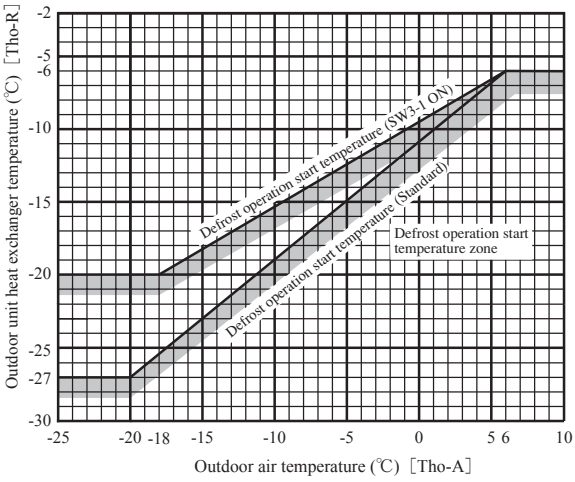


(5) Defrost operation

(a) Starting conditions

If all of the following defrost operation conditions A or conditions B are satisfied, the defrost operation starts.

i) Defrost conditions A
   a) Cumulative compressor operation time after the end of defrost operation has elapsed 37 minutes, and the cumulative compressor operation time after the start of heating operation (remote control ON) has elapsed 30 minutes.
   b) After 5 minutes from the compressor ON
   c) After 5 minutes from the start of outdoor unit fan
   d) After satisfying all above conditions, if temperatures of the outdoor unit heat exchanger temperature thermistor (Tho-R1, R2) and the outdoor air temperature thermistor (Tho-A) become lower than the defrost operation start temperature as shown by the right figure for 15 seconds continuously.



ii) Defrost conditions B
   a) When previous defrost ending condition is the time out of defrost operation and it is in the heating operation after the cumulative compressor operation time after the end of defrost operation has become 30 minutes.
   b) After 5 minutes from the start of compressor
   c) After 5 minutes from the start of outdoor unit fan

(b) Ending conditions

When any of the following conditions is satisfied, the heating operation starts.

i) When it has elapsed 8 minutes and 20 seconds after the start of defrost operation.

ii) When the outdoor unit heat exchanger temperatures (Tho-R1, R2), whichever the lower, becomes 7°C or higher for 10 seconds continuously.

(c) Switching of defrost operation with SW3-1

i) If SW3-1 on the outdoor unit control PCB is turned to ON, it becomes easier to enter the defrost operation. Use this when installing a unit at snowing regions.

ii) Control contents

a) It allows entering the defrost operation under the defrost condition A when the cumulative heating operation time becomes 30 minutes. It is 37 minutes at SW3-1 OFF (Factory default).

b) It allows entering the defrost operation under the defrost condition B when the cumulative heating operation time becomes 25 minutes. It is 30 minutes at SW3-1 OFF (Factory default).

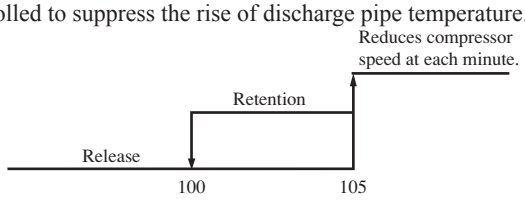
c) It allows the defrost operation with the outdoor unit heat exchanger temperature (Tho-R).

(6) Protective control/anomalous stop control by compressor's number of revolutions

(a) Compressor discharge pipe temperature protection

i) Protective control

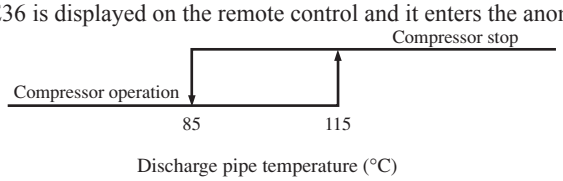
As the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of discharge pipe temperature.



ii) Anomalous stop control

a) If the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor stops.

b) When it is detected 2 times within 60 minutes or after continuous 60 minutes, including the stop of compressor, E36 is displayed on the remote control and it enters the anomalous stop mode.



iii) Reset of anomalous stop mode

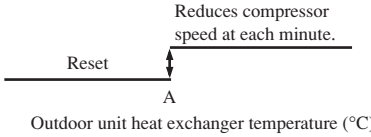
As it drops to the reset value of 85°C or lower for 45 minutes continuously, it becomes possible to restart from the remote control.

(b) Cooling high pressure protection

i) Protective control

a) When the outdoor air temperature (Tho-A) is 40°C or higher and the outdoor unit heat exchanger temperature (Tho-R) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of high pressure.

b) Control value A is updated to an optimum value automatically according to the operating conditions.

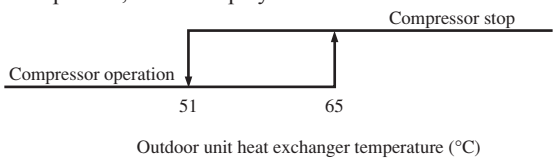


Control value A
54-60°C

ii) Anomalous stop control

a) As the outdoor unit heat exchanger temperature (Tho-R) exceeds the setting value, the compressor stops.

b) If it is detected 5 times within 60 minutes or 65°C or higher continues for 60 minutes, including the stop of compressor, E35 is displayed on the remote control and it enters the anomalous stop mode.

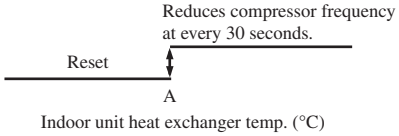


iii) Reset of anomalous stop mode

As it reaches the reset value of 51°C or lower, it becomes possible to restart from the remote control.

(c) Heating high pressure protection

i) Protective control
   a) As the indoor unit heat exchanger temperature (Thi-R) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of high pressure.
   b) Control value A is updated to an optimum value automatically according to the operating conditions.

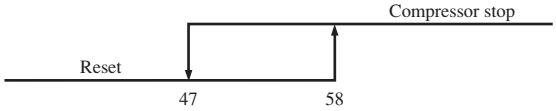


Model	Existing piping adaptation switch: SW5-1	
	OFF (Shipping)	ON
	Control value A (°C)	
100-140	48-54	46-52

Note (1) Adaptation to existing piping is at ON.

ii) Anomalous stop control
Operation control function by the indoor unit control - See the heating overload protection, page 18.

iii) Adaptation to existing piping, stop control
If the existing piping adaptation switch, SW5-1, is turned ON, the compressor stops to protect existing piping when the indoor unit heat exchanger temperature (Thi-R) exceeds the setting value.

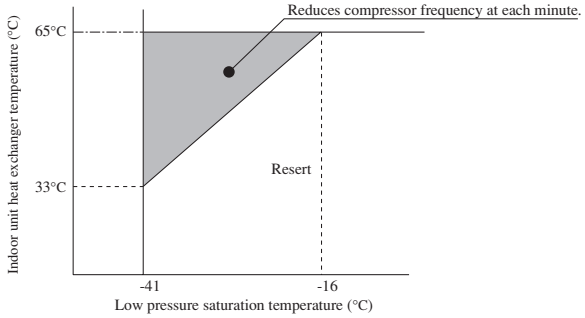


(d) Anomaly detection control by the high pressure switch (63H1)

i) If the pressure rises and operates the high pressure switch (opens at 4.15MPA/closes at 3.15MPa), the compressor stops.
ii) Under any of the following conditions, E40 is displayed and it enters the anomalous stop mode.
   a) When it occurs 5 times within 60 minutes that pressure rises and the compressor is stopped by 63H1.
   b) When 63H1 has been in the open state for 60 minutes continuously, including the stop of compressor.

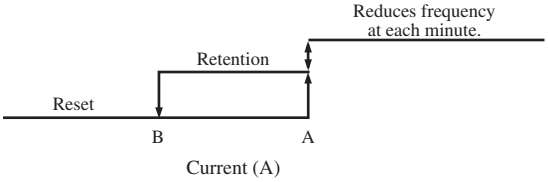
(e) Compressor pressure ratio protection control

i) During heating operation, if the indoor unit heat exchanger temperature (Thi-R) and the low pressure saturation temperature (SST) exceed the setting values at 10 minutes after the start of compressor, the compressor speed (frequency) is controlled to protect the compressor.
ii) This control is not performed during the outdoor fan ON and for 10 minutes from the start of outdoor unit fan.
iii) This control is not performed during defrost operation and at 10 minutes after the reset of defrost operation.
iv) When there are 3 indoor unit heat exchanger temperatures (Thi-R), the highest temperature is detected.

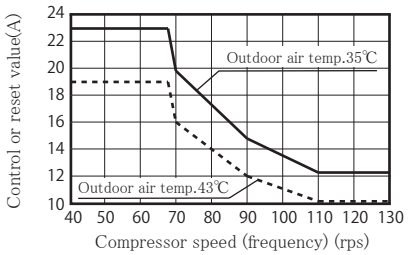


(f) Over-current protection current safe controls I, II

Detecting the outdoor unit inverter input (primary) current and the output (secondary) current, if the current values exceed setting values, the compressor speed (frequency) is controlled to protect the inverter.



(Fig. C) The control value "A" and the reset value vary depending on the compressor speed.



Model		Cooling		Heating	
		Control value A	Reset value B	Control value A	Reset value B
Primary current side	100	13.5 (23.0)	12.5 (22.0)	13.5 (23.0)	12.5 (22.0)
	125, 140	13.5 (23.0)	12.5 (22.0)	13.5 (23.0)	12.5 (22.0)
Secandary current side	100	12.0 (Fig.C)	11.0 (A-1)	12.0 (23)	11.0 (22)
	125, 140	12.0 (Fig.C)	11.0 (A-1)	12.0 (23)	11.0 (22)

Note (1) Value in ( ) are for the single phase models.

(g) Power transistor temperature protection

Anomalous stop control

i) If the power transistor drops supply voltage, the protective switch in the power transistor operates to protect the compressor and the power transistor.

ii) Under any of the following condition, E41 is displayed and it enters the anomalous stop mode.
i)When the protective switch in the power transistor operates 5 times within 60 minutes and the compressor stops.

(h) Anomalous power transistor current

i) Prevents over-current on the inverter. If the current value in the power transistor exceeds the setting value, the compressor stops.

ii) If the current value in the power transistor exceeds the specified value and the compressor stops 4 times within 30 minutes, E42 is displayed on the remote control and it enters the anomalous stop mode.

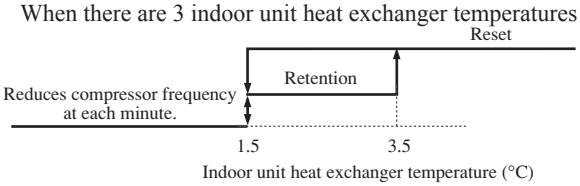
(i) Anomalous inverter PCB

If the power transistor detects any anomaly for 15 minutes, including the stop of compressor, E51 is displayed on the remote control and it enters the anomalous stop mode.

(j) Anti-frost control by the compressor frequency control

i) If the indoor unit heat exchanger temperature (detected with Thi-R) exceeds the setting value at 4 minutes after the start of compressor, the compressor speed (frequency) is controlled to initiate the anti-frost control of indoor unit heat exchanger.

ii) When there are 3 indoor unit heat exchanger temperatures (Thi-R), the lowest temperature is detected.



iii) Regarding the anti-frost control by the operation stop, refer to the operation control function by the indoor unit control and the cooling, dehumidifying frost prevention of page 18.

(k) Dewing prevention control

[Control condition] During cooling and dehumidifying operation, if all the following conditions are established, the compressor speed (frequency) is reduced to prevent dewing and water splash.
① Cooling electronic expansion valve aperture (EEVC) is 500 pulses.
② Suction overheat is 10°C or higher.
③Compressor speed (frequency) is 60 rps or higher.

[Control contents] ① When the suction overheat is 10°C or higher, the compressor speed (frequency) is reduced at each 1 minute.
② Compressor speed (frequency) does not rise till the cooling expansion valve becomes 460 pulses.
③ This control takes 60 rps as its lower limit so that compressor speed is not controlled when it is less than 60 rps.

(l) Refrigerant quantity shortage protection

Under the compressor protection start III control during cooling and dehumidifying operations, the following control is performed by detecting the indoor unit heat exchanger temperature (Thi-R) and the indoor unit return air temperature (Thi-A).

[Control condition] When the state that the indoor unit heat exchanger temperature (Thi-R) does not become lower than the indoor unit return air temperature (Thi-A) by 4°C or more continues for 1 minute.

[Control contents] It judges that the flowing of refrigerant in to the indoor unit is insufficient so that the compressor is stopped and E57 is displayed on the remote control.

(m) Broken wire detection on temperature sensor

i) Outdoor unit heat exchanger temperature sensor and outdoor air temperature sensor
If the following is detected for 5 second continuously within 2 minutes to 2 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.
Note (1) During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.
- Outdoor unit heat exchanger temperature sensor: -50°C or lower
- Outdoor air temperature sensor: -45°C or lower

ii) Discharge pipe temperature sensor and suction pipe temperature sensor
If the following is detected for 5 second continuously within 10 minutes to 10 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.
Note (1) During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.
- Discharge pipe temperature sensor: -10°C or lower
- Suction pipe temperature sensor: -50°C or lower

(n) Fan motor error

i) If the fan speed of 100min^{-1} or under is detected for 30 second continuously under the outdoor unit fan control (with the operation command of fan tap at ① speed or higher), the compressor stops.

ii) When the fan motor speed drops to 100min^{-1} or under 5 times within 60 minutes and the compressor stops, it enters the anomalous stop mode with E48 displayed on the remote control.

(o) Anomalous stop by the compressor start stop

i) When it fails to shift to the compressor DC motor's rotor position defection operation at 5 seconds after establishing the compressor start condition, the compressor stops temporarily and restarts 3 minutes later.

ii) If it fails to shift to the position detection operation again at second time, it judges the anomalous compressor start and stops the compressor by the anomalous stop (E59).

(7) Silent mode

(a) As "Silent mode start" signal is received from the remote control, it operates by dropping the outdoor unit fan tap and the compressor speed (frequency).

(b) For details, refer to items (1) and (4) above.

(8) Test run

(a) It is possible to operate from the outdoor unit using the DIP switch on the outdoor unit control PCB.

SW3-3	ON	SW3-4	OFF	Cooling test run
			ON	Heating test run
	OFF	Normal and end of test run		

Make sure to turn SW3-3 to OFF after the end of operation.

(b) Test run control

i) Operation is performed at the maximum compressor speed (frequency), which is determined for each model.

ii) Each protective control and error detection control are effective.

iii) If SW3-4 is switched during test run, the compressor is stoped for once by the stop control and the cooling/heating operation is switched.

iv) Setting and display of remote control during test run

Item / Mode	Contents of remote control setting/display
Cooling test run	Setting temperature of cooling is 5°C.
Heating test run	Setting temperature of heating (preparation) is 30°C.

(9) Pump-down control

When SW7-1 is OFF, turning ON the pump-down switch SW1 for 2 seconds during the operation stop or anomalous stop (excluding the thermostat OFF), the pump-down operation is performed. (This is invalid when the indoor unit is operating. This is effective even when the indoor unit is stopped by the anomalous stop or the power source is turned OFF.)

(a) Control contents

i) Close the service valve at the liquid side. (It is left open at the gas side.)
ii) Compressor is started with the target speed (frequency) at 55 rps in the cooling mode.
iii) Red and green lamps (LED) flash continuously on the outdoor unit control PCB.
iv) Each of protection and error detection controls, excluding the low pressure control, anti-frost control and dewing prevention control, is effective.
v) Outdoor unit fan is controlled as usual.
vi) Electronic expansion valve is fully opened.

(b) Ending conditions

Stop control is initiated depending on any of the following conditions.

i) Suction pipe temperature of -36°C or lower is detected for 5 seconds continuously.
   a) Red LED: Light, Green LED: Flashing, Remote control: Displays stop.
   b) It is possible to restart when the suction pipe temperature of -36°C or higher.
   c) Electronic expansion valve (cooling/heating) is kept fully open.
ii) Stop by the error detection control
   a) Red LED: Flashing, Green LED: Flashing
   b) Restart is prohibited. To return to normal operation, reset the power source.
   c) Electronic expansion valve (cooling/heating) is left fully open.
iii) When the cumulative operation time of compressor under the pump-down control becomes 5 minutes.
   a) Red LED: OFF, Green LED: Flashing, Remote control: Stop
   b) It is possible to pump-down again.
   c) Electronic expansion valve (cooling/heating) is left fully open.

Note (1) After the stop of compressor, close the service valve at the gas side.

Caution: Since pressing the pump-down switch cancels communications with the indoor unit, the indoor unit and the remote control display “Transmission error – E5”. This is normal.

(10) Base heater ON/OFF output control (Option)

(a) Base heater ON conditions

When all of following conditions are satisfied, the base heater is turned ON.

・When power source is turned ON
・During the compressor stop and when “heater OFF condition” indicated in the following (c) isn't formed
・For 5 minutes from the compressor start
  But, when the compressor ON condition is formed and when it's heater OFF by the following (c) item, the heater isn't tured ON.
・During defrost operation

(b) Base heater OFF conditions

When all of following conditions are satisfied, the base heater is turned OFF.

・When it has passed for 5 minutes or more from the compressor start
・After it passed for 5 minutes from defrost operation return
・When “heater OFF condition” indicated in the following (c) is formed

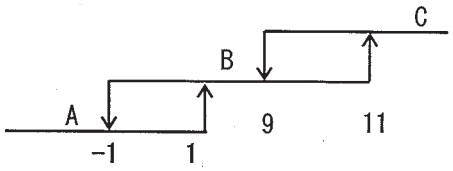
(c) Base heater ON/OFF condition

After the compressor stop, the base heater ON/OFF changes the control method by the outdoor air temperature〔Tho-A〕.

(i) When the outdoor air temperature is A territory
After the compressor stop, the base heater is always turned ON.

(ii) When the outdoor air temperature is B territory
(ii-1) After it passed for 8 minutes 30 seconds from the compressor stop, the base heater is turned OFF.
(ii-2) (ii-1) later, after it passed for 8 hours from the compressor stop, the base heater is always turned ON.

(iii) When the outdoor air temperature is C territory
After the compressor stop, the base heater is always turned OFF.



Outdoor air temperature (°C)〔Tho-A〕

(II) Models FDC200, 250VSA

(1) Determination of compressor speed (Frequency)

Required frequency

(a) Cooling/dehumidifying operation. Unit: rps

Model		FDC200	FDC250
Max. required frequency	Usual operation	120	120
	Outdoor air temperature ≦ 15°C or indoor return air temperature ≦ 20°C	100	100
	Silent mode	80 (100)	70 (100)
Min. required frequency		15	20

Note(1) Value in ( ) are for the SW7-3 OFF.

(b) Heating operation. Unit: rps

Model		FDC200	FDC250
Max. required frequency	Usual operation	120	120
	Silent mode	80 (100)	70 (100)
Min. required frequency		15	20

Note(1) Value in ( ) are for the SW7-3 OFF.

(c) If the indoor fan speed becomes “Me” or “Lo”, Max required frequency goes down accordingly depending on indoor unit model.

(d) Max. required frequency under high outdoor air temperature in cooling mode.
Maximum required frequency is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		FDC200	FDC250
Max. required frequency	Outdoor air temperature is 40°C or higher	100	120

(e) Max. required frequency under outdoor air temperature in heating mode.
Maximum required frequency is selected according to the outdoor air temperature (Tho-A).

Unit: rps

Model		FDC200	FDC250
Max. required frequency	Outdoor air temperature is 10°C or higher	120	120
	Outdoor air temperature is 18°C or higher	100	120

(f) Selection of max. required frequency by heat exchanger temperature.

(i) Maximum required frequency is selected according to the outdoor heat exchanger temperature (Tho-R) during cooling/dehumidifying or according to the indoor heat exchanger temperature (Thi-R) during heating mode.

(ii) When there are 3 indoor heat exchanger temperatures (Thi-R), whichever the highest applies,

Unit: rps

Model			FDC200	FDC250
Max. required frequency	Cooling/ dehumidifying	Outdoor heat exchanger temperature is 56°C or higher	110	120
	Heating	Indoor heat exchanger temperature is 56°C or higher	120	120

(g) When any of the controls from (a) to (f) above may duplicate, whichever the smallest value among duplicated controls is taken as the maximum required frequency.

(h) During heating, it is operated with the maximum required frequency until the indoor heat exchanger temperature becomes 40°C or higher.

(2) Compressor start control

(a) Compressor starts upon receipt of the thermostat ON signal from the indoor unit.

(b) However, at initial start after turning the power source breaker, it may enter the standby state for maximum 30 minutes (“ PREPARATION” is displayed on the remote control) in order to prevent the oil loss in the compressor.
If the cooling/dehumidifying/heating operation is selected from the remote control when the outdoor unit is in the standby state, “ PREPARATION” is displayed for 3 seconds on the remote control.

(3) Compressor soft start control

(a) Compressor protection start I

[Control condition]

Normally, the compressor operation frequency is raised in this start pattern.

[Control contents]

(i) Starts with the compressor's target frequency at **A** rps.
However, when the outdoor air temperature (Tho-A) is 35°C or higher during cooling/dehumidifying or the indoor return air temperature (Thi-A) is 25°C or higher during heating, it starts at **C** rps.

(ii) At 30 seconds after the start of compressor, its target frequency changes to **B** rps and the compressor is operated for 2 - 4 minutes with its operation frequency fixed at **B** rps.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC200	Cooling/Dehumidifying	45	45	25
	Heating	45	45	25
FDC250	Cooling/Dehumidifying	55	55	30
	Heating	55	55	30

(b) Compressor protection start III

[Control condition]

Number of compressor starts is only 1 counted after the power source breaker ON.

[Control contents]

Operates by selecting one of following start patterns according to the operation mode and the outdoor air temperature (Tho-A).

(i) Low frequency operation control during cooling/dehumidifying.

[Control condition]

Upon establishing the conditions of compressor protection start III, the low frequency operation control is performed during cooling/dehumidifying.

[Control contents]

1) Starts with the compressor's target frequency at **A** rps. When the outdoor air temperature (Tho-A) is 35°C or higher, it starts at **C** rps.
2) At 30 seconds after the compressor start, the compressor's target frequency is changed to **B** rps and the compressor's operation frequency is fixed for 10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC200	Cooling/Dehumidifying	45	45	25
FDC250	Cooling/Dehumidifying	55	55	30

(ii) Low frequency operation control during heating.

[Control condition]

When the conditions of compressor protection start III are established and one of following conditions. a) is satisfied, the low frequncy operation control is performed during heating.

a) At 30 minutes or more after turning the power source breaker on.

[Control contents]

a) If the compressor stats with 6 hours after the power source breaker turns on, and outdoor air temperature is lower than -2°C, unit starts by cooling mode for 3 minutes to prevent the liquid refrigerant from returning to compressor. (model FDC200 only)
b) Starts the compressor with its target frequency at **A** rps. However, when the indoor return air temperature (Thi-A) is 25°C or higher, it start at **C** rps.
c) At 30 seconds after the start of compressor, the compressor's target frequency is changed to **B** rps and the compressor's operation frequency is fixed for 6-10 minutes.

Model	Operation mode	**A** rps	**B** rps	**C** rps
FDC200	Heating	45	30	25
FDC250	Heating	55	30	30

(4) Outdoor fan control

(a) Outdoor fan tap and fan motor speed

Unit: min^{-1}

Model	Mode	Fan motor tap						
FDC200		① speed	② speed	③ speed	④ speed	⑤ speed	⑥ speed	⑦ speed
	Cooling/Dehumidifying	200	390	560	830	870	910	950
	Heating	200	390	560	830	870	910	950
FDC250		① speed	② speed	③ speed	④ speed	⑤ speed	⑥ speed	⑦ speed
	Cooling/Dehumidifying	200	370	600	750	850	900	950
	Heating	200	370	600	820	850	910	950

(b) Fan tap control during Cooling/Defumidifying operation

Fan taps are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).

Note (1) It is detected by Tho-R1 or R2, whichever the higher.

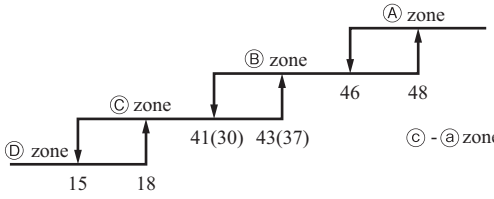
	Ⓐ zone	Ⓑ zone	Ⓒ zone	Ⓓ zone
ⓐ zone	Tap 5(6)	Tap 5(6)	Tap 6(5/6)	Tap 4
ⓑ zone	Tap 5	Tap 5	Tap 4	Tap 3
ⓒ zone	Tap 4	Tap 4	Tap 3	Tap 2
ⓓ zone	Tap 3	Tap 3	Tap 2	Tap 1

Note (1) Value in ( ) are for the model FDC200.

• Silent mode only

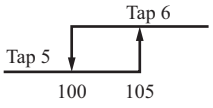
	Ⓐ zone	Ⓑ zone	Ⓒ zone	Ⓓ zone
ⓐ zone	Tap 5	Tap 5	Tap 4(5)	Tap 4
ⓑ zone	Tap 4	Tap 4	Tap 3	Tap 3
ⓒ zone	Tap 4	Tap 3	Tap 3	Tap 2
ⓓ zone	Tap 3	Tap 3	Tap 2	Tap 1

Note (1) Value in ( ) is for the model FDC200.

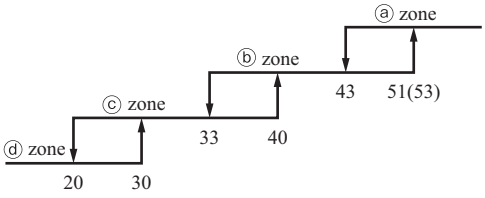


Outdoor air temperature (˚C)

ⓒ - ⓐ zone (Model FDC200 only)



Compressor speed (rps)



Outdoor heat exchanger temperature (˚C)

Note (1) Value in ( ) are for the model FDC200.

(c) Fan tap control during heating operation

Fan taps are selected depending on the outdoor heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A).

Note (1) It is detected by Tho-R1 or R2, whichever the lower.

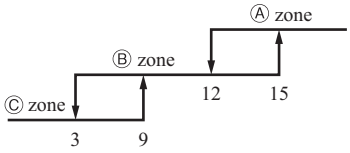
	Ⓐ zone	Ⓑ zone	Ⓒ zone
ⓐ zone	Tap 3	Tap 3	Tap 4
ⓑ zone	Tap 3	Tap 4	Tap 5
ⓒ zone	Tap 4	Tap 7(5)	Tap 7(6)

Note (1) Value in ( ) are for the model FDC200.

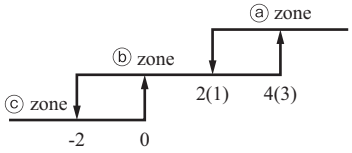
• Silent mode only

	Ⓐ zone	Ⓑ zone	Ⓒ zone
ⓐ zone	Tap 3	Tap 3	Tap 3
ⓑ zone	Tap 3	Tap 3	Tap 4
ⓒ zone	Tap 3(4)	Tap 5(4)	Tap 6(5)

Note (1) Value in ( ) are for the model FDC200.



Outdoor air temperature (˚C)



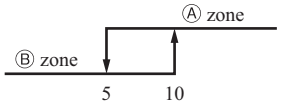
Outdoor heat exchanger temperature (˚C)

Note (1) Value in ( ) are for the model FDC200.

(d) Outdoor fan control at cooling low outdoor air

(i) When all the following conditions are established after the start of compressor, the following control is implemented. If the outdoor air temperature (Tho-A) is in the zone Ⓑ in the cooling/dehumidifying mode, it has elapsed 20 seconds from the start of outdoor fan and the outdoor fan is at the tap 1 speed, the outdoor fan speed is controlled according to the outdoor heat exchanger temperature (Tho-R1, R2).

Note (1) It is detected with Tho-R1 or R2, whichever the higher.



Outdoor air temperature (˚C)

(ii) The outdoor heat exchanger temperature is detected always and, when the number of revolutions of the outdoor fan speed has been increased or decreased, there is no change of fan speed for 20 seconds.

(iii) Rage of the outdoor fan speed under this control is as follows.

1) Lower limit: 130min^{-1}
2) Upper limit: 500min^{-1}

(iv) As any of the following conditions is established, this control terminates.

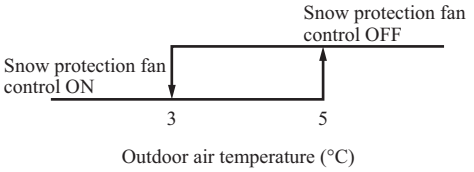
1) When the outdoor air temperature is in the zone Ⓐ and the outdoor heat exchanger temperature at 30°C or higher is established for 40 seconds or more continuously.
2) When the outdoor fan speed is 500min^{-1} and the outdoor heat exchanger temperature at 30°C or higher is established for 40 seconds or more continuously.
3) When the outdoor heat changer temperature at 45°C (model FDC250:50°C) or higher is established for 40 seconds or more.

(e) Caution at the outdoor fan start control

When the outdoor fan is running at 400min^{-1} before operating the compressor, it may operate with the compressor only, without starting up the outdoor fan. This is normal.

(f) Snow protection fan control

If the dip switch (SW3-2) on the outdoor control PCB is turned ON, the outdoor fan is operated for 30 seconds at 4 tap speed once in every 10 minutes depending on the outdoor air temperature (detected with Tho-A) in the stop mode or anomalous stop mode.



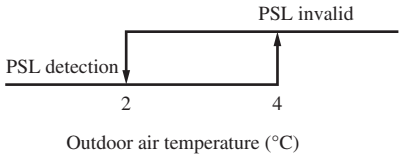
(5) Defrost operation

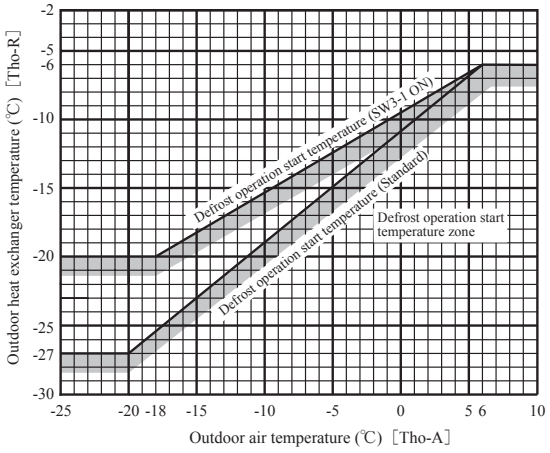
(a) Starting conditions

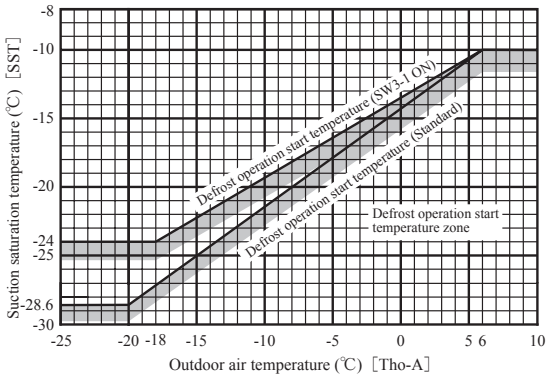
If all of the following defrost conditions A or conditions B are satisfied, the defrost operation starts.

(i) Defrost conditions A

1) Cumulative compressor operation time after the end of defrost operation has elapsed 37 minutes, and the cumulative compressor operation time after the start of heating operation (remote control ON) has elapsed 30 minutes.
2) After 5 minutes from the compressor ON
3) After 5 minutes from the start of outdoor fan
4) After satisfying all above conditions, if temperatures of the outdoor heat exchanger temperature thermistor (Tho-R1, R2) and the outdoor air temperature thermistor (Tho-A) become lower than the defrost operation start temperature as shown by the right figure for 15 seconds continuously, or the suction gas saturation temperature (SST) and the outdoor air temperature (Tho-A), which are obtained from the value detected by the low pressure sensor (PSL) stay for 3 minutes within the range below the defrost operation start temperature as shown by the right figure. However, it excludes for 10 minutes after the start of compressor and the outdoor air temperature is as shown by the lower figure.







(ii) Defrost conditions B

1) When previous defrost ending condition is the time out of defrost operation and it is in the heating operation after the cumulative compressor operation time after the end of defrost operation has become 30 minutes.
2) After 5 minutes from the start of compressor.
3) After 5 minutes from the start of outdoor fan.

(b) Ending conditions

When any of the following conditions is satisfied, the heating operation starts.

(i) When it has elapsed 8 minutes and 20 seconds after the start of defrost operation. (After 10 minutes and 20 seconds for FDC250 model)

(ii) When the outdoor heat exchanger temperatures (Tho-R1, R2), whichever the lower, becomes 16 (FDC250:12)°C or higher for 10 seconds continuously.

(c) Switching of defrost control with SW3-1

(i) If SW3-1 on the outdoor control PCB is turned to ON, it becomes easier to enter the defrost operation. Use this when installing a unit at snowing regions.

(ii) Control contents

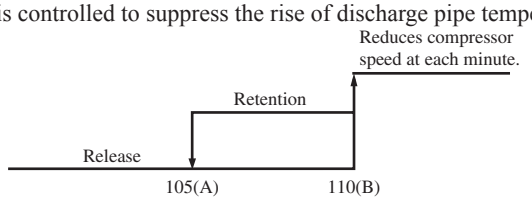
1) It allows entering the defrost operation under the defrost condition A when the cumulative heating operation time becomes 30 minutes. It is 37 minutes at SW3-1 OFF (Factory default).
2) It allows entering the defrost operation under the defrost condition B when the cumulative heating operation time becomes 25 minutes. It is 30 minutes at SW3-1 OFF (Factory default).
3) It allows the defrost operation with the outdoor heat exchanger temperature (Tho-R) and suction pressure saturation temperature (SST) being higher than normal.

(6) Protective control/anomalous stop control by compressor's number of revolutions

(a) Compressor discharge pipe temperature protection

(i) Protective control

As the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of discharge pipe temperature.

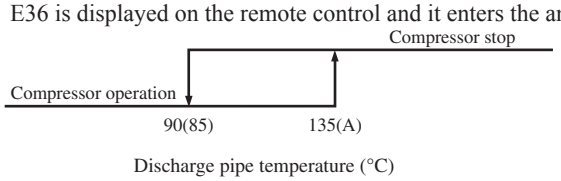


Note (1) Value in ( ) are for the model FDC200.

Super heat	A	B
25°C or more	95	100
20°C or less	100	105

(ii) Anomalous stop control

1) If the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor stops.
2) When it is detected 2 times within 60 minutes or after continuous 60 minutes, including the stop of compressor, E36 is displayed on the remote control and it enters the anomalous stop mode.



Note (1) Value in ( ) are for the model FDC200.

Super heat	A
25°C or more	110
20°C or less	115

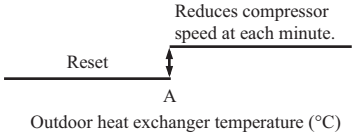
(iii) Reset of anomalous stop mode

As it drops to the reset value of 90 (85)°C or lower for 45 minutes continuously, it becomes possible to restart from the remote control.

(b) Cooling high pressure protection

(i) Protective control

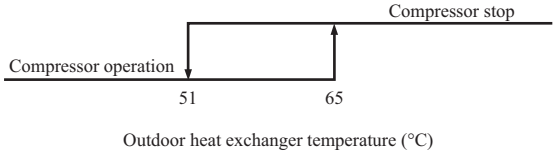
1) Outdoor heat exchanger temperature (Tho-R) exceeds the setting value A.
2) When the outdoor air temperature (Tho-A) is 40°C or higher and the outdoor heat exchanger temperature (Tho-R) exceeds certain value (depends on compressor frequency).
3) Control value A is updated to an optimum value automatically according to the operating conditions.



Control value A
54-60°C

(ii) Anomalous stop control

1) As the outdoor heat exchanger temperature (Tho-R) exceeds the setting value, the compressor stops.
2) If it is detected 5 times within 60 minutes or 65°C or higher continues for 60 minutes, including the stop of compressor, E35 is displayed on the remote control and it enters the anomalous stop mode.



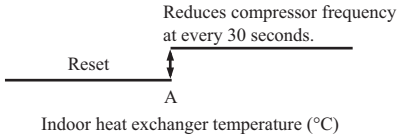
(iii) Reset of anomalous stop mode

As it reaches the reset value of 51°C or lower, it becomes possible to restart from the remote control.

(c) Heating high pressure protection

(i) Protective control

1) As the indoor heat exchanger temperature (Thi-R) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of high pressure.
2) Control value A is updated to an optimum value automatically according to the operating conditions.

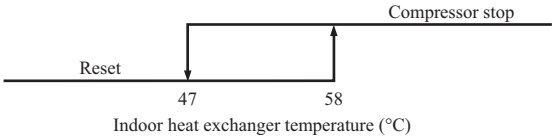


Model	Existing piping adaptation switch: SW5-1	
	OFF (Shipping)	ON
	Control value A (°C)	
FDC200	48-54	46-52
FDC250	52-58	

Note (1) Adaptation to existing piping is at ON.

(ii) Anomalous stop control
Operation control function by the indoor unit control - See the heating overload protection, page 107.

(iii) Adaptation to existing piping, stop control
If the existing piping adaptation switch, SW5-1, is turned ON, the compressor stops to protect existing piping when the indoor heat exchanger temperature (Thi-R) exceeds the setting value.

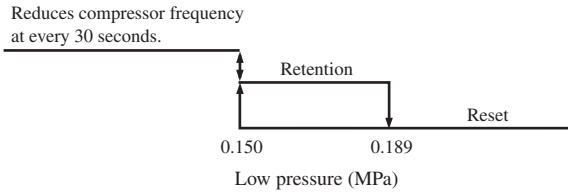


(d) Anomaly detection control by the high pressure switch (63H1)

(i) If the pressure rises and operates the high pressure switch (opens at 4.15MPa/closes at 3.15MPa), the compressor stops.
(ii) Under any of the following conditions, E40 is displayed and it enters the anomalous stop mode.
1) When it occurs 5 times within 60 minutes that pressure rises and the compressor is stopped by 63H1.
2) When 63H1 has been in the open state for 60 minutes continuously, including the stop of compressor.

(e) Low pressure control

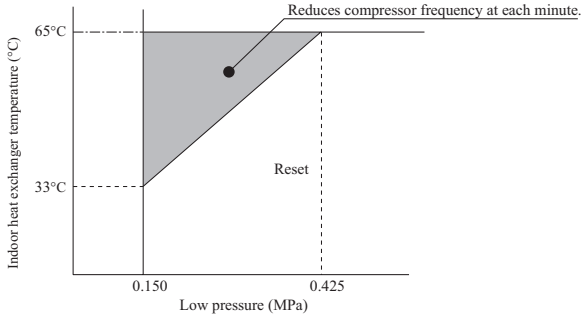
(i) Protective control
If the value detected by the low pressure sensor (PSL) exceeds the setting value, the compressor speed (frequency) is controlled to restrain the drop of pressure.



(ii) Anomalous stop control
1) When a value detected by the low pressure sensor (PSL) satisfies any of the following conditions, the compressor stops for its protection.
a) When the low pressure drops to 0.079MPa or under for 15 seconds continuously.
b) At 10 minutes after the start of compressor, the suction overheat becomes 30°C and the low pressure becomes 0.15MPa or under for 60 seconds continuously.
2) E49 is displayed under any of the following conditions and it enters the anomalous stop mode.
a) When the low pressure drops 5 times within 60 minutes and the compressor stops under any of the above conditions.
b) When a value detected with the low pressure sensor becomes 0.079MPa or under for 5 minutes, including the stop of compressor.
3) However, when the control condition 1). a) is established during the compressor protection start III, E49 is displayed at initial stop and it enters the anomalous stop mode.

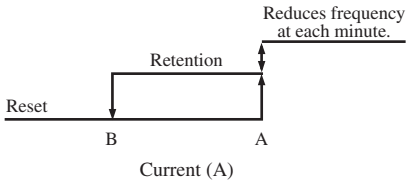
(f) Compressor pressure ratio protection control

(i) During heating operation, if the indoor heat exchanger temperature (Thi-R) and low pressure sensor (PSL) exceed the setting values at 10 minutes after the start of compressor, the compressor speed (frequency) is controlled to protect the compressor.
(ii) This control is not performed during the outdoor fan ON and for 10 minutes from the start of outdoor fan.
(iii) This control is not performed during defrost operation and at 10 minutes after the reset of defrost operation.
(iv) When there are 3 indoor heat exchanger temperatures (Thi-R), the highest temperature is detected.



(g) Over-current protection current safe controls I, II

Detecting the outdoor inverter input (primary) current and the output (secondary) current, if the current values exceed setting values, the compressor speed (frequency) is controlled to protect the inverter.

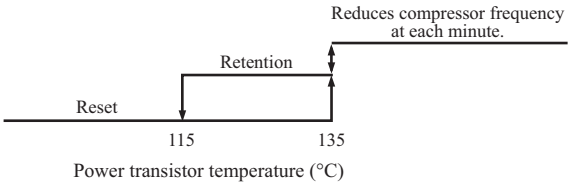


Model		Cooling		Heating	
		Control value A	Reset value B	Control value A	Reset value B
Primary current side	FDC200	16.0	15.0	16.0	15.0
	FDC250	18.0	17.0	18.0	17.0
Secandary current side	FDC200	15.5	14.5	15.5	14.5
	FDC250	17.0	16.0	17.0	16.0

(h) Power transistor temperature protection (model FDC250 only)

(i) Protective control

If the power transistor temperature (detected with TIP) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of power transistor temperature.



(ii) Anomalous stop control

1) If the power transistor temperature increases further, the protective switch in the power transistor trips and stops the compressor to protect the power transistor.
2) It enters the anomalous stop mode depending on one of the following conditions.
   a) When the protective switch in the power transistor trips and stops the compressor 5 times within 60 minutes (Displays E41.)
   b) When the protective switch in the power transistor trips and the state continues for 15 minutes, including the stop of compressor (Displays E51.)

(iii) Anomalous inverter PCB

1) If the power transistor detects anomaly 5 times within 60 minutes with compressor stop, E41 is displayed on the remote control and it enters the anomalous stop mode.
2) If the power transistor detects any anomaly for 15 minutes, including the stop of compressor, E51 is displayed on the remote control and it enters the anomalous stop mode.

(i) Anomalous power transistor current

(i) Prevents over-current on the inverter. If the current value in the power transistor exceeds the setting value, the compressor stops.

(ii) If the current value in the power transistor exceeds the specified value and the compressor stops 4 times within 30 minutes, E42 is displayed on the remote control and it enters the anomalous stop mode.

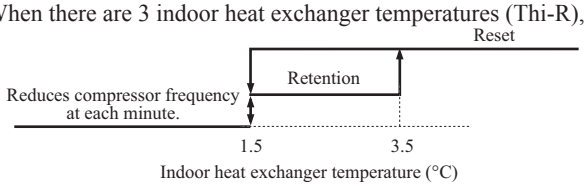
(j) Anomalous inverter communication

If the power transistor detects anomalies 4 times within 15 minutes, including the stop of compressor, E45 is displayed on the remote control and it enters the anomalous stop mode.

(k) Anti-frost control by the compressor frequency control

(i) If the indoor heat exchanger temperature (detected with Thi-R) exceeds the setting value at 4 minutes after the start of compressor, the compressor speed (frequency) is controlled to initiate the anti-frost control of indoor heat exchanger.

(ii) When there are 3 indoor heat exchanger temperatures (Thi-R), the lowest temperature is detected.



(iii) Regarding the anti-frost control by the operation stop, refer to the operation control function by the indoor control and the cooling, dehumidifying frost prevention of page 107.

(l) Dewing prevention control

[Control condition]

During cooling and dehumidifying operation, if all the following conditions are established, the compressor speed (frequency) is reduced to prevent dewing and water splash.

(i) Cooling electronic expansion valve aperture (EEVC) is 500 pulses.

(ii) Suction overheat is 10°C or higher.

(iii) Compressor speed (frequency) is **A** rps or higher.

[Control contents]

(i) When the suction overheat is 10°C or higher, the compressor speed (frequency) is reduced at each 1 minute.

(ii) Compressor speed (frequency) does not rise till the cooling expansion valve becomes 460 pulses.

(iii) This control takes **A** rps as its lower limit so that compressor speed is not controlled when it is less than **A** rps.

Model	**A** rps
FDC200	60
FDC250	60

(m) Refrigerant quantity shortage protection

Under the compressor protection start III control during cooling and dehumidifying operations, the following control is performed by detecting the indoor heat exchanger temperature (Thi-R) and the indoor return air temperature (Thi-A).

[Control condition]

When the state that the indoor heat exchanger temperature (Thi-R) does not become lower than the indoor return air temperature (Thi-A) by 4°C or more continues for 1 minute.

[Control contents]

It judges that the flowing of refrigerant in to the indoor unit is insufficient so that the compressor is stopped and E57 is displayed on the remote control.

(n) Broken wire detection on temperature sensor and low pressure sensor

(i) Outdoor heat exchanger temperature sensor, outdoor air temperature sensor and low pressure sensor

If the following is detected for 5 second continuously within 2 minutes to 2 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note (1) During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.

- Outdoor heat exchanger temperature sensor: -50°C or lower
- Outdoor air temperature sensor: -45°C or lower
- Low pressure sensor: 0V or under or 4.0V or over

(ii) Discharge pipe temperature sensor, suction pipe temperature sensor, compressor under dome temperature sensor

If the following is detected for 5 seconds continuously within 10 minutes to 10 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note (1) During defrost operation and for 3 minutes after the end of defrost operation, it is not detected.

- Discharge pipe temperature sensor: -10°C or lower
- Suction pipe temperature sensor: -50°C or lower
- Compressor under dome temperature sensor : -50°C or lower

(o) Fan motor error

(i) If the fan speed of 100min^{-1} or under is detected for 30 seconds continuously under the outdoor fan control (with the operation command of fan tap at ① speed or higher), the compressor stops.

(ii) When the fan motor speed drops to 100min^{-1} or under 5 times within 60 minutes and the compressor stops, it enters the anomalous stop mode with E48 displayed on the remote control.

(p) Anomalous stop by the compressor start stop

(i) When it fails to shift to the compressor DC motor's rotor position defection operation at 5 seconds after establishing the compressor start condition, the compressor stops temporarily and restarts 3-minute later.

(ii) If it fails to shift to the position detection operation again 20 times, it judges the anomalous compressor start and stops the compressor by the anomalous stop (E59).

(7) Silent mode

(a) As "Silent mode start" signal is received from the remote control, it operates by dropping the outdoor fan tap and the compressor speed (frequency).

(b) For details, refer to items (1) and (4) above.

(8) Test run

(a) It is possible to operate from the outdoor unit using the DIP switch on the outdoor control PCB.

SW3-3	ON	SW3-4	OFF	Cooling test run
			ON	Heating test run
	OFF	Normal and end of test run		

Make sure to turn SW3-3 to OFF after the end of operation.

(b) Test run control

(i) Operation is performed at the maximum compressor speed (frequency), which is determined for each model.

(ii) Each protective control and error detection control are effective.

(iii) If SW3-4 is switched during test run, the compressor is stopped once by the stop control and the cooling/heating operation is switched.

(iv) Setting and display of remote control during test run

Item / Mode	Contents of remote control setting/display
Cooling test run	Setting temperature of cooling is 5°C.
Heating test run	Setting temperature of heating (preparation) is 30°C.

(9) Pump-down control

Turning ON the pump-down switch SW1 for 2 seconds during the operation stop or anomalous stop (excluding the thermostat OFF), the pump-down operation is performed. (This is invalid when the indoor unit is operating. This is effective even when the indoor unit is stopped by the anomalous stop or the power source is turned OFF.)

(a) Control contents

(i) Close the service valve at the liquid side. (It is left open at the gas side.)

(ii) Compressor is started with the target speed (frequency) at FDC200:45, FDC250:55 rps in the cooling mode.

(iii) Red and green lamps (LED) keeps flashing on the outdoor control PCB.

(iv) Each of protection and error detection controls, excluding the low pressure control, anti-frost control and dewing prevention control, is effective.

(v) Outdoor unit fan is controlled as usual.

(vi) Electronic expansion valve is fully opened.

(b) Control ending conditions

Stop control is initiated depending on any of the following conditions.

(i) Low pressure of 0.087MPa or lower is detected for 5 seconds continuously.
1) Red LED: Light, Green LED: keeps flashing, Remote control: Displays stop.
2) It is possible to restart when the low pressure is 0.087MPa or higher.
3) Electronic expansion valve (cooling/heating) is kept fully open.

(ii) Stop by the error detection control
1) Red LED: keeps flashing, Green LED: keeps flashing
2) Restart is prohibited. To return to normal operation, reset the power source.
3) Electronic expansion valve (cooling/heating) is left fully open.

(iii) When the cumulative operation time of compressor under the pump-down control becomes 5 minutes.
1) Red LED: stays OFF, Green LED: keeps flashing, Remote control: Stop
2) It is possible to pump-down again.
3) Electronic expansion valve (cooling/heating) is left fully open.

Note (1) After the stop of compressor, close the service valve at the gas side.

Caution: Since pressing the pump-down switch cancels communications with the indoor unit, the indoor unit and the remote control display "Transmission error – E5". This is normal.

(10) Base heater ON/OFF output control (Option)

(i) Base heater ON conditions

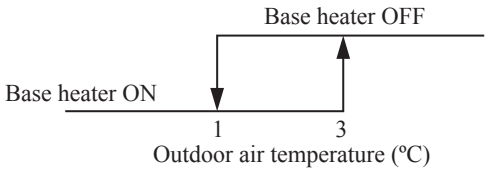
When all of following conditions are satisfied, the base heater is turned ON.

- Outdoor air temperature (detected with Tho-A) is 1ºC or lower.
- In the heating mode
- When the compressor is turned ON

(ii) Base heater OFF conditions

When either one of following conditions is satisfied, the base heater is turned OFF.

- Outdoor air temperature (detected with Tho-A) is 3ºC or higher.
- When the compressor stop has been detected for 30 minutes continuously
- In the cooling or dehumidifying mode



2.11 MAINTENANCE DATA

See page 134 of 1.11 chapter.

2.12 TECHNICAL INFORMATION

Model FDT100VNAPVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDT50VH x 2**
Outdoor unit model name	**FDC100VNA**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

Average(mandatory)	**Yes**
Warmer(if designated)	**Yes**
Colder(if designated)	**Yes**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**10**	kW
heating / Average	Pdesignh	**8.5**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**6.89**	A++
heating / Average	SCOP/A	**4.47**	A+
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**8.5**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**10**	kW
Tj=30℃	Pdc	**7.37**	kW
Tj=25℃	Pdc	**4.74**	kW
Tj=20℃	Pdc	**3.55**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.55**	-
Tj=30℃	EERd	**5.02**	-
Tj=25℃	EERd	**9.27**	-
Tj=20℃	EERd	**13.57**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**7.52**	kW
Tj=2℃	Pdh	**4.58**	kW
Tj=7℃	Pdh	**2.94**	kW
Tj=12℃	Pdh	**2.77**	kW
Tj=bivalent temperature	Pdh	**8.5**	kW
Tj=operating limit	Pdh	**6.77**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**3.13**	-
Tj=2℃	COPd	**4.22**	-
Tj=7℃	COPd	**5.92**	-
Tj=12℃	COPd	**7.04**	-
Tj=bivalent temperature	COPd	**2.65**	-
Tj=operating limit	COPd	**2.37**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-20**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**8**	W
standby mode	Psb	**8**	W
thermostat-off mode	Pto(cooling)	**20**	W
	Pto(heating)	**36**	W
crankcase heater mode	Pck	**8**	W

Annual electricity consumption			
cooling	Qce	**508**	kWh/a
heating / Average	Qhe	**2665**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**54**	dB(A)
Sound power level(outdoor)	Lwa	**70**	dB(A)
Global warming potential	GWP	**2088**	kgCO2eq.
Rated air flow(indoor)	-	**1200**	m3/h
Rated air flow(outdoor)	-	**4500**	m3/h

Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United kingdom

PJF000Z551 A

Model FDT100VSAPVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDT50VH x 2**
Outdoor unit model name	**FDC100VSA**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

Average(mandatory)	**Yes**
Warmer(if designated)	**Yes**
Colder(if designated)	**Yes**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**10**	kW
heating / Average	Pdesignh	**8.5**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**6.89**	A++
heating / Average	SCOP/A	**4.47**	A+
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**8.5**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**10**	kW
Tj=30℃	Pdc	**7.37**	kW
Tj=25℃	Pdc	**4.74**	kW
Tj=20℃	Pdc	**3.55**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.55**	-
Tj=30℃	EERd	**5.02**	-
Tj=25℃	EERd	**9.27**	-
Tj=20℃	EERd	**13.57**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**7.52**	kW
Tj=2℃	Pdh	**4.58**	kW
Tj=7℃	Pdh	**2.94**	kW
Tj=12℃	Pdh	**2.77**	kW
Tj=bivalent temperature	Pdh	**8.5**	kW
Tj=operating limit	Pdh	**6.77**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**3.13**	-
Tj=2℃	COPd	**4.22**	-
Tj=7℃	COPd	**5.92**	-
Tj=12℃	COPd	**7.04**	-
Tj=bivalent temperature	COPd	**2.65**	-
Tj=operating limit	COPd	**2.37**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-20**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**8**	W
standby mode	Psb	**8**	W
thermostat-off mode	Pto(cooling)	**20**	W
	Pto(heating)	**36**	W
crankcase heater mode	Pck	**8**	W

Annual electricity consumption			
cooling	Qce	**508**	kWh/a
heating / Average	Qhe	**2665**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**54**	dB(A)
Sound power level(outdoor)	Lwa	**70**	dB(A)
Global warming potential	GWP	**2088**	kgCO2eq.
Rated air flow(indoor)	-	**1200**	m3/h
Rated air flow(outdoor)	-	**4500**	m3/h

Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United kingdom

PJF000Z551 A

Model FDT125VNAPVH

Model(s) : FDC125VNA / FDT60VH (x2 units)							
Outdoor side heat exchanger of air conditioner : air							
Indoor side heat exchanger of air conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**12.5**	kW	Seasonal space cooling energy efficiency $\eta_{s,c}$		**315.5**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**12.5**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**338.0**	%
Tj=+30℃	Pdc	**9.2**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**587.0**	%
Tj=+25℃	Pdc	**5.9**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**925.0**	%
Tj=+20℃	Pdc	**3.5**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1667.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.008**	kW	Crankcase heater mode	P_{CK}	**0.008**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.008**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m3/h
Sound power level, outdoor	L_{WA}	**71.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Information to identify the model(s) to which the information relates :	FDC125VNA / FDT60VH (x2 units)
Outdoor side heat exchanger of heat pump :	air
Indoor side heat exchanger of heat pump :	air
Indication if the heater is equipped with a supplementary heater :	No
if applicable :	electric motor

Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.

Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**14.0**	kW
Seasonal space heating energy efficiency η s, h		**205.1**	%

Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj

T_j=-7℃	Pdh	**8.7**	kW
T_j=+2℃	Pdh	**5.3**	kW
T_j=+7℃	Pdh	**3.4**	kW
T_j=+12℃	Pdh	**2.7**	kW
T_{biv}=bivalent temperature	Pdh	**9.8**	kW
T_{OL}=operation limit	Pdh	**7.7**	kW
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW
Bivalent temperature	T_{biv}	**-10.0**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-

Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj

T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**350.0**	%
T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**503.0**	%
T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**678.0**	%
T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**794.0**	%
T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**292.0**	%
T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**261.0**	%
For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
For water-to-air heat pumps:Operation limit T_{oi} temperature		**-**	℃

Power consumpiton in modes other than 'active mode'

Off mode	P_{OFF}	**0.008**	kW
Thermostat-off mode	P_{TO}	**0.015**	kW
Crankcase heater mode	P_{CK}	**0.008**	kW

Supplementary heater back-up heating capacity	elbu	**-**	kW
Type of energy input Standby mode	P_{SB}	**0.008**	kW

Other items

Capacity control		**variable**	
Sound power level, outdoor measured	L_{WA}	**71.0**	dB
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV

For air-to-air heat pumps: air flow-rate,outdoor measured	**4380**	m3/h
For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger	**-**	m3/h

GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)

Contact details	Mitsubishi heavy industries thermal systems,LTD

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Model FDT140VNATVH

Model(s) : FDC140VNA / FDT50VH (x3 units)							
Outdoor side heat exchanger of air conditioner : air							
Indoor side heat exchanger of air conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**13.6**	kW	Seasonal space cooling energy efficiency $\eta_{s,c}$		**297.5**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**13.6**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**330.0**	%
Tj=+30℃	Pdc	**10.0**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**545.0**	%
Tj=+25℃	Pdc	**6.4**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**815.0**	%
Tj=+20℃	Pdc	**3.5**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1750.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.008**	kW	Crankcase heater mode	P_{CK}	**0.008**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.008**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m3/h
Sound power level, outdoor	L_{WA}	**73.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Information to identify the model(s) to which the information relates :	FDC140VNA / FDT50VH (x3 units)
Outdoor side heat exchanger of heat pump :	air
Indoor side heat exchanger of heat pump :	air
Indication if the heater is equipped with a supplementary heater :	No
if applicable :	electric motor

Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.

Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**15.5**	kW

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η s, h	**192.6**	%

Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj

T_j=-7℃	Pdh	**9.3**	kW
T_j=+2℃	Pdh	**5.7**	kW
T_j=+7℃	Pdh	**3.7**	kW
T_j=+12℃	Pdh	**2.6**	kW
T_{biv}=bivalent temperature	Pdh	**10.5**	kW
T_{OL}=operation limit	Pdh	**7.9**	kW
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW
Bivalent temperature	T_{biv}	**-10.0**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-

Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj

T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**326.0**	%
T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**466.0**	%
T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**640.0**	%
T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**813.0**	%
T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**277.0**	%
T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**246.0**	%
For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
For water-to-air heat pumps:Operation limit T_{oi} temperature		**-**	℃

Power consumpiton in modes other than 'active mode'

Off mode	P_{OFF}	**0.008**	kW
Thermostat-off mode	P_{TO}	**0.015**	kW
Crankcase heater mode	P_{CK}	**0.008**	kW

Supplementary heater back-up heating capacity	elbu	**-**	kW
Type of energy input Standby mode	P_{SB}	**0.008**	kW

Other items

Capacity control		**variable**	
Sound power level, outdoor measured	L_{WA}	**73.0**	dB
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV

For air-to-air heat pumps: air flow-rate,outdoor measured		**4380**	m3/h
For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m3/h

GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)

Contact details	Mitsubishi heavy industries thermal systems,LTD

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 Ⓐ

Model FDT125VSAPVH

Model(s) : FDC125VSA / FDT60VH (x2 units)							
Outdoor side heat exchanger of air conditioner : air							
Indoor side heat exchanger of air conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**12.5**	kW	Seasonal space cooling energy efficiency $\eta_{s,c}$		**315.5**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**12.5**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**338.0**	%
Tj=+30℃	Pdc	**9.2**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**587.0**	%
Tj=+25℃	Pdc	**5.9**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**925.0**	%
Tj=+20℃	Pdc	**3.5**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1667.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.008**	kW	Crankcase heater mode	P_{CK}	**0.008**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.008**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m3/h
Sound power level, outdoor	L_{WA}	**71.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :	FDC125VSA / FDT60VH (x2 units)
Outdoor side heat exchanger of heat pump :	air
Indoor side heat exchanger of heat pump :	air
Indication if the heater is equipped with a supplementary heater :	No
if applicable :	electric motor

Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.

Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**14.0**	kW
Seasonal space heating energy efficiency η s, h		**205.1**	%

Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj

T_j=-7℃	Pdh	**8.7**	kW
T_j=+2℃	Pdh	**5.3**	kW
T_j=+7℃	Pdh	**3.4**	kW
T_j=+12℃	Pdh	**2.7**	kW
T_{biv}=bivalent temperature	Pdh	**9.8**	kW
T_{OL}=operation limit	Pdh	**7.7**	kW
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW
Bivalent temperature	T_{biv}	**-10.0**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-

Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj

T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**350.0**	%
T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**503.0**	%
T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**678.0**	%
T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**794.0**	%
T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**292.0**	%
T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**261.0**	%
For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
For water-to-air heat pumps:Operation limit T_{oi} temperature		**-**	℃

Power consumpiton in modes other than 'active mode'

Off mode	P_{OFF}	**0.008**	kW
Thermostat-off mode	P_{TO}	**0.015**	kW
Crankcase heater mode	P_{CK}	**0.008**	kW

Supplementary heater back-up heating capacity	elbu	**-**	kW
Type of energy input Standby mode	P_{SB}	**0.008**	kW

Other items

Capacity control		**variable**	
Sound power level, outdoor measured	L_{WA}	**71.0**	dB
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV

For air-to-air heat pumps: air flow-rate,outdoor measured	**4380**	m3/h
For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger	**-**	m3/h

GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)

Contact details	Mitsubishi heavy industries thermal systems,LTD

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Model FDT140VSATVH

Model(s) : FDC140VSA / FDT50VH (x3 units)							
Outdoor side heat exchanger of air conditioner : air							
Indoor side heat exchanger of air conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**13.6**	kW	Seasonal space cooling energy efficiency $\eta_{s,c}$		**297.5**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**13.6**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**330.0**	%
Tj=+30℃	Pdc	**10.0**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**545.0**	%
Tj=+25℃	Pdc	**6.4**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**815.0**	%
Tj=+20℃	Pdc	**3.5**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1750.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.008**	kW	Crankcase heater mode	P_{CK}	**0.008**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.008**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m3/h
Sound power level, outdoor	L_{WA}	**73.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Information to identify the model(s) to which the information relates :	FDC140VSA / FDT50VH (x3 units)						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**15.5**	kW	Seasonal space heating energy efficiency η s, h		**192.6**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**9.3**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**326.0**	%
T_j=+2℃	Pdh	**5.7**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**466.0**	%
T_j=+7℃	Pdh	**3.7**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**640.0**	%
T_j=+12℃	Pdh	**2.6**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**813.0**	%
T_{biv}=bivalent temperature	Pdh	**10.5**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**277.0**	%
T_{OL}=operation limit	Pdh	**7.9**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**246.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{oi} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumpiton in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.008**	kW	Type of energy input Standby mode	P_{SB}	**0.008**	kW
Thermostat-off mode	P_{TO}	**0.015**	kW				
Crankcase heater mode	P_{CK}	**0.008**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**4380**	m3/h
Sound power level, outdoor measured	L_{WA}	**73.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Model FDT200VSADVH

Model(s) : FDC200VSA / FDT50VH (x4 units)							
Outdoor side heat exchanger of air conditioner : air							
Indoor side heat exchanger of air conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**19.0**	kW	Seasonal space cooling energy efficiency $\eta_{s,c}$		**291.8**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**19.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**316.0**	%
Tj=+30℃	Pdc	**14.0**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**548.0**	%
Tj=+25℃	Pdc	**9.0**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**935.0**	%
Tj=+20℃	Pdc	**4.3**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1142.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.010**	kW	Crankcase heater mode	P_{CK}	**0.010**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.010**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**8100**	m3/h
Sound power level, outdoor	L_{WA}	**72.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Information to identify the model(s) to which the information relates :	FDC200VSA / FDT50VH (x4 units)
Outdoor side heat exchanger of heat pump :	air
Indoor side heat exchanger of heat pump :	air
Indication if the heater is equipped with a supplementary heater :	No
if applicable :	electric motor

Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.

Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**22.4**	kW

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η s, h	**180.1**	%

Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj

T_j=-7℃	Pdh	**11.1**	kW
T_j=+2℃	Pdh	**6.7**	kW
T_j=+7℃	Pdh	**4.3**	kW
T_j=+12℃	Pdh	**3.5**	kW
T_{biv}=bivalent temperature	Pdh	**12.5**	kW
T_{OL}=operation limit	Pdh	**10.5**	kW
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW
Bivalent temperature	T_{biv}	**-10.0**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-

Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj

T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**278.0**	%
T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**489.0**	%
T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**519.0**	%
T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**688.0**	%
T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**277.0**	%
T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**245.0**	%
For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
For water-to-air heat pumps:Operation limit T_{oi} temperature		**-**	℃

Power consumpiton in modes other than 'active mode'

Off mode	P_{OFF}	**0.010**	kW
Thermostat-off mode	P_{TO}	**0.010**	kW
Crankcase heater mode	P_{CK}	**0.015**	kW

Supplementary heater back-up heating capacity	elbu	**-**	kW
Type of energy input Standby mode	P_{SB}	**0.010**	kW

Other items

Capacity control		**variable**	
Sound power level, outdoor measured	L_{WA}	**74.0**	dB
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV

For air-to-air heat pumps: air flow-rate,outdoor measured		**8100**	m3/h
For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m3/h

GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)

Contact details	Mitsubishi heavy industries thermal systems,LTD

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Model FDT250VSADVH

Model(s) : FDC250VSA / FDT60VH (x4 units)							
Outdoor side heat exchanger of air conditioner : air							
Indoor side heat exchanger of air conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**24.0**	kW	Seasonal space cooling energy efficiency $\eta_{s,c}$		**228.7**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**24.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**297.0**	%
Tj=+30℃	Pdc	**17.7**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**441.0**	%
Tj=+25℃	Pdc	**11.4**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**702.0**	%
Tj=+20℃	Pdc	**6.5**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**852.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumpiton in other than 'active mode'							
Off mode	P_{OFF}	**0.010**	kW	Crankcase heater mode	P_{CK}	**0.010**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.010**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**8580**	m3/h
Sound power level, outdoor	L_{WA}	**73.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Information to identify the model(s) to which the information relates :	FDC250VSA / FDT60VH (x4 units)
Outdoor side heat exchanger of heat pump :	air
Indoor side heat exchanger of heat pump :	air
Indication if the heater is equipped with a supplementary heater :	No
if applicable :	electric motor

Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.

Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**27.0**	kW

Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj			
T_j=-7℃	Pdh	**12.6**	kW
T_j=+2℃	Pdh	**7.7**	kW
T_j=+7℃	Pdh	**5.6**	kW
T_j=+12℃	Pdh	**6.0**	kW
T_{biv}=bivalent temperature	Pdh	**14.2**	kW
T_{OL}=operation limit	Pdh	**12.5**	kW
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW
Bivalent temperature	T_{biv}	**-10.0**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-

Power consumpiton in modes other than 'active mode'			
Off mode	P_{OFF}	**0.010**	kW
Thermostat-off mode	P_{TO}	**0.010**	kW
Crankcase heater mode	P_{CK}	**0.015**	kW

Other items			
Capacity control		**variable**	
Sound power level, outdoor measured	L_{WA}	**75.0**	dB
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV

GWP of the refrigerant		**2088**	kg CO_{2eq} (100years)

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η s, h	**169.7**	%

Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**297.0**	%
T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**444.0**	%
T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**514.0**	%
T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**632.0**	%
T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**268.0**	%
T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**268.0**	%
For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
For water-to-air heat pumps:Operation limit T_{oj} temperature		**-**	℃

Supplementary heater back-up heating capacity	elbu	**-**	kW
Type of energy input Standby mode	P_{SB}	**0.010**	kW

For air-to-air heat pumps: air flow-rate,outdoor measured	**9060**	m3/h
For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger	**-**	m3/h

Contact details	Mitsubishi heavy industries thermal systems,LTD

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PJF000Z551 A

Models FDT40VH, 50VH, 60VH

Model(s) : FDT40VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	3.9	kW	Total electric power input	P_{elec}	0.030	kW
Cooling capacity (latent)	$P_{rated,c}$	0.1	kW	Sound power level (per speed setting,if applicable)	L_{WA}	50.0	dB
Heating capacity	$P_{rated,h}$	4.5	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

Model(s) : FDT50VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	4.4	kW	Total electric power input	P_{elec}	0.040	kW
Cooling capacity (latent)	$P_{rated,c}$	0.6	kW	Sound power level (per speed setting,if applicable)	L_{WA}	55.0	dB
Heating capacity	$P_{rated,h}$	5.4	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

Model(s) : FDT60VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	5.5	kW	Total electric power input	P_{elec}	0.070	kW
Cooling capacity (latent)	$P_{rated,c}$	0.1	kW	Sound power level (per speed setting,if applicable)	L_{WA}	58.0	dB
Heating capacity	$P_{rated,h}$	6.7	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

3. V MULTI SYSTEM

TABLE OF CONTENTS

3.1 HYPER INVERTER PACKAGED AIR-CONDITIONERS 360
3.2 MICRO INVERTER PACKAGED AIR-CONDITIONERS 377

3.1 HYPER INVERTER PACKAGED AIR-CONDITIONERS

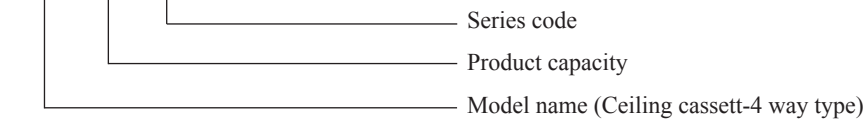
CONTENTS

3.1.1 GENERAL INFORMATION 361
(1) How to read the model name 361
(2) Table of models 361
(3) Table of system combinations 361
3.1.2 SPECIFICATIONS 362
(1) Indoor units 362
(2) Outdoor units 365
(3) Operation chart 372
3.1.3 EXTERIOR DIMENSIONS 375
3.1.4 ELECTRICAL WIRING 375
3.1.5 NOISE LEVEL 375
3.1.6 TEMPERATURE AND VELOCITY DISTRIBUTION 375
3.1.7 PIPING SYSTEM 375
3.1.8 RANGE OF USAGE & LIMITATIONS 375
3.1.9 SELECTION CHART 375
3.1.10 APPLICATION DATA 375
3.1.11 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER 375
3.1.12 MAINTENANCE DATA 375
3.1.13 TECHNICAL INFORMATION 376

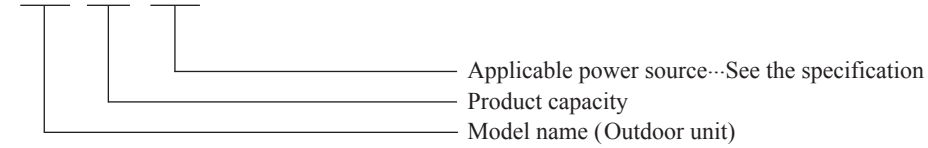
3.1.1 GENERAL INFORMATION

(1) How to read the model name

Example: FDT 40 VH



Example: FDC 100 VNX



(2) Table of models

Model \ Capacity	40	50	60
Ceiling cassete-4 way type (FDT)	○	○	○
Outdoor unit to be combined (FDC)	FDC71VNX	FDC100VNX FDC100VSX	FDC125VNX FDC125VSX	FDC140VNX FDC140VSX

(3) Table of system combinations

Outdoor unit	Type	Indoor unit assembly capacity	Branch pipe set (Option)
FDC71VNX	Twin	40+40	DIS-WA1
FDC100VNX FDC100VSX		50+50	
FDC125VNX FDC125VSX		60+60	
FDC140VNX FDC140VSX	Triple	50+50+50	DIS-TA1 or DIS-WA1×2set

Notes(1) Always use the branch piping set (option) at branches in the refrigerant piping.
(2) If wireless specifications are used, use 1 wireless indoor unit in combination with wired indoor units.
(3) The combinations except the above table forbids.

3.1.2 SPECIFICATIONS

(1) Indoor units

Item \ Model				FDT40VH
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity		kW	4.0
	Nominal heating capacity		kW	4.5
	Sound power level	Cooling	dB(A)	50
		Heating		
	Sound pressure level	Cooling		P-Hi : 36 Hi : 33 Me : 30 Lo : 26
		Heating		P-Hi : 36 Hi : 33 Me : 28 Lo : 20
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 × 840 × 840 Panel 35 × 950 × 950
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent
Net weight			kg	Unit 19 Panel 5
Heat exchanger				Louver fin & inner grooved tubing
Fan type & Q'ty				Turbo fan ×1
Fan motor (Starting method)			W	50 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 19 Hi : 16 Me : 13 Lo : 10
		Heating		
Available external static pressure			Pa	0
Outside air intake				Possible
Air filter, Quality / Quantity				Pocket plastic net ×1(Washable)
Shock & vibration absorber				Rubber sleeve(for fan motor)
Electric heater			W	—
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2
	Room temperature control			Thermostat by electronics
	Operation display			—
Safety equipments				Internal thermostat for fan motor. Frost protection thermostat
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ø6.35 (1/4")
				Gas line: ø12.7 (1/2")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Drain hose			Hose connectable VP25(O.D.32)
Drain pump, max lift height			mm	Built-in drain pump, 850
IP number				IPX0
Standard accessories				Mounting kit, Drain hose
Option parts				—

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDT50VH
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity		kW	5.0
	Nominal heating capacity		kW	5.4
	Sound power level	Cooling	dB(A)	55
		Heating		56
	Sound pressure level	Cooling		P-Hi : 41 Hi : 33 Me : 30 Lo : 26
		Heating		P-Hi : 42 Hi : 33 Me : 28 Lo : 20
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 × 840 × 840 Panel 35 × 950 × 950
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent
Net weight			kg	Unit 19 Panel 5
Heat exchanger				Louver fin & inner grooved tubing
Fan type & Q'ty				Turbo fan ×1
Fan motor (Starting method)			W	50 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 22 Hi : 16 Me : 13 Lo : 10
		Heating		
Available external static pressure			Pa	0
Outside air intake				Possible
Air filter, Quality / Quantity				Pocket plastic net ×1(Washable)
Shock & vibration absorber				Rubber sleeve(for fan motor)
Electric heater			W	—
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2
	Room temperature control			Thermostat by electronics
	Operation display			—
Safety equipments				Internal thermostat for fan motor. Frost protection thermostat
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ø6.35 (1/4")
				Gas line: ø12.7 (1/2")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Drain hose			Hose connectable VP25(O.D.32)
Drain pump, max lift height			mm	Built-in drain pump, 850
IP number				IPX0
Standard accessories				Mounting kit, Drain hose
Option parts				—

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDT60VH
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity		kW	5.6
	Nominal heating capacity		kW	6.7
	Sound power level	Cooling	dB(A)	58
		Heating		59
	Sound pressure level	Cooling		P-Hi : 44 Hi : 34 Me : 30 Lo : 27
		Heating		P-Hi : 44 Hi : 34 Me : 30 Lo : 23
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	Unit 236 × 840 × 840 Panel 35 × 950 × 950
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent
Net weight			kg	Unit 21 Panel 5
Heat exchanger				Louver fin & inner grooved tubing
Fan type & Q'ty				Turbo fan ×1
Fan motor (Starting method)			W	50 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 26 Hi : 17 Me : 14 Lo : 11
		Heating		
Available external static pressure			Pa	0
Outside air intake				Possible
Air filter, Quality / Quantity				Pocket plastic net ×1(Washable)
Shock & vibration absorber				Rubber sleeve(for fan motor)
Electric heater			W	—
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2
	Room temperature control			Thermostat by electronics
	Operation display			—
Safety equipments				Internal thermostat for fan motor. Frost protection thermostat
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ø6.35 (1/4")
				Gas line: ø12.7 (1/2")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Drain hose			Hose connectable VP25(O.D.32)
Drain pump, max lift height			mm	Built-in drain pump, 850
IP number				IPX0
Standard accessories				Mounting kit, Drain hose
Option parts				—

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

(2) Outdoor units

Item \ Model				FDC71VNX
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity (range)		kW	7.1 [3.2(Min.)-8.0(Max.)]
	Nominal heating capacity (range)		kW	8.0 [3.6(Min.)-9.0(Max.)]
	Sound power level	Cooling	dB(A)	66
		Heating		
	Sound pressure level	Cooling		51
		Heating		48
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	750×880(+88)×340
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	60
Compressor type & Q'ty				RMT5118MDE2(Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.675 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 2.95kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×1
Fan motor (Starting method)			W	86 < Direct line start >
Air flow		Cooling	m^3/min	60
		Heating		50
Shock & vibration absorber				Rubber sleeve(for compressor)
Electric heater			W	20(Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.50m
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 x 3 pcs
IP number				IP24
Standard accessories				—
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDC100VNX
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity (range)		kW	10.0 [4.0(Min.)-11.2(Max.)]
	Nominal heating capacity (range)		kW	11.2 [4.0(Min.)-12.5(Max.)]
	Sound power level	Cooling	dB(A)	70
		Heating		
	Sound pressure level	Cooling		48
		Heating		50
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	1300×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	105
Compressor type & Q'ty				RMT5134MDE2(Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×2
Fan motor (Starting method)			W	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	100
		Heating		
Shock & vibration absorber				Rubber sleeve(for compressor)
Electric heater			W	20(Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.100m
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 x 3 pcs
IP number				IP24
Standard accessories				Edging
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDC100VSX
Power source				3 Phase 380-415V 50Hz / 380V 60Hz
Operation data	Nominal cooling capacity (range)		kW	10.0 [4.0(Min.)-11.2(Max.)]
	Nominal heating capacity (range)		kW	11.2 [4.0(Min.)-16.0(Max.)]
	Sound power level	Cooling	dB(A)	70
		Heating		
	Sound pressure level	Cooling		48
		Heating		50
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	1300×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	105
Compressor type & Q'ty				RMT5134MDE3(Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×2
Fan motor (Starting method)			W	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	100
		Heating		
Shock & vibration absorber				Rubber sleeve(for compressor)
Electric heater			W	20(Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.100m
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 x 3 pcs
IP number				IP24
Standard accessories				Edging
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

PJF000Z551 A

Item \ Model				FDC125VNX
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity (range)		kW	12.5 [5.0(Min.)-14.0(Max.)]
	Nominal heating capacity (range)		kW	14.0 [4.0(Min.)-17.0(Max.)]
	Sound power level	Cooling	dB(A)	70
		Heating		
	Sound pressure level	Cooling		48
		Heating		50
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	1300×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	105
Compressor type & Q'ty				RMT5134MDE2(Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×2
Fan motor (Starting method)			W	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	100
		Heating		
Shock & vibration absorber				Rubber sleeve(for compressor)
Electric heater			W	20(Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.100m
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 x 3 pcs
IP number				IP24
Standard accessories				Edging
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDC125VSX
Power source				3 Phase 380-415V 50Hz / 380V 60Hz
Operation data	Nominal cooling capacity (range)		kW	12.5 [5.0(Min.)-14.0(Max.)]
	Nominal heating capacity (range)		kW	14.0 [4.0(Min.)-18.0(Max.)]
	Sound power level	Cooling	dB(A)	70
		Heating		
	Sound pressure level	Cooling		48
		Heating		50
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	1300×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	105
Compressor type & Q'ty				RMT5134MDE3 (Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×2
Fan motor (Starting method)			W	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	100
		Heating		
Shock & vibration absorber				Rubber sleeve(for compressor)
Electric heater			W	20(Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.100m
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 x 3 pcs
IP number				IP24
Standard accessories				Edging
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

PJF000Z551 A

Item \ Model				FDC140VNX
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity (range)		kW	14.0 [5.0(Min.)-16.0(Max.)]
	Nominal heating capacity (range)		kW	16.0 [4.0(Min.)-18.0(Max.)]
	Sound power level	Cooling	dB(A)	72
		Heating		
	Sound pressure level	Cooling		49
		Heating		52
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	1300×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	105
Compressor type & Q'ty				RMT5134MDE2(Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×2
Fan motor (Starting method)			W	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	100
		Heating		
Shock & vibration absorber				Rubber sleeve(for compressor)
Electric heater			W	20(Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.100m
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 x 3 pcs
IP number				IP24
Standard accessories				Edging
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDC140VSX
Power source				3 Phase 380-415V 50Hz / 380V 60Hz
Operation data	Nominal cooling capacity (range)		kW	14.0 [5.0(Min.)-16.0(Max.)]
	Nominal heating capacity (range)		kW	16.0 [4.0(Min.)-20.0(Max.)]
	Sound power level	Cooling	dB(A)	72
		Heating		
	Sound pressure level	Cooling		49
		Heating		52
	Silent mode sound pressure level			—
Exterior dimensions (Height x Width x Depth)			mm	1300×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	105
Compressor type & Q'ty				RMT5134MDE3(Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 4.5kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×2
Fan motor (Starting method)			W	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	100
		Heating		
Shock & vibration absorber				Rubber sleeve(for compressor)
Electric heater			W	20(Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.100m
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 x 3 pcs
IP number				IP24
Standard accessories				Edging
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃	—	7℃	6℃	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

PJF000Z551 A

(3) Operation chart

The V Multi is a system that allows for different models and capacities of indoor units to be connected so the individual operating characteristics of the indoor and outdoor are provided. Use the procedure shown in Item (c) to calculate the combined operating characteristics.

(a) Operating characteristic of outdoor unit

(220-240V 50Hz/220V 60Hz)

Item \ Model		FDC71VNX	FDC100VNX	FDC125VNX	FDC140VNX
Cooling power consumption	kW	1.95	2.33	3.11	4.02
Heating power consumption		1.85	2.41	3.26	4.03
Cooling running current	A	8.5/8.9	10.3/10.8	13.7/14.3	17.6/18.4
Heating running current		8.1/8.5	10.6/11.1	14.3/15.0	17.6/18.4
Inrush current <Max. running current>	A	5 <17>	5 <24>	5 <26>	

(380-415V 50Hz/380V 60Hz)

Item \ Model		FDC100VSX	FDC125VSX	FDC140VSX
Cooling power consumption	kW	2.33	3.11	4.02
Heating power consumption		2.41	3.26	4.03
Cooling running current	A	5.9/6.2	7.9/8.3	10.1/10.7
Heating running current		6.1/6.4	8.2/8.7	10.1/10.7
Inrush current <Max. running current>	A	5 <15>		

Note(1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO5151-T1 "UNITARY AIR-CONDITIONERS"

(b) Operating characteristic of indoor unit

(220-240V 50Hz/220V 60Hz)

Item \ Model		FDT40VH	FDT50VH	FDT60VH
Cooling power consumption	kW	0.03-0.03/0.03	0.04-0.04/0.04	0.07-0.07/0.07
Heating power consumption		0.03-0.03/0.03	0.04-0.04/0.04	0.07-0.07/0.07
Cooling running current	A	0.27-0.25/0.27	0.36-0.33/0.36	0.62-0.57/0.62
Heating running current		0.27-0.25/0.27	0.36-0.33/0.36	0.62-0.57/0.62

Notes(1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO5151-T1 "UNITARY AIR-CONDITIONERS"
(2) The values shown in the above table are common to both cooling and heating operations.

(c) Calculation of total operation characteristics

Since the operation characteristics of V Multi system depend on combination of indoor unit, calculate the total operation characteristics of the system by using the formulas below according to speciations of each indoor unit or outdoor unit.

1) 1 Phase models

a) Total power consumption

Total power consumption (kW) = Power consumption of outdoor unit + ∑ (Power consumption of indoor unit)

b) Total running current

Total running current (A) = Running current of outdoor unit + ∑ (Running current of indoor unit)

c) Total power factor

Total power factor (%) = [Total power consumption (W) / Total running current (A) × Power source] × 100

Total operation characteristics = Operation characteristic value of outdoor unit + Operation characteristic value of indoor unit

[Example]

(Conditions) Operation voltage ····· Indoor unit: 220V, 50Hz
Outdoor unit: 220V, 50Hz
Operation mode ····· Cooling and Heating
Unit····· Outdoor unit: FDC140VNX × 1 unit
Indoor unit: FDT50VH × 3 units

Operation characteristics of each unit (Cooling/Heating)

Item \ Model	FDC140VNX	FDT50VH
Power consumption (kW)	4.02/4.03	0.04/0.04
Running current (A)	17.6/17.6	0.36/0.36

① Total power consumption (kW)

(Cooling) 4.02 + (0.04 × 3) = 4.14

(Heating) 4.03 + (0.04 × 3) = 4.15

② Total running current (A)

(Cooling) 17.6 + (0.36 × 3) = 18.68

(Heating) 17.6 + (0.36 × 3) = 18.68

③ Total power factor (%)

(Cooling) $\frac{4.14 \times 1000}{18.68 \times 220} \times 100 \fallingdotseq 99\%$

(Heating) $\frac{4.15 \times 1000}{18.68 \times 220} \times 100 \fallingdotseq 99\%$

2) 3 Phase models

a) Total power consumption

Total power consumption (kW) = Power consumption of outdoor unit + ∑ (Power consumption of indoor unit)

b) Total running current

Total running current (A) = Running current of outdoor unit + [∑ (Running current of indoor unit) × 1/3]

c) Total power factor

Total power factor (%) = [Total power consumption (W) / $\sqrt{3}$ × Total running current (A) × Power source] × 100

Total operation characteristics = Operation characteristic value of outdoor unit + Operation characteristic value of indoor unit

[Example]

(Conditions) Operation voltage ····· Indoor unit: 220V, 50Hz
Outdoor unit: 380V, 50Hz
Operation mode ····· Cooling and Heating
Unit····· Outdoor unit: FDC125VSX × 1 unit
Indoor unit: FDT60VH × 2 units

Operation characteristics of each unit

(Cooling/Heating)

Item \ Model	FDC125VSX	FDT60VH
Power consumption (kW)	3.11/3.26	0.07/0.07
Running current (A)	7.9/8.2	0.62/0.62

① Total power consumption (kW)

(Cooling) 3.11 + 0.07 × 2 = 3.25 (kW)

(Heating) 3.26 + 0.07 × 2 = 3.4 (kW)

② Total running current (A)

(Cooling) $7.9 + \left[(0.62 + 0.62 \times \frac{1}{3})\right] \fallingdotseq 8.3$ (A)

(Heating) $8.2 + \left[(0.62 + 0.62 \times \frac{1}{3})\right] \fallingdotseq 8.6$ (A)

③ Total power factor (%)

(Cooling) $\frac{3.25 \times 1000}{\sqrt{3} \times 8.3 \times 380} \times 100 \fallingdotseq 59$ %

(Heating) $\frac{3.4 \times 1000}{\sqrt{3} \times 8.6 \times 380} \times 100 \fallingdotseq 60$ %

3.1.3 EXTERIOR DIMENSIONS

(1) Indoor units .....See page 15

(2) Outdoor units .....See page 16

(3) Remote control (Option parts) .....See page 19

3.1.4 ELECTRICAL WIRING

(1) Indoor units .....See page 22

(2) Outdoor units .....See page 23

3.1.5 NOISE LEVEL

(1) Indoor units .....See page 27

(2) Outdoor units .....See page 28

3.1.6 TEMPERATURE AND VELOCITY DISTRIBUTION .....See page 30

3.1.7 PIPING SYSTEM .....See page 32

3.1.8 RANGE OF USAGE & LIMITATIONS .....See page 34

3.1.9 SELECTION CHART .....See page 38

3.1.10 APPLICATION DATA

(1) Installation of indoor unit .....See page 48

(2) Electric wiring work installation .....See page 54

(3) Installation of wired remote control (Option) .....See page 58

(4) Installation of outdoor unit

(a) Model FDC71VNX .....See page 74

(b) Models FDC100−140VNX,100−140VSX .....See page 82

(5) Instructions for branching pipe set (DIS-WA1,WB1,TA1,TB1) ....See page 90

3.1.11 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER .....See page 93

3.1.12 MAINTENANCE DATA .....See page 134

3.1.13 TECHNICAL INFORMATION

Models FDT40VH, 50VH, 60VH

Model(s) : FDT40VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	3.9	kW	Total electric power input	P_{elec}	0.030	kW
Cooling capacity (latent)	$P_{rated,c}$	0.1	kW	Sound power level (per speed setting,if applicable)	L_{WA}	50.0	dB
Heating capacity	$P_{rated,h}$	4.5	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

Model(s) : FDT50VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	4.4	kW	Total electric power input	P_{elec}	0.040	kW
Cooling capacity (latent)	$P_{rated,c}$	0.6	kW	Sound power level (per speed setting,if applicable)	L_{WA}	55.0	dB
Heating capacity	$P_{rated,h}$	5.4	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

Model(s) : FDT60VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	5.5	kW	Total electric power input	P_{elec}	0.070	kW
Cooling capacity (latent)	$P_{rated,c}$	0.1	kW	Sound power level (per speed setting,if applicable)	L_{WA}	58.0	dB
Heating capacity	$P_{rated,h}$	6.7	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

3.2 MICRO INVERTER PACKAGED AIR-CONDITIONERS

CONTENTS

3.2.1 GENERAL INFORMATION 377
(1) How to read the model name 377
(2) Table of models 378
(3) Table of system combinations 378
3.2.2 SPECIFICATIONS 379
(1) Indoor units 379
(2) Outdoor units 381
(3) Operation chart 389
3.2.3 EXTERIOR DIMENSIONS 392
3.2.4 ELECTRICAL WIRING 392
3.2.5 NOISE LEVEL 392
3.2.6 TEMPERATURE AND VELOCITY DISTRIBUTION 392
3.2.7 PIPING SYSTEM 392
3.2.8 RANGE OF USAGE & LIMITATIONS 392
3.2.9 SELECTION CHART 392
3.2.10 APPLICATION DATE 392
3.2.11 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER 392
3.2.12 MAINTENANCE DATA 392
3.2.13 TECHNICAL INFORMATION 393

3.2.1 GENERAL INFORMATION

(1) How to read the model name

Example: FDT 50 VH

- VH — Series code
- 50 — Product capacity
- FDT — Model name (Ceiling cassett-4 way type)

Example: FDC 100 VNA

- VNA — Applicable power source···See the specification
- 100 — Product capacity
- FDC — Model name (Outdoor unit)

(2) Table of models

Model \ Capacity	50	60
Ceiling suspended type (FDE)	○	○
Outdoor unit to be combined (FDC)	FDC100VNA FDC125VNA FDC140VNA FDC200VSA FDC250VSA FDC100VSA FDC125VSA FDC140VSA (8 Horse Power) (10 Horse Power) (4 Horse Power) (5 Horse Power) (6 Horse Power)	

(3) Table of system combinations

Outdoor unit	Type	Indoor unit assembly capacity	Branch pipe set (Option)
FDC100VNA FDC100VSA	Twin	50+50	DIS-WA1
FDC125VNA FDC125VSA		60+60	
FDC140VNA FDC140VSA	Triple	50+50+50	DIS-TA1 or DIS-WA1×2set
FDC200VSA	Double twin	50+50+50+50	DIS-WA1×2set DIS-WB1×1set
FDC250VSA	Double twin	60+60+60+60	DIS-WA1×2set DIS-WB1×1set

Notes(1) Always use the branch piping set (option) at branches in the refrigerant piping.
(2) If wireless specifications are used, use 1 wireless indoor unit in combination with wired indoor units.
(3) The combinations except the above table forbids.

3.2.2 SPECIFICATIONS

(1) Indoor units

Item \ Model				FDT50VH
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Sound power level	Cooling	dB(A)	55
		Heating		56
	Sound pressure level	Cooling		P-Hi : 41 Hi : 33 Me : 30 Lo : 26
		Heating		P-Hi : 42 Hi : 33 Me : 28 Lo : 20
	Silent mode sound pressure level			—
Exterior dimensions (Height × Width × Depth)			mm	Unit 236 × 840 × 840 Panel 35 × 950 × 950
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent
Net weight			kg	Unit 19 Panel 5
Heat exchanger				Louver fin & inner grooved tubing
Fan type & Q'ty				Turbo fan ×1
Fan motor (Starting method)			W	50 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 22 Hi : 16 Me : 13 Lo : 10
		Heating		
Available external static pressure			Pa	0
Outside air intake				Possible
Air filter, Quality / Quantity				Pocket plastic net ×1 (Washable)
Shock & vibration absorber				Rubber sleeve (for fan motor)
Electric heater			W	—
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2
	Room temperature control			Thermostat by electronics
	Operation display			—
Safety equipments				Internal thermostat for fan motor. Frost protection thermostat.
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ø6.35 (1/4")
				Gas line: ø12.7 (1/2")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Drain hose			Hose connectable VP25 (O.D.32)
Drain pump, max lift height			mm	Built-in drain pump, 850
IP number				IPX0
Standard accessories				Mounting kit, Drain hose
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDT60VH
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Sound power level	Cooling	dB(A)	58
		Heating		59
	Sound pressure level	Cooling		P-Hi : 44 Hi : 34 Me : 30 Lo : 27
		Heating		P-Hi : 44 Hi : 34 Me : 30 Lo : 23
	Silent mode sound pressure level			—
Exterior dimensions (Height × Width × Depth)			mm	Unit 236 × 840 × 840 Panel 35 × 950 × 950
Exterior appearance (Munsell color)				Plaster white (6.8Y8.9/0.2) near equivalent
Net weight			kg	Unit 21 Panel 5
Heat exchanger				Louver fin & inner grooved tubing
Fan type & Q'ty				Turbo fan ×1
Fan motor (Starting method)			W	50 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 26 Hi : 17 Me : 14 Lo : 11
		Heating		
Available external static pressure			Pa	0
Outside air intake				Possible
Air filter, Quality / Quantity				Pocket plastic net ×1 (Washable)
Shock & vibration absorber				Rubber sleeve (for fan motor)
Electric heater			W	—
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-T-5AW-E2
	Room temperature control			Thermostat by electronics
	Operation display			—
Safety equipments				Internal thermostat for fan motor. Frost protection thermostat.
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ø6.35 (1/4")
				Gas line: ø12.7 (1/2")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Drain hose			Hose connectable VP25 (O.D.32)
Drain pump, max lift height			mm	Built-in drain pump, 850
IP number				IPX0
Standard accessories				Mounting kit, Drain hose
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

(2) Outdoor units

Item \ Model				FDC100VNA
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity (range)		kW	10.0 [4.0(Min.)-11.2(Max.)]
	Nominal heating capacity (range)		kW	11.2 [4.0(Min.)-12.5(Max.)]
	Sound power level	Cooling	dB(A)	70
		Heating		
	Sound pressure level	Cooling		54
		Heating		56
	Silent mode sound pressure level			50/44 (Normal/Silent)
Exterior dimensions (Height × Width × Depth)			mm	845×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	80
Compressor type & Q'ty				RMT5126MCE3(Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×1
Fan motor (Starting method)			W	86 < Direct line start >
Air flow		Cooling	m^3/min	75
		Heating		73
Shock & vibration absorber				Rubber sleeve (for compressor)
Electric heater			W	20 (Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.50m
	Vertical height diff. between O/U and I/U		m	Max.50m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 × 3 pcs
IP number				IP24
Standard accessories				—
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDC100VSA
Power source				3 Phase 380-415V 50Hz / 380V 60Hz
Operation data	Nominal cooling capacity (range)		kW	10.0 [4.0(Min.)-11.2(Max.)]
	Nominal heating capacity (range)		kW	11.2 [4.0(Min.)-12.5(Max.)]
	Sound power level	Cooling	dB(A)	70
		Heating		
	Sound pressure level	Cooling		54
		Heating		56
	Silent mode sound pressure level			50/44 (Normal/Silent)
Exterior dimensions (Height × Width × Depth)			mm	845×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	82
Compressor type & Q'ty				RMT5126MCE4 (Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×1
Fan motor (Starting method)			W	86 < Direct line start >
Air flow		Cooling	m^3/min	75
		Heating		73
Shock & vibration absorber				Rubber sleeve (for compressor)
Electric heater			W	20 (Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.50m
	Vertical height diff. between O/U and I/U		m	Max.50m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 × 3 pcs
IP number				IP24
Standard accessories				—
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

PJF000Z551 A

Item \ Model				FDC125VNA
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity (range)		kW	12.5 [5.0(Min.)-14.0(Max.)]
	Nominal heating capacity (range)		kW	14.0 [4.0(Min.)-16.0(Max.)]
	Sound power level	Cooling	dB(A)	71
		Heating		
	Sound pressure level	Cooling		55
		Heating		57
	Silent mode sound pressure level			51/45 (Normal/Silent)
Exterior dimensions (Height × Width × Depth)			mm	845×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	80
Compressor type & Q'ty				RMT5126MCE3 (Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×1
Fan motor (Starting method)			W	86 < Direct line start >
Air flow		Cooling	m^3/min	75
		Heating		73
Shock & vibration absorber				Rubber sleeve (for compressor)
Electric heater			W	20 (Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.50m
	Vertical height diff. between O/U and I/U		m	Max.50m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 × 3 pcs
IP number				IP24
Standard accessories				—
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDC125VSA
Power source				3 Phase 380-415V 50Hz / 380V 60Hz
Operation data	Nominal cooling capacity (range)		kW	12.5 [5.0(Min.)-14.0(Max.)]
	Nominal heating capacity (range)		kW	14.0 [4.0(Min.)-16.0(Max.)]
	Sound power level	Cooling	dB(A)	71
		Heating		
	Sound pressure level	Cooling		55
		Heating		57
	Silent mode sound pressure level			51/45 (Normal/Silent)
Exterior dimensions (Height × Width × Depth)			mm	845×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	82
Compressor type & Q'ty				RMT5126MCE4 (Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×1
Fan motor (Starting method)			W	86 < Direct line start >
Air flow		Cooling	m^3/min	75
		Heating		73
Shock & vibration absorber				Rubber sleeve (for compressor)
Electric heater			W	20 (Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.50m
	Vertical height diff. between O/U and I/U		m	Max.50m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 × 3 pcs
IP number				IP24
Standard accessories				—
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

PJF000Z551 A

Item \ Model				FDC140VNA
Power source				1 Phase 220-240V 50Hz / 220V 60Hz
Operation data	Nominal cooling capacity (range)		kW	13.6 [5.0(Min.)-14.5(Max.)]
	Nominal heating capacity (range)		kW	15.5 [4.0(Min.)-16.5(Max.)]
	Sound power level	Cooling	dB(A)	73
		Heating		
	Sound pressure level	Cooling		57
		Heating		59
	Silent mode sound pressure level			53/47 (Normal/Silent)
Exterior dimensions (Height × Width × Depth)			mm	845×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	80
Compressor type & Q'ty				RMT5126MCE3 (Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×1
Fan motor (Starting method)			W	86 < Direct line start >
Air flow		Cooling	m^3/min	75
		Heating		73
Shock & vibration absorber				Rubber sleeve (for compressor)
Electric heater			W	20 (Crank case heater)
Safety equipments				Internal thermostat for fan motor Abnormal discharge temperature protection
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.50m
	Vertical height diff. between O/U and I/U		m	Max.50m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 × 3 pcs
IP number				IP24
Standard accessories				—
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PJF000Z551 A

Item \ Model				FDC140VSA
Power source				3 Phase 380-415V 50Hz / 380V 60Hz
Operation data	Nominal cooling capacity (range)		kW	13.6 [5.0(Min.)-14.5(Max.)]
	Nominal heating capacity (range)		kW	15.5 [4.0(Min.)-16.5(Max.)]
	Sound power level	Cooling	dB(A)	73
		Heating		
	Sound pressure level	Cooling		57
		Heating		59
	Silent mode sound pressure level			53/47 (Normal/Silent)
Exterior dimensions (Height × Width × Depth)			mm	845×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	82
Compressor type & Q'ty				RMT5126MCE4 (Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (M-MA68)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 3.8kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				Straight fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×1
Fan motor (Starting method)			W	86 < Direct line start >
Air flow		Cooling	m^3/min	75
		Heating		73
Shock & vibration absorber				Rubber sleeve (for compressor)
Electric heater			W	20 (Crank case heater)
Safety equipments				Internal thermostat for fan motor. Abnormal discharge temperature protection.
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ15.88 (5/8")
	Connecting method			Flare piping
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.50m
	Vertical height diff. between O/U and I/U		m	Max.50m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 × 3 pcs
IP number				IP24
Standard accessories				—
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

PJF000Z551 A

Item \ Model				FDC200VSA
Power source				3 Phase 380-415V 50Hz / 380V 60Hz
Operation data	Nominal cooling capacity (range)		kW	19.0 [5.2(Min.)-22.4(Max.)]
	Nominal heating capacity (range)		kW	22.4 [3.3(Min.)-25.0(Max.)]
	Sound power level	Cooling	dB(A)	72
		Heating		74
	Sound pressure level	Cooling		58
		Heating		59
	Silent mode sound pressure level			52
Exterior dimensions (Height × Width × Depth)			mm	1,300×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	115
Compressor type & Q'ty				RMT5134MDE3 (Twin rotary type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	0.9 (compressor) + 0.6 (unit) (M-MA32R)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 5.6kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×2
Fan motor (Starting method)			W	86x2 < Direct line start >
Air flow		Cooling	m^3/min	135
		Heating		
Shock & vibration absorber				Rubber sleeve (for compressor)
Electric heater			W	20 (Crank case heater)
Safety equipments				Internal thermostat for fan motor. Abnormal discharge temperature protection.
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ9.52 (3/8")
				Gas line: ϕ22.22 (7/8")
	Connecting method			Liquid line : Flare / Gas : Brazing
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.70m (Liquid piping : ϕ12.7, Gas piping ϕ25.4 or ϕ28.58), Max.40m (Liquid piping : ϕ9.52, Max.35m (Gas piping : ϕ22.22),
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 × 3 pcs
IP number				IP24
Standard accessories				Connecting pipe, Edging
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

PJF000Z551 A

Item \ Model				FDC250VSA
Power source				3 Phase 380-415V 50Hz / 380V 60Hz
Operation data	Nominal cooling capacity (range)		kW	24.0 [6.9(Min.)-28.0(Max.)]
	Nominal heating capacity (range)		kW	27.0 [5.5(Min.)-31.5(Max.)]
	Sound power level	Cooling	dB(A)	73
		Heating		75
	Sound pressure level	Cooling		59
		Heating		62
	Silent mode sound pressure level			54
Exterior dimensions (Height × Width × Depth)			mm	1,505×970×370
Exterior appearance (Munsell color)				Stucco white (4.2Y7.5/1.1) near equivalent
Net weight			kg	143
Compressor type & Q'ty				GTC5150NC40KF (Scroll type)×1
Compressor motor (Starting method)			kW	Direct line start
Refrigerant oil (Amount, type)			ℓ	1.45 (M-MA32R)
Refrigerant (Type, amount, pre-charge length)			kg	R410A 7.2kg in outdoor unit (Incl. the amount for the piping of : 30m)
Heat exchanger				M shape & inner grooved tubing
Refrigerant control				Electronic expansion valve
Fan type & Q'ty				Propeller fan ×2
Fan motor (Starting method)			W	86x2 < Direct line start >
Air flow		Cooling	m^3/min	143
		Heating		151
Shock & vibration absorber				Rubber sleeve (for compressor)
Electric heater			W	20 (Crank case heater)
Safety equipments				Internal thermostat for fan motor. Abnormal discharge temperature protection.
Installation data	Refrigerant piping size (O.D.)		mm	Liquid line: ϕ12.7 (1/2")
				Gas line: ϕ22.22 (7/8")
	Connecting method			Liquid line : Flare / Gas : Brazing
	Attached length of piping		m	—
	Insulation for piping			Necessary (both Liquid & Gas lines)
	Refrigerant line (one way) length		m	Max.70m (Gas piping : ϕ25.4 or ϕ28.58, Max.35m (Gas piping : ϕ22.22)
	Vertical height diff. between O/U and I/U		m	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)
	Drain hose			Hole size ϕ20 × 3 pcs
IP number				IP24
Standard accessories				Connecting pipe, Edging
Option parts				—

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C	—	7˚C	6˚C	

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

PJF000Z551 A

(3) Operation chart

The V Multi is a system that allows for different models and capacities of indoor units to be connected so the individual operating characteristics of the indoor and outdoor are provided. Use the procedure shown in item (c) to calculate the combined operating characteristics.

(a) Operating characteristic of outdoor unit

(220-240V 50Hz/220V 60Hz)

Item \ Model		FDC100VNA	FDC125VNA	FDC140VNA
Cooling power consumption	kW	2.60/2.62	3.91/3.91	4.70/4.70
Heating power consumption		2.51/2.51	3.60/3.60	4.29/4.29
Cooling running current	A	12.8-11.7/12.8	18.5-16.9/18.5	21.6-19.8/21.6
Heating running current		12.5-11.4/12.5	17.2-15.8/17.2	19.4-17.8/19.4
Inrush current (L.R.A) <Max. running current>	A	5 <24>		

(380-415V 50Hz/380V 60Hz)

Item \ Model		FDC100VSA	FDC125VSA	FDC140VSA
Cooling power consumption	kW	2.60/2.62	3.91/3.91	4.70/4.70
Heating power consumption		2.51/2.51	3.60/3.60	4.29/4.29
Cooling running current	A	3.8-3.5/3.8	5.9-5.4/5.9	7.2-6.6/7.2
Heating running current		3.7-3.3/3.7	5.4-4.9/5.4	6.8-6.2/6.8
Inrush current (L.R.A) <Max. running current>	A	5 <15>		

(380-415V 50Hz/380V 60Hz)

Item \ Model		FDC200VSA	FDC250VSA
Cooling power consumption	kW	7.05/7.05	8.22/8.16
Heating power consumption		7.02/7.02	7.42/7.38
Cooling running current	A	10.2/10.5	11.8/12.3
Heating running current		10.0/10.5	10.8/11.2
Inrush current (L.R.A) <Max. running current>	A	5 <20>	5 <21>

Note(1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(b) Operating characteristic of indoor unit

(220-240V 50Hz/220V 60Hz)

Item \ Model		FDT50VH	FDT60VH
Cooling power consumption	kW	0.04-0.04/0.04	0.07-0.07/0.07
Heating power consumption		0.04-0.04/0.04	0.07-0.07/0.07
Cooling running current	A	0.36-0.33/0.36	0.62-0.57/0.62
Heating running current		0.36-0.33/0.36	0.62-0.57/0.62

Notes(1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"
(2) The values shown in the above table are common to both cooling and heating operations.

(c) Calculation of total operation characteristics

Since the operation characteristics of V Multi system depend on combination of indoor unit, calculate the total operation characteristics of the system by using the formulas below according to speciations of each indoor unit or outdoor unit.

(i) 1 Phase models

1) Total power consumption

Total power consumption (kW) = Power consumption of outdoor unit + ∑ (Power consumption of indoor unit)

2) Total running current

Total running current (A) = Running current of outdoor unit + ∑ (Running current of indoor unit)

3) Total power factor

Total power factor (%) = [Total power consumption (W) / Total running current (A) × Power source] × 100

Total operation characteristics = Operation characteristic value of outdoor unit + Operation characteristic value of indoor unit

[Example]

(Conditions) Operation voltage ····· Indoor unit: 220V, 50Hz
Outdoor unit: 220V, 50Hz
Operation mode ····· Cooling and Heating
Unit····· Outdoor unit: FDC140VNA × 1 unit
Indoor unit: FDT50VH × 3 units

Operation characteristics of each unit (Cooling/Heating)

Item \ Model	FDC140VNA	FDT50VH
Power consumption (kW)	4.70/4.29	0.04/0.04
Running current (A)	21.6/19.4	0.36/0.36

① Total power consumption (kW)

(Cooling) 4.70 + (0.04 × 3) = 4.82

(Heating) 4.29 + (0.04 × 3) = 4.41

② Total running current (A)

(Cooling) 21.6 + (0.36 × 3) = 22.68

(Heating) 19.4 + (0.36 × 3) = 20.48

③ Total power factor (%)

(Cooling) $\frac{4.82 \times 1000}{22.68 \times 220} \times 100 \fallingdotseq 97\ \%$

(Heating) $\frac{4.41 \times 1000}{20.48 \times 220} \times 100 \fallingdotseq 98\ \%$

(ii) 3 Phase models

1) Total power consumption

Total power consumption (kW) = Power consumption of outdoor unit + ∑ (Power consumption of indoor unit)

2) Total running current

Total running current (A) = Running current of outdoor unit + [∑ (Running current of indoor unit) × 1/3]

3) Total power factor

Total power factor (%) = [Total power consumption (W) / $\sqrt{3}$ × Total running current (A) × Power source] × 100

Total operation characteristics = Operation characteristic value of outdoor unit + Operation characteristic value of indoor unit

[Example]

(Conditions) Operation voltage ····· Indoor unit: 220V, 50Hz
Outdoor unit: 380V, 50Hz
Operation mode ····· Cooling and Heating
Unit····· Outdoor unit: FDC200VSA × 1 unit
Indoor unit: FDT50VH × 4 units

Operation characteristics of each unit

(Cooling/Heating)

Item \ Model	FDC200VSA	FDT50VH
Power consumption (kW)	7.05/7.02	0.04/0.04
Running current (A)	10.2/10.0	0.36/0.36

① Total power consumption (kW)

(Cooling) 7.05 + 0.04 × 4 = 7.21 (kW)

(Heating) 7.02 + 0.04 × 4 = 7.18 (kW)

② Total running current (A)

(Cooling) $10.2 + \left[(0.36 \times 4) \times \frac{1}{3})\right] = 10.68$ (A)

(Heating) $10.0 + \left[(0.36 \times 4) \times \frac{1}{3})\right] = 10.48$ (A)

③ Total power factor (%)

(Cooling) $\frac{7.21 \times 1000}{\sqrt{3} \times 10.68 \times 380} \times 100 \fallingdotseq 99$ %

(Heating) $\frac{7.18 \times 1000}{\sqrt{3} \times 10.48 \times 380} \times 100 \fallingdotseq 99$ %

3.2.3 EXTERIOR DIMENSIONS
(1) Indoor units .....See page 278
(2) Outdoor units .....See page 278
(3) Remote control (Option parts) .....See page 280
3.2.4 ELECTRICAL WIRING
(1) Indoor units .....See page 281
(2) Outdoor units .....See page 281
3.2.5 NOISE LEVEL .....
(1) Indoor units .....See page 285
(2) Outdoor units .....See page 285
3.2.6 TEMPERATURE AND VELOCITY DISTRIBUTION .....See page 286
3.2.7 PIPING SYSTEM .....See page 287
3.2.8 RANGE OF USAGE & LIMITATIONS .....See page 291
3.2.9 SELECTION CHART .....See page 295
3.2.10 APPLICATION DATE
(1) Installation of indoor unit .....See page 304
(2) Electric wiring work installation .....See page 304
(3) Installation of wired remote control (Option) .....See page 304
(4) Installation of outdoor unit
(a) Models FDC100-140VNA,100-140VSA .....See page 304
(b) Models FDC200,250VSA .....See page 313
(c) Method for connecting the accessory pipe
(Models FDC200,250VSA) .....See page 321
(5) Instructions for branching pipe set (DIS-WA1,WB1,TA1,TB1) .....See page 324
3.2.11 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER .....See page 325
3.2.12 MAINTENANCE DATA .....See page 344

3.2.13 TECHNICAL INFORMATION

Models FDT50VH, 60VH

Model(s) : FDT50VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	4.4	kW	Total electric power input	P_{elec}	0.040	kW
Cooling capacity (latent)	$P_{rated,c}$	0.6	kW	Sound power level (per speed setting,if applicable)	L_{WA}	55.0	dB
Heating capacity	$P_{rated,h}$	5.4	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

Model(s) : FDT60VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	5.5	kW	Total electric power input	P_{elec}	0.070	kW
Cooling capacity (latent)	$P_{rated,c}$	0.1	kW	Sound power level (per speed setting,if applicable)	L_{WA}	58.0	dB
Heating capacity	$P_{rated,h}$	6.7	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD						

4. OPTION PARTS

CONTENTS

4.1 WIRELESS KIT (RCN-T-5AW-E2) 395
4.2 MOTION SENSOR KIT (LB-T-5W-E) 403
4.3 SIMPLE WIRED REMOTE CONROL (RCH-E3) 407
4.4 BASE HEATER KIT (CW-H-E1) 413
4.5 INTERFACE KIT (SC-BIKN2-E) 419
4.6 SUPERLINK E BOARD (SC-ADNA-E) 423

4.1 WIRELESS KIT (RCN-T-5AW-E2)

Notes:
Following function of FDT indoor unit series are not able to be set with this wireless remote control (RCN-T-5AW-E2).
1. Individual flap control system

PJF012D035 B

Safety precautions

●Please read this manual carefully before starting installation work to install the unit properly.
Every one of the followings is important information to be observed strictly.
⚠WARNING Failure to follow these instructions properly may result in serious consequences such as death, severe injury, etc.
⚠CAUTION Failure to follow these instructions properly may cause injury or property damage. It could have serious consequences depending on the circumstances.
●The following pictograms are used in the text.

⃠	Never do.	❗	Always follow the instructions given.

●Keep this manual at a safe place where you can consult with whenever necessary. Show this manual to installers when moving or repairing the unit. When the ownership of the unit is transferred, this manual should be given to a new owner.

⚠WARNING

- **Consult your dealer or a professional contractor to install the unit.**
  Improper installation made on your own may cause electric shocks, fire or dropping of the unit.
- **Installation work should be performed properly according to this installation manual.**
  Improper installation work may result in electric shocks, fire or break-down.
- **Be sure to use accessories and specified parts for installation work.**
  Use of unspecified parts may result in drop, fire or electric shocks.
- **Install the unit properly to a place with sufficient strength to hold the weight.**
  If the place is not strong enough, the unit may drop and cause injury.
- **Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.**
  Power source with insufficient and improper work can cause electric shock and fire.
- **Shut OFF the main power source before starting electrical work.**
  Otherwise, it could result in electric shocks, break-down or malfunction.
- **Do not modify the unit.**
  It could cause electric shocks, fire, or break-down.
- **Be sure to turn OFF the power circuit breaker before repairing/inspecting the unit.**
  Repairing/inspecting the unit with the power circuit breaker turned ON could cause electric shocks or injury.
- **Do not install the unit in appropriate environment or where inflammable gas could generate, flow in, accumulate or leak.**
  If the unit is used at places where air contains dense oil mist, steam, organic solvent vapor, corrosive gas (ammonium, sulfuric compound, acid, etc) or where acidic or alkaline solution, special spray, etc. are used, it could cause electric shocks, break-down, smoke or fire as a result of significant deterioration of its performance or corrosion.
- **Do not install the unit where water vapor is generated excessively or condensation occurs.**
  It could cause electric shocks, fire, or break-down.
- **Do not use the unit in a place where it gets wet, such as laundry room.**
  It could cause electric shocks, fire, or break-down.
- **Do not operate the unit with wet hands.**
  It could cause electric shocks.

⚠WARNING

- **Do not wash the unit with water.**
  It could cause electric shocks, fire, or break-down.
- **Use the specified cables for wiring, and connect them securely with care to protect electronic parts from external forces.**
  Improper connections or fixing could cause heat generation, fire, etc.
- **When installing the unit at a hospital, telecommunication facility, etc., take measures to suppress electric noises.**
  It could cause malfunction or break-down due to hazardous effects on the inverter, private power generator, high frequency medical equipment, radio communication equipment, etc.
  The influences transmitted from the remote control to medical or communication equipment could disrupt medical activities, video broadcasting or cause noise interference.
- **Do not leave the remote control with its PCB case removed.**
  If dew, water, insect, etc. enters through the hole, it could cause electric shocks, fire or break-down.

⚠CAUTION

- Do not install the wireless kit at the following places in order to avoid malfunction.
  It could cause break-down or deformation of remote control.
  (1) Places exposed to direct sunlight
  (2) Places near heat devices
  (3) High humidity places
  (4) Hot surface or cold surface enough to generate condensation
  (5) Places exposed to oil mist or steam directly
  (6) Uneven surface
  (7) Places affected by the direct air flow of the AC unit
  (8) Places where the receiver is influenced by the fluorescent lamp (especially inverter type) or sunlight
  (9) Places where the receiver is affected by infrared rays of any other communication devices
  (10) Places where some object may obstruct the communication with the remote control

①Accessories

Please make sure that you have all of the following accessories.

① Receiver		1
② Parts set (A)		1
③ Installation manual		1

① Wireless remote control		1
② Remote control holder		1
③ Screw for holder		2
④ AAA dry cell battery (LR03)		2
⑤ User's manual		1

②Preparation before installation

Setting on site

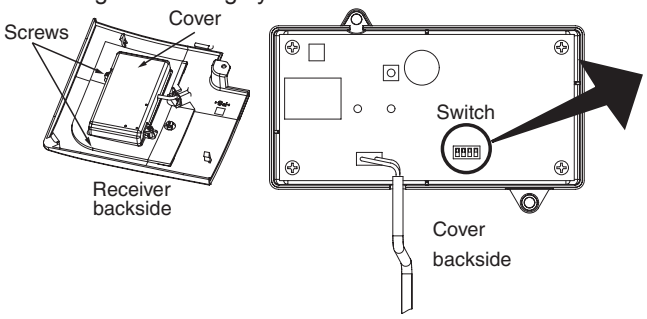
PCB on the receiver has the following switches to set the function.
Default setting is shown with ☐ mark.

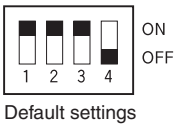
SW1	Prevents interference during plural setting	☐ ON : Normal	OFF : Customized
SW2	Receiver master/ slave setting	☐ ON : Master	OFF : Slave
SW3	Buzzer	☐ ON : Valid	OFF : Invalid
SW4	Auto restart	ON : Valid	☐ OFF : Invalid

② Preparation before installation (continued)

To change setting

1. Remove the cover by unscrewing two screws from the back of receiver.
2. Change the setting by the switch on PCB.





Master/Slave setting when using plural remote controls

Up to two receiver or wired remote control can be installed in one indoor unit group.
When two receiver or wired remote control are used, it is necessary to change SW on the PCB to set it as slave.

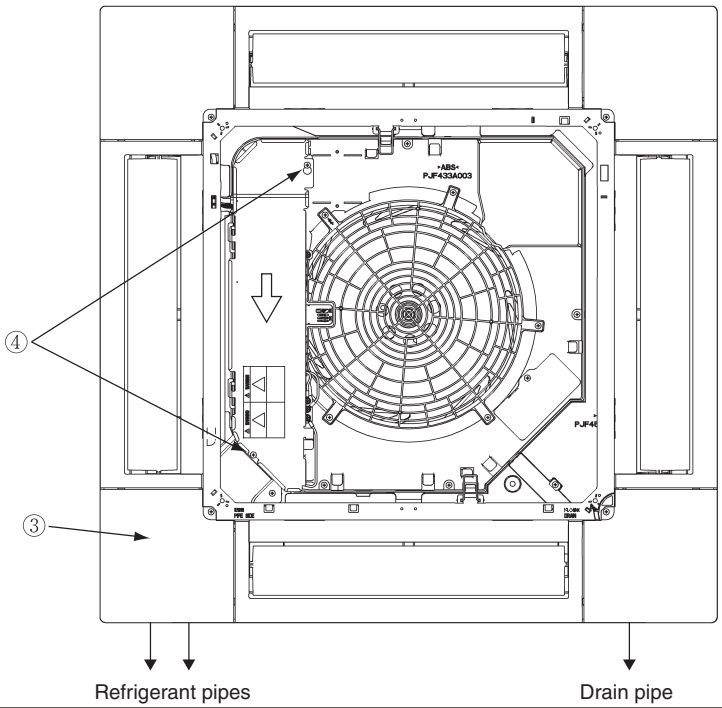
3. When SW1 is turned to OFF position, change the wireless remote control setting.
   For the method of changing the setting, refer to Setting to avoid mixed communication of ④ Wireless remote control .
   *The receivable area of the signal refer to ⑤ Receiver .

③ How to install the receiver

The receiver can be installed by replacing with a corner panel on the applicable decorative panel.

Preparation before installation

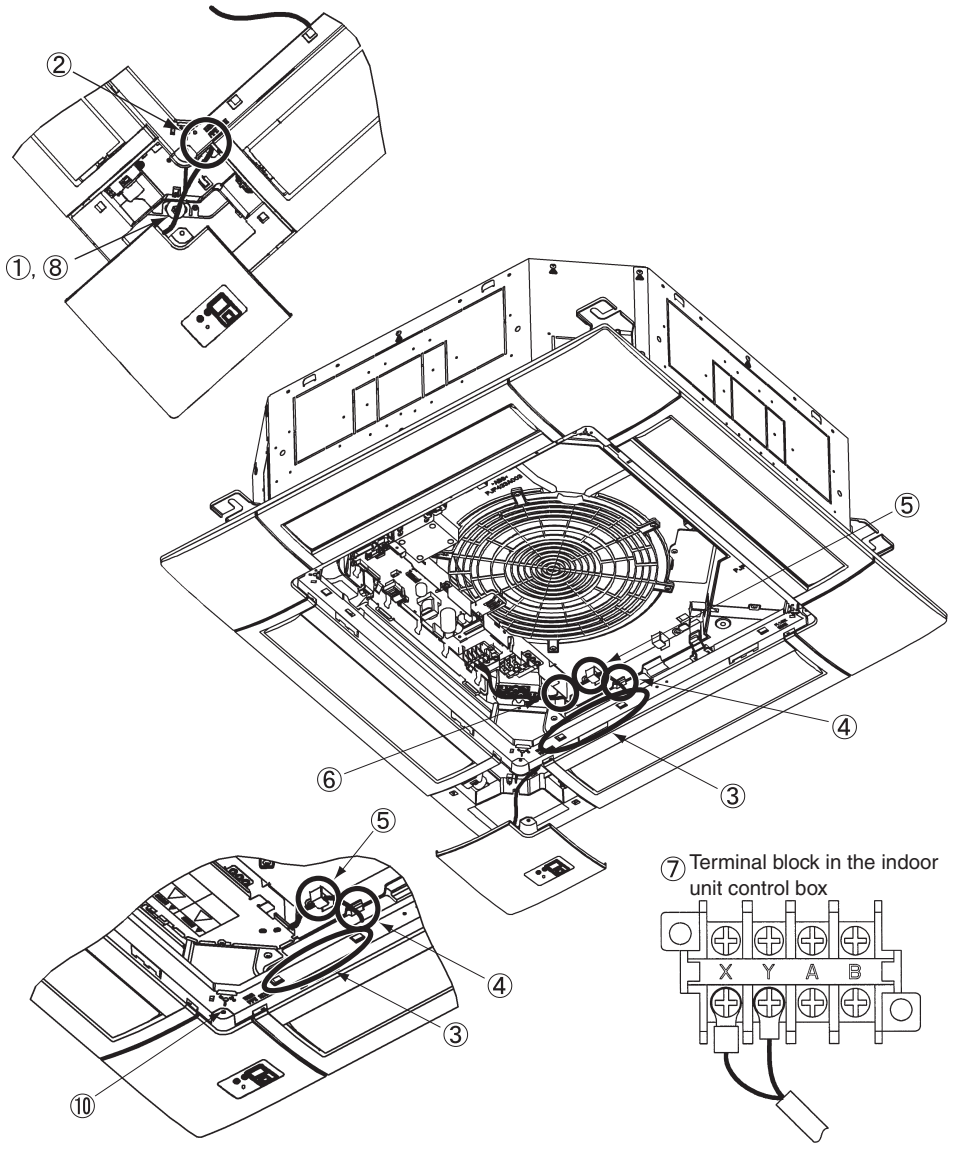
① Attach the decorative panel onto the air-conditioner according to the installation manual for the panel.
② Remove the air return grille.
③ Remove a corner panel located on the refrigerant pipes side.
④ Remove three screws and detach the cover (indicated as shadowed area) from the control box of the air- conditioner.



③ How to install the receiver(continued)

Installation of the receiver

① Loosen the bolts which fix the panel and make a gap between the panel and the indoor unit.
② Put the wiring of the receiver through the opening.
③ Put the wiring on the notch on the control box so as not to be pinched by the control box and lid as shown below.
④ Connect the wiring to the terminal block provided in the control box. (No polarity)
⑤ Attach the receiver to the panel according to the panel installation manual.
⑥ Fix the wiring with the clamp so that the wiring do not contact the edge of control box's metal sheet.
⑦ Reattach the control box lid with 3 screws removed.

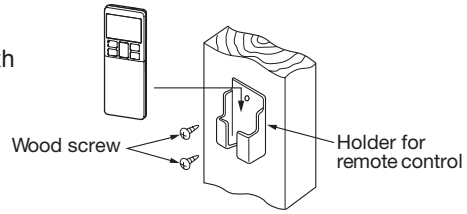


④ Wireless remote control

Installation tips for the remote control holder

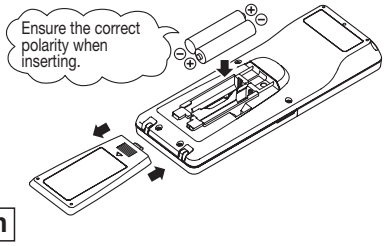
Fix the remote control holder using the screws supplied with this product.

* Precautions for installing the holder
- Adjust the position so that it is upright.
- Ensure that the screw heads are not protruding.
- Do not attach the holder on plaster wall



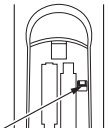
How to insert batteries

1. Detach the back lid.
2. Insert the batteries. (two AAA batteries)
3. Reattach the back lid.



Setting to avoid mixed communication

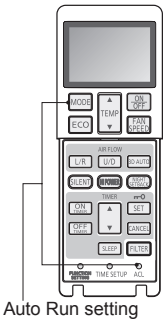
1. Detach the back lid, and remove the batteries.
2. Cut off the switching wire in the battery compartment using nippers.
3. Insert the batteries, and attach the back lid.



Changing the remote control setting

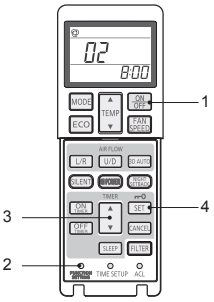
How to change the Auto Run setting
The Auto Run mode is not available on the building air-conditioning and gas heat pump series (excluding the cooling/heating free multi system).
When using the remote control to operate those models, set the remote control to disable the Auto Run mode.
To disable the Auto Run mode, press the ACL switch while holding down the MODE button, or insert batteries while holding down the MODE button.

* Note: Once the batteries are removed, the setting is reset to the factory default.
When the batteries are removed, repeat the steps described above.



Indoor function settings

1. How to set indoor functions
   ① Press the ON/OFF button to stop the unit.
   ② Press the desired one of the buttons shown item **2.** while holding down the FUNCTION SETTING switch.
   ③ Use the selection buttons, ▲ and ▼, to change the setting.
   ④ Press the SET button.
   The buzzer on the remote control signal receiver beeps twice, and the LED lamp flashes four times at two-second intervals.



④ Wireless remote control (continued)

2. Setting details
   The following functions can be set.

Button	Number indicator	Function setting
FAN SPEED	00	Fun speed setting : Standard
	01	Fun speed setting : Setting 1 *
	02	Fun speed setting : Setting 2 *
MODE	00	Room heating temperature adjustment : Disable
	01	Room heating temperature adjustment : +1°C
	02	Room heating temperature adjustment : +2°C
	03	Room heating temperature adjustment : +3°C
FILTER	00	Filter sign display : OFF
	01	Filter sign display : 180 hours
	02	Filter sign display : 600 hours
	03	Filter sign display : 1000 hours
	04	Filter sign display : Operation stop after 1000 hours have elapsed
U/P	00	Anti draft setting : Disable
	01	Anti draft setting : Enable
SILENT	00	Infrared sensor setting (Motion sensor setting) : Disable
	01	Infrared sensor setting (Motion sensor setting) : Enable
HI POWER	00	Infrared sensor control (Motion sensor control) : Disable
	01	Infrared sensor control (Motion sensor control) : Power control only
	02	Infrared sensor control (Motion sensor control) : Auto OFF only
	03	Infrared sensor control (Motion sensor control) : Power control and Auto OFF
ON TIMER	00	Cooling fan residual-period running : Disable
	01	Cooling fan residual-period running : 0.5 hours
	02	Cooling fan residual-period running : 2 hours
	03	Cooling fan residual-period running : 6 hours
OFF TIMER	00	Heating fan residual-period running : Disable
	01	Heating fan residual-period running : 0.5 hours
	02	Heating fan residual-period running : 2 hours
	03	Heating fan residual-period running : 6 hours
NIGHT SETBACK	00	Remote control signal receiver LED : Brightness High
	01	Remote control signal receiver LED : Brightness Low
	02	Remote control signal receiver LED : OFF

* Refer to technical data.

⑤ Receiver

1 Control plural indoor units with one remote control

Up to 16 indoor units can be connected.

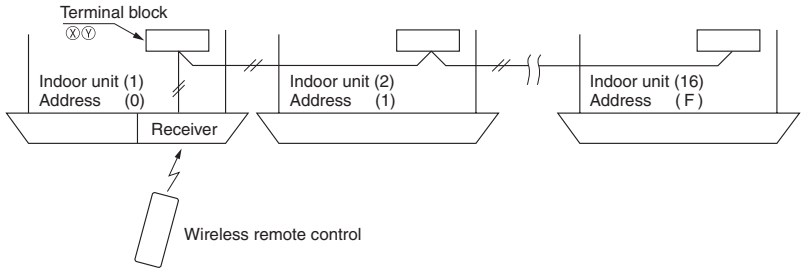
1. Connect the XY terminal with 2 cores wire. As for the size, refer to the following note.
2. For Packaged air-conditioner series, set the indoor unit address with SW2 on the indoor unit PCB from [0] to [F] so as not to duplicate.

Restrictions on the thickness and length of wire
(Maximun total extension 600m.)

Standard	Within 0.3 mm² × 100m
	Within 0.5 mm² × 200m
	Within 0.75mm² × 300m
	Within 1.25mm² × 400m
	Within 2.0 mm² × 600m

For the shop series

For VRF series, set the indoor unit address with SW1, SW2 and SW5-2 on the indoor unit PCB from [000] to [127] so as not to duplicate.

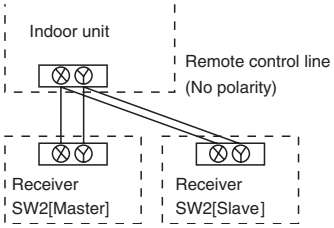


For the building air-conditioning and gas heat pump series

Set the indoor unit and outdoor unit numbers by manually specifying the addresses.
Use the rotary switches SW1 and SW2 provided on the indoor unit PCB (printed circuit board) to set the indoor unit numbers so that they are not duplicated.

Master/Slave setting when using plural remote control

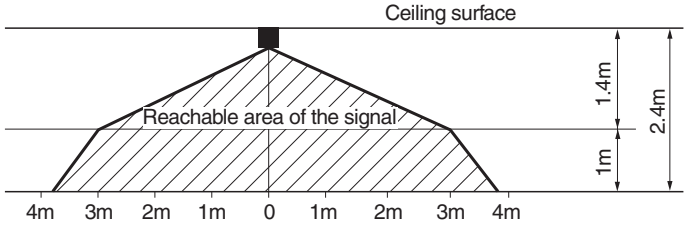
Up to two receivers can be installed in one indoor unit group.



Switch	Setting	Function
SW2	ON	Master
	OFF	Slave

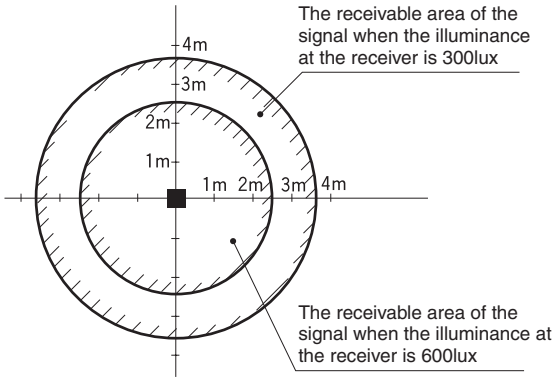
Wireless remote control's operable area

1. Standard reachable area of the signal
   [condition] Illuminance at the receiver: 300lux
   (when no lighting is installed within 1m of the receiver in an ordinary office.)



⑤ Receiver (continued)

2. Correlation between illuminance at the receiver and reachable area of the signal in a plain view. The drawing in the right shows the correlation between the reachable area of the signal and illuminance at the receiver when the remote control is operated at 1.0m high under the condition of ceiling height of 2.4m. When the illuminance becomes double, the area is narrowed down to two thirds.

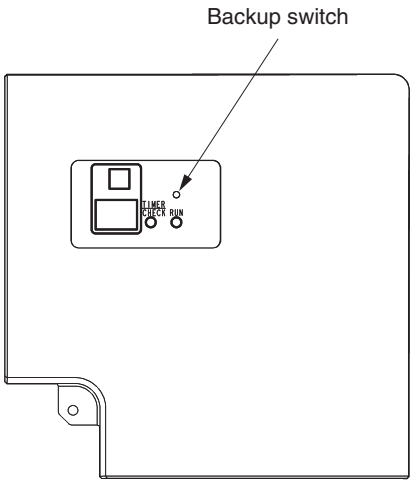


3. Installation tips when several receivers are installed close
   Minimum distance between the indoor units which can avoid cross communication is 5m under the condition of 300lux of illuminance at the receiver.
   (When no lighting is installed within 1m of the receiver in an ordinary office)

Backup switch

A backup switch is provided on the receiver. Even when the operation from the wireless remote control is not possible (due to flat batteries, control lost, or control failure), still it possible to operate as temporary means. Press the switch directly when operating it.

1. The air-conditioner starts the operation with the condition of Auto mode, 23°C of set point, High fan speed and horizontal louver position.
2. The air-conditioner stops the operation when the switch is pressed when in operation.



Cooling test run operation

- After safety confirmation, turn on the power.
- Transmit a cooling operation command with the wireless remote control unit, while the backup switch on the receiver is depressed.
- If the backup switch on the receiver is pressed during a test run, it will end the test run.
- If you cannot operate the unit properly during a test run, please check wiring by consulting with inspection guides.

How to read the 2-digit display

On the receiver of a wireless kit, a two-digit (7-segment) display is provided.

1. An indication will be displayed for one hour after power on.
2. An indication will be displayed for 3.5 seconds after transmitting a “STOP” command from the wireless remote control or the operation of the backup switch to stop the unit.
3. An indication appearing in (1) or (2) above will go off as soon as the unit starts operation.
4. When there are no error records to indicate, addresses of all the connected units are displayed.
5. When there are some error records remaining, the error records are displayed.
6. Error records can be cleared by transmitting a "STOP" command from the wireless remote control, while the backup button is pressed.

4.2 MOTION SENSOR KIT (LB-T-5W-E)

PJF012D036 B

⚠ WARNING

- Connect the wiring to the PCB in the control box on the indoor unit and hold the wiring securely so as not to apply unexpected stress on the PCB.
  Loose connection or hold will cause abnormal heat generation or fire.
- Make sure the power source is turned off when electric wiring work.
  Otherwise, electric shock, malfunction and improper running may occur.

⚠ CAUTION

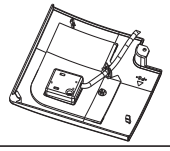
- Do not install the motion sensor kit at the following places in order to aboid malfunction.
  (1) Places exposed to direct sunlight
  (2) Places near heat devices
  (3) High humidity places
  (4) Hot surface or cold surface enough to generate condensation
  (5) Places exposed to oil mist or steam directly
  (6) Places affected by the direct air flow of the Indoor unit
  (7) Places where the motion sensor is influenced by the fluorescent lamp or sunlight
  (8) Places where the motion sensor is affected by infrared rays of any other communication devices
  (9) Places where some object may obstruct the motion sensor
- Do not leave the motion sensor without the cover.
  In case the cover needs to be detached, protect the motion sensor with a packaging or bag.
  In order to keep it away from water and dust.

Attention

- Instruct the customer how to operate it correctly referring to the instruction manual.
- For the installation method of the air-conditioner itself, refer to the installation manual enclosed in the package.

① Accessories

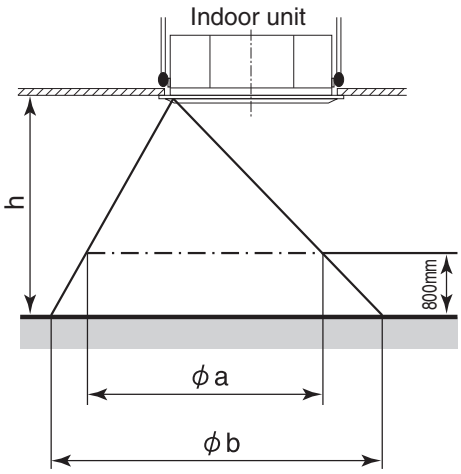
Please make sure that you have the motion sensor.

Motion sensor		1

② Installing the motion sensor

It is possible to install the motion sensor by replacing with a corner lid on the panel.

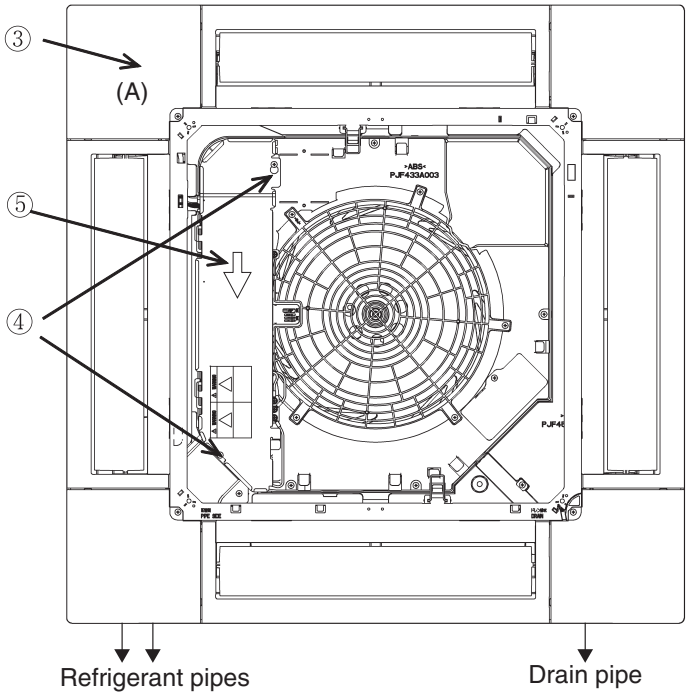
Aim of the detectable scope



Hight of the ceiling	h[m]	2.7	3.5	4.0
Detectable scope①	ϕ a[m]	about 4.5	about 6.4	about 7.6
Detectable scope②	ϕ b[m]	about 6.4	about 8.3	about 9.5

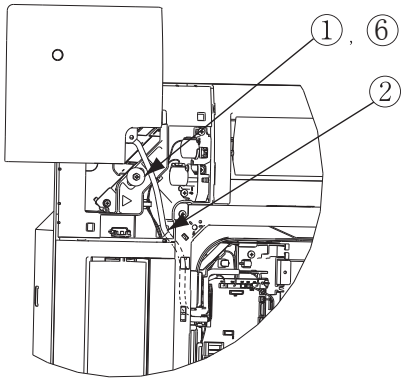
Preparation before installation

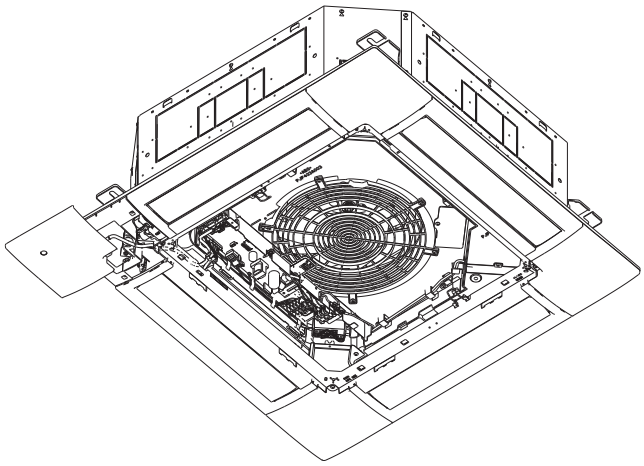
① Install the panel onto the indoor unit according to the installation manual for the panel.
② Remove the inlet grille.
③ Remove the corner lid (A) located on the panel.
④ Loosen 2 screws for the control lid. (It is unnecessury to remove the screws.)
⑤ Slide the control lid, and open and remove it.

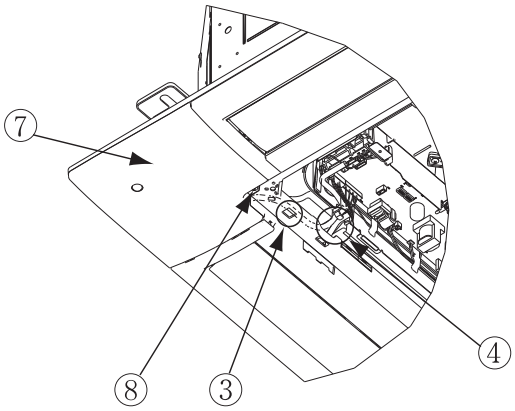


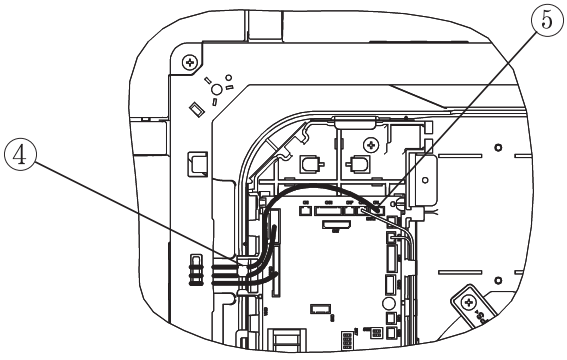
Installation of the motion sensor

① Loosen the bolts which fix the panel, and make a gap between the panel and the indoor unit.
② Pass the wiring of the motion sensor through the opening of the panel.
③ Hang the wiring on the hook which is on the panel's inside.
④ Pass the wiring through the opening of the control box.
⑤ Connect the connecter to CNL(3P,Black) on PWB in the contorl box.
⑥ Tighten the bolts which fix the panel.
⑦ Install the motion sensor on the panel.
⑧ Fix the motion sensor by the screw.
⑨ Reinstall the control lid, and tighten 2 screws.









③ Setting the motion sensor

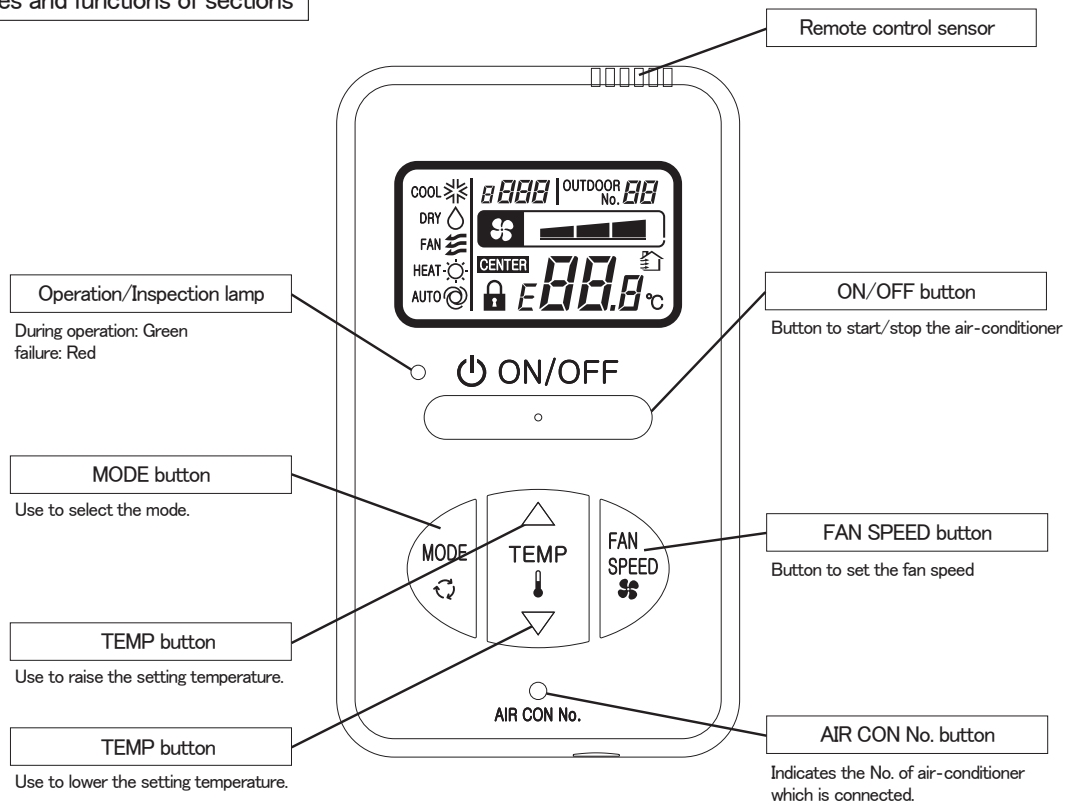
The motion sensor will not function if it is only installed.
Set the function of the motion sensor by the wired or wireless remote control.
Refer to the manual instruction of each remote control for the setting procedure.

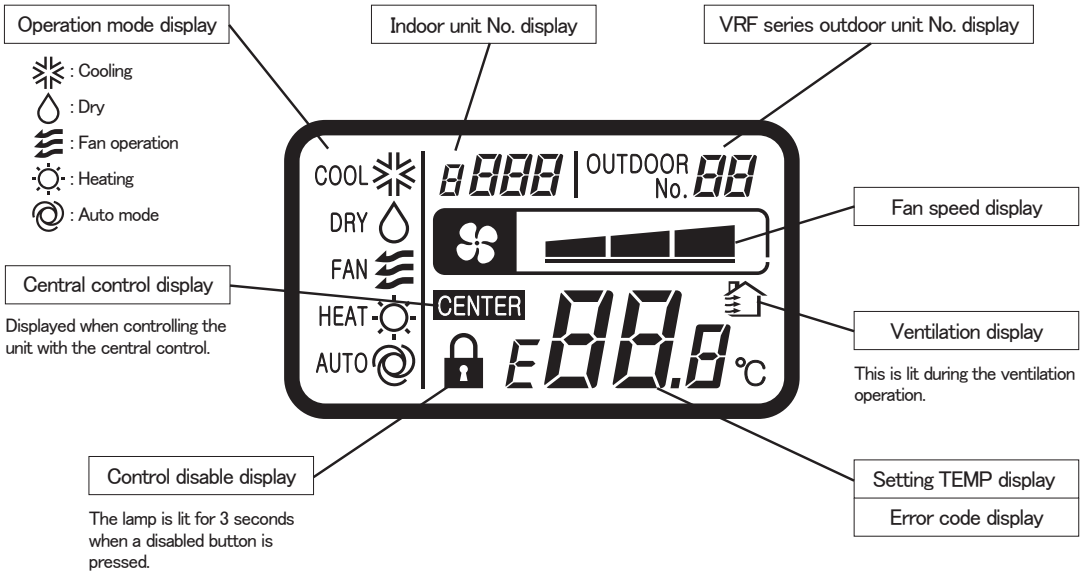
Note: It is not possible to set by the following remote control models or older.
Wired:RC-EX1A, RC-E5, RCH-E3
Wireless: RCN-E1R

4.3 SIMPLE WIRED REMOTE CONTROL (RCH-E3)

Note:
Following functions of FDU indoor unit series are not able to be set with this simple wired remote control (RCH-E3).
1. 4-fan speed setting (P-Hi/Hi/Me/Lo)→ 3-fan speed setting (Hi/Me/Lo)

Names and functions of sections





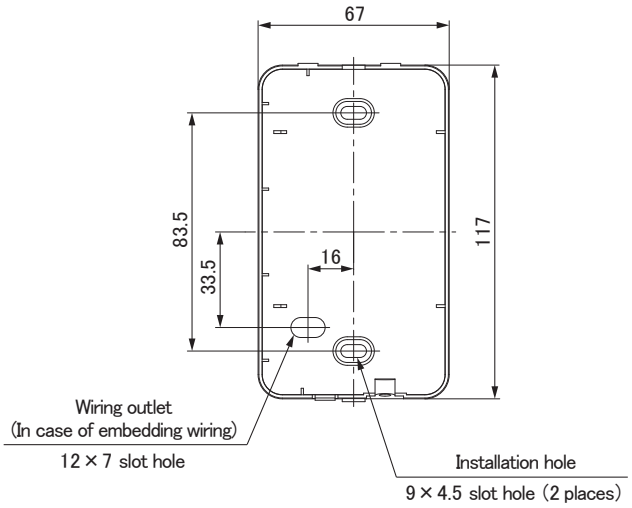
Installation of remote control

Do not install the remote control at the following places in order to avoid malfunction.

(1) Places exposed to direct sunlight
(2) Places near heat devices
(3) High humidity places
(4) Hot surface or cold surface enough to generate condensation
(5) Places exposed to oil mist or steam directly
(6) Uneven surface

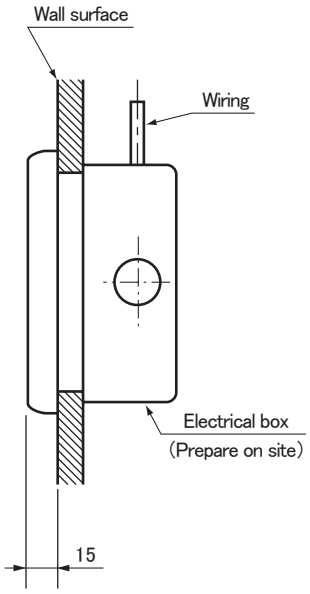
PJZ000Z272

Remote control installation dimensions

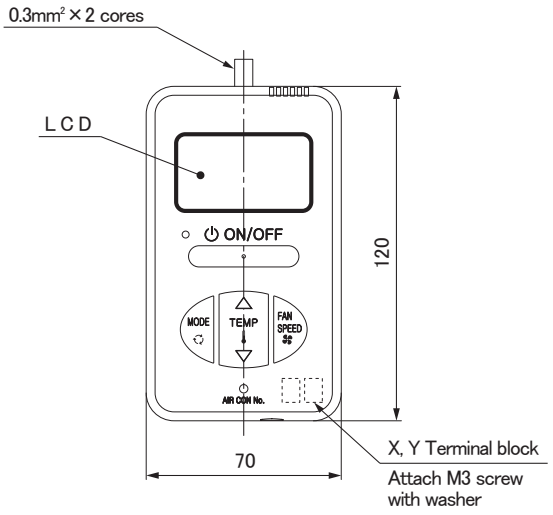


Note: Installation screw for remote control
M4 screw (2 pieces)

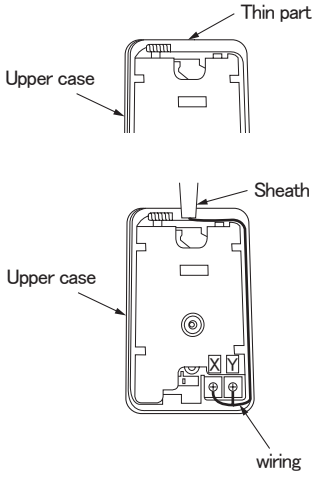
In case of embedding wiring



In case of exposing wiring

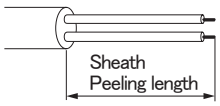


The remote control wiring can be extracted from the upper center.
After the thin part in the upper side of the remote control upper case is scraped with a nipper or knife, remove burr with a file.



The peeling length of each wiring is as follows:

X wiring : 160mm Y wiring : 150mm



Wiring specifications

(1) Wiring of remote control should use 0.3mm² × 2 cores wires or cables. (on-site configuration)
(2) Maximum prolongation of remote control wiring is 600m.
If the prolongation is over 100m, change to the size below.
But, the wiring in the remote control case should be 0.3mm² (recommended) to 0.5mm².
Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

Unit:mm

Length	Wiring thickness
100 to 200m	0.5mm² × 2 cores
Under 300m	0.75mm² × 2 cores
Under 400m	1.25mm² × 2 cores
Under 600m	2.0mm² × 2 cores

Adapted to **RoHS** directive

Simple Remote Control Installation Manual

PJZ012D069Ⓐ

Read together with indoor unit's installation manual.

⚠WARNING

- **Fasten the wiring to the terminal securely and hold the cable securely so as not to apply unexpected stress on the terminal.**
  Loose connection or hold will cause abnormal heat generation or fire.
- **Make sure the power source is turned off when electric wiring work.**
  Otherwise, electric shock, malfunction and improper running may occur.

⚠ CAUTION

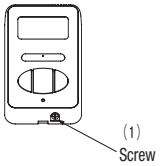
- **Do not install the remote control at the following places in order to avoid malfunction.**
  (1) Places exposed to direct sunlight
  (2) Places near heat devices
  (3) High humidity places
  (4) Hot surface or cold surface enough to generate condensation
  (5) Places exposed to oil mist or steam directly
  (6) Uneven surface
- **Do not leave the remote control without the upper case.**
  In case the upper cace needs to be detached, protect the remote control with a packaging box or bag in order to keep it away from water and dust.

Accessories	Remote control, wood screw (ϕ 3.5×16) 2 pieces
Prepare on site	Remote control cord (2 cores) (Refer to [2. Installation and wiring of remote control]) [In case of embedding cord] Electrical box, M4 screw (2 pieces) [In case of exposing cord] Cord clamp (if needed)

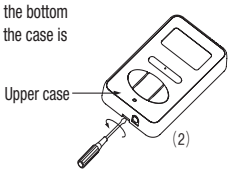
1. Installation procedure

In case of embedding cord

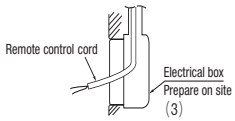
(1) Make certain to remove the screw on the bottom surface of the remote control.



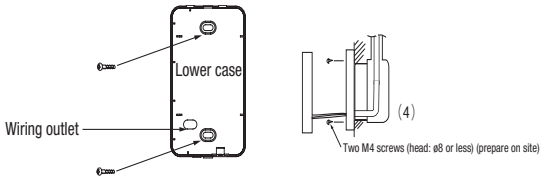
(2) Remove the upper case of the remote control.
Insert a flat-blade screwdriver to a concave portion of the bottom surface of the remote control and slightly twist it, and the case is removed.



(3) Pre-bury the electrical box and remote control cord.



(4) Prepare two M4 screws (recommended length: 12 – 16mm), and install the lower case to the electrical box.
Do not use a screw whose screw head is larger than the height of the wall around the screw hole.

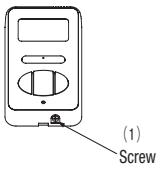


(5) Connect the remote control cord to the terminal block.
Connect the terminals (X and Y) of the remote control and the terminals (X and Y) of the indoor unit. (No polarity of X and Y)

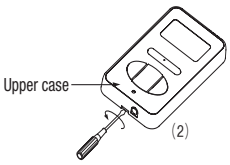
(6) Mount the upper case for restoring to its former state so as not to crimp the remote control cord, and secure with the removed screw.

In case of exposing cord

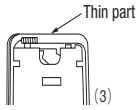
(1) Make certain to remove a screw on the bottom surface of the remote control.



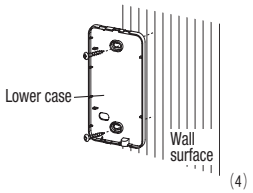
(2) Remove the upper case of the remote control.
Insert a flat-blade screwdriver to a concave portion of the bottom surface of the remote control and slightly twist it, and the case is removed.



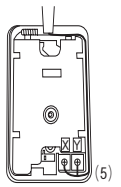
(3) The remote control cord can be extracted from the upper center.
After the thin part in the upper side of the remote control upper case is scraped with a nipper or knife, remove burr with a file.



(4) The lower case of the remote control is mounted to a flat wall with two accessory wood screws.

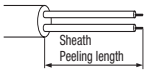


(5) Connect the remote control cord to the terminal block.
Connect the terminals (X and Y) of the remote control and the terminals (X and Y) of the indoor unit. (No polarity of X and Y)
The wiring route is as shown in the right.



The wiring in the remote control case should be 0.3 mm^2 (recommended) to 0.5 mm^2 at maximum.
Further, peel off the sheath.
The peeling length of each wiring is as follows:

X wiring : 160mm
Y wiring : 150mm



(6) Mount the upper case for restoring to its former state so as not to crimp the remote control cord, and secure with the removed screw.

(7) In the case of exposing installation, secure the remote control cord to the wall surface with a cord clamp so as not to loosen the remote control cord.

2. Installation and wiring of remote control

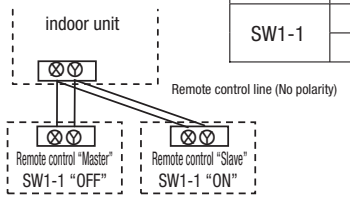
(1) Wiring of remote control should use 0.3mm^2 × 2 cores wires or cables. (on-site configuration)
(2) Maximum prolongation of remote control wiring is 600 m.
If the prolongation is over 100m, change to the size below.
But, the wiring in the remote control case should be 0.3mm^2 (recommended) to 0.5mm^2.
Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

100 - 200m ····· 0.5mm^2 × 2 cores
Under 300m ····· 0.75mm^2 × 2 cores
Under 400m ····· 1.25mm^2 × 2 cores
Under 600m ····· 2.0mm^2 × 2 cores

3. Master/ slave setting when more than one remote control are used

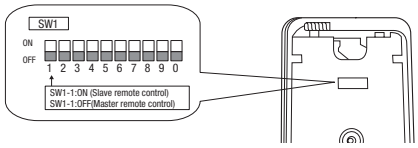
(1) Up to two remote controls can be connected to one unit (or one group) of indoor unit.

Switch	Setting	Function detail
SW1-1	ON	Slave remote control
	OFF	Master remote control



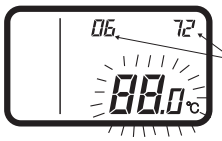
(2) Set the switch SW1-1 of the slave remote control is "Slave" (ON). The factory default is set as "Master" (OFF).

(Note) • The remote control temperature sensor enabled setting can be set only to the master remote control.
• Install the master remote control at the position to detect room temperature.
• The air-conditioner operation follows the last operation of the remote control in case of the master / slave setting.



4. The indication when power source is supplied

(1) At the time of turning the power source on, after the light is on for the first 2 seconds, the display becomes as shown below.
The number displayed on the upper side of LCD in the remote control is the software number, and this is not an error code.



Software number
(The number in the left is one example. Another number may be shown.)

(2) Then, "88.0 °C" blinks on the remote control until the communication between the remote control and the indoor unit is established.

(3) In the case of connecting one remote control with one unit (or one group) of indoor unit, make certain to set the master remote control (factory default).
If the slave remote control is set, a communication cannot be established.

(4) If a state where the communication between the remote control and the indoor unit cannot be established continues about for 30 minutes, "E" is displayed. Confirm the wiring of the indoor unit and the outdoor unit and master/slave setting of the remote control.



5. Confirmation method for return air temperature

Return air temperature can be confirmed by the remote control operation.

(1) **Press AIR CON No. button for over 5 seconds.**
"88" blinks on the temperature setting indicator.
("88" blinks for approximately 2 seconds while data is read.)
↓
Then, the return air temperature is displayed.
(Example) return air temperature: "27 °C" (blinking)

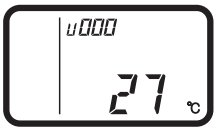


(Note) For the return air temperature, in the normal case, the return air temperature of the indoor unit is displayed; however, in the case that the remote control temperature sensor is effective, detected temperature by the remote control temperature sensor is displayed.

(2) **Press ⏻ ON/OFF button.**
End.

[In the case that the remote temperature sensor is ineffective and plural indoor units are connected to one remote control]

(1) **Press AIR CON No. button for over 5 seconds.**
indoor unit No. indicator: "U 000" (blinking)
(Among the connected indoor units, the lowest number is displayed.)



(2) **Press TEMP△ or TEMP▽ button.**
Select the indoor unit No.

(3) **Press MODE button.**
Dectder the indoor unit No.
(Example) indoor unit No. indicator: "U 000"
"88" blinks on the temperature setting indicator. (blinking for approximately 2 to 10 seconds while data is read) Then, the return air temperature is displayed. When **AIR CON No.** is pressed, return to the indoor unit selection display (example, "U 000").

(4) **Press ⏻ ON/OFF button.**
End.

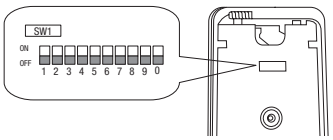
6. Function setting

Each function of the remote control and the indoor unit is automatically set to the initial setting, which is the standard use, on the occasion of connecting the remote control with the indoor unit. In the case of the standard use, the setting change is unnecessary. However, if you whould like to change the initial setting " ○ ", change the setting for only the item of the function number. Record the setting contents and stored them.

(1) Function setting item by switch on PCB

Switch No.	Setting	Setting detail	Initial setting
SW1-1	ON	Slave remote control	
	OFF	Master remote control	○
SW1-2	ON	Remote control temperature sensor enabled	
	OFF	Remote control temperature sensor disabled	○
SW1-3	ON	"MODE" button prohibited	
	OFF	"MODE" button enabled	○
SW1-4	ON	"ON/OFF" button prohibited	
	OFF	"ON/OFF" button enabled	○

Switch No.	Setting	Setting detail	Initial setting
SW1-5	ON	"TEMP" button prohibited	
	OFF	"TEMP" button enabled	○
SW1-6	ON	"FAN SPEED" button prohibited	※ Note 1
	OFF	"FAN SPEED" button enabled	※ Note 1
SW1-7	ON	Auto restart function enabled	
	OFF	Auto restart function disabled	○
SW1-8, 9, 0	ON	Not used	
	OFF		



- As for the slave remote control, function setting is impossible other than SW1-1.
- In the indoor unit with only one fan speed, "FAN SPEED" button cannot be enabled.

(2) Function setting item by button operation

Classification	Function No.	Function	Setting No.	Setting	Initial setting	Remarks
Remote control function	01	Indoor unit fan speed	01	Fan speed: three steps	※ Note 1	The fan speed is three steps, ❋■■■ - ❋■■ - ❋■ .
			02	Fan speed: two steps (Hi-Lo)	※ Note 1	The fan speed is two steps, ❋■■■ - ❋■ .
			03	Fan speed: two steps (Hi-Me)		The fan speed is two steps, ❋■■■ - ❋■■ .
			04	Fan: one step	※ Note 1	The fan speed is fixed to one step.
	03	Remote control thermistor at the time of cooling	01	Remote control temperature sensor: no offset	○	
			02	Remote control temperature sensor: +3.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at +3.0°C.
			03	Remote control temperature sensor: +2.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at +2.0°C.
			04	Remote control temperature sensor: +1.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at +1.0°C.
			05	Remote control temperature sensor: -1.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at -1.0°C.
			06	Remote control temperature sensor: -2.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at -2.0°C.
			07	Remote control temperature sensor: -3.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offsett temperature at -3.0°C.
	04	Remote control thermistor at the time of heating	01	Remote control temperature sensor: no offset	○	
			02	Remote control temperature sensor: +3.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at +3.0°C.
			03	Remote control temperature sensor: +2.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at +2.0°C.
			04	Remote control temperature sensor: +1.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at +1.0°C.
			05	Remote control temperature sensor: -1.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at -1.0°C.
			06	Remote control temperature sensor: -2.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at -2.0°C.
			07	Remote control temperature sensor: -3.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at -3.0°C.
	05	Ventilation setting	01	No ventilator connection	○	
			02	Ventilator links air-conditioner		In case of Single split series, by connecting ventilation device to CNT of the indoor printed circuit board (in case of VRF series, by connecting it to CND of the indoor printed circuit board), the operation of ventilation device is linked with the operation of indoor unit.
	06	"Auto" operation setting	01	"Auto" operation enabled	※ Note 1	
			02	"Auto" operation disabled	※ Note 1	"Auto" operation disabled
Indoor unit function	07	Operation permission/ prohibition	01	Disabled	○	
			02	Enabled		Operation permission/prohibition control is enabled.
	08	External input	01	Level input	○	
			02	Pulse input		
	09	Fan speed setting	01	Standard	Note2	
			02	High speed 1	Note2	
			03	High speed 2	Note2	
	10	Fan remaining operation at the time of cooling	01	No remaining operation	○	After cooling stopped, no fan remaining operation
			02	0.5 hours		After cooling stopped, fan remaining operation for 0.5 hours
			03	1 hour		After cooling stopped, fan remaining operation for 1 hour
			04	6 hours		After cooling stopped, fan remaining operation for 6 hours
	11	Fan remaining operation at the time of heating	01	No remaining operation	○	After heating stopped or after heating thermostat OFF, no fan remaining operation
			02	0.5 hours		After heating stopped or after heating thermostat OFF, fan remaining operation for 0.5 hours
			03	2 hours		After heating stopped or after heating thermostat OFF, fan remaining operation for 2 hours
			04	6 hours		After heating stopped or after heating thermostat OFF, fan remaining operation for 6 hours
	12	Setting temperature offset at the time of heating	01	No offset	○	
			02	Setting temperature offset + 3.0 °C		The setting temperature at the time of heating is offset by +3.0 °C.
			03	Setting temperature offset + 2.0 °C		The setting temperature at the time of heating is offset by +2.0 °C.
			04	Setting temperature offset + 1.0 °C		The setting temperature at the time of heating is offset by +1.0 °C.
	13	Heating fan controller	01	Low fan speed	※ Note 1	At the time of heating thermostat OFF, operate with low fan speed.
			02	Setting fan speed		At the time of heating thermostat OFF, operate with the setting fan speed.
			03	Intermittent operation	※ Note 1	At the time of heatingr thermostat OFF, intermittently operate.
			04	Fan off		At the time of heating thermostat OFF, a fan will be stopped. When the remote control thermistor is enabled, automatically set to "Fan off". Do not set at the time of the indoor unit temperature sensor.
	14	Return air temperature offset	01	No offset	○	
			02	Return air temperature offset +2.0 °C		Offset the return air temperature of the indoor unit by +2.0 °C.
			03	Return air temperature offset +1.5 °C		Offset the return air temperature of the indoor unit by +1.5 °C.
			04	Return air temperature offset +1.0 °C		Offset the return air temperature of the indoor unit by +1.0 °C.
			05	Return air temperature offset -1.0 °C		Offset the return air temperature of the indoor unit by -1.0 °C.
			06	Return air temperature offset -1.5 °C		Offset the return air temperature of the indoor unit by -1.5 °C.
			07	Return air temperature offset -2.0 °C		Offset the return air temperature of the indoor unit by -2.0 °C.

Note 1: The symbol " ※ " in the initial setting varies depending upon the indoor unit and the outdoor unit to be connected, and this is automatically determined as follows:

Swith No. Function No.	Function	Setting	Product model
SW1-6	"FAN SPEED" button	"FAN SPEED" button prohibited	Product model whose indoor fan speed is only one step
		"FAN SPEED" button enabled	Product model whose indoor fan speed is two steps or three steps
Remote control function 01	Indoor unit fan speed	Fan speed: three steps	Product model whose indoor unit fan speed is three steps
		Fan speed: two steps (Hi-Lo)	Product model whose indoor unit fan speed is two steps
		Fan speed: two steps (Hi-Me)	
		Fan: one step	Product model whose indoor unit fan speed is only one step
Remote control function 06	"Auto" operation setting	"Auto" operation enabled	Product model where "Auto" mode is selectable
		"Auto" operation disabled	Product model without "Auto" mode
Indoor unit function 13	Heating fan control	Low fan speed	Product model except FDUS
		Intermittent operation	FDUS

Note 2: Fan speed of "High speed" setting

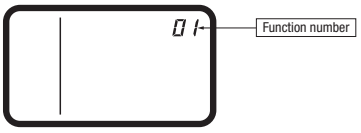
Fan speed setting	Indoor unit fan speed setting		
	❋■■■ - ❋■■ - ❋■	❋■■■ - ❋■	❋■■■ - ❋■■
Standard	Hi — Mid — Lo	Hi — Lo	Hi — Mid
High speed 1・2	UHi — Hi — Mid	UHi — Mid	UHi — Hi

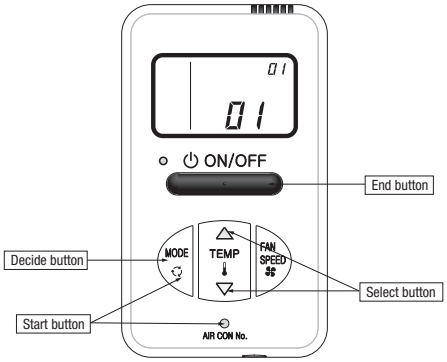
Initial setting of some indoor unit is "High speed".

Note 3: As for plural indoor unit, set indoor functions to each master and slave indoor unit.
But only master indoor unit is received the setting change of indoor unit function "07 Operation permission/ prohibition" and "08 External input".

7. How to set functions by button operation

(1) **Stop air-conditioner, and simultaneously press AIR CON No. and MODE buttons at the same time for over three seconds.**
The function number "01" blinks in the upper right.

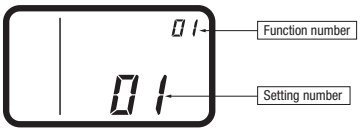




(2) **Press TEMP△ or TEMP▽ button.**
Select the function number.

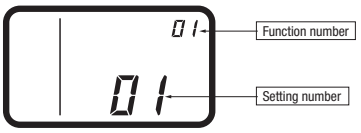
(3) **Press MODE button.**
Decide the function number.

(4) **[In the case of selecting the remote control function (01-06)]**
① The current setting number of the selected function number blinks
(Example)
Function number: "01" (lighting)
Setting number: "01" (blinking)



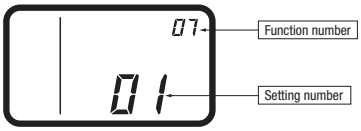
② **Press TEMP△ or TEMP▽ button.**
Select the setting number.

③ **Press MODE button.**
The setting is completed.
Light is on for approximately 3 to 20 seconds while data of the decided function No. and setting No. is transmitted.
(Example)
Function number: "01" (lighting for 3 to 20 seconds)
Setting number: "01" (lighting for 3 to 20 seconds)



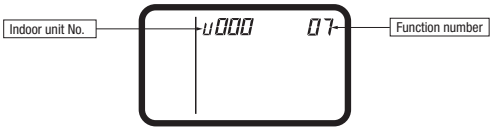
Then, the screen goes back to the function number blinking indication (1), if the setting is sequentially conducted, continue with the same procedures. If the setting is finished, proceed to (5).

[In the case of selecting the indoor unit function (07-14)]
① **"88" blinks on the temperature setting indicators.**
(blinking for approximately 2 to 10 seconds while data are read)
↓
After that, the current setting number of the selected function number blinks.
(Example)
Function number: "07" (lighting)
Setting number: "01" (blinking)



Proceed to ② .

[Note]
a. In the case of connecting one remote control to plural indoor units, the display will be as follows:
Indoor unit No. display: "U 000" (blinking)
(Display the lowest number among the connected indoor units.)

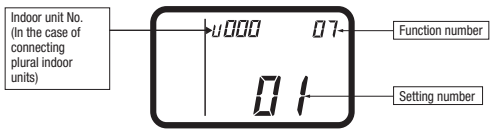


b. Press TEMP△ or TEMP▽ button.
Select the indoor unit No. to be set.
If "U ALL" is selected, the same setting can be set to all units.

c. Press MODE button.
Decide the indoor unit No.
"88" blinks on the temperature setting indicators. (blinking for 2 to 10 seconds while data is read)
When AIR CON No. button is pressed, go back to the indoor unit selection display (for example, "U 000" blinking).

② **Press TEMP△ or TEMP▽ button.**
Select the setting number

③ **Press MODE button.**
The setting is completed.
Light is on for approximately 3 to 20 seconds while data of the decided function No. and setting No. is transmitted.
(Example)
Indoor unit No.: "U 000" (lighting for 3 to 20 seconds)
Function number: "07" (lighting for 3 to 20 seconds)
Setting number: "01" (lighting for 3 to 20 seconds)



Then, the screen goes back to the function number blinking indication (1), if the setting is sequentially conducted, continue with the same procedures. If the setting is finished, proceed to (5).

(5) **Press ON/OFF button.**
The setting is completed.

- Even if ON/OFF button is pressed during setting, the setting is ended. However, any details where the setting has not been completed will be ineffective.
- The setting contents are stored in the control, and even if the power failure occur, this will not be lost.

[Confirmation method for current setting]
According to the operation, the "setting number" displayed first after selecting "function number" and pressing MODE button is the currently set content.
(However, in the case of selecting "U ALL" (all units), the setting number of the lowest number among the indoor units is displayed.)

4.4 BASE HEATER KIT (CW-H-E1)

PCZ012D007A A

Model Name: CW-H-E1

⚠ WARNING

- Follow the instruction and installation manual for outdoor unit when installing the heater.
- This heater must be installed by authorized personnel.
- Turn off the power source when the kit is installed.
- Failure to follow the above will result in serious accident like electrical shock or fire.

⚠ CAUTION

- Follow the law or regulation of the country where it is installed.
- Do not alter the heater.
- Lay down the heater so that the edge of the sheet metal does not damage the heater.
- Bending radius must be bigger than 25mm.
- Do not use the heater near flammable substances.
- Be sure to check the electrical insulation before use.
- Be sure to check the drain is not trapped by the heater.
- Do not leave refrigerant oil on the base.

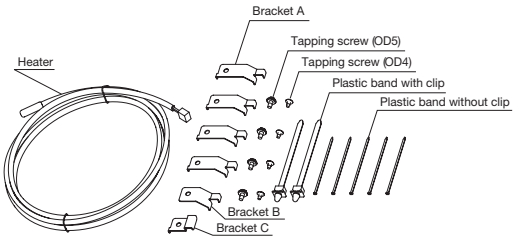
AREAS TO BE APPLIED

This kit is to be used in an area where the lowest temperature drops below zero.

⚠Caution: In case the heater is not applied on the unit which is installed in an area mentioned above, it may be regarded as installation failure and warranty may not be given.

Components

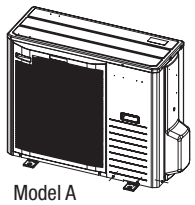
- Heater : 1pc
- Bracket A : 4pcs
- Bracket B : 1pcs
- Bracket C : 1pcs
- Tapping screw (OD5) : 4pcs
- Tapping screw (OD4) : 4pcs
- Plastic band with clip : 2pcs
- Plastic band : 5pcs



Applicable model

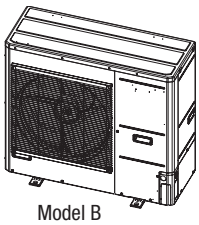
This heater kit is applicable for 3 different models.

<Model A>
Single fan with plastic fan guard model



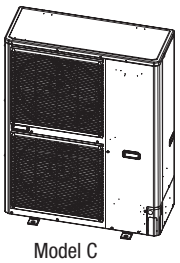
Model A

<Model B>
Single fan model



Model B

<Model C>
Double fan model



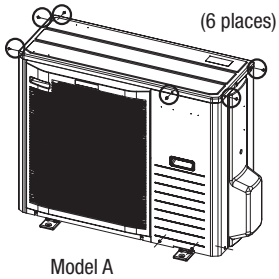
Model C

Installation procedure

Step 1

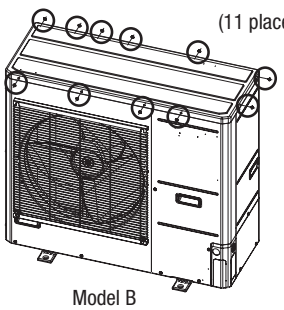
1. Remove the top panel of the outdoor unit.

(6 places)



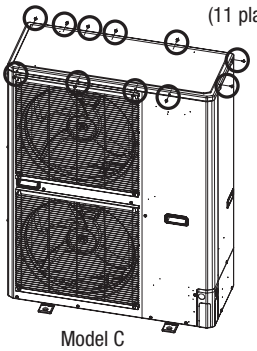
Model A

(11 places)



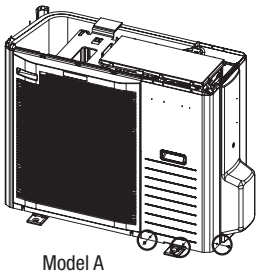
Model B

(11 places)

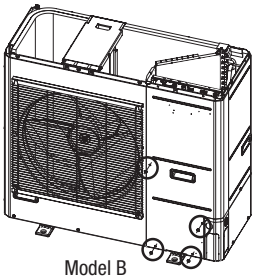


Model C

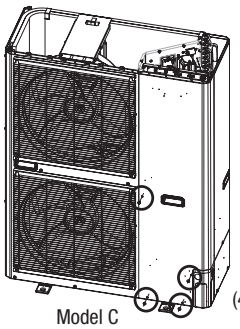
Step 2 2. Remove the service panel.



Model A (3 places)

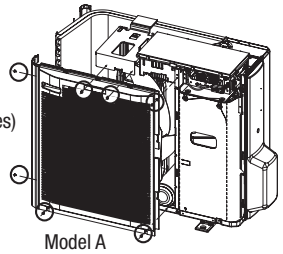


Model B (4 places)

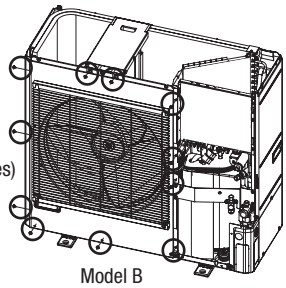


Model C (4 places)

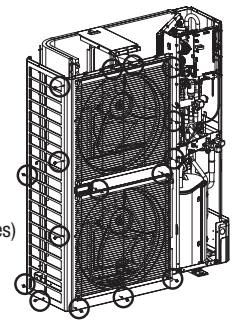
Step 3 3. Remove the front panel.
Pull the panel straightforward so that the panel doesn't touch the fan blade.



(7 places) Model A



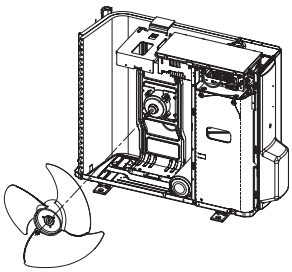
(11 places) Model B



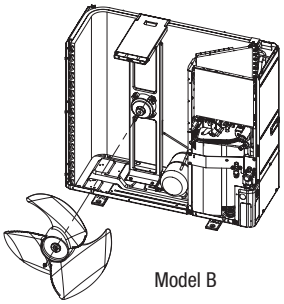
(16 places) Model C

Step 4 4. Remove the fan blade if necessary.

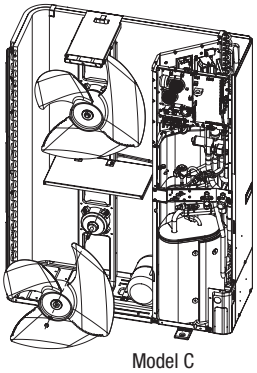
<Note>
Do not rotate the axis of fan motor when removing the fan blade.
It may cause malfunction of the fan motor.



Model A

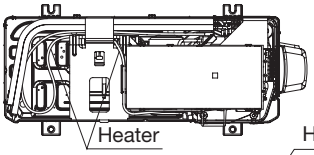


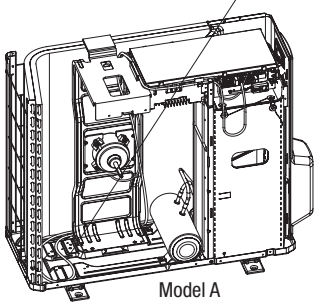
Model B



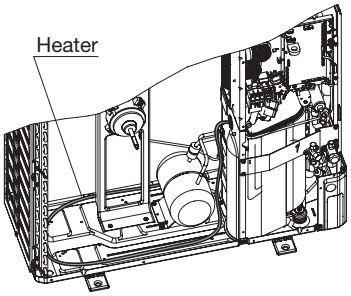
Model C

Step 5 5. Lay down the drain pan heater on the base.
For model A, put the cables rear the fan motor bracket.

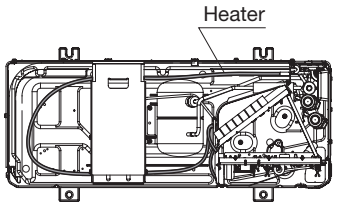




Model A

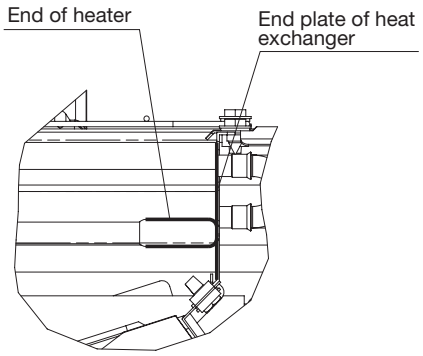


Model B, C



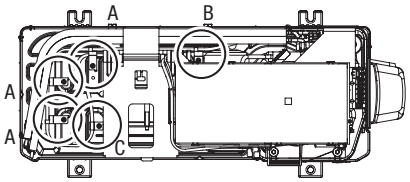
Step 6

6. Put the heater underneath the heat exchanger and align the end of heater with the end plate of heat exchanger.

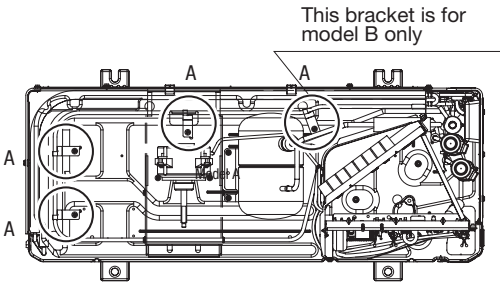


Step 7

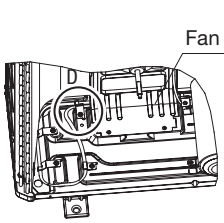
7. Fix the heater with brackets.



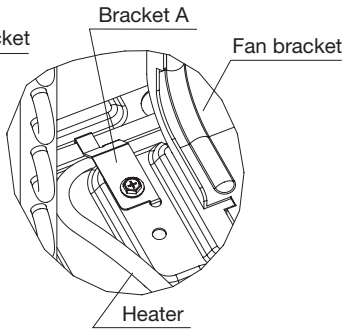
For model A, use 3 pcs of bracket A, 1pc of bracket B and C. Fix bracket A and C with the attached screw (OD4), and fix bracket B with the removed screw which is fastened at the same place.



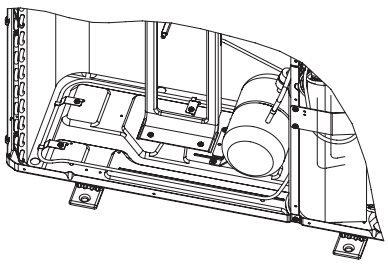
For model B and C, fix bracket A with the attached screw (OD5).



Model A



Detail view D



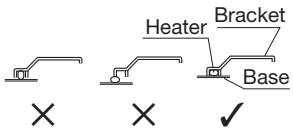
Model B, C

<Note for model A>

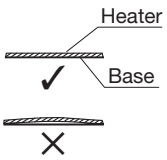
1) Put the end of heating part just after the bracket C.
2) Fix the incoming and out going cable with one bracket A on the left of fan bracket as figure shows.

<Note>

1) Fix the heater so that the bracket doesn't pinch the heater as figure shows.



2) Place the heater so as to touch the base completely.



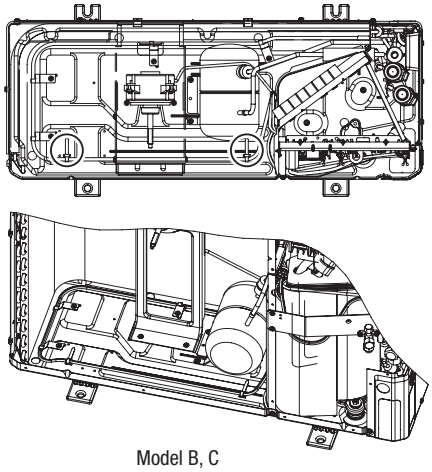
3) In bending position, twist the heater to make it easier to bend, and get back to be able to fix it with bracket.



4) Be careful not to be injured by aluminum fin when fixing the heater with screw.

Step 8

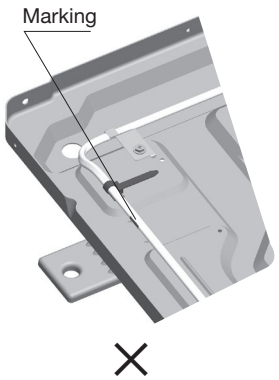
8. Insert the plastic band with clip on the designated place (2 places), and fix the heater.(Model B,C only)



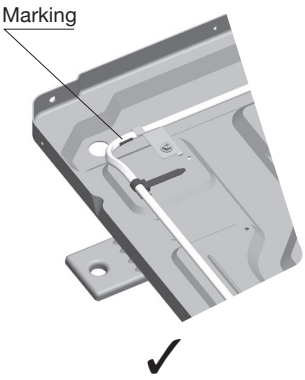
Model B, C

<Note>

1) Do not fasten the heating part with the plastic band.
   There is a marking on the end of heating part.



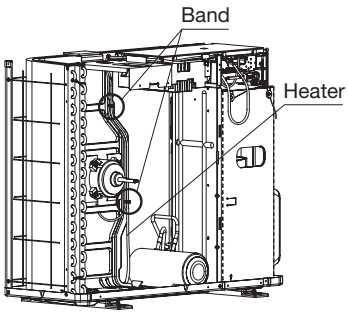
2) When the heater is laid down correctly, the end of heating part comes to the corner of the base.



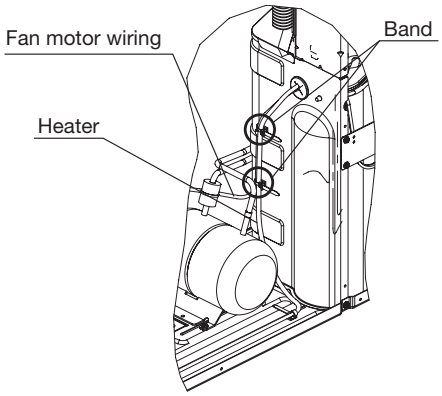
Step 9

9. Lay down the wiring on the same route of fan motor wiring, and fix the wire with attached plastic band at the same place where the fan motor wiring is banded.

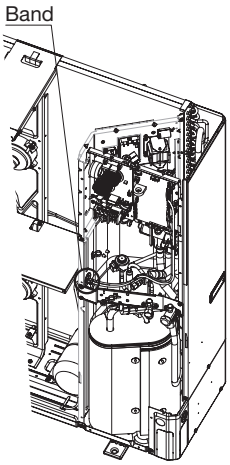
Model A

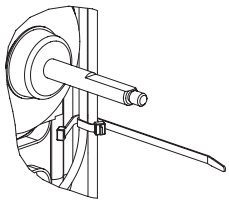


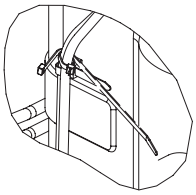
Model B

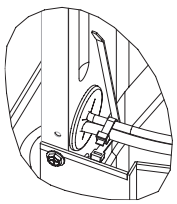


Model C









<Note>

Fan motor wiring is banded on the bracket so that it doesn't loosen.
Do not loose the band for the motor wiring to band the heater wire together but use the attached plastic band.

Step 10

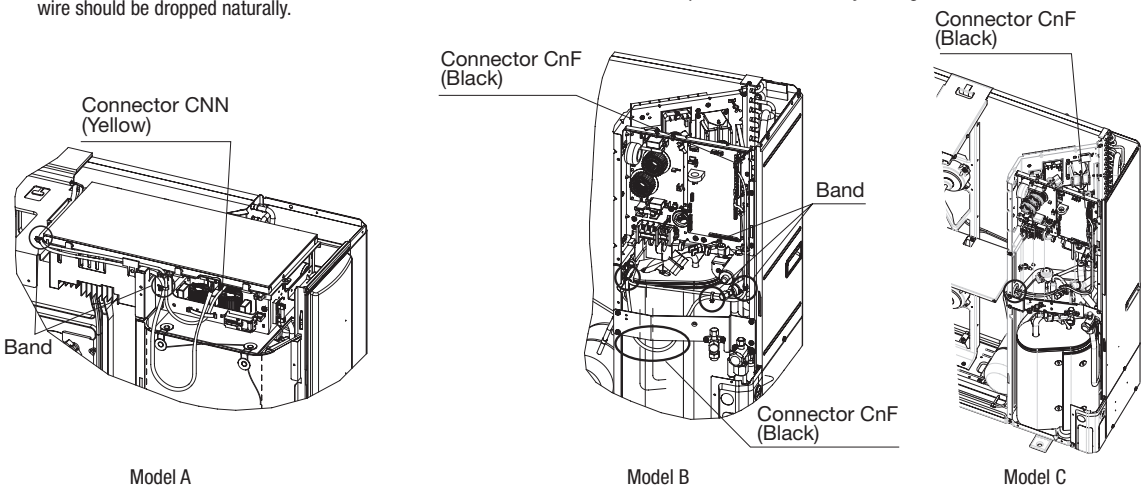
10.Insert the connector to the port (Model A: CNN, Model B,C:CNF) on the PCB, and fix the wire with bands. Excess part of the wire should be dropped naturally.

<Note>

Be sure to cut the excess part of plastic band.

It may cause abnormal noise when hit by fan blade or misassembling of panels.

Do not bundle excess part of the wire. It may damage the heater.



Model A Model B Model C

Step 11

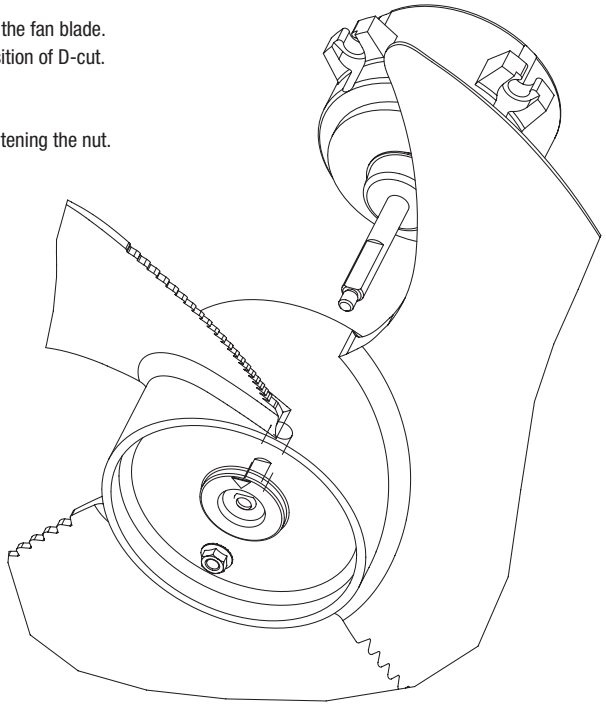
11. Reassemble the fan blade.

Take care to align the D-cut of motor shaft and the fan blade.

▽ mark on the center of the fan shows the position of D-cut.

<Note>

1. Tightening torque of the nut is 4.0-4.9 N·m.
2. Do not rotate the axis of fan motor when tightening the nut. It may cause malfunction of the fan motor.



<Note>

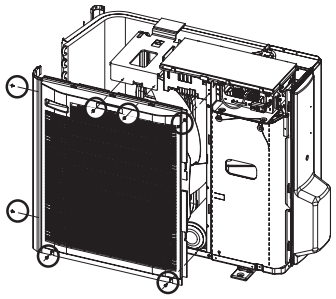
- This heater should have bending radius of at least 25mm including non-heating part. Do not bundle the excess part of the wire. It may cause disconnection of the heater or insufficient capacity.
- Be sure to prevent the heater from touching any refrigerant piping.

  Especially, pay close attention not to make it touch with pipes which are close to the wiring route such as suction pipe, check valve and check joint.

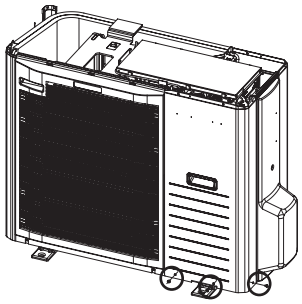
Step 12

12. Reassemble the panels.

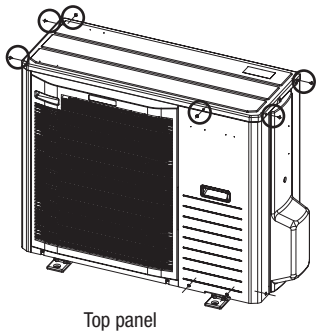
[Model A]



Front panel

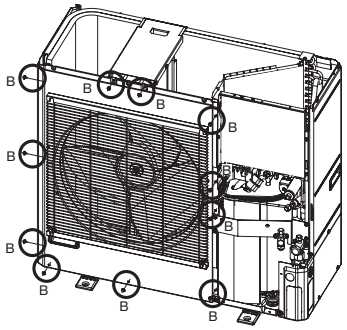


Service panel

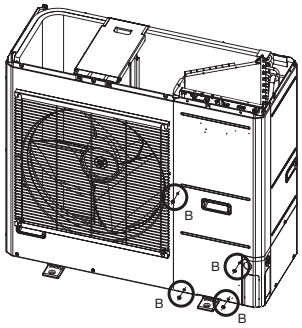


Top panel

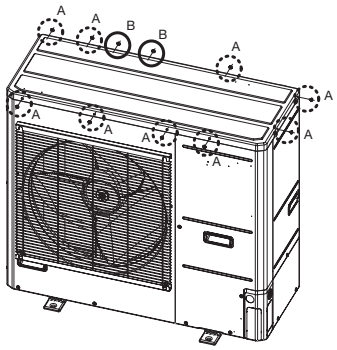
[Model B]



Front panel

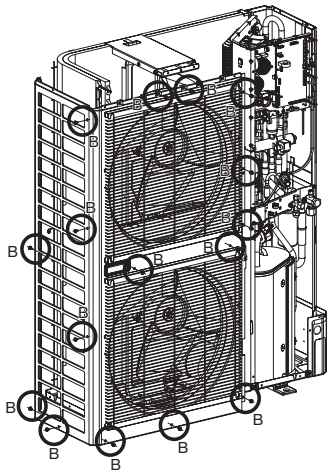


Service panel

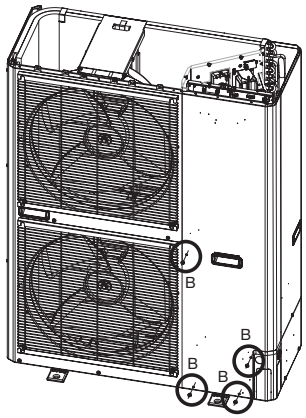


Top panel

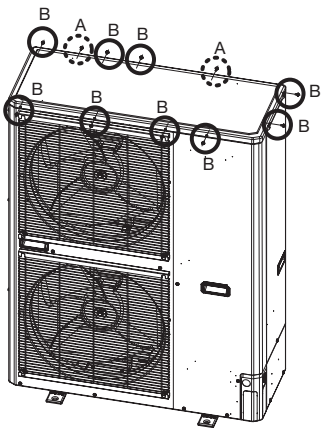
[Model C]



Front panel



Service panel

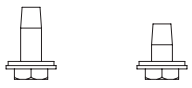


Top panel

<Note>

1) When reassembling the service panel, take care not to damage the front panel with the edge.

2) Top panel of model B and model C is fixed with two different screws.
Be sure to use correct screw as figure shows.



A **B**

4.5 INTERFACE KIT (SC-BIKN2-E)

※ When RC-EX3A is connected, please use SC-BIKN2-E by all means.

RKZ012A099

Accessories included in package

Be sure to check all the accessories included in package.

No.	Part name	Quantity
①	Indoor unit's connection cable (cable length: 1.8m)	1
②	Wood screws (for mounting the interface: ø4x 25)	2
③	Tapping screws (for the cable clump and the interface mounting bracket)	3
④	Interface mounting bracket	1
⑤	Cable clamp (for the indoor unit's connection cable)	1
⑥	CnT terminal connection cable (total cable length: 0.5m)	1

Safety precautions

Before use, please read these Safety precautions thoroughly before installation.

- All the cautionary items mentioned below are important safety related items to be taken into consideration, so be sure to observe them at all times.

⚠Warning	Incorrect installation could lead to serious consequences such as death, major injury or enviromental destruction.

- Symbols used in these precautions

❗	Always go along these instruction.

- After completed installation, carry out trial operation to confirm no anomaly, and ask the user to keep this installation manual in a good place for future reference.

⚠ Warnings

❗

- **Installation must be carried out by a qualified installer.**
  If you install it by yourself, it may cause an electric shock, fire and personal injury , as a result of a system malfunction.
- **Install it in full accordance with the installation manual.**
  Incorrect installation may cause an electric shock, fire and personal injury.
- **Electrical work must be carried out by a qualified electrician in accordance with the technical standard for electrical equipment, the indoor wiring standard and this installation manual.**
  Incorrect installation may cause an electric shock, fire and personal injury.
- **Use the specific cables for wiring. And connect all the cables to terminals or connectors securely and clamp them with cable clamps in order for external forces not to be transmitted to the terminals directly.**
  Incomplete connection may cause malfunction, and lead to heat generation and fire.
- **Use the original accessories and specified components for installation.**
  If the parts other than those prescribed by us are used, it may cause an electric shock, fire and sersonal injury.

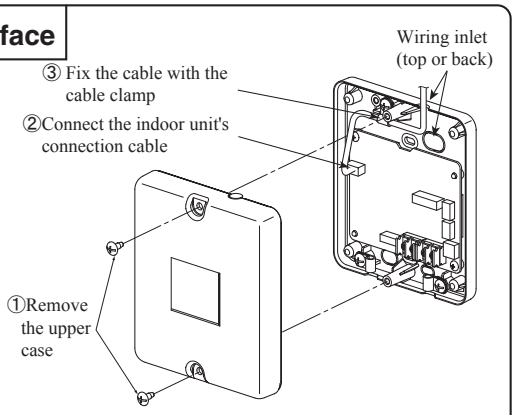
Connecting the indoor unit's connection cable to the interface

①Remove the upper case of the interface.
- Remove 2 screws from the interface casing before removal of upper casing.

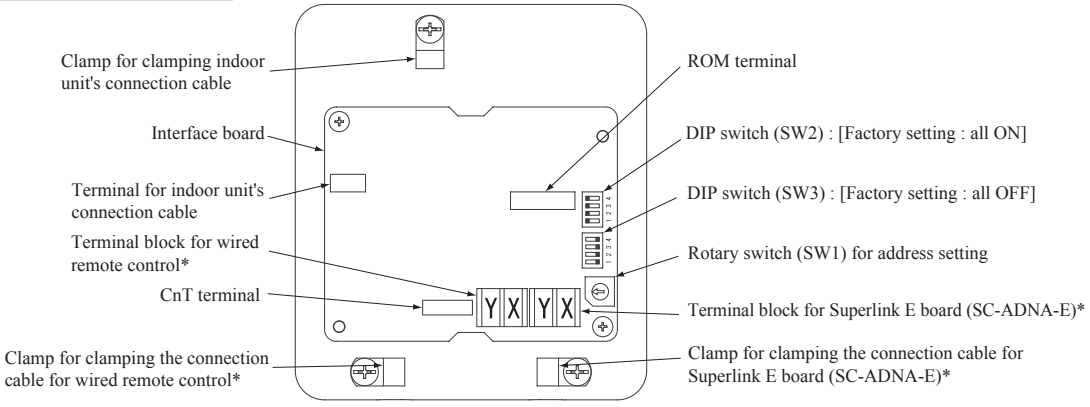
②Connect the indoor unit's connection cable to the interface.
- Connect the connector of the indoor unit connection cable to the connector on the interface's circuit board.

③Fix the indoor unit's connection cable with the cable clamp.
- Cable can be brought in from the top or from the back.
- Cut out the punch-outs for the connection cables running into the casing with cutter.

④Connect the indoor unit's connection cable to the indoor control PCB.
- Connect the indoor unit's connection cable to the indoor control PCB securely.
- Clamp the connection cable to the indoor control box securely with the cable clamp provided as an accessory.
- Regarding the cable connection to the indoor unit, refer to the installation manual for indoor unit.



Name of each part of the interface



*Either the connection cables of Superlink E board (SC-ADNA-E) or of wired remote control is connectable.

Switch	Setting	Function	Switch	Setting	Function
SW2-1	ON**	CnT level input	SW2-3	ON**	External input (CnT input)
	OFF	CnT pulse input		OFF	Operation permission/prohibition (CnT input)
SW2-2	ON**	Wired remote control : Enable	SW2-4	ON**	Annual cooling : Enable***
	OFF	Wired remote control : Disable		OFF	Annual cooling : Disable***

** Factory setting

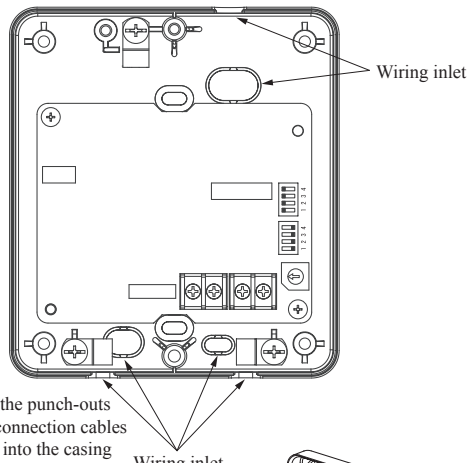
*** Indoor fan control at low outdoor air temperature in cooling

Installation of the interface

- Install the interface within the range of the connection cable length (approximately 1.3m) from the indoor unit.
- Be sure not to extend the connection cable on site. If the connection cable is extended, malfunction may occur.
- Fix the interface on the wall, pillar or the like.

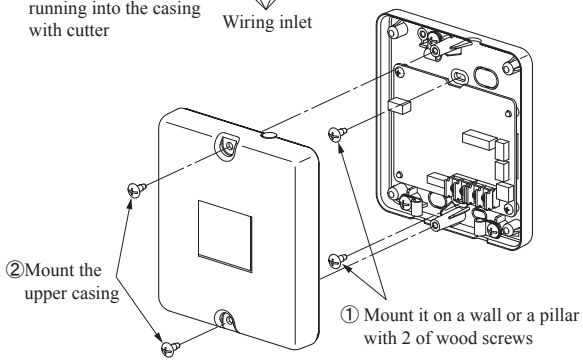
●Don't install the interface and wired remote control at the following places.

○Places exposed to direct sunlight
○Places near heating devices
○High humidity places
○Surfaces where are enough hot or cold to generate condensation
○Places exposed to oil mist or steam directly
○Uneven surface



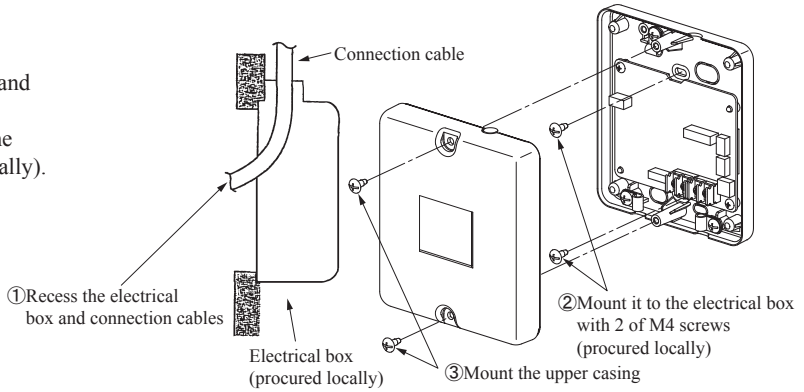
Mounting the interface directly on a wall

①Mount the lower casing of the interface on a flat surface with wood screws provided as standard accessory.
②Mount the upper casing.



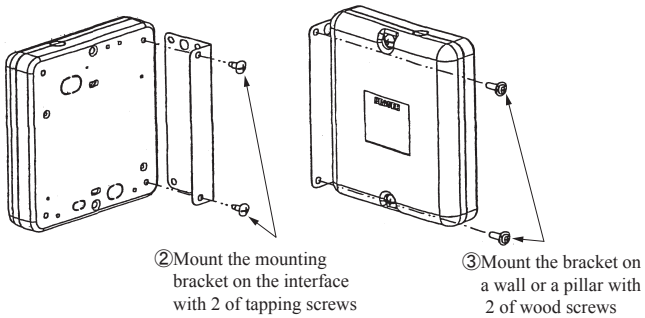
Recessing the interface in the wall

①Recess the electrical box (procured locally) and connection cables in the wall.
②Mount the lower casing of the interface to the electrical box with M4 screws (procured locally).
③Mount the upper casing.



Mounting the interface with the mounting bracket

①Mount the upper casing.
②Mount the mounting bracket to the interface with tapping screws provided as standard accessory.
③Mount the mounting bracket on wall or the like with wood screws provided as standard accessory.



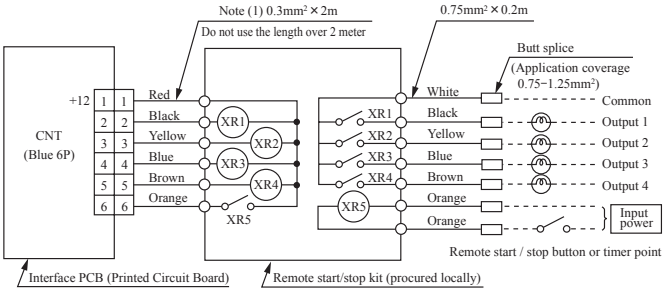
Installation check items

☐ Are the connection cables connected securely to the terminal blocks and connectors?
☐ Are the thickness and length of the connection cables conformed with the standard?

Functions of CnT connector

It is available to operate the air-conditioner and to monitor the operation status with the external control unit (remote display) by sending the input/output signal through CnT connector on the indoor control PCB.

①Connect a external remote control unit (procured locally) to CnT terminal.
②In case of the pulse input, switch OFF the DIP switch SW2-1 on the interface PCB.
③When setting operation permission/prohibition mode, switch OFF the DIP switch SW2-3 on the interface PCB.



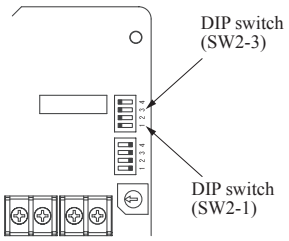
Input/ Output	Function	Output signal		Content
		Relay	ON/OFF	
Output 1	Operation output	XR_1	ON	During air-conditioner operation
Output 2	Heating output	XR_2	ON	During heating operation
Output 3	Compressor operation output	XR_3	ON	During compressor running
Output 4	Malfunction output	XR_4	ON	During anomalous stop

- $XR_{1\text{-}4}$ are for the DC 12V relay
- XR_5 is a DC 12/24V or AC 220-240V relay
- CnT connector (local) maker, model

Connector	Molex	5264-06
Terminals	Molex	5263T

Input/ Output	Function	SW2-1		SW2-3				Air-conditioner	Operation by remote control
		Setting		Setting	Input signal		Content		
					Level/Pulse	XR_5			
Input	External control input	ON*	Level input	ON*	Level	OFF→ON	External input	ON	Allowed
						ON→OFF		OFF	
				OFF		OFF→ON	Operation permission	OFF	
						ON→OFF	Operation prohibition	OFF	Not allowed
		OFF	Pulse input	ON*	Pulse	OFF→ON	External input	OFF→ON	Allowed
								ON→OFF	
				OFF	Level	OFF→ON	Operation permission	ON	
						ON→OFF	Operation prohibition	OFF	Not allowed

* Factory setting

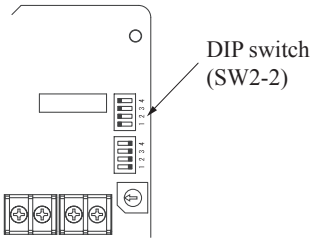


In case of the remote control (RC-EX3 or later model), the external outputs (1 – 4) and the external input can be changed using the function setting of remote control. For the setting method, refer to the installation manual.
Also refer to the technical manual to know how it is adapted to the function setting for the external outputs and input, at the indoor unit side.

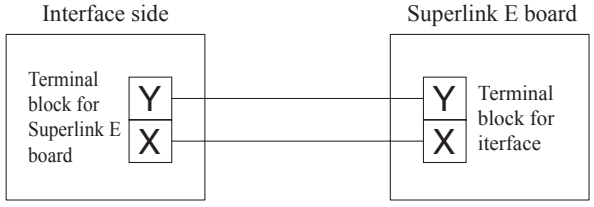
Connection of Superlink E board

Regarding the connection of Superlink E board, refer to the installation manual of Superlink E board.
For electrical work, power source for all of units in the Superlink system must be turned OFF.

①Switch ON the DIP switch SW2-2 (Factory setting: ON) on the interface PCB.
Caution: Wireless remote control attached to the indoor unit can be used in parallel, after connecting the wired remote control. However, some of functions other than the basic functions such as RUN/STOP, temperature setting, etc. may not work properly and may have a mismatch between the display and the actual behavior.



②Wiring connection between the interface and the Superlink E board.

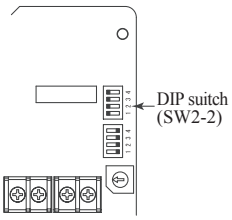


No.	Names of recommended signal wires
1	Shielded wire
2	Vinyl cabtyre round cord
3	Vinyl cabtyre round cable
4	Vinyl insulated wire vinyl sheathed cable for control

Within 200 m 0.5 mm² × 2 cores
Within 300 m 0.75 mm² × 2 cores
Within 400 m 1.25 mm² × 2 cores
Within 600 m 2.0 mm² × 2 cores

③Clamp the connection cables with cable clamps.

Connection of wired remote control



Regarding the connection of wired remote control, refer to the installation manual of wired remote control.

①Switch ON the DIP switch SW2-2 (Factory setting : ON) on the interface PCB.

Caution: Wireless remote control attached to the indoor unit can be used in parallel, after connecting the wired remote control. However, some of functions other than the basic functions such as RUN/STOP, temperature setting, etc. may not work properly and may have a mismatch between the display and the actual behavior.

②Wiring connection between the interface and the wired remote control.

Installation and wiring of wired remote control

Ⓐ Install the wired remote control with reference to the attached installation manual of wired remote control.

Ⓑ 0.3mm² x 2 cores cable should be used for the wiring of wired remote control.

Ⓒ Maximum length of wiring is 600m.

If the length of wiring exceeds 100m, change the size of cable as mentioned below.

100m-200m: 0.5mm² x 2 cores, 300m or less: 0.75mm² x 2 cores, 400m or less: 1.25mm² x 2 cores, 600m or less: 2.0mm² x 2 cores

However, cable size connecting to the terminal of wired remote control should not exceed 0.5mm². Accordingly if the size of connection cable exceeds 0.5mm², be sure to downsize it to 0.5mm² at the nearest section of the wired remote control and waterproof treatment should be done at the connecting section in order to avoid contact failure.

Ⓓ Don't use the multi-core cable to avoid malfunction.

Ⓔ Keep the wiring of wired remote control away from grounding (Don't touch it to any metal frame of building, etc.).

Ⓕ Connect the connection cables to the terminal blocks of the wired remote control and the interface securely (No polarity).

③Clamp the connection cables with cable clamps.

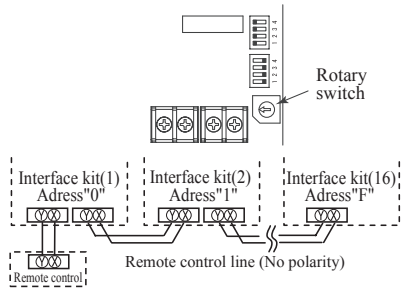
Control of multiple units by a single wired remote control

Multiple units (up to 16) can be controlled by a single wired remote control.
In this case, all units connected with a single wired remote control will operate under the same mode and same setting temperature.

①Connect all the interface with 2 cores cables of wired remote control line.

②Set the address of indoor unit for remote control communication from "0" to "F" with the rotary switch SW1 on the interface PCB.

③After turning the power ON, the address of indoor unit can be displayed by pressing AIR CON No. button on the wired remote control.
Make sure all indoor units connected are displayed in order by pressing ▲ or ▼ button.

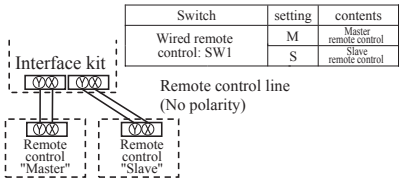


Master/Slave setting wired when 2 of wired remote control are used

Maximum two wired remote control can be connected to one indoor unit (or one group of indoor units)

①Set the DIP switch SW1 on the wired remote control to "Slave" for the slave remote control. (Factory setting : Master)

○ Caution : Remote control sensor of the slave remote control is invalid.



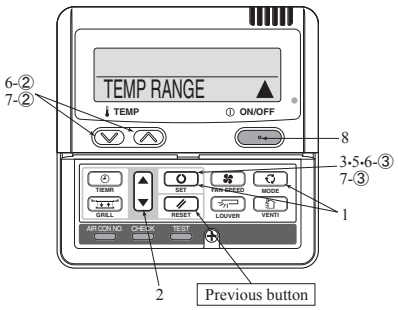
●When using the wireless remote control in parallel with the wired remote control;
Since temperature setting range of wired remote control is different from that of wireless remote control, please adjust the setting range of wired remote control to be the same setting range of wireless remote control by following procedure. (The set temperature may not be displayed correctly on the wireless remote control, unless change of temperature setting range is done.)
Changing procedure of temperature setting range is as follows.

How to set upper and lower limit of temperature setting range

1. Stop the air-conditioner, and press (SET) and (MODE) button at the same time for 3 seconds or more.
   The indication changes to"FUNCTION SET▼"
2. Press▼button once, and change to the "TEMP RANGE ▲" indication.
3. Press (SET) button, and enter the temperature range setting mode.
4. Confirm that the "Upper limit ▼ " is shown on the display.
5. Press (SET)button to fix.
6. ①Indication: "∨ ∧ SET UP"→"UPPER 28℃ ∨ ∧"
   ②Select the upper limit value 30℃ with temperature setting button △."UPPER30℃∨ " (blinking)
   ③Press (SET) button to fix. "UPPER 30℃" (Displayed for two seconds)
   After the fixed upper limit value displayed for two seconds, the indication will return to"UPPER LIMIT▼".
7. Press▼button once, "LOWER LIMIT ▲ " is selected, press (SET) button to fix.
   ①Indication: "∨ ∧ SET UP" → "LOWER 20℃∨ ∧"
   ②Select the lower limit value 18℃ with temperature setting button ▽."LOWER18℃∧ " (blinking)
   ③Press (SET) button to fix. "LOWER 18℃" (Displayed for two seconds)
   After the fixed lower limit value displayed for two seconds, the indication will return to"LOWER LIMIT▼"
8. Press ON/OFF button to finish.

Temperature setting range

Mode	Temperature setting range
Cooling, Heating, Dry, Auto	18-30℃



- It is possible to quit in the middle by pressing ON/OFF button, but the change of setting is incompleted.
- During setting, if pressing (RESET) button, it returns to the previous screen.

4.6 SUPERLINK E BOARD (SC-ADNA-E)

PJZ012D029K

- Read and understand the instructions completely before starting installation.
- Refer to the instructions for both indoor and outdoor units.

Safety precautions

- Carefully read "Safety precautions" first. Follow the instructions for installation.
- Precautions are grouped into "Warning⚠" and "Caution⚠". The "Warning⚠" group includes items that may lead to serious injury or death if not observed. The items included in the "Caution⚠" group also may lead to serious results under certain conditions. Both groups are crucial for safety installation. Read and understand them carefully.
- After installation, conduct the test operation of the device to check for any abnormalities. Describe how to operate the device to the customer following the installation instruction manual. Instruct the customer to keep this installation instruction for future reference.

⚠Warning

- This device should be installed by the dealer where you purchase the device or a licensed professional shop. If the device is incorrectly installed by the customer, it may result in electric shock or fire.
- Install the device carefully following the installation instruction. If the device is incorrectly installed, it may result in electric shock or fire.
- Use the accessory parts and specified parts for installation. If any parts that do not match the specifications are used, it may result in electric shock or fire.
- A person with the electrical service certification should conduct the service based on the "Technical standards for electrical facilities", "Electrical Wiring Code", and the installation instruction. If the work is done incorrectly, it may result in electric shock or fire.
- Wiring should be securely connected using the specified types of wire. No external force on the wire should be applied to any terminals. If a secure connection is not achieved, it may result in electric shock or fire.

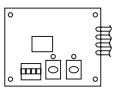
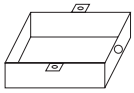
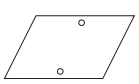
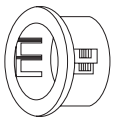
⚠Caution

- Provide ground connection.
  The ground line should never be connected to the gas supply piping, the water supply piping, the lightning conductor rod, nor the telephone ground.If the grounding is improper, it may result in electric shock.
- Do not install the device in the following locations.
  1.Where there is mist/spray of oil or steam such as kitchens.
  2.Where there is corrosive gases such as sulfurous acid gas.
  3.Where there is a device generating electromagnetic waves.
  These may interfere with the control system resulting in the device becoming uncontrollable.
  4.Where flammable volatile materials such as paint thinner and gasoline may exist or where they are handled. This may cause a fire.

1 Application

Indoor-to-outdoor three core communication specification type 3 (since October 2007)

2 Accessories

SL E board	Metal box	Metal cover	Screw for ground
			M4×8L 2 pieces 
Pan head screws	Locking supports	Binding band	Grommet
ø4×8L 2 pieces 	To secure the print board and the metal box Made of nylon 4 pieces 		

3 Function

Allowing the central control SL1N-E, SL2NA-E, and SL4-AE/BE to control and monitor the commercial air-conditioner unit.

4 Control switching

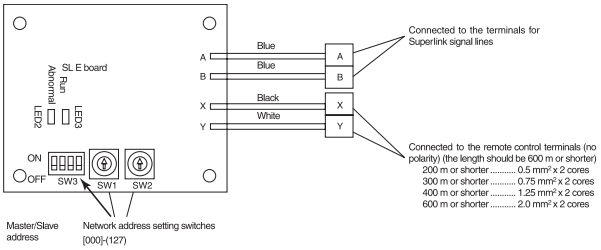
Settings can be changed by the DIP switch SW3 on the SL E board as in the following.

Switch	Symbol	Switch	Remarks
SW3	1	ON	Master
		OFF (default)	Slave
	2	ON	Fixed previous protocol
		OFF (default)	Automatic adjustment of Superlink protocol
	3	ON	Indicates the forced operation stop when abnormality has occurred.
		OFF (default)	Indicates the status of running/stop as it is, when abnormality has occurred.
	4	ON	The hundredth address activated "1"
		OFF (default)	The hundredth address activated "0"

5 Connection outline

Note for setting the address

- Set the address between 00 and 47 for the previous Superlink connection and between 000 and 127 for the new Superlink connection. (*1)
- Do not set the address overlapping with those of the other devices in the network. (The default is 000)



(*1) Whether the actual link is either the new Superlink or the previous Superlink depends on the models of the connected outdoor and indoor units. Consult the agent or the dealer.

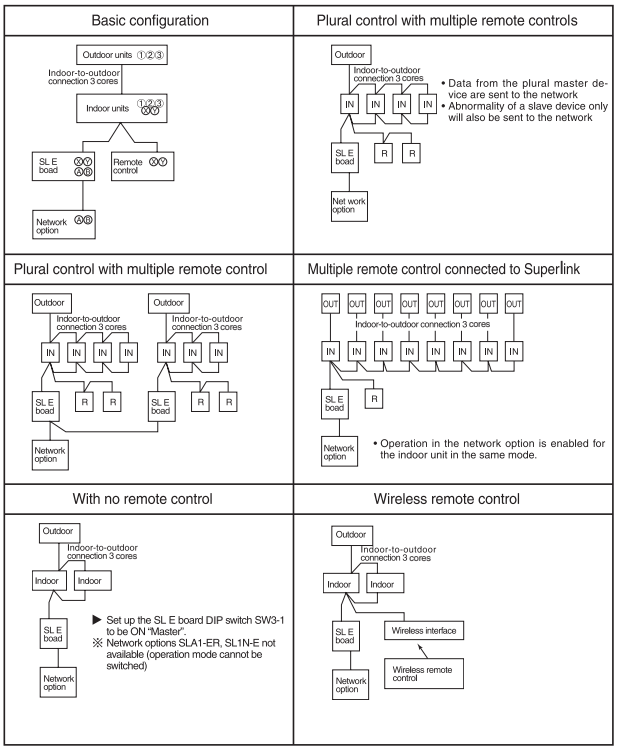
Signal line specification

Communication method	Previous Superlink	New Superlink
Line type	MVVS	MVVS
Line diameter	0.75 - 1.25mm²	0.75/1.25mm²
Signal line (total length)	up to 1000m	up to 1500/1000m (*2)
Signal line (maximum length)	up to 1000m	up to 1000m

(*2) Up to 1500 m for 0.75 mm², and up to 1000 m for 1.25 mm².
Do not use 2.0 mm². It may cause an error.

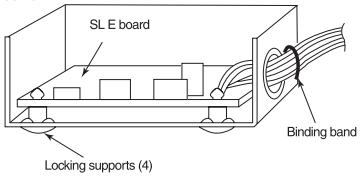
(*3) Connect grounding on both ends of the shielding wire.
For the grounding method, refer to the section "6 Installation".

(1) Set the Superlink network address with SW1 (tens place), SW2 (ones place), and SW3 (hundreds place).
(2) Set the SL E board SW3-1 to be ON (Master) when using this without any remote control (no wired remote controller nor wireless remote control).
(3) Set up the plural master/slave device using the DIP switches on the indoor unit board.
(4) Set up the remote control master/slave device using the slide switch on the remote control board.
(5) Set up "0" to "F" using the address rotary switch on the indoor unit board when controlling the indoor unit with the multiple remote control.

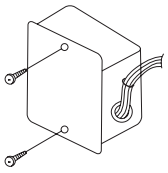


6 Installation

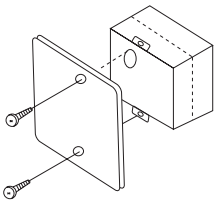
1. When using the metal box (mounted on the indoor unit / mounted on the back of the remote control):
   (1) Mount the SL E board in the metal box using the locking supports.
   (2) Wiring should go through the provided grommet since then through the wiring to the hole on the Metal box.
   Secure the grommet after inserting the grommet into the Metal box as shown in below figure, then tie the wiring at the outlet of the unit using a binding band.



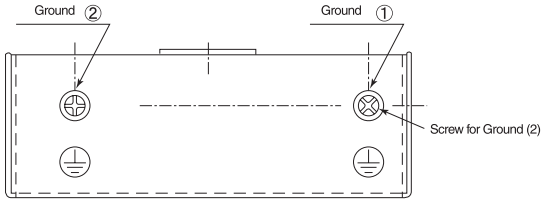
▲ When installed outside the indoor unit, put the metal cover on.



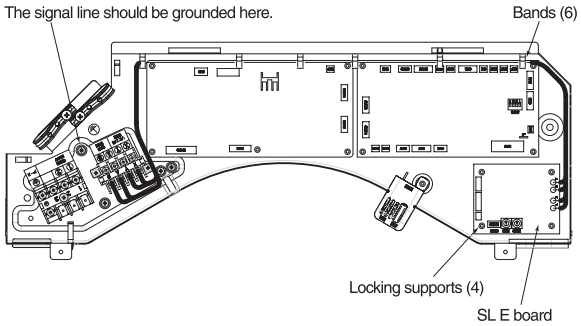
▲ When installed on the back of the remote control, mount it directly on the remote control bottom case.



Connect grounding. Connect grounding for the power line to Ground ①, and grounding for the signal line to Ground ② or to the Ground on the indoor unit control box.



2. When connecting to the indoor unit control box (ceiling-concealed type and FDT type only):
   (1) Mount the SL E board in the control box using the locking supports.
   (2) Remove 6 bands from the box and put the wiring through the bands to be secured.



Electrical shock hazard! make sure to turn the power off for servicing. Be cautious so that no abnormal force should be applied to the wiring. Do not let the SL E board hung by the wiring. Do not damage the board with a screw driver.
The board is sensitive to static electricity. Release the static electricity of your body before servicing.
(You can do this by touching the control board which is grounded).

Location of installation

Install the device at the location where there are no electromagnetic waves nor where there is water and dust. The specified temperature range of the device is 0 to 40°C. Install the device at the location where the ambient temperature stays within the range. If it exceeds the specification, make sure to provide solution such as installing a cooling fan. When used outside of the range, it may cause abnormal operation.

7 Indicator display

Check the LED 3 (green) and LED 2 (red) on the SL E board for flashing.

SL E board LEDs		Inspection mode	Display on the integrated network control device
Red	Green		
Off	Flashing	Normal communication	
Off	Off	• Disconnection in the remote control communication line (X or Y) • Short-circuit in the remote control communication line (between X and Y) • Faulty indoor unit remote control power • Faulty remote control communication circuit • Faulty CPU on SL E board	No corresponding unit number
One flash	Flashing	• Disconnection in the Superlink signal line (A or B) • Short-circuit in the Superlink signal line (between A and B) • Faulty Superlink signal circuit	
Two flashes	Flashing	• Faulty address setting for the SL E board (Set up the address for previous SL E board : more than 48 new SL E board : more than 128)	
Three flashes	Flashing	• SL E board parent not set up when used without a remote control • Faulty remote control communication circuit	E1
Four flashes	Flashing	• Address overlapping for the SL E board and the Superlink network connected indoor unit	E2
Off	Flashing	• Number of connected devices exceeds the specification for the multiple indoor unit control	E10

INVERTER PACKAGED AIR-CONDITIONERS

MITSUBISHI HEAVY INDUSTRIES

MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.
16-5 Konan 2-chome, Minato-ku, Tokyo, 108-8215, Japan
http://www.mhi-mth.co.jp/en/

Because of our policy of continuous improvement, we reserve the right to make changes in all specifications without notice.
© Copyright MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.