MHI

Manual No. '04•KX-T-092

TECHNICAL MANUAL

Collection data

INVERTER DRIVEN MULTI-INDOOR-UNIT CLIMATE CONTROL SYSTEM

Alternative refrigerant R410A use models

(OUTDOOR UNIT)

FDCA335,400,450HKXE4

(INDOOR UNIT)

FDTA28KXE4	FDTWA28KXE4	FDTQA22KXE4	FDRA22KXE4	FDQMA22KXE4
36KXE4	45KXE4	28KXE4	28KXE4	28KXE4
45KXE4	56KXE4	36KXE4	45KXE4	36KXE4
56KXE4	71KXE4		56KXE4	
71KXE4	90KXE4	FDTSA22KXE4	71KXE4	
90KXE4	112KXE4	28KXE4	90KXE4	
112KXE4	140KXE4	36KXE4	112KXE4	
140KXE4		45KXE4	140KXE4	
		71KXE4		

FDUMA36KXE4	FDURA45KXE4	FDEA36KXE4	FDKA22KXE4	FDFLA28KXE4
45KXE4	56KXE4	45KXE4	28KXE4	45KXE4
56KXE4	71KXE4	56KXE4	36KXE4	71KXE4
71KXE4	90KXE4	71KXE4	45KXE4	
90KXE4	112KXE4	112KXE4	56KXE4	FDFUA28KXE4
112KXE4	140KXE4	140KXE4	71KXE4	45KXE4
140KXE4				56KXE4
				71KXE4

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CONTENTS

1 GENERAL INFORMATION

1.1 Specific features

(1) The new R410A refrigerant is used

The new refrigerant R410A, with an ozone destruction coefficient of zero, is used and the CO2 discharge volume is reduced, In addition, R410A is a pseudo-azeotropic refrigerant, so there is little change in its consistency that would cause it to divide into the gas and liquid phases, or undergo temperature slide, and it is also possible to add refrigerant on-site.

(2) Connectable indoor capacity

Capacity from 50% to 130% is possible.

- FDCA335HKXE4
  Number of connectable units : 1 to 20 units
  Connectable capacity : 16700 ~ 43600 W
- FDCA400HKXE4
  Number of connectable units : 1 to 23 units
  Connectable capacity : 20000 ~ 52000 W
- FDCA450HKXE4
  Number of connectable units : 1 to 26 units
  Connectable capacity : 22500 ~ 58500 W

(3) Indoor units are available with 9 capacities, in 12 types and 66 models.

- 9 capacities…22(0.8 HP), 28(1 HP), 36(1.25 HP), 45(1.6 HP), 56(22 HP), 71(2.5 HP), 90(3.2 HP), 112(4 HP) and 140(5 HP).
- 12 types…Ceiling recessed type(FDT), 2-way outlet ceiling recessed type(FDTW), Ceiling recessde single air supply port type (FDTQ), 1-way outlet ceiling recessed type(FDTS), Cassetteria type(FDR), Medium static pressure ducted type(FDQM), Satellite ducted type(FDUM), Ceiling mounted duct type(FDUR), Ceiling suspension type(FDE), Wall mounted type(FDK), Floor standing exposed type(FDFL), and Floor standing hidden type (FDFU) .

(4) Long piping design offeres One way piping length of 160 m

- Indoor and outdoor units can have a level difference of up to 50 m, with a one way piping length of up to 160 m. This is the top-class long piping design in the industry. A level difference of as 15 m between indoor units ensures that the system can meet a wide variety of air conditioning requirements in any building.

(5) Super lynk system

- Non polar 2-core signal wires for indoor, outdoor units by means of the automatic polarity selection.
- In addition, the max. 48 units can be controlled with a pair of signal wires. The high speed transmission method same as the computer network system [start up of 48 units can be completed within a few seconds by the determination of operation mode and the start of operation].
- As separate power supplies for the indoor and the outdoor units are employed, a pair of 2 signal wires only are required for the inter connecting wiring of indoor and outdoor uniits regardless of the number of units so that the installation work can be simplified, the cost of wiring work can be curtailed and causes of wiring error can be minimized.

(6) Floor layout can be changed by resetting address unit number.

- For change of floor layout, the control group can be recombined only by resetting address unit number.

(7) Installation of automatic address setting function

- The address setting method are divided into three types according to wiring method: “Automatic Address Setting,”“Remote controller Address Setting” and “Manual Address Setting,” In case of the Automatic Address Setting, no address needs be set as usual.

(8) Layout free refrigerant piping

- The branch type piping makes the system flexible enough to satisfy any layout plan on the floor or in a room.

(9) Improvement of serviceability

(a) Failures of indoor unit and outdoor units are shown on the liquid crystal display on the remote controller.
- Failures of indoor unit and outdoor units can be checked by remote controller.

(b) Easy checking of outdoor inspection LED.
- The LED can be checked without removing the service panel, and faulty units can be easily indentified out of several units.

1.2 How to read the model name

Example: FDC A 335 H KX E 4

- 4 — Series No.
- E — Application power source...See the specifications
- KX — Multi KX series
- H — Heat pump type
- 335 — Nominal capacity
- A — R410A model
- FDC — Model name
  - Indoor unit : FDT, FDTW, FDTQ, FDTS, FDR, FDQM, FDUM, FDUR, FDE, FDK, FDFL, FDFU
  - Outdoor unit : FDC

1.3 Table of models

Model \ Capacity	22	28	36	45	56	71	90	112	140
Ceiling recessed type (FDT)		○	○	○	○	○	○	○	○
2-way outlet ceiling recessed type (FDTW)		○		○	○	○	○	○	○
Ceiling recessed single air supply port type (FDTQ)	○	○	○						
1-way outlet ceiling recessed type (FDTS)	○	○	○	○		○			
Cassetteria type (FDR)	○	○		○	○	○	○	○	○
Medium static pressure ducted type (FDQM)	○	○	○						
Stellite ducted type (FDUM)			○	○	○	○	○	○	○
Ceiling mounted duct type (FDUR)				○	○	○	○	○	○
Ceiling suspension type (FDE)			○	○	○	○		○	○
Wall mounted type (FDK)	○	○	○	○	○	○			
Floor standing exposed type (FDFL)		○		○		○			
Floor standing hidden type (FDFU)		○		○	○	○			
Outdoor units to be combined FDC	FDCA335HKXE4, 400HKXE4, 450HKXE4								

1.4 Table of indoor units panel (Optional)

Model		Parts Model
FDT	Capacity:28,36,45,56, 71,90,112,140	T-PSA-34W-E
FDTW (Standard type)	Capacity:28,45,56	TW-PSA-22W-E
	Capacity:71,90	TW-PSA-32W-E
	Capacity:112,140	TW-PSA-42W-E
FDTW (Attachment of ceiling material type)	Capacity:28,45,56	TW-PSB-28W-E
	Capacity:71,90	TW-PSB-38W-E
	Capacity:112,140	TW-PSB-48W-E
FDTQ (Direct blow panel)	Capacity:22,28,36	TQ-PSA-13W-E
		TQ-PSB-13W-E
FDTQ (Duct panel)	Capacity:22,28,36	QR-PNA-13W-E
		QR-PNB-13W-E
FDTS	Capacity:22, 28, 36, 45	TS-PSA-27W-E
	Capacity:71	TS-PSA-37W-E
FDR (Silent type)	Capacity:22,28,45,56	R-PNLS-26W-E
	Capacity:71,90	R-PNLS-36W-E
	Capacity:112,140	R-PNLS-46W-E
FDR (Canvas duct type)	Capacity:22,28,45,56	R-PNLC-26W-E
	Capacity:71,90	R-PNLC-36W-E
	Capacity:112,140	R-PNLC-46W-E

2 SELECTION DATA

2.1 Specifications

(1) Indoor unit

(a) Ceiling recessed type (FDT)

Models FDTA28KXE4, 36KXE4

Item \ Models		FDTA28KXE4	FDTA36KXE4
Nominal cooling capacity*1	**W**	**2800**	**3600**
Nominal heating capacity*2	**W**	**3200**	**4000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 35 Me: 33 Lo: 31	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:270 × 840 × 840 Panel:35 × 950 × 950**	
Net weight	**kg**	**Unit:24 Panel:7**	
Refrigerant equipment Heat exchanger		Louver fine & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Turbo fan × 1	
Motor	**W**	**14×1**	
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 15 Me: 14 Lo: 13**	
Fresh air intake		Possible	
Air filter, Q'ty		Long life filter × 1(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4") Gas line: ϕ9.52(3/8")**	**Liquid line: ϕ6.35(1/4") Gas line: ϕ12.7(1/2")**
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas line)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Decorative Panel**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
FDTA28,36 type	T-PSA-34W-E

Models FDTA45KXE4, 56KXE4, 71KXE4

Item \ Models		FDTA45KXE4	FDTA56KXE4	FDTA71KXE4
Nominal cooling capacity*1	**W**	**4500**	**5600**	**7100**
Nominal heating capacity*2	**W**	**5000**	**6300**	**8000**
Power source		**1 Phase 220/240V 50Hz**		
Noise level	dB(A)	Hi: 35 Me: 33 Lo: 31	Hi: 36 Me: 34 Lo: 32	Hi: 37 Me: 35 Lo: 33
Exterior dimensions Height × Width × Depth	**mm**	**Unit:270 × 840 ×840 Panel:35 × 950 × 950**		
Net weight	**kg**	**Unit:24 Panel:7**		
Refrigerant equipment Heat exchanger		Louver fine & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Turbo fan × 1		
Motor	**W**	**14×1**		**20×1**
Starting method		Line starting		
Air flow(Standard)	**CMM**	**Hi: 15 Me: 14 Lo: 13**		
Fresh air intake		Possible		
Air filter, Q'ty		Long life filter × 1(Washable)		
Shock & vibration absorber		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")**		**Liquid line:ϕ 9.52(3/8") Gas line:ϕ15.88(5/8")**
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		**Decorative Panel**		

Notes (1) The data are measured at the following conditions.

Item \ Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
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●Decorative Panel model (Optional)

Model \ Item	Panel Part No.
FDTA45,56,71 type	T-PSA-34W-E

Models FDTA90KXE4, 112KXE4, 140KXE4

Item \ Models		FDTA90KXE4	FDTA112KXE4	FDTA140KXE4
Nominal cooling capacity*1	**W**	**9000**	**11200**	**14000**
Nominal heating capacity*2	**W**	**10000**	**12500**	**16000**
Power source		**1 Phase 220/240V 50Hz**		
Noise level	dB(A)	Hi: 43 Me: 41 Lo: 38	Hi: 43 Me: 41 Lo: 38	Hi: 45 Me: 43 Lo: 41
Exterior dimensions Height × Width × Depth	**mm**	**Unit: 295 × 840 × 840 Panel:35 × 950 × 950**	**Unit: 365 × 840 × 840 Panel:35 × 950 × 950**	
Net weight	**kg**	**Unit:26 Panel:7**	**Unit:31 Panel:7**	
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Turbo fan × 1		
Motor	**W**	**40×1**	**120×1**	
Starting method		Line starting		
Air flow(Standard)	**CMM**	**Hi: 21 Me: 19 Lo: 17**	**Hi: 27 Me: 23 Lo: 20**	**Hi: 29 Me: 26 Lo: 23**
Fresh air intake		Possible		
Air filter, Q'ty		Long life filter × 1(Washable)		
Shock & vibration absorber		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ9.52(3/8") Gas line:ϕ15.88(5/8")**		
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		**Decorative Panel**		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1"UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
FDTA90,112,140 type	T-PSA-34W-E

(b) 2-way outlet ceiling recessed type (FDTW)

Models FDTWA28KXE4, 45KXE4, 56KXE4

Item \ Models		FDTWA28KXE4	FDTWA45KXE4	FDTWA56KXE4
Nominal cooling capacity*1	**W**	**2800**	**4500**	**5600**
Nominal heating capacity*2	**W**	**3200**	**5000**	**6300**
Power source		**1 Phase 220/240V 50Hz**		
Noise level	dB(A)	Hi: 39 Me:36 Lo: 33		
Exterior dimensions Height × Width × Depth	**mm**	**Unit:285× 817×620 Panel:8 ×1055 ×680**		
Net weight	**kg**	**Unit:19 Panel:7**		
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Turbo fan ×1		
Motor	**W**	**30×1**		
Starting method		Line starting		
Air flow(Standard)	**CMM**	**Hi: 14 Me: 12 Lo: 10**		
Fresh air intake		Possible		
Air filter, Q'ty		Long life filter × 1(Washable)		
Shock & vibration absorber		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4") Gas line:φ9.52(3/8")**	**Liquid line:φ6.35(1/4") Gas line:φ12.7(1/2")**	
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		**Decorative Panel**		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.	
	Standard type	Attachment of ceiling material type
FDTWA28,45,56 type	TW-PSA-22W-E	TW-PSB-28W-E

Models FDTWA71KXE4, 90KXE4

Item \ Models		FDTWA71KXE4	FDTWA90KXE4
Nominal cooling capacity*1	**W**	**7100**	**9000**
Nominal heating capacity*2	**W**	**8000**	**10000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 41 Me: 38 Lo: 35	Hi: 41 Me: 39 Lo: 36
Exterior dimensions Height × Width × Depth	**mm**	**Unit:335 ×1054× 620 Panel:8 ×1300 × 680**	
Net weight	**kg**	**Unit:26 Panel:9**	
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Turbo fan × 1	
Motor	**W**	**35×1**	**40×1**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 16 Me: 13 Lo: 11**	**Hi: 19 Me: 16 Lo: 12**
Fresh air intake		Possible	
Air filter, Q'ty		Long life filter × 1(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ9.52(3/8"),Gas line:φ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Decorative Panel**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
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●Decorative Panel model (Optional)

Item / Model	Panel Part No.	
	Standard type	Attachment of ceiling material type
FDTWA71,90 type	TW-PSA-32W-E	TW-PSB-38W-E

Models FDTWA112KXE4, 140KXE4

Item \ Models		FDTWA112KXE4	FDTWA140KXE4
Nominal cooling capacity*1	**W**	**11200**	**14000**
Nominal heating capacity*2	**W**	**12500**	**16000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 44 Me: 41 Lo: 38	Hi: 45 Me: 42 Lo: 39
Exterior dimensions Height × Width × Depth	**mm**	**Unit:357 ×1524 × 620 Panel:8 ×1770 × 680**	
Net weight	**kg**	**Unit:38 Panel:11**	
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Turbo fan ×2	
Motor	**W**	**40 × 2**	**50 × 2**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 28 Me: 25 Lo: 23**	**Hi: 32 Me: 28 Lo: 24**
Fresh air intake		Possible	
Air filter, Q'ty		Long life filter × 2(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ9.52(3/8"),Gas line:φ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas linse)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Decorative Panel**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.	
	Standard type	Attachment of ceiling material type
FDTWA112,140 type	TW-PSA-42W-E	TW-PSB-48W-E

(c) Ceiling recessed single air supply port type (FDTQ)

Model FDTQA22KXE4

Item \ Model		FDTQA22KXE4			
Panel name		**Direct blow panel**		**Duct panel(3)**	
Panel model(Option)		**TQ-PSA-13W-E**	**TQ-PSB-13W-E**	**QR-PNA-13W-E**	**QR-PNB-13W-E**
Nominal cooling capacity*1	**W**	**2200**			
Nominal heating capacity*2	**W**	**2500**			
Power source		**1 Phase, 220/240V 50Hz**			
Noise level	dB(A)	Hi: 38 Lo: 34		Hi: 42 Lo: 39	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**
Net weight	**kg**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan × 1			
Motor	**W**	**20 × 1**			
Starting method		Line starting			
Air flow(Standard)	**CMM**	**Hi: 7 Lo: 5.4**		**Hi: 7 Lo: 6.5**	
Available static pressure(at Hi)	**Pa**	—		**30**	
Fresh air intake		Possible			
Air filter, Q'ty		Long life filter × 1(Washable)			
Shock & vibration absorber		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4"), Gas line: ϕ9.52(3/8")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Decorative Panel**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) This is the panel to be used when modified to the Duct panel type on site. See page 207 for the execution.

Model FDTQA28KXE4

Item \ Model		FDTQA28KXE4			
Panel name		**Direct blow panel**		**Duct panel(3)**	
Panel model(Option)		**TQ-PSA-13W-E**	**TQ-PSB-13W-E**	**QR-PNA-13W-E**	**QR-PNB-13W-E**
Nominal cooling capacity*1	**W**	**2800**			
Nominal heating capacity*2	**W**	**3200**			
Power source		**1 Phase, 220/240V 50Hz**			
Noise level	dB(A)	Hi: 38 Lo: 34		Hi: 42 Lo:39	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**
Net weight	**kg**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**
Refrigerant equipment Heat exchanger		Slit fins & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan ×1			
Motor	**W**	**20 × 1**			
Starting method		Line starting			
Air flow(Standard)	**CMM**	**Hi: 7 Lo: 5.4**		**Hi: 7 Lo: 6.5**	
Available static pressure(at Hi)	**Pa**	—		**30**	
Fresh air intake		Possible			
Air filter, Q'ty		Long life filter × 1(Washable)			
Shock & vibration absorber		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4"), Gas line: ϕ9.52(3/8")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Decorative Panel**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) This is the panel to be used when modified to the Duct panel type on site. See page 207 for the execution.

Model FDTQA36KXE4

Item \ Model		FDTQA36KXE4			
Panel name		**Direct blow panel**		**Duct panel(3)**	
Panel model(Option)		**TQ-PSA-13W-E**	**TQ-PSB-13W-E**	**QR-PNA-13W-E**	**QR-PNB-13W-E**
Nominal cooling capacity*1	**W**	**3600**			
Nominal heating capacity*2	**W**	**4000**			
Power source		**1 Phase, 220/240V 50Hz**			
Noise level	dB(A)	Hi: 38 Lo: 34		Hi: 42 Lo:39	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**	**Unit:250×570×570 Panel:35 ×625 ×650**	**Unit:250×570×570 Panel:35 ×780 ×650**
Net weight	**kg**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**
Refrigerant equipment Heat exchanger		Slit fins & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan ×1			
Motor	**W**	**20× 1**			
Starting method		Line starting			
Air flow(Standard)	**CMM**	**Hi: 7 Lo: 5.4**		**Hi: 7 Lo: 6.5**	
Available static pressure(at Hi)	**Pa**	—		**30**	
Fresh air intake		Possible			
Air filter, Q'ty		Long life filter × 1(Washable)			
Shock & vibration absorber		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4"), Gas line: ϕ12.7(1/2")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Decorative Panel**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) This is the panel to be used when modified to the Duct panel type on site. See page 207 for the execution.

(d) 1-way outlet ceiling recessed type (FDTS)

Models FDTSA22KXE4, 28KXE4, 36KXE4

Item \ Models		FDTSA22KXE4	FDTSA28KXE4	FDTSA36KXE4
Nominal cooling capacity*1	**W**	**2200**	**2800**	**3600**
Nominal heating capacity*2	**W**	**2500**	**3200**	**4000**
Power source		**1 Phase 220/240V 50Hz**		
Noise level	dB(A)	Hi: 39 Lo: 38	Hi: 40 Me: 39 Lo: 38	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:194 × 1040 × 650 Panel:10 × 1290 × 770**		
Net weight	**kg**	**Unit:26 Panel:6**		
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2		
Motor	**W**	**35× 1**		
Starting method		Line starting		
Air flow(Standard)	**CMM**	**Hi: 11 Lo: 8**	**Hi: 12 Me: 11 Lo: 10**	
Fresh air intake		Possible		
Air filter, Q'ty		Long life filter × 1(Washable)		
Shock & vibration absorber		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ9.52(3/8")**		**Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")**
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		**Decorative Panel**		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
JIS B8616"UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
	With Auto Swing
FDTSA22, 28, 36 type	TS-PSA-27W-E

Models FDTSA45KXE4, 71KXE4

Item \ Models		FDTSA45KXE4	FDTSA71KXE4
Nominal cooling capacity*1	**W**	**4500**	**7100**
Nominal heating capacity*2	**W**	**5000**	**8000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 43 Me: 40 Lo: 38	Hi: 44 Me: 40 Lo: 38
Exterior dimensions Height × Width × Depth	**mm**	**Unit:194 × 1040 ×650 Panel:10 × 1290 ×770**	**Unit:194 × 1300 ×650 Panel:10 × 1500 ×790**
Net weight	**kg**	**Unit:26 Panel:6**	**Unit:30 Panel:7**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	Centrifugal fan × 4
Motor	**W**	**40×1**	**25×2**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 14 Me: 12 Lo: 10**	**Hi: 18 Me: 15 Lo: 12**
Fresh air intake		Possible	
Air filter, Q'ty		Long life filter × 1(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")**	**Liquid line:ϕ9.52(3/8") Gas line:ϕ15.88(5/8")**
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Decorative Panel**	

Notes (1) The data are measured at the following conditions.

Item \ Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item \ Model	Panel Part No.
	With Auto Swing
FDTSA45 type	TS-PSA-27W-E
FDTSA71 type	TS-PSA-37W-E

(e) Cassetteria type (FDR)

Models FDRA22KXE4, 28KXE4

Item \ Models		FDRA22KXE4		FDRA28KXE4	
Air inlet panel		**Silent panel**	**Canvas panel**	**Silent panel**	**Canvas panel**
Panel model (Option)		**R-PNLS-26W-E**	**R-PNLC-26W-E**	**R-PNLS-26W-E**	**R-PNLC-26W-E**
Nominal cooling capacity*1	**W**	**2200**		**2800**	
Nominal heating capacity*2	**W**	**2500**		**3200**	
Power source		**1 Phase 220/240V 50Hz**			
Noise level	dB(A)	Hi: 41 Me: 39 Lo: 36	Hi: 42 Me: 40 Lo: 37	Hi: 42 Me: 40 Lo: 37	Hi: 43 Me: 41 Lo: 38
Exterior dimensions Height × Width × Depth	**mm**	**Unit:355 × 750 ×635 Panel:10 × 1040 ×750**	**Unit:(355+α) × 750 ×635 Panel:10 × 864 × 585**	**Unit:355 × 750 ×635 Panel:10 × 1040 ×750**	**Unit:(355+α) × 750 ×635 Panel:10 × 864 × 585**
Net weight	**kg**	**Unit:30 Panel:7**	**Unit:30 Panel:5**	**Unit:30 Panel:7**	**Unit:30 Panel:5**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2			
Motor	**W**	**40×1**		**50×1**	
Starting method		Line starting			
Air flow(Standard)	**CMM**	**Hi: 10 Me: 9 Lo: 8**		**Hi: 12 Me: 11 Lo: 10**	
Available static pressure (at Me)	**Pa**	**Standard:45, Hi speed:85**			
Fresh air intake		Side or back			
Air filter Q'ty		Long life filter × 1(Washable)			
Shock & vibration absorber		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4"),Gas line:φ9.52(3/8")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Silent panel, Canvas panel, Canvas duct**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) Canvas panel is used in combination with following canvas duct
Canvas duct: HA01503

(4) Indoor unit height of canvas specification type is higher than the other type for canvas duct portion.

Models FDRA45KXE4, 56KXE4

Item \ Models		FDRA45KXE4		FDRA56KXE4	
Air inlet panel		**Silent panel**	**Canvas panel**	**Silent panel**	**Canvas panel**
Panel model (Option)		**R-PNLS-26W-E**	**R-PNLC-26W-E**	**R-PNLS-26W-E**	**R-PNLC-26W-E**
Nominal cooling capacity*1	**W**	**4500**		**5600**	
Nominal heating capacity*2	**W**	**5000**		**6300**	
Power source		**1 Phase 220/240V 50Hz**			
Noise level	dB(A)	Hi: 43 Me: 40 Lo: 37	Hi: 44 Me: 41 Lo: 38	Hi:43 Me: 40 Lo: 37	Hi: 44 Me: 41 Lo: 38
Exterior dimensions Height × Width × Depth	**mm**	**Unit:355 × 750 ×635 Panel:10 × 1040 ×750**	**Unit:(355+α) ×750 ×635 Panel:10 × 864 × 585**	**Unit:355 × 750 ×635 Panel:10 × 1040 ×750**	**Unit:(355+α) ×750 ×635 Panel:10 × 864 × 585**
Net weight	**kg**	**Unit:30 Panel:7**	**Unit:30 Panel:5**	**Unit:30 Panel:7**	**Unit:30 Panel:5**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2			
Motor	**W**	**55× 1**			
Starting method		Line starting			
Air flow(Standard)	**CMM**	**Hi: 14 Me: 12 Lo: 11**			
Available static pressure (at Me)	**Pa**	**Standard:50, Hi speed:85**			
Fresh air intake		Side or back			
Air filter Q'ty		Long life filter × 1(Washable)			
Shock & vibration absorber		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4") Gas line:φ12.7(1/2")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Silent panel, Canvas panel, Canvas duct**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) Canvas panel is used in combination with following canvas duct
Canvas duct: HA01503

(4) Indoor unit height of canvas specification type is higher than the other type for canvas duct portion.

Models FDRA71KXE4, 90KXE4

Item \ Models		FDRA71KXE4		FDRA90KXE4	
Air inlet panel		**Silent panel**	**Canvas panel**	**Silent panel**	**Canvas panel**
Panel model (Option)		**R-PNLS-36W-E**	**R-PNLC-36W-E**	**R-PNLS-36W-E**	**R-PNLC-36W-E**
Nominal cooling capacity*1	**W**	**7100**		**9000**	
Nominal heating capacity*2	**W**	**8000**		**10000**	
Power source		**1 Phase 220/240V 50Hz**			
Noise level	dB(A)	Hi: 43 Me: 40 Lo: 37	Hi: 44 Me: 41 Lo: 38	Hi: 43 Me: 40 Lo: 37	Hi: 44 Me: 41 Lo: 38
Exterior dimensions Height × Width × Depth	**mm**	**Unit:355 × 950 ×635 Panel:10 × 1240 ×750**	**Unit:(355+α) ×950 ×635 Panel:10 × 1064 × 585**	**Unit:355 × 950 ×635 Panel:10 × 1240 ×750**	**Unit:(355+α) ×950 ×635 Panel:10 × 1064 × 585**
Net weight	**kg**	**Unit:35 Panel:8**	**Unit:35 Panel:6**	**Unit:35 Panel:8**	**Unit:35 Panel:6**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2			
Motor	**W**	**90 × 1**		**100 × 1**	
Starting method		Line starting			
Air flow(Standard)	**CMM**	**Hi: 18 Me: 16 Lo: 14**		**Hi: 20 Me: 18 Lo: 15**	
Available static pressure (at Me)	**Pa**	**Standard:45, Hi speed:80**			
Fresh air intake		Side or back			
Air filter Q'ty		Long life filter × 1(Washable)			
Shock & vibration absorber		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ9.52(3/8"),Gas line:φ15.88(5/8")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Silent panel, Canvas panel, Canvas duct**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) Canvas panel is used in combination with following canvas duct
Canvas duct: HA01490

(4) Indoor unit height of canvas specification type is higher than the other type for canvas duct portion.

Models FDRA112KXE4, 140KXE4

Item \ Models		FDRA112KXE4		FDRA140KXE4	
Air inlet panel		**Silent panel**	**Canvas panel**	**Silent panel**	**Canvas panel**
Panel model (Option)		**R-PNLS-46W-E**	**R-PNLC-46W-E**	**R-PNLS-46W-E**	**R-PNLC-46W-E**
Nominal cooling capacity*1	**W**	**11200**		**14000**	
Nominal heating capacity*2	**W**	**12500**		**16000**	
Power source		**1 Phase 220/240V 50Hz**			
Noise level	dB(A)	Hi: 45 Me: 42 Lo: 38	Hi: 46 Me: 43 Lo: 39	Hi: 46 Me: 43 Lo: 39	Hi: 47 Me: 44 Lo: 40
Exterior dimensions Height × Width × Depth	**mm**	**Unit:406 × 1370 × 635 Panel:10 × 1660 × 750**	**Unit:(406+α) × 1370 × 635 Panel:10 × 1484 × 585**	**Unit:406 × 1370 × 635 Panel:10 × 1660 × 750**	**Unit:(406+α) × 1370 × 635 Panel:10 × 1484 × 585**
Net weight	**kg**	**Unit:52 Panel:9**	**Unit:52 Panel:7**	**Unit:52 Panel:9**	**Unit:52 Panel:7**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan × 3			
Motor	**W**	**45 × 1, 90 × 1**		**50 × 1, 100 × 1**	
Starting method		Line starting			
Air flow(Standard)	**CMM**	**Hi: 28 Me: 25 Lo: 22**		**Hi: 34 Me: 31 Lo: 27**	
Available static pressure (at Me)	**Pa**	**Standard:50, Hi speed:80**			
Fresh air intake		Side or back			
Air filter Q'ty		Long life filter × 2(Washable)			
Shock & vibration absorber		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ9.52(3/8"),Gas line:φ15.88(5/8")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Silent panel, Canvas panel, Canvas duct**			

Notes (1) The data are measured at the following conditions.

Item \ Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) Canvas panel is used in combination with following canvas duct
Canvas duct: HA01484

(4) Indoor unit height of canvas specification type is higher than the other type for canvas duct portion.

(f) Medium static pressure ducted type (FDQM)

Models FDQMA22KXE4, 28KXE4, 36KXE4

Item \ Models		FDQMA22KXE4	FDQMA28KXE4	FDQMA36KXE4
Nominal cooling capacity*1	**W**	**2200**	**2800**	**3600**
Nominal heating capacity*2	**W**	**2500**	**3200**	**4000**
Power source		**1 Phase 220/240V 50Hz**		
Noise level	dB(A)	Hi: 34 Lo: 31		
Exterior dimensions Height × Width × Depth	**mm**	**257 × 570 × 570**		
Net weight	**kg**	**21**		
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	Slit fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 1		
Motor	**W**	**20×1**		
Starting method		Line starting		
Air flow(Standard)	**CMM**	**Hi: 7 Lo: 6.5**		
Available static pressure (at Me)	**Pa**	**30**		
Fresh air intake		Side		
Air filter, Q'ty		–		
Shock & vibration absorber		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4") Gas line: ϕ9.52(3/8")**		**Liquid line: ϕ6.35(1/4") Gas line: ϕ12.7(1/2")**
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(g) Satellite ducted type (FDUM)

Models FDUMA36KXE4, 45KXE4, 56KXE4

Item \ Models		FDUMA36KXE4	FDUMA45KXE4	FDUMA56KXE4
Nominal cooling capacity*1	**W**	**3600**	**4500**	**5600**
Nominal heating capacity*2	**W**	**4000**	**5000**	**6300**
Power source		**1 Phase 220/240V 50Hz**		
Noise level	dB(A)	Hi: 34 Me: 32 Lo: 29	Hi: 35 Me: 32 Lo: 29	
Exterior dimensions Height × Width × Depth	**mm**	**299 × 750 × 635**		
Net weight	**kg**	**34**		
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2		
Motor	**W**	**50× 1**	**55× 1**	
Starting method		Line starting		
Air flow(Standard)	**CMM**	**Hi: 12 Me: 11 Lo: 10**	**Hi: 14 Me: 12 Lo: 11**	
Available static pressure (at Me)	**Pa**	**Standard:50, Hi speed:85**		
Fresh air intake		Side		
Air filter, Q'ty		–		
Shock & vibration absorber		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4"),Gas line:φ12.7(1/2")**		
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDUMA71KXE4, 90KXE4

Item \ Models		FDUMA71KXE4	FDUMA90KXE4
Nominal cooling capacity*1	**W**	**7100**	**9000**
Nominal heating capacity*2	**W**	**8000**	**10000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 35 Me: 32 Lo: 29	Hi: 36 Me: 33 Lo: 30
Exterior dimensions Height × Width × Depth	**mm**	**299 × 950 × 635**	
Net weight	**kg**	**40**	
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	
Motor	**W**	**90×1**	**100×1**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 18 Me: 16 Lo: 14**	**Hi: 20 Me: 18 Lo: 15**
Available static pressure (at Me)	**Pa**	**Standard:50, Hi speed:85**	
Fresh air intake		Side	
Air filter, Q'ty		–	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ9.52(3/8"),Gas line:ϕ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDUMA112KXE4, 140KXE4

Item \ Models		FDUMA112KXE4	FDUMA140KXE4
Nominal cooling capacity*1	**W**	**11200**	**14000**
Nominal heating capacity*2	**W**	**12500**	**16000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 38 Me: 35 Lo: 32	Hi: 39 Me: 37 Lo: 34
Exterior dimensions Height × Width × Depth	**mm**	**350 × 1370 × 635**	
Net weight	**kg**	**59**	**59**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 3	
Motor	**W**	**45 × 1, 90 × 1**	**50 × 1, 100 × 1**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 28 Me: 25 Lo: 22**	**Hi: 34 Me: 31 Lo: 27**
Available static pressure (at Me)	**Pa**	**Standard:60, Hi speed:90**	**Standard:60, Hi speed:85**
Fresh air intake		Side	
Air filter, Q'ty		–	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RCD-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ9.52(3/8"),Gas line:φ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(h) Ceiling mounted duct type (FDUR)

Models FDURA45KXE4, 56KXE4

Item \ Models		FDURA45KXE4	FDURA56KXE4
Nominal cooling capacity*1	**W**	**4500**	**5600**
Nominal heating capacity*2	**W**	**5000**	**6300**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 40 Lo: 36	Hi: 41 Lo: 37
Exterior dimensions Height × Width × Depth	**mm**	**295 × 850 × 650**	
Net weight	**kg**	**39**	**39**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion valve	
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 2	
Motor	**W**	**90 × 1**	**130 × 1**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 17 Lo: 13.5**	**Hi: 21 Lo: 17**
Available static pressure	**Pa**	**Standard:50, Max:85**	
Fresh air intake		—	
Air filter Q'ty		Polypropylene net × 1(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35 (1/4")** **Gas line: ϕ12.7 (1/2")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Silent panel, Duct joint**	

Notes (1)The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2)This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1"UNITARY AIR-CONDITIONERS"

●Silent Panel model (Optional)

Item / Model	Panel Part No.	Color
FDURA45, 56KXE4	UR-PS-27W-E	Ceramic white

●Duct Joint (For flexibleduct) [Optional]

Item / Model	Part No.
FDURA45, 56KXE4	UR-DJ-21-E

Models FDURA71KXE4, 90KXE4

Item \ Models		FDURA71KXE4	FDURA90KXE4
Nominal cooling capacity*1	**W**	**7100**	**9000**
Nominal heating capacity*2	**W**	**8000**	**10000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 41 Lo: 37	Hi: 42 Lo: 37
Exterior dimensions Height × Width × Depth	**mm**	**295 × 850 × 650**	**350 × 1370 × 650**
Net weight	**kg**	**40**	**63**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion valve	
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 2	
Motor	**W**	**230 × 1**	**280 × 1**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 25 Lo: 18.5**	**Hi: 34 Lo: 27**
Available static pressure	**Pa**	**Standard:50, Max:130**	
Fresh air intake		—	
Air filter Q'ty		Polypropylene net × 1(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ9.52 (3/8") Gas line: ϕ15.88 (5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Silent panel, Duct Joint**	

Notes (1)The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2)This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1"UNITARY AIR-CONDITIONERS"

●Silent Panel model (Optional)

Model \ Item	Panel Part No.	Color
FDURA71KXE4	UR-PS-27W-E	Ceramic white
FDURA90KXE4	UR-PS-47W-E	

●Duct Joint (For flexibleduct) [Optional]

Model \ Item	Part No.
FDURA71KXE4	UR-DJ-21-E
FDURA90KXE4	UR-DJ-41-E

Models FDURA112KXE4, 140KXE4

Item \ Models		FDURA112KXE4	FDURA140KXE4
Nominal cooling capacity*1	**W**	**11200**	**14000**
Nominal heating capacity*2	**W**	**12500**	**16000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 42 Lo: 38	Hi: 43 Lo: 39
Exterior dimensions Height × Width × Depth	**mm**	**350 × 1370 × 650**	
Net weight	**kg**	**63**	**65**
Refrigerant equipment Heat exchanger		Louver fine & inner grooved tubing	
Refrigerant control		Electronic Expansion valve	
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 2	
Motor	**W**	**280×1**	**460×1**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 34 Lo: 27**	**Hi: 42 Lo: 33.5**
Available static pressure	**Pa**	**Standard: 50, Max: 130**	
Fresh air intake		—	
Air filter, Q'ty		Polypropylene net × 1(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ9.52 (3/8") Gas line:ϕ15.88 (5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Silent panel, Duct joint**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1"UNITARY AIR-CONDITIONERS"

●Silent Panel model (Optional)

Item / Model	Panel Part No.	Color
FDURA112, 140KXE4	UR-PS-47W-E	Ceramic white

●Duct Joint (For flexibleduct) [Optional]

Item / Model	Part No.
FDURA112, 140KXE4	UR-DJ-41-E

(i) Ceiling suspension type (FDE)

Models FDEA36KXE4, 45KXE4

Item \ Models		FDEA36KXE4	FDEA45KXE4
Nominal cooling capacity*1	**W**	**3600**	**4500**
Nominal heating capacity*2	**W**	**4000**	**5000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 39 Me: 38 Lo: 36	
Exterior dimensions Height × Width × Depth	**mm**	**210 ×1070 × 690**	
Net weight	**kg**	**30**	
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	
Motor	**W**	**25×1**	
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 11 Me: 9 Lo: 7**	
Fresh air intake		Not possible	
Air filter, Q'ty		Polypropylene net × 2(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4"), Gas line:φ12.7(1/2")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP20	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDEA56KXE4, 71KXE4

Item \ Models		FDEA56KXE4	FDEA71KXE4
Nominal cooling capacity*1	**W**	**5600**	**7100**
Nominal heating capacity*2	**W**	**6300**	**8000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 39 Me: 38 Lo: 36	Hi: 41 Me: 39 Lo: 37
Exterior dimensions Height × Width × Depth	**mm**	**210 × 1070 × 690**	**210 × 1320 × 690**
Net weight	**kg**	**30**	**36**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	Centrifugal fan × 4
Motor	**W**	**25×1**	**25×2**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 11 Me: 9 Lo: 7**	**Hi: 18 Me: 14 Lo: 12**
Fresh air intake		Not possible	
Air filter, Q'ty		Polypropylene net × 2(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4"), Gas line:φ12.7(1/2")**	**Liquid line:φ9.52(3/8"), Gas line:φ15.88(5/8")**
Connecting method		**Flare piping**	
Drain hose		Connectable with VP20	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDEA112KXE4, 140KXE4

Item \ Models		FDEA112KXE4	FDEA140KXE4
Nominal cooling capacity*1	**W**	**11200**	**14000**
Nominal heating capacity*2	**W**	**12500**	**16000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 44 Me: 41 Lo: 39	Hi: 46 Me: 44 Lo: 43
Exterior dimensions Height × Width × Depth	**mm**	**250 × 1620 × 690**	
Net weight	**kg**	**46**	
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 4	
Motor	**W**	**30×2**	**38×2**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 26 Me: 23 Lo: 21**	**Hi: 29 Me: 26 Lo: 23**
Fresh air intake		Not possible	
Air filter, Q'ty		Polypropylene net × 2(Washable)	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ9.52(3/8"), Gas line:ϕ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP20	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(j) Wall mounted type (FDK)

Models FDKA22KXE4, 28KXE4, 36KXE4, 45KXE4

Item \ Models		FDKA22KXE4	FDKA28KXE4	FDKA36KXE4	FDKA45KXE4
Nominal cooling capacity*1	**W**	**2200**	**2800**	**3600**	**4500**
Nominal heating capacity*2	**W**	**2500**	**3200**	**4000**	**5000**
Power source		**1 Phase 220/240V 50Hz**			
Noise level	dB(A)	Hi: 40 Me: 36 Lo: 32		Hi: 41 Me: 37 Lo: 33	Hi: 41 Me: 37 Lo: 32
Exterior dimensions Height × Width × Depth	**mm**	**298 × 840 × 240**			
Net weight	**kg**	**12**			**12.5**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Tangential fan ×1			
Motor	**W**	**33×1**			
Starting method		Line starting			
Air flow(Standard)	**CMM**	**Hi: 8 Me: 7 Lo: 6**		**Hi: 10 Me: 9 Lo: 7**	**Hi: 11 Me: 9 Lo: 7**
Fresh air intake		Not possible			
Air filter, Q'ty		Polypropylene net × 2(Washable)			
Shock & vibration absorber		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:Φ6.35(1/4") Gas line:Φ9.52(3/8")**		**Liquid line:Φ6.35(1/4") Gas line:Φ12.7(1/2")**	
Connecting method		**Flare piping**			
Drain hose		Connectable with I.D. 16mm			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDKA56KXE4, 71KXE4

Item \ Models		FDKA56KXE4	FDKA71KXE4
Nominal cooling capacity*1	**W**	**5600**	**7100**
Nominal heating capacity*2	**W**	**6300**	**8000**
Power source		**1 Phase 220/240V 50Hz**	
Noise level	dB(A)	Hi: 46 Me: 43 Lo: 39	Hi: 47 Me: 44 Lo: 40
Exterior dimensions Height × Width × Depth	**mm**	**298×840× 240**	**375 × 1436 × 194**
Net weight	**kg**	**13**	**22**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Tangential fan ×1	Tangential fan ×2
Motor	**W**	**33×1**	**45×1**
Starting method		Line starting	
Air flow(Standard)	**CMM**	**Hi: 14 Me: 12 Lo: 10**	**Hi: 21 Me: 18 Lo: 15**
Fresh air intake		Not possible	
Air filter, Q'ty		Polypropylene net × 2(Washable)	Polypropylene net × 3(Washable)
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")**	**Liquid line:ϕ9.52(3/8") Gas line:ϕ15.88(5/8")**
Connecting method		**Flare piping**	
Drain hose		Connectable with I.D. 16mm	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(k) Floor standing exposed type (FDFL)

Models FDFLA28KXE4, 45KXE4, 71KXE4

Item \ Models		FDFLA28KXE4	FDFLA45KXE4	FDFLA71KXE4
Nominal cooling capacity*1	**W**	**2800**	**4500**	**7100**
Nominal heating capacity*2	**W**	**3200**	**5000**	**8000**
Power source		**1 Phase 220/240V 50Hz**		
Noise level	dB(A)	Hi: 41 Me:38 Lo: 36	Hi: 43 Me:41 Lo: 40	
Exterior dimensions Height × Width × Depth	**mm**	**630 × 1196 × 225**		**630 × 1481 × 225**
Net weight	**kg**	**32**		**40**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2		
Motor	**W**	**30×1**	**40×1**	
Starting method		Line starting		
Air flow(Standard)	**CMM**	**Hi: 12 Me: 11 Lo: 10**	**Hi: 14 Me: 12 Lo: 10**	**Hi: 18 Me: 15 Lo: 12**
Fresh air intake		Not possible		
Air filter, Q'ty		Polypropylene net × 2(Washable)		
Shock & vibration absorber		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ 6.35(1/4") Gas line:φ9.52(3/8")**	**Liquid line:φ 6.35(1/4") Gas line:φ12.7(1/2")**	**Liquid line:φ9.52(3/8") Gas line:φ15.88(5/8")**
Connecting method		**Flare piping**		
Drain hose		Connectable with PT20A		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(I) Floor standing hidden type (FDFU)

Models FDFUA28KXE4, 45KXE4, 56KXE4, 71KXE4

Item \ Models		FDFUA28KXE4	FDFUA45KXE4	FDFUA56KXE4	FDFUA71KXE4
Nominal cooling capacity*1	**W**	**2800**	**4500**	**5600**	**7100**
Nominal heating capacity*2	**W**	**3200**	**5000**	**6300**	**8000**
Power source		**1 Phase 220/240V 50Hz**			
Noise level	dB(A)	Hi: 41 Me:38 Lo: 36	Hi: 43 Me:41 Lo: 40		
Exterior dimensions Height × Width × Depth	**mm**	**630 × 1077 × 225**			**630 × 1362 × 225**
Net weight	**kg**	**25**			**32**
Refrigerant equipment Heat exchanger		Louver fins & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2			
Motor	**W**	**30×1**	**40×1**		
Starting method		Line starting			
Air flow(Standard)	**CMM**	**Hi: 12 Me: 11 Lo: 10**	**Hi: 14 Me: 12 Lo: 10**		**Hi: 18 Me: 15 Lo: 12**
Fresh air intake		Not possible			
Air filter, Q'ty		Polypropylene net × 2(Washable)			
Shock & vibration absorber		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Remote control switch (Optional:RC-E1)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ9.52(3/8")**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")**		**Liquid line:ϕ9.52(3/8") Gas line:ϕ15.88(5/8")**
Connecting method		**Flare piping**			
Drain hose		Connectable with PT20A			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional 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*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(2) Outdoor unit

Models FDCA335HKXE4, 400HKXE4, 450HKXE4

Item \ Models		FDCA335HKXE4	FDCA400HKXE4	FDCA450HKXE4
Power source		**3 Phase 380/415V**		
Nominal cooling capacity*1	**W**	**33500**	**40000**	**45000**
Nominal heating capacity*2	**W**	**37500**	**45000**	**50000**
Noise level	dB(A)	Cooling: 60.5, Heating: 61	Cooling: 58.5, Heating: 59	Cooling: 61, Heating: 61
Exterior dimensions Height × Width × Depth	**mm**	**1690 × 1350 × 720**		
Net weight	**kg**	**290**		
Refrigerant equipment compressor type & Q' ty		GT-C5150ND71 × 1	GT-C5150ND78 × 2	
Motor	**kW**	**8.4**	**4.8 + 4.8**	**5.6 + 5.6**
Starting method		Direct start		
Capacity control	%	19 ~ 117	15 ~ 114	13 ~ 112
Crankcase heater	**W**	**33 × 1**	**33 × 2**	
Heat exchanger		Louver fines & inner grooved tubing		
Refrigerant control		Electronic expansion valve		
Refrigerant		**R410A**		
Quantity	**kg**	**14.2**	**17**	
Refrigerant oil	ℓ	2.1 (MA32R)	3.7 (MA32R)	
Defrost control		MC controlled De-Icer		
Air handling equipment Fan type & Q'ty		Propeller fan × 2		
Motor	**W**	**386 × 2**		
Starting method		Direct start		
Air flow(Standard)	**CMM**	**Cooling: 280, Heating: 260**	**Cooling: 250, Heating: 220**	**Cooling: 260, Heating: 240**
Shock & vibration absorber		Rubber mount (for compressor)		
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ12.7(1/2") Gas line: ϕ25.4(1")**		**Liquid line: ϕ12.7(1/2") Gas line: ϕ28.58(11/8")**
Connecting method		Gas line:Brazing, Liquid line:Flare		
Drain		**Hole for drain (ϕ 20 × 5pcs, ϕ45 × 3pcs)**		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		–		
Indoor units to be combined		**FDTA28, 36, 45, 56, 71, 90, 112, 140 FDTWA28, 45, 56, 71, 90, 112, 140 FDTQA22, 28, 36 FDTSA22, 28, 36, 45, 71 FDRA22, 28, 45, 56, 71, 90, 112, 140 FDQMA22, 28, 36 FDUMA36, 45, 56, 71, 90, 112, 140**	**FDURA45, 56, 71, 90, 112, 140 FDEA36, 45, 56, 71, 112, 140 FDKA22, 28, 36, 45, 56, 71 FDFLA28, 45, 71 FDFUA28, 45, 56, 71**	

Notes (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.

(2) The refrigerant quantity in the connecting pipe is not included Charge it additionally at the site.

List of Branch Pipe Part Numbers (Select parts in accordance with the branching system used.)

Corresponding Outdoor Unit	Number of Indoor Units that can be Connected	Branching System	
		Branch Pipe System(1) (Total Capacity after each Branch)	Header System
FDCA335HKXE4	1~20 units	• Downstream Capacity less than 180 DIS-22-1 • Downstream Capacity 180 to less than 371 DIS-180-1	• Connection Capacity less than 180 HEAD4-22-1 (for up to 4 units max) • Connection Capacity 180 to less than 371 HEAD6-180-1 (up to 6 units max)
FDCA400HKXE4	1~23 units		
FDCA450HKXE4	1~26 units	• Downstream Capacity 371 to less than 540 DIS-371-1 • Downstream Capacity 540 or more DIS-540-1	• Connection Capacity 371 to less than 540 HEAD8-371-1 (up to 8 units max) • Connection Capacity 540 or more HEAD8-540-1 (up to 8 units max)

Note (1) In the branch piping method, the way branch piping is run needs to be in accordance with the total downstream capacity of the indoor units.

(3) Operation chart

Since the Multi KX series air conditioner units are free multitype to which the indoor units of different capacity and different model can be combined, the operation characteristics of all combinations are very complicated, therefore only the individual operation characteristics of indoor and outdoor units are shown. For the combined operation characteristics, calculate them with the method shown in the next page.

(a) Operating characteristic of outdoor unit

(380 V/415 V)

Item \ Models		FDCA335HKXE4	FDCA400HKXE4	FDCA450HKXE4
Cooling input	kW	9.53/9.53	11.27/11.27	12.97/12.97
Heating input		9.84/9.84	11.73/11.73	13.10/13.10
Cooling running current	A	15.5/14.2	18.4/16.9	21.1/19.3
Heating running current		16.3/14.9	19.6/17.9	21.7/19.9
Inrush current (MAX.)	A	5	8	
Cooling power factor	%	93/93	93/93	93/93
Heating power factor		92/92	91/91	92/92

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

FDT Series

(220 V/240 V)

Item \ Models	FDT Series							
	28	36	45	56	71	90	112	140
Power input (kW)	Cooling : 0.05/0.05 Heating : 0.04/0.05		0.05/0.05		0.06/0.07	0.10/0.11	0.20/0.24	0.23/0.27
Running current (A)	0.23/0.21				0.32/0.30	0.46/0.46	0.90/0.98	1.03/1.13

FDTW Series

(220 V/240 V)

Item \ Models	FDTW Series						
	28	45	56	71	90	112	140
Power input (kW)	0.09/0.10			0.10/0.11	0.12/0.13	0.18/0.20	0.20/0.24
Running current (A)	0.43/0.44			0.48/0.50	0.57/0.59	0.86/0.89	0.90/0.98

FDTQ Series

(220 V/240 V)

Item \ Models	FDTQ Series(Direct blow panel)			FDTQ Series(Duct panel)		
	22	28	36	22	28	36
Power input (kW)	0.045/0.050			0.050/0.055		
Running current (A)	0.21/0.22			0.23/0.24		

FDTS Series

(220 V/240 V)

Item \ Models	FDTS Series				
	22	28	36	45	71
Power input (kW)	0.07/0.08			0.09/0.11	0.12/0.15
Running current (A)	0.33/0.36			0.43/0.46	0.58/0.63

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.

FDR Series (220 V/240 V)

Item \ Models	FDR Series							
	22	28	45	56	71	90	112	140
Power input (kW)	0.09/0.11	0.11/0.13	0.14/0.16		0.15/0.17	0.16/0.19	0.24/0.28	0.28/0.32
Running current (A)	0.41/0.46	0.51/0.56	0.63/0.67		0.68/0.71	0.73/0.79	1.07/1.17	1.28/1.32

FDQM, FDUM Series (220 V/240 V)

Item \ Models	FDQM Series			FDUM Series					
	22	28	36	36	45, 56	71	90	112	140
Power input (kW)	0.050/0.055			0.11/0.13	0.14/0.16	0.15/0.17	0.16/0.19	0.24/0.28	0.28/0.32
Running current (A)	0.23/0.24			0.51/0.56	0.63/0.67	0.68/0.71	0.73/0.79	1.07/1.17	1.28/1.32

FDE Series (220 V/240 V)

Item \ Models	FDE Series					
	36	45	56	71	112	140
Power input (kW)	0.07/0.08			0.09/0.10	0.14/0.15	0.16/0.17
Running current (A)	0.3/0.3			0.4/0.4	0.6/0.6	0.7/0.7

FDK, FDFL, FDFU Series (220 V/240 V)

Item \ Models	FDK Series						FDFL, FDFU Series		
	22	28	36	45	56	71	28	45, 56	71
Power input (kW)	Cooling : 0.05/0.05 Heating : 0.04/0.05			0.05/0.05		0.09/0.11	0.09/0.10	0.09/0.10	0.09/0.10
Running current (A)	0.23/0.21			0.23/0.21		0.41/0.48	0.41/0.42	0.40/0.41	0.40/0.41

FDUR Series (220 V/240 V)

Item \ Models	FDUR Series					
	45	56	71	90	112	140
Power input (kW)	0.15/0.17	0.21/0.24	0.23/0.26	0.34/0.40		0.39/0.45
Running current (A)	0.69/0.73	0.95/1.01	1.05/1.11	1.55/1.64		1.79/1.90

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 series Multi-KX depend on combination of indoor unit, calculate the total operation characteristics of the system by using the formulas below according to specifications of each indoor unit or outdoor unit.

1) Total power input

Total power input (kW) = Power input of outdoor unit + $\sum$ (Power input of indoor unit)

2) Total running current

Total running current (A) = Running current of outdoor unit + [$\sum$ (Running current of indoor unit) $\times$ 2/3]

3) Total power factor

Total power factor (%) = [Total power input (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: 220 V, 50 Hz
Outdoor unit: 380 V, 50 Hz
Operation mode ····· Cooling and Heating
Unit····· Outdoor unit: FDCA335HKXE4 × 1 unit
Indoor unit: FDTA71KXE4 × 3 units
FDTA45KXE4 × 3 units

Operation characteristics of each unit (Cooling/Heating)

Item \ Models	FDCA335HKXE4	FDTA71KXE4	FDTA45KXE4
Power input (kW)	9.53/9.84	0.06/0.06	0.05/0.05
Running current (A)	15.5/16.3	0.32/0.32	0.23/0.23

① Total power input (kW)

(Cooling) $9.53 + (0.06 \times 3 + 0.05 \times 3) = 9.86$ (kW)

(Heating) $9.84 + (0.06 \times 3 + 0.05 \times 3) = 10.17$ (kW)

② Total running current (A)

(Cooling) $15.5 + (0.32 \times 3 + 0.23 \times 3) \times \frac{2}{3} \fallingdotseq 16.6$ (A)

(Heating) $16.3 + (0.32 \times 3 + 0.23 \times 3) \times \frac{2}{3} \fallingdotseq 17.4$(A)

③ Total power factor (%)

(Cooling) $\frac{9.86 \times 1000}{\sqrt{3} \times 16.6 \times 380} \times 100 \fallingdotseq 90$ %

(Heating) $\frac{10.17 \times 1000}{\sqrt{3} \times 17.4 \times 380} \times 100 \fallingdotseq 89$ %

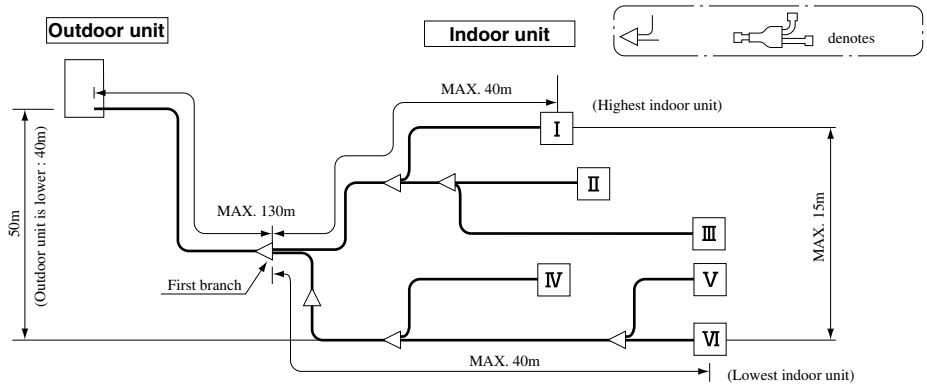
4) See page 80 concerning the power consumption compensation coefficient.

2.2 Range of usage & limitations

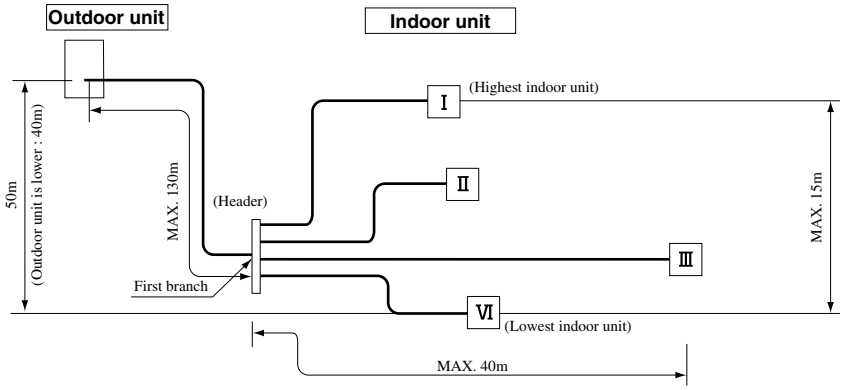
Item \ System		FDCA335HKXE4	FDCA400HKXE4	FDCA450HKXE4
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (See page 80)		
Outdoor air temperature (Upper, lower limits)				
Indoor units that can be used in combination	Number of connected units	1 to 20 units	1 to 23 units	1 to 26 units
	Total capacity	167 ~ 436	200 ~ 520	225 ~ 585
Total piping length		MAX. 510m		
Single direction piping lenght		Indoor unit MAX. 160m		
Outdoor unit to first branching (main piping)		Max. 130m		
Piping length after the first branching		Max. 40m		
Difference in height between indoor and outdoor units	When above outdoor unit	MAX. 50m		
	When below outdoor unit	MAX. 40m		
Difference in height between indoor units		MAX. 15m		
Indoor unit atmosphere (behind ceiling) temperature and humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less		
Compressor stop/start frequency	1 cycle time	6 min or more(from stop to stop or from start to start)		
	Stop time	3 min or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop during start	Within ±15% of rated voltage		
	Interval unbalance	Within ± 3% of rated voltage		

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

(1) Branch pipe method (using brancn PiPe)



(2) Header System (Header used)



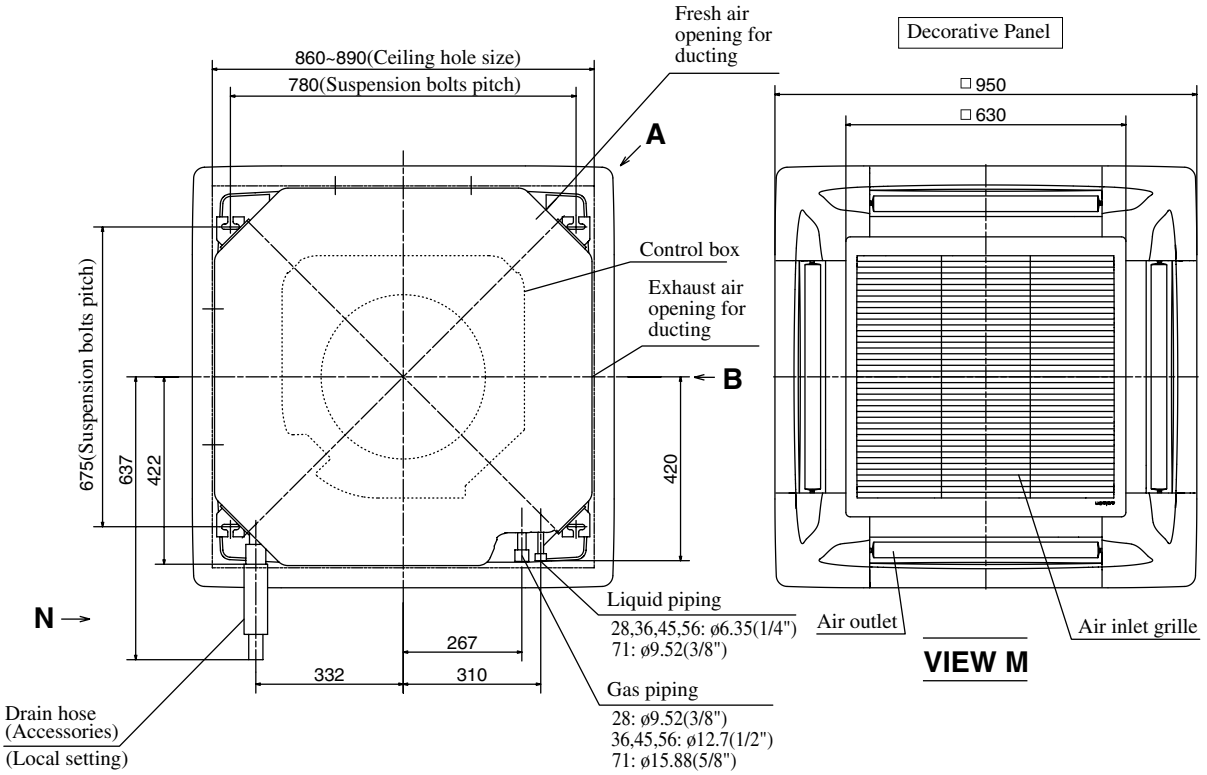
2.3 Exterior dimensions

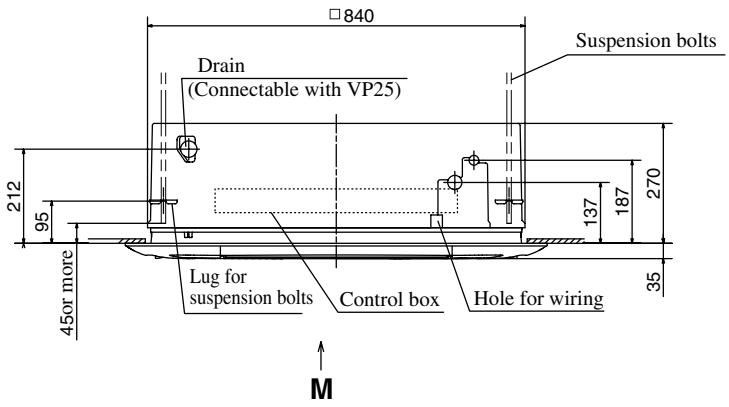
(1) Indoor unit

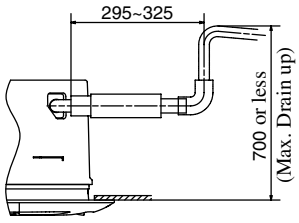
(a) Ceiling recessed type (FDT)

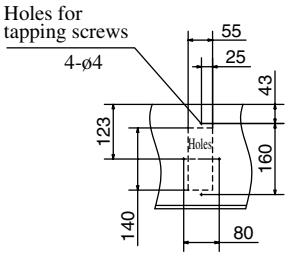
Models FDTA28KXE4, 36KXE4, 45KXE4, 56KXE4, 71KXE4

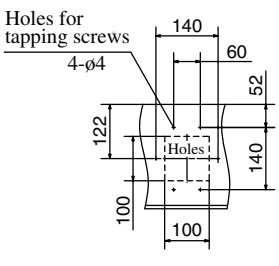
unit : mm

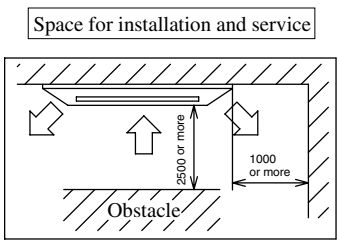






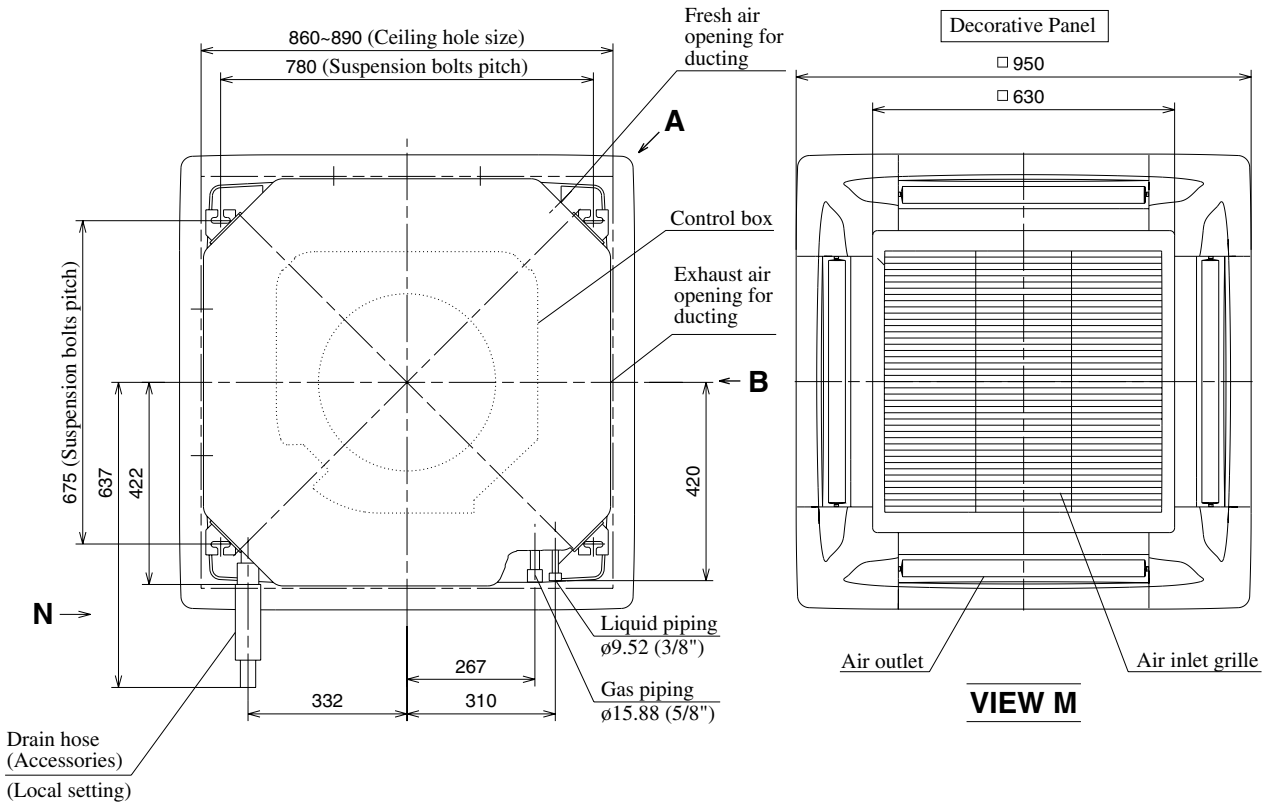


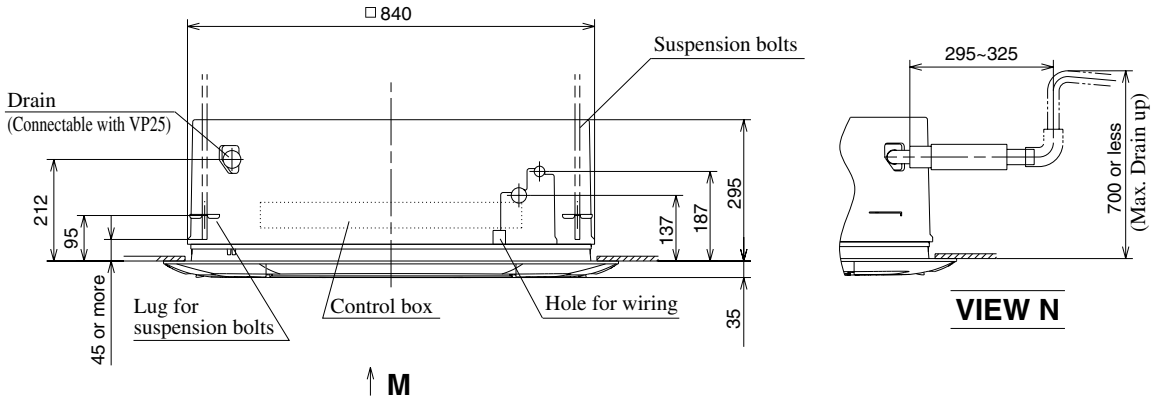


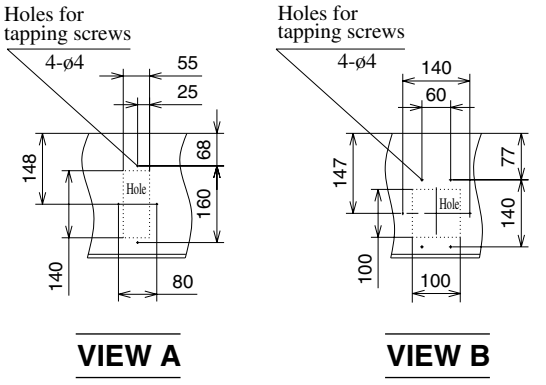


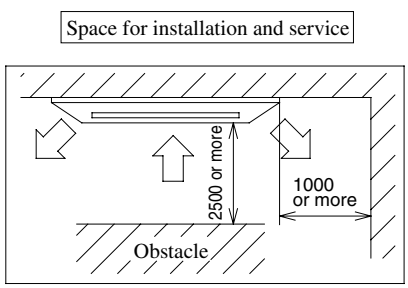
Model FDTA90KXE4

unit : mm



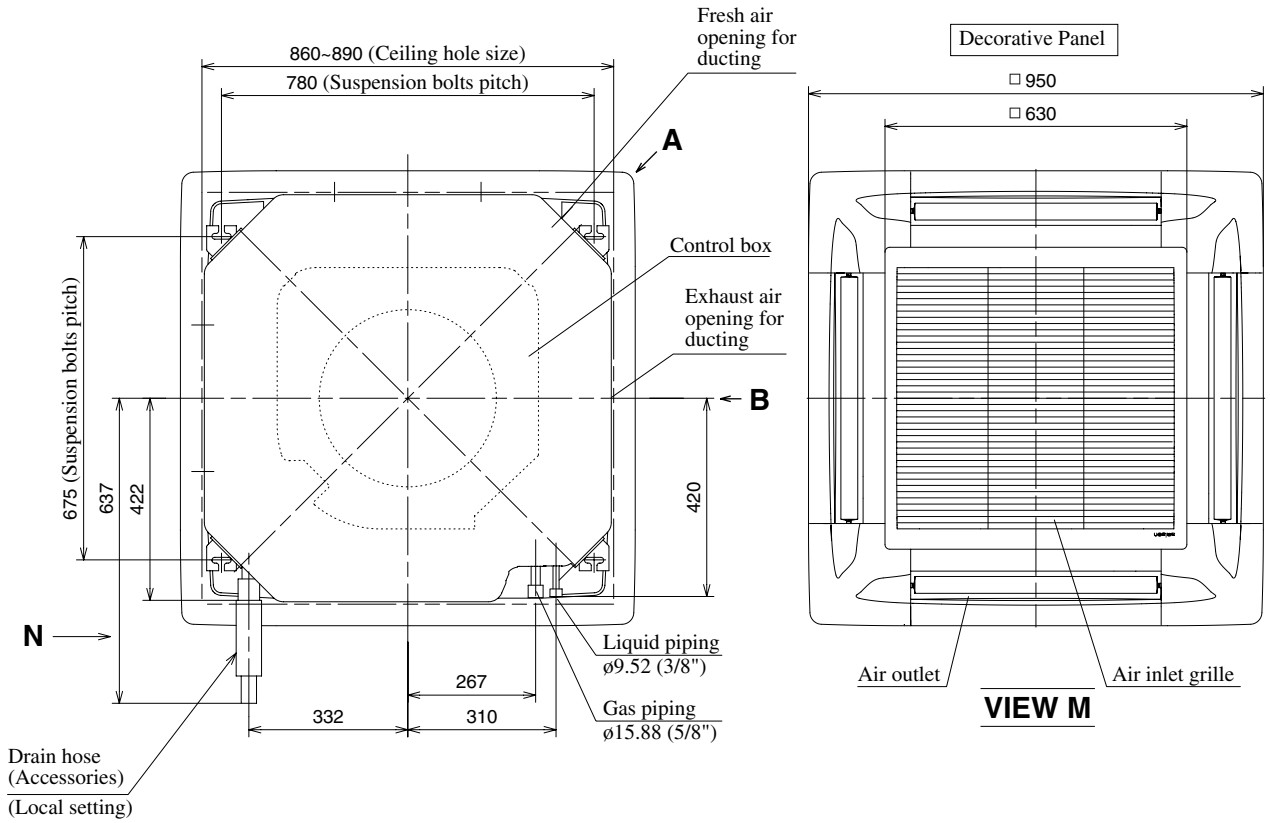


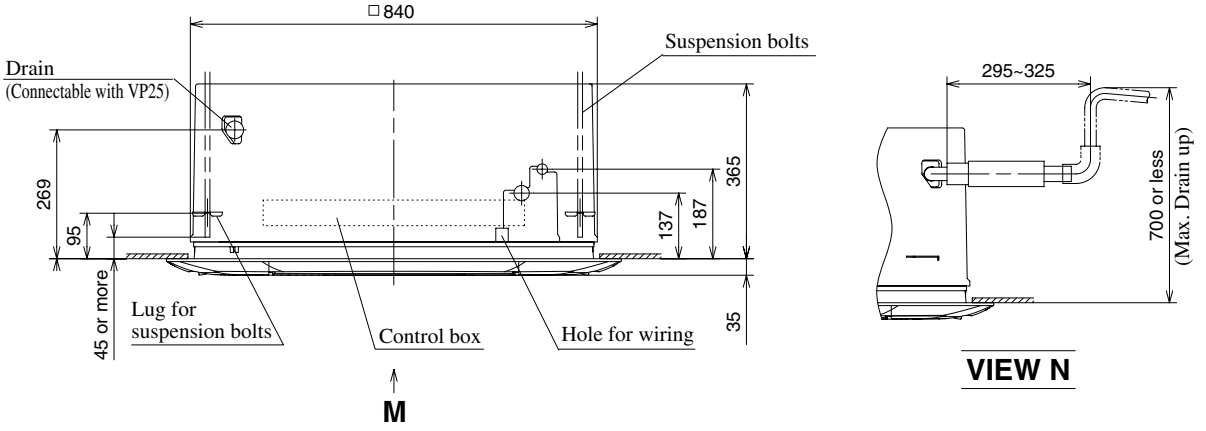


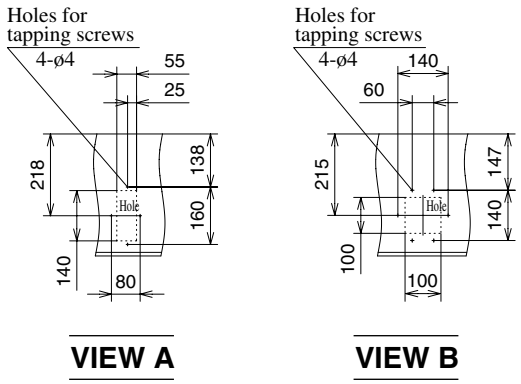


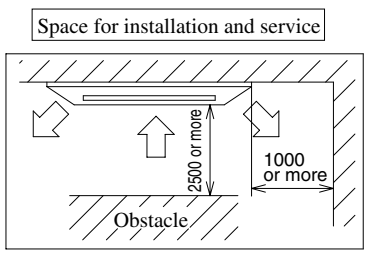
Models FDTA112KXE4, 140KXE4

unit : mm





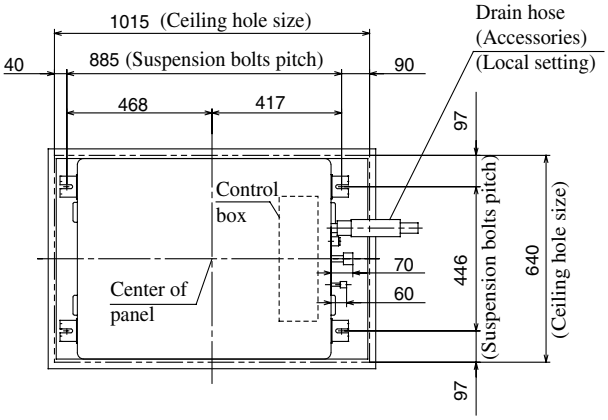


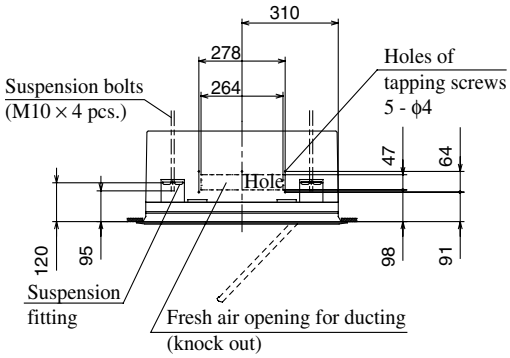


(b) 2-way outlet ceiling recessed type (FDTW)

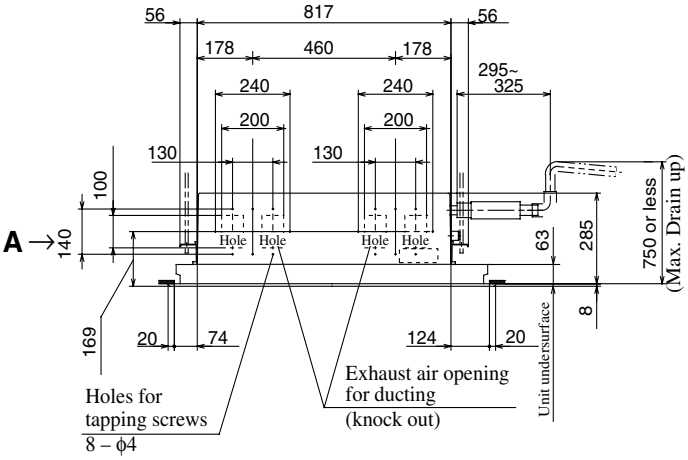
Models FDTWA28KXE4, 45KXE4, 56KXE4

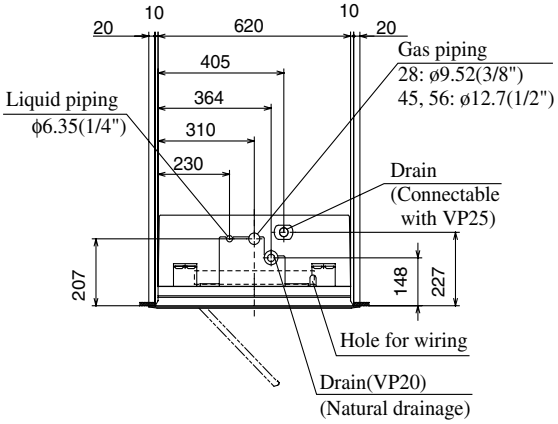
Unit : mm



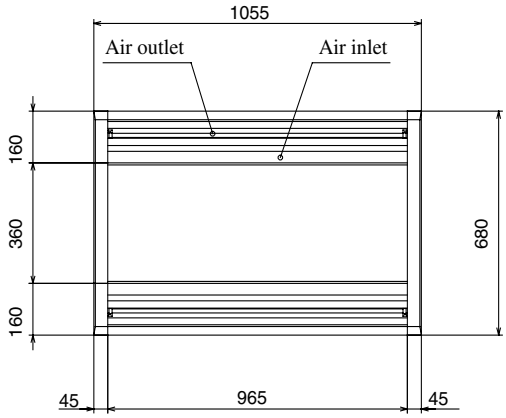


VIEW A

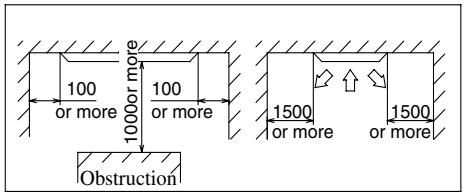




Decorative Panel

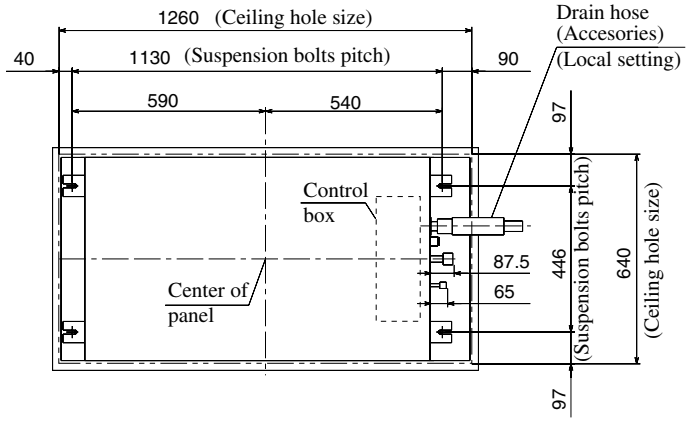


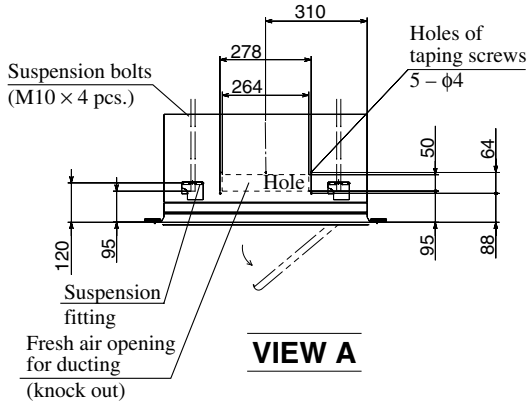
Space for installation and service

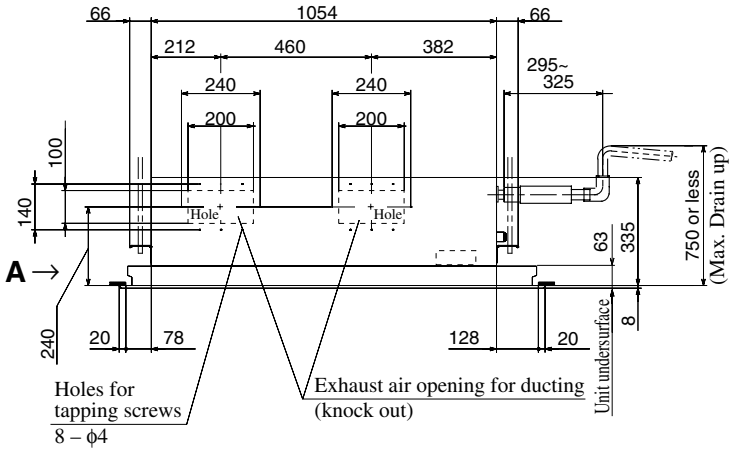


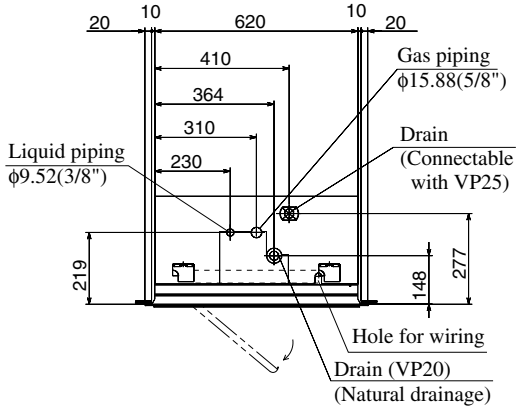
Models FDTWA71KXE4, 90KXE4

Unit : mm

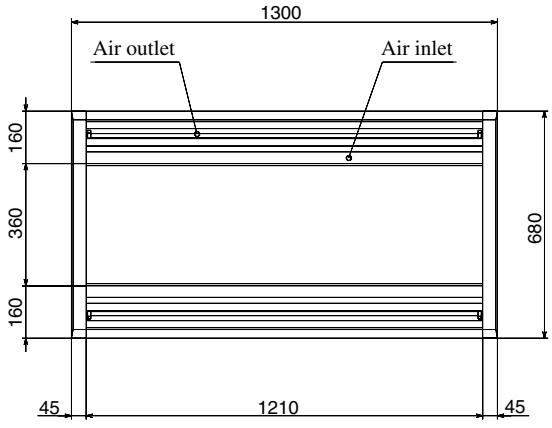




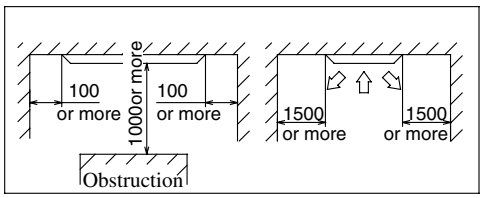




Decorative Panel

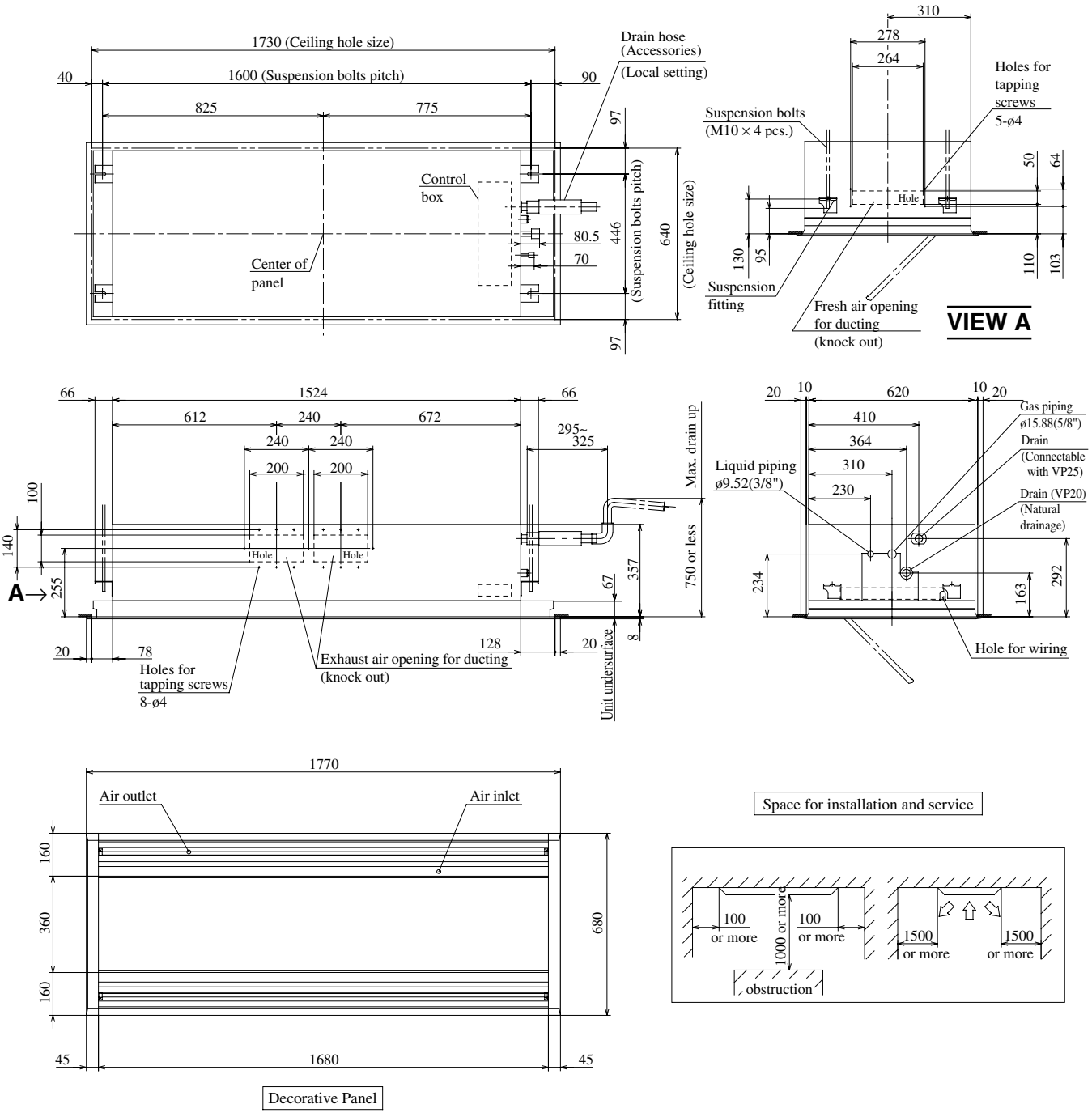


Space for installation and service



Models FDTWA112KXE4, 140KXE4

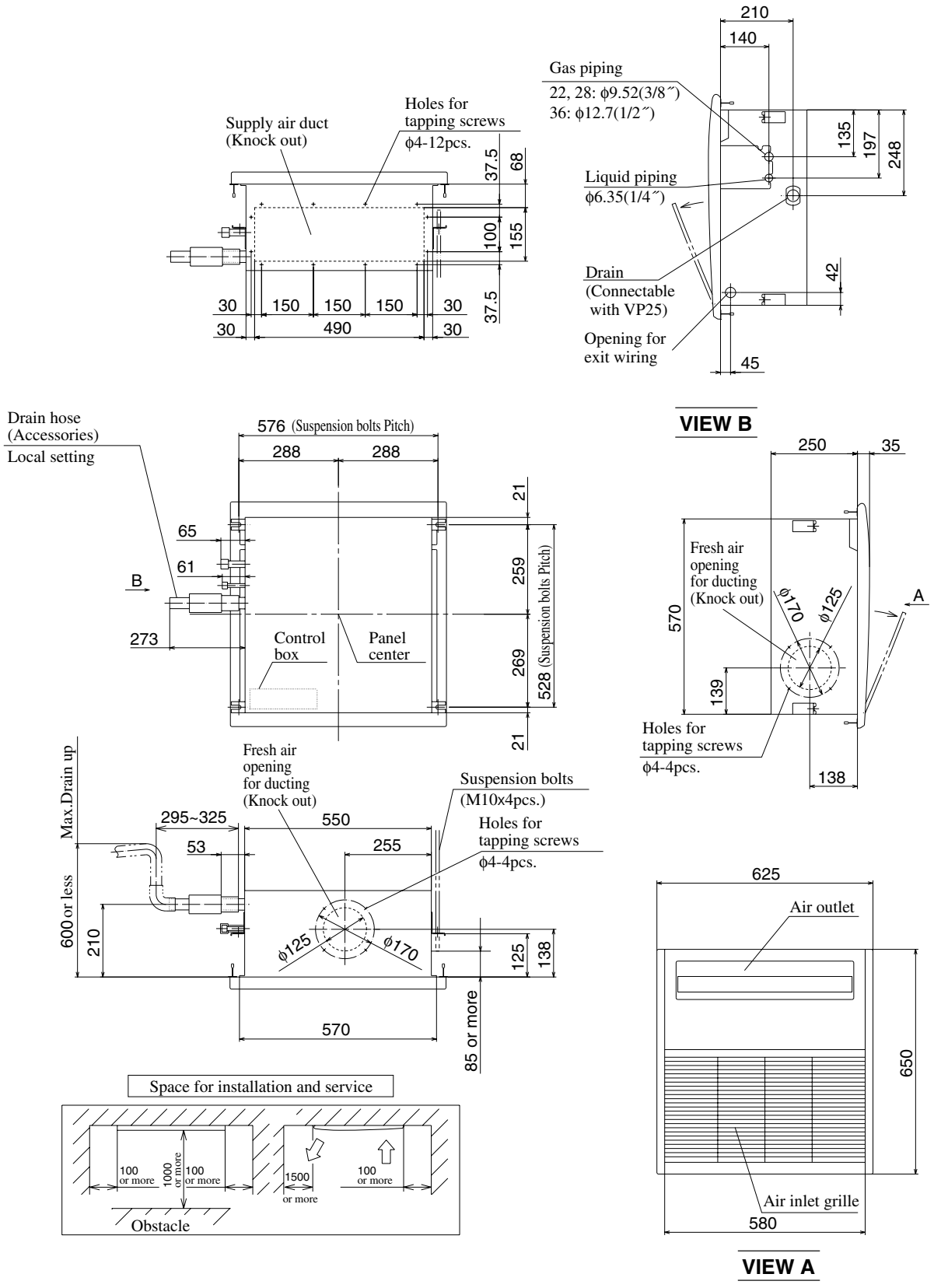
Unit: mm



(c) Ceiling recessed single air supply port type (FDTQ)

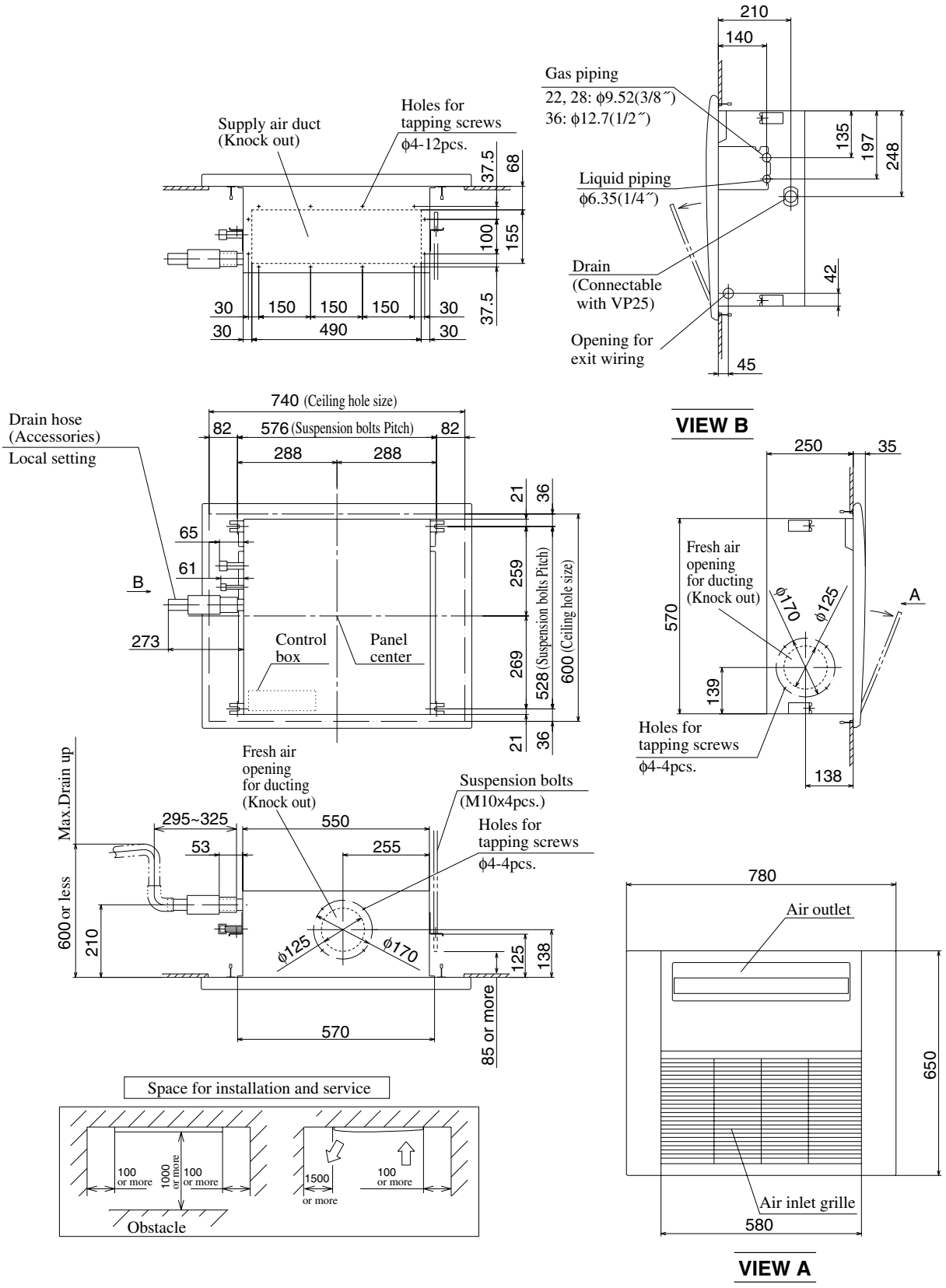
Models FDTQA22KXE4, 28KXE4, 36KXE4

Direct blow panel (TQ-PSA-13W-E)



Models FDTQA22KXE4, 28KXE4, 36KXE4

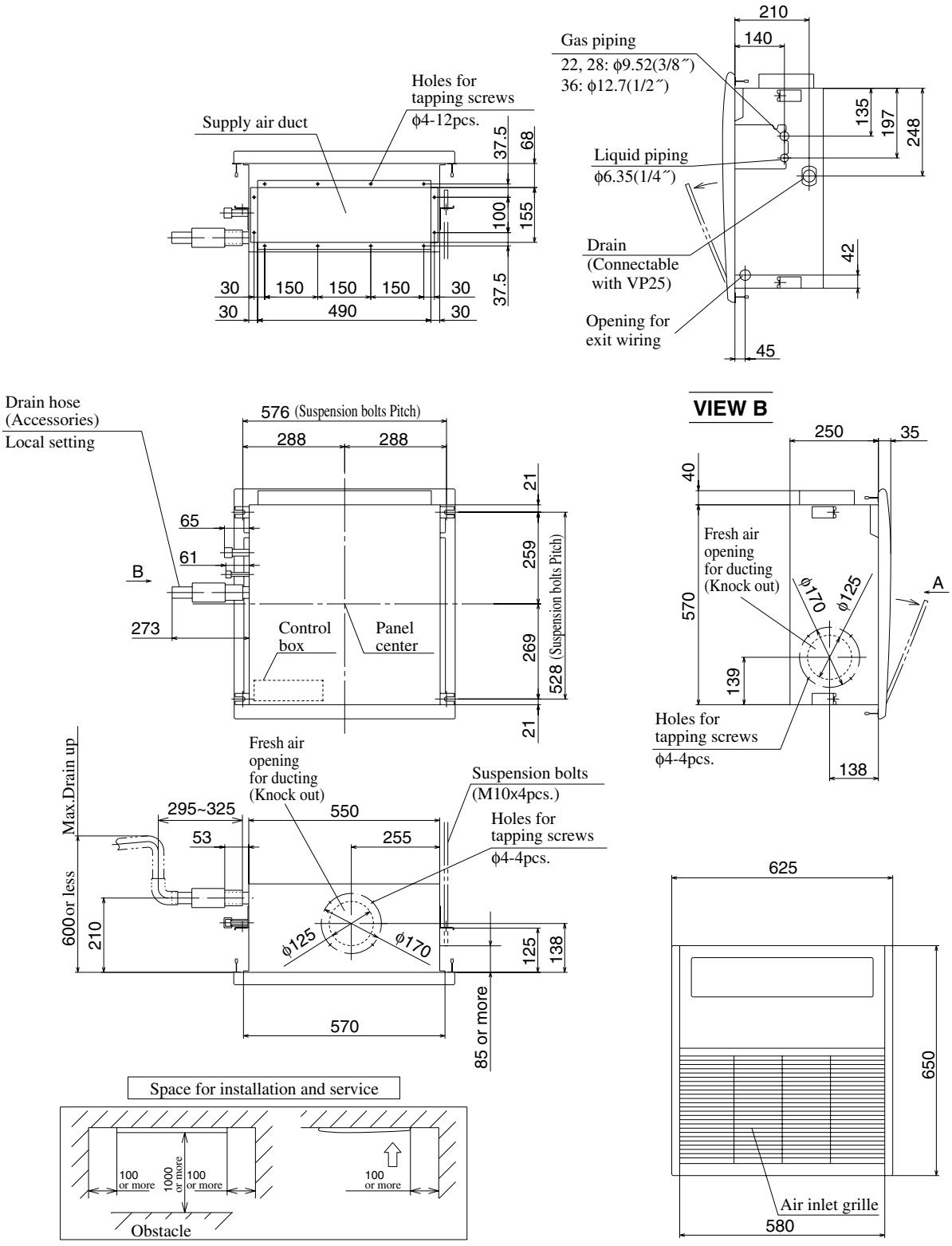
Direct blow panel (TQ-PSB-13W-E)



- **When modified to the Duct panel type on site.**

Models FDTQA22KXE4, 28KXE4, 36KXE4

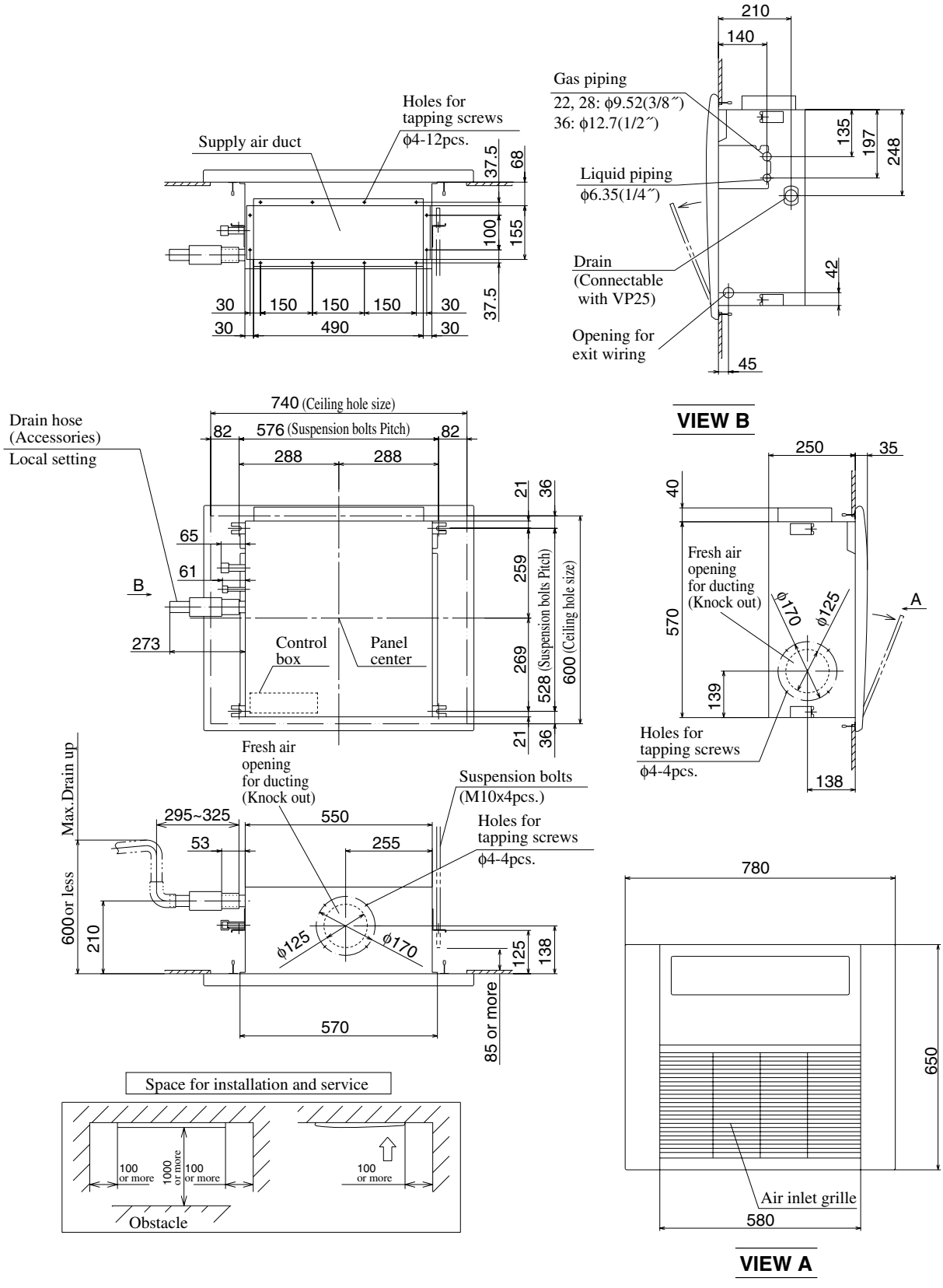
Duct panel (QR-PNA-13W-E)



- **When modified to the Duct Cassetteria type on site.**

Models FDTQA22KXE4, 28KXE4, 36KXE4

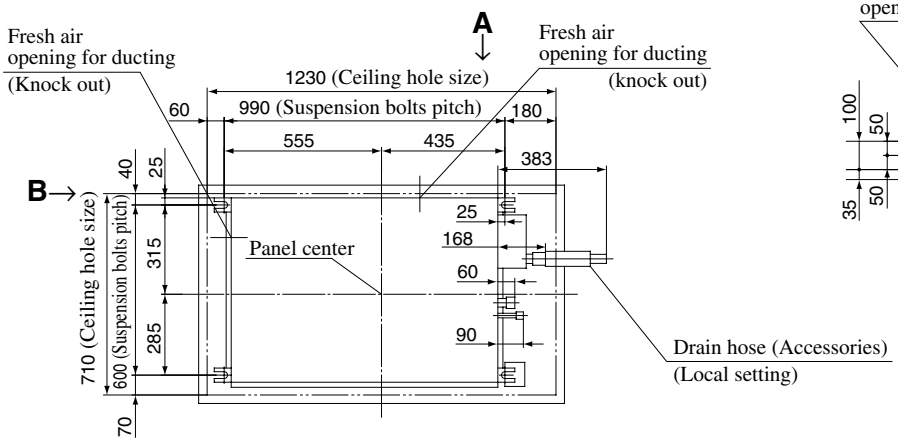
Duct panel (QR-PNB-13W-E)

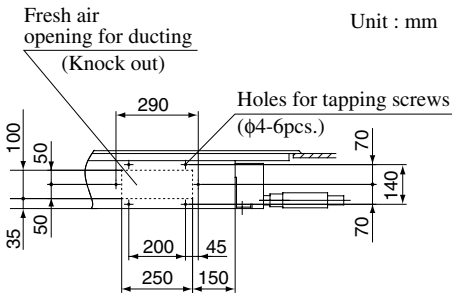


(d) 1-way outlet ceiling recessed type (FDTS)

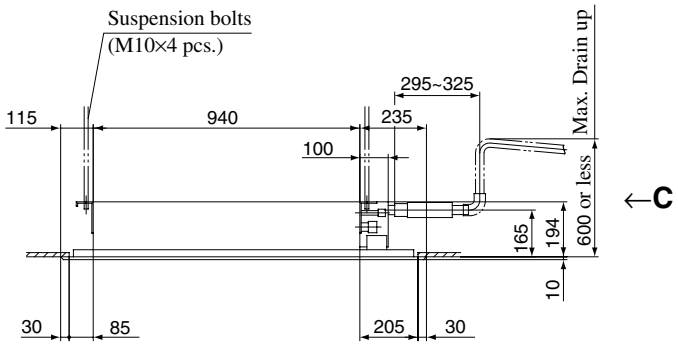
Models FDTSA22KXE4, 28KXE4, 36KXE4, 45KXE4

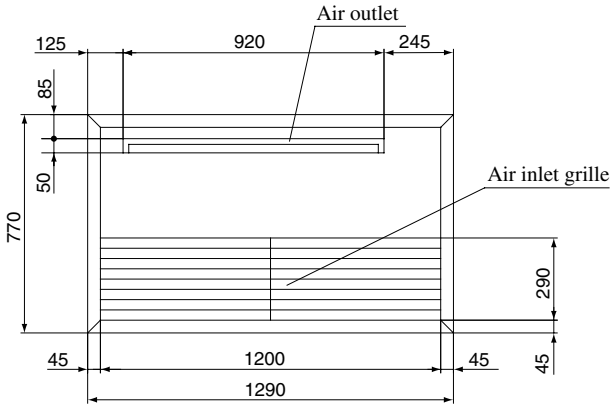
Unit : mm



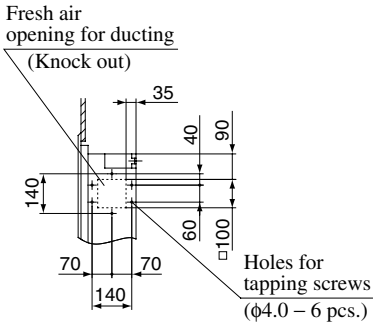


VIEW A

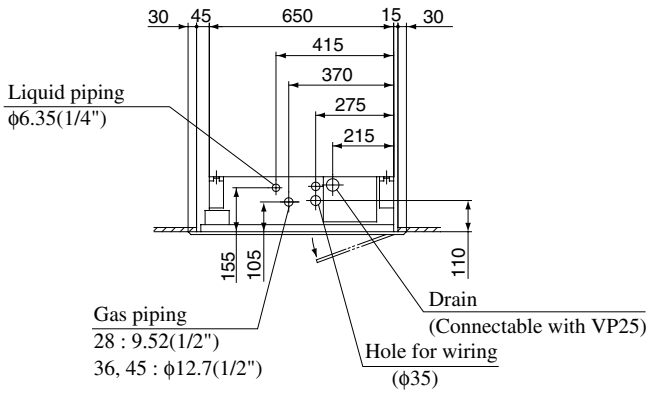




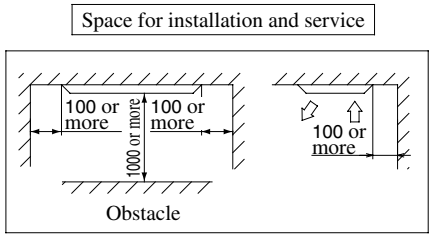
Decorative Panel



VIEW B

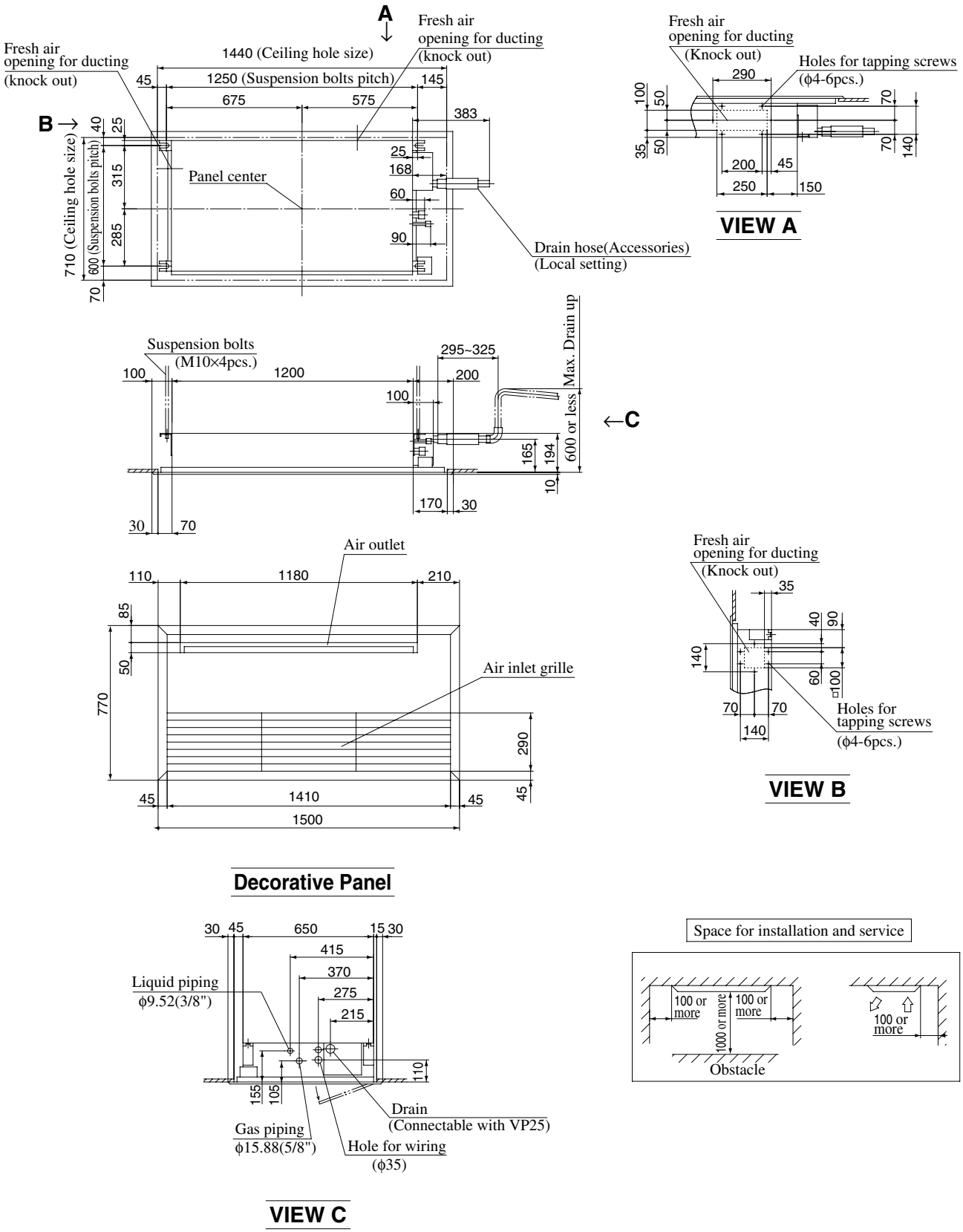


VIEW C



Model FDTSA71KXE4

Unit : mm

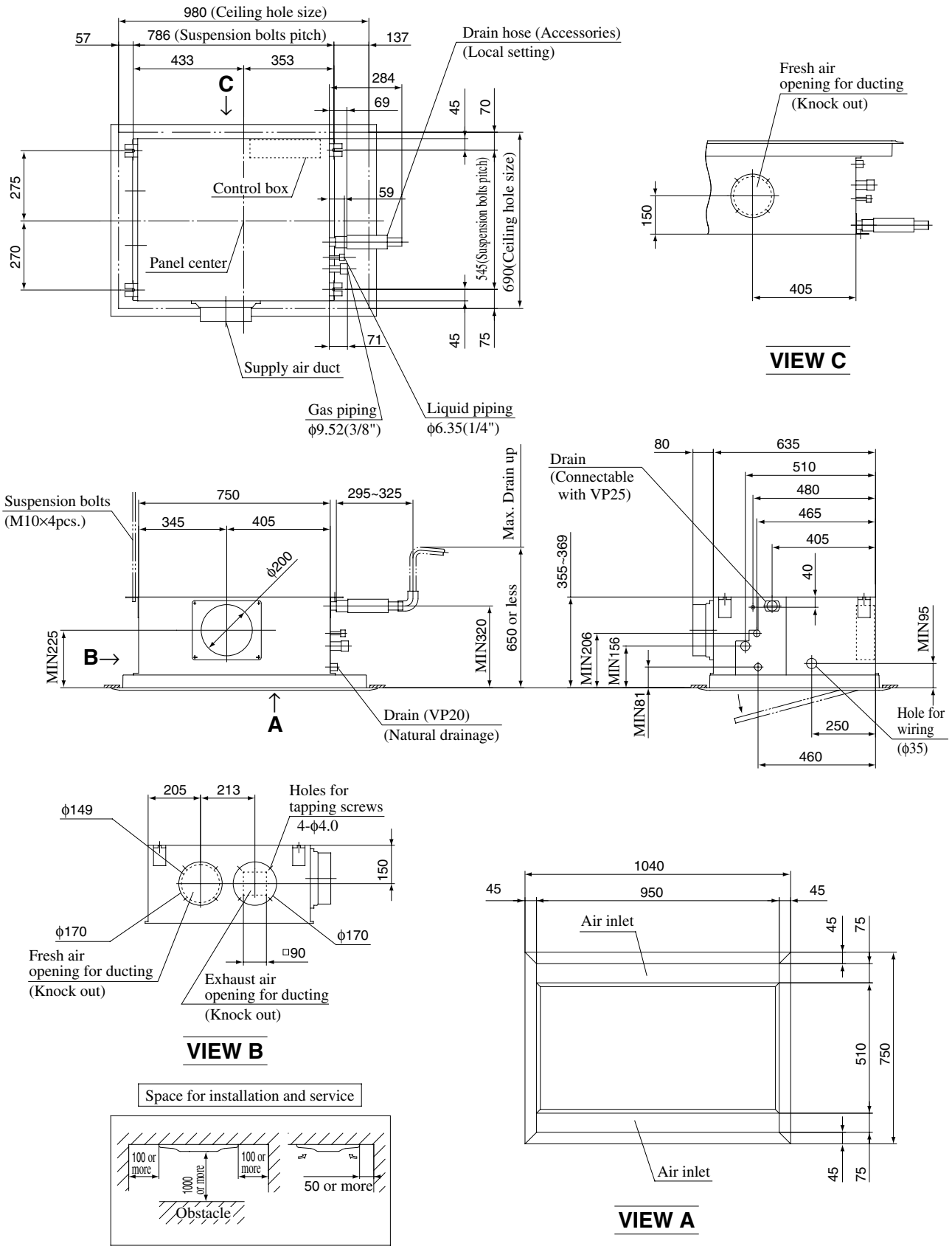


(e) Cassetteria type (FDR)

Model FDRA22KXE4

Silent Panel (Model: R-PNLS-26W-E)

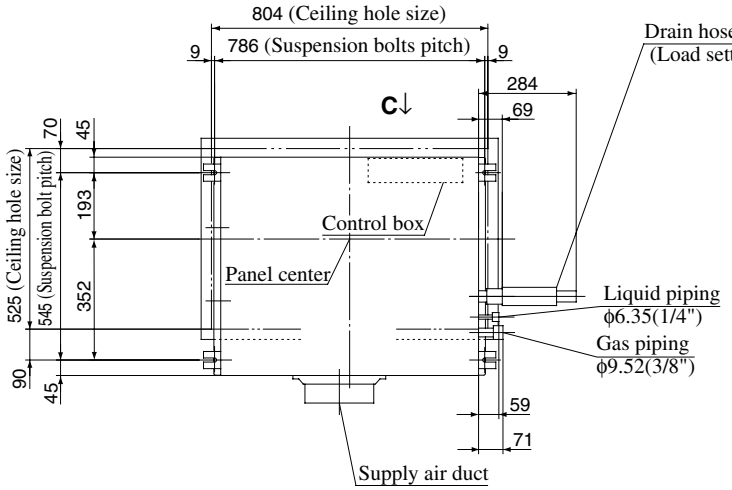
Unit : mm

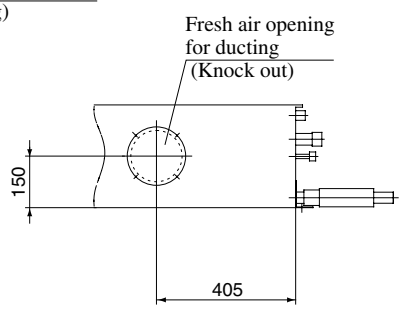


Model FDRA22KXE4

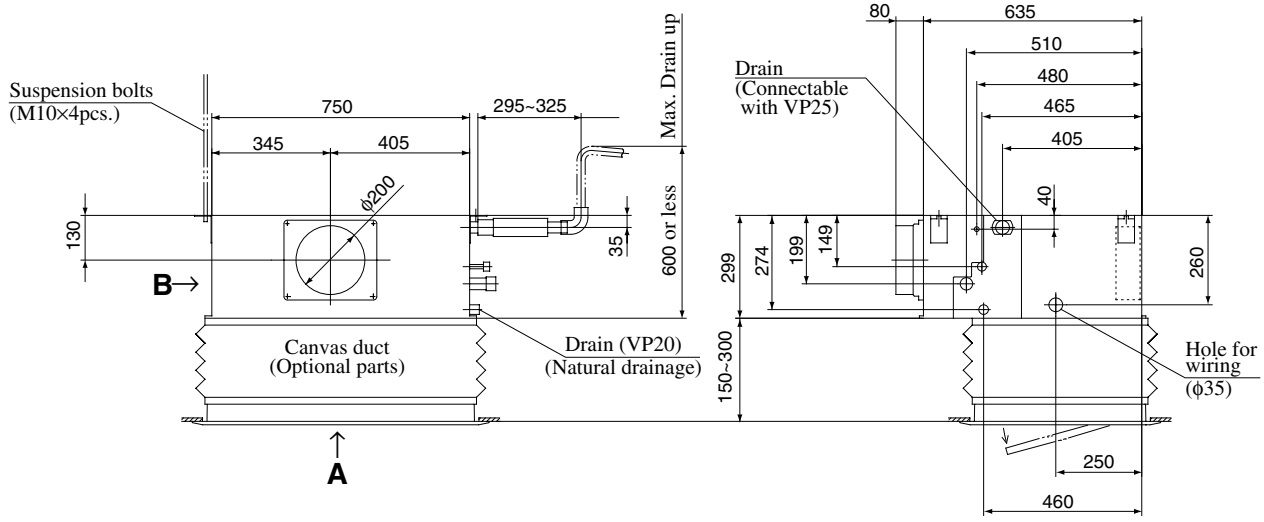
Canvas Panel (Model: R-PNLC -26W-E)

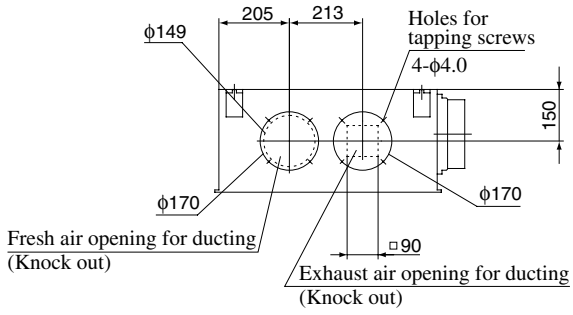
Unit : mm



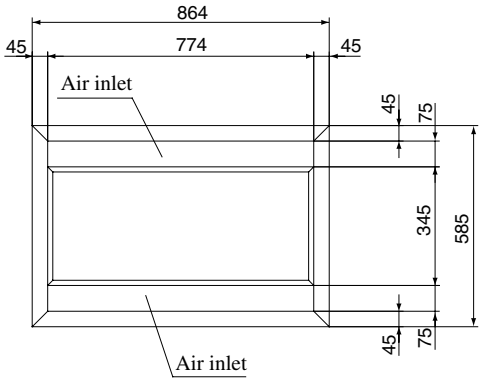


VIEW C



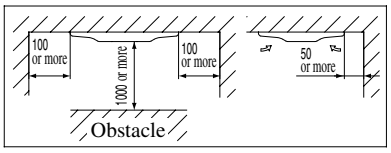


VIEW B



VIEW A

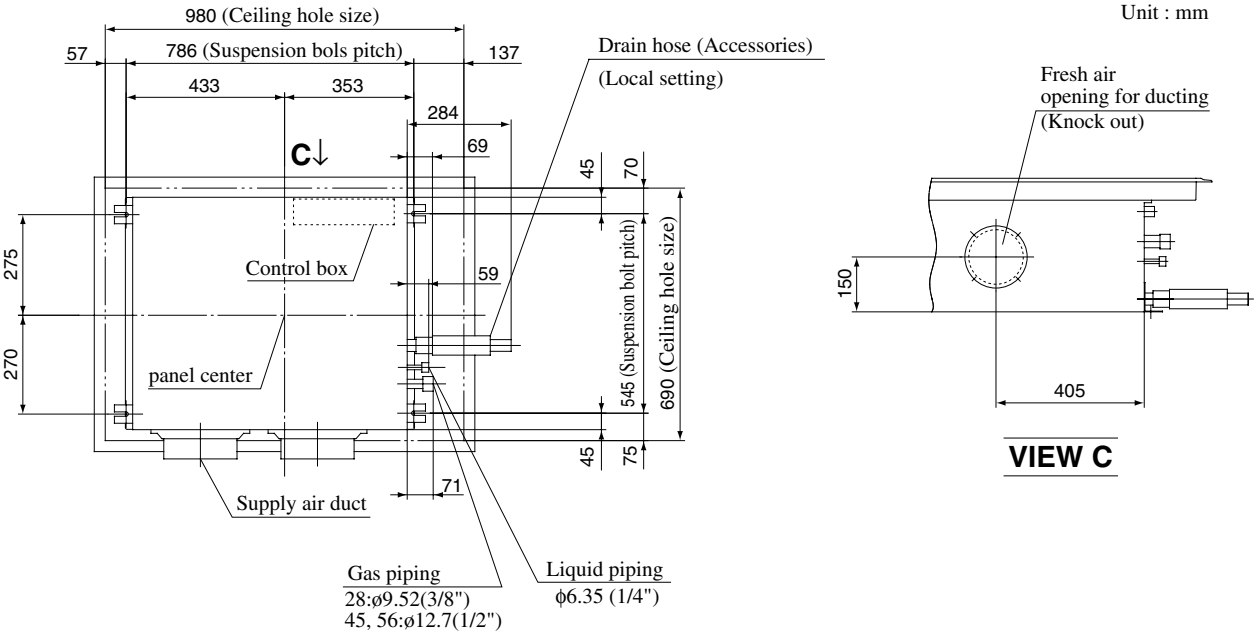
Space for installation and service

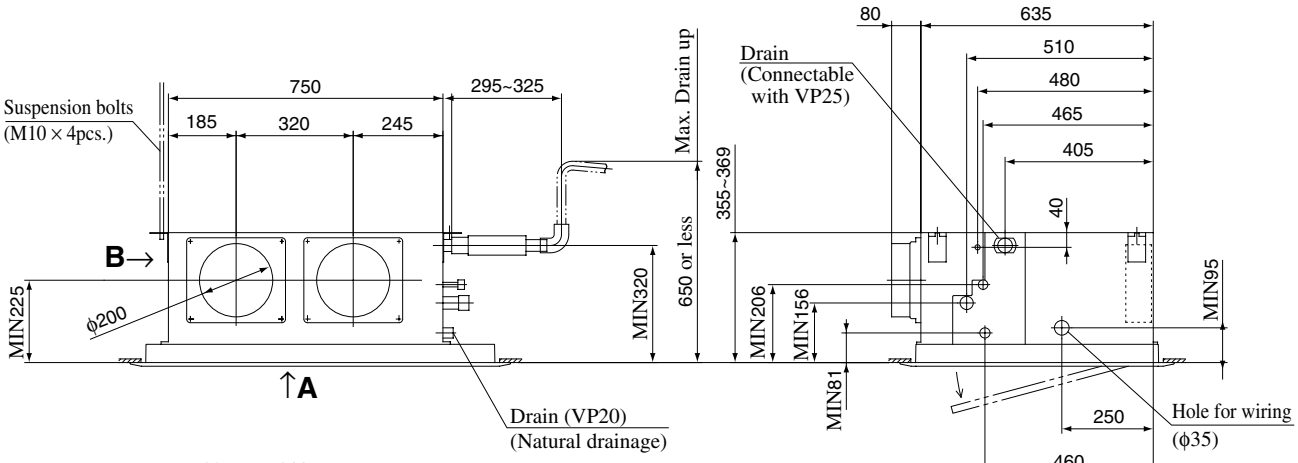


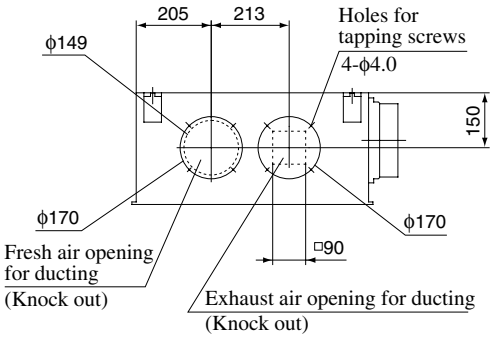
Models FDRA28KXE4, 45KXE4, 56KXE4

Silent Panel (Model: R-PNLS-26W-E)

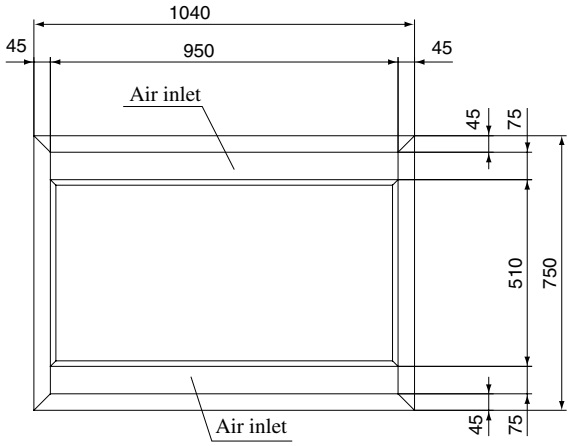
Unit : mm





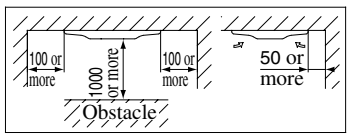


VIEW B



VIEW A

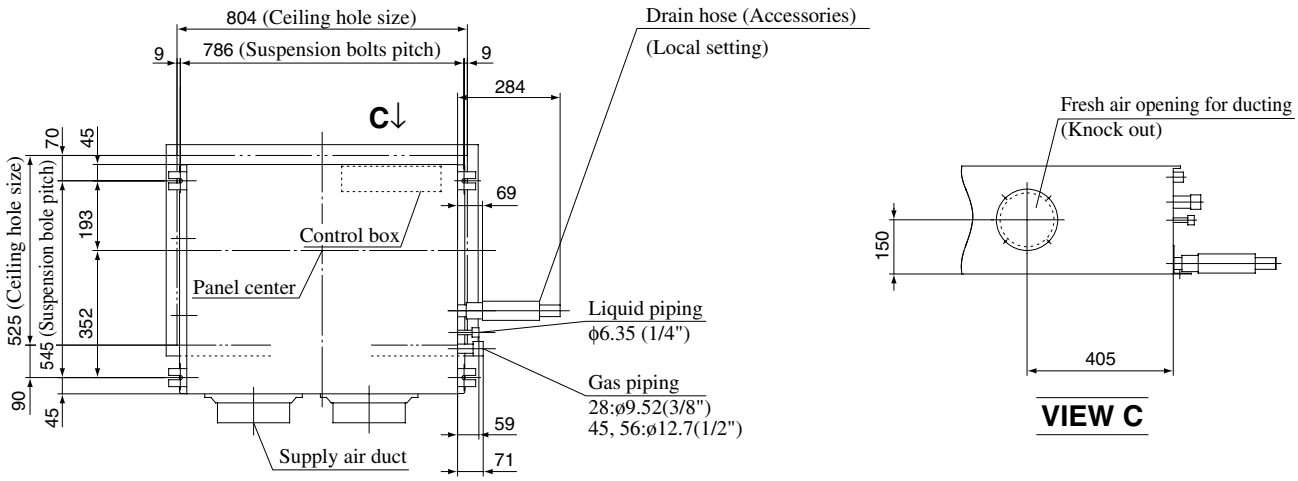
Space for installation and service

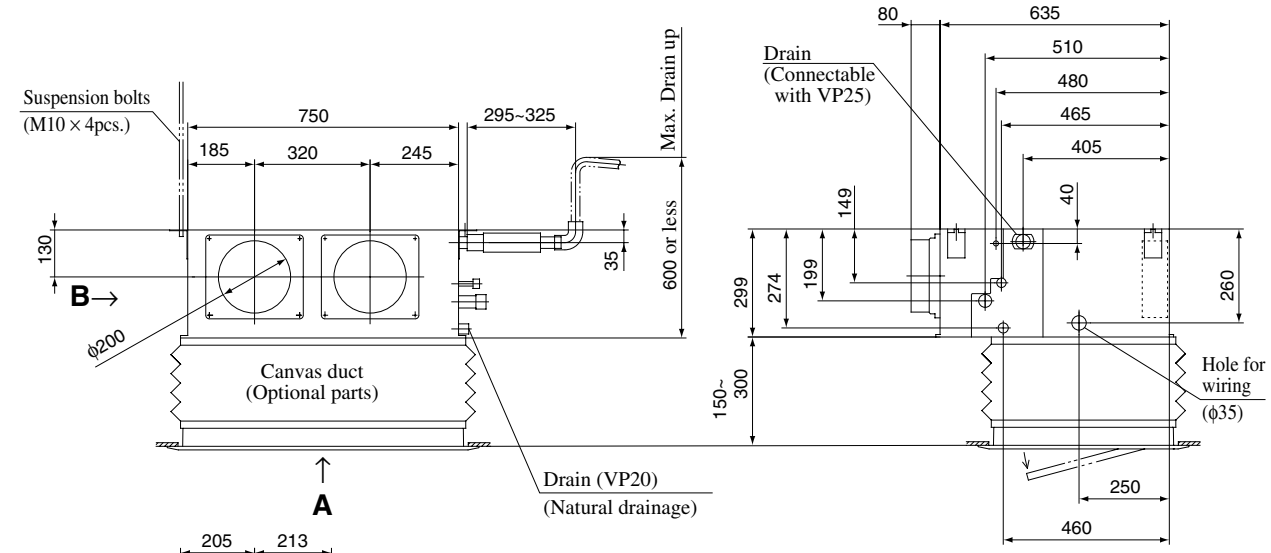


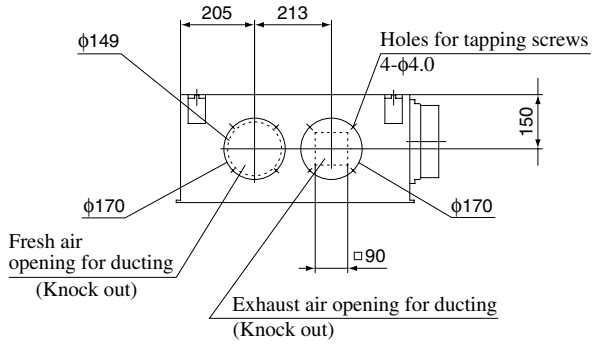
Models FDRA28KXE4, 45KXE4, 56KXE4

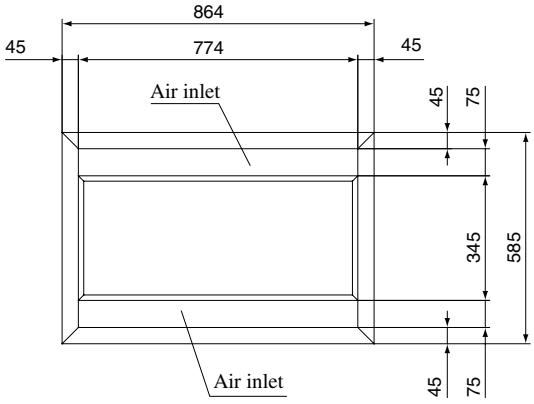
Canvas Panel (Model: R-PNLC-26W-E)

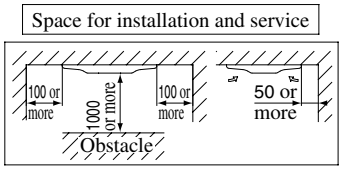
Unit : mm







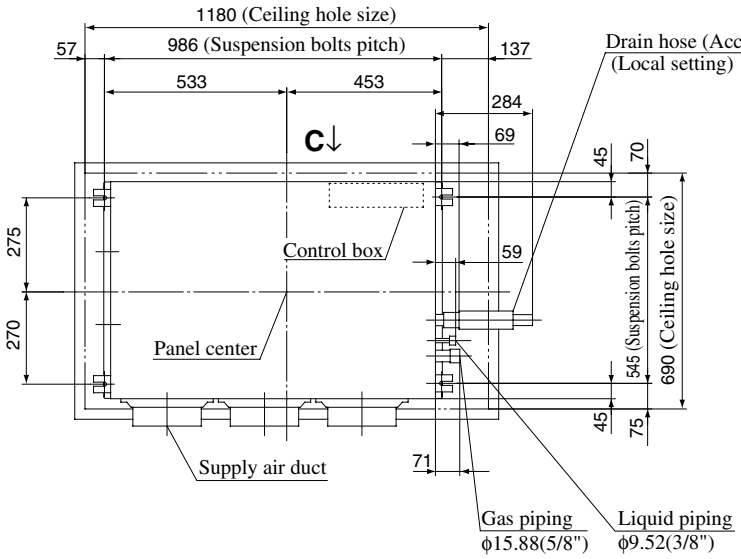


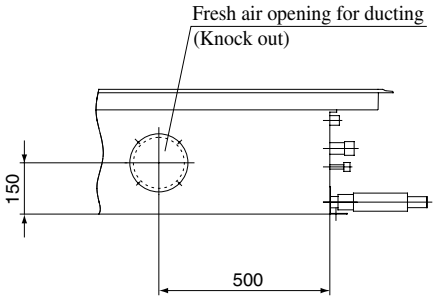


Models FDRA71KXE4, 90KXE4

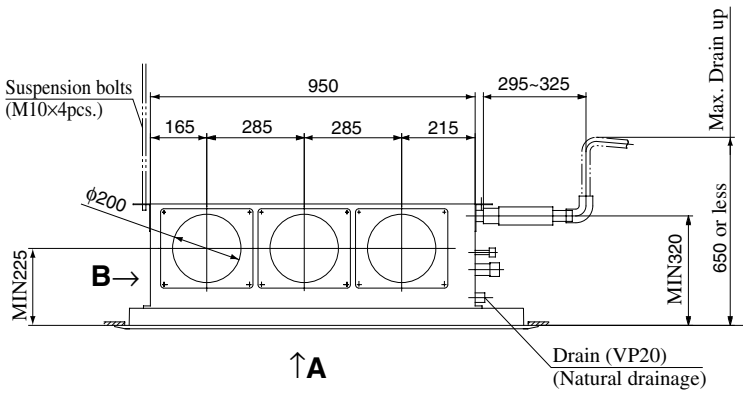
Silent Panel (Model: R-PNLS-36W-E)

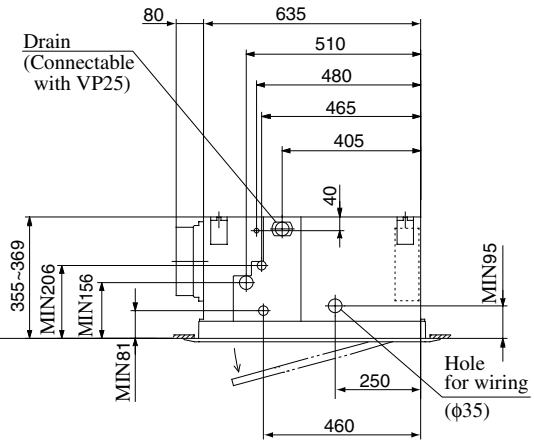
Unit : mm

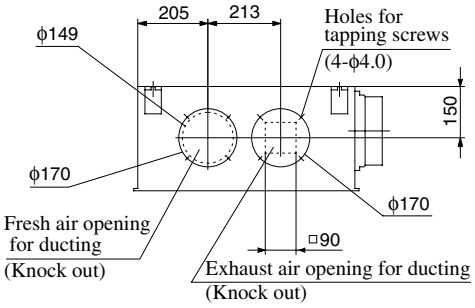




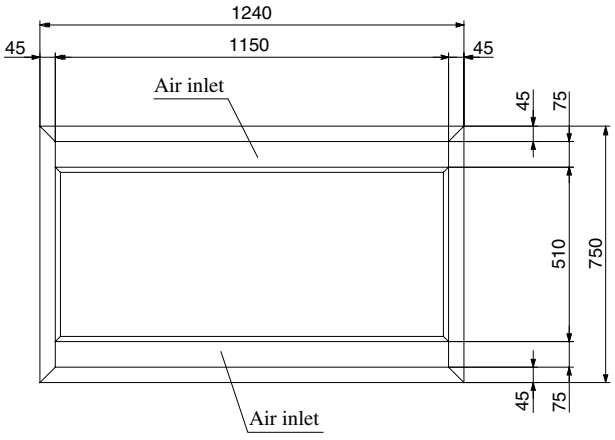
VIEW C



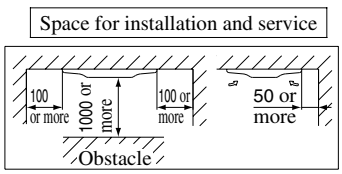




VIEW B



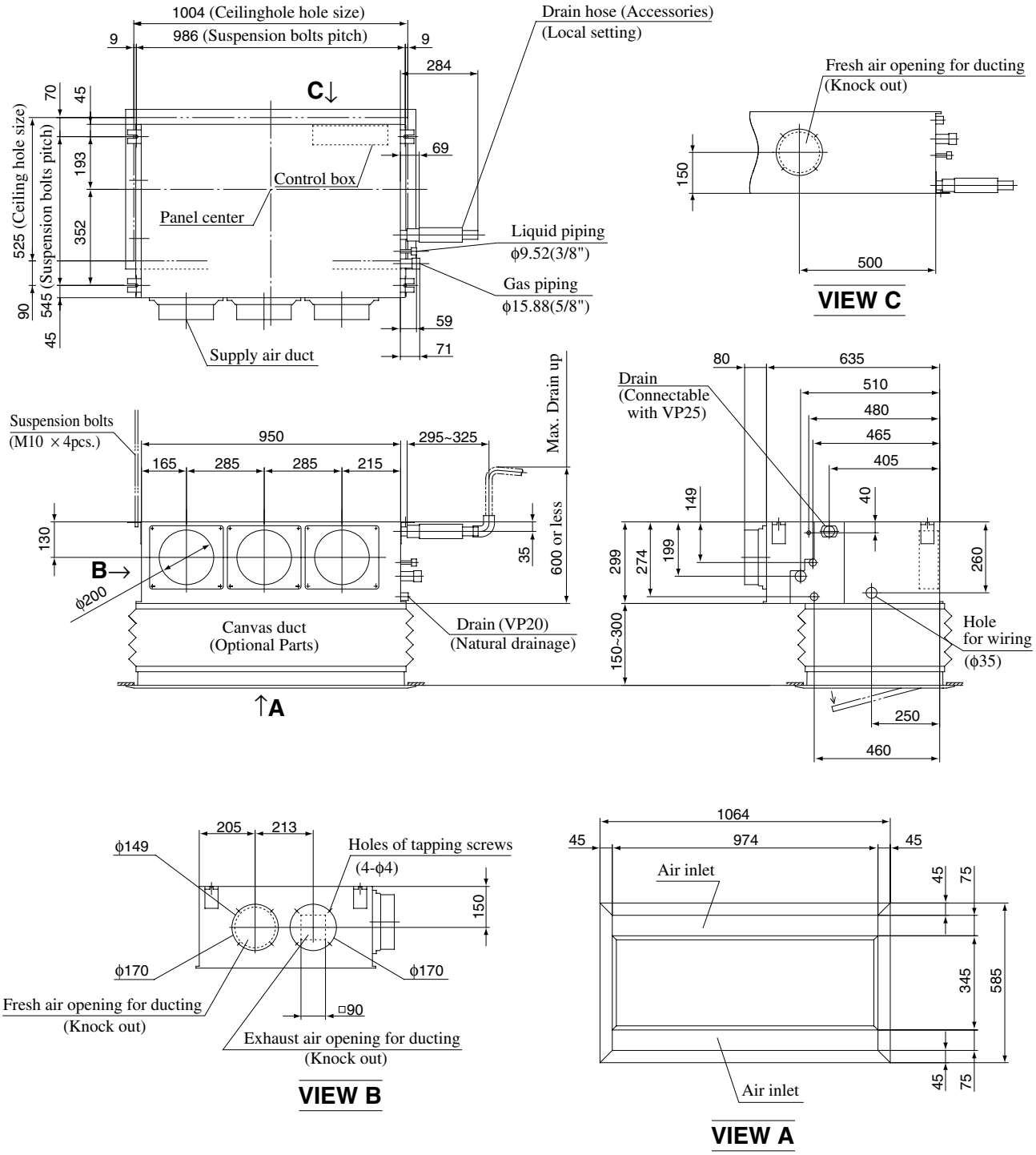
VIEW A



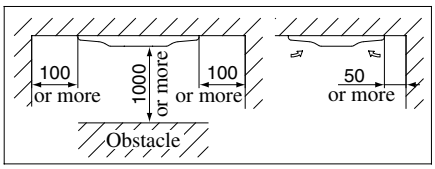
Models FDRA71KXE4, 90KXE4

Canvas Panel (Model: R-PNLC-36W-E)

Unit : mm



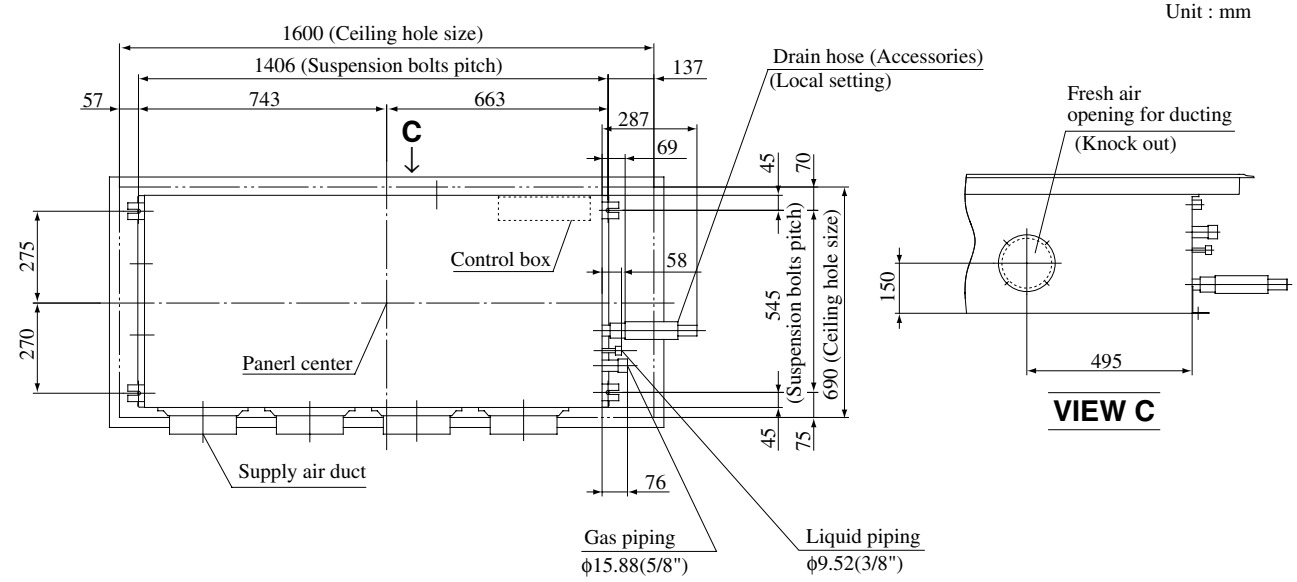
Space for installation and service

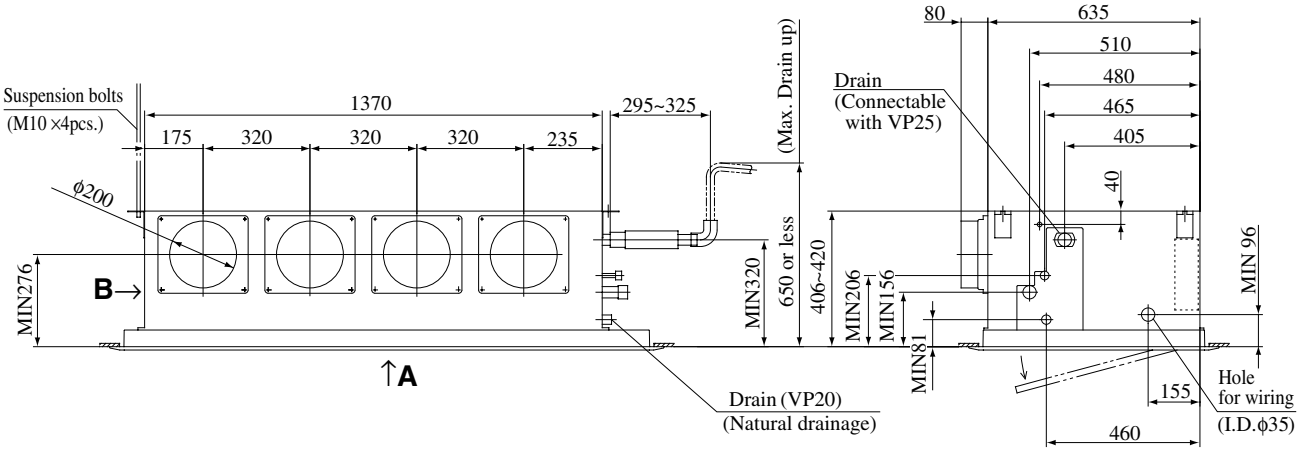


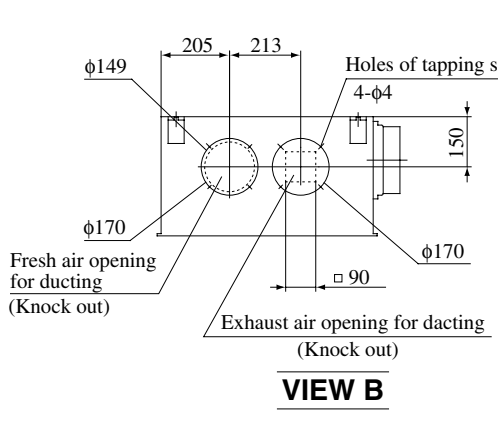
Models FDRA112KXE4, 140KXE4

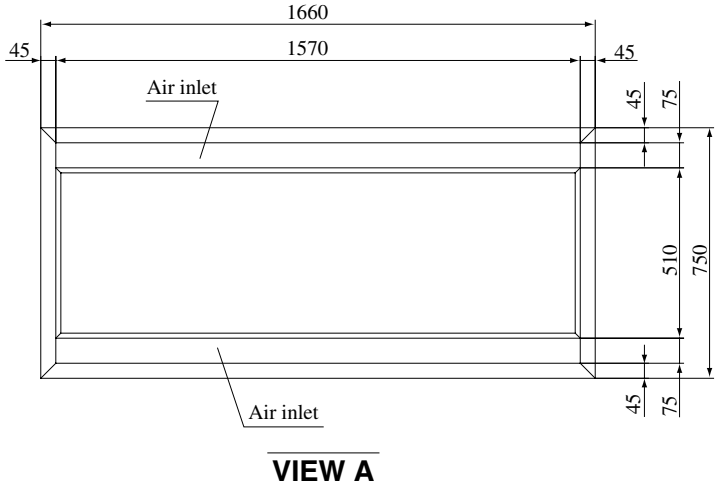
Silent Panel (Model: R-PNLS-46W-E)

Unit : mm

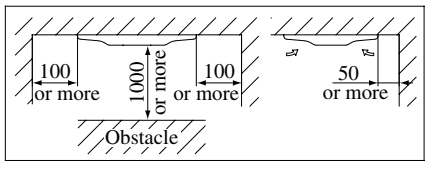








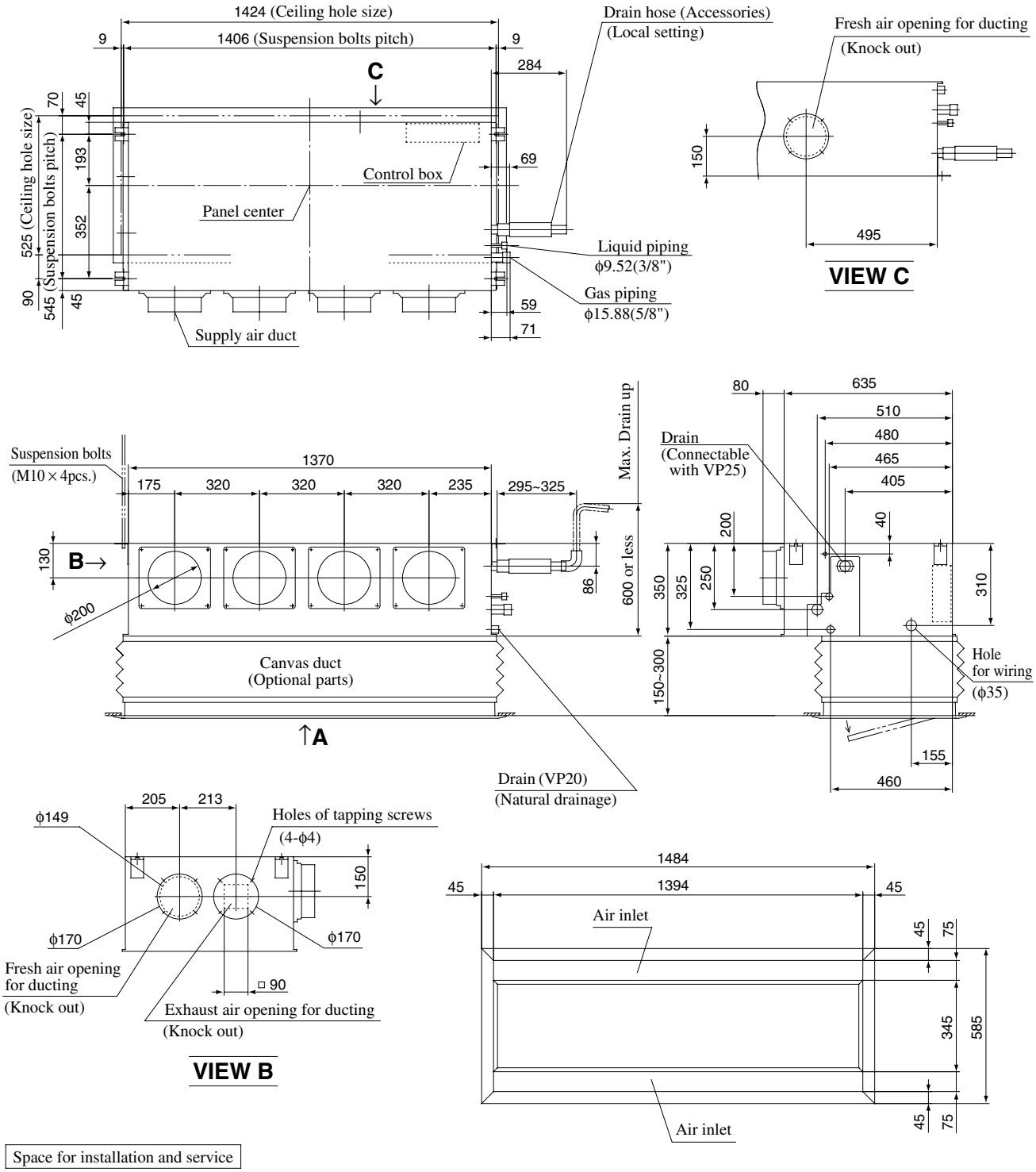
Space for installation and service



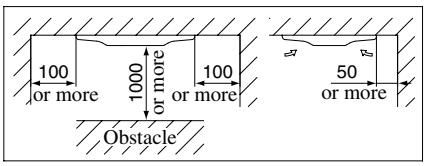
Models FDRA112KXE4, 140KXE4

Canvas Panel (Model: R-PNLC-46W-E)

Unit : mm

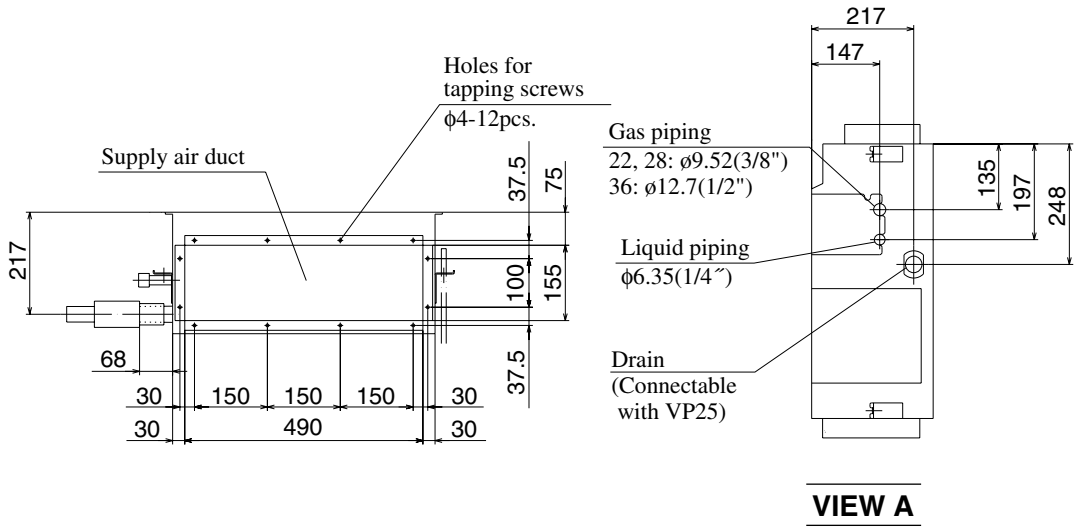


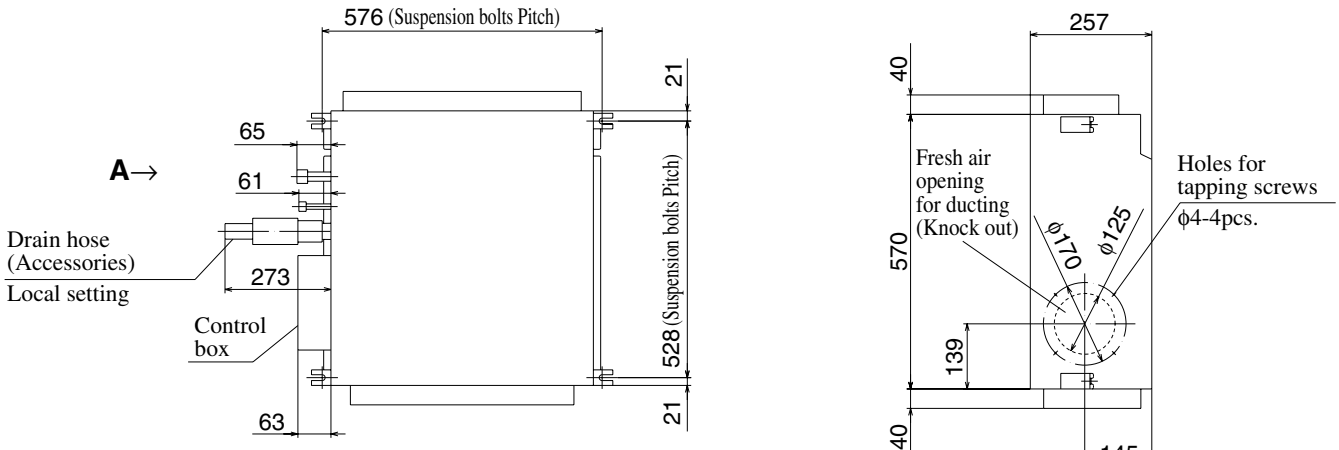
Space for installation and service

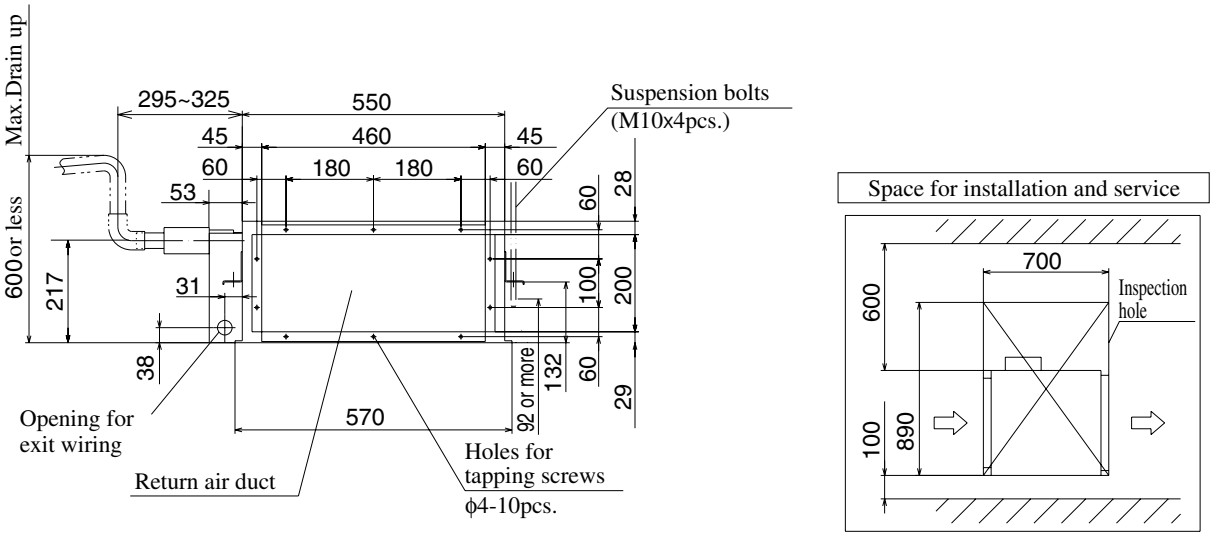


(f) Medium static pressure ducted type (FDQM)

Models FDQMA22KXE4, 28KXE4, 36KXE4



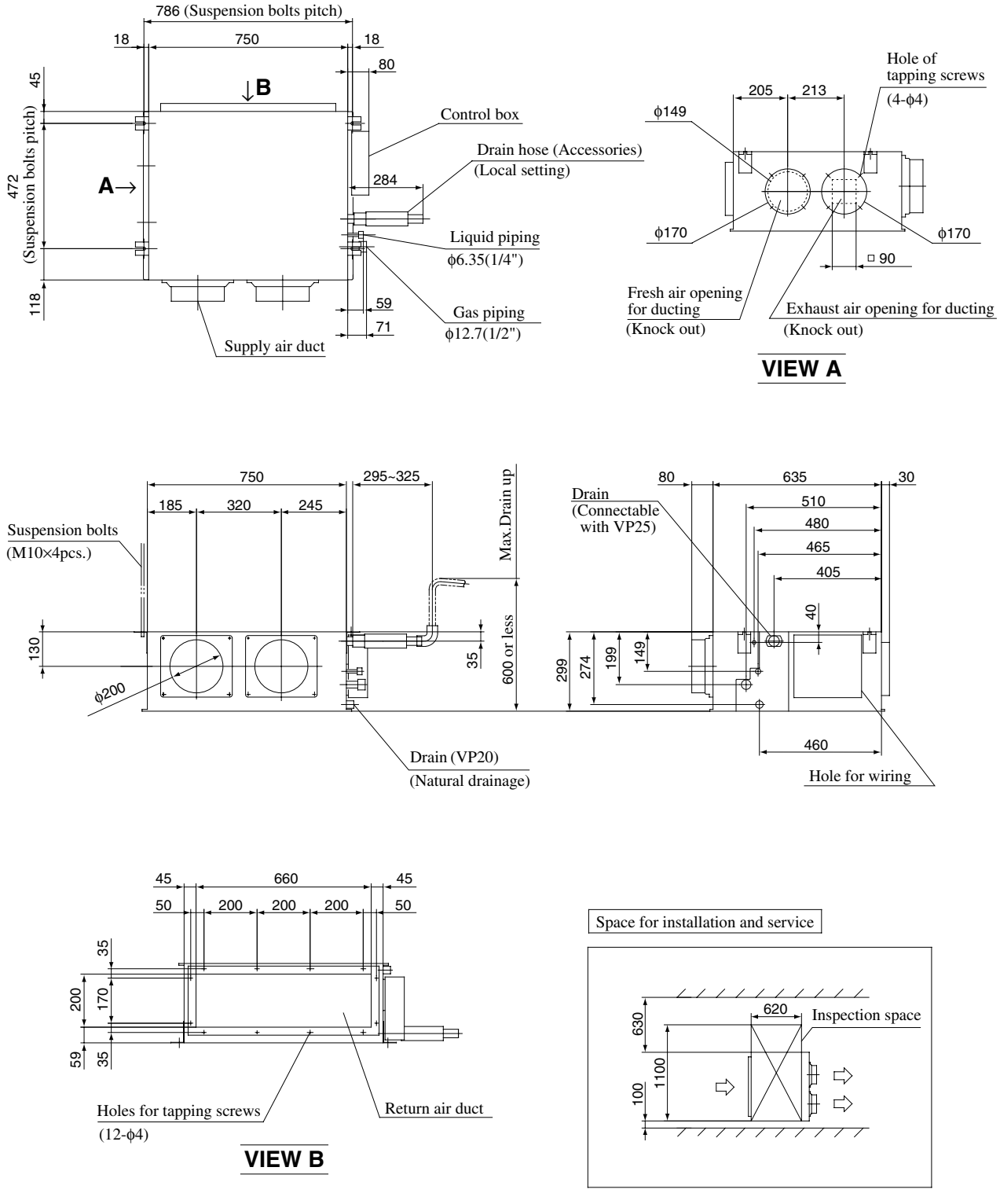




(g) Satellite ducted type (FDUM)

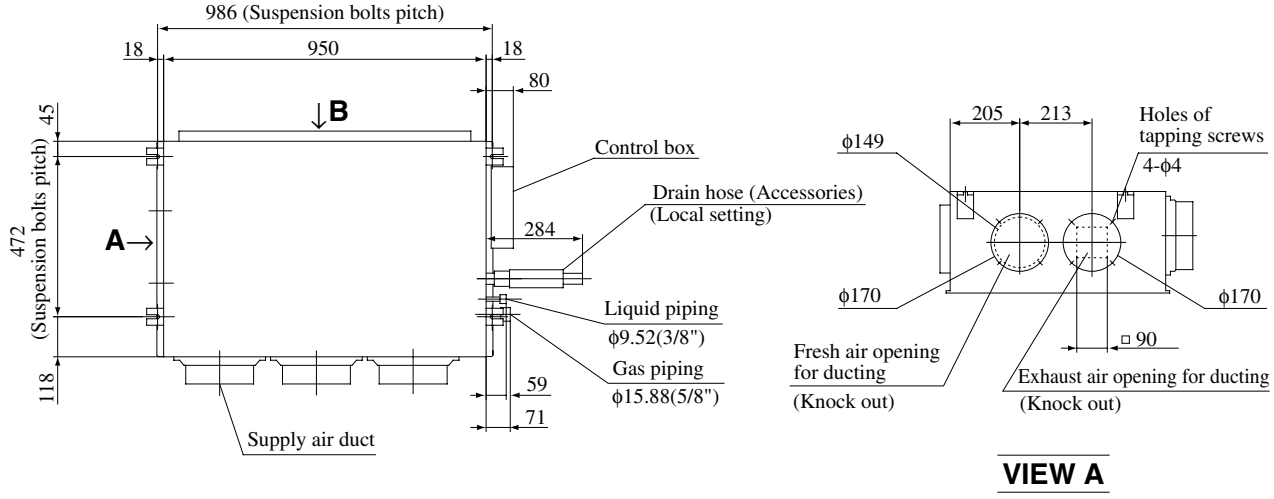
Models FDUMA36KXE4, 45KXE4, 56KXE4

Unit : mm

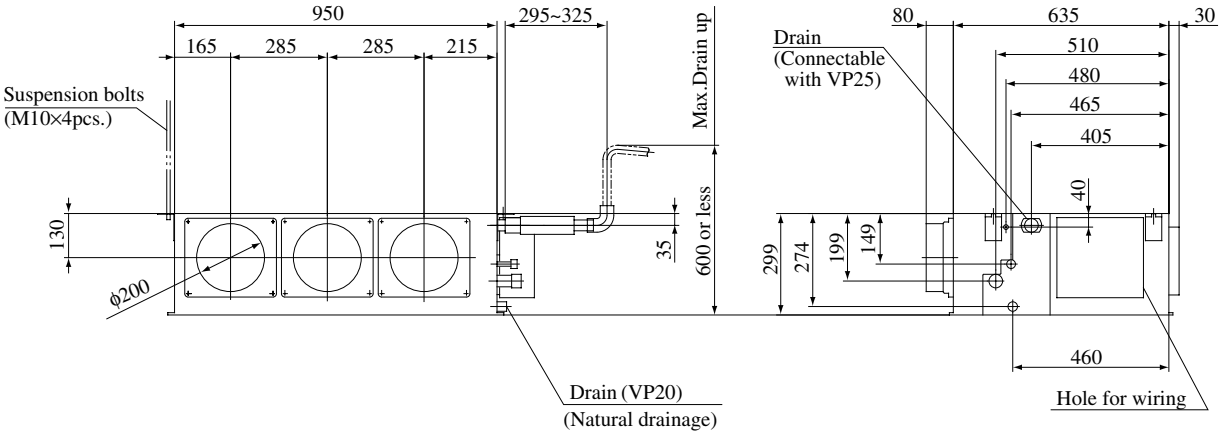


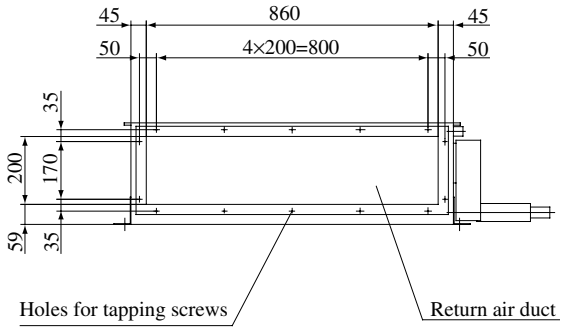
Models FDUMA71KXE4, 90KXE4

Unit : mm



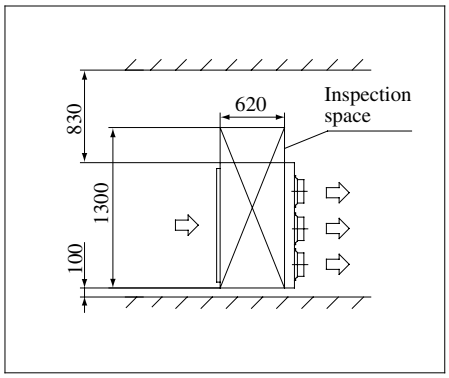
VIEW A





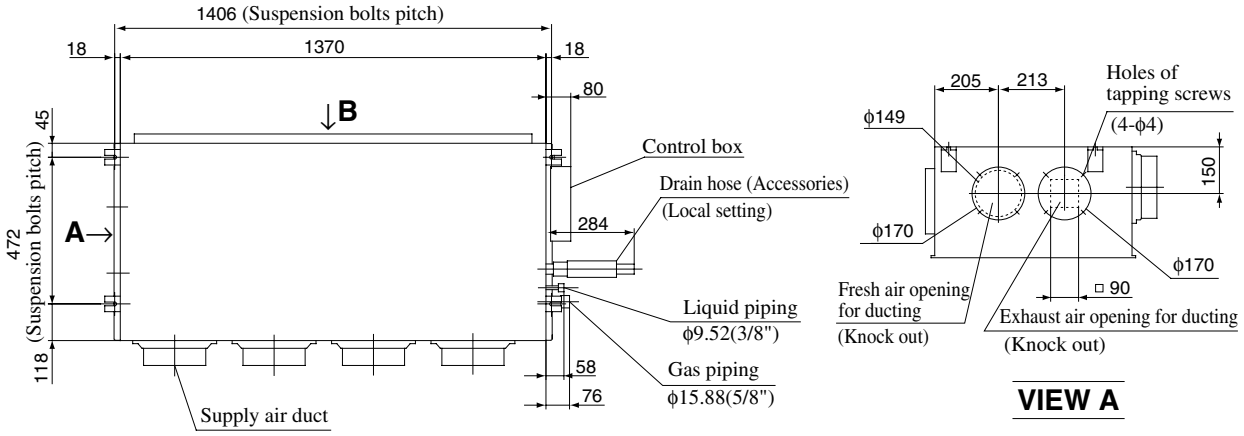
VIEW B

Space for installation and service

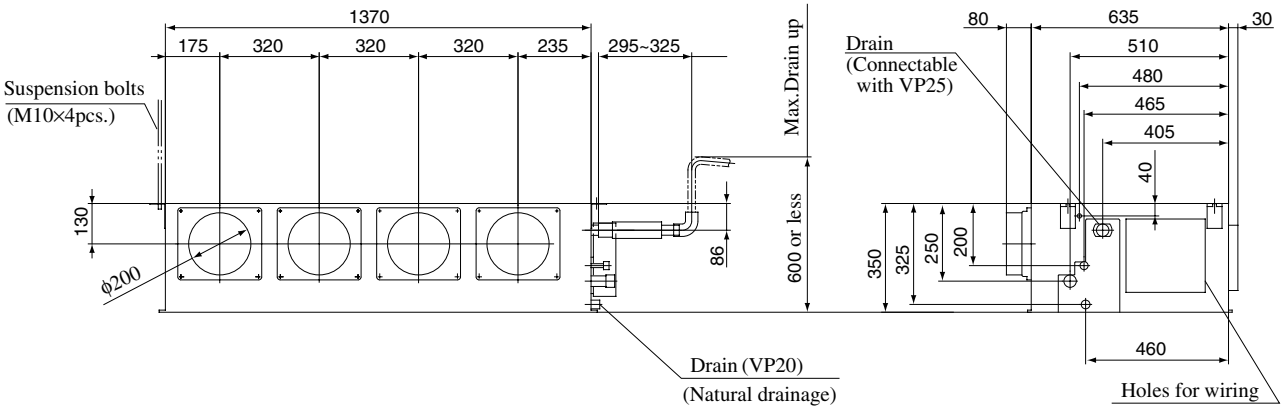


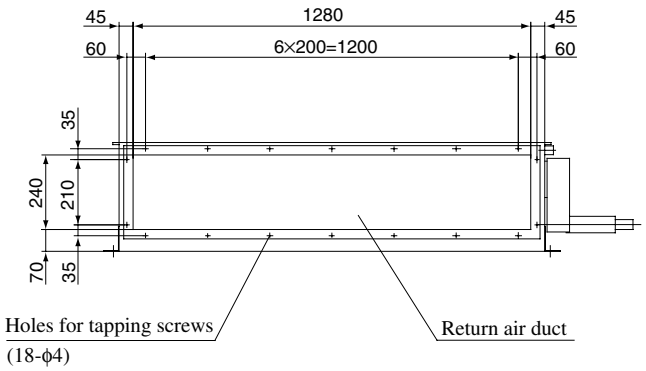
Models FDUMA112KXE4, 140KXE4

Unit : mm



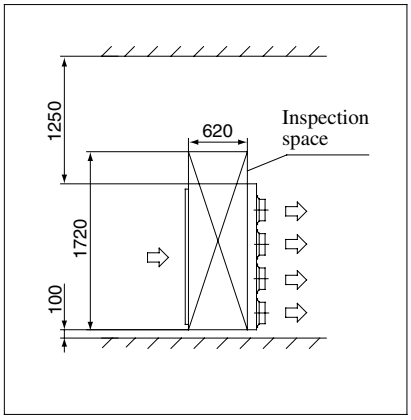
VIEW A





VIEW B

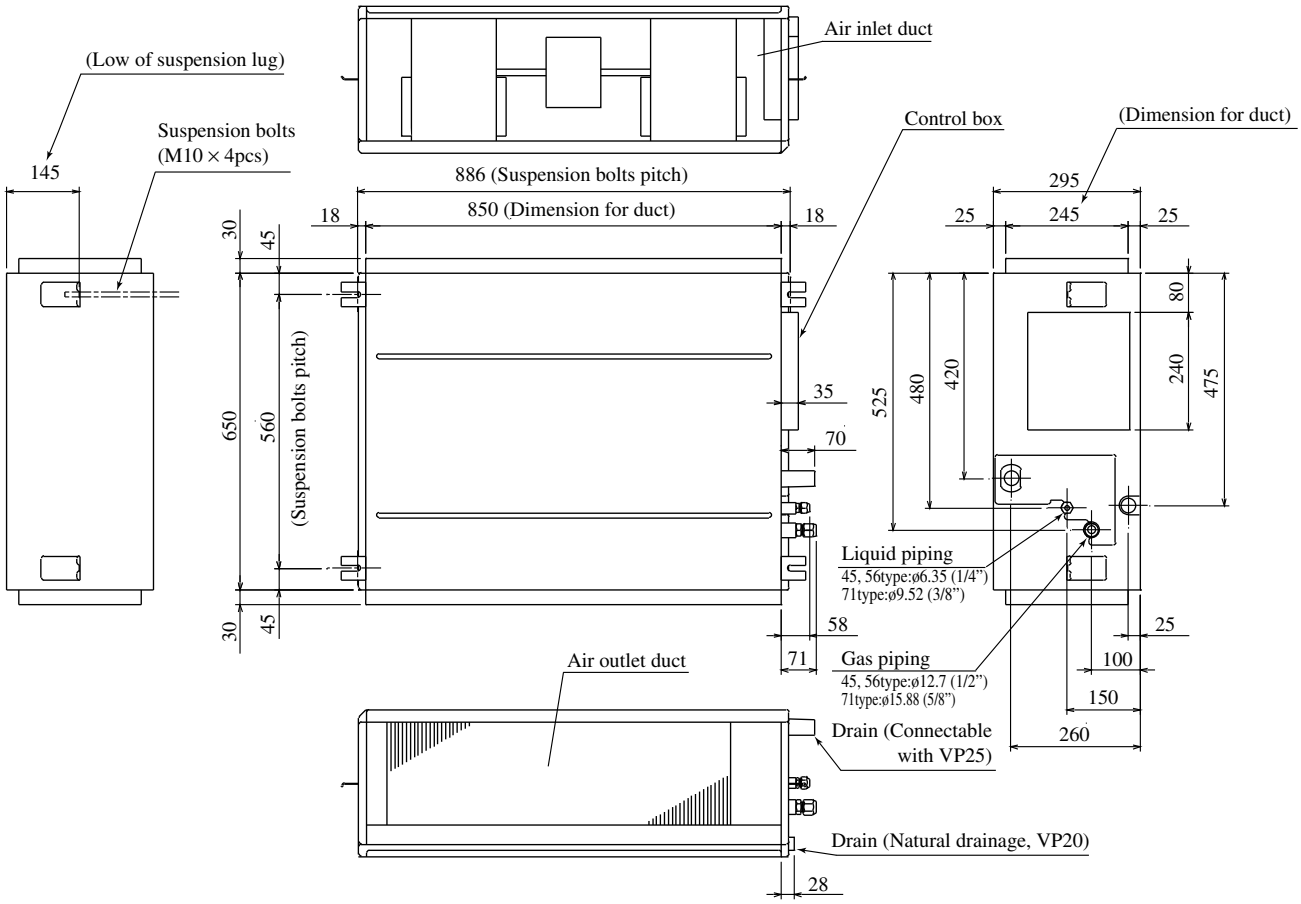
Space for installation and service



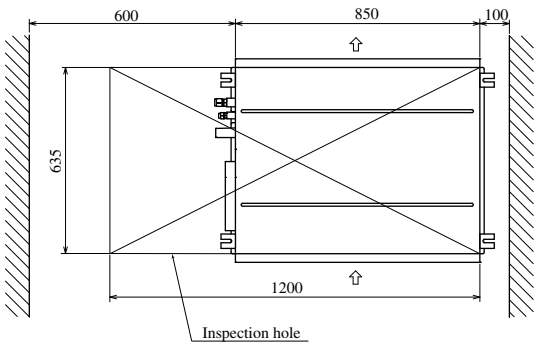
(h) Ceiling mounted duct type (FDUR)

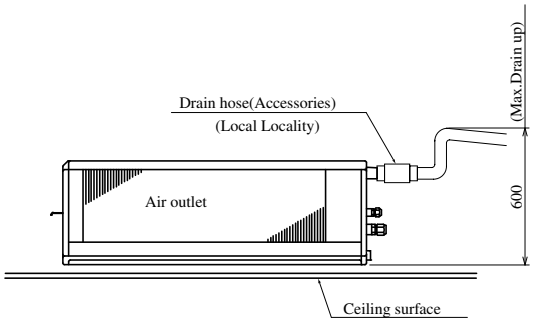
Models FDURA45KXE4, 56KXE4, 71KXE4

Unit : mm



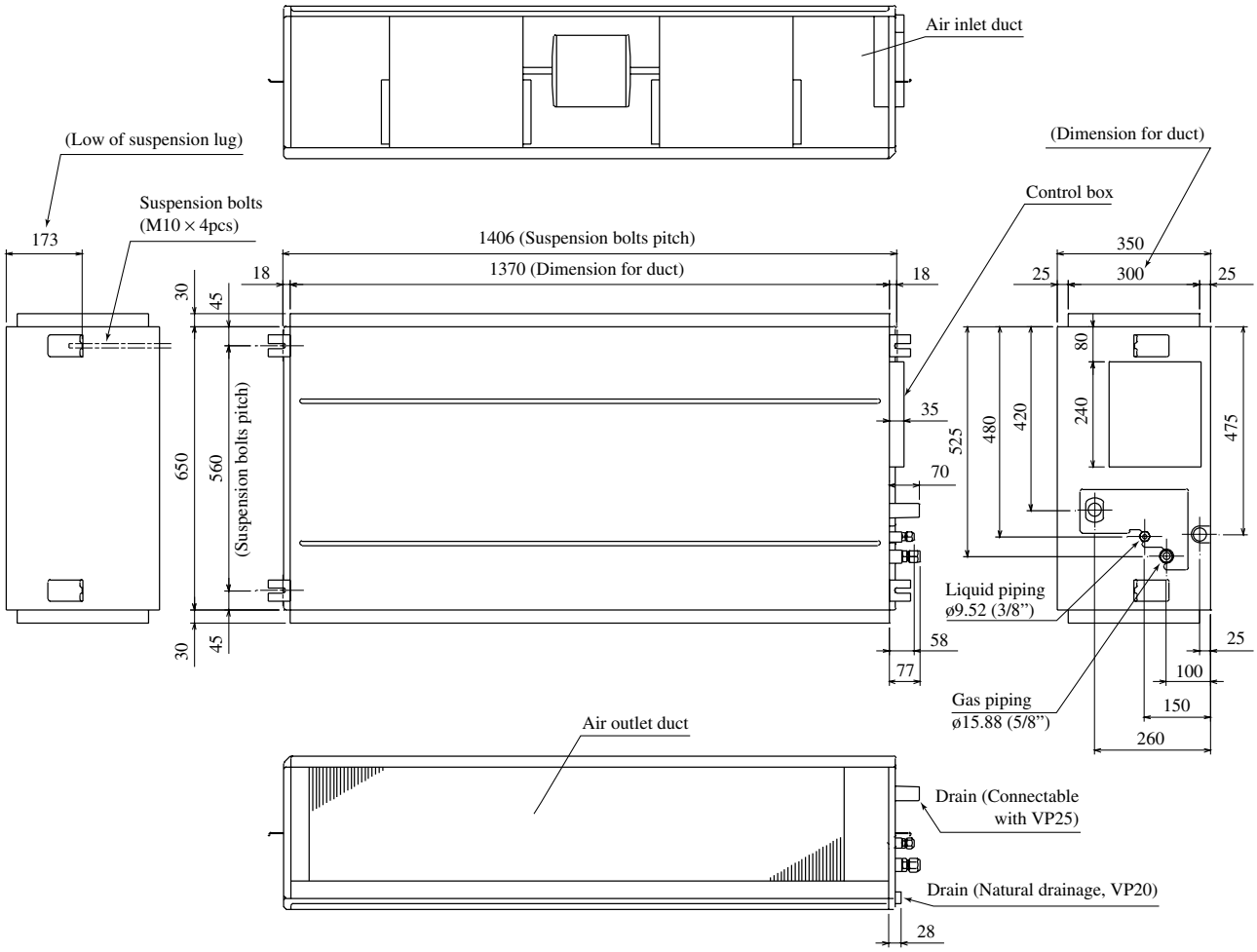
Space for installation and service



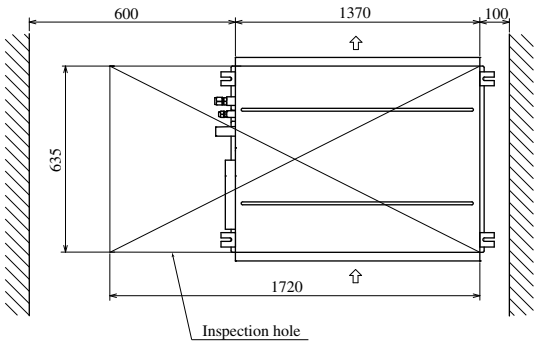


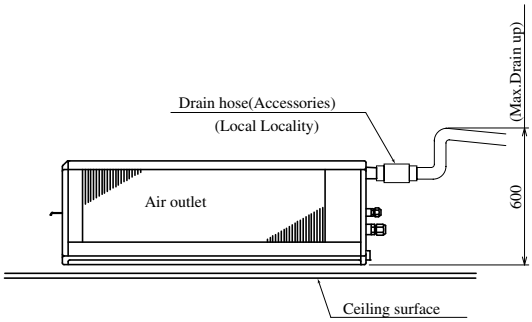
Models FDURA90KXE4, 112KXE4, 140KXE4

Unit : mm



Space for installation and service

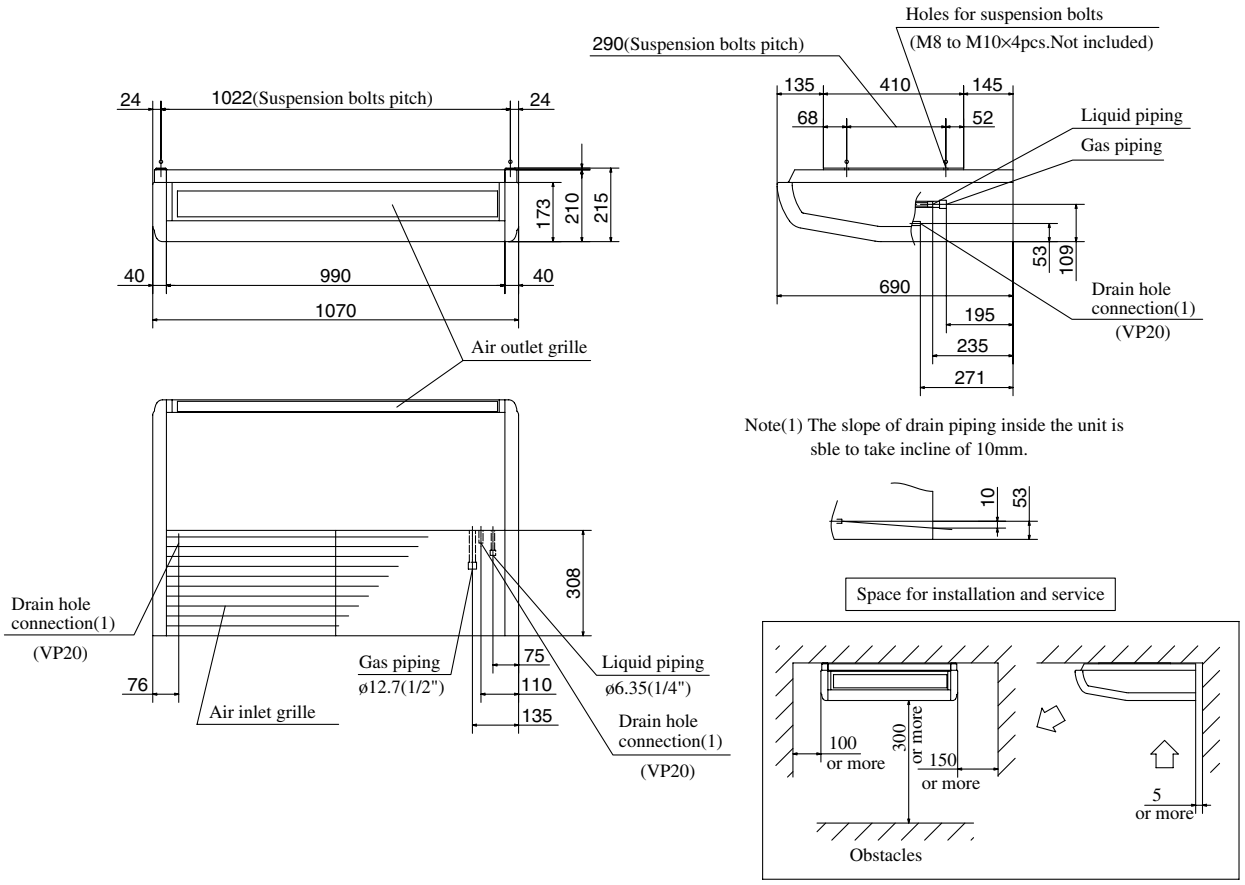




(i) Ceiling suspension type (FDE)

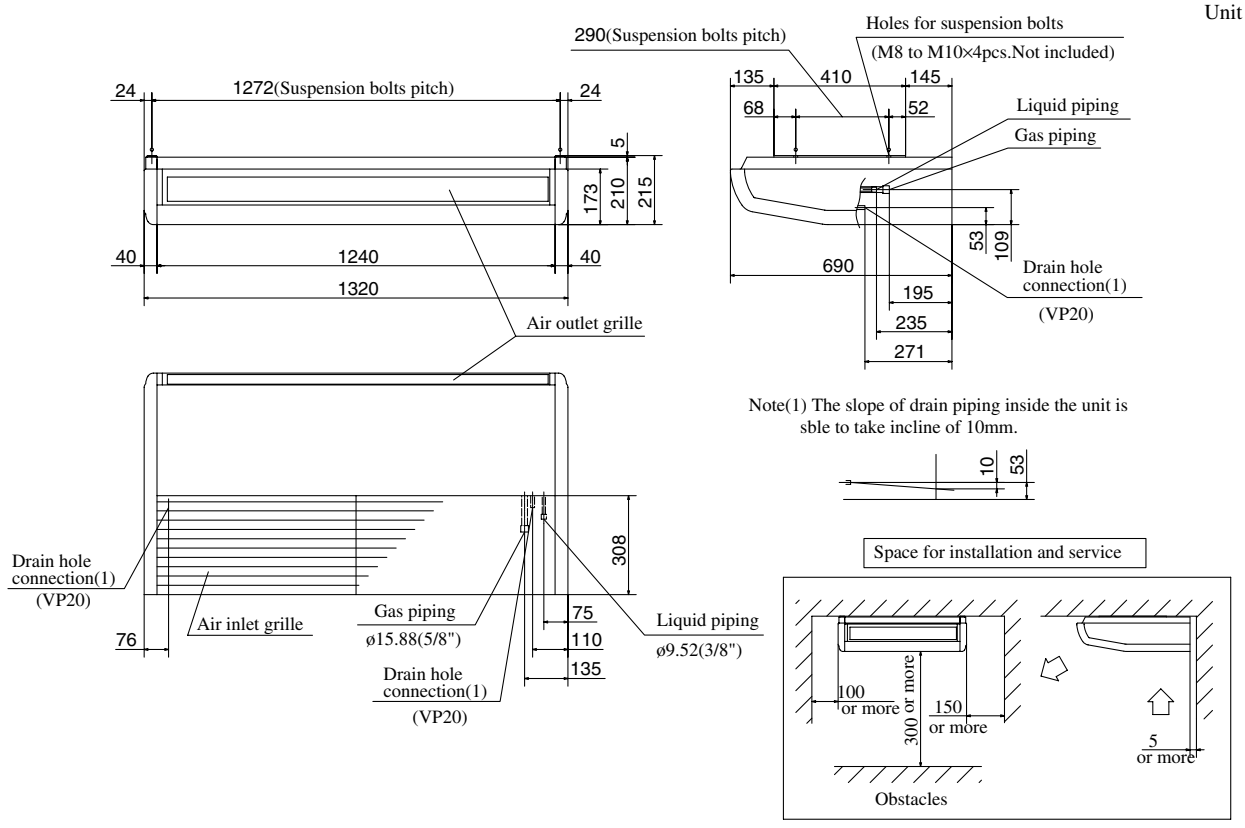
Models FDEA36KXE4, 45KXE4, 56KXE4

Unit : mm



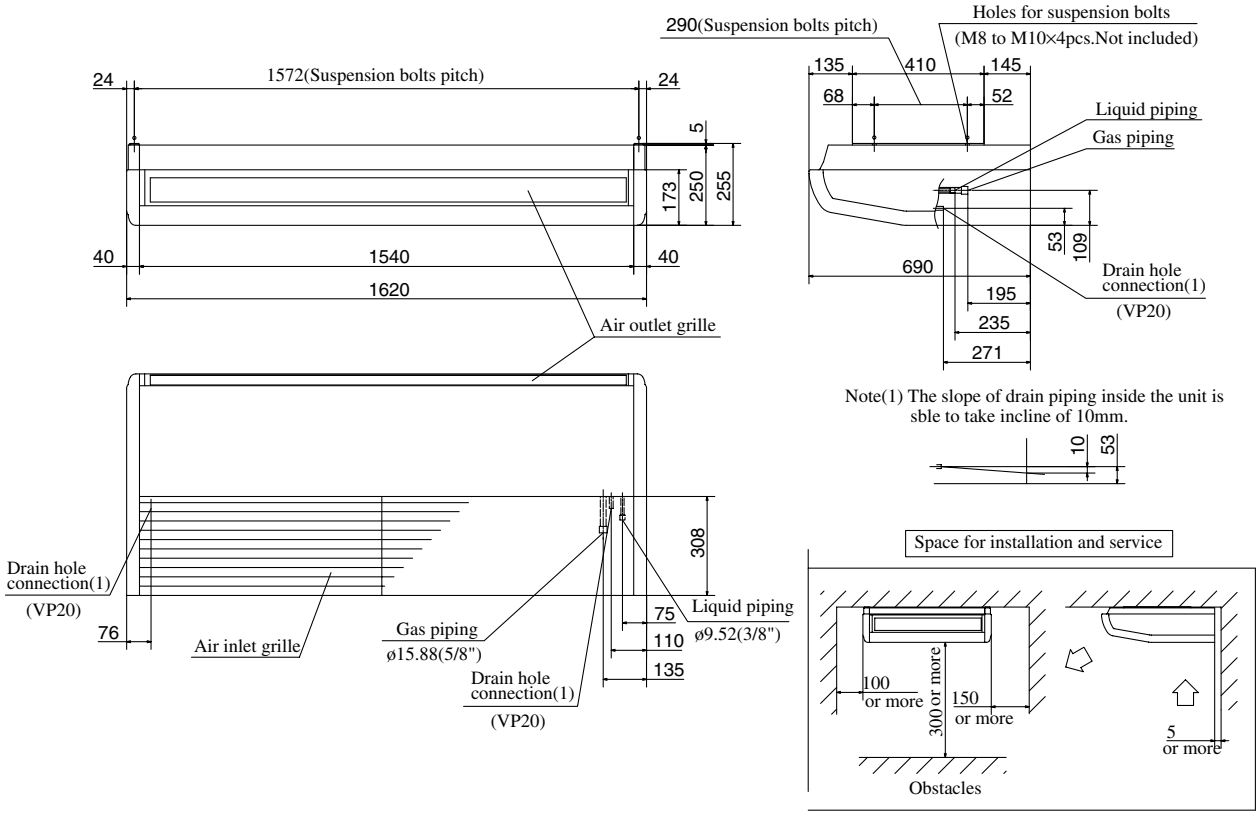
Model FDEA71KXE4

Unit : mm



Models FDEA112KXE4, 140KXE4

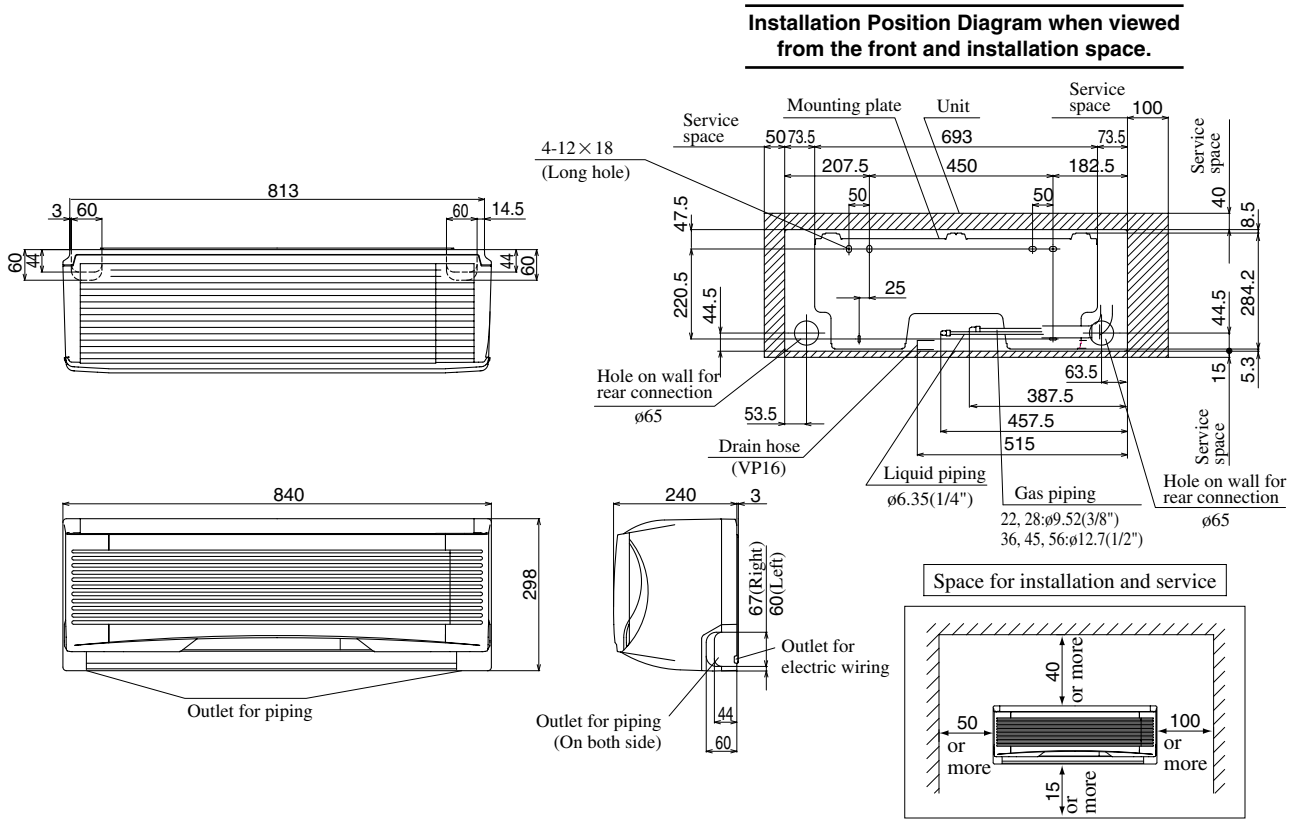
Unit : mm



(j) Wall mounted type (FDK)

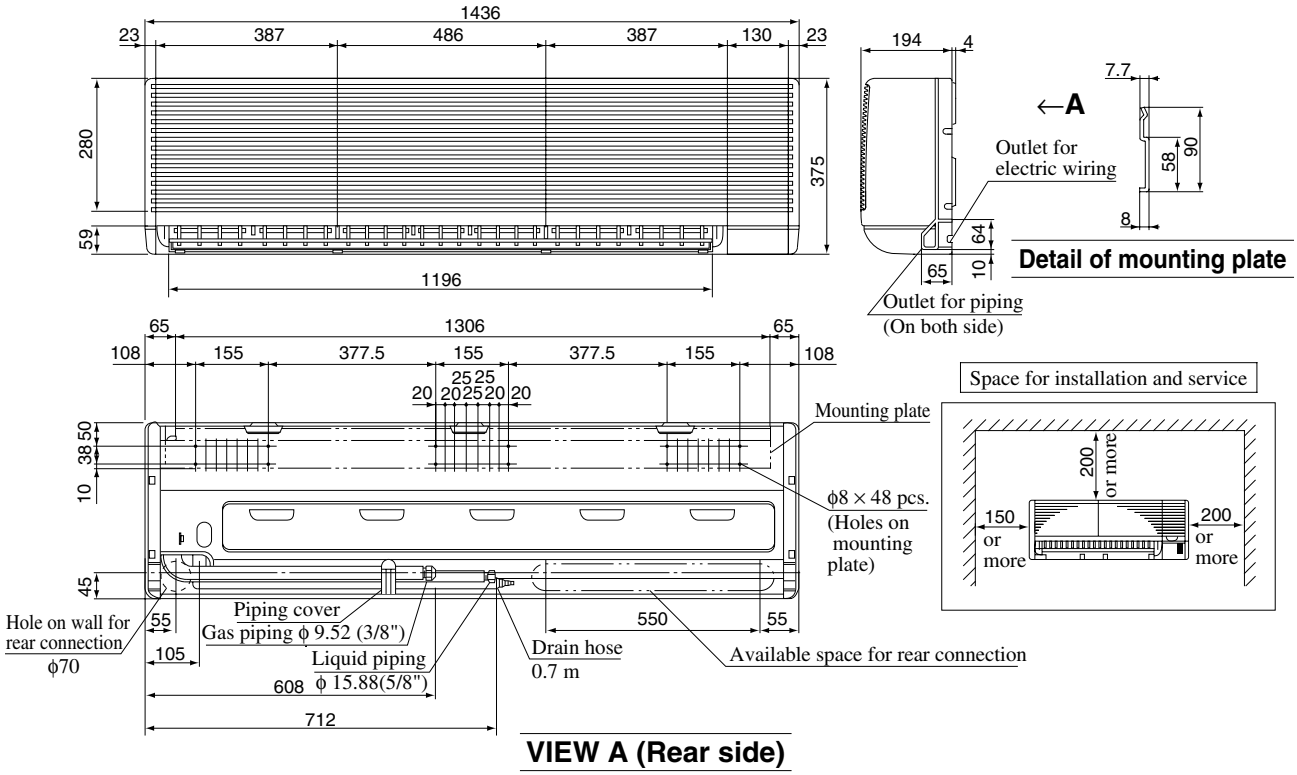
Models FDKA22KXE4, 28KXE4, 36KXE4, 45KXE4, 56KXE4

Unit : mm



Model FDKA71KXE4

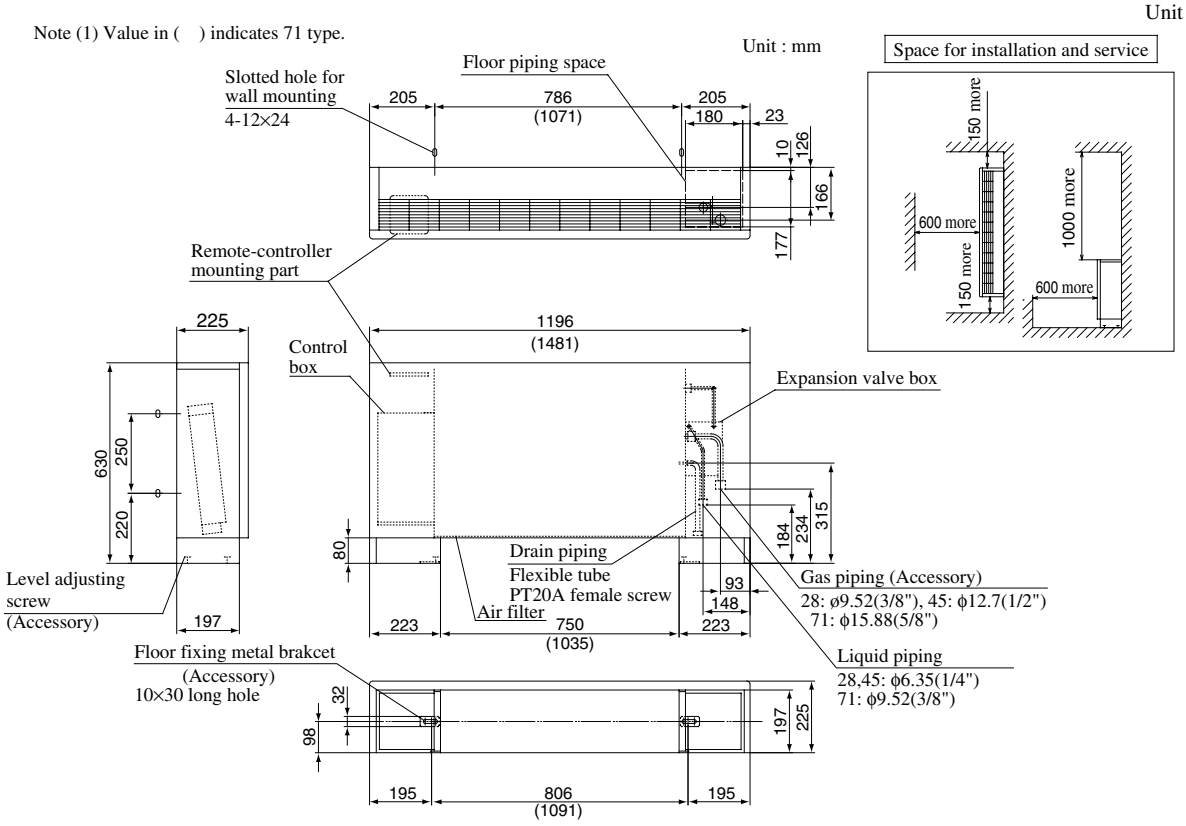
Unit : mm



(k) Floor standing exposed type (FDFL)

Models FDFLA28KXE4, 45KXE4, 71KXE4

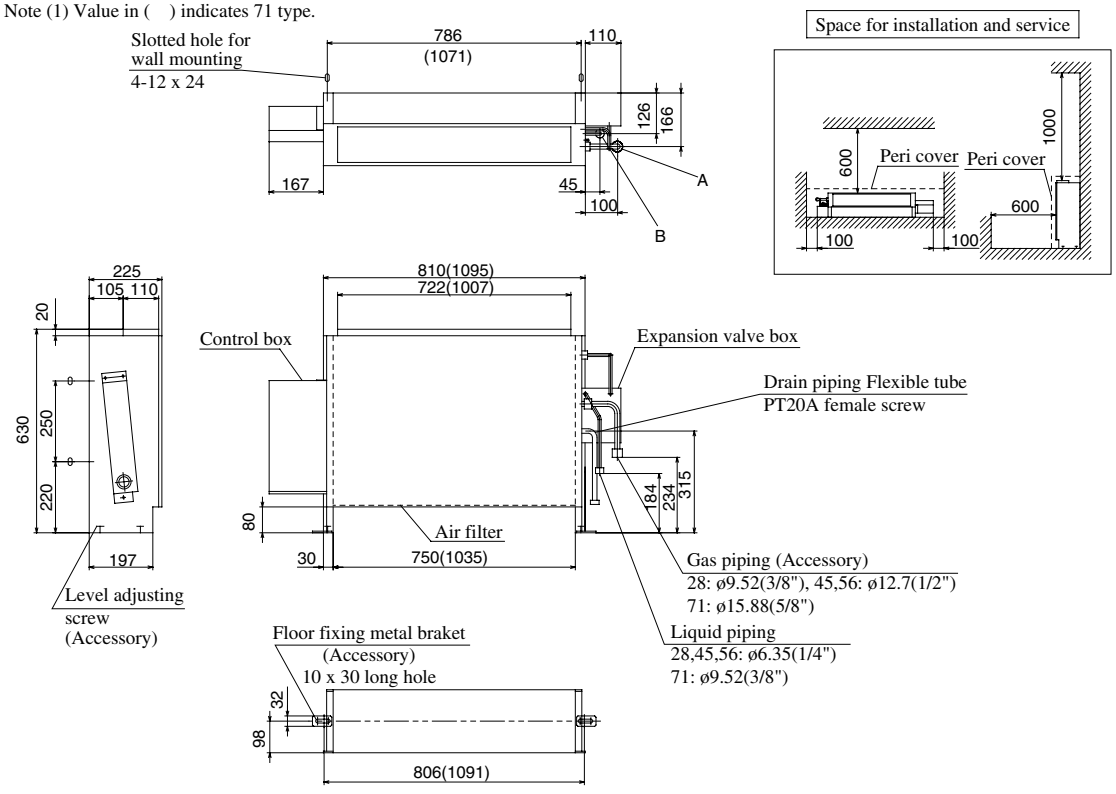
Unit : mm



(l) Floor standing hidden type (FDFU)

Models FDFUA28KXE4, 45KXE4, 56KXE4, 71KXE4

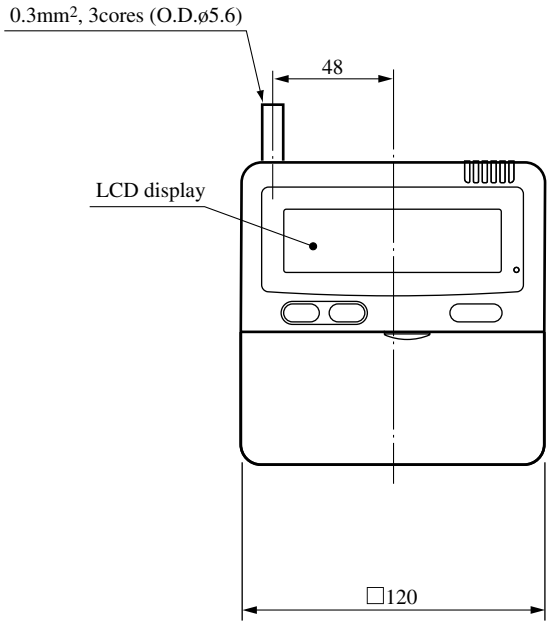
Unit : mm



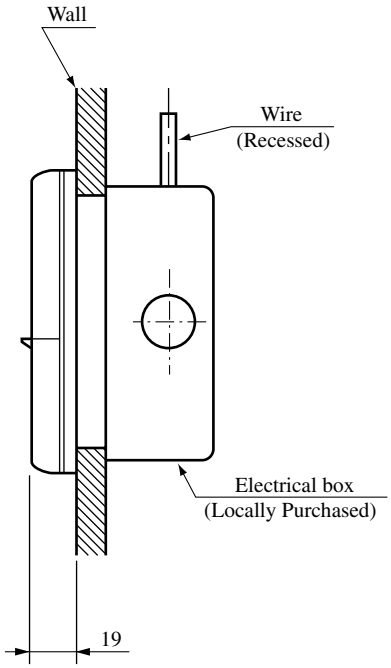
(2) Remote controller (Optional parts)

Unit : mm

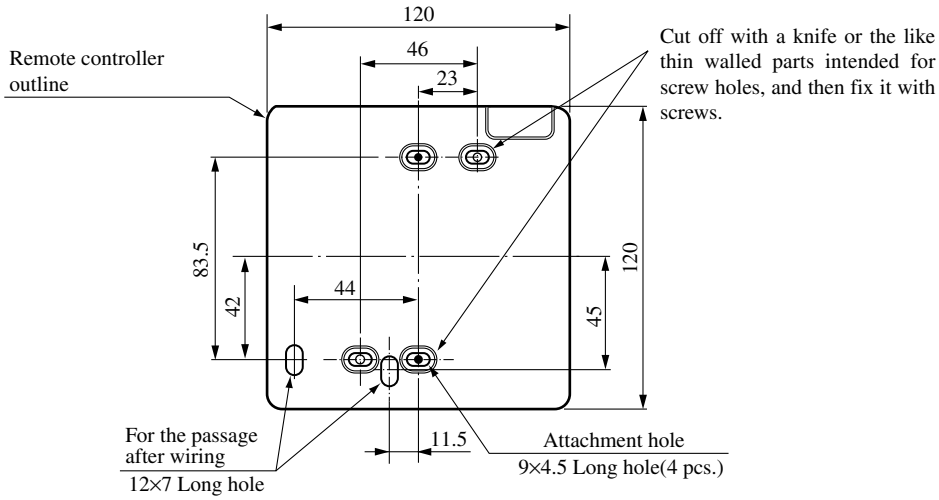
Installation with wiring exposed



Installation with wiring recessed



Remote controller mounting dimensions



Precation in Extending the Remote control cord

▶ Maximum total extension 600m.

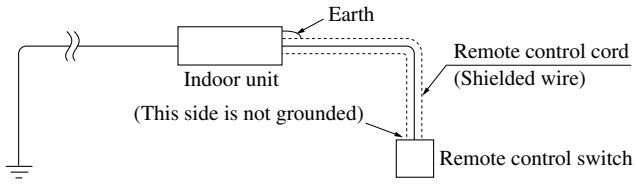
The cord should be a shielded wire.

● For all types : 0.3mm² × 3 cores

Note: (1) Use cables up to 0.5mm² (maximum) for those laid inside the remote control unit casing and connect to a different size cable at a vicinity point outside the remote control unit, if necessary.

Within 100-200m····· 0.5 mm² × 3 cores
Within 300m····· 0.75 mm² × 3 cores
Within 400m····· 1.25 mm² × 3 cores
Within 600m····· 2.0 mm² × 3 cores

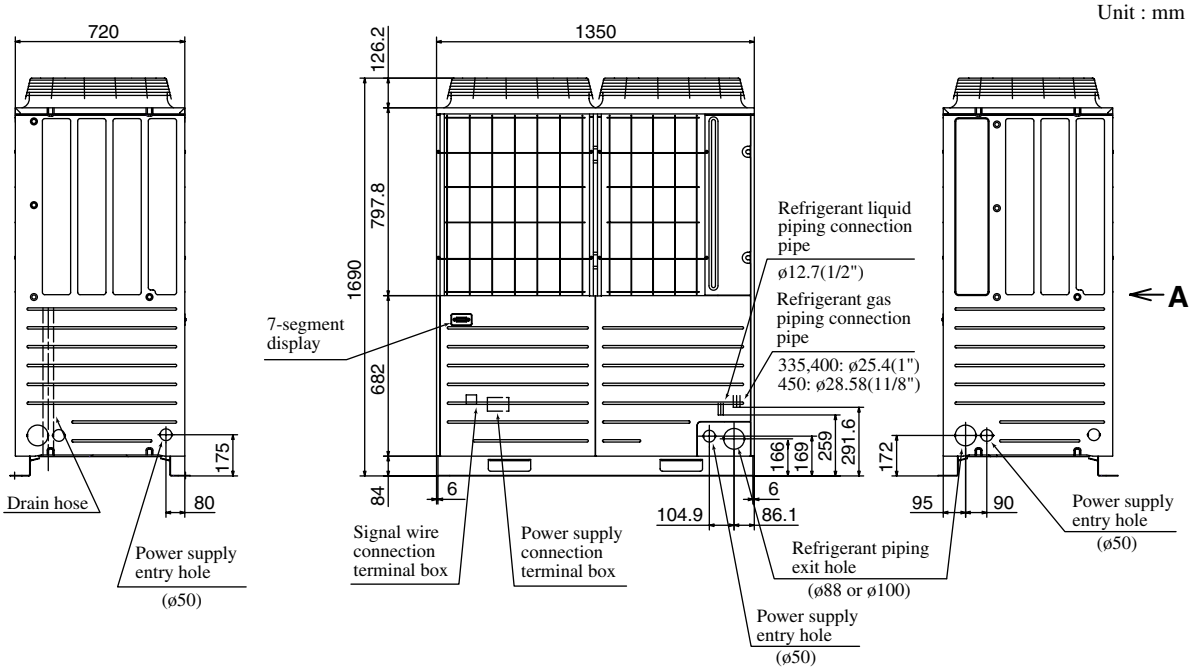
● The shielded wire should be grounded at one side only.

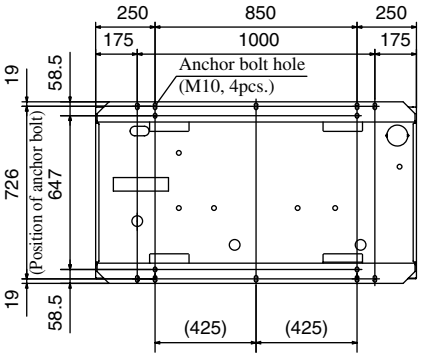


(3) Outdoor unit

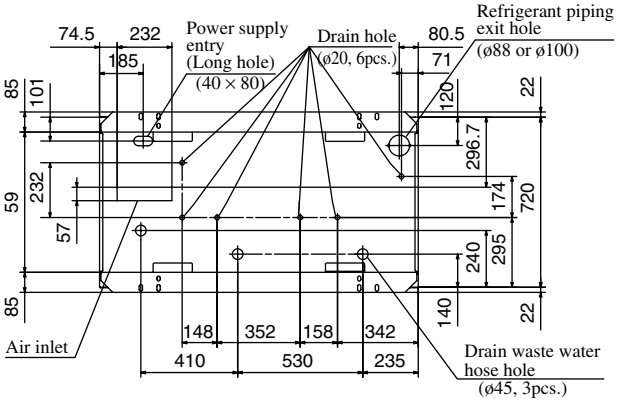
Models FDCA335HKXE4, 400HKXE4, 450HKXE4

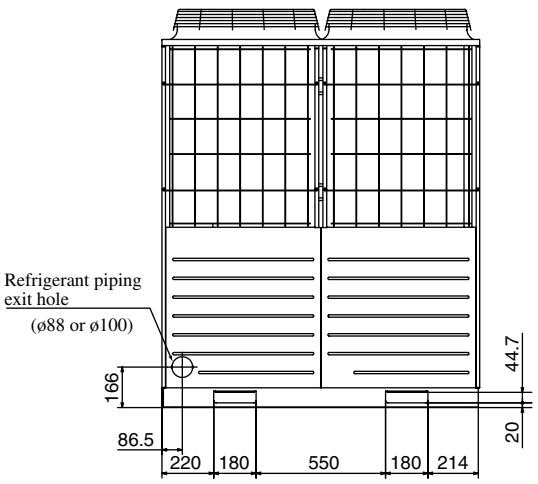
Unit : mm





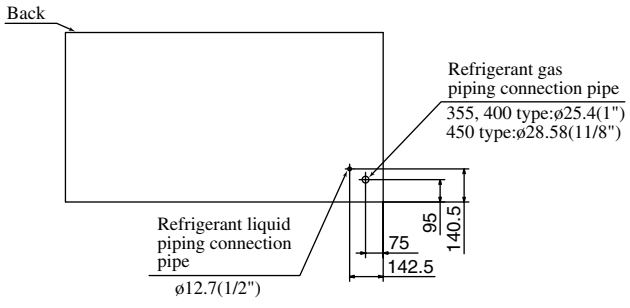
For dimensions of anchor bolt hole





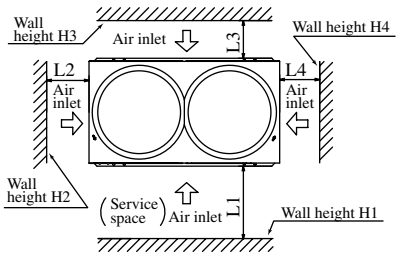
VIEW A

Dimesions after connecting included refrigerant piping (Top view)



Unit:mm

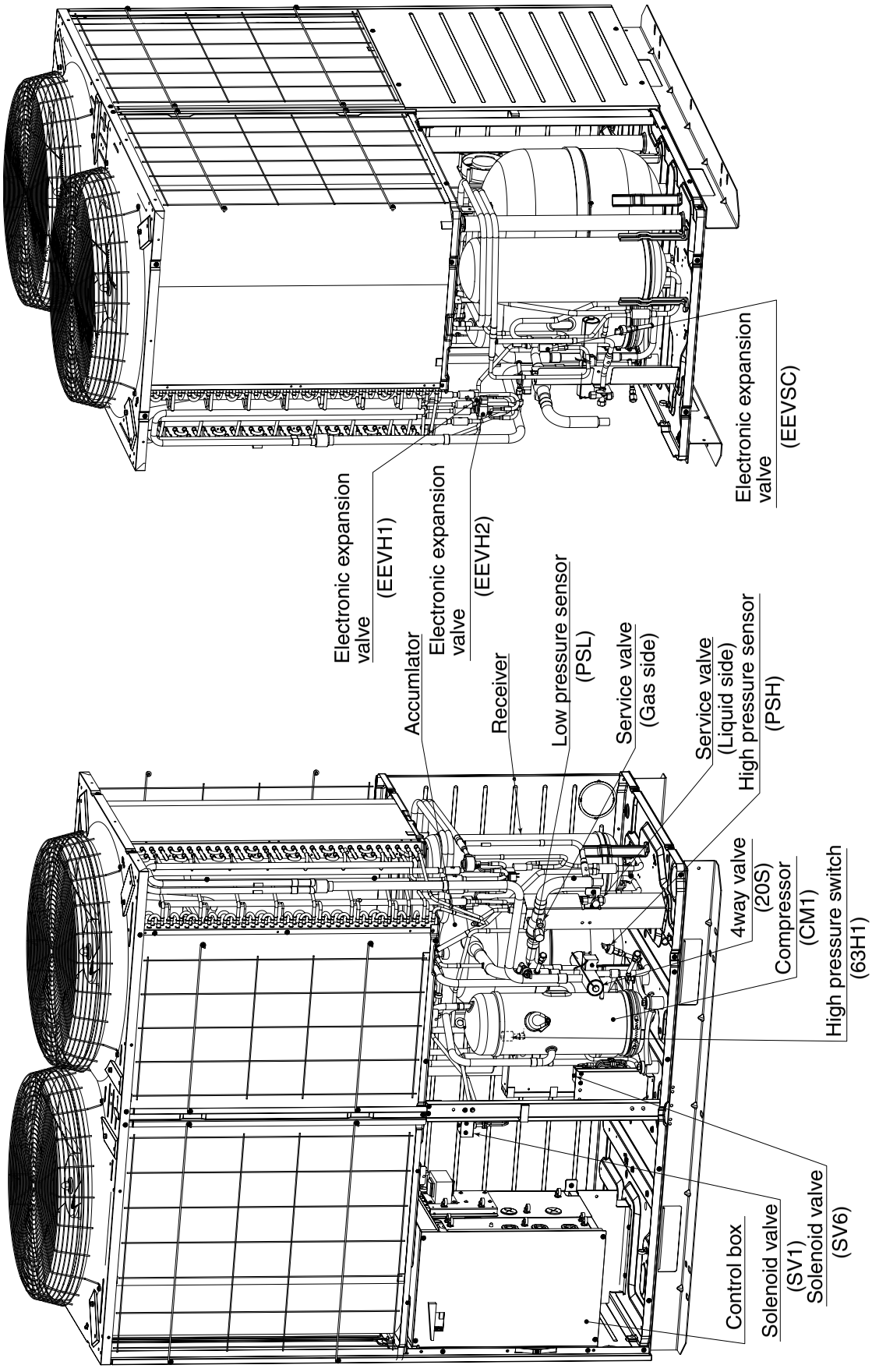
Dimensions \ Installation example	1	2
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	——
H2	Not limited	Not limited
H3	1000	Not limited
H4	Not limited	——



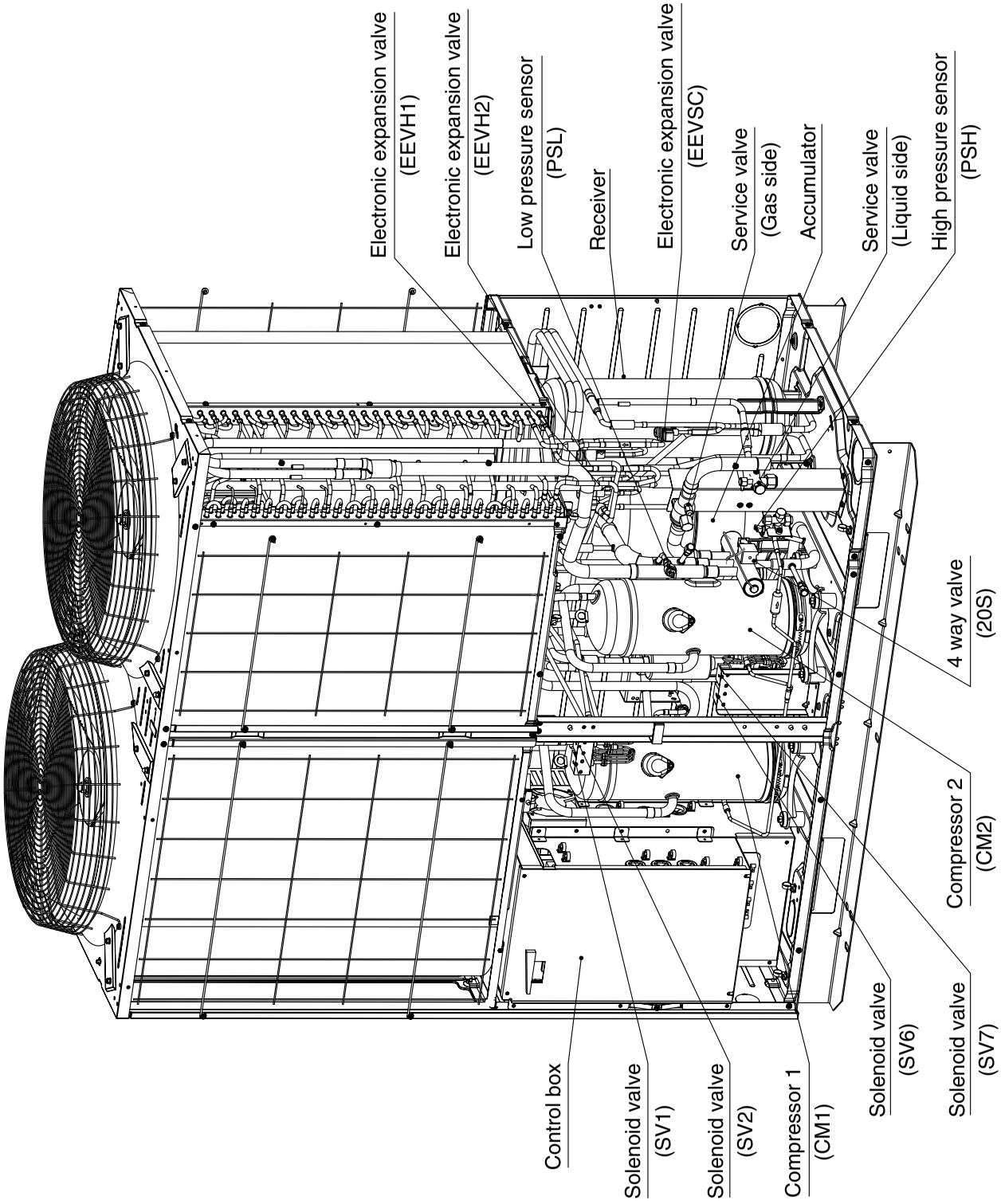
2.4 Inseide view

(1) Outdoor unit

Model FDCA335HKXE4



Models FDCA400HKXE4, 450HKXE4

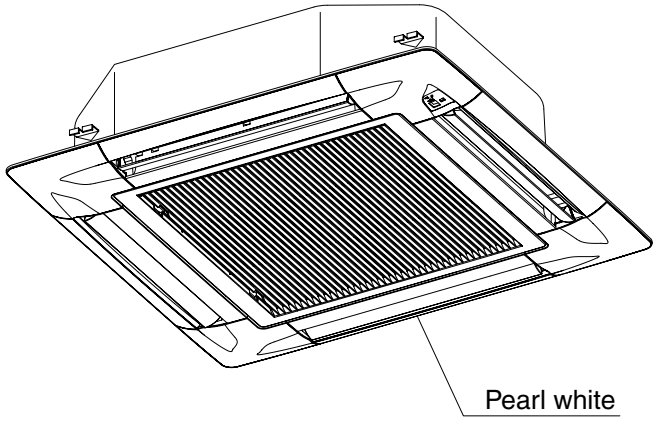


2.5 Exterior appearance

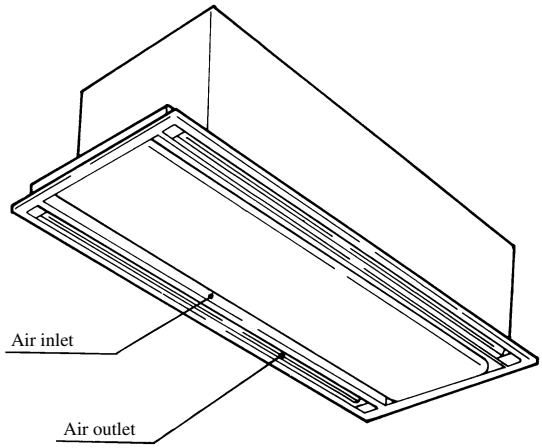
(1) Indoor unit

(a) Ceiling recessed type (FDT)

- Decorative panel



(b) 2-way outlet ceiling recessed type (FDTW)



- Decorative panel

(i) Standard type

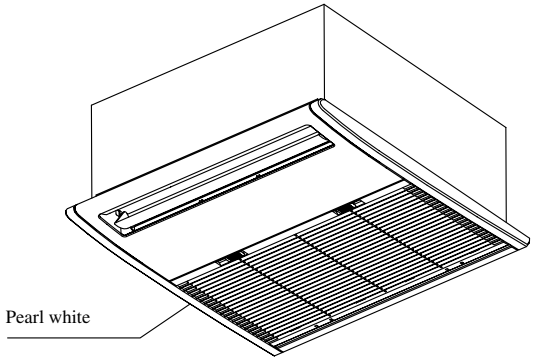
Panel part No.	Type	Panel color	Applicable model
TW-PSA-22W-E	With Auto swing	Pearl white	FDTW28, 45, 56
TW-PSA-32W-E			FDTW71, 90
TW-PSA-42W-E			FDTW112, 140

(ii)Attachment of ceiling material type

Panel part No.	Type	Panel color	Applicable model
TW-PSB-28W-E	With Auto swing	Misty white	FDTW28, 45, 56
TW-PSB-38W-E			FDTW71, 90
TW-PSB-48W-E			FDTW112, 140

(c) Ceiling recessed single air supply port type (FDTQ)

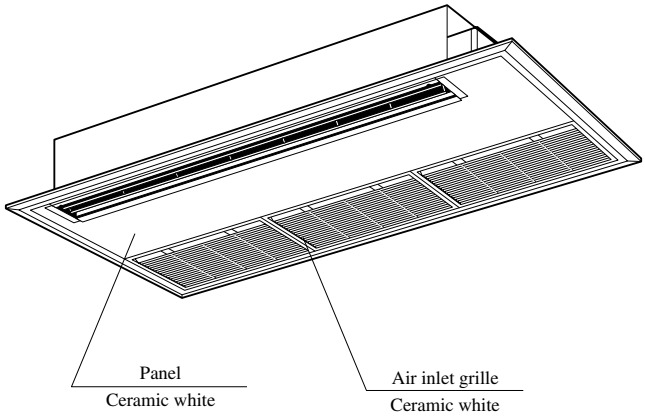
This illustration shows the direct blow panel (TQ-PSA-13W-E). Painting color is the same for other panels.



- Decorative panel

Panel part No.		Type	Panel color	Applicable model
Direct blow panel	TQ-PSA-13W-E	With Auto swing	Pearl white	FDTQ22, 28, 36
	TQ-PSB-13W-E			
Duct panel	QR-PNA-13W-E	Non Auto swing	Pearl white	FDTQ22, 28, 36
	QR-PNB-13W-E			

(d) 1-way outlet ceiling recessed type (FDTS)

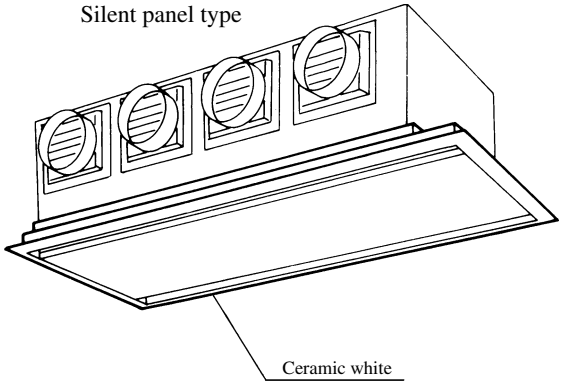


- Decorative panel

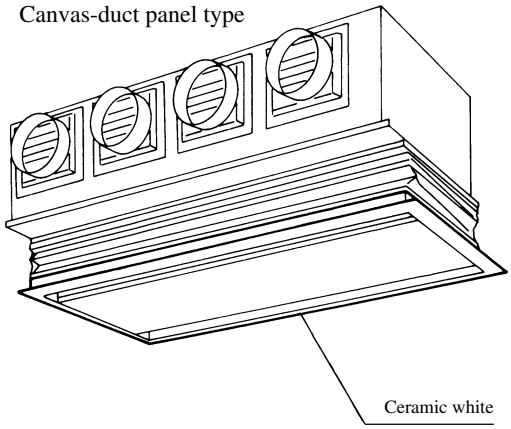
Panel part No.	Type	Panel color	Applicable model
TS-PSA-27W-E	With Auto swing	Ceramic white	FDTS22, 28, 36, 45
TS-PSA-37W-E			FDTS71

(e) Cassetteria type (FDR)

Silent panel type



Canvas-duct panel type

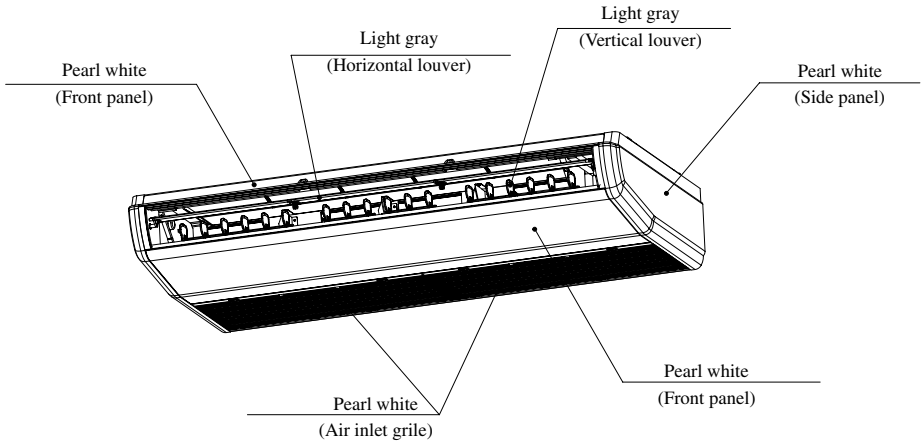


(f) Medium static pressure ducted type (FDQM) .....Zinc steel plate

(g) Satellite ducted type (FDQM, FDUM) ..... Zinc steel plate

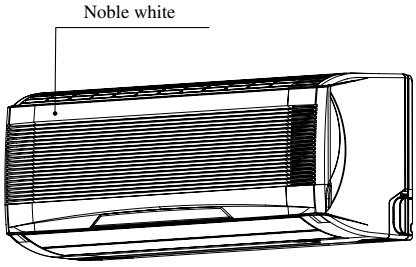
(h) Ceiling mounted duct type (FDUR) ..... Zinc steel plate

(i) Ceiling suspension type (FDE)

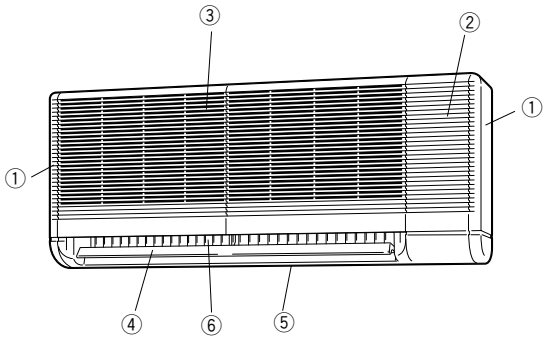


(j) Wall mounted type (FDK)

Models FDKA22~56KXE4

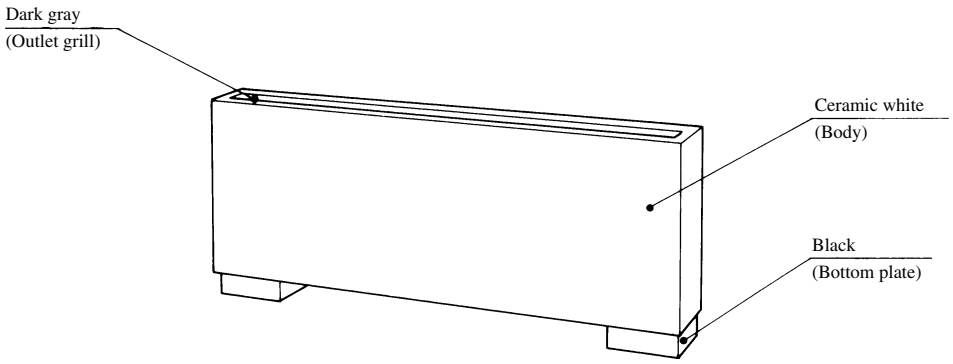


Model FDKA71KXE4



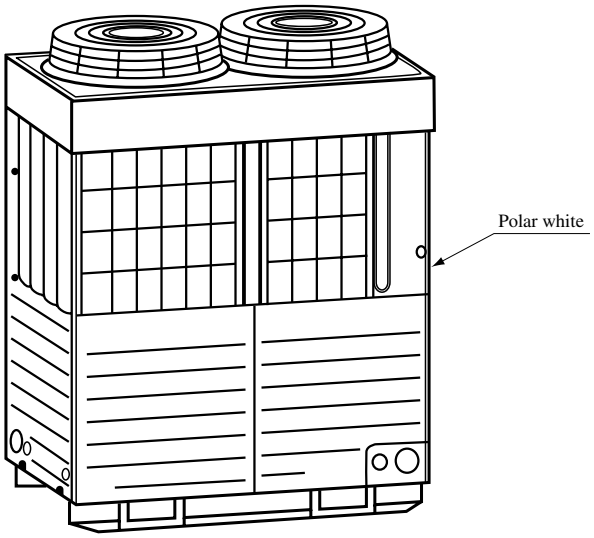
No.	Parts name	Color
①	Side plate	Ceramic white
②	Front panel	
③	Inlet grill	
④	Flap	
⑤	Bottom plate	
⑥	louver	Light gray

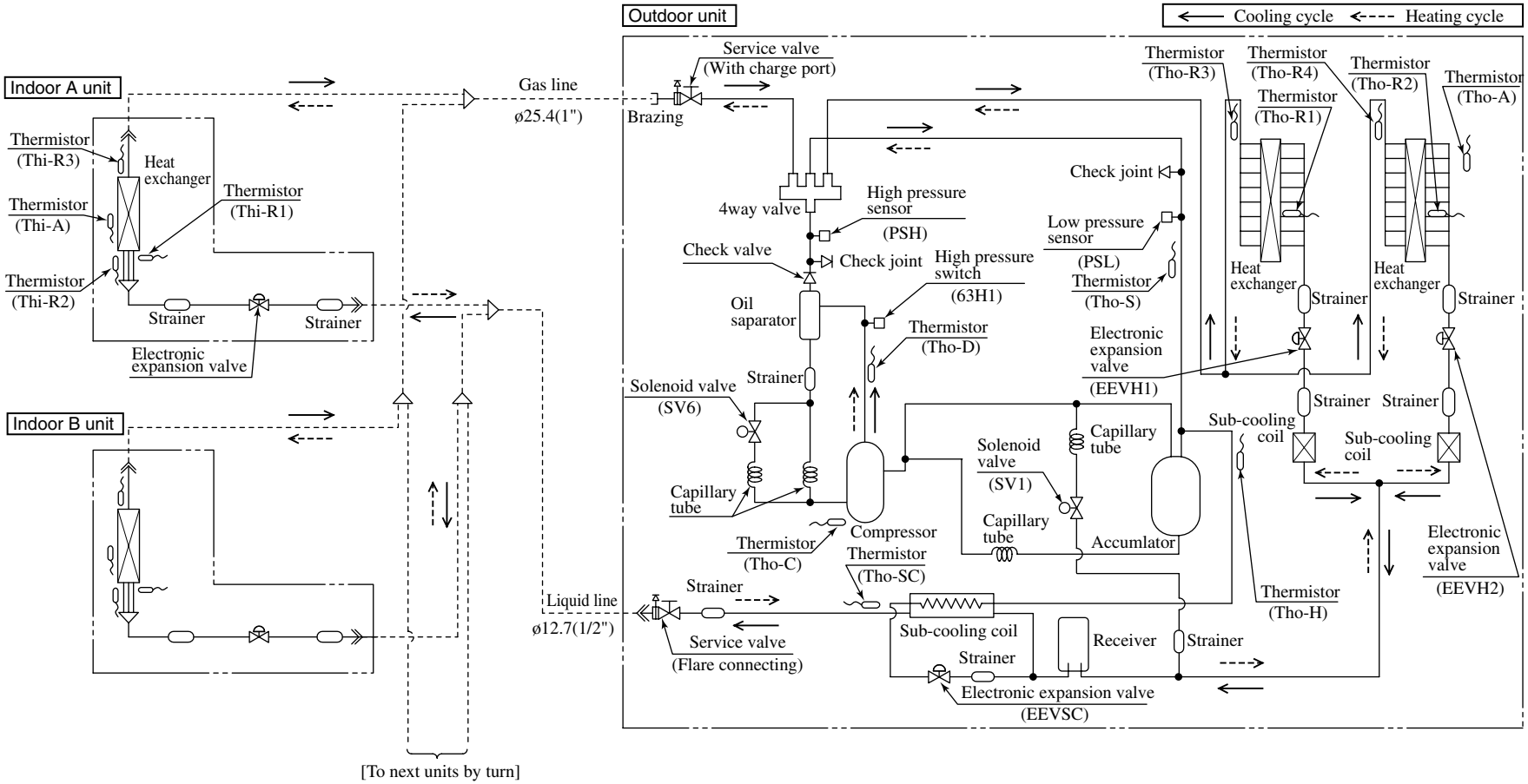
(k) Floor standing exposed type (FDFL)



(l) Floor standing hidden type (FDFU) ..... Zinc steel plate

(2) Outdoor unit

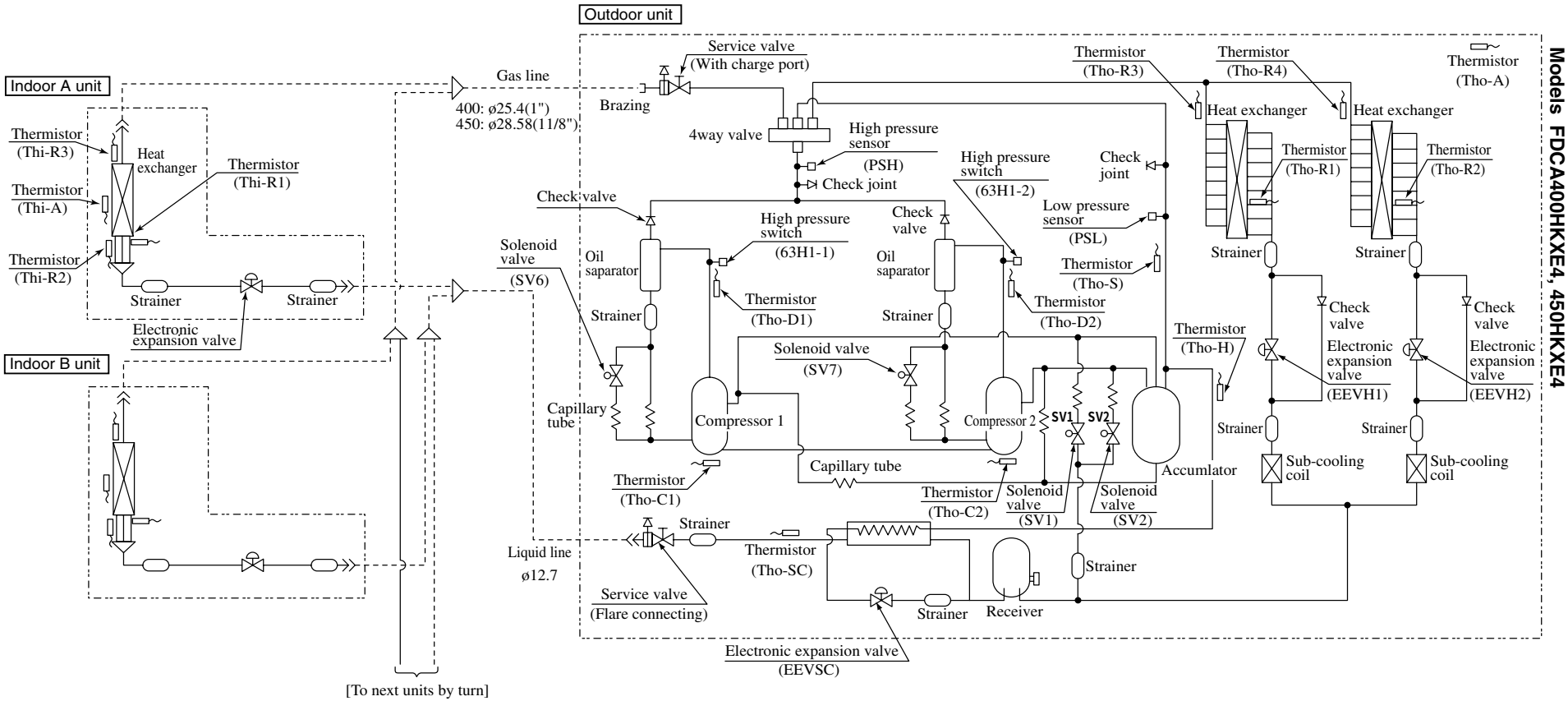




Notes (1) Preset point of protective devices
63H1: Open 3.8MPa, Close 2.9MPa
(For protection)

(2) Function of thermistor
PSH: ON 3.50MPa
(For compressor control of cooling operation)
ON 3.00MPa
(For compressor control of heating operation)
PSL: ON 0.18MPa, OFF 0.20MPa
(For compressor control)
ON 0.18MPa, OFF 0.18MPa
(For protection)

Thı-R1, R2: Heating operation : Indoor fan control.
Cooling operation : Frost prevention control.
Super heat control.
Thı-R3: For super heat control of cooling operation.
Tho-D: For control of discharge pipe temperature.
Tho-C: For control of temperature under the dome.
Tho-S: For control of suction pipe temperature.
Tho-R1, R2: For control of defrosting.
Tho-A: For control of defrosting.
Tho-R3, R4: Electronic expansion valve (EEVH1, 2) control of heating operation
Tho-SC: Electronic expansion valve (EEVSC) control of cooling operation.
Tho-H: For super heat control of sub-cooling coil.



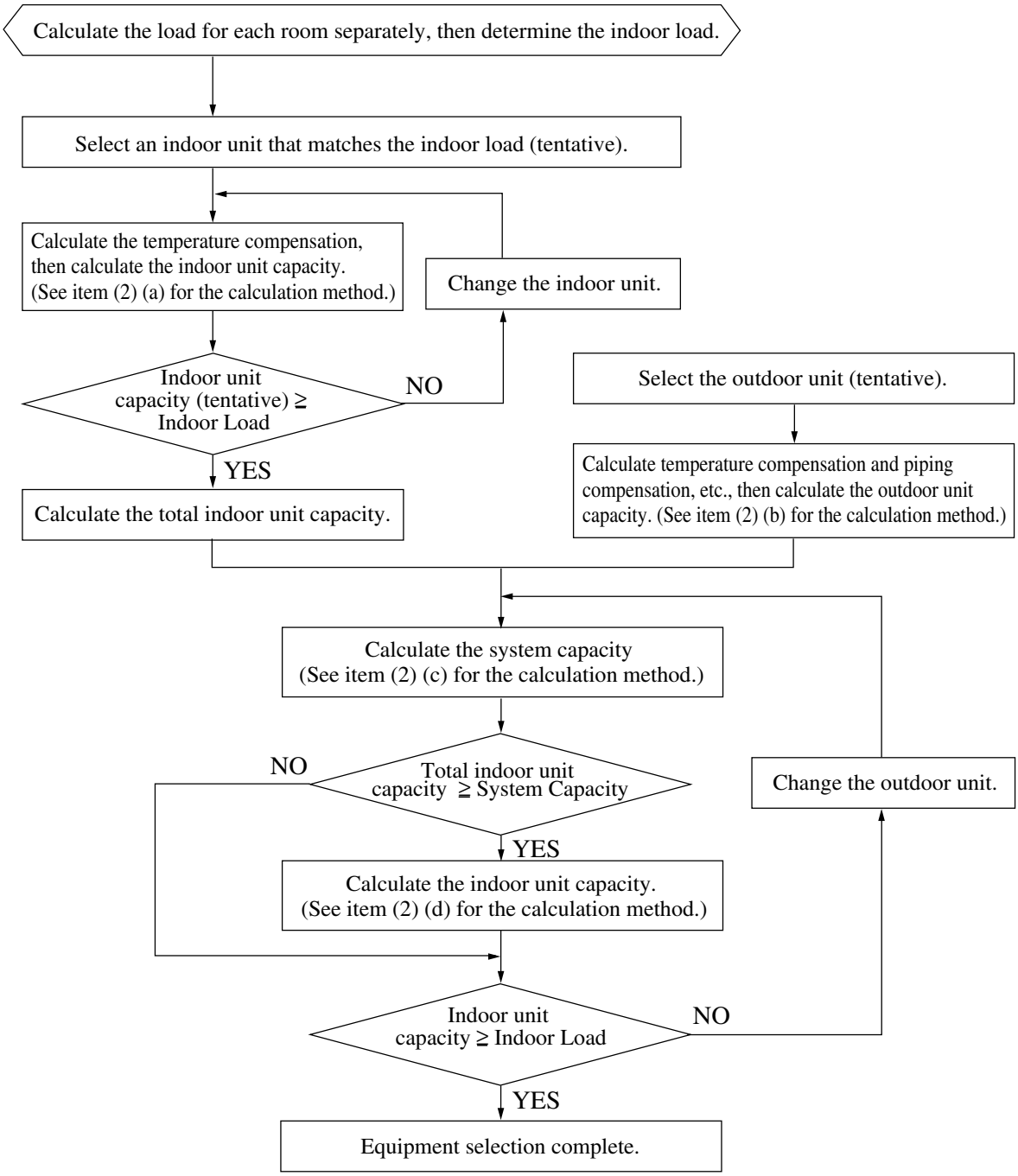
Notes (1) Preset point of protective devices
63H1-1, 2: Open 4.15MPa, Close 3.15MPa
(For protection)

(2) Function of thermistor
PSH: ON 3.70MPa
(For compressor control of cooling operation)
ON 3.00MPa
(For compressor control of heating operation)
PSL: ON 0.18MPa, OFF 0.20MPa
(For compressor control)
ON 0.18MPa, OFF 0.18MPa
(For protection)

Thı-R1, R2: Heating operation : Indoor fan control.
Cooling operation : Frost prevention control.
Super heat control.
Thı-R3: For super heat control of cooling operation.
Tho-D: For control of discharge pipe temperature.
Tho-C: For control of temperature under the dome.
Tho-S: For control of suction pipe temperature.
Tho-R1, R2: For control of defrosting.
Tho-A: For control of defrosting.
Tho-R3, R4: Electronic expansion valve (EEVH1, 2) control of heating operation
Tho-SC: Electronic expansion valve (EEVSC) control of cooling operation.
Tho-H: For super heat control of sub-cooling coil.

2.7 Selection chart

(1) Equipment selection flow



(2) Capacity calculation method

(a) Calculating the indoor unit capacity compensation

Indoor unit capacity (cooling, heating) = Indoor unit total rated capacity
× capacity compensation coefficient according to temperature conditions

See item (3) (a) concerning the capacity compensation coefficient according to temperature conditions.

(b) Calculating the outdoor unit capacity compensation

Outdoor Unit Capacity (Cooling, Heating) = Outdoor unit rated capacity (rated capacity when 100% connected)
× capacity compensation coefficient according to temperature conditions
× Capacity compensation coefficient according to piping length
× Capacity compensation coefficient according to height difference
× Heating capacity compensation coefficient according to condensation
× Capacity compensation coefficient according to indoor unit connection capacity

① See item (3) (a) concerning the capacity compensation coefficient according to temperature conditions.

② See item (3) (b) concerning the capacity compensation coefficient according to piping length.
In the case of cooling capacity compensation, the compensation coefficient differs depending on the piping size if the length exceeds 90 m, so exercise caution. The compensation coefficient is the same in the case of heating capacity compensation regardless of the model (horsepower).

③ See item (3) (c) concerning the capacity compensation coefficient according to height difference. This compensation should be carried out only in cases where the outdoor unit is lower during cooling and higher during heating.

④ See item (3) (d) concerning the heating capacity compensation coefficient according to condensation. This compensation should be carried out only when calculating the heating capacity.

⑤ See item (3) (e) concerning the capacity compensation coefficient according to indoor unit connected capacity. This compensation should be carried out only in cases where the indoor unit total capacity is 100% or higher.

(c) Calculating system capacity

Compare the capacities determined in items (a) and (b) above and let the smaller value be the system capacity (cooling, heating).

① In cases where indoor unit total capacity (cooling, heating) > outdoor unit capacity (cooling, heating)
System capacity (cooling, heating) = Outdoor unit capacity (cooling, heating)

② In cases where indoor unit total capacity (cooling, heating) < outdoor unit capacity (cooling, heating)
System capacity (cooling, heating) = Indoor unit capacity (cooling, heating)

(d) Calculating indoor unit capacity [item (c) ①only]

Indoor unit capacity (cooling, heating) = System capacity (cooling, heating)
× [(Indoor unit capacity) / (Indoor unit total capacity)]

Capacity calculation examples

Example 1

Cooling (when the indoor unit connected total capacity is less than 100%)

- Outdoor unit FDCA450HKXE4 ..... 1 Unit
- Indoor unit FDTA71KXE4 ..... 5 Units
- Piping length ..... 60 m (Equivalent length)
- Indoor, outdoor unit height difference ..... 15 m (Outdoor unit is lower)
- Temperature conditions ..... Outdoor temperature: 33°C DB
- Temperature conditions ..... Indoor temperature: 19°C WB

<Indoor unit total cooling capacity>: Item (2) (a) calculation.

- Indoor unit rated cooling capacity: 7100W
- Capacity compensation coefficient according to temperature conditions:
  1.0 (Calculated according to Indoor 19°C WB / Outdoor 33°C DB) Indoor unit cooling capacity: 7100 W × 1.0 = 7100 W
- Indoor unit total cooling capacity calculation; indoor unit total cooling capacity: 7100 W × 5 units = <u>35500 W</u>

<Outdoor unit maximum cooling capacity> : Item (2) (b) calculation

- Outdoor unit rated cooling capacity: 45000 W
- Capacity compensation coefficient according to temperature conditions:
  1.0 (Calculated according to Indoor 19°C WB / Outdoor 33°C DB) Outdoor unit cooling capacity: 45000 W × 1.0 = 45000 W
- Capacity compensation coefficient according to piping length:
  0.94 (calculated according to 60 m length); 45000 W × 0.94 = 42300 W
- Capacity compensation coefficient according to height difference:
  0.97 (calculated according to 15 m difference); 42300 W × 0.97 ≒ <u>41000 W</u>

• Capacity compensation coefficient according to indoor unit connected total capacity:
1.0 (45 × 5) / 450 < 100%); No compensation

<System cooling capacity>: Item (2) (c) calculation

Compare the indoor unit total cooling capacity and the outdoor unit maximum cooling capacity. The smaller value is the actual system cooling capacity.

• Indoor unit total cooling capacity: 35500 W ⇨ System cooling capacity: 35500 W
• Outdoor unit maximum cooling capacity: 41000 W

<Indoor unit capacity compensation> No compensation (7100 W)

Example 2

Cooling (when the indoor unit connected total capacity is 100% or higher)

• Outdoor unit FDCA450HKXE4 ..... 1 Unit
• Indoor unit FDTA71KXE4 ..... 7 Units
• Piping length ..... 120 m (Equivalent length)
• Indoor, outdoor unit height difference ..... 15 m (Outdoor unit is higher)
• Temperature conditions ..... Outdoor temperature: 35°C DB
• Temperature conditions ..... Indoor temperature: 18°C WB

<Indoor unit total cooling capacity>: Item (2) (a) calculation.

• Indoor unit rated cooling capacity: 7100W
• Capacity compensation coefficient according to temperature conditions:
0.95 (Calculated according to Indoor 18°C WB / Outdoor 35°C DB) Indoor unit cooling capacity: 7100 W × 0.95 ≒ 6700 W
• Indoor unit total cooling capacity calculation; indoor unit total cooling capacity: 6700 W × 7 units = 46900 W

<Outdoor unit maximum cooling capacity> : Item (2) (b) calculation

• Outdoor unit rated cooling capacity: 45000 W
• Capacity compensation coefficient according to temperature conditions:
0.95 (Calculated according to Indoor 18°C WB / Outdoor 35°C DB) Outdoor unit cooling capacity: 45000 W × 0.95 ≒ 42800 W
• Capacity compensation coefficient according to piping length:
0.94 (calculated according to 120 m length); 42800 W × 0.94 ≒ 40200 W
• Capacity compensation coefficient according to height difference:
1.0 (the outdoor unit is higher during cooling) No compensation
• Capacity compensation coefficient according to indoor unit connected total capacity:
1.1 ((71 × 7) / 450 = 110%); 40200 W × 1.1 ≒ 44200 W

<System cooling capacity>: Item (2) (c) calculation

Compare the indoor unit total cooling capacity and the outdoor unit maximum cooling capacity. The smaller value is the actual system cooling capacity.

• Indoor unit total cooling capacity : 46900 W ⇨ System cooling capacity: 44200 W
• Outdoor unit maximum cooling capacity : 44200 W

<Indoor unit cooling capacity Compensation>: Item (2) (d) calculation.

$$\frac{44200 \times 7100\ \text{W}}{46900\ \text{W}} \fallingdotseq 6700\ \text{W}$$

Example 3

Heating (when the indoor unit connected total capacity is 100% or higher)

• Outdoor unit FDCA450HKXE4 ..... 1 Unit
• Indoor unit FDTA71KXE4 ..... 7 Units
• Piping length ..... 60 m (Equivalent length)
• Indoor, outdoor unit height difference ..... 20 m (Outdoor unit is higher)
• Temperature conditions ..... Outdoor temperature: 6°C WB
• Temperature conditions ..... Indoor temperature: 19°C DB

<Indoor unit total heating capacity>: Item (2) (a) calculation.

• Indoor unit rated heating capacity: 8000W
• Capacity compensation coefficient according to temprature conditions:
1.04 (Calculated according to Outdoor 6°C WB / Indoor 19°C DB) Indoor unit heating capacity: 8000 W × 1.04 ≒ 8300 W
• Indoor unit total heating capacity calculation; indoor unit total heating capacity: 8300 W × 7 units ≒ 58100 W

<Outdoor unit maximum heating capacity> : Item (2) (b) calculation

• Outdoor unit rated heating capacity: 50000 W
• Capacity compensation coefficient according to temperature conditions:
1.0 (Calculated according to Outdoor 6°C WB / Indoor 19°C DB) Outdoor unit heating capacity: 50000 W × 1.04 = 52000 W

• Capacity compensation coefficient according to piping length:
0.94 (calculated according to 60 m length); 52000 W × 0.94 ≒ 52300 W
• Capacity compensation coefficient according to height difference:
0.96 (calculated according to 20 m difference); 52300 W × 0.96 ≒ 50200 W
• Heating capacity compensation coefficient according to condensation: 0.92; 50200W × 0.92 ≒ 46200 W.
• Capacity compensation coefficient according to indoor unit connected total capacity:
1.13 (71 × 7) / 450W = 113%; 46200W × 1.13 ≒ 52200 W.

<System heating capacity>: Item (2) (c) calculation

Compare the indoor unit total heating capacity and the outdoor unit maximum heating capacity. The smaller value is the actual system heating capacity.

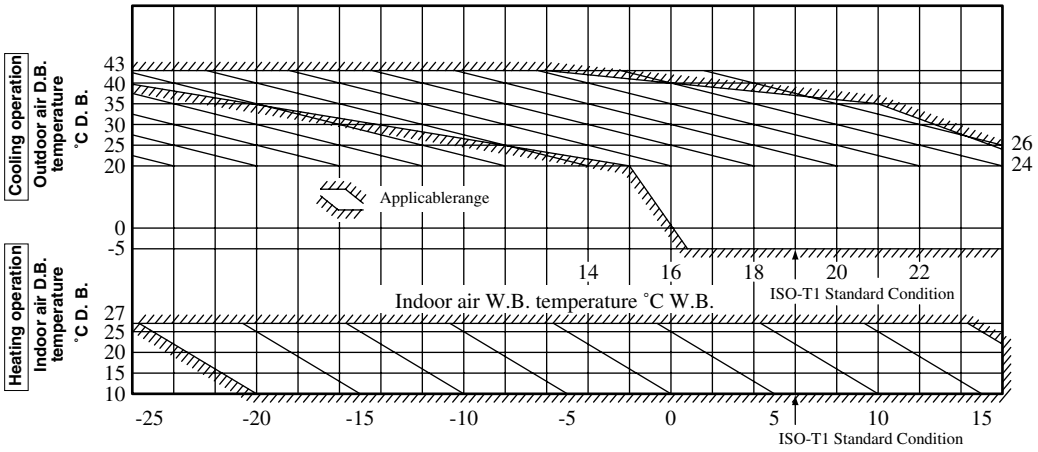
• Indoor unit total heating capacity : 58100 W ⇨ System heating capacity: 52200 W
• Outdoor unit maximum heating capacity : 52200 W

<Indoor unit heating capacity compensation> (Item (2) (d) calculation

$$\frac{52200 \times 8000\ \text{W}}{58100\ \text{W}} \fallingdotseq 7200\ \text{W}$$

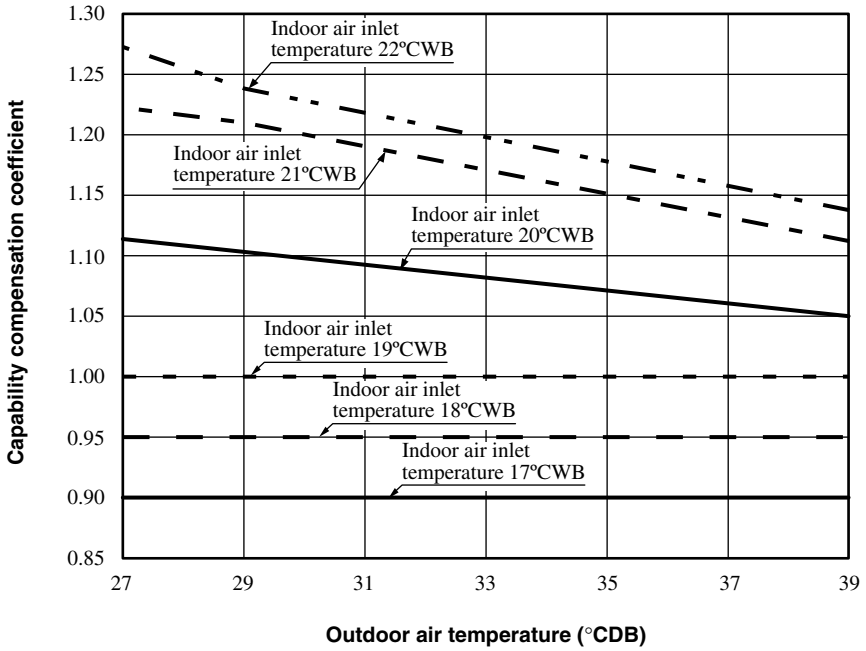
(3) Capability compensation coefficient

(a) Coefficient of cooling and heating capacity in relation to temperatures

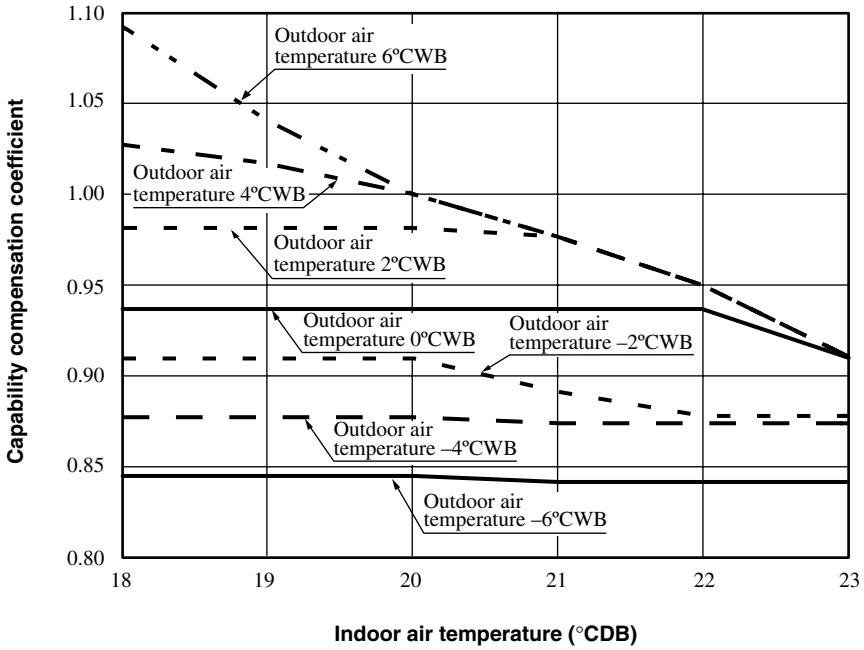


Outdoor air W.B. temperature °C W.B.

◆ **Cooling**



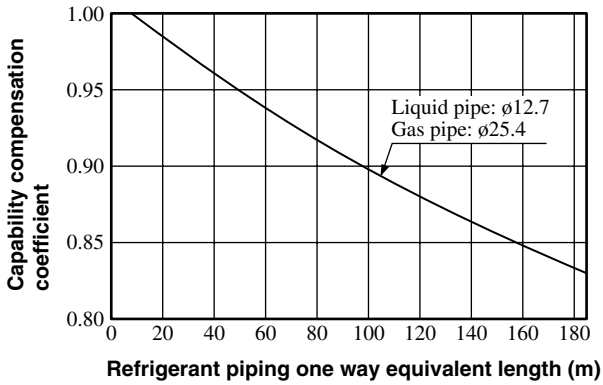
◆ **Heating**



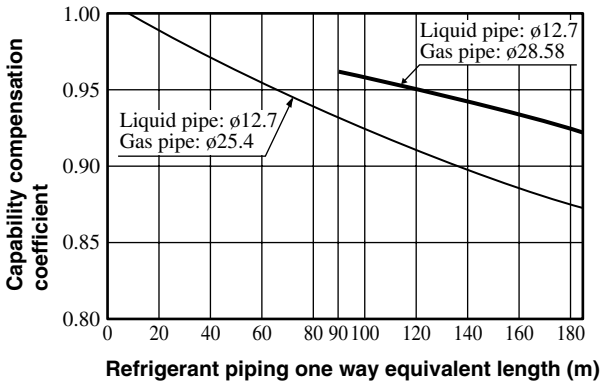
(b) Correction of cooling and heating capacity in relation to one way length of refrigerant piping.

1) Cooling

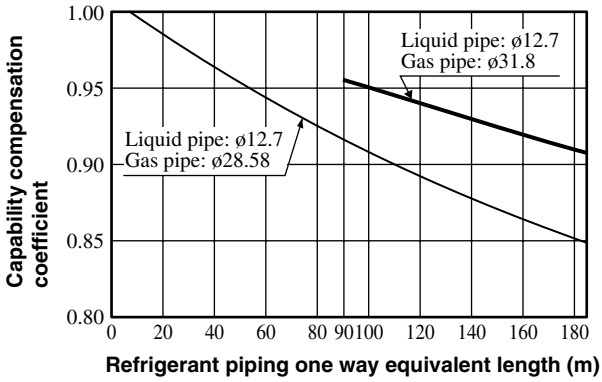
Model FDCA335HKXE4



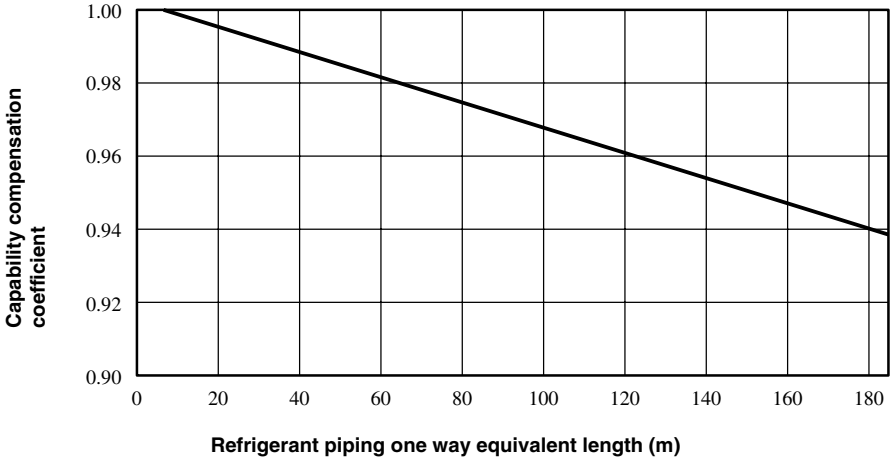
Model FDCA400HKXE4



Model FDCA450HKXE4



2) Heating (Common)



Note (1) Equivalent piping length can be obtained by calculating as follows.
quivalent piping length = Real gas piping length + Number of bends in gas piping × Equivalent piping length of bends.

Equivalent length of each joint — Unit : m/one part

Gas piping size	ϕ9.52	ϕ12.7	ϕ15.88	ϕ19.05	ϕ25.4	ϕ28.58	ϕ31.8
Joint (90˚elbow)	0.15	0.20	0.25	0.30	0.40	0.45	0.55

(c) When the outdoor unit is located at a lower height than the indoor unit in cooling operation and when the outdoor unit is located at a higher height than the indoor unit in heating operation, the following values should be subtracvted from the values in the above table.

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

Height difference between the indoor unit and outdoor unit in the vertical height difference	**35 m**	**40 m**	**45 m**	**50 m**
Adjustment coefficient	0.93	0.92	0.91	0.90

(d) Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger

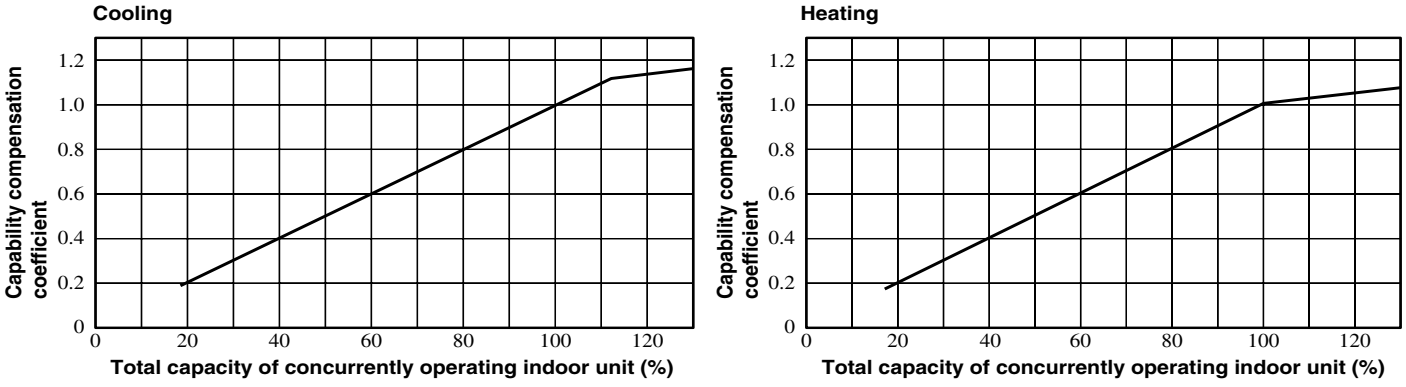
Air inlet temperature of outdoor unit in ˚C WB	**-15**	**-13**	**-11**	**-9**	**-7**	**-5**	**-3**	**-1**	**1**	**3**	**5**
Adjustment coefficient	0.96	0.96	0.95	0.94	0.93	0.91	0.88	0.86	0.87	0.92	1.00

The correction factors will change drastically according to weather conditions. So necessary adjustment should be made empirically according to the weather data of the particulsr area.

(e) The capability compensation coefficient and power consumption compensation coefficient vary according to the total capacity of concurrently operating indoor units, as shown below.

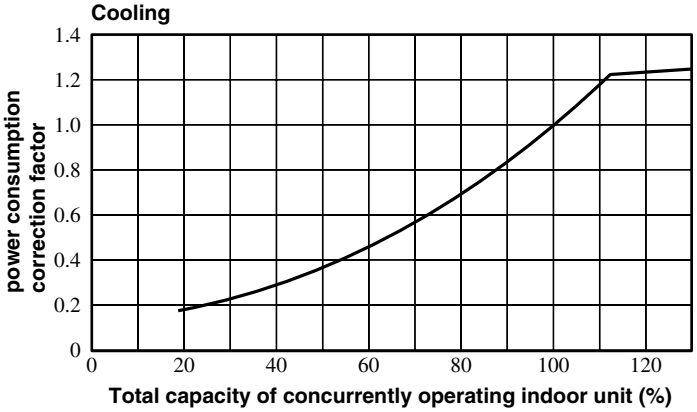
Model FDCA335HKXE4

◆ **Capability compensation coefficient**

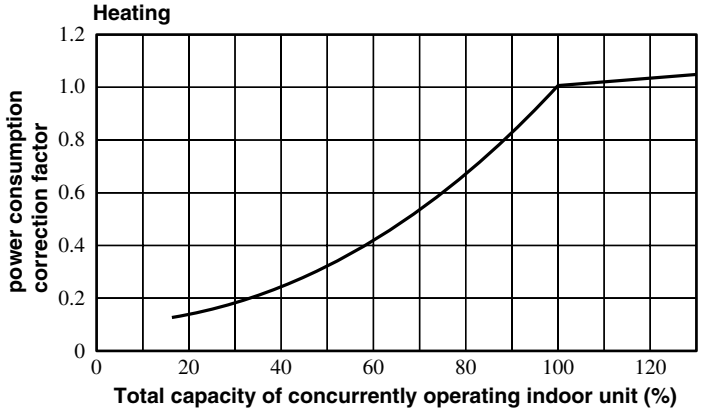


◆ **Power consumption compensation coefficient**

Cooling



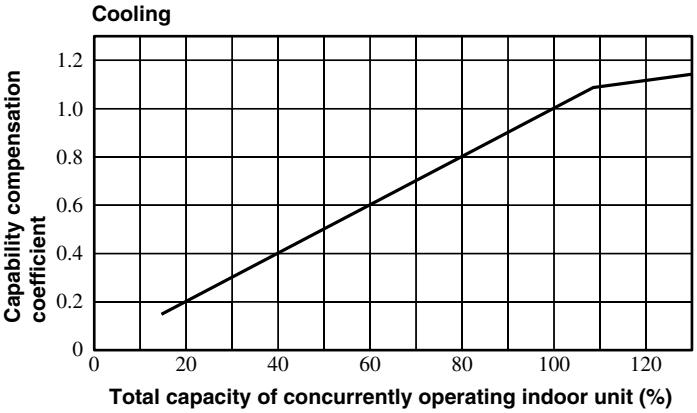
Heating



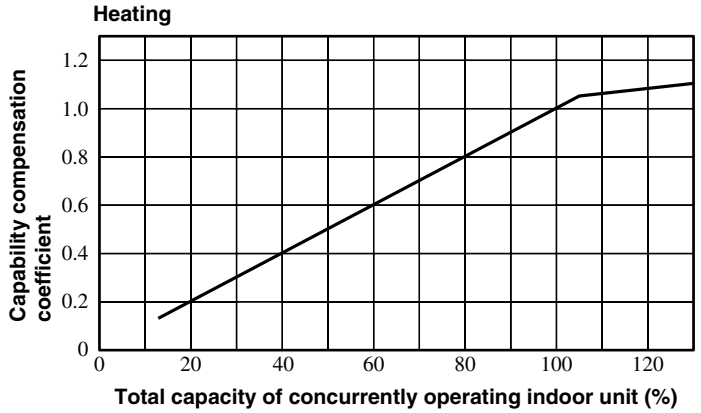
Model FDCA400HKXE4

◆ **Capability compensation coefficient**

Cooling

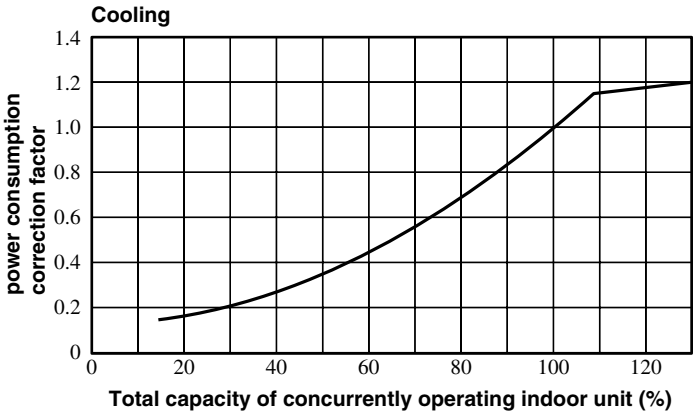


Heating

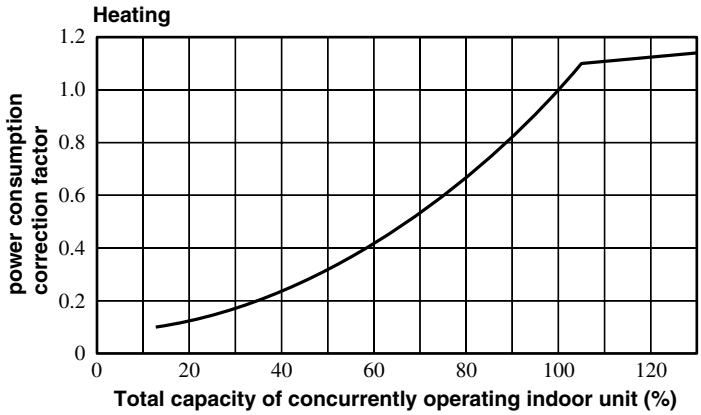


◆ **Power consumption compensation coefficient**

Cooling



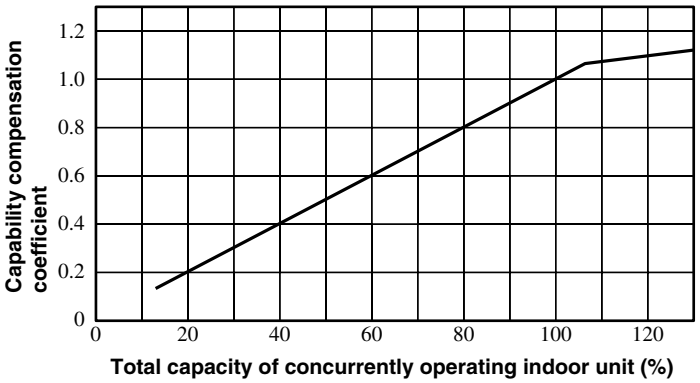
Heating



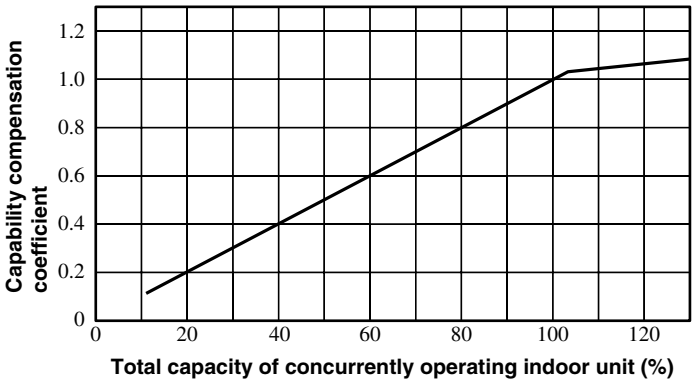
Model FDCA450HKXE4

◆ **Capability compensation coefficient**

Cooling

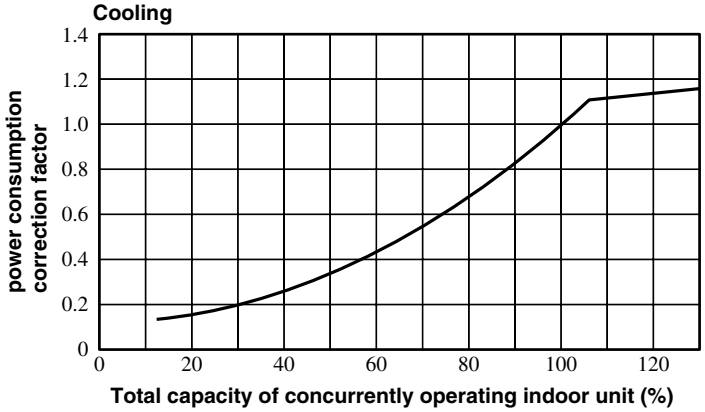


Heating

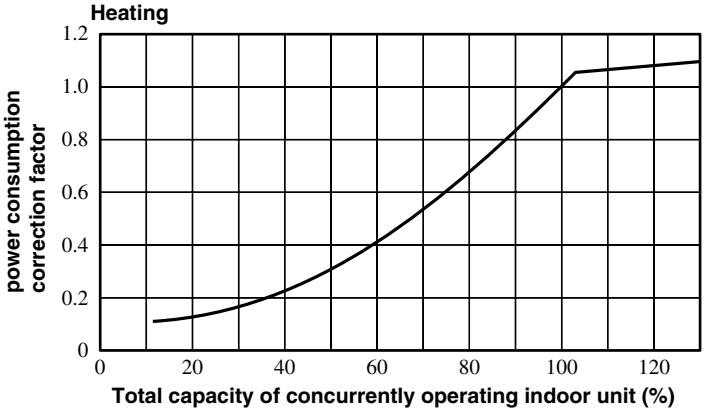


◆ **Power consumption compensation coefficient**

Cooling



Heating



(4) Sensible heat capacity

(a) FDT Series

Model FDTA28KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
15	27	2.52	2.42	2.66	2.48	2.80	2.52	3.11	2.62	3.42	2.71	3.56	2.74
	29	2.52	2.42	2.66	2.48	2.80	2.52	3.08	2.61	3.39	2.70	3.47	2.71
	31	2.52	2.42	2.66	2.48	2.80	2.52	3.08	2.61	3.33	2.68	3.42	2.69
	33	2.52	2.42	2.66	2.48	2.80	2.52	3.02	2.59	3.28	2.66	3.36	2.67
	35	2.52	2.42	2.66	2.48	2.80	2.52	3.00	2.58	3.22	2.64	3.30	2.66
	37	2.52	2.42	2.66	2.48	2.80	2.52	2.97	2.57	3.16	2.62	3.25	2.65
	39	2.52	2.42	2.66	2.48	2.80	2.52	2.94	2.56	3.11	2.61	3.19	2.63

Model FDTA36KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
15	27	3.24	2.82	3.42	2.88	3.60	2.94	4.00	3.07	4.39	3.19	4.57	3.23
	29	3.24	2.82	3.42	2.88	3.60	2.94	3.96	3.06	4.36	3.18	4.46	3.19
	31	3.24	2.82	3.42	2.88	3.60	2.94	3.96	3.06	4.28	3.15	4.39	3.17
	33	3.24	2.82	3.42	2.88	3.60	2.94	3.89	3.03	4.21	3.13	4.32	3.14
	35	3.24	2.82	3.42	2.88	3.60	2.94	3.85	3.01	4.14	3.10	4.25	3.12
	37	3.24	2.82	3.42	2.88	3.60	2.94	3.82	3.00	4.07	3.07	4.18	3.09
	39	3.24	2.82	3.42	2.88	3.60	2.94	3.78	2.99	4.00	3.05	4.10	3.07

Model FDTA45KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
15	27	4.05	3.33	4.28	3.40	4.50	3.47	5.00	3.63	5.49	3.79	5.72	3.83
	29	4.05	3.33	4.28	3.40	4.50	3.47	4.95	3.61	5.45	3.77	5.58	3.78
	31	4.05	3.33	4.28	3.40	4.50	3.47	4.95	3.61	5.36	3.73	5.49	3.74
	33	4.05	3.33	4.28	3.40	4.50	3.47	4.86	3.58	5.27	3.70	5.40	3.71
	35	4.05	3.33	4.28	3.40	4.50	3.47	4.82	3.56	5.18	3.67	5.31	3.68
	37	4.05	3.33	4.28	3.40	4.50	3.47	4.77	3.54	5.09	3.63	5.22	3.65
	39	4.05	3.33	4.28	3.40	4.50	3.47	4.73	3.53	5.00	3.60	5.13	3.61

Model FDTA56KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
15	27	5.04	3.77	5.32	3.85	5.60	3.92	6.22	4.13	6.83	4.33	7.11	4.38
	29	5.04	3.77	5.32	3.85	5.60	3.92	6.16	4.11	6.78	4.31	6.94	4.31
	31	5.04	3.77	5.32	3.85	5.60	3.92	6.16	4.11	6.66	4.26	6.83	4.26
	33	5.04	3.77	5.32	3.85	5.60	3.92	6.05	4.06	6.55	4.21	6.72	4.22
	35	5.04	3.77	5.32	3.85	5.60	3.92	5.99	4.04	6.44	4.17	6.61	4.17
	37	5.04	3.77	5.32	3.85	5.60	3.92	5.94	4.02	6.33	4.12	6.50	4.13
	39	5.04	3.77	5.32	3.85	5.60	3.92	5.88	3.99	6.22	4.08	6.38	4.08

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDTA71KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
15	27	6.39	4.68	6.75	4.78	7.10	4.87	7.88	5.14	8.66	5.39	9.02	5.44
	29	6.39	4.68	6.75	4.78	7.10	4.87	7.81	5.11	8.59	5.36	8.80	5.36
	31	6.39	4.68	6.75	4.78	7.10	4.87	7.81	5.11	8.45	5.30	8.66	5.30
	33	6.39	4.68	6.75	4.78	7.10	4.87	7.67	5.05	8.31	5.24	8.52	5.24
	35	6.39	4.68	6.75	4.78	7.10	4.87	7.60	5.02	8.17	5.18	8.38	5.18
	37	6.39	4.68	6.75	4.78	7.10	4.87	7.53	4.99	8.02	5.12	8.24	5.12
	39	6.39	4.68	6.75	4.78	7.10	4.87	7.46	4.96	7.88	5.06	8.09	5.07

Model FDTA90KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
27	27	8.10	6.90	8.55	7.04	9.00	7.17	9.99	7.50	10.98	7.81	11.43	7.89
	29	8.10	6.90	8.55	7.04	9.00	7.17	9.90	7.46	10.89	7.77	11.16	7.79
	31	8.10	6.90	8.55	7.04	9.00	7.17	9.90	7.46	10.71	7.70	10.98	7.73
	33	8.10	6.90	8.55	7.04	9.00	7.17	9.72	7.39	10.53	7.64	10.80	7.66
	35	8.10	6.90	8.55	7.04	9.00	7.17	9.63	7.36	10.35	7.57	10.62	7.60
	37	8.10	6.90	8.55	7.04	9.00	7.17	9.54	7.33	10.17	7.50	10.44	7.53
	39	8.10	6.90	8.55	7.04	9.00	7.17	9.45	7.29	9.99	7.43	10.26	7.47

Model FDTA112KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
27	27	10.08	7.81	10.64	7.98	11.20	8.13	12.43	8.54	13.66	8.92	14.22	9.01
	29	10.08	7.81	10.64	7.98	11.20	8.13	12.32	8.49	13.55	8.88	13.89	8.88
	31	10.08	7.81	10.64	7.98	11.20	8.13	12.32	8.49	13.33	8.79	13.66	8.80
	33	10.08	7.81	10.64	7.98	11.20	8.13	12.10	8.40	13.10	8.70	13.44	8.71
	35	10.08	7.81	10.64	7.98	11.20	8.13	11.98	8.35	12.88	8.61	13.22	8.62
	37	10.08	7.81	10.64	7.98	11.20	8.13	11.87	8.31	12.66	8.52	12.99	8.54
	39	10.08	7.81	10.64	7.98	11.20	8.13	11.76	8.26	12.43	8.43	12.77	8.45

Model FDTA140KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
29	27	12.60	9.18	13.30	9.38	14.00	9.56	15.54	10.09	17.08	10.59	17.78	10.69
	29	12.60	9.18	13.30	9.38	14.00	9.56	15.40	10.03	16.94	10.53	17.36	10.52
	31	12.60	9.18	13.30	9.38	14.00	9.56	15.40	10.03	16.66	10.41	17.08	10.40
	33	12.60	9.18	13.30	9.38	14.00	9.56	15.12	9.91	16.38	10.28	16.80	10.28
	35	12.60	9.18	13.30	9.38	14.00	9.56	14.98	9.85	16.10	10.16	16.52	10.17
	37	12.60	9.18	13.30	9.38	14.00	9.56	14.84	9.79	15.82	10.05	16.24	10.05
	39	12.60	9.18	13.30	9.38	14.00	9.56	14.70	9.72	15.54	9.93	15.96	9.94

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

(b) FDTW Series

Model FDTWA28KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	2.52	2.32	2.66	2.37	2.80	2.42	3.11	2.52	3.42	2.62	3.56	2.65
	29	2.52	2.32	2.66	2.37	2.80	2.42	3.08	2.51	3.39	2.61	3.47	2.62
	31	2.52	2.32	2.66	2.37	2.80	2.42	3.08	2.51	3.33	2.59	3.42	2.60
	33	2.52	2.32	2.66	2.37	2.80	2.42	3.02	2.49	3.28	2.57	3.36	2.58
	35	2.52	2.32	2.66	2.37	2.80	2.42	3.00	2.48	3.22	2.55	3.30	2.56
	37	2.52	2.32	2.66	2.37	2.80	2.42	2.97	2.47	3.16	2.53	3.25	2.55
	39	2.52	2.32	2.66	2.37	2.80	2.42	2.94	2.46	3.11	2.51	3.19	2.53

Model FDTWA45KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	4.05	3.39	4.28	3.46	4.50	3.52	5.00	3.69	5.49	3.84	5.72	3.88
	29	4.05	3.39	4.28	3.46	4.50	3.52	4.95	3.67	5.45	3.82	5.58	3.83
	31	4.05	3.39	4.28	3.46	4.50	3.52	4.95	3.67	5.36	3.79	5.49	3.80
	33	4.05	3.39	4.28	3.46	4.50	3.52	4.86	3.64	5.27	3.76	5.40	3.77
	35	4.05	3.39	4.28	3.46	4.50	3.52	4.82	3.62	5.18	3.72	5.31	3.74
	37	4.05	3.39	4.28	3.46	4.50	3.52	4.77	3.60	5.09	3.69	5.22	3.70
	39	4.05	3.39	4.28	3.46	4.50	3.52	4.73	3.58	5.00	3.65	5.13	3.67

Model FDTWA56KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	5.04	3.86	5.32	3.94	5.60	4.02	6.22	4.22	6.83	4.42	7.11	4.46
	29	5.04	3.86	5.32	3.94	5.60	4.02	6.16	4.20	6.78	4.40	6.94	4.40
	31	5.04	3.86	5.32	3.94	5.60	4.02	6.16	4.20	6.66	4.35	6.83	4.35
	33	5.04	3.86	5.32	3.94	5.60	4.02	6.05	4.15	6.55	4.30	6.72	4.31
	35	5.04	3.86	5.32	3.94	5.60	4.02	5.99	4.13	6.44	4.26	6.61	4.27
	37	5.04	3.86	5.32	3.94	5.60	4.02	5.94	4.11	6.33	4.21	6.50	4.22
	39	5.04	3.86	5.32	3.94	5.60	4.02	5.88	4.09	6.22	4.17	6.38	4.18

Model FDTWA71KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
16	27	6.39	4.76	6.75	4.86	7.10	4.95	7.88	5.22	8.66	5.46	9.02	5.52
	29	6.39	4.76	6.75	4.86	7.10	4.95	7.81	5.19	8.59	5.43	8.80	5.43
	31	6.39	4.76	6.75	4.86	7.10	4.95	7.81	5.19	8.45	5.37	8.66	5.37
	33	6.39	4.76	6.75	4.86	7.10	4.95	7.67	5.12	8.31	5.31	8.52	5.32
	35	6.39	4.76	6.75	4.86	7.10	4.95	7.60	5.09	8.17	5.26	8.38	5.26
	37	6.39	4.76	6.75	4.86	7.10	4.95	7.53	5.06	8.02	5.20	8.24	5.20
	39	6.39	4.76	6.75	4.86	7.10	4.95	7.46	5.03	7.88	5.14	8.09	5.15

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDTWA90KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
19	27	8.10	5.85	8.55	5.97	9.00	6.09	9.99	6.43	10.98	6.76	11.43	6.82
	29	8.10	5.85	8.55	5.97	9.00	6.09	9.90	6.39	10.89	6.72	11.16	6.71
	31	8.10	5.85	8.55	5.97	9.00	6.09	9.90	6.39	10.71	6.64	10.98	6.63
	33	8.10	5.85	8.55	5.97	9.00	6.09	9.72	6.31	10.53	6.56	10.80	6.56
	35	8.10	5.85	8.55	5.97	9.00	6.09	9.63	6.27	10.35	6.48	10.62	6.48
	37	8.10	5.85	8.55	5.97	9.00	6.09	9.54	6.23	10.17	6.40	10.44	6.41
	39	8.10	5.85	8.55	5.97	9.00	6.09	9.45	6.19	9.99	6.33	10.26	6.33

Model FDTWA112KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
28	27	10.08	7.83	10.64	8.00	11.20	8.15	12.43	8.56	13.66	8.95	14.22	9.04
	29	10.08	7.83	10.64	8.00	11.20	8.15	12.32	8.51	13.55	8.90	13.89	8.91
	31	10.08	7.83	10.64	8.00	11.20	8.15	12.32	8.51	13.33	8.81	13.66	8.82
	33	10.08	7.83	10.64	8.00	11.20	8.15	12.10	8.42	13.10	8.72	13.44	8.73
	35	10.08	7.83	10.64	8.00	11.20	8.15	11.98	8.38	12.88	8.63	13.22	8.65
	37	10.08	7.83	10.64	8.00	11.20	8.15	11.87	8.33	12.66	8.54	12.99	8.56
	39	10.08	7.83	10.64	8.00	11.20	8.15	11.76	8.28	12.43	8.45	12.77	8.48

Model FDTWA140KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
32	27	12.60	9.38	13.30	9.59	14.00	9.77	15.54	10.29	17.08	10.78	17.78	10.89
	29	12.60	9.38	13.30	9.59	14.00	9.77	15.40	10.23	16.94	10.72	17.36	10.72
	31	12.60	9.38	13.30	9.59	14.00	9.77	15.40	10.23	16.66	10.61	17.08	10.61
	33	12.60	9.38	13.30	9.59	14.00	9.77	15.12	10.11	16.38	10.49	16.80	10.49
	35	12.60	9.38	13.30	9.59	14.00	9.77	14.98	10.05	16.10	10.37	16.52	10.38
	37	12.60	9.38	13.30	9.59	14.00	9.77	14.84	9.99	15.82	10.26	16.24	10.27
	39	12.60	9.38	13.30	9.59	14.00	9.77	14.70	9.94	15.54	10.14	15.96	10.16

(c) FDTQ, FDQM Series

Models FDTQA22KXE4, FDQMA22KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
7	27	1.98	1.50	2.09	1.54	2.20	1.57	2.44	1.65	2.68	1.73	2.79	1.75
	29	1.98	1.50	2.09	1.54	2.20	1.57	2.42	1.64	2.66	1.72	2.73	1.72
	31	1.98	1.50	2.09	1.54	2.20	1.57	2.42	1.64	2.62	1.70	2.68	1.70
	33	1.98	1.50	2.09	1.54	2.20	1.57	2.38	1.62	2.57	1.68	2.64	1.68
	35	1.98	1.50	2.09	1.54	2.20	1.57	2.35	1.61	2.53	1.66	2.60	1.67
	37	1.98	1.50	2.09	1.54	2.20	1.57	2.33	1.60	2.49	1.65	2.55	1.65
	39	1.98	1.50	2.09	1.54	2.20	1.57	2.31	1.60	2.44	1.63	2.51	1.63

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Models FDTQA28KXE4, FDQMA28KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
7	27	2.52	1.95	2.66	1.99	2.80	2.03	3.11	2.14	3.42	2.23	3.56	2.26
	29	2.52	1.95	2.66	1.99	2.80	2.03	3.08	2.12	3.39	2.22	3.47	2.22
	31	2.52	1.95	2.66	1.99	2.80	2.03	3.08	2.12	3.33	2.20	3.42	2.20
	33	2.52	1.95	2.66	1.99	2.80	2.03	3.02	2.10	3.28	2.18	3.36	2.18
	35	2.52	1.95	2.66	1.99	2.80	2.03	3.00	2.09	3.22	2.15	3.30	2.16
	37	2.52	1.95	2.66	1.99	2.80	2.03	2.97	2.08	3.16	2.13	3.25	2.14
	39	2.52	1.95	2.66	1.99	2.80	2.03	2.94	2.07	3.11	2.11	3.19	2.11

Models FDTQA36KXE4, FDQMA36KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
7	27	3.24	2.32	3.42	2.38	3.60	2.42	4.00	2.56	4.39	2.69	4.57	2.71
	29	3.24	2.32	3.42	2.38	3.60	2.42	3.96	2.54	4.36	2.67	4.46	2.67
	31	3.24	2.32	3.42	2.38	3.60	2.42	3.96	2.54	4.28	2.64	4.39	2.64
	33	3.24	2.32	3.42	2.38	3.60	2.42	3.89	2.51	4.21	2.61	4.32	2.61
	35	3.24	2.32	3.42	2.38	3.60	2.42	3.85	2.49	4.14	2.58	4.25	2.58
	37	3.24	2.32	3.42	2.38	3.60	2.42	3.82	2.48	4.07	2.55	4.18	2.55
	39	3.24	2.32	3.42	2.38	3.60	2.42	3.78	2.46	4.00	2.51	4.10	2.52

(d) FDTS Series

Model FDTSA22KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11	27	1.98	1.90	2.09	1.95	2.20	1.98	2.44	2.05	2.68	2.12	2.79	2.14
	29	1.98	1.90	2.09	1.95	2.20	1.98	2.42	2.05	2.66	2.11	2.73	2.13
	31	1.98	1.90	2.09	1.95	2.20	1.98	2.42	2.05	2.62	2.10	2.68	2.11
	33	1.98	1.90	2.09	1.95	2.20	1.98	2.38	2.04	2.57	2.08	2.64	2.08
	35	1.98	1.90	2.09	1.95	2.20	1.98	2.35	2.02	2.53	2.07	2.60	2.08
	37	1.98	1.90	2.09	1.95	2.20	1.98	2.33	2.02	2.49	2.07	2.55	2.08
	39	1.98	1.90	2.09	1.95	2.20	1.98	2.31	2.01	2.44	2.05	2.51	2.07

Model FDTSA28KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
12	27	2.52	2.22	2.66	2.27	2.80	2.31	3.11	2.41	3.42	2.51	3.56	2.54
	29	2.52	2.22	2.66	2.27	2.80	2.31	3.08	2.40	3.39	2.50	3.47	2.51
	31	2.52	2.22	2.66	2.27	2.80	2.31	3.08	2.40	3.33	2.48	3.42	2.49
	33	2.52	2.22	2.66	2.27	2.80	2.31	3.02	2.38	3.28	2.46	3.36	2.47
	35	2.52	2.22	2.66	2.27	2.80	2.31	3.00	2.37	3.22	2.44	3.30	2.45
	37	2.52	2.22	2.66	2.27	2.80	2.31	2.97	2.36	3.16	2.42	3.25	2.43
	39	2.52	2.22	2.66	2.27	2.80	2.31	2.94	2.35	3.11	2.40	3.19	2.41

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDTSA36KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
12	27	3.24	2.86	3.42	2.92	3.60	2.97	4.00	3.10	4.39	3.23	4.57	3.26
	29	3.24	2.86	3.42	2.92	3.60	2.97	3.96	3.09	4.36	3.21	4.46	3.22
	31	3.24	2.86	3.42	2.92	3.60	2.97	3.96	3.09	4.28	3.18	4.39	3.20
	33	3.24	2.86	3.42	2.92	3.60	2.97	3.89	3.06	4.21	3.16	4.32	3.17
	35	3.24	2.86	3.42	2.92	3.60	2.97	3.85	3.05	4.14	3.13	4.25	3.15
	37	3.24	2.86	3.42	2.92	3.60	2.97	3.82	3.03	4.07	3.11	4.18	3.12
	39	3.24	2.86	3.42	2.92	3.60	2.97	3.78	3.02	4.00	3.08	4.10	3.10

Model FDTSA45KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	4.05	3.54	4.28	3.62	4.50	3.68	5.00	3.85	5.49	4.00	5.72	4.04
	29	4.05	3.54	4.28	3.62	4.50	3.68	4.95	3.83	5.45	3.98	5.58	3.99
	31	4.05	3.54	4.28	3.62	4.50	3.68	4.95	3.79	5.36	3.95	5.49	3.96
	33	4.05	3.54	4.28	3.62	4.50	3.68	4.86	3.78	5.27	3.92	5.40	3.93
	35	4.05	3.54	4.28	3.62	4.50	3.68	4.82	3.76	5.18	3.88	5.31	3.90
	37	4.05	3.54	4.28	3.62	4.50	3.68	4.77	3.74	5.09	3.85	5.22	3.87
	39	4.05	3.54	4.28	3.62	4.50	3.68	4.73	3.74	5.00	3.82	5.13	3.84

Model FDTSA71KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
18	27	6.39	5.06	6.75	5.17	7.10	5.27	7.88	5.52	8.66	5.77	9.02	5.83
	29	6.39	5.06	6.75	5.17	7.10	5.27	7.81	5.50	8.59	5.74	8.80	5.74
	31	6.39	5.06	6.75	5.17	7.10	5.27	7.81	5.50	8.45	5.68	8.66	5.69
	33	6.39	5.06	6.75	5.17	7.10	5.27	7.67	5.44	8.31	5.63	8.52	5.64
	35	6.39	5.06	6.75	5.17	7.10	5.27	7.60	5.41	8.17	5.57	8.38	5.58
	37	6.39	5.06	6.75	5.17	7.10	5.27	7.53	5.38	8.02	5.51	8.24	5.53
	39	6.39	5.06	6.75	5.17	7.10	5.27	7.46	5.35	7.88	5.46	8.09	5.48

(e) FDR Series

Model FDRA22KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
10	27	1.98	1.84	2.09	1.87	2.20	1.91	2.44	1.99	2.68	2.07	2.79	2.09
	29	1.98	1.84	2.09	1.87	2.20	1.91	2.42	1.98	2.66	2.06	2.73	2.07
	31	1.98	1.84	2.09	1.87	2.20	1.91	2.42	1.98	2.62	2.05	2.68	2.06
	33	1.98	1.84	2.09	1.87	2.20	1.91	2.38	1.97	2.57	2.03	2.64	2.04
	35	1.98	1.84	2.09	1.87	2.20	1.91	2.35	1.96	2.53	2.01	2.60	2.03
	37	1.98	1.84	2.09	1.87	2.20	1.91	2.33	1.95	2.49	2.00	2.55	2.01
	39	1.98	1.84	2.09	1.87	2.20	1.91	2.31	1.94	2.44	1.98	2.51	2.00

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDRA28KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
12	27	2.52	2.21	2.66	2.26	2.80	2.30	3.11	2.40	3.42	2.50	3.56	2.53
	29	2.52	2.21	2.66	2.26	2.80	2.30	3.08	2.39	3.39	2.49	3.47	2.50
	31	2.52	2.21	2.66	2.26	2.80	2.30	3.08	2.39	3.33	2.47	3.42	2.48
	33	2.52	2.21	2.66	2.26	2.80	2.30	3.02	2.37	3.28	2.45	3.36	2.46
	35	2.52	2.21	2.66	2.26	2.80	2.30	3.00	2.36	3.22	2.43	3.30	2.44
	37	2.52	2.21	2.66	2.26	2.80	2.30	2.97	2.35	3.16	2.41	3.25	2.42
	39	2.52	2.21	2.66	2.26	2.80	2.30	2.94	2.34	3.11	2.39	3.19	2.40

Model FDRA45KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	4.05	3.41	4.28	3.48	4.50	3.55	5.00	3.71	5.49	3.86	5.72	3.91
	29	4.05	3.41	4.28	3.48	4.50	3.55	4.95	3.69	5.45	3.85	5.58	3.86
	31	4.05	3.41	4.28	3.48	4.50	3.55	4.95	3.69	5.36	3.81	5.49	3.82
	33	4.05	3.41	4.28	3.48	4.50	3.55	4.86	3.66	5.27	3.78	5.40	3.79
	35	4.05	3.41	4.28	3.48	4.50	3.55	4.82	3.64	5.18	3.74	5.31	3.76
	37	4.05	3.41	4.28	3.48	4.50	3.55	4.77	3.62	5.09	3.71	5.22	3.73
	39	4.05	3.41	4.28	3.48	4.50	3.55	4.73	3.61	5.00	3.68	5.13	3.69

Model FDRA56KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	5.04	3.96	5.32	4.05	5.60	4.12	6.22	4.33	6.83	4.52	7.11	4.57
	29	5.04	3.96	5.32	4.05	5.60	4.12	6.16	4.31	6.78	4.50	6.94	4.50
	31	5.04	3.96	5.32	4.05	5.60	4.12	6.16	4.31	6.66	4.45	6.83	4.46
	33	5.04	3.96	5.32	4.05	5.60	4.12	6.05	4.26	6.55	4.41	6.72	4.42
	35	5.04	3.96	5.32	4.05	5.60	4.12	5.99	4.24	6.44	4.36	6.61	4.37
	37	5.04	3.96	5.32	4.05	5.60	4.12	5.94	4.21	6.33	4.32	6.50	4.33
	39	5.04	3.96	5.32	4.05	5.60	4.12	5.88	4.19	6.22	4.28	6.38	4.29

Model FDRA71KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
18	27	6.39	5.06	6.75	5.17	7.10	5.26	7.88	5.52	8.66	5.77	9.02	5.83
	29	6.39	5.06	6.75	5.17	7.10	5.26	7.81	5.49	8.59	5.74	8.80	5.74
	31	6.39	5.06	6.75	5.17	7.10	5.26	7.81	5.49	8.45	5.68	8.66	5.69
	33	6.39	5.06	6.75	5.17	7.10	5.26	7.67	5.44	8.31	5.62	8.52	5.64
	35	6.39	5.06	6.75	5.17	7.10	5.26	7.60	5.41	8.17	5.57	8.38	5.58
	37	6.39	5.06	6.75	5.17	7.10	5.26	7.53	5.38	8.02	5.51	8.24	5.53
	39	6.39	5.06	6.75	5.17	7.10	5.26	7.46	5.35	7.88	5.46	8.09	5.48

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDRA90KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
20	27	8.10	6.05	8.55	6.18	9.00	6.30	9.99	6.64	10.98	6.95	11.43	7.02
	29	8.10	6.05	8.55	6.18	9.00	6.30	9.90	6.60	10.89	6.91	11.16	6.91
	31	8.10	6.05	8.55	6.18	9.00	6.30	9.90	6.60	10.71	6.84	10.98	6.84
	33	8.10	6.05	8.55	6.18	9.00	6.30	9.72	6.52	10.53	6.76	10.80	6.77
	35	8.10	6.05	8.55	6.18	9.00	6.30	9.63	6.48	10.35	6.69	10.62	6.69
	37	8.10	6.05	8.55	6.18	9.00	6.30	9.54	6.45	10.17	6.61	10.44	6.62
	39	8.10	6.05	8.55	6.18	9.00	6.30	9.45	6.41	9.99	6.54	10.26	6.55

Model FDRA112KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
28	27	10.08	7.96	10.64	8.13	11.20	8.28	12.43	8.69	13.66	9.07	14.22	9.17
	29	10.08	7.96	10.64	8.13	11.20	8.28	12.32	8.65	13.55	9.03	13.89	9.04
	31	10.08	7.96	10.64	8.13	11.20	8.28	12.32	8.65	13.33	8.94	13.66	8.95
	33	10.08	7.96	10.64	8.13	11.20	8.28	12.10	8.55	13.10	8.85	13.44	8.87
	35	10.08	7.96	10.64	8.13	11.20	8.28	11.98	8.51	12.88	8.76	13.22	8.78
	37	10.08	7.96	10.64	8.13	11.20	8.28	11.87	8.46	12.66	8.67	12.99	8.70
	39	10.08	7.96	10.64	8.13	11.20	8.28	11.76	8.42	12.43	8.59	12.77	8.61

Model FDRA140KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
34	27	12.60	9.79	13.30	9.99	14.00	10.18	15.54	10.70	17.08	11.18	17.78	11.29
	29	12.60	9.79	13.30	9.99	14.00	10.18	15.40	10.64	16.94	11.12	17.36	11.13
	31	12.60	9.79	13.30	9.99	14.00	10.18	15.40	10.64	16.66	11.01	17.08	11.02
	33	12.60	9.79	13.30	9.99	14.00	10.18	15.12	10.52	16.38	10.89	16.80	10.91
	35	12.60	9.79	13.30	9.99	14.00	10.18	14.98	10.47	16.10	10.78	16.52	10.80
	37	12.60	9.79	13.30	9.99	14.00	10.18	14.84	10.41	15.82	10.67	16.24	10.69
	39	12.60	9.79	13.30	9.99	14.00	10.18	14.70	10.35	15.54	10.56	15.96	10.59

(f) FDUM Series

Model FDUMA36KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
12	27	3.24	3.07	3.42	3.14	3.60	3.20	4.00	3.33	4.39	3.46	4.57	3.50
	29	3.24	3.07	3.42	3.14	3.60	3.20	3.96	3.32	4.36	3.44	4.46	3.46
	31	3.24	3.07	3.42	3.14	3.60	3.20	3.96	3.32	4.28	3.42	4.39	3.44
	33	3.24	3.07	3.42	3.14	3.60	3.20	3.89	3.29	4.21	3.39	4.32	3.41
	35	3.24	3.07	3.42	3.14	3.60	3.20	3.85	3.28	4.14	3.37	4.25	3.39
	37	3.24	3.07	3.42	3.14	3.60	3.20	3.82	3.27	4.07	3.34	4.18	3.36
	39	3.24	3.07	3.42	3.14	3.60	3.20	3.78	3.25	4.00	3.32	4.10	3.34

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDUMA45KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
12	27	4.05	3.41	4.28	3.48	4.50	3.55	5.00	3.71	5.49	3.86	5.72	3.91
	29	4.05	3.41	4.28	3.48	4.50	3.55	4.95	3.69	5.45	3.85	5.58	3.86
	31	4.05	3.41	4.28	3.48	4.50	3.55	4.95	3.69	5.36	3.81	5.49	3.82
	33	4.05	3.41	4.28	3.48	4.50	3.55	4.86	3.66	5.27	3.78	5.40	3.79
	35	4.05	3.41	4.28	3.48	4.50	3.55	4.82	3.64	5.18	3.74	5.31	3.76
	37	4.05	3.41	4.28	3.48	4.50	3.55	4.77	3.62	5.09	3.71	5.22	3.73
	39	4.05	3.41	4.28	3.48	4.50	3.55	4.73	3.61	5.00	3.68	5.13	3.69

Model FDUMA56KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	5.04	3.96	5.32	4.05	5.60	4.12	6.22	4.33	6.83	4.52	7.11	4.57
	29	5.04	3.96	5.32	4.05	5.60	4.12	6.16	4.31	6.78	4.50	6.94	4.50
	31	5.04	3.96	5.32	4.05	5.60	4.12	6.16	4.31	6.66	4.45	6.83	4.46
	33	5.04	3.96	5.32	4.05	5.60	4.12	6.05	4.26	6.55	4.41	6.72	4.42
	35	5.04	3.96	5.32	4.05	5.60	4.12	5.99	4.24	6.44	4.36	6.61	4.37
	37	5.04	3.96	5.32	4.05	5.60	4.12	5.94	4.21	6.33	4.32	6.50	4.33
	39	5.04	3.96	5.32	4.05	5.60	4.12	5.88	4.19	6.22	4.28	6.38	4.29

Model FDUMA71KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
18	27	6.39	5.06	6.75	5.17	7.10	5.26	7.88	5.52	8.66	5.77	9.02	5.83
	29	6.39	5.06	6.75	5.17	7.10	5.26	7.81	5.49	8.59	5.74	8.80	5.74
	31	6.39	5.06	6.75	5.17	7.10	5.26	7.81	5.49	8.45	5.68	8.66	5.69
	33	6.39	5.06	6.75	5.17	7.10	5.26	7.67	5.44	8.31	5.62	8.52	5.64
	35	6.39	5.06	6.75	5.17	7.10	5.26	7.60	5.41	8.17	5.57	8.38	5.58
	37	6.39	5.06	6.75	5.17	7.10	5.26	7.53	5.38	8.02	5.51	8.24	5.53
	39	6.39	5.06	6.75	5.17	7.10	5.26	7.46	5.35	7.88	5.46	8.09	5.48

Model FDUMA90KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
20	27	8.10	6.05	8.55	6.18	9.00	6.30	9.99	6.64	10.98	6.95	11.43	7.02
	29	8.10	6.05	8.55	6.18	9.00	6.30	9.90	6.60	10.89	6.91	11.16	6.91
	31	8.10	6.05	8.55	6.18	9.00	6.30	9.90	6.60	10.71	6.84	10.98	6.84
	33	8.10	6.05	8.55	6.18	9.00	6.30	9.72	6.52	10.53	6.76	10.80	6.77
	35	8.10	6.05	8.55	6.18	9.00	6.30	9.63	6.48	10.35	6.69	10.62	6.69
	37	8.10	6.05	8.55	6.18	9.00	6.30	9.54	6.45	10.17	6.61	10.44	6.62
	39	8.10	6.05	8.55	6.18	9.00	6.30	9.45	6.41	9.99	6.54	10.26	6.55

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDUMA112KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
28	27	10.08	7.96	10.64	8.13	11.20	8.28	12.43	8.69	13.66	9.07	14.22	9.17
	29	10.08	7.96	10.64	8.13	11.20	8.28	12.32	8.65	13.55	9.03	13.89	9.04
	31	10.08	7.96	10.64	8.13	11.20	8.28	12.32	8.65	13.33	8.94	13.66	8.95
	33	10.08	7.96	10.64	8.13	11.20	8.28	12.10	8.55	13.10	8.85	13.44	8.87
	35	10.08	7.96	10.64	8.13	11.20	8.28	11.98	8.51	12.88	8.76	13.22	8.78
	37	10.08	7.96	10.64	8.13	11.20	8.28	11.87	8.46	12.66	8.67	12.99	8.70
	39	10.08	7.96	10.64	8.13	11.20	8.28	11.76	8.42	12.43	8.59	12.77	8.61

Model FDUMA140KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
34	27	12.60	9.79	13.30	9.99	14.00	10.18	15.54	10.70	17.08	11.18	17.78	11.29
	29	12.60	9.79	13.30	9.99	14.00	10.18	15.40	10.64	16.94	11.12	17.36	11.13
	31	12.60	9.79	13.30	9.99	14.00	10.18	15.40	10.64	16.66	11.01	17.08	11.02
	33	12.60	9.79	13.30	9.99	14.00	10.18	15.12	10.52	16.38	10.89	16.80	10.91
	35	12.60	9.79	13.30	9.99	14.00	10.18	14.98	10.47	16.10	10.78	16.52	10.80
	37	12.60	9.79	13.30	9.99	14.00	10.18	14.84	10.41	15.82	10.67	16.24	10.69
	39	12.60	9.79	13.30	9.99	14.00	10.18	14.70	10.35	15.54	10.56	15.96	10.59

(g) FDUR Series

Model FDURA45KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
17	27	4.05	3.90	4.28	3.98	4.50	4.05	5.00	4.22	5.49	4.36	5.72	4.42
	29	4.05	3.90	4.28	3.98	4.50	4.05	4.95	4.19	5.45	4.35	5.58	4.36
	31	4.05	3.90	4.28	3.98	4.50	4.05	4.95	4.19	5.36	4.32	5.49	4.34
	33	4.05	3.90	4.28	3.98	4.50	4.05	4.86	4.16	5.27	4.28	5.40	4.30
	35	4.05	3.90	4.28	3.98	4.50	4.05	4.82	4.15	5.18	4.26	5.31	4.27
	37	4.05	3.90	4.28	3.98	4.50	4.05	4.77	4.13	5.09	4.22	5.22	4.25
	39	4.05	3.90	4.28	3.98	4.50	4.05	4.73	4.11	5.00	4.20	5.13	4.22

Model FDURA56KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
21	27	5.04	4.85	5.32	4.95	5.60	5.04	6.22	5.24	6.83	5.44	7.11	5.50
	29	5.04	4.85	5.32	4.95	5.60	5.04	6.16	5.22	6.78	5.42	6.94	5.44
	31	5.04	4.85	5.32	4.95	5.60	5.04	6.16	5.22	6.66	5.38	6.83	5.41
	33	5.04	4.85	5.32	4.95	5.60	5.04	6.05	5.18	6.55	5.34	6.72	5.37
	35	5.04	4.85	5.32	4.95	5.60	5.04	5.99	5.16	6.44	5.30	6.61	5.33
	37	5.04	4.85	5.32	4.95	5.60	5.04	5.94	5.14	6.33	5.26	6.50	5.29
	39	5.04	4.85	5.32	4.95	5.60	5.04	5.88	5.12	6.22	5.22	6.38	5.25

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDURA71KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
25	27	6.39	5.88	6.75	6.00	7.10	6.11	7.88	6.37	8.66	6.62	9.02	6.69
	29	6.39	5.88	6.75	6.00	7.10	6.11	7.81	6.35	8.59	6.59	8.80	6.62
	31	6.39	5.88	6.75	6.00	7.10	6.11	7.81	6.35	8.45	6.54	8.66	6.57
	33	6.39	5.88	6.75	6.00	7.10	6.11	7.67	6.30	8.31	6.49	8.52	6.52
	35	6.39	5.88	6.75	6.00	7.10	6.11	7.60	6.27	8.17	6.44	8.38	6.47
	37	6.39	5.88	6.75	6.00	7.10	6.11	7.53	6.24	8.02	6.39	8.24	6.42
	39	6.39	5.88	6.75	6.00	7.10	6.11	7.46	6.22	7.88	6.34	8.09	6.37

Model FDURA90KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
34	27	8.10	7.81	8.55	7.97	9.00	8.10	9.99	8.42	10.98	8.72	11.43	8.82
	29	8.10	7.81	8.55	7.97	9.00	8.10	9.90	8.40	10.89	8.69	11.16	8.73
	31	8.10	7.81	8.55	7.97	9.00	8.10	9.90	8.40	10.71	8.63	10.98	8.67
	33	8.10	7.81	8.55	7.97	9.00	8.10	9.72	8.33	10.53	8.57	10.80	8.62
	35	8.10	7.81	8.55	7.97	9.00	8.10	9.63	8.30	10.35	8.51	10.62	8.56
	37	8.10	7.81	8.55	7.97	9.00	8.10	9.54	8.26	10.17	8.45	10.44	8.50
	39	8.10	7.81	8.55	7.97	9.00	8.10	9.45	8.23	9.99	8.39	10.26	8.58

Model FDURA112KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
34	27	10.08	8.71	10.64	8.89	11.20	9.05	12.43	9.46	13.66	9.84	14.22	9.94
	29	10.08	8.71	10.64	8.89	11.20	9.05	12.32	9.41	13.55	9.79	13.89	9.82
	31	10.08	8.71	10.64	8.89	11.20	9.05	12.32	9.41	13.33	9.71	13.66	9.74
	33	10.08	8.71	10.64	8.89	11.20	9.05	12.10	9.33	13.10	9.63	13.44	9.66
	35	10.08	8.71	10.64	8.89	11.20	9.05	11.98	9.29	12.88	9.55	13.22	9.58
	37	10.08	8.71	10.64	8.89	11.20	9.05	11.87	9.24	12.66	9.46	12.99	9.50
	39	10.08	8.71	10.64	8.89	11.20	9.05	11.76	9.20	12.43	9.38	12.77	9.42

Model FDURA140KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
42	27	12.60	10.75	13.30	10.97	14.00	11.17	15.54	11.68	17.08	12.16	17.78	12.29
	29	12.60	10.75	13.30	10.97	14.00	11.17	15.40	11.63	16.94	12.10	17.36	12.14
	31	12.60	10.75	13.30	10.97	14.00	11.17	15.40	11.63	16.66	12.00	17.08	12.03
	33	12.60	10.75	13.30	10.97	14.00	11.17	15.12	11.52	16.38	11.89	16.80	11.93
	35	12.60	10.75	13.30	10.97	14.00	11.17	14.98	11.46	16.10	11.79	16.52	11.83
	37	12.60	10.75	13.30	10.97	14.00	11.17	14.84	11.41	15.82	11.68	16.24	11.73
	39	12.60	10.75	13.30	10.97	14.00	11.17	14.70	11.36	15.54	11.58	15.96	11.63

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

(h) FDE Series

Model FDEA36KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11	27	3.24	2.77	3.42	2.82	3.60	2.88	4.00	3.01	4.39	3.13	4.57	3.16
	29	3.24	2.77	3.42	2.82	3.60	2.88	3.96	2.99	4.36	3.12	4.46	3.12
	31	3.24	2.77	3.42	2.82	3.60	2.88	3.96	2.99	4.28	3.09	4.39	3.10
	33	3.24	2.77	3.42	2.82	3.60	2.88	3.89	2.97	4.21	3.06	4.32	3.07
	35	3.24	2.77	3.42	2.82	3.60	2.88	3.85	2.95	4.14	3.03	4.25	3.05
	37	3.24	2.77	3.42	2.82	3.60	2.88	3.82	2.94	4.07	3.01	4.18	3.02
	39	3.24	2.77	3.42	2.82	3.60	2.88	3.78	2.92	4.00	2.98	4.10	2.99

Model FDEA45KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11	27	4.05	3.12	4.28	3.18	4.50	3.24	5.00	3.41	5.49	3.56	5.72	3.60
	29	4.05	3.12	4.28	3.18	4.50	3.24	4.95	3.39	5.45	3.54	5.58	3.55
	31	4.05	3.12	4.28	3.18	4.50	3.24	4.95	3.39	5.36	3.51	5.49	3.51
	33	4.05	3.12	4.28	3.18	4.50	3.24	4.86	3.35	5.27	3.47	5.40	3.48
	35	4.05	3.12	4.28	3.18	4.50	3.24	4.82	3.33	5.18	3.44	5.31	3.44
	37	4.05	3.12	4.28	3.18	4.50	3.24	4.77	3.31	5.09	3.40	5.22	3.41
	39	4.05	3.12	4.28	3.18	4.50	3.24	4.73	3.30	5.00	3.36	5.13	3.37

Model FDEA56KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11	27	5.04	3.63	5.32	3.71	5.60	3.78	6.22	3.99	6.83	4.19	7.11	4.24
	29	5.04	3.63	5.32	3.71	5.60	3.78	6.16	3.97	6.78	4.17	6.94	4.16
	31	5.04	3.63	5.32	3.71	5.60	3.78	6.16	3.97	6.66	4.12	6.83	4.12
	33	5.04	3.63	5.32	3.71	5.60	3.78	6.05	3.92	6.55	4.07	6.72	4.07
	35	5.04	3.63	5.32	3.71	5.60	3.78	5.99	3.89	6.44	4.02	6.61	4.02
	37	5.04	3.63	5.32	3.71	5.60	3.78	5.94	3.87	6.33	3.97	6.50	3.98
	39	5.04	3.63	5.32	3.71	5.60	3.78	5.88	3.85	6.22	3.93	6.38	3.93

Model FDEA71KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
18	27	6.39	5.08	6.75	5.19	7.10	5.28	7.88	5.54	8.66	5.79	9.02	5.85
	29	6.39	5.08	6.75	5.19	7.10	5.28	7.81	5.51	8.59	5.76	8.80	5.76
	31	6.39	5.08	6.75	5.19	7.10	5.28	7.81	5.51	8.45	5.70	8.66	5.71
	33	6.39	5.08	6.75	5.19	7.10	5.28	7.67	5.46	8.31	5.65	8.52	5.66
	35	6.39	5.08	6.75	5.19	7.10	5.28	7.60	5.43	8.17	5.59	8.38	5.60
	37	6.39	5.08	6.75	5.19	7.10	5.28	7.53	5.40	8.02	5.53	8.24	5.55
	39	6.39	5.08	6.75	5.19	7.10	5.28	7.46	5.37	7.88	5.48	8.09	5.50

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDEA112KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
26	27	10.08	7.73	10.64	7.90	11.20	8.04	12.43	8.46	13.66	8.84	14.22	8.93
	29	10.08	7.73	10.64	7.90	11.20	8.04	12.32	8.41	13.55	8.80	13.89	8.80
	31	10.08	7.73	10.64	7.90	11.20	8.04	12.32	8.41	13.33	8.70	13.66	8.71
	33	10.08	7.73	10.64	7.90	11.20	8.04	12.10	8.32	13.10	8.61	13.44	8.62
	35	10.08	7.73	10.64	7.90	11.20	8.04	11.98	8.27	12.88	8.52	13.22	8.54
	37	10.08	7.73	10.64	7.90	11.20	8.04	11.87	8.23	12.66	8.43	12.99	8.45
	39	10.08	7.73	10.64	7.90	11.20	8.04	11.76	8.18	12.43	8.34	12.77	8.36

Model FDEA140KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
29	27	12.60	9.23	13.30	9.43	14.00	9.61	15.54	10.13	17.08	10.63	17.78	10.73
	29	12.60	9.23	13.30	9.43	14.00	9.61	15.40	10.07	16.94	10.57	17.36	10.56
	31	12.60	9.23	13.30	9.43	14.00	9.61	15.40	10.07	16.66	10.45	17.08	10.44
	33	12.60	9.23	13.30	9.43	14.00	9.61	15.12	9.95	16.38	10.33	16.80	10.33
	35	12.60	9.23	13.30	9.43	14.00	9.61	14.98	9.89	16.10	10.21	16.52	10.21
	37	12.60	9.23	13.30	9.43	14.00	9.61	14.84	9.83	15.82	10.09	16.24	10.10
	39	12.60	9.23	13.30	9.43	14.00	9.61	14.70	9.77	15.54	9.97	15.96	9.99

(i) FDK Series

Model FDKA22KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
8	27	1.98	1.88	2.09	1.92	2.20	1.95	2.44	2.04	2.68	2.11	2.79	2.14
	29	1.98	1.88	2.09	1.92	2.20	1.95	2.42	2.03	2.66	2.10	2.73	2.11
	31	1.98	1.88	2.09	1.92	2.20	1.95	2.42	2.03	2.62	2.09	2.68	2.10
	33	1.98	1.88	2.09	1.92	2.20	1.95	2.38	2.01	2.57	2.07	2.64	2.08
	35	1.98	1.88	2.09	1.92	2.20	1.95	2.35	2.00	2.53	2.06	2.60	2.07
	37	1.98	1.88	2.09	1.92	2.20	1.95	2.33	2.00	2.49	2.04	2.55	2.05
	39	1.98	1.88	2.09	1.92	2.20	1.95	2.31	1.99	2.44	2.02	2.51	2.04

Model FDKA28KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
8	27	2.52	2.10	2.66	2.15	2.80	2.19	3.11	2.29	3.42	2.38	3.56	2.41
	29	2.52	2.10	2.66	2.15	2.80	2.19	3.08	2.28	3.39	2.37	3.47	2.38
	31	2.52	2.10	2.66	2.15	2.80	2.19	3.08	2.28	3.33	2.35	3.42	2.36
	33	2.52	2.10	2.66	2.15	2.80	2.19	3.02	2.26	3.28	2.33	3.36	2.34
	35	2.52	2.10	2.66	2.15	2.80	2.19	3.00	2.24	3.22	2.31	3.30	2.32
	37	2.52	2.10	2.66	2.15	2.80	2.19	2.97	2.23	3.16	2.29	3.25	2.30
	39	2.52	2.10	2.66	2.15	2.80	2.19	2.94	2.22	3.11	2.27	3.19	2.28

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

Model FDKA36KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
10	27	3.24	2.65	3.42	2.70	3.60	2.75	4.00	2.88	4.39	3.01	4.57	3.04
	29	3.24	2.65	3.42	2.70	3.60	2.75	3.96	2.87	4.36	2.99	4.46	3.00
	31	3.24	2.65	3.42	2.70	3.60	2.75	3.96	2.87	4.28	2.96	4.39	2.97
	33	3.24	2.65	3.42	2.70	3.60	2.75	3.89	2.84	4.21	2.94	4.32	2.94
	35	3.24	2.65	3.42	2.70	3.60	2.75	3.85	2.83	4.14	2.91	4.25	2.92
	37	3.24	2.65	3.42	2.70	3.60	2.75	3.82	2.81	4.07	2.88	4.18	2.89
	39	3.24	2.65	3.42	2.70	3.60	2.75	3.78	2.80	4.00	2.85	4.10	2.87

Model FDKA45KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11	27	4.05	3.16	4.28	3.22	4.50	3.28	5.00	3.45	5.49	3.60	5.72	3.64
	29	4.05	3.16	4.28	3.22	4.50	3.28	4.95	3.43	5.45	3.59	5.58	3.59
	31	4.05	3.16	4.28	3.22	4.50	3.28	4.95	3.43	5.36	3.55	5.49	3.55
	33	4.05	3.16	4.28	3.22	4.50	3.28	4.86	3.39	5.27	3.51	5.40	3.52
	35	4.05	3.16	4.28	3.22	4.50	3.28	4.82	3.38	5.18	3.48	5.31	3.48
	37	4.05	3.16	4.28	3.22	4.50	3.28	4.77	3.36	5.09	3.44	5.22	3.45
	39	4.05	3.16	4.28	3.22	4.50	3.28	4.73	3.34	5.00	3.41	5.13	3.42

Model FDKA56KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	5.04	3.94	5.32	4.03	5.60	4.10	6.22	4.31	6.83	4.50	7.11	4.55
	29	5.04	3.94	5.32	4.03	5.60	4.10	6.16	4.28	6.78	4.48	6.94	4.48
	31	5.04	3.94	5.32	4.03	5.60	4.10	6.16	4.28	6.66	4.43	6.83	4.44
	33	5.04	3.94	5.32	4.03	5.60	4.10	6.05	4.24	6.55	4.39	6.72	4.39
	35	5.04	3.94	5.32	4.03	5.60	4.10	5.99	4.22	6.44	4.34	6.61	4.35
	37	5.04	3.94	5.32	4.03	5.60	4.10	5.94	4.19	6.33	4.30	6.50	4.31
	39	5.04	3.94	5.32	4.03	5.60	4.10	5.88	4.17	6.22	4.25	6.38	4.27

Model FDKA71KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
21	27	6.39	5.33	6.75	5.44	7.10	5.54	7.88	5.80	8.66	6.04	9.02	6.11
	29	6.39	5.33	6.75	5.44	7.10	5.54	7.81	5.77	8.59	6.01	8.80	6.03
	31	6.39	5.33	6.75	5.44	7.10	5.54	7.81	5.77	8.45	5.96	8.66	5.98
	33	6.39	5.33	6.75	5.44	7.10	5.54	7.67	5.72	8.31	5.90	8.52	5.92
	35	6.39	5.33	6.75	5.44	7.10	5.54	7.60	5.69	8.17	5.85	8.38	5.87
	37	6.39	5.33	6.75	5.44	7.10	5.54	7.53	5.66	8.02	5.80	8.24	5.82
	39	6.39	5.33	6.75	5.44	7.10	5.54	7.46	5.63	7.88	5.74	8.09	5.77

Note (1) Symbols are as follows :

TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

(j) FDFL, FDFU Series

Models FDFLA28KXE4, FDFUA28KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
12	27	2.52	2.43	2.66	2.48	2.80	2.52	3.11	2.62	3.42	2.70	3.56	2.73
	29	2.52	2.43	2.66	2.48	2.80	2.52	3.08	2.61	3.39	2.69	3.47	2.70
	31	2.52	2.43	2.66	2.48	2.80	2.52	3.08	2.61	3.33	2.67	3.42	2.69
	33	2.52	2.43	2.66	2.48	2.80	2.52	3.02	2.59	3.28	2.66	3.36	2.67
	35	2.52	2.43	2.66	2.48	2.80	2.52	3.00	2.58	3.22	2.64	3.30	2.65
	37	2.52	2.43	2.66	2.48	2.80	2.52	2.97	2.57	3.16	2.62	3.25	2.64
	39	2.52	2.43	2.66	2.48	2.80	2.52	2.94	2.56	3.11	2.61	3.19	2.62

Models FDFLA45KXE4, FDFUA45KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	4.05	3.52	4.28	3.60	4.50	3.66	5.00	3.83	5.49	3.98	5.72	4.02
	29	4.05	3.52	4.28	3.60	4.50	3.66	4.95	3.81	5.45	3.96	5.58	3.97
	31	4.05	3.52	4.28	3.60	4.50	3.66	4.95	3.81	5.36	3.93	5.49	3.94
	33	4.05	3.52	4.28	3.60	4.50	3.66	4.86	3.78	5.27	3.90	5.40	3.91
	35	4.05	3.52	4.28	3.60	4.50	3.66	4.82	3.76	5.18	3.86	5.31	3.88
	37	4.05	3.52	4.28	3.60	4.50	3.66	4.77	3.74	5.09	3.83	5.22	3.85
	39	4.05	3.52	4.28	3.60	4.50	3.66	4.73	3.72	5.00	3.80	5.13	3.81

Model FDFUA56KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
14	27	5.04	3.95	5.32	4.03	5.60	4.10	6.22	4.31	6.83	4.50	7.11	4.55
	29	5.04	3.95	5.32	4.03	5.60	4.10	6.16	4.29	6.78	4.48	6.94	4.48
	31	5.04	3.95	5.32	4.03	5.60	4.10	6.16	4.29	6.66	4.44	6.83	4.44
	33	5.04	3.95	5.32	4.03	5.60	4.10	6.05	4.24	6.55	4.39	6.72	4.40
	35	5.04	3.95	5.32	4.03	5.60	4.10	5.99	4.22	6.44	4.35	6.61	4.35
	37	5.04	3.95	5.32	4.03	5.60	4.10	5.94	4.20	6.33	4.30	6.50	4.31
	39	5.04	3.95	5.32	4.03	5.60	4.10	5.88	4.17	6.22	4.26	6.38	4.27

Models FDFLA71KXE4, FDFUA71KXE4

Air flow (m^3/min)	Indoor air temperature											
	Outdoor air temp. (˚CDB)	17.0˚CWB		18.0˚CWB		19.0˚CWB		20.0˚CWB		21.0˚CWB		22.0˚CWB	
		TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
18	27	6.39	5.06	6.75	5.16	7.10	5.26	7.88	5.52	8.66	5.76	9.02	5.82
	29	6.39	5.06	6.75	5.16	7.10	5.26	7.81	5.49	8.59	5.73	8.80	5.74
	31	6.39	5.06	6.75	5.16	7.10	5.26	7.81	5.49	8.45	5.68	8.66	5.68
	33	6.39	5.06	6.75	5.16	7.10	5.26	7.67	5.43	8.31	5.62	8.52	5.63
	35	6.39	5.06	6.75	5.16	7.10	5.26	7.60	5.40	8.17	5.56	8.38	5.58
	37	6.39	5.06	6.75	5.16	7.10	5.26	7.53	5.37	8.02	5.51	8.24	5.52
	39	6.39	5.06	6.75	5.16	7.10	5.26	7.46	5.35	7.88	5.45	8.09	5.47

Note (1) Symbols are as follows :

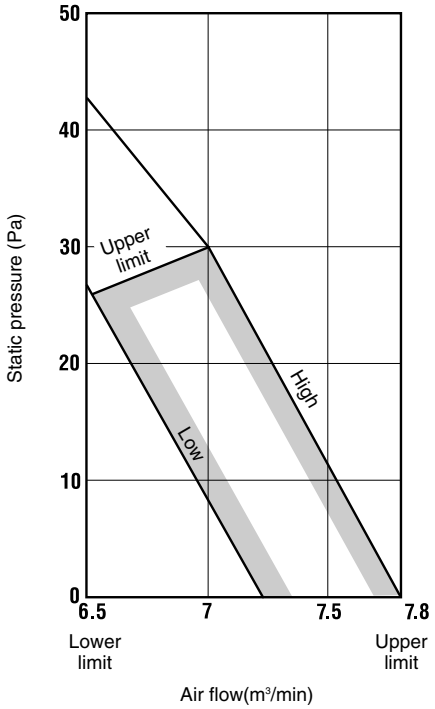
TC : Total cooling capacity (kW)
SHC : Sensible heat capacity (kW)

2.8 Characteristics of fan

(1) Ceiling recessed single air suppy port type (FDTQ)

(Only when FDTQA22, 28 and 36 model are used for the Duct panel type.)

Models FDTQA22, 28 36KXE4



(2) Cassetteria type (FDR)

- External static pressure table

Unit : Pa

model \ Duct specs. / Air flow (m³/min)		1 spot (1) closing		Standard (2)		Square duct (3)	
		Stan-dard	High(4) speed	Stan-dard	High(4) speed	Stan-dard	High(4) speed
FDRA22	10	-	-	45	85	50	90
FDRA28	12	-	-	45	85	45	85
FDRA45 56	14	-	-	50	85	50	90
FDRA71	18	30	65	45	80	50	85
FDRA90	20	25	60	45	80	50	85
FDRA112	28	40	70	50	80	55	85
FDRA140	34	40	70	50	80	55	85

Notes (1) 1 spot closing: Round duct flange at center is removed and shield with a special panel (option).

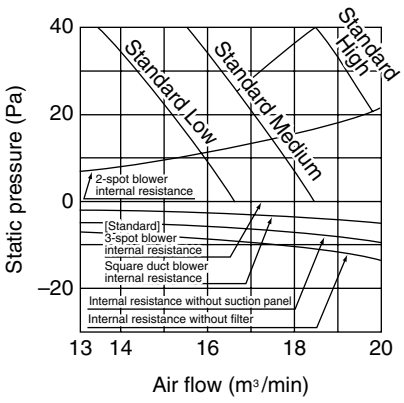
(2) Standard: Ø200 duct are installed at all blowout holes.

(3) Square duct: All round ducts are removed and replaced with special square duct flanges (option).

(4) When operating at a high speed, invert the connection of white and red connectors on the flank of control box.

How to interpret the blower characteristics table

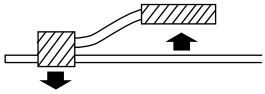
Example : Case of FDRA71KXE4



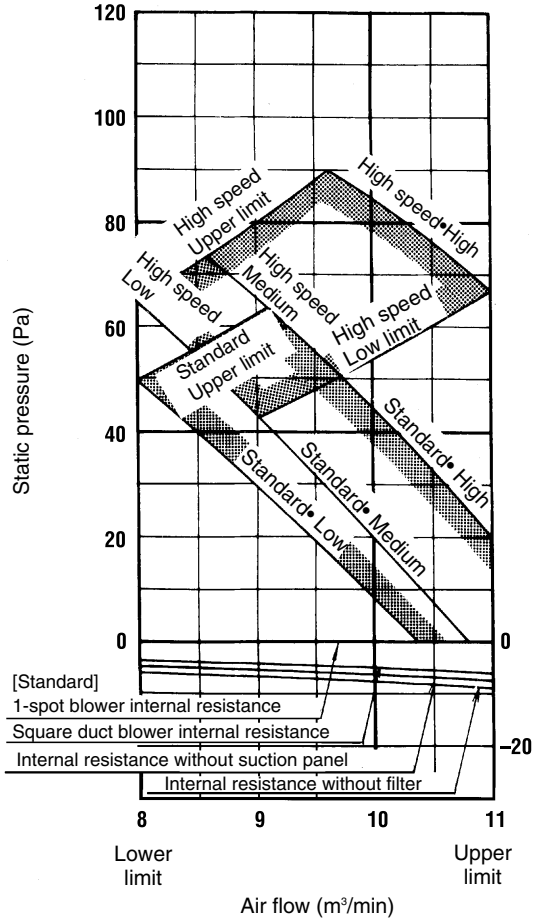
① **2-spot blowout.....**
Internal resistance increases more than the standard 3-spot blowout. Approx. 14 Pa at 17m³/min

② **Square duct blowout.....**
Internal resistance decreases more than the standard round duct (ø200 3-spot). 3 Pa at 17 m³/nin. (External static pressure increases in reverse.)

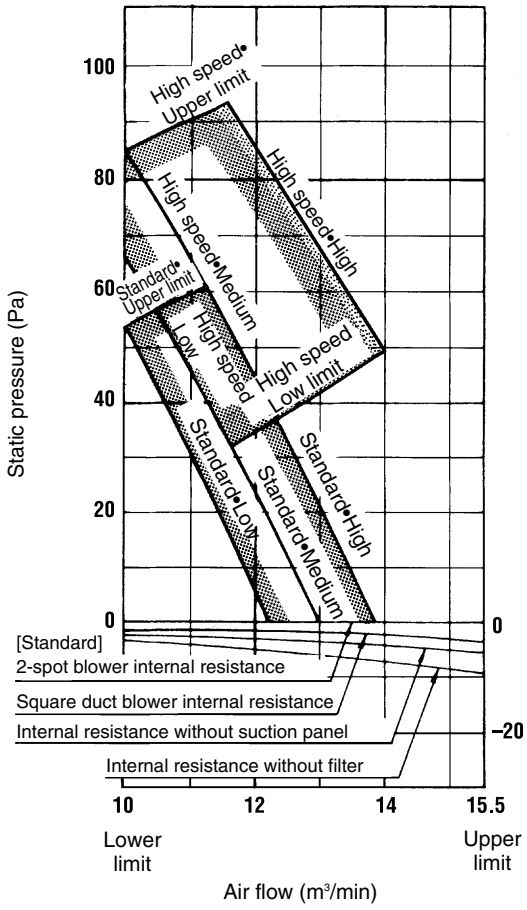
③ **Suction panel.....**
When the suction panel is not used with the ceiling return type, the part of internal resistance related to the panel decrease. 3 Pa (= 0.6–0.3) at 17mm³/min.



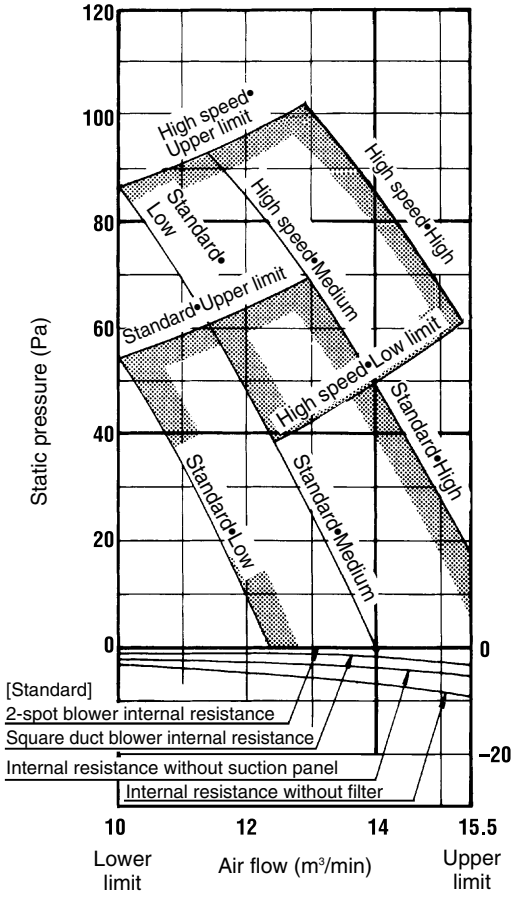
Model FDRA22KXE4



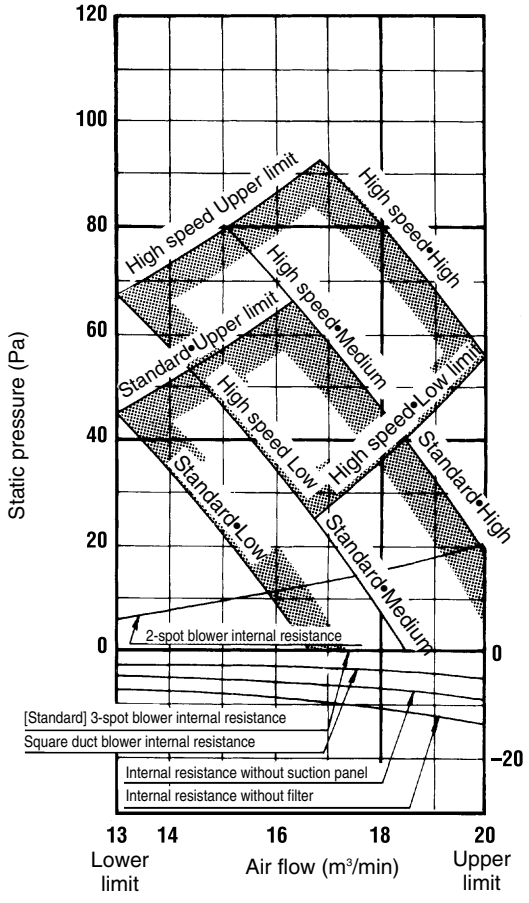
Model FDRA28KXE4



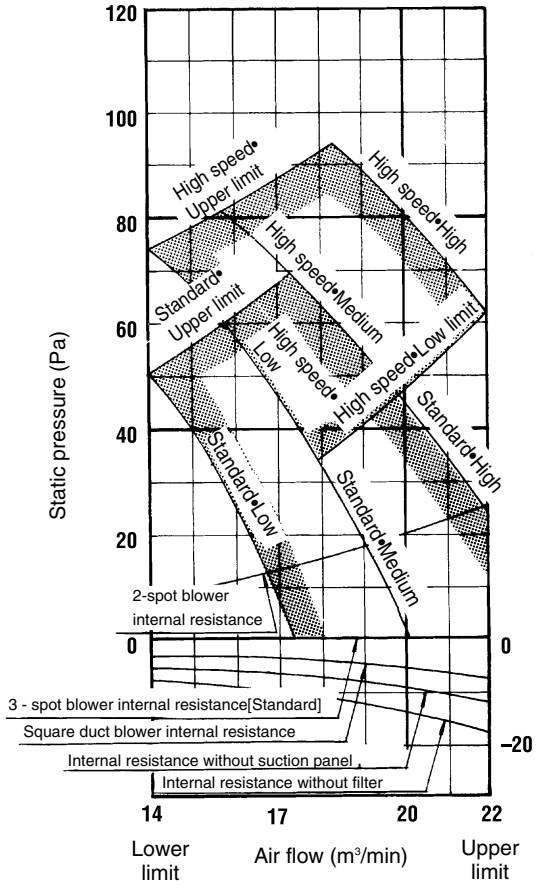
Models FDRA45KXE4, 56KXE4



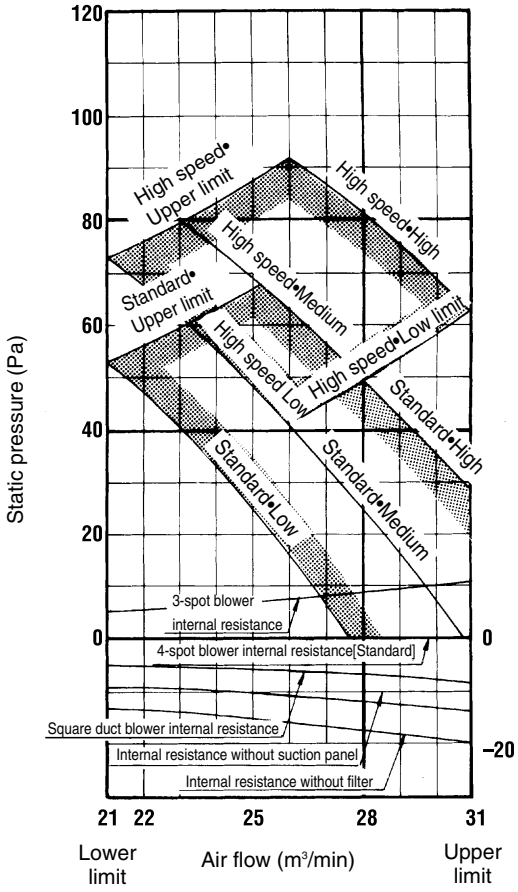
Model FDRA71KXE4



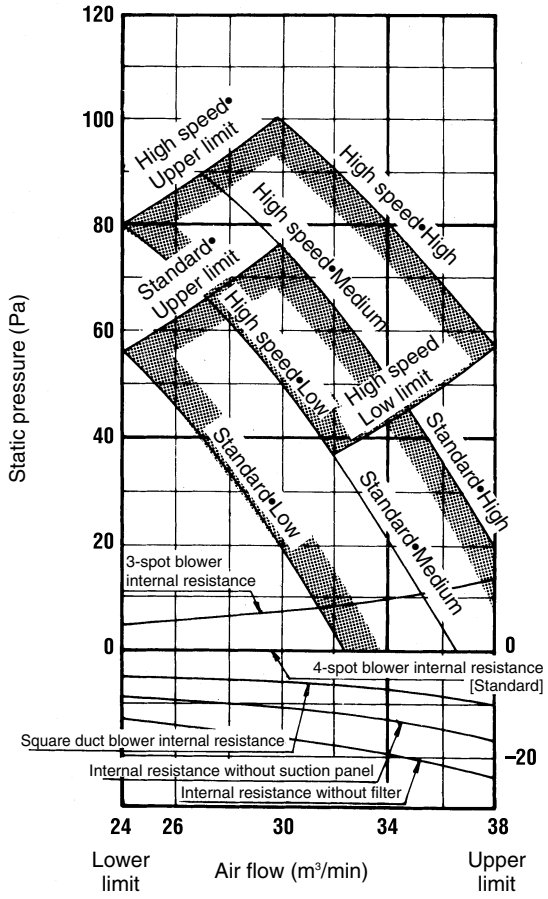
Model FDRA90KXE4



Model FDRA112KXE4



Model FDRA140KXE4



(3) Medium static pressure ducted type (FDQM)
Satellite ducted type (FDUM)

- External static pressure table

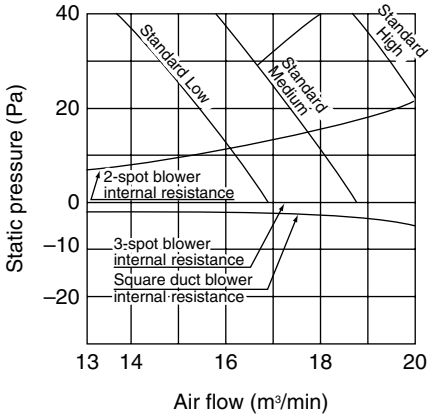
Unit : Pa

Model \ Duct specs. / Air flow (m^3/min)		1 spot closing		Standard		Square duct	
		Stan-dard	High(4) speed	Stan-dard	High(4) speed	Stan-dard	High(1) speed
FDQMA22 28 36	7	-	-	-	-	30	-
FDUMA36	12	-	-	50	85	50	90
FDUMA45 56	14	-	-	50	85	50	90
FDUMA71	18	35	70	50	85	55	90
FDUMA90	20	30	65	50	85	55	90
FDUMA112	28	50	80	60	90	65	95
FDUMA140	34	50	75	60	85	65	95

Note (1) For high speed operation, insert the white connector and the red connector beside the control box in other places respectively.

How to interpret the blower characteristics table

Example : Case of FDUMA71KXE4



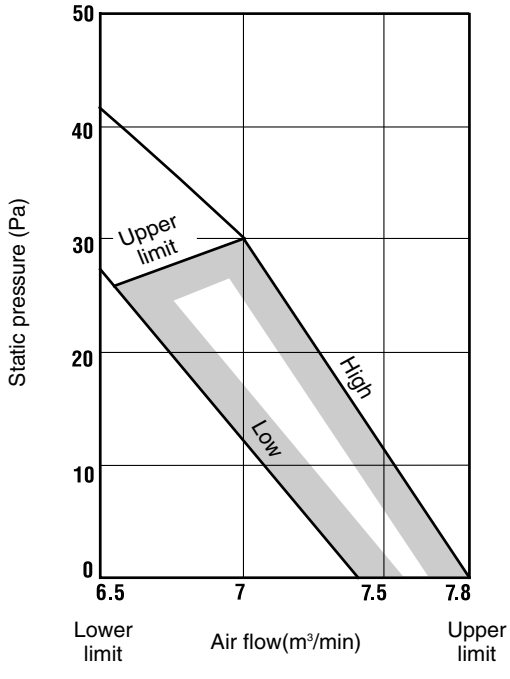
① **2-spot blowout.....**

Internal resistance increases more than the standard 3-spot blowout. Approx. 14Pa at 17m³/min

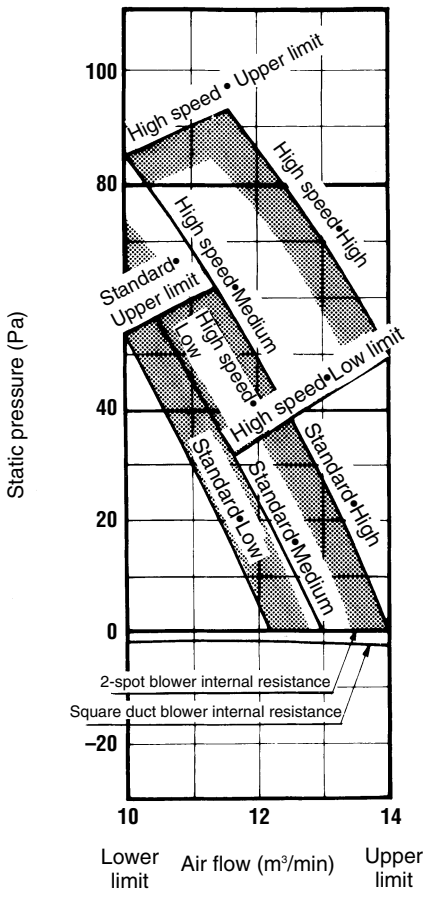
② **Square duct blowout.....**

Internal resistance decreases more than the standard round duct (ø200 3-spot). 3Pa at 17 m³/min. (External static pressure increases in reverse.)

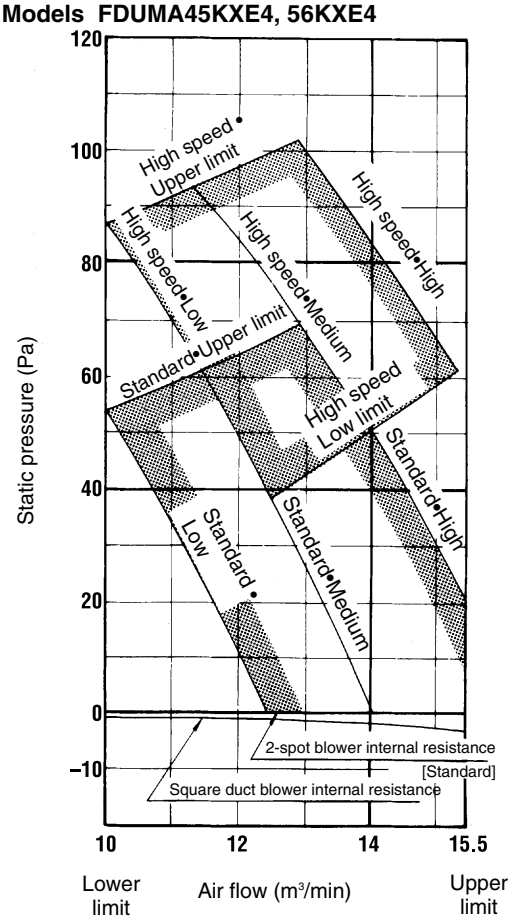
Models FDQMA22KXE4, 28KXE4, 36KXE4



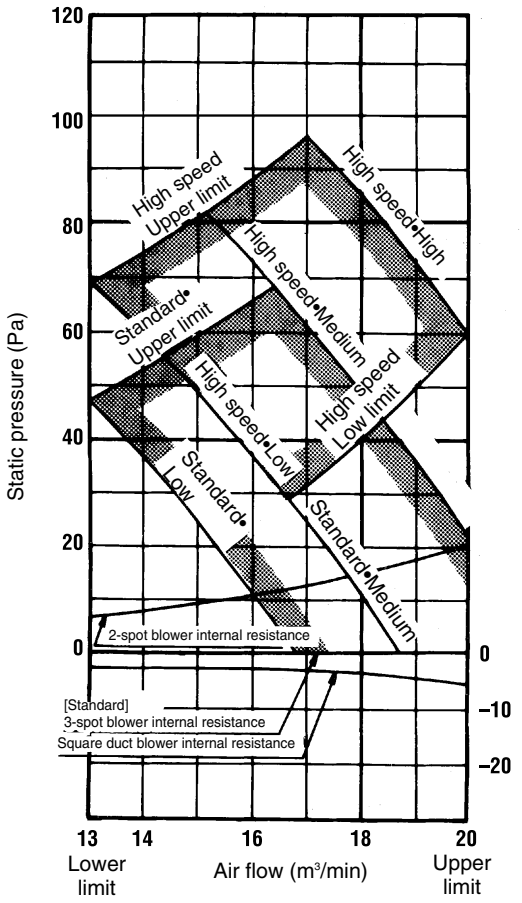
Model FDUMA36KXE4



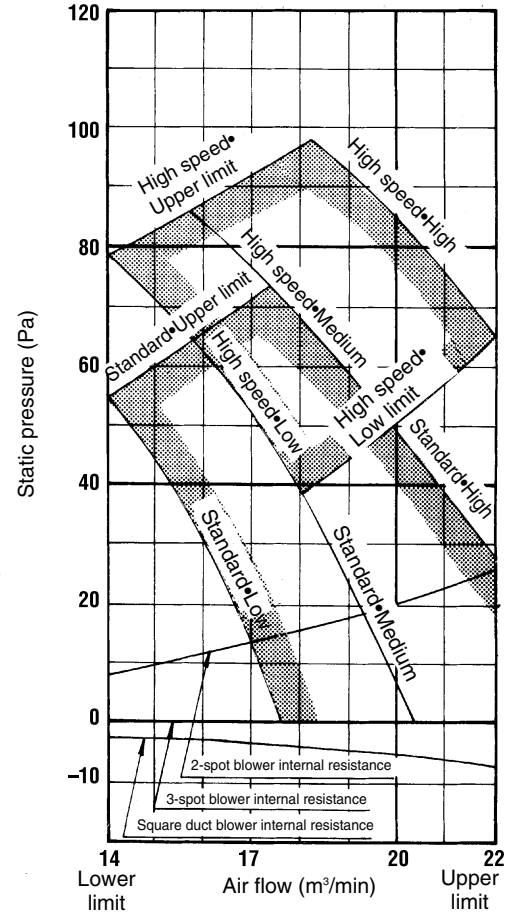
Models FDUMA45KXE4, 56KXE4



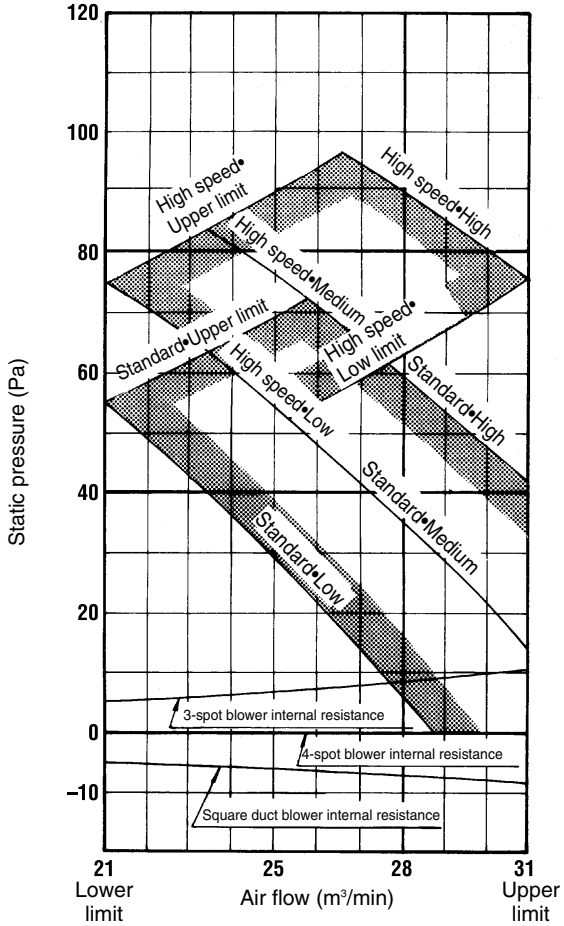
Model FDUMA71KXE4



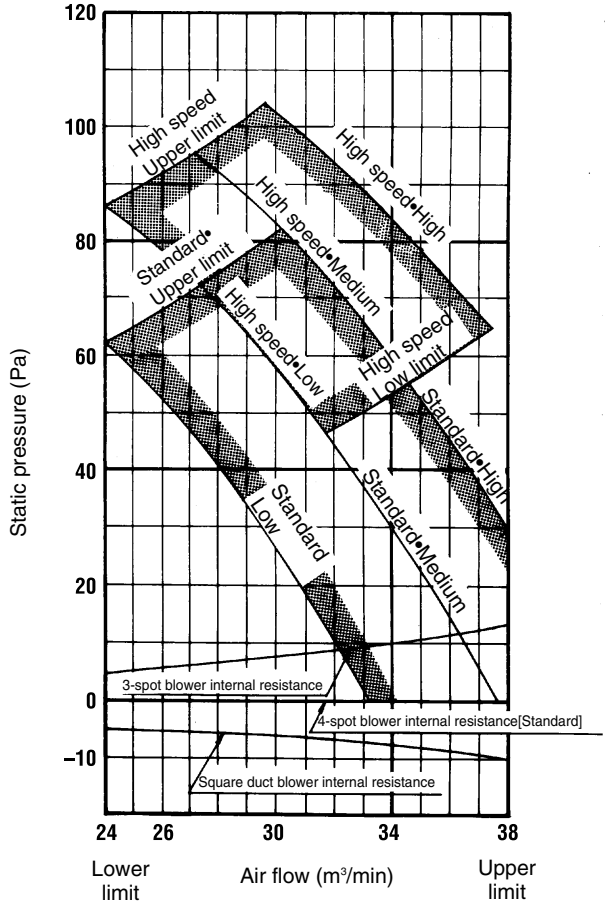
Model FDUMA90KXE4



Model FDUMA112KXE4

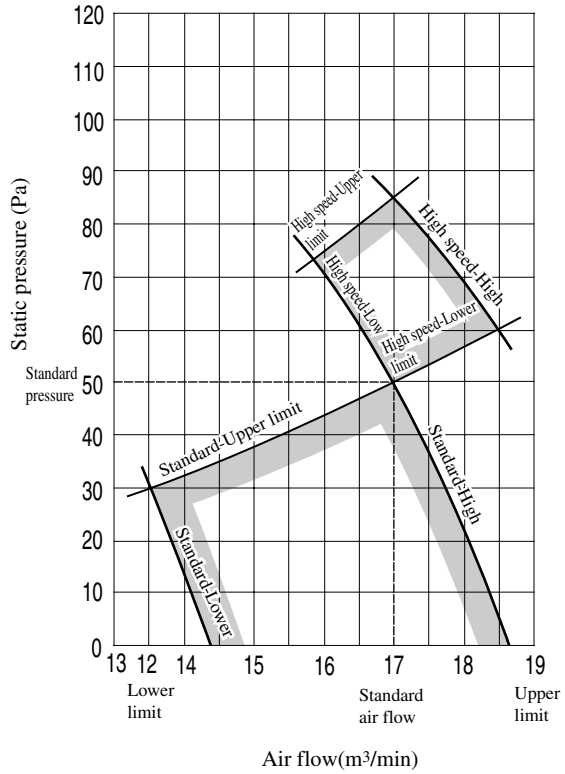


Model FDUMA140KXE4

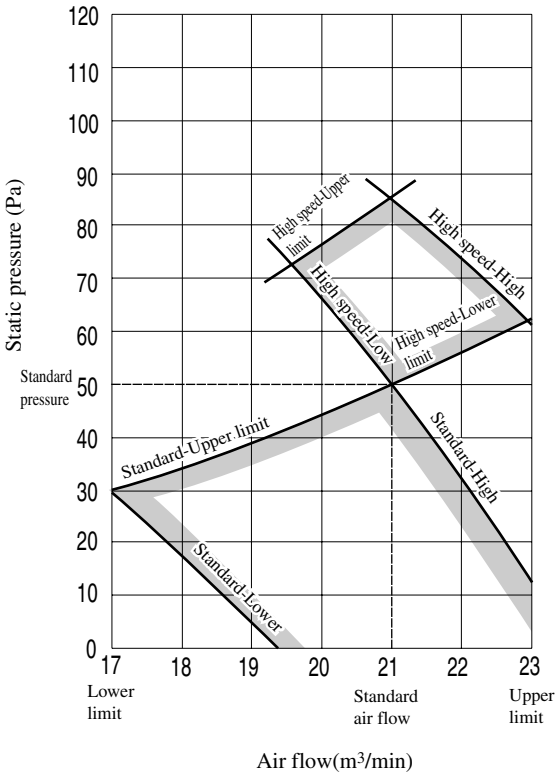


(4) Ceiling mounted dact type (FDUR)

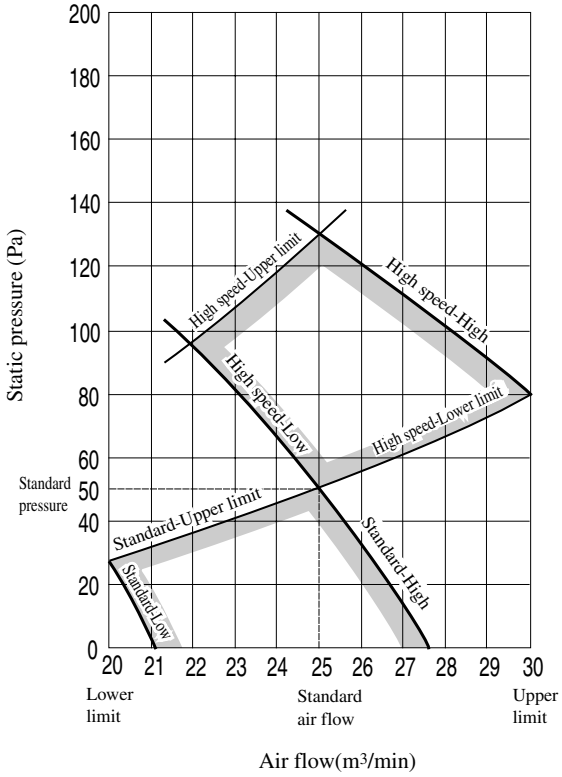
Model FDURA45KXE4



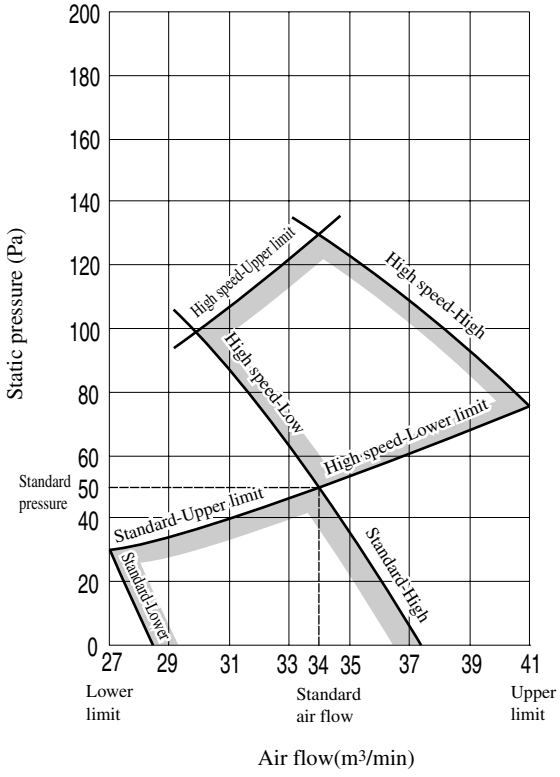
Model FDURA56KXE4



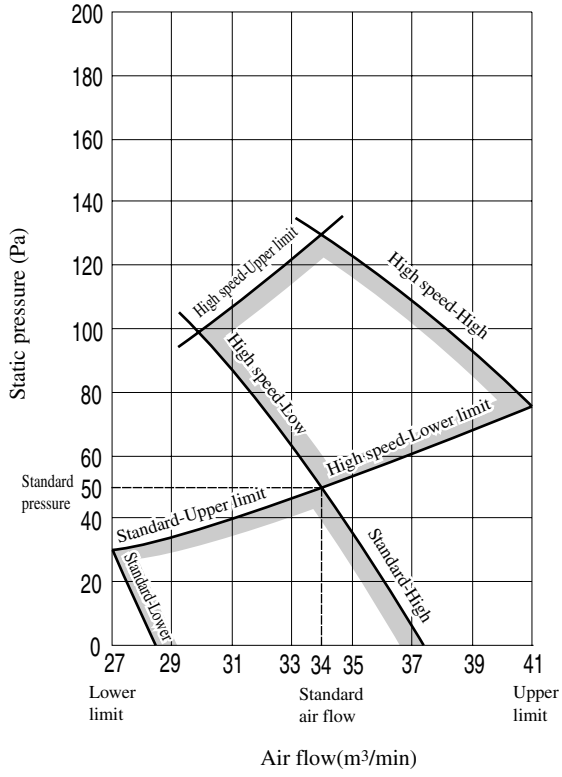
Model FDURA71KXE4



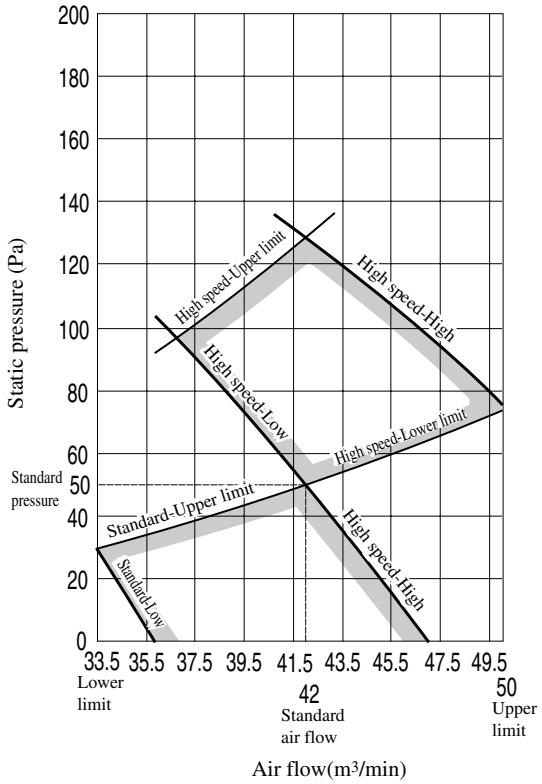
Model FDURA90KXE4



Model FDURA112KXE4



Model FDURA140KXE4



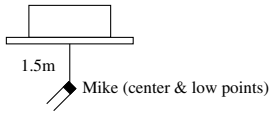
2.9 Noise level

Note (1) The data are based on the following conditions.
Ambient air tempetature: Indoor unit 27˚C DB, 19˚C WB. Outdoor unit 35˚C DB
(2) The data in the chart are measuted in an unechonic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

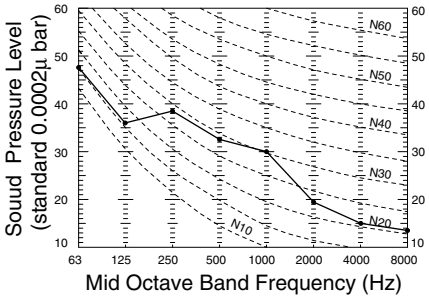
(1) Indoor unit

(a) Ceiling recessed type (FDT)

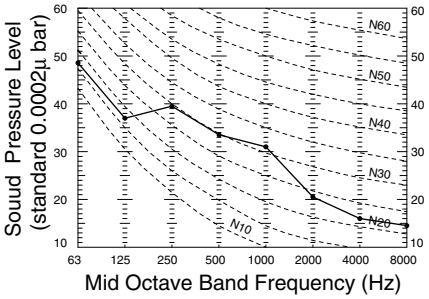
Measured based on JIS B 8616
Mike position as right



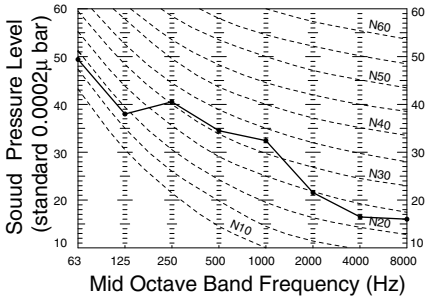
Models FDTA28KXE4, 36KXE4 45KXE4
Noise level 35 dB (A) at HIGH
33 dB (A) at MEDIUM
31 dB (A) at LOW



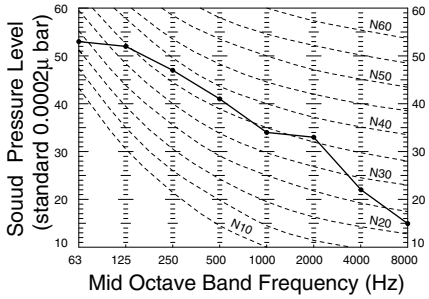
Model FDTA56KXE4
Noise level 36 dB (A) at HIGH
34 dB (A) at MEDIUM
32 dB (A) at LOW



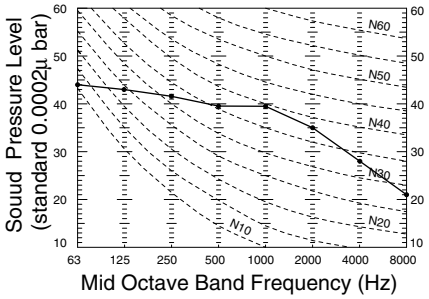
Model FDTA71KXE4
Noise level 37 dB (A) at HIGH
35 dB (A) at MEDIUM
33 dB (A) at LOW



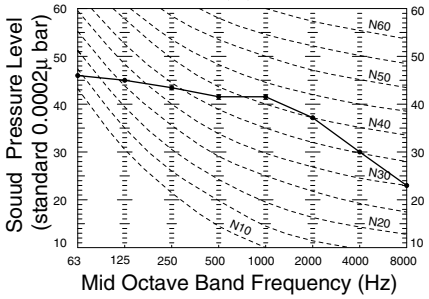
Model FDTA90KXE4
Noise level 43 dB (A) at HIGH
41 dB (A) at MEDIUM
38 dB (A) at LOW



Model FDTA112KXE4
Noise level 43 dB (A) at HIGH
41 dB (A) at MEDIUM
38 dB (A) at LOW

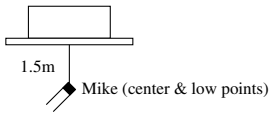


Model FDTA140KXE4
Noise level 45 dB (A) at HIGH
43 dB (A) at MEDIUM
41 dB (A) at LOW

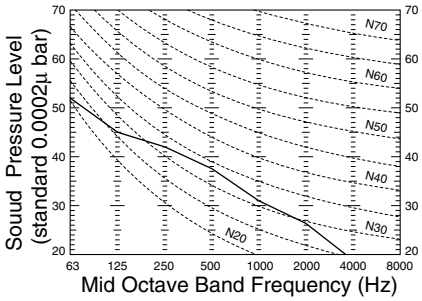


(b) 2-way outlet ceiling recessed type (FDTW)

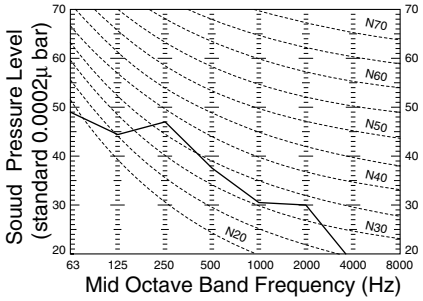
Measured based on JIS B 8616
Mike position as below



Models FDTWA28KXE4, 45KXE4 56KXE4
Noise level 39 dB (A) at HIGH
36 dB (A) at MEDIUM
33 dB (A) at LOW

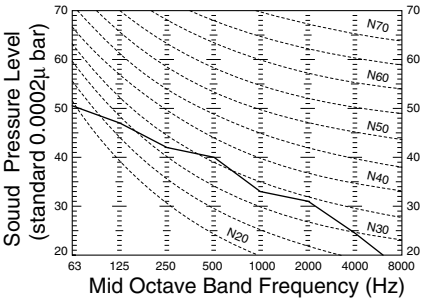


Model FDTWA71KXE4
Noise level 41 dB (A) at HIGH
38 dB (A) at MEDIUM
35 dB (A) at LOW



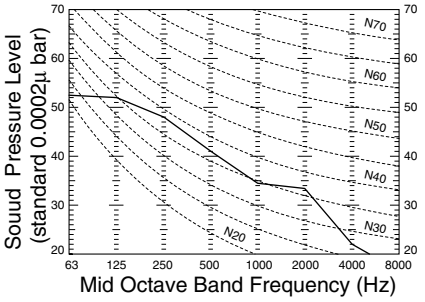
Model FDTWA90KXE4

Noise level 41 dB (A) at HIGH
39 dB (A) at MEDIUM
36 dB (A) at LOW



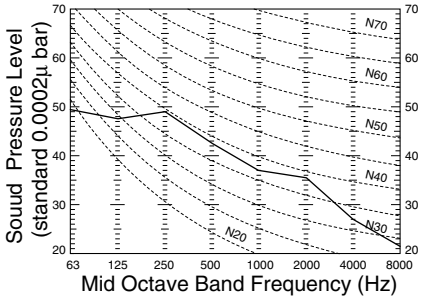
Model FDTWA112KXE4

Noise level 44 dB (A) at HIGH
41 dB (A) at MEDIUM
38 dB (A) at LOW



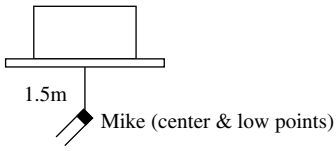
Model FDTWA140KXE4

Noise level 45 dB (A) at HIGH
42 dB (A) at MEDIUM
39 dB (A) at LOW



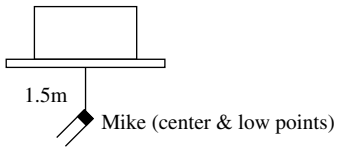
(c) Ceiling recessed single air suppy type (FDTQ)

Measured based on JIS B 8616
Mike position as right



(d) 1-way outlet ceiling recessed type (FDTS)

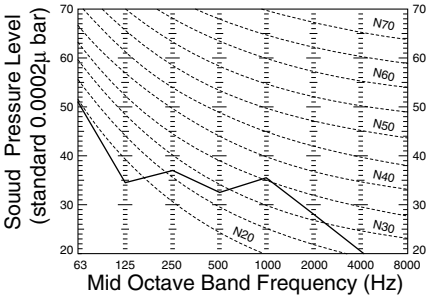
Measured based on JIS B 8616
Mike position as below



When used as the Duct panel type

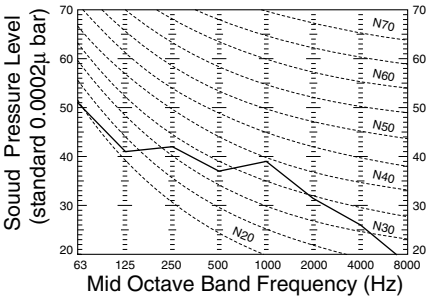
Models FDTQA22KXE4, 28KXE4 36KXE4

Noise level 38 dB (A) at HIGH
33 dB (A) at LOW



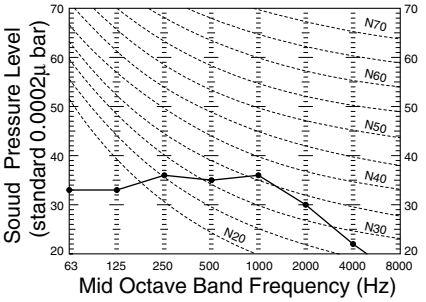
Models FDTQA22KXE4, 28KXE4 36KXE4

Noise level 42 dB (A) at HIGH
39 dB (A) at LOW



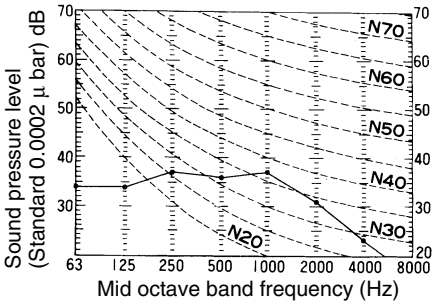
Model FDTSA22KXE4

Noise level 39 dB (A) at HIGH
38 dB (A) at LOW



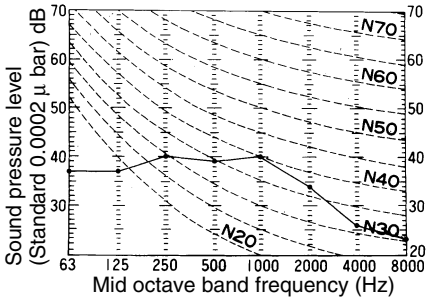
Models FDTSA28KXE4, 36KXE4

Noise level 40 dB (A) at HIGH
39 dB (A) at MEDIUM
38 dB (A) at LOW



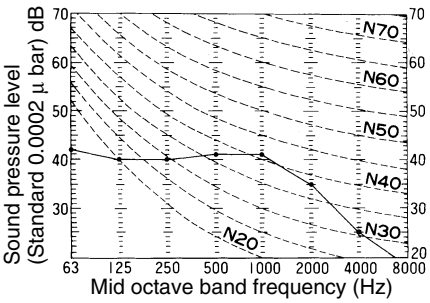
Model FDTSA45KXE4

Noise level 43 dB (A) at HIGH
40 dB (A) at MEDIUM
38 dB (A) at LOW



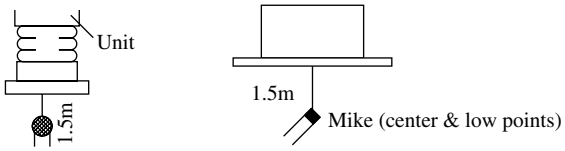
Model FDTSA71KXE4

Noise level 44 dB (A) at HIGH
40 dB (A) at MEDIUM
38 dB (A) at LOW



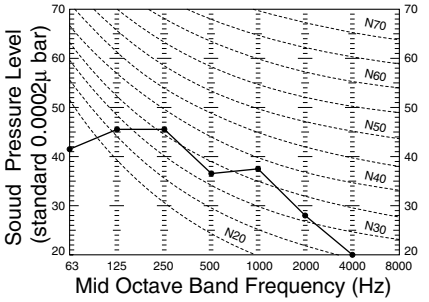
(e) Cassetteria type (FDR)

Measured based on JIS B 8616
Mike position as right

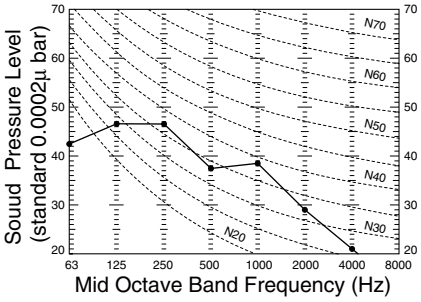


(i) Canvas duct Panel type

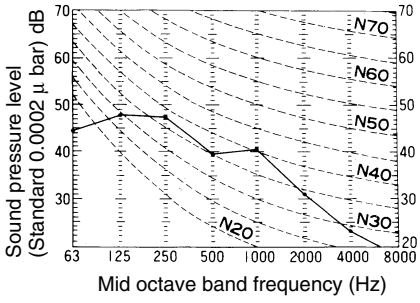
Model FDRA22KXE4
Noise level 42 dB (A) at HIGH
40 dB (A) at MEDIUM
37 dB (A) at LOW



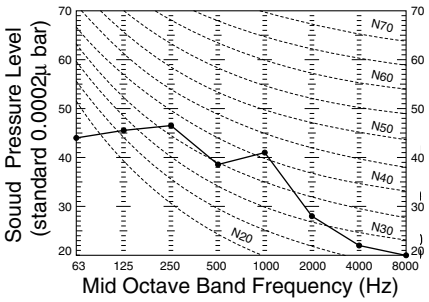
Model FDRA28KXE4
Noise level 43 dB (A) at HIGH
41 dB (A) at MEDIUM
38 dB (A) at LOW



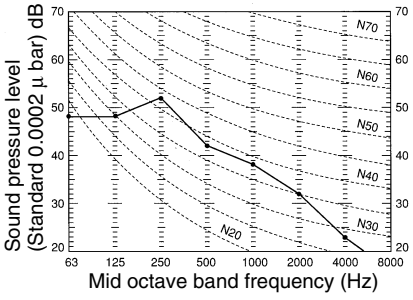
Models FDRA45KXE4, 56KXE4
Noise level 44 dB (A) at HIGH
41 dB (A) at MEDIUM
38 dB (A) at LOW



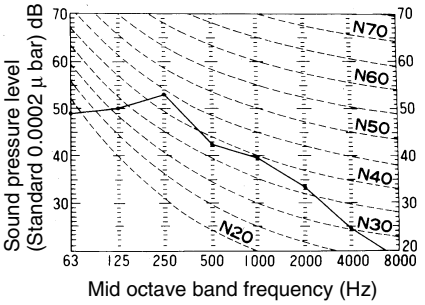
Models FDRA71KXE4, 90KXE4
Noise level 44 dB (A) at HIGH
41 dB (A) at MEDIUM
38 dB (A) at LOW



Model FDRA112KXE4
Noise level 46 dB (A) at HIGH
43 dB (A) at MEDIUM
39 dB (A) at LOW

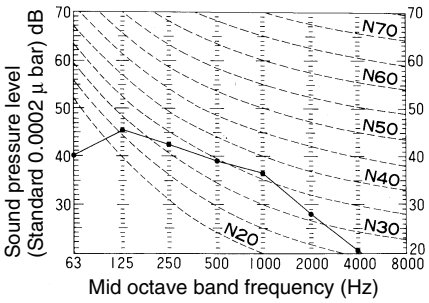


Model FDRA140KXE4
Noise level 47 dB (A) at HIGH
44 dB (A) at MEDIUM
40 dB (A) at LOW

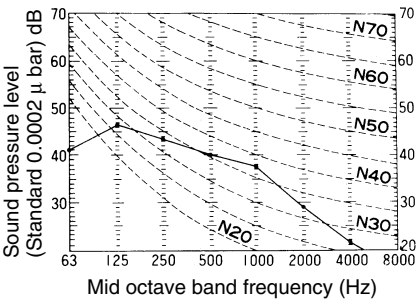


(ii)Silent Panel type

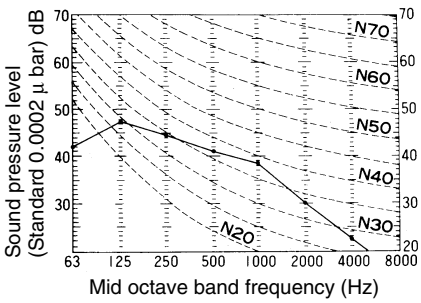
Model FDRA22KXE4
Noise level 41 dB (A) at HIGH
39 dB (A) at MEDIUM
36 dB (A) at LOW



Model FDRA28KXE4
Noise level 42 dB (A) at HIGH
40 dB (A) at MEDIUM
37 dB (A) at LOW

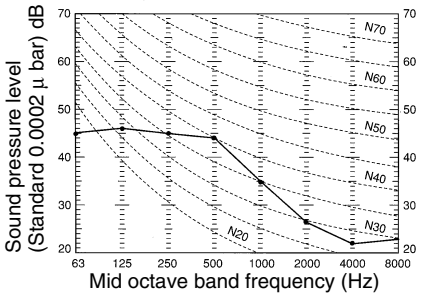


Models FDRA45KXE4, 56KXE4
Noise level 43 dB (A) at HIGH
40 dB (A) at MEDIUM
37 dB (A) at LOW



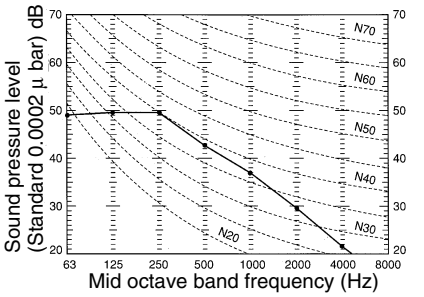
Models FDRA71KXE4, 90KXE4

Noise level 43 dB (A) at HIGH
40 dB (A) at MEDIUM
37 dB (A) at LOW



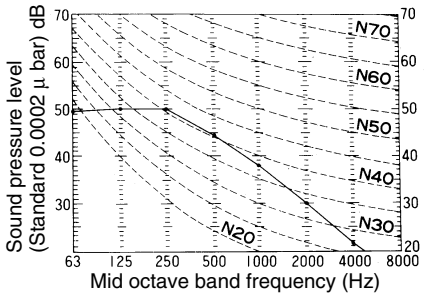
Model FDRA112KXE4

Noise level 45 dB (A) at HIGH
42 dB (A) at MEDIUM
38 dB (A) at LOW



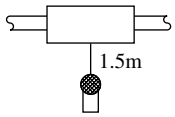
Model FDRA140KXE4

Noise level 46 dB (A) at HIGH
43 dB (A) at MEDIUM
39 dB (A) at LOW



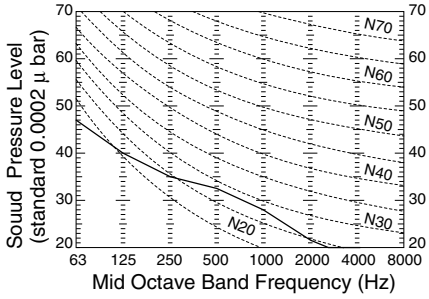
(f) Medium static pressure ducted type (FDQU)
Satellite ducted type (FDUM)

Measured based on JIS B 8616
Mike position as right



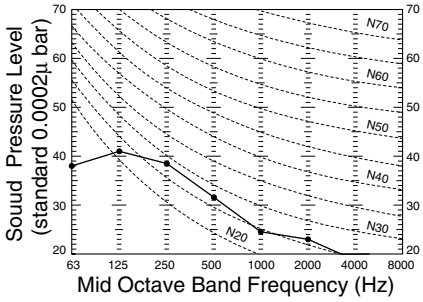
Model FDQMA22KXE4, 28KXE4
36KXE4

Noise level 34 dB (A) at HIGH
31 dB (A) at LOW



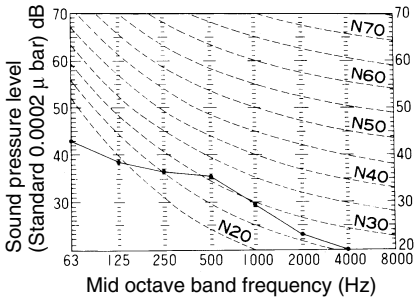
Models FDUMA36KXE4

Noise level 34 dB (A) at HIGH
32 dB (A) at MEDIUM
29 dB (A) at LOW



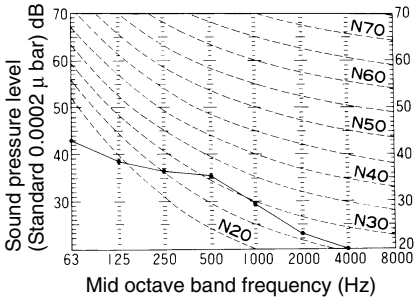
Models FDUMA45KXE4, 56KXE4
71KXE4

Noise level 35 dB (A) at HIGH
32 dB (A) at MEDIUM
29 dB (A) at LOW



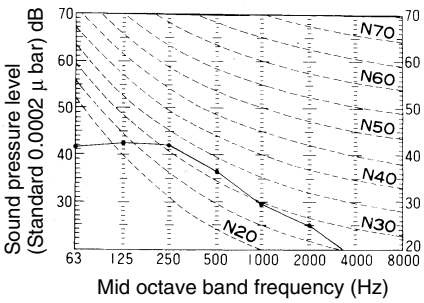
Model FDUMA90KXE4

Noise level 36 dB (A) at HIGH
33 dB (A) at MEDIUM
30 dB (A) at LOW



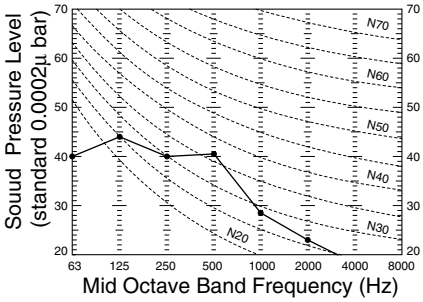
Model FDUMA112KXE4

Noise level 38 dB (A) at HIGH
35 dB (A) at MEDIUM
32 dB (A) at LOW

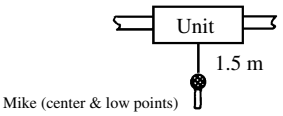


Model FDUMA140KXE4

Noise level 39 dB (A) at HIGH
37 dB (A) at MEDIUM
34 dB (A) at LOW

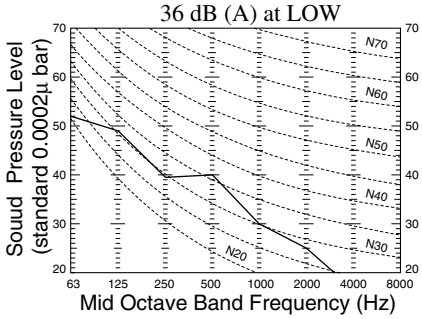


(g) Ceiling mounted duct type (FDUR)

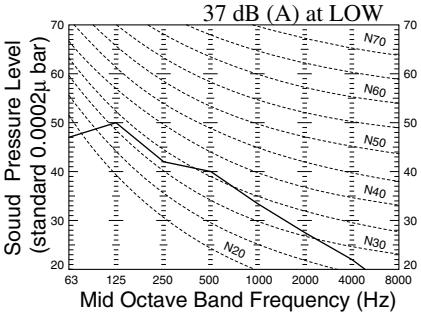


Measured based on JIS B 8616
Mike position as right

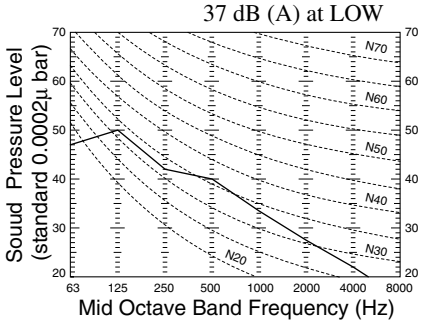
Model FDURA45KXE4
Noise level 40 dB (A) at HIGH
36 dB (A) at LOW



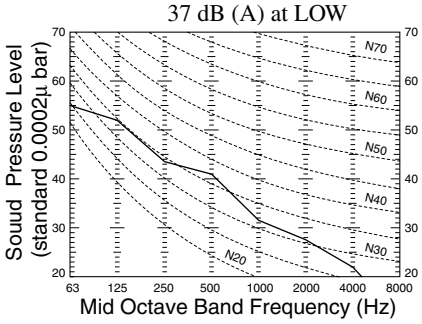
Model FDURA56KXE4
Noise level 41 dB (A) at HIGH
37 dB (A) at LOW



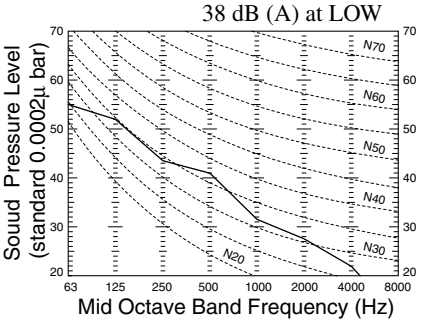
Model FDURA71KXE4
Noise level 41 dB (A) at HIGH
37 dB (A) at LOW



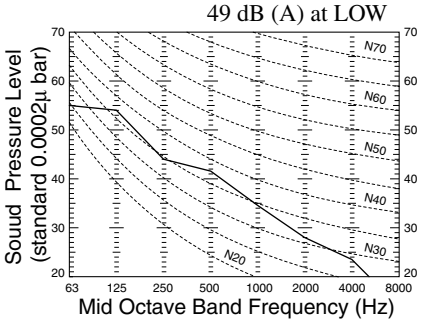
Model FDURA90KXE4
Noise level 42 dB (A) at HIGH
37 dB (A) at LOW



Model FDURA112KXE4
Noise level 42 dB (A) at HIGH
38 dB (A) at LOW

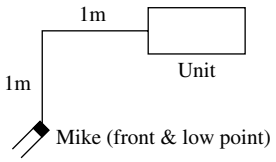


Model FDURA140KXE4
Noise level 43 dB (A) at HIGH
49 dB (A) at LOW

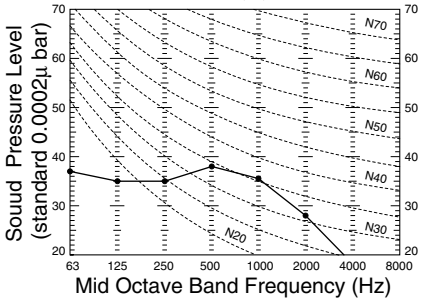


(h) Ceiling suspension type (FDE)

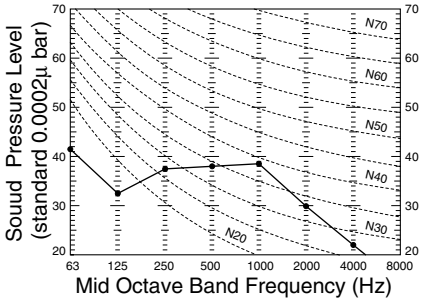
Measured based on JIS B 8616
Mike position as below



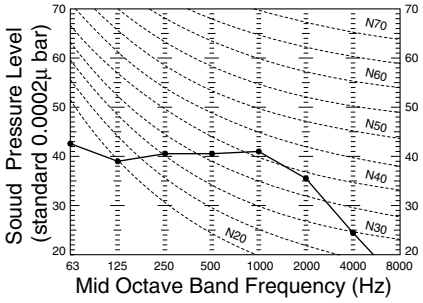
Models FDEA36KXE4, 45KXE4
56KXE4
Noise level 39 dB (A) at HIGH
38 dB (A) at MEDIUM
36 dB (A) at LOW



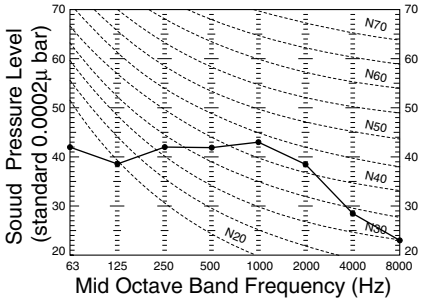
Model FDEA71KXE4
Noise level 41 dB (A) at HIGH
39 dB (A) at MEDIUM
37 dB (A) at LOW



Model FDEA112KXE4
Noise level 44 dB (A) at HIGH
41 dB (A) at MEDIUM
39 dB (A) at LOW

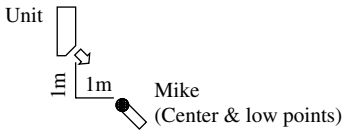


Model FDEA140KXE4
Noise level 46 dB (A) at HIGH
44 dB (A) at MEDIUM
43 dB (A) at LOW



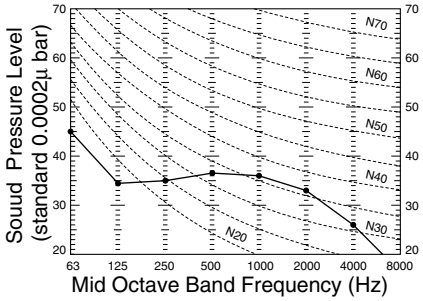
(i) Wall mounted type (FDK)

Measured based on JIS B 8616
Mike position as right



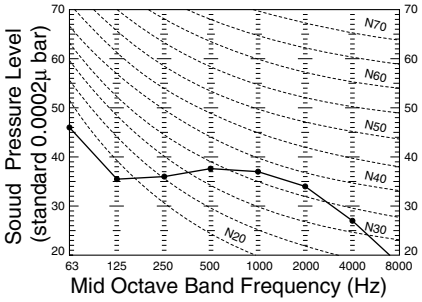
Models FDKA22KXE4, 28KXE4

Noise level 40 dB (A) at HIGH
36 dB (A) at MEDIUM
32 dB (A) at LOW



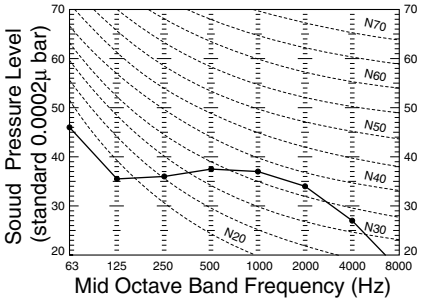
Model FDKA36KXE4

Noise level 41 dB (A) at HIGH
37 dB (A) at MEDIUM
33 dB (A) at LOW



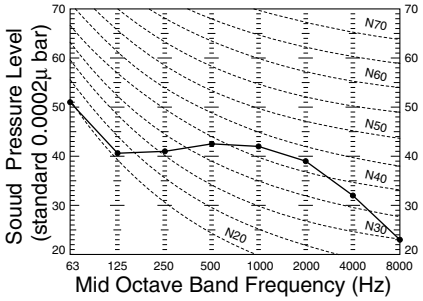
Model FDKA45KXE4

Noise level 41 dB (A) at HIGH
37 dB (A) at MEDIUM
32 dB (A) at LOW



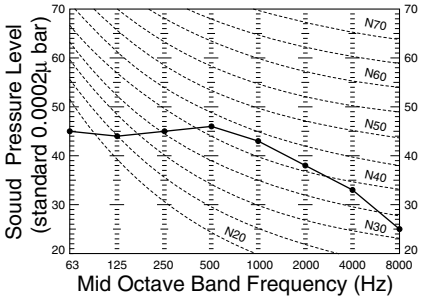
Model FDKA56KXE4

Noise level 46 dB (A) at HIGH
43 dB (A) at MEDIUM
39 dB (A) at LOW



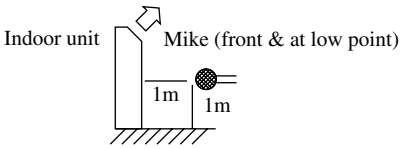
Model FDKA71KXE4

Noise level 47 dB (A) at HIGH
44 dB (A) at MEDIUM
40 dB (A) at LOW



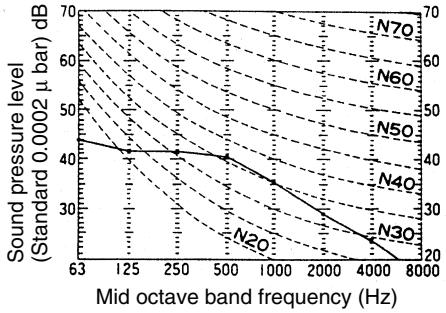
(j) Floor standing type (FDFL, FDFU))

Measured based on JIS B 8616
Mike position as right



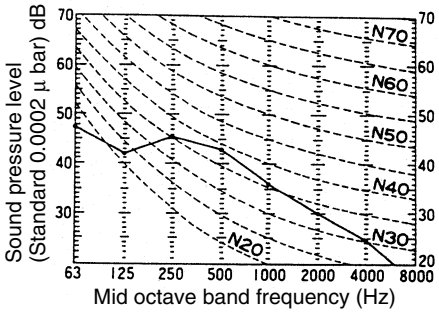
Models FDFLA28KXE4, FDFUA28KXE4

Noise level 41 dB (A) at HIGH
38 dB (A) at MEDIUM
36 dB (A) at LOW



Models FDFLA45KXE4, 71KXE4
FDFUA45KXE4, 56KXE4, 71KXE4

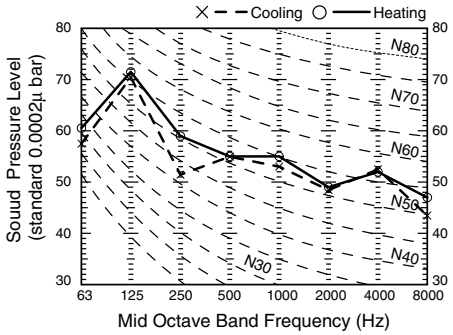
Noise level 43 dB (A) at HIGH
41 dB (A) at MEDIUM
40 dB (A) at LOW



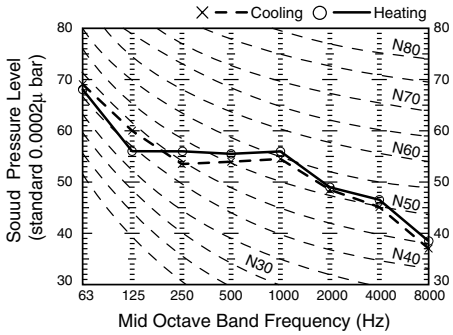
(2) Outdoor unit (FDC)

Measured based on JIS B 8616
Mike position as highest noise level in position as below
Distance from front side 1m
Height 1m

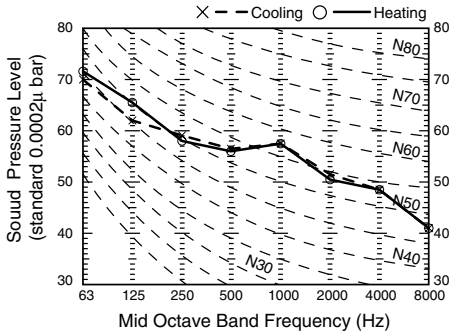
Model FDCA335HKXE4
Noise level 60.5 dB (A) at cooling
61 dB (A) at heating



Model FDCA400HKXE4
Noise level 58.5 dB (A) at cooling
59 dB (A) at heating



Model FDCA450HKXE4
Noise level 61 dB (A) at cooling
61 dB (A) at heating



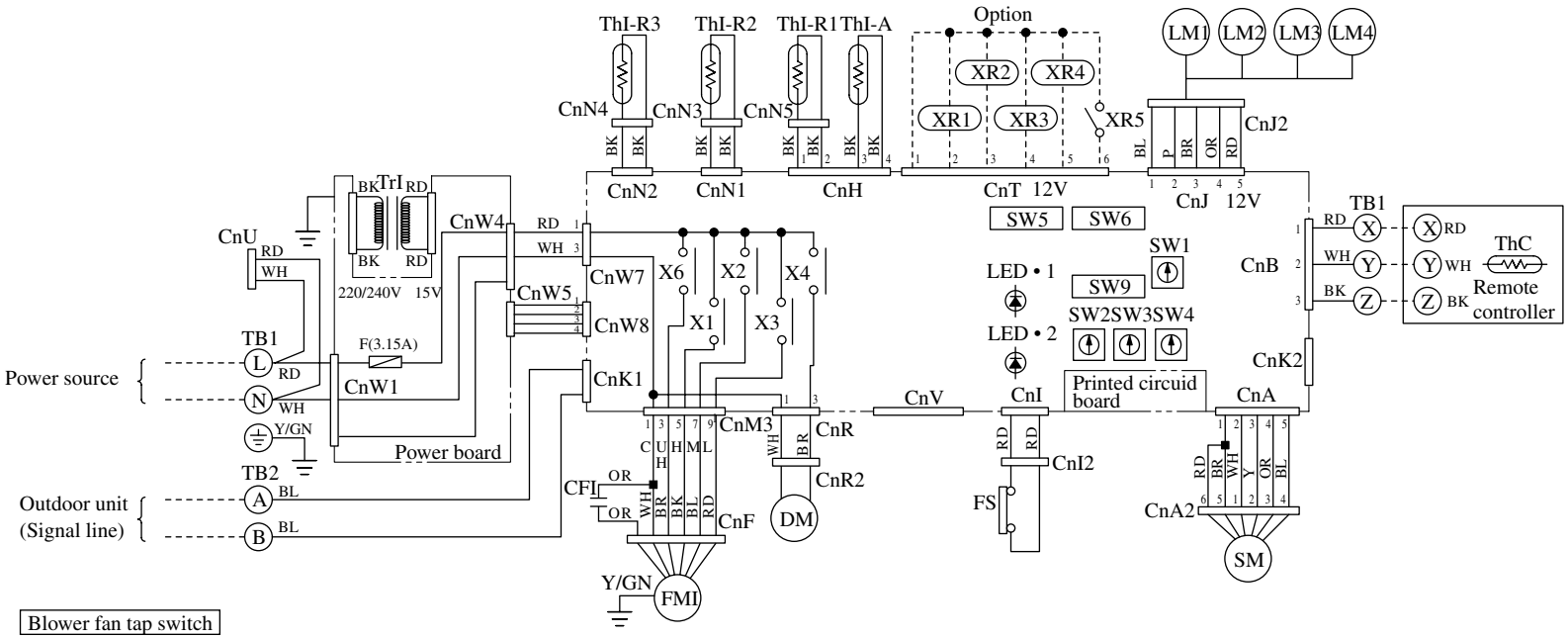
3 ELECTRICAL DATA

3.1 Electrical wiring

(1) Indoor unit

(a) Ceiling recessed type (FDT)

Models FDTA28KXE4,36KXE4,45KXE4, 56KXE4,71KXE4



Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

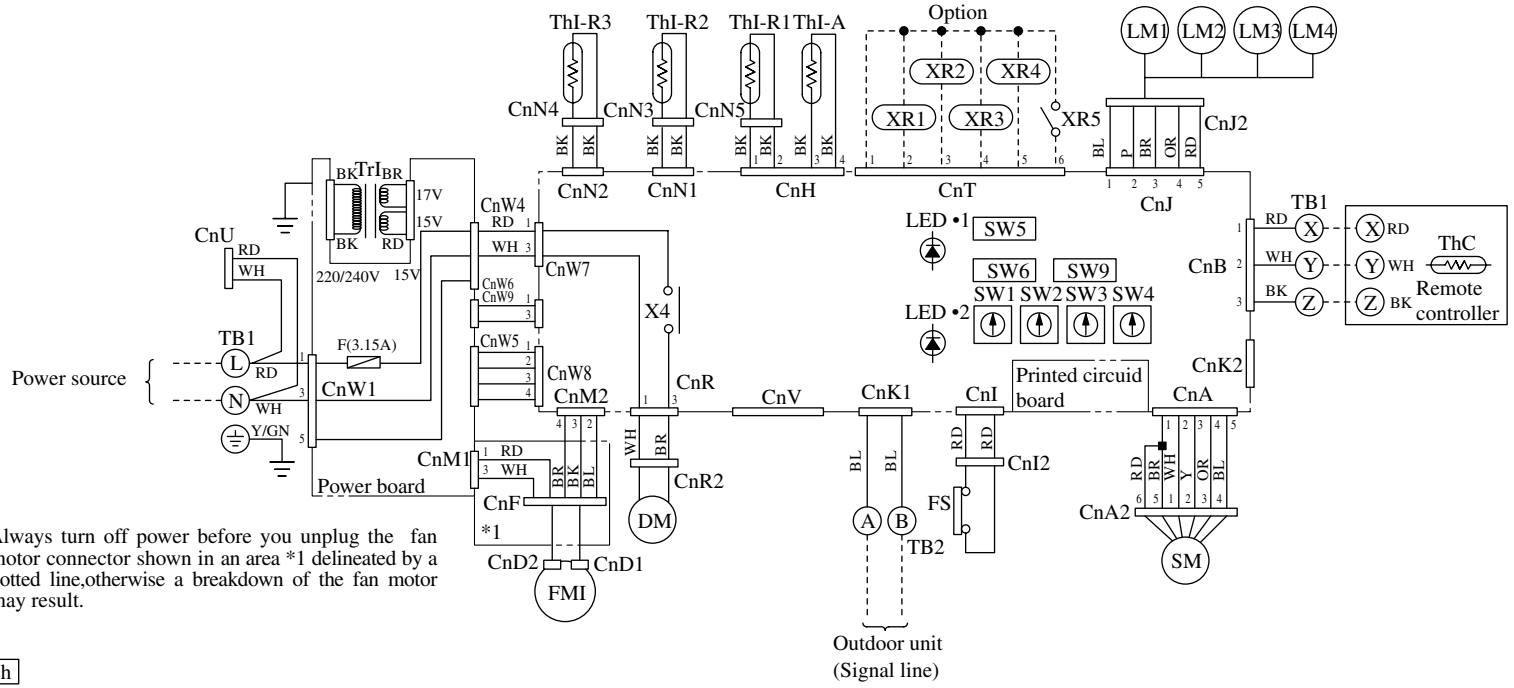
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW1**	Indoor unit address ten's place	**XR3**	Thermo ON output(DC12V output)
CFI	Capacitor for FMI	**SW2**	Indoor unit address unit's place	**XR4**	Inspection output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address ten's place	**XR5**	Remote operation input(volt-free contact)
FS	Float switch	**SW4**	Outdoor unit address unit's place	**X1,2,3,6**	Auxiliary relay(For FM)
LM1~4	Louver motor	**SW6**	Model capacity setting	**X4**	Auxiliary relay(For DM)
SM	Stepping motor(For Exp.v)	**TrI**	Transformer	**TB1,2**	Terminal block(○ mark)
ThI-A	Thermistor	**F**	Fuse	**CnA~Z**	Connector
ThI-R1	Thermistor	**LED1**	Indication lamp(Red)	**■mark**	Closed-end connector
ThI-R2	Thermistor	**LED2**	Indication lamp(Green)		
ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)		
ThC	Thermistor	**XR2**	Heating output(DC12V output)		

Color marks

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

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	



Note(1) Always turn off power before you unplug the fan motor connector shown in an area *1 delineated by a dotted line,otherwise a breakdown of the fan motor may result.

Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW2**	Indoor unit address unit's place	**XR4**	Inspection output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address ten's place	**XR5**	Remote operation input(volt-free contact)
FS	Float switch	**SW4**	Outdoor unit address unit's place	**X4**	Auxiliary relay(For DM)
LM1~4	Louver motor	**SW6**	Model capacity setting	**TB1,2**	Terminal block(○ mark)
SM	Stepping motor(For Exp.v)	**TrI**	Transformer	**CnA~Z**	Connector
ThI-A	Thermistor	**F**	Fuse	**■mark**	Closed-end connector
ThI-R1	Thermistor	**LED1**	Indication lamp(Red)		
ThI-R2	Thermistor	**LED2**	Indication lamp(Green)		
ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)		
ThC	Thermistor	**XR2**	Heating output(DC12V output)		
SW1	Indoor unit address ten's place	**XR3**	Thermo ON output(DC12V output)		

Color marks

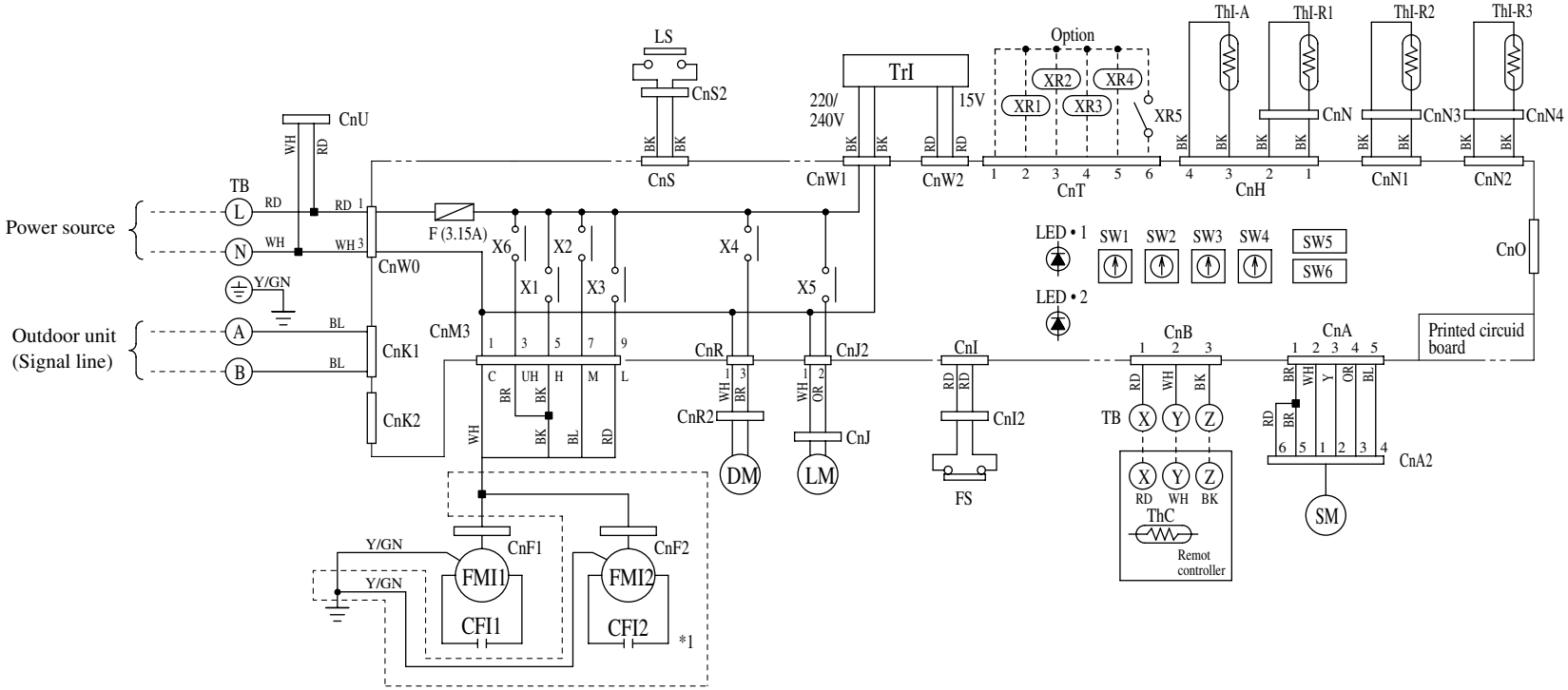
Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
BR/WH	Brown/White	**P**	Pink
OR	Orange	**Y/GN**	Yellow/Green
OR/WH	Orange/White		

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	

(b) 2-way outlet ceiling recessed type(FDTW)

Model All models



Note(1) *1. FMI2 is equipped only for 112,140.

Meaning of marks

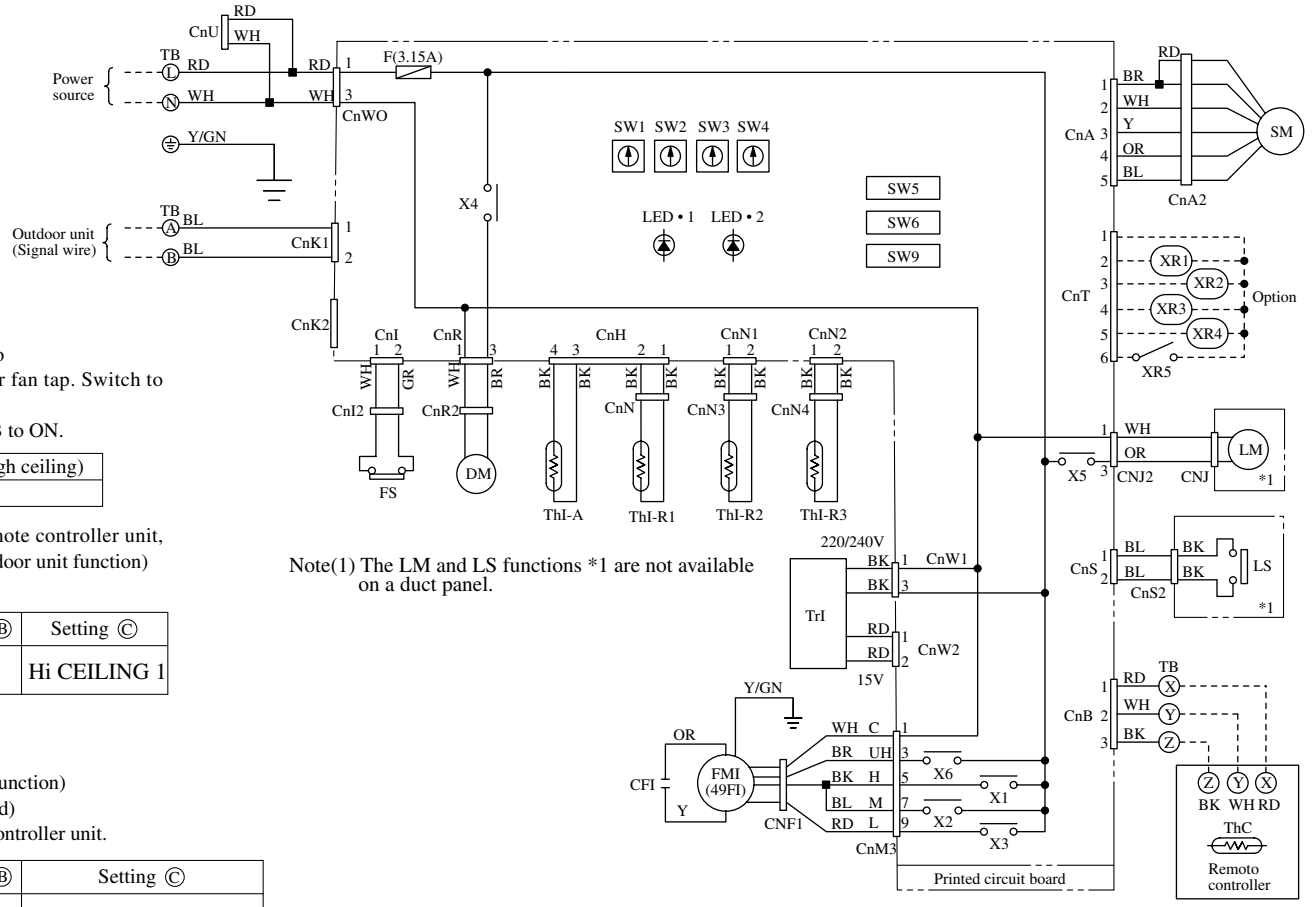
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI1,2	Fan motor	**SW1**	Indoor unit address ten's place	**XR3**	Thermo ON output(DC12V output)
CFI1,2	Capacitor for FMI	**SW2**	Indoor unit address unit's place	**XR4**	Inspection output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address ten's place	**XR5**	Remote operation input(volt-free contact)
FS	Float switch	**SW4**	Outdoor unit address unit's place	**X1,2,3,6**	Auxiliary relay(For FM)
LM	Louver motor	**SW6**	Model capacity setting	**X4**	Auxiliary relay(For DM)
SM	Stepping motor(For Exp.v)	**TrI**	Transformer	**X5**	Auxiliary relay(For LM)
ThI-A	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R1	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R2	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)		
ThC	Thermistor	**XR2**	Heating output(DC12V output)		

Color marks

Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
OR	Orange	**Y/GN**	Yellow/Green

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:Invalid	
	OFF	Emergency stop signal:valid	



Note(1) The LM and LS functions *1 are not available on a duct panel.

Blower fan tap switch

In case of using duct panel, the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒ of "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

LOUVER switch disabled setting

In case of using duct panel, set the setting Ⓒ of " FUNCTION ▲" (remote control unit function) to " INVALID" (LOUVER switch disabled) by means of function setting from the remote controller unit.

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
07	LOUVER S/W	INVALID

Meaning of marks

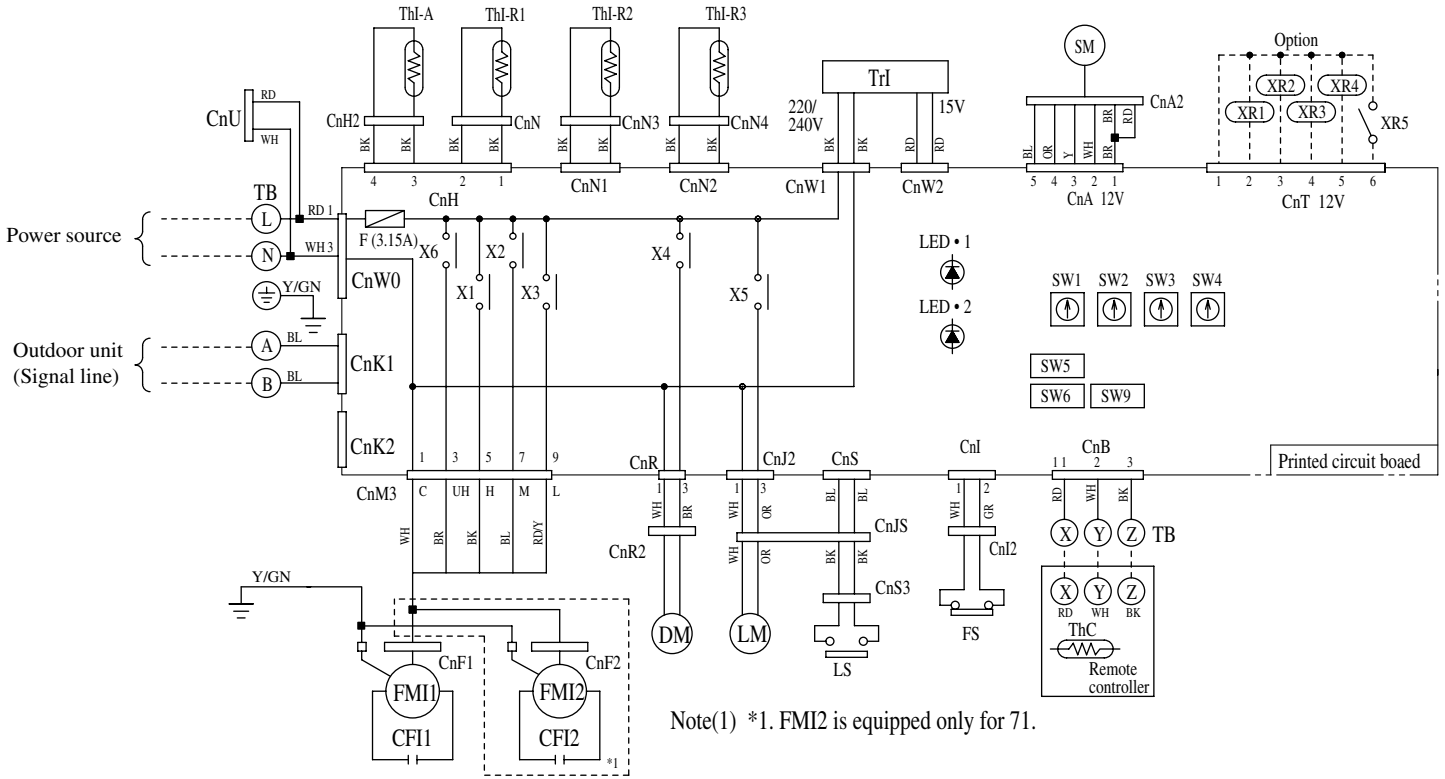
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)
49FI	Internal thermostat for FMI	ThC	Thermistor	**XR2**	Heating output(DC12V output)
CFI	Capacitor for FMI	SW1	Indoor unit address ten's place	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	SW2	Indoor unit address unit's place	**XR4**	Inspection output(DC12V output)
FS	Float switch	SW3	Outdoor unit address ten's place	**XR5**	Remote operation input(volt-free contact)
LM	Louver motor	SW4	Outdoor unit address unit's place	**X1,2,3,6**	Auxiliary relay(For FM)
LS	Limit switch	SW6	Model capacity setting	**X4**	Auxiliary relay(For DM)
SM	Stepping motor(For Exp.v)	TrI	Transformer	**X5**	Auxiliary relay(For LM)
ThI-A	Thermistor	F	Fuse	**TB**	Terminal block(○ mark)
ThI-R1	Thermistor	LED1	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R2	Thermistor	LED2	Indication lamp(Green)	**■mark**	Closed-end connector

Color marks

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

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	



Note(1) *1. FMI2 is equipped only for 71.

Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI1,2	Fan motor	**ThC**	Thermistor	**XR2**	Heating output(DC12V output)
CFI1,2	Capacitor for FMI	**SW1**	Indoor unit address ten's place	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	**SW2**	Indoor unit address unit's place	**XR4**	Inspection output(DC12V output)
FS	Float switch	**SW3**	Outdoor unit address ten's place	**XR5**	Remote operation input(volt-free contact)
LM	Louver motor	**SW4**	Outdoor unit address unit's place	**X1,2,3,6**	Auxiliary relay(For FM)
LS	Limit switch	**SW6**	Model capacity setting	**X4**	Auxiliary relay(For DM)
SM	Stepping motor(For Exp.v)	**TrI**	Transformer	**X5**	Auxiliary relay(For LM)
ThI-A	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R1	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R2	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)		

Color marks

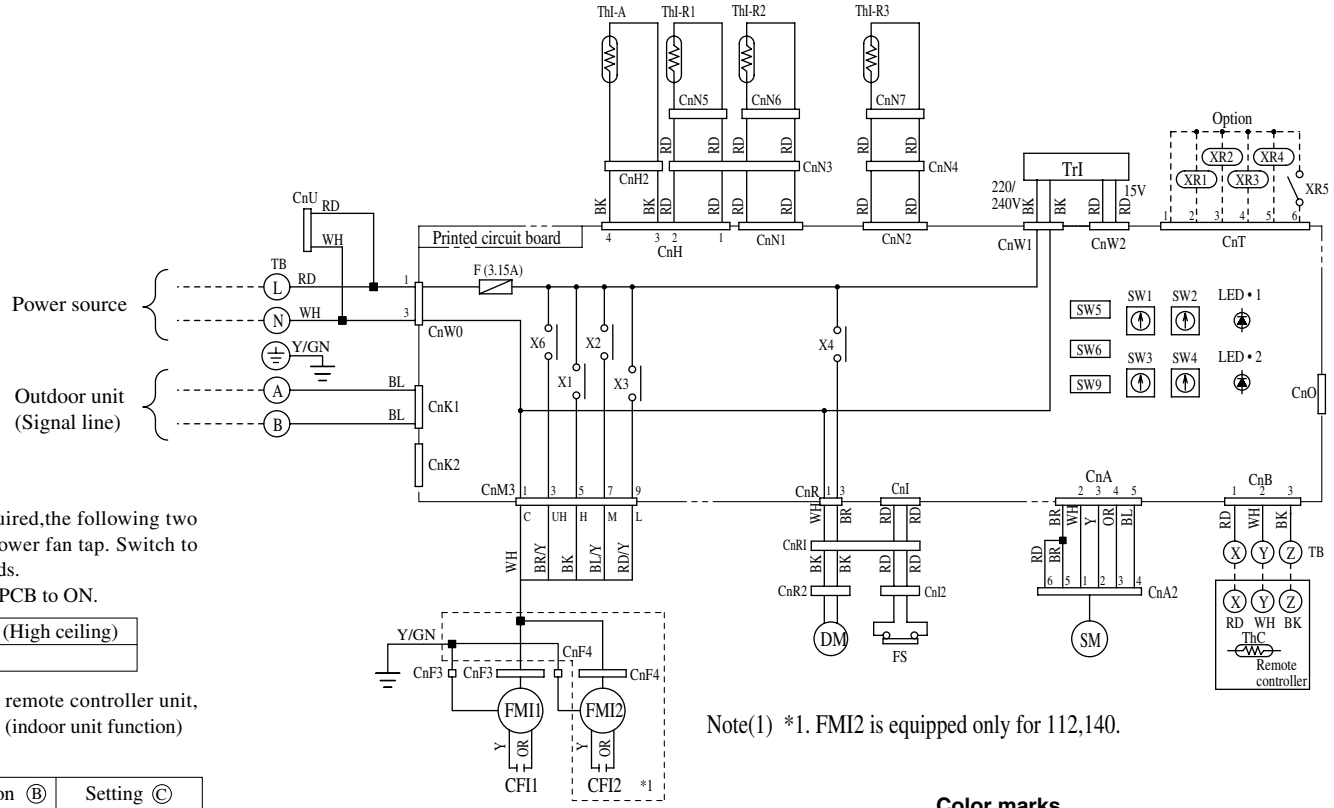
Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**RD/Y**	Red/Yellow
BR	Brown	**WH**	White
GR	Gray	**Y**	Yellow
OR	Orange	**Y/GN**	Yellow/Green

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	

(e) Cassetteria type (FDR)

Models All models



Note(1) *1. FMI2 is equipped only for 112,140.

Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Color marks

Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**RD/Y**	Red/Yellow
BL/Y	Blue/Yellow	**WH**	White
BR	Brown	**Y**	Yellow
BR/Y	Brown/Yellow	**Y/GN**	Yellow/Green
OR	Orange		

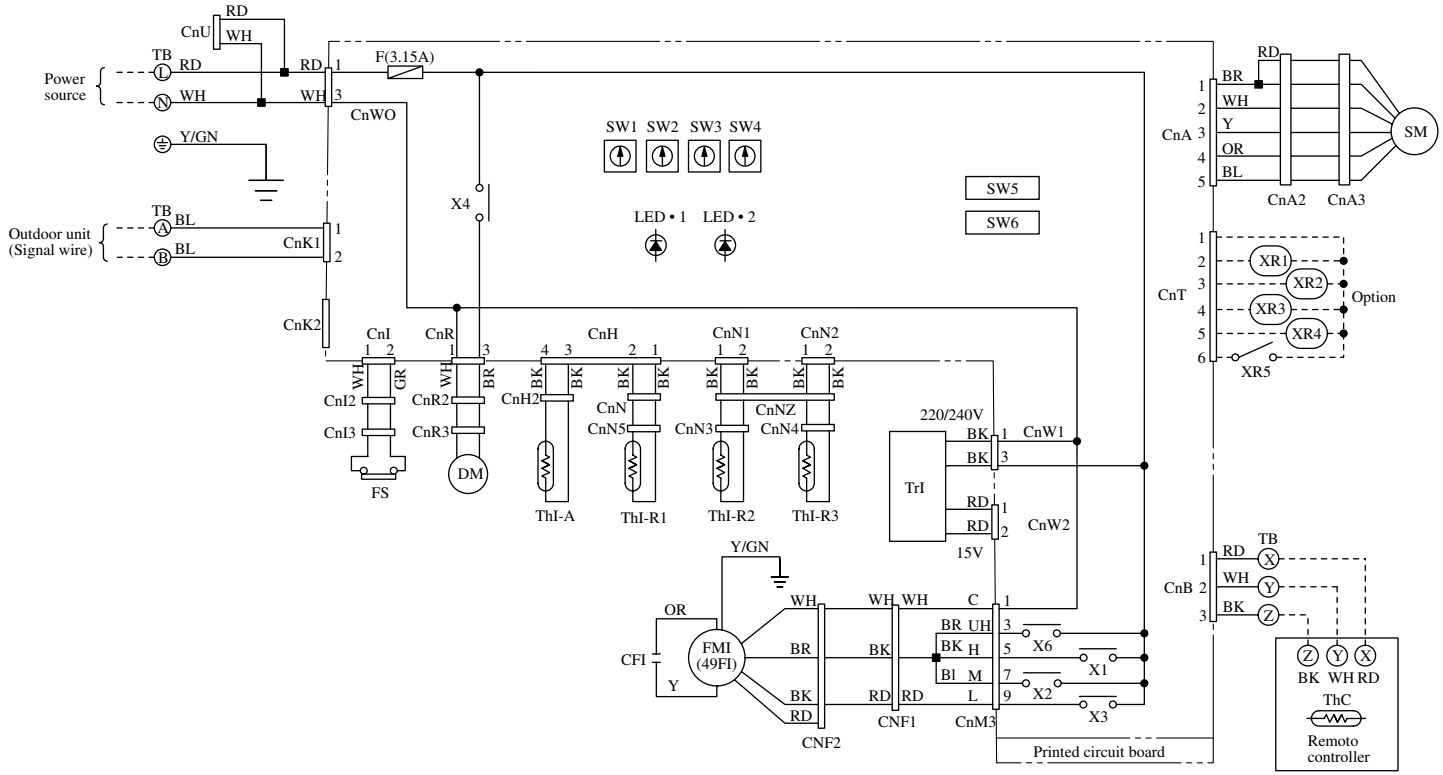
Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI1,2	Fan motor	**SW1**	Indoor unit address ten's place	**XR2**	Heating output(DC12V output)
CFI1,2	Capacitor for FMI	**SW2**	Indoor unit address unit's place	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address ten's place	**XR4**	Inspection output(DC12V output)
FS	Float switch	**SW4**	Outdoor unit address unit's place	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**X4**	Auxiliary relay(For DM)
ThI-R1	Thermistor	**F**	Fuse	**TB**	Terminal block(○ maek)
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThC	Thermistor	**XR1**	Operation output(DC12V output)		

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:Invalid	
	OFF	Emergency stop signal:valid	

(f) Medium static pressure type(FDQM)
Models FDQMA22KXE4,28KXE4,36KXE4



Meaning of marks

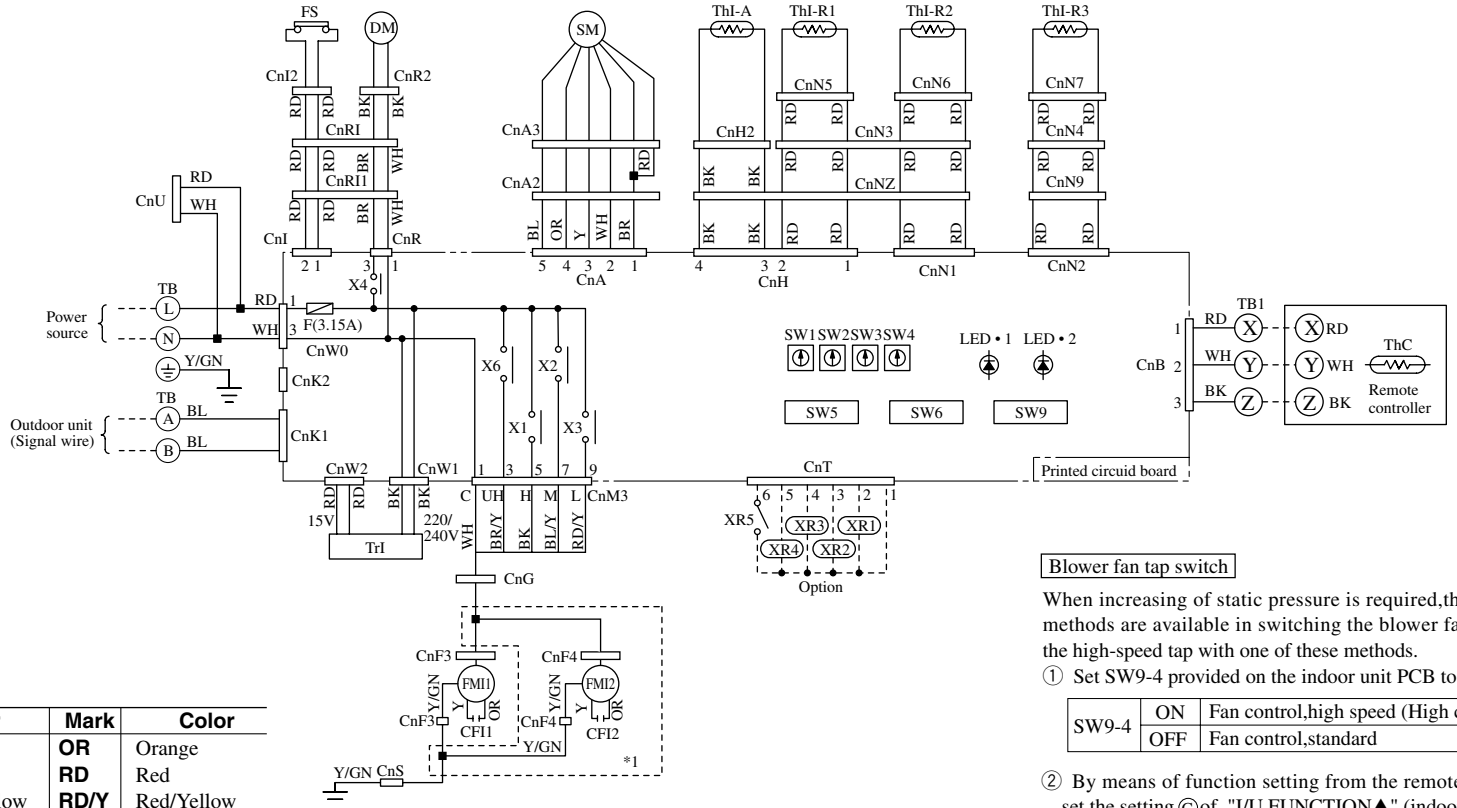
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**ThC**	Thermistor	**XR1**	Operation output(DC12V output)
49FI	Internal thermostat for FMI	**SW1**	Indoor unit address ten's place	**XR2**	Heating output(DC12V output)
CFI	Capacitor for FMI	**SW2**	Indoor unit address unit's place	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address ten's place	**XR4**	Inspection output(DC12V output)
FS	Float switch	**SW4**	Outdoor unit address unit's place	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**X4**	Auxiliary relay(For DM)
ThI-R1	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector

Color marks

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

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input	Reverse Invalid
	OFF	signal	Run stop
SW5-4	ON	Emergency stop signal:Valid	
	OFF	Emergency stop signal:Invalid	



Note(1) A one-motor type installation does not have the circuits shown in an area *1 delineated by a dotted line.

Color marks

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

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI1,2	Fan motor	**SW1**	Indoor unit address ten's place	**XR2**	Heating output(DC12V output)
CFI1,2	Capacitor for FMI	**SW2**	Indoor unit address unit's place	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address ten's place	**XR4**	Inspection output(DC12V output)
FS	Float switch	**SW4**	Outdoor unit address unit's place	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**X4**	Auxiliary relay(For DM)
ThI-R1	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThC	Thermistor	**XR1**	Operation output(DC12V output)		

Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

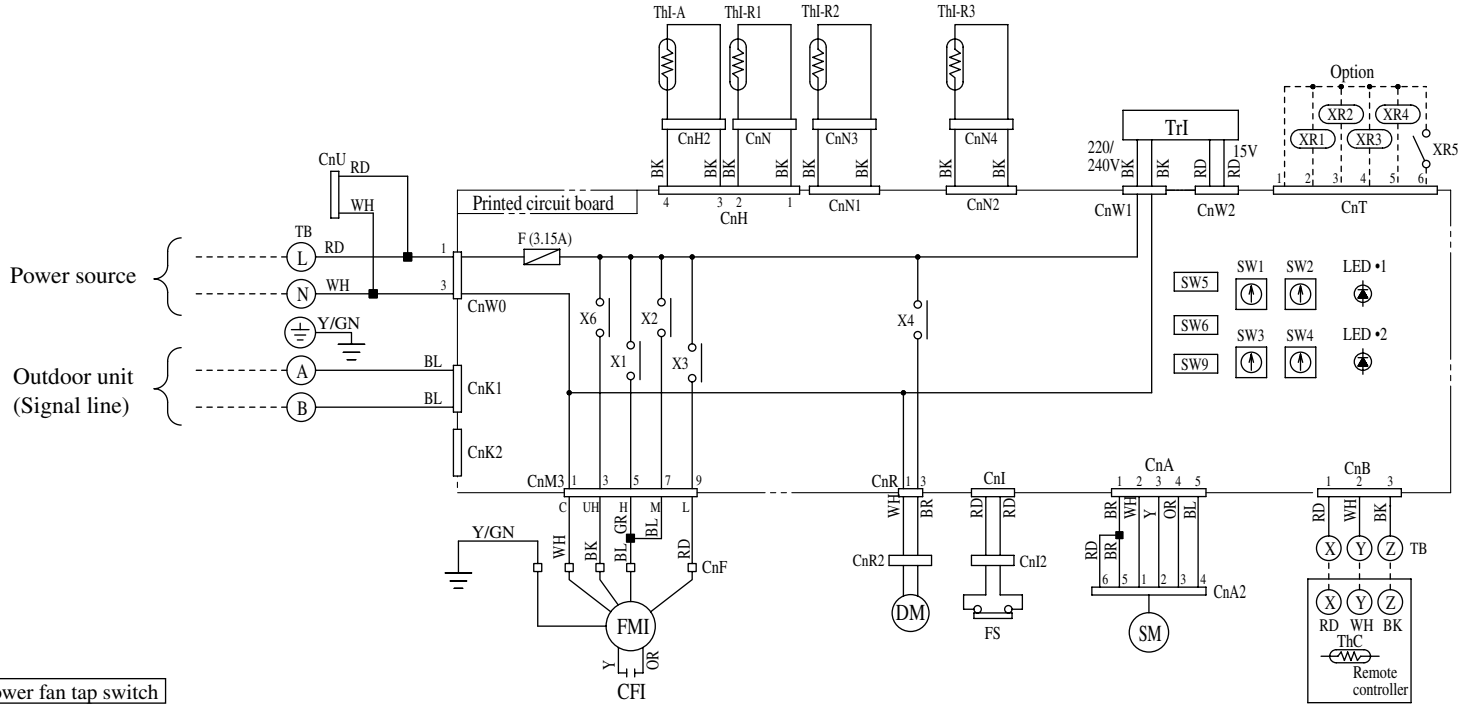
SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input	Reverse Invalid
	OFF	signal	Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	



Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

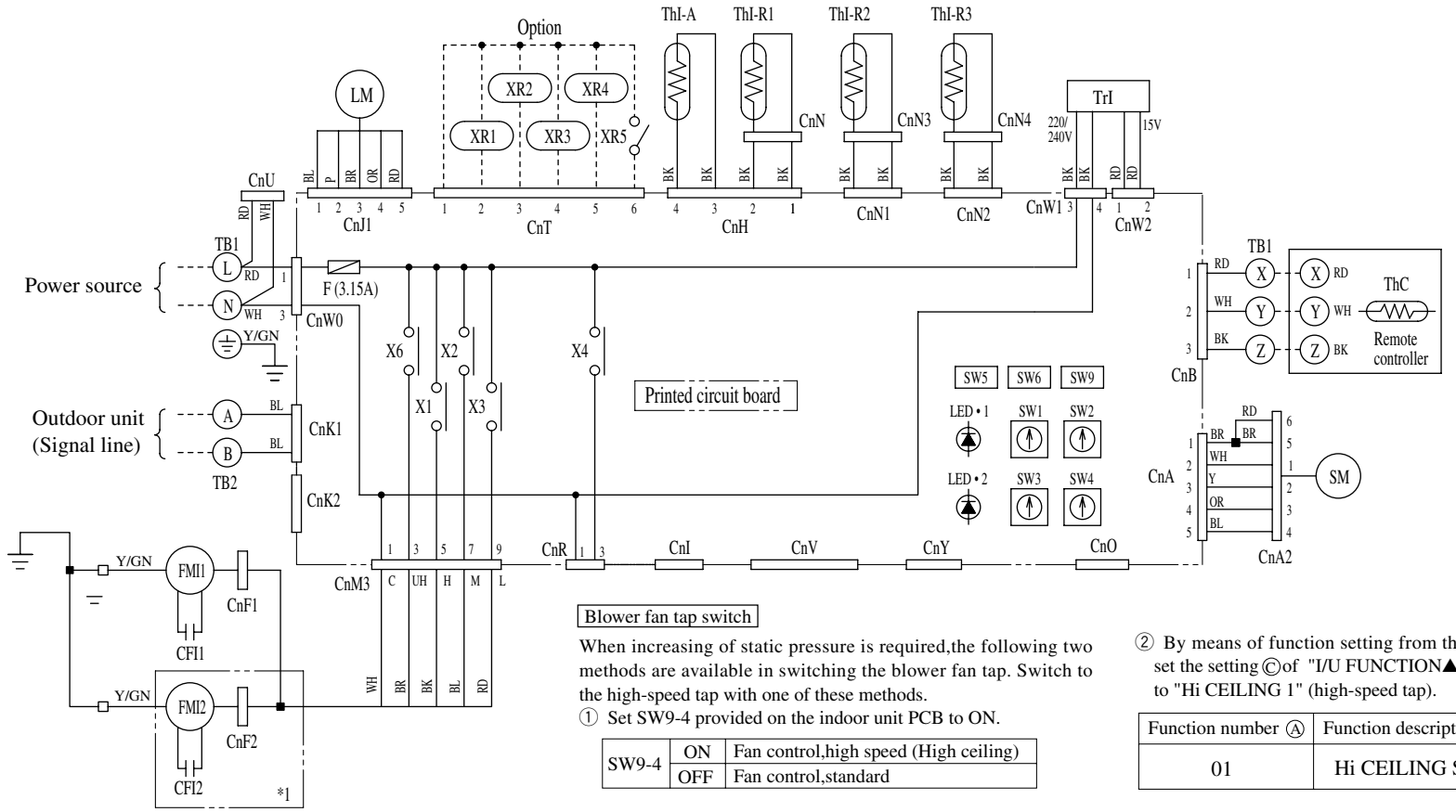
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW1**	Indoor unit address ten's place	**XR2**	Heating output(DC12V output)
CFI	Capacitor for FMI	**SW2**	Indoor unit address unit's place	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address ten's place	**XR4**	Inspection output(DC12V output)
FS	Float switch	**SW4**	Outdoor unit address unit's place	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**X4**	Auxiliary relay(For DM)
ThI-R1	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThC	Thermistor	**XR1**	Operation output(DC12V output)		

Color marks

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

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	



Note(1) *1. FMI2 is equipped only for 71,112,140.

Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒ of "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI1,2	Fan motor	**SW2**	Indoor unit address unit's place	**XR3**	Thermo ON output(DC12V output)
CFI1,2	Capacitor for FMI	**SW3**	Outdoor unit address ten's place	**XR4**	Inspection output(DC12V output)
LM	Louver motor	**SW4**	Outdoor unit address unit's place	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**TB1,2**	Terminal block(○ mark)
ThI-R1	Thermistor	**F**	Fuse	**CnA~Z**	Connector
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**■mark**	Closed-end connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)		
ThC	Thermistor	**XR1**	Operation output(DC12V output)		
SW1	Indoor unit address ten's place	**XR2**	Heating output(DC12V output)		

Color marks

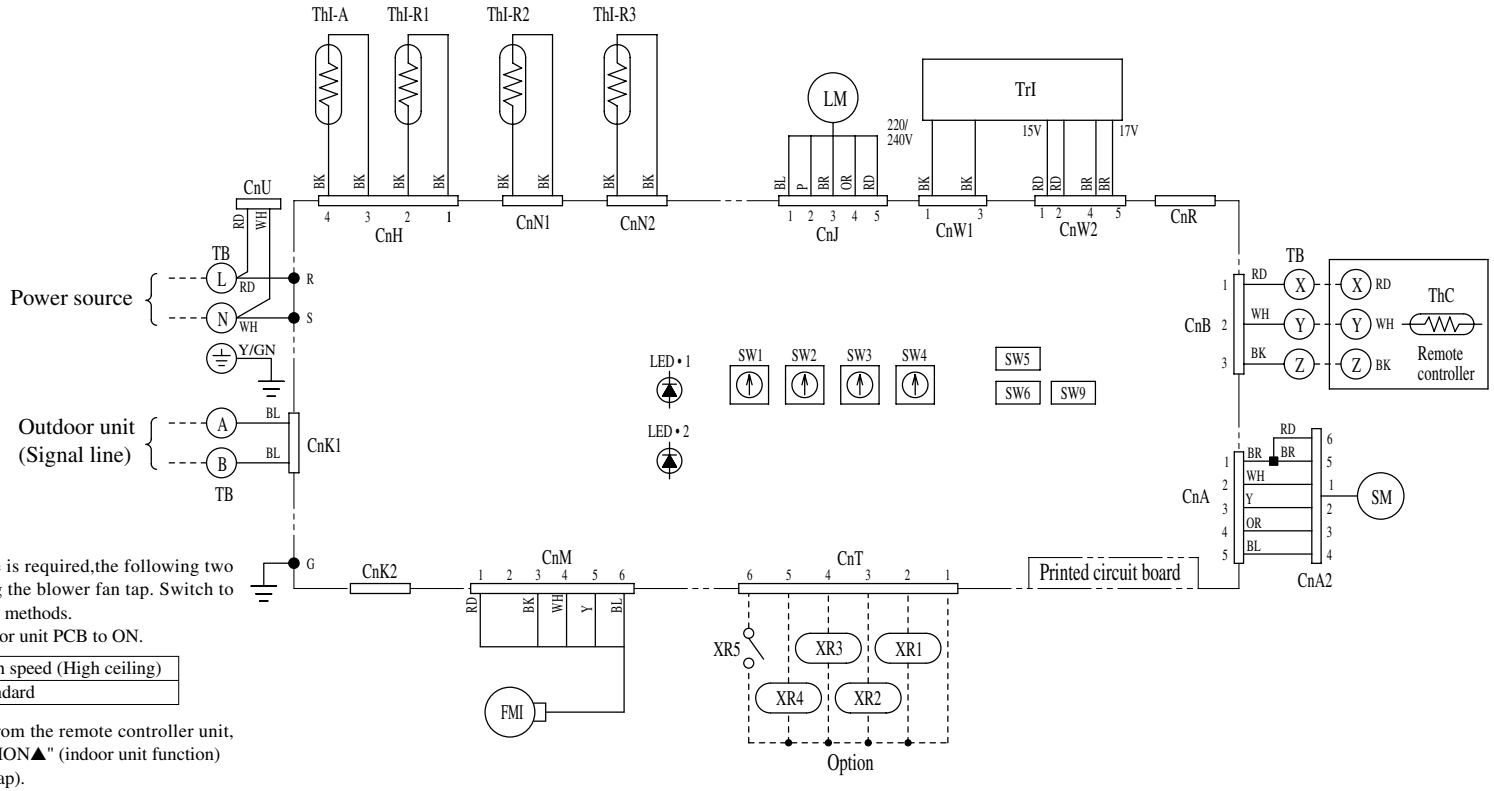
Mark	Color	Mark	Color
BK	Black	**WH**	White
BL	Blue	**Y**	Yellow
BR	Brown	**P**	Pink
OR	Orange	**Y/GN**	Yellow/Green
RD	Red		

Function of switches

Mark		Function	
SW5-3	ON	Input	Reverse Invalid
	OFF	signal	Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	

(j) Wall mounted type (FDK)

Models FDKA22KXE4,28KXE4,36KXE4,45KXE4,56KXE4



Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

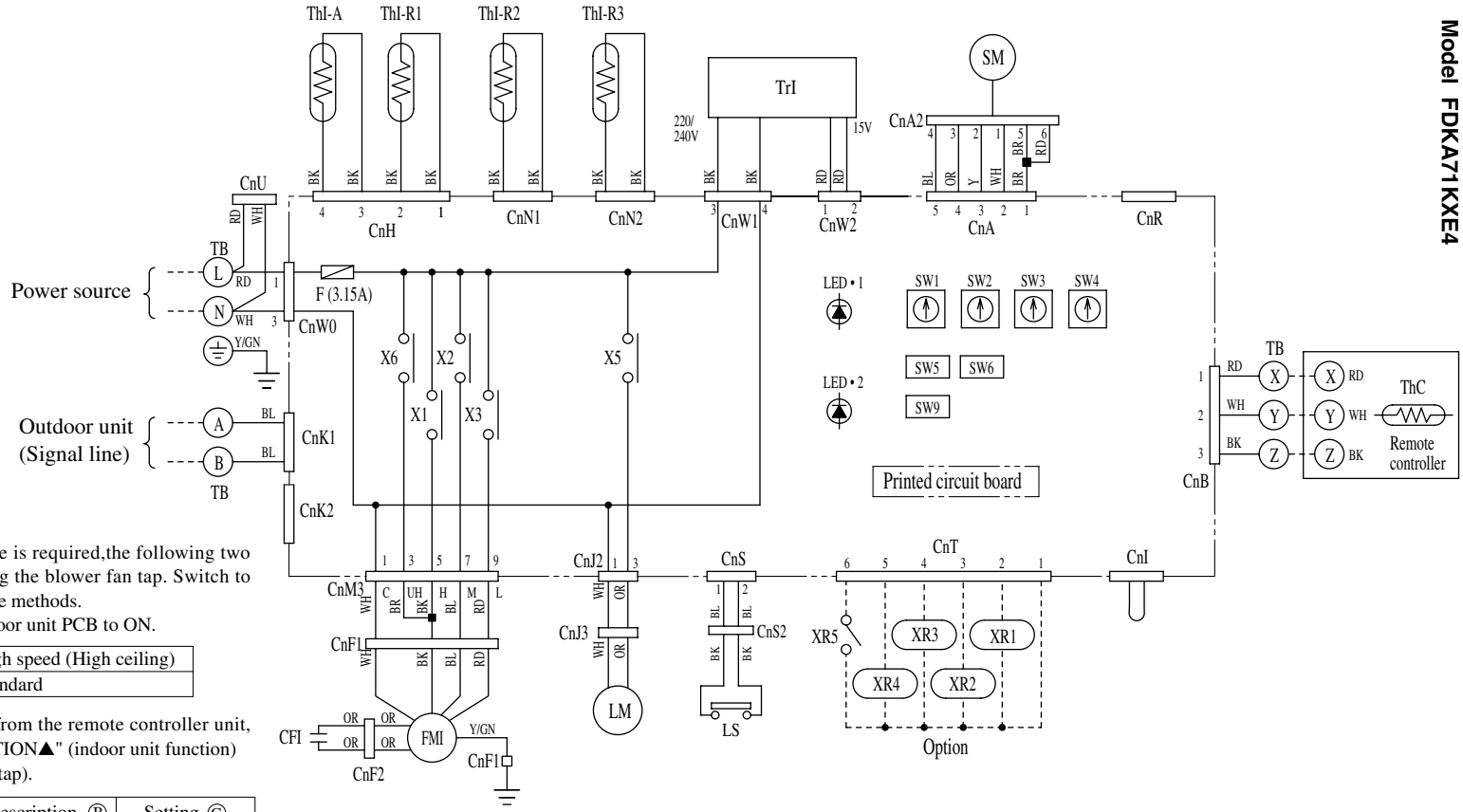
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW3**	Outdoor unit address ten's place	**XR4**	Inspection output(DC12V output)
LM	Louver motor	**SW4**	Outdoor unit address unit's place	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**TB**	Terminal block(○ mark)
ThI-A	Thermistor	**TrI**	Transformer	**CnA~Z**	Connector
ThI-R1	Thermistor	**F**	Fuse	**■mark**	Closed-end connector
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)		
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)		
ThC	Thermistor	**XR1**	Operation output(DC12V output)		
SW1	Indoor unit address ten's place	**XR2**	Heating output(DC12V output)		
SW2	Indoor unit address unit's place	**XR3**	Thermo ON output(DC12V output)		

Color marks

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

Function of switches

Mark		Function	
SW5-3	ON	Input	Reverse Invalid
	OFF	signal	Run stop
SW5-4	ON	Emergency stop signal:vali	
	OF	Emergency stop signal:Invalid	



Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW2**	Indoor unit address unit's place	**XR3**	Thermo ON output(DC12V output)
CFI	Capacitor for FMI	**SW3**	Outdoor unit address ten's place	**XR4**	Inspection output(DC12V output)
LM	Louver motor	**SW4**	Outdoor unit address unit's place	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**X5**	Auxiliary relay(For LM)
ThI-R1	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThC	Thermistor	**XR1**	Operation output(DC12V output)		
SW1	Indoor unit address ten's place	**XR2**	Heating output(DC12V output)		

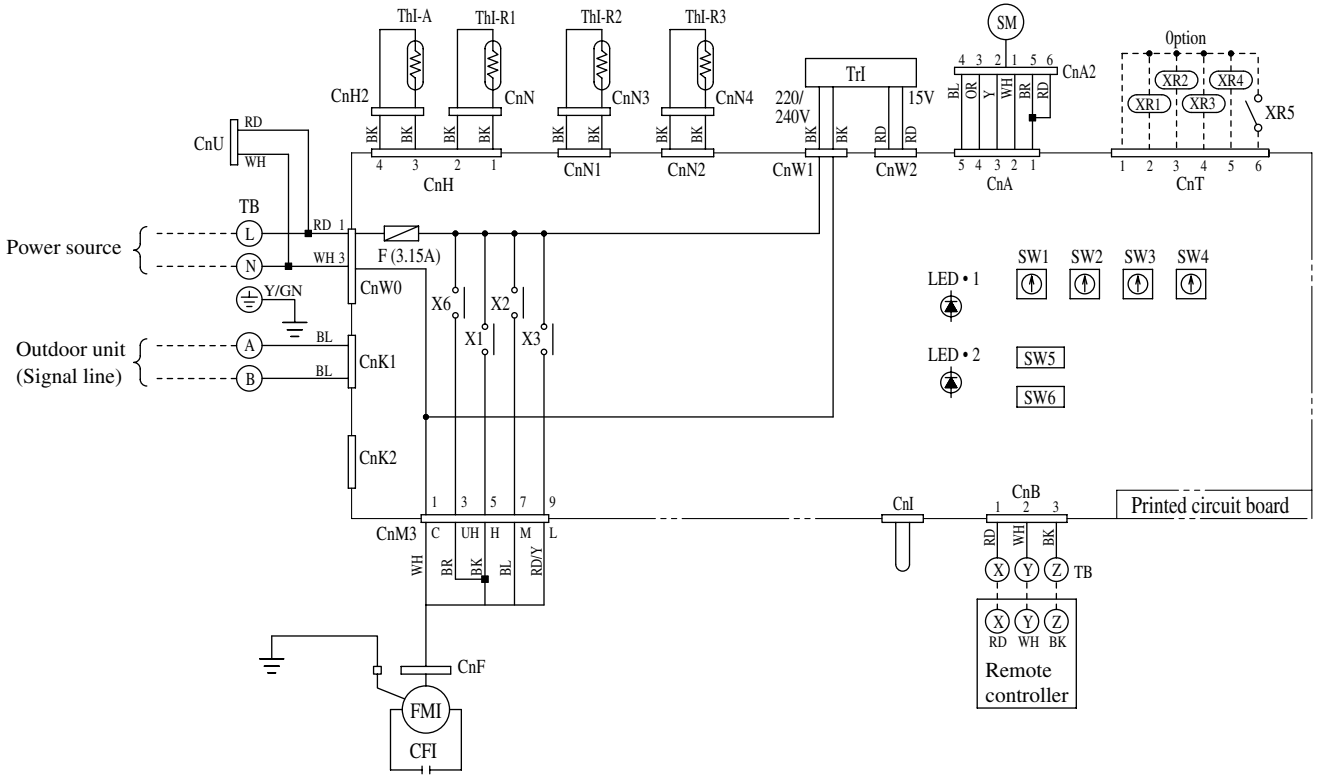
Color marks

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

Function of switches

Mark		Function	
SW5-3	ON	Input	Reverse Invalid
	OFF	signal	Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	

(k) Floor standing exposed type (FDFL)
(l) Floor standing hidden type (FDFU)
Models All models



Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW3**	Outdoor unit address ten's place	**XR3**	Thermo ON output(DC12V output)
CFI	Capacitor for FMI	**SW4**	Outdoor unit address unit's place	**XR4**	Inspection output(DC12V output)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**XR5**	Remote operation input(volt-free contact)
ThI-A	Thermistor	**TrI**	Transformer	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-R1	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
SW1	Indoor unit address ten's place	**XR1**	Operation output(DC12V output)		
SW2	Indoor unit address unit's place	**XR2**	Heating output(DC12V output)		

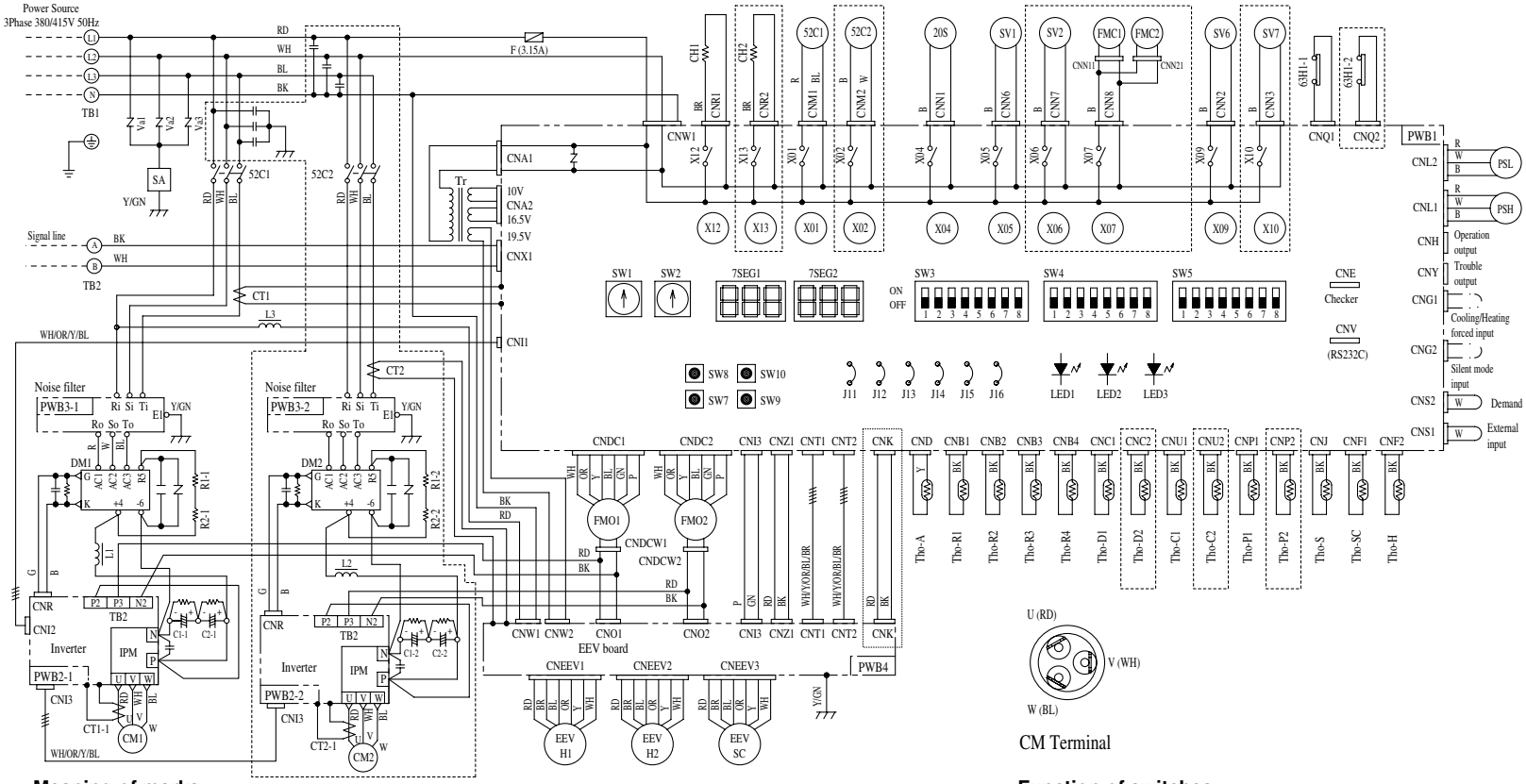
Color marks

Mark	Color	Mark	Color
BK	Black	**RD/Y**	Red/Yellow
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
OR	Orange	**Y/GN**	Yellow/Green
RD	Red		

Function of switches

Mark		Function
SW5-4	ON	Emergency stop signal : Valid
	OFF	Emergency stop signal : Invalid

Note(1) FDCA335 type does not have circuits shown in [ ] area.



CM Terminal

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
CM1,2	Compressor motor	**Tho-R2**	Thermistor (outdoor H.X. temp exhaust)	**SW7**	Data clear/insert
FMO1,2	Fan motor (outdoor unit)	**Tho-R3**	Thermistor (outdoor H.X. temp inlet)	**SW8**	7seg indicate (unit's place)
52C1,2	Magnetic contactor for CM	**Tho-R4**	Thermistor (outdoor H.X. temp inlet)	**SW9**	7seg indicate (ten's place)
CH1,2	Crankcase heater	**PSL**	Low pressure sensor	**SW10**	Reset
X01~13	Auxiliary relay	**PSH**	High pressure sensor	**J11,12**	Set up model (volt)
20S	4way valve	**CT1,CT2**	Current sensor	**J13**	External input select level/pulse
SV1	Solenoid valve (CM1:bypass)	**SA**	Arrestor	**J14**	Defrost recover temp
SV2	Solenoid valve (CM2:bypass)	**Tr**	Transformer	**J15**	Defrost start temp
SV6	Solenoid valve (oil separator CM1)	**Va1~3**	Varistor	**J16**	Heat recovery unit
SV7	Solenoid valve (oil separator CM2)	**TB1,2**	Terminal block	**LED1**	Indication lamp (red)
EEVH1,2	Expansion valve for heating	**F**	Fuse	**LED2**	Indication lamp (green)
EEVSC	Expansion valve for SC	**CNA-Z**	Connector	**LED3**	Indication lamp (green for service)
63H1-1,2	High pressure switch (for protection)	**SW1**	Outdoor unit address (ten's place)	**7SEG1**	7seg L.E.D. (function indication)
Tho-A	Thermistor (outdoor air temp)	**SW2**	Outdoor unit address (unit's place)	**7SEG2**	7seg L.E.D. (data indication)
Tho-C1,2	Thermistor (dome temp)	**SW3-1**	L.E.D.reset	**L1,L2**	D.C.reactor
Tho-D1,2	Thermistor (discharge temp)	**SW4-1~4**	Set up model	**C1-1,2,C2-1,2**	Condensor
Tho-P1,2	Thermistor (IPM temp)	**SW4-5**	Demand	**PWB1~4**	Printed wiring board
Tho-S	Thermistor (suction temp)	**SW4-6**	Demand	**IPM**	Intelligent power module
Tho-SC	Thermistor (SC1 temp)	**SW4-7**	Address setting switch (master·slave)	**FMC1,2**	Fan for IPM
Tho-H	Thermistor (SC2 temp)	**SW4-8**	Address setting switch (master·slave)		
Tho-R1	Thermistor (outdoor H.X. temp exhaust)	**SW5-4~8**	Spare		

Function of switches

Mark		Function
SW3-2	ON	Auto backup operation
	OFF	Regular operation
SW3-3	ON	Set of renewal
	OFF	Regular operation
SW3-4	ON	Check mode non-available
	OFF	Check mode available
SW3-5	ON	Check of trial operation
	OFF	Regular operation
SW3-6	ON	Pipe wash mode
	OFF	Regular operation
SW3-7	ON	Forced cooling/heating
	OFF	Regular operation
SW3-8	ON	Test mode
	OFF	Regular operation
SW5-1	ON	Trial operation
	OFF	Regular operation
SW5-2	ON	Trial operation mode/cooling
	OFF	Trial operation mode/heating
SW5-3	ON	Pump down operation
	OFF	Regular operation

Color marks

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

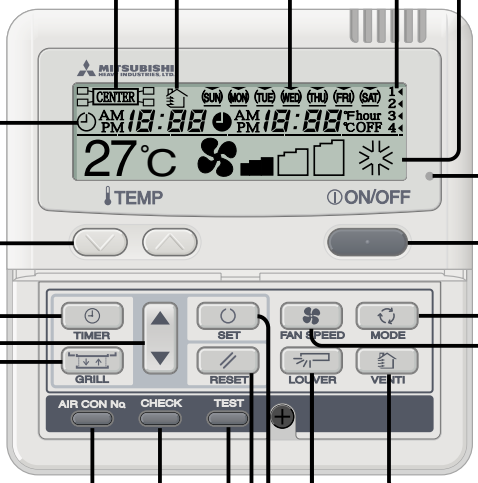
4 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

4.1 Wired remote controller (Optional parts)

The figure below shows the remote controller 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.

Pull the cover downward to open it.



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

Timer operation display
Displays the settings related to timer operation.

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

TIMER switch
This switch is used to select a timer mode.

Timer setting switches
These switches are used to set the timer mode and time.

GRILL switch
This switch has no function.
When this switch is pressed,
INVALID OPER (Invalid Operation)
is displayed, but it does not mean a failure.

AIR CON No. (Air conditioning system No.) switch
Displays the number of the connected air conditioning system.

CHECK switch
This switch is used at servicing.

TEST switch
This switch is used during test operation.

Vent Indicator
Indicates operation in the Ventilation mode.

Weekly timer display
Displays the settings of the weekly timer.

Operation setting display area
Displays setting temperature, airflow volume, operation mode and operation message.

Operation/Check indicator light
During operation: Lit in green
In case of error: Flashing in red

Operation/Stop switch
This switch is used to operate and stop the air conditioning system. Press the switch once to operate the system and press it once again to stop the system.

MODE switch
This switch is used to switch between operation modes.

FAN SPEED switch
This switch is used to set the airflow volume.

VENT switch
Switch that operates the connected ventilator.

LOUVER switch
This switch is used to operate/stop the swing louver.

SET switch
This switch is used to apply the timer operation setting.
This switch is also used to make silent mode operation settings.

RESET switch
Press this switch while making settings to go back to the previous operation.
This switch is also used to reset the "FILTER CLEANING" message display.
(Press this switch after cleaning the air filter.)

* If you oress any of the switches above and " INVALID OPER" is display, the switch has no function.
But it does not mean a failure.

4.2 Operation control function by the indoor controller

(1) Cooling operation

(a) Cooling

1) If the sum of selected and required frequencies is not larger than the maximum frequency, the required frequencies listed in the following table apply. If the sum of required frequencies is larger than the maximum frequency, the required frequencies divided proportionally apply.

Frequency bands for indoor unit models

Model (Indoor) / Category	All series								
	22 model	28 model	36 model	45 model	56 model	71 model	90 model	112 model	140 model
Required frequency (Hz)	5 ~ 15	5 ~ 20	5 ~ 24	5 ~ 27	5 ~ 30	5 ~ 40	5 ~ 50	5 ~ 60	5 ~ 70
Selected frequency (Hz)	5 ~ 15	5 ~ 20	5 ~ 24	5~ 27	5 ~ 30	5 ~ 40	5 ~ 50	5 ~ 60	5 ~ 70

Notes (1) The required frequency is counted in the unit and the selected frequency in the unit of 1 Hz.

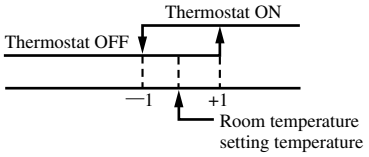
2) This indoor unit electronic expansion valve (EEV) controls opening of each indoor unit corresponding to decision frequency. Also, the thermostat is sampled in pitch of 20 second.

(b) Cooling thermostat off

1) Fan control operates the thermostat as shown in the following diagram.

   If the thermostat goes ON, even if the thermostat is OFF as shown in the following diagram, the thermostat does not go OFF for 2 minutes after the compressor goes ON. If the thermostat goes OFF within 2 minutes, a minimum required frequency other than 0 Hz is output.

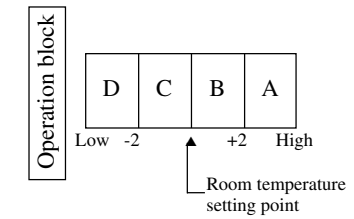
2) If all the thermostats for indoor units in a module go OFF, outdoor units carry out cooling thermostat OFF operation in modular units.



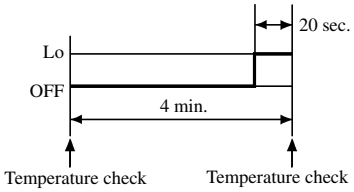
Room temperature (detected with Thı-A)(deg)

(2) Dehumidifying (Thermal dry)

- This cooling operation is mainly for dehumidifying, with which the compressor, indoor and outdoor fans are operated in the patterns as listed in the following table and in accordance with operation blocks switched with the room temperature sensor. The operation blocks are selected by checking the return air temperature at 4-minute intervals. Respective functional items are operated in each operation block as shown by the following table.



- Indoor unit fan will be operated in D block as shown below.



Item / Operation block		A	B	C	D
Indoor unit frequency (Hz)	22 model	10	10	10	0
	28 model	15	10	10	0
	36 model	20	15	10	0
	45 model	20	15	10	0
	56 model	25	15	15	0
	71 model	30	20	15	0
	90 model	45	30	25	0
	112 model	50	40	35	0
	140 model	60	45	35	0
Compressor		Sum of frequencies on combined indoor units			
Indoor unit electronic expansion valve		Superheat control			
Indoor unit fan	3 speed model	Me	Lo	Lo	Lo↔OFF
	2 speed model	Hi	Lo	Lo	Lo↔OFF
Outdoor unit fan		Operation	Operation	Operation	Stop

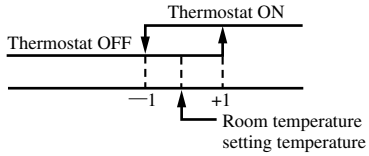
(3) Heating operation

(a) Heating

- This is same as the cooling operation.

(b) Heating operation with thermostat OFF

1) The thermostat operates as shown in the following diagram through fuzzy control.
   If the thermostat goes ON, even if the thermostat is off in the following diagram, it doesn't go OFF for 2 minutes after the compressor goes ON. If the thermostat goes OFF within 2 minutes, a minimum required frequency other than 0 Hz is output.



Room temperature (detected with Thı-A)(deg)

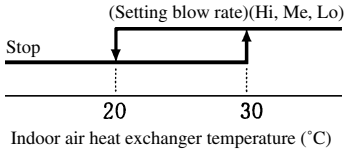
2) If all the thermostats for indoor units in a module go OFF, outdoor units carry out heating thermostat OFF operation in modular units.
3) Intermittent fan operation control
   a) When the jumper wire J3 (SW7-3), J4 (SW-7) on the indoor PCB is shorted (installed at shipping),the fan of the unit of which the thermostat is turned OFF during heating is operated in the Lo mode, and the indoor fan is turned OFF if the temperature rises 1˚C or more than the return air temperature at the thermostat OFF.
   b) Indoor fan OFF condition is maintained for 5 minutes and then the operation is reset at the Lo mode again. After operating for 2 minutes in the Lo mode, return air temperature is checked and, if it is 1˚C or higher, the indoor fan is turned OFF or, if it is not higher than 1˚C, the Lo mode operation continues.

Notes (1) If the heating thermostat has been turned OFF, the temperature is indicated on the remote controller only when the indoor fan is operated in the Lo mode. When it is OFF, the room temperature at the end of Lo operation is indicated.
(2) If the operation is changed to the defrosting mode while the heating thermostat is at OFF or the thermostat is turned OFF during defrosting, the indoor fan is turned OFF.

4) Fan Lo Operation Control
   If jumper wire J4 (SW7-4) on the indoor PCB (set at shipping) is disconnected, indoor units with the thermostat turned OFF during heating operation will operate with the fan on Lo.
5) Fan stop control
   a) If the jumper wire J3 (SW7-3) on the indoor PCB (installed at shipment) is opened or the thermostat is turned OFF during heating operation with the remote control sensor operating, the fan on the indoor unit is turned OFF.

(c) Hot start (Prevention of cold draft during heating)

1) If the required frequency in the room is other than 0 Hz at the start of heating operation, the indoor fan is controlled in accordance with the temperature of indoor air heat exchanger (detected with Thı-R1, R2).



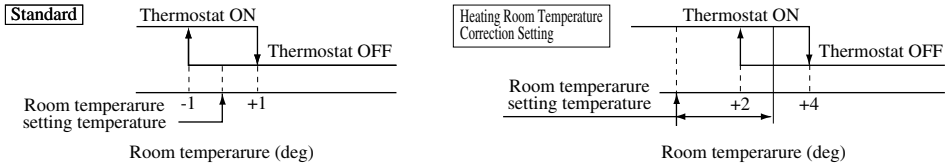
Note (1) When the hot start (the compressor is operating and the indoor unit fan is not operating at the setting blow rate) is going on, the heating preparation is displayed (LCD on the remote controller).

2) During heating, the required frequency becomes 0 Hz (heating thermostat OFF), then afterward, if the required frequency is other than 0 Hz, and the answer back frequency from the outdoor unit is other than 0 Hz (during thermostat reset), hot start control is carried out.
3) If the indoor fan motor is OFF continuously for 7 minutes due to hot start control, the indoor fan motor goes ON regardless of the temperature detected by the heat exchanger temperature thermistor (Thi-R1, R2) and "Heating Preparation" LCD goes off.
4) Even if the fan motor is stopped continuously for 7 minutes during defrosting, it is not turn ON forcibly, but after defrosting is completed, if the fan motor is OFF continuously for 7 minutes, it is turned ON regardless of the temperature detected by the heat exchanger temperature thermistor (Thi-R1, R2).

(4) Value shift adjustment of room air temperature detection in heating

Under the standard specifications, the room temperature is adjusted at the setting temperature by controlling the indoor unit capacity based on the setting temperature of thermostat and the suction air temperature.

However, where the unit is installed in the ceiling and warm air tends to stay around the ceiling, temperature in the living space may not be adjusted at the setting temperature. If "ROOM TEMP OFFSET" (heating space temperature compensation) is set in the remote controller's functions, the thermostat is set to go OFF at a temperature which is 3 degrees higher than the space temperature setting, enabling an improved feeling of warmth in the room.



(5) FILTER sign

(a) If cumulative operating time (the time the Run/Stop switch is ON) reaches 600 hours, "FILTER CLEANING" is displayed in the remote controller.

Note (1) If jumper wire J1 (SW7-1) on the indoor PCB is disconnected, this function is deactivated.

(b) The functions of the remote controller can be set to display 180 hours, 600 hours, 1,000 hours, 1,000 hours & Forced Stop, and no display.

(c) If it is set on 1,000 hours & Forced Stop, after 1,000 hours of operation, there is a forced stop after an additional 24 hours have passed. (If the filter sign is not reset, operation cannot be resumed.)

Resetting from the remote controller is possible at all times (while running, while stopped and before time up) when a filter reset signal is received. It is also reset when the power is turned OFF.

(6) Auto swing control (FDT, FDTW, FDTQ, FDTS, FDE and FDK only)

(a) Louver Control

(i) When the air conditioner is operating, press the "LOUVER" switch to move the swing louvers. "AUTO " is displayed for 3 seconds, then the swing louvers begin moving up and down continuously.

(ii) When you desire to fix the position of the swing louvers, press the "LOUVER" switch while the swing louvers are moving, and 4 stop positions will be displayed one at a time in 1 second intervals. When the position you desire to louvers to stop at is displayed, press the "LOUVER" switch again. The display will stop message (ex. "STOP 1-") will be displayed for 3 seconds and the swing louvers will stop.

(iii) Louver operation when the power to the 4-position louver controller is turned on.

When the power is turned on, the louvers automatically swing 1 (2) time (without remotecontroller operation). This operation inputs the position of the louver motor (LM) in the microcomputer so it can confirm the louver position.

Notes (1) The louver position LCD displays the swing operation for 10 seconds when the "LOUVER" switch is turned ON. After that, "AUTO " is displayed for 3 seconds in the LCD.

Notes (2) Values in ( ) show in cases other than the FDT, FDE and FDK 22~56 models.

(b) Louver auto horizontal set during heating

The louvers are in the horizontal position regardless of whether the auto swing switch is operated (auto swing or louver stop) while " (Heating Preparation)" is displayed (during hot start and when the heating thermostat is OFF). (This is to prevent cold drafts), and the display that was in the louver position display LCD before this control was activated continues. If the "Heating Preparation" display goes off, both the louvers and the LCD display return to their original setting.

(c) Louver free stop control

If "IN MOTION (louver free stop)" is set in the remote controller's function settings, the louver motor stops if there is a stop signal from the remote control unit and the stop position is stored in memory. Also, if there is an auto swing signal from the remote control unit, auto swing control starts from the position the louvers were in before being stopped.

(7) Condensate pump motor (DM) control (Only FDT, FDTW, FDTQ, FDTS, FDR, FDQM, FDUM models)

(a) Drain motor is started no sooner than the compressor is turned ON during cooling or dehumidifying operation. The drain motor continues to operate for 5 minutes after the stop of unit operation, stop with the error stop, thermostat stop and at switching from cooling or dehumidifying operation to blowing or heating operation. When there is any unit subjected to oil return control, the drain motor is operated for 5 minutes at such occasion.

(b) Overflow detection is always operable by means of the float switch regardless of operation modes. If the overflow is detected (or when the float switch is disconnected or its wire is broken), operation is stopped with the error stopped. If the overflow is detected while the drain motor is stopped, the drain motor is operated for 3 minutes and then the overflow detection is performed to judge whether it is normal or not.

	Indoor unit operation mode				
	OFF (1)	COOL	DRY	FAN (2)	HEAT
During compressor ON		Control A			
During compressor OFF		Control B			

Notes (1) Including OFF and error stop during COOL, DRY, FAN and HEAT.
(2) Including "FAN" operation due to unmatch of operation mode.

(i) Control A

1) If the float switch senses draining, it performs an abnormal stop (E9 is displayed) and operates the drain pump. after 3 minutes pass, the float switch is checked and if it is normal, drain pump operation is stopped. It also preserves an abnormal stop state.
2) If the float switch continues to detect draining, the drain pump continues to operate and the float switch operates while draining is detected.

(ii) Control B

If the float switch detects draining, it turns the drain motor on for 3 minutes, then 10 seconds after the drain motor goes OFF, it checks the float switch. If it is normal, a normal stop is performed and if it is abnormal, E9 is displayed and the drain motor goes ON. (It remains ON while draining is detected.)

(8) High ceiling control

In the case of indoor units installed in high ceilings, air flow mode control can be changed using DIP switch SW9-4 on the indoor PCB, or by using the remote controller indoor function setting (see page 288).

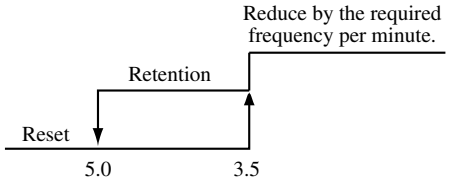
DIP SW / Item	SW9-4 OFF (Normal Control)	SW9-4 ON (High Ceiling Control)
Air Flow Mode	Hi, Me, Lo	UHi, Hi, Me

Notes (1) When the unit is shipped, SW9-4 is turned OFF.
(2) If SW9-4 is ON, the fan operates in Me even during hot start and when the heating thermostat is OFF.

(9) Frost prevention during cooling, dehumidifying

In order to prevent frost during cooling and dehumidifying, 9 minutes after compressor operation starts, the temperature sensed the indoor heat exchanger (sensed by Thi-R1, R2) is checked and the following controls are carried out.

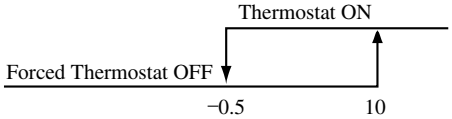
(a) Required frequency down control



Indoor heat exchanger temp. (˚C)

Notes (1) Through required frequency down control, if the required frequency is not reached, fuzzy control is carried out.
(2) If the temperature at Thi-R1 and R2 becomes 5.0ºC continuously for 6 minutes, this control is terminated.

(b) Thermostat OFF control



Indoor heat exchanger temperature (˚C)

Notes (1) After the thermostat goes ON, forced thermostat OFF does not operate for a period of 9 minutes.
(2) Forced thermostat OFF operates if the temperature at Thi-R1 or R2 becomes –0.5ºC or lower.

(10) Indoor expansion valve control

(a) Cooling superheat control

1 minute after the thermostat switches ON during a cooling or dehumidifying operation, superheating is maintained at a suitable level by expansion valve aperture control based on the difference between the indoor heat exchanger's inlet and outlet temperatures (detected by Thı-R3 and Thı-R1 or R2), and the amount of deviation from the superheat setting value. Cooling superheat control ends when operation stops, or when the thermostat switches OFF.

(b) Heating paused unit refrigerant control

In order to control the amount of refrigerant collected in a heating paused unit during outdoor unit heating operation, paused unit refrigerant control occurs individually at the paused units that satisfy the following conditions.

(i) Start conditions

① After thermostat switches OFF
② After heating → stop, or stop → blow switching
③ After outdoor unit heating begins during a stop (including error stops)
④ After electronic expansion valve full-closed control
⑤ After receiving a "refrigerant recovery" signal from the outdoor unit

} After 12 hours elapses

(ii) Control description

The electronic expansion valve opens to the setting aperture for 1 minutes.

(iii) Control termination conditions.

① When the outdoor unit stops
② When a defrost operation begins
③ When the thermostat switches ON
④ When the indoor heat exchanger sensor (Thı-R1 or Thı-R2) detects a temperature exceeding 55°C.

(11) Thermistor (Return air, heat exchanger) disconnected

(a) Return air temperature thermistor

If the temperature detected by the thermistor is –20ºC or lower continuously for 5 seconds, an abnormal stop is performed.

(b) Indoor heat exchanger temperature thermistor

If the temperature detected by the thermistor (Thi-R1, R2 or R3) 2 minutes ~ 2 minutes 20 seconds after the thermostat goes ON and the compressor starts is –40ºC or lower continuously for 5 seconds, or if the temperature is –40ºC or lower continuously for 5 seconds within 10 seconds after the power is turned on, an abnormal stop is performed.

(12) Indoor fan abnormal [FDTA112, 140 or FDKA22 ~ 56 types only]

If the indoor unit fan speed is less than 200 rpm continuously for 30 seconds after a n indoor unit fan run command is output, it stops for 2 seconds. After 2 seconds, it restarts, but if this operation is repeated 4 times within 60 seconds, an abnormal stop is performed.

(13) External control (remote display)/control of input signal

Make sure to connect the standard remote control unit. Control of input signal is not available without the standard remote control unit.

(a) External control (remote display) output

Following output connectors (CNT) are provided on the printed circuit board of indoor unit.

(i) Operation output: Power to engage DC 12V relay (provided by the customer) is outputted during operation.

(ii) Heating output: Power to engage DC 12V relay (provided by the customer) is outputted during the heating operation.

(iii) Compressor ON output: Power to engage DC 12V relay (provided by the customer) is outputted while the compressor is operating.

(iv) Error output: When any error occurs, the power to engage DC 12V relay (provided by the customer) is outputted.

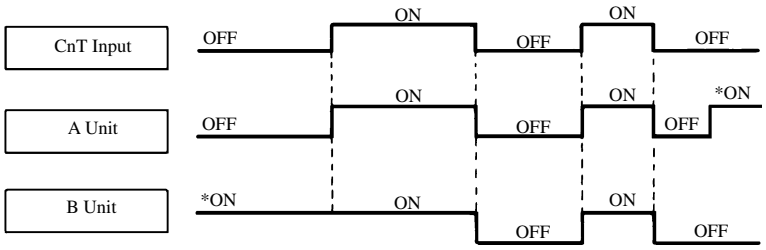
(b) Control of input signal

Control of input signal (switch input, timer input) connectors (CNT) are provided on the control circuit board of the indoor unit. However, when the operation of air conditioner is under the Center Mode, the remote control by CnT is invalid.

(i) If the factory settings (SW5-3 on the PCB is OFF) are set, or "LEVEL INPUT" is selected in the remote controller's indoor unit settings.

1) Input signal to CnT OFF → ON – – – – Air conditioner ON

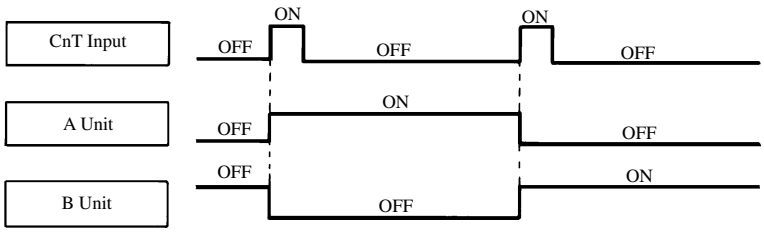
2) Input signal to CnT ON → OFF – – – – Air conditioner OFF



Note (1) The ON with the * mark indicates an ON operation using the remote control unit switch, etc.

(ii) When SW5-3 on the PCB of indoor unit is turned on at the field or "PULSE INPUT" is selected in the remote controller's indoor unit settings.

Input signal to CnT becomes valid at OFF → ON only and the motion of air conditioner [ON/OFF] is inverted.



(14) Multiple units control-simultaneous control of 16 unit with one remote controller

(a) Function

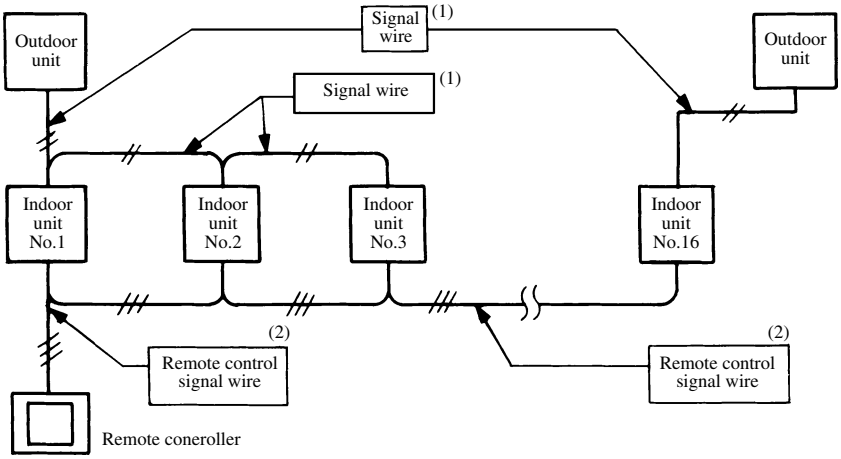
Multiple units (even of outdoor different systems, 16 units maximum) can be simultaneously controlled by using a remote controller. The remote controller is used to set the "operation mode", and all the unit can be operated and stopped. Thermostat and protective functions of each unit functions independently.

Note(1) When part of the group gets out of order (the protective device operates), the relevant unit comes to an abnormal stop, but other normal units keep operating.

(b) Wiring Procedures

(i) Lay power cable of each unit and signal wire as usual. (Remove the remote control switches from all units excluding only one unit.) Lay wiring for the remote controller separately from power cable and wires for all other electrical equipment.

(ii) Arrange the terminal block (X, Y, Z) of the remote controller as shown below for the simultaneous control, and lay cross over in each indoor unit.



Notes (1) The overall length of the signal wire shall be less than 1000m.

(2) The length of remote control signal wire and crossover for remote controller between room shall be less than 600m.

4.3 Operation control function by the outdoor controller

◆ **Model FDCA335HKXE4**

(1) Operations of major functional items under each operation mode

Functional item \ Operation mode	Cooling		Fan	Heating			Dehumidify
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Defrost	
Indoor unit fan	Remote controller command	Remote controller command	Remote controller command	Remote controller command	Intermittent operation	○→×	○/×
Indoor unit electronic expansion valve	Overheating control response	Fully closed	Fully closed	Overheating control response	60 pulse	Model-specific aperture opening angle	Overheating Control Response
Compressor [CM1]	○	×	×	○	×	○	○/×
Magnetic contactor CM1 [52C1]	○	○	×/○	○	○	○	○
Outdoor unit fan [FMo-1]	○/×	×	×/○	○/×	×	○→×	○/×
Outdoor unit fan [FMo-2]	○	×	×/○	○	×	○→×	○/×
Inverter cooling fan [FMC1]	○/×	○/×	×	○/×	○/×	○/×	○/×
4 way valve	×	×	×	○	○	○→×	×
Electronic expansion valve for heating [EEVH1, 2]	Fully open	Fully open	Fully closed	Opening Angle Control	Fully closed	Opening Angle Control	Fully open
Electronic expansion valve for sub-cooling [EEVSC]	Opening Angle Control	Fully closed	Fully closed	Opening Angle Control	Fully closed	Fully closed	Opening Angle Control
Solenoid valve [SV1]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV6]	○/×	×	×	○/×	×	○/×	○/×
Crankcase heater [CM1]	○/×	○/×	○/×	○/×	○/×	○/×	○/×

Notes(1) ○ : ON, × : OFF, ○/× : ON or OFF

(2) 4-way valve switching assurance

When the compressor is switching from the stopped state to the start state, after the compressor start control functions, there is an increase in frequency from 10Hz (synchronous operation).

(a) 0-20Hz Operation

It operates in the range of 0 – 20Hz. However, in this operation, the compressor cannot be operated with the current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. control, unde-dome temp. control or compression ratio protection controls.

(b) 20 – 40Hz (49) Operation

Maximum frequency is determined based on the temperature detected with the outdoor air temperature thermistor (Tho-A).

1) If the temperature is 0 °C or lower, after starting with 49Hz as the maximum frequency, it stops at 49Hz.
2) If the temperature is higher than 0°C, after starting with 40Hz as the maximum frequency, it stops at 40Hz. However, if the starting conditions for current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls or compession ratio protection controls are satisfied during this time, this control ends and control according to current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls , unde-dome temp. control or compession ratio protection controls commences, and if the compressor's frequency is determined and cancelled, operation returns to normal operation.

(3) Compressor protective start

After 4-way valve switching assurance is completed, the following compressor protection begins.

		Initial Start (Remote controller ON error cancel)	Thermostat ON start	
			Operation Mode Changed While Thermostat Was OFF	Operation Mode Unchanged While Thermostat Was OFF
Compressor ON count: 1st time	Less than 45 minutes after power ON	Compressor protective start B according to crankcase heater's power ON time	Compressor protective start B according to crankcase heater's power ON time	Compressor protective start B according to crankcase heater's power ON time
	45 minutes or more after power ON	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time
Compressor ON count: From 2nd time	Less than 45 minutes after stop	Protective start	Protective start	Protective start
	45 minutes or more after stop	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time

(a) Compressor protective start

The compressor's speed is controlled as follows, regardless of the target frequency.

1) Operation occurs at 20Hz for a 1 minute 45 second period following a compressor start.
2) Operation occurs in accordance with pressure control after the post-start 1 minute 45 second period.

(b) Compressor protective start sequence "A" according to crankcase heater power ON time

The cumulative power ON time from power ON is calculated, and compressor protective start sequence "A" control occurs at the 1st compressor start after a 45-minute period, and at all subsequent compressor starts that follow a power ON after a compressor stop of 45 minutes or longer.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 15-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 15-minute period becomes the inverter's start completion point (10Hz).
3) If the inverter is stopped within a 15-minute period after a compressor start, this control increases the frequency 5Hz per minute for 15 minutes when the compressor starts again.

(c) Compressor protective start sequence "B" according to crankcase heater power ON time

The cumulative power ON time from power ON is calculated, and compressor protective start sequence "B" control occurs at the 1st compressor start within a 45-minute period.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 18-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 18-minute period becomes the inverter's start completion point (10Hz).
3) The frequency is increased 5Hz per minute through the 18-minute to 24-minute period, and this control ends when 24 minutes is reached.
4) After this control ends 1 time, the system reverts to protective start "A" control from the 2nd time, or after 45 minutes have elapsed.
5) If the inverter is stopped for 24 minutes following a compressor start, a protective start is performed when started again, and protective start sequence "B" control increases the frequency for a period of 24 minutes. However, the system reverts to protective start sequence "A" control when started again if 45 minutes or more have elapsed since the inverter stop.

(4) Crankcase heater control

The crankcase heater (CH1) is switched OFF and ON in accordance with the under-dome temperature thermistor (Tho-C1).

(a) Under-dome temperature thermistor (Tho-C1) ≤ low-pressure sensor (LPS) detected pressure saturation temperature (°C) + 20°C ⇨ crankcase heater (CH1) ON.

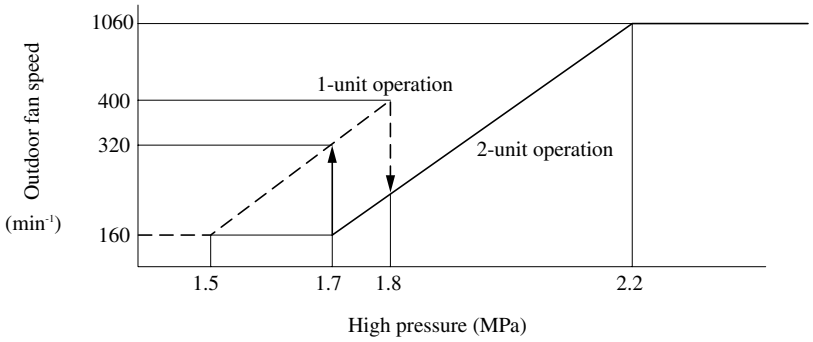
(b) Under-dome temperature thermistor (Tho-C1) ≥ low-pressure sensor (LPS) detected pressure saturation temperature (°C) + 25°C ⇨ crankcase heater (CH1) OFF.

(c) Under-dome temperature thermistor (Tho-C1) ≤ -40°C or less, and compressor (CM1) is running.
⇨ crankcase heater (CH1) OFF.

(5) Cooling high pressure control

High pressure is controlled by the outdoor fan speed during cooling and dehumidifying operations, and this control is activated when the high pressure is less than 2.20MPa at 1 minute 45 seconds after a compressor protective start completion. Moreover, the outdoor fan speed is determined by the high pressure level, and outdoor fans are switched between 2-unit operation and 1-unit operation accordingly.

High level side setting pressure (HPH)	Pressure classification	2-unit operation	1-unit operation
2.2	Low level side high pressure (HPL1)	1.7	1.5
	High level side high pressure (HPH1)	2.2	1.8



Control termination conditions

1) When a mode other than cooling or dehumidifying is selected.

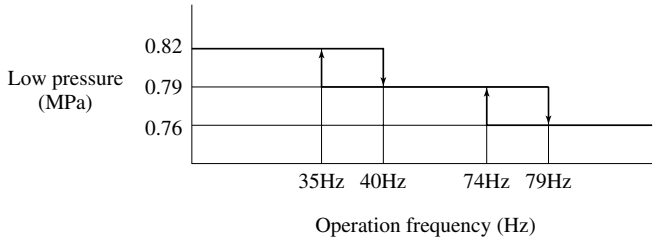
2) When compressor stops

3) When high pressure is 2.20MPa or more

(6) Cooling low pressure control

During cooling and dehumidifying operations, a constant low pressure is maintained by compressor frequency control.

(a) Compressor frequency control occurs as shown below, 1 minute 45 seconds after the completion of a compressor protective start.



(b) Control termination conditions

(i) When a mode other than cooling or dehumidifying is selected.

(ii) When the compressor stops.

(7) Heating high pressure control

During heating operation, a constant high pressure is maintained by compressor frequency control.

(a) Control activation condition

1 minute 45 seconds have elapsed since the completion of a compressor protective start.

(b) Control description

The compressor frequency is controlled to maintain a high pressure of 2.75Mpa.

(c) Control termination conditions

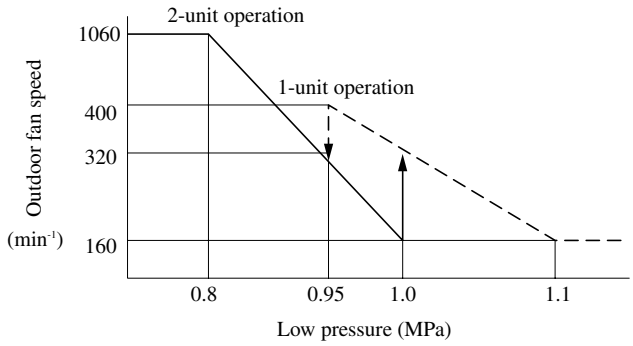
(i) When a mode other than heating is selected.

(ii) When the compressor stops.

(8) Heating low pressure control

Low pressure is controlled by the outdoor fan speed during heating operation, and this control is activated when the low pressure is 0.80MPa or higher at 1 minute 45 seconds after a compressor protective start completion. Moreover, the outdoor fan speed is determined by the low pressure level, and outdoor fans are switched between 2-unit operation and 1-unit operation accordingly.

Low level side setting pressure (LPL)	Pressure classification	2-unit operation	1-unit operation
0.8	Low level side high pressure (LPL1)	0.80	0.95
	High level side high pressure (LPH1)	1.00	1.10



Control termination conditions

1) When a mode other than heating is selected.

2) When the compressor stops.

(9) Overcooling coil control

During cooling and dehumidifying operations, a constant low pressure is maintained by compressor frequency control.

(a) Control activation condition

Control is activated 6 seconds after a compressor start occurs during cooling and dehumidifying operations.

(b) Control description

(i) The specified sub cooling coil outlet superheat is maintained by controlling the sub cooling coil's electronic expansion valve.

(ii) Sub cooling coil superheat feed-forward control

(Applied when a sudden change occurs in the compressor frequency)

1) The sub cooling coil's expansion valve (EEVSC) closes at a rate of –4 pulses/sec. if the superheat control value (SHS) reaches 5°C or lower.

2) Superheat PI control is resumed when the superheat control value (SHS) subsequently returns to 8°C or higher.

(c) Control termination conditions

(i) When a mode other than heating is selected.

(ii) When the compressor stops.

(d) Changing the sub cooling coil's target superheat level

(i) Control activation conditions

Control occurs when all the following conditions are satisfied.

1) When 10 minutes are more have elapsed since the compressor start.

2) When the high pressure (HP) is 1.1MPa or lower.

(ii) Control description

1) The sub cooling coil outlet's target temperature (SHC) is changed to 5.0°C.

2) The cooling coil's expansion valve (EEVSC) closes at a rate of –4 pulses/sec. if the superheat control value (SHS) reaches 3°C or lower.

3) Superheat PI control is resumed when the superheat control value (SHS) subsequently returns to 4°C or higher.

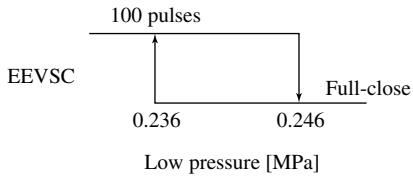
(iii) Control termination conditions

1) When the compressor stops.

2) When the target low pressure (LPS) reaches 0.246Mpa or higher.

(e) When the control termination conditions are satisfied, the following sub cooling coil's expansion valve (EEVSC) apertures are adopted:

100 pulses if the low pressure (LPS) is less than 0.236Mpa when stopped. Full-open (0 pulse) at all other times. If the low pressure (LPS) subsequently reaches 0.246Mpa or higher when stopped, the sub cooling coil's expansion valve (EEVSC) is fully closed.



(10) Indoor unit refrigerant recovery control

When a refrigerant shortage occurs due to a heating overload, the indoor unit's expansion valve is opened in accordance with the outdoor unit inlet's superheat level and operation pressure, to permit a refrigerant recovery.

(a) Control activation conditions

This control is activated when any one of the following conditions are satisfied.

(i) Superheat control temperature ≥ 15°C, and heating electronic expansion valve 1 (front)

[EEVH1] ≥ 470 pulses

(ii) Superheat control temperature ≥ 15°C, and heating electronic expansion valve 2 (back)

[EEVH2] ≥ 470 pulses

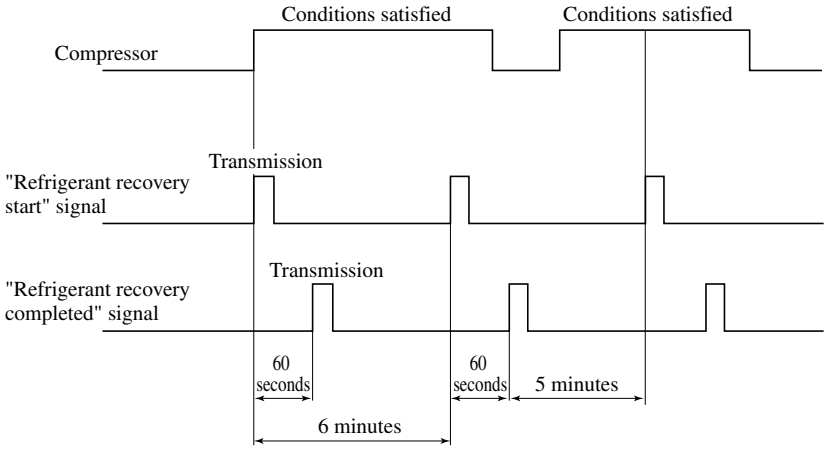
(iii) Discharge pipe temperature (Td1 or Td2) ≥ 120°C

(b) Control description

(i) When the control activation conditions are satisfied, refrigerant recovery occurs at 6-minute intervals.

Following the "refrigerant recovery completed" signal transmission, another "refrigerant recovery start" signal is not transmitted again for 5 minutes even if the control activation conditions are satisfied.

(ii) If defrost or low frequency protection conditions are satisfied during this 5-minute period, the refrigerant recovery for those operations takes precedence, and the 6-minute timer is cleared.



(c) Control termination conditions

(i) When a mode other than heating is selected.

(ii) When the compressor stops.

(iii) When none of the control activation conditions are satisfied.

(11) Emergency stop control

When an indoor unit's external input (optional: refrigerant leakage, etc.) indicates a refrigerant leak, that information is transmitted to the outdoor unit, stopping operation. An emergency stop error is then transmitted to all indoor units that are running.

(a) Error stop occurs when the "emergency stop" command is received from the indoor unit.

(b) Error code E63 occurs, and the "emergency stop" command is transmitted to all indoor units.

(c) When a "emergency stop clear" command is received from the indoor unit, the outdoor unit's error status is cleared, and an "emergency stop clear" command is transmitted to all the indoor units.

(12) Compression ratio protection control

The frequency is reduced in accordance with the compressor's compression ratio.

(a) Control activation conditions

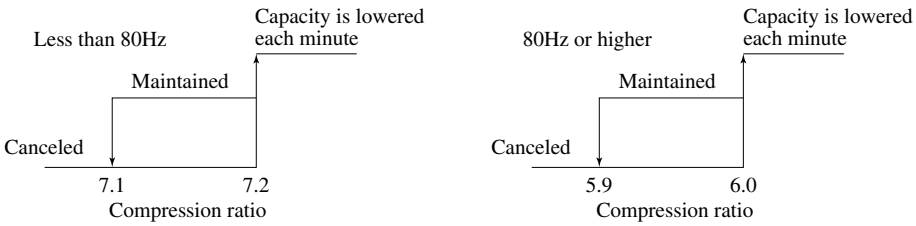
This control is activated when all the following conditions are satisfied.

(i) When 10 minutes or more have elapsed since the compressor start.

(ii) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

Note (1) The above does not apply for a 10-minute period following a defrost, or when pump-down control is in progress.

(b) Control description



(c) Control termination conditions

Control ends when any one of the following conditions is satisfied.

(i) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

(ii) When the compression ratio falls below the cancel value.

(13) Outdoor fan control

(a) DC fan motor control

The outdoor fan tap has 0 speed to 4nd speed assigned as the regular speed depending on the model and operation mode. Under normal operation, 1st speed and 4nd speed is used, and in each outdoor fan control, control is stepless between 1st speed and 4nd speed.

(b) Outdoor fan tap

Unit: min^{-1}

Fan tap	Cooling		Heating	
	FM_{O1}	FM_{O2}	FM_{O1}	FM_{O2}
1th speed	0	160	0	160
2th speed	0	400	0	400
3th speed	160	160	160	160
4th speed	1060	1060	1060	1060

(c) When operation is starting, operation is at 4nd speed.

(d) Judgment of whether or not to start the DC fan motor

(i) If the outdoor fan starts after stopping, the fan speed is checked and start control is performed.

(ii) If the unit is stopped (free-running state) and the fan speed is in reverse, either FM_{O1} or FM_{O2} is 700 min^{-1} or higher, it is not started, and if both FM_{O1} and FM_{O2} is under 700 min^{-1} for 3 seconds, it is started.

(iii) The compressor is started regardless of the state of the outdoor fan, and the above contents are sensed 5 seconds or more after the time that 52C1 goes ON.

(14) Snow protection fan control

(a) This control is enabled/disabled by the selector switch at the 7-segment display.

① Set the Code No. to "75".

② "0" or "1" displays at the data display area.

0: Outdoor fan control disabled (factory setting)

1: Outdoor fan control enabled

③ Press SW7 continuously for 3 seconds.

④ "0" or "1" blinks every 0.5 seconds at the data display area.

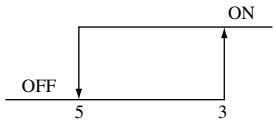
⑤ Press SW8 to toggle between the blinking "0" and "1" displays.

⑥ If SW7 is pressed for 3 seconds or longer while "0" and "1" is blinking, the blinking stops, and that enabled/disabled setting is registered. If enabled, fan control occurs as described below.

⑦ Outdoor fan control occurs in accordance with the information stored in memory, even if the power is turned OFF and back ON again.

(b) Control description

(i) If the outside temperature drops to 3°C or lower when all units are stopped, or during an error stop, the outdoor fan runs at level 4 speed once every 10 minutes.



Outdoor air temperature (°C)

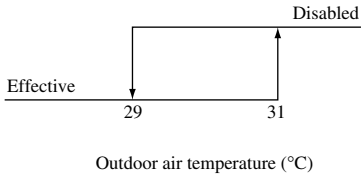
(ii) The outdoor fan runs for 30 seconds.

(iii) During this snow protection control, the compressor's magnetic contactor (52C1) is ON.

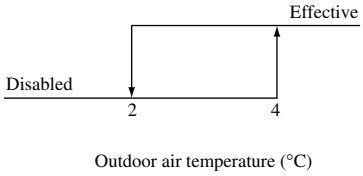
(15) Silent mode control

(a) If the silent mode start signal is received from an indoor unit or CnG2 (with short pin) is shorted, if the outdoor temperature is within the following range, operation is performed in the silent mode.

• Cooling



• Heating



(b) The outdoor fan's upper limit speed for each model has been raised by 400 min^{-1}. However, the following conditions are excluded.

① For 30 sec. after operation starts.

② During defrosting.

(c) The compressor operating frequency upper limit has been set at 79Hz.

(16) Oil return control

When in the cooling or dehumidifying mode, this control occurs every 10 hours (after an initial 2 hours of cumulative compressor operation time counting from the 1st compressor start after power ON), or when the oil rise amount reaches the setting value.

Note (1) The operation time count begins at the point when heating-to-cooling switching occurs.

(a) Control description

(i) Oil return control occurs at units where the thermostat is OFF, at units that are blowing, and at stopped and emergency stopped units.

(ii) The oil return operation frequency is 100Hz.

Note (1) Refrigerant low-pressure control is disabled during oil return control.

(b) Control termination conditions

(i) When 3 minutes have elapsed since the compressor reached the oil return operation frequency.

(ii) When a compressor inlet superheat level of 4°C or lower continues for a 10-second period after 180 seconds have elapsed from the point when the control activation conditions were satisfied.

(17) Forced heating/cooling operation

With this control, SW3-7 on the outdoor unit PCB is turned on and CnG1 (equipped with short circuit pin) is shorted or opened so as to forcibly determine whether the indoor unit is operated for cooling or heating. If any operation mode other than the forcible mode is commanded from the indoor unit, the mode unmatch message is displayed on the remote controller or others and the operation enters in the blowing mode.

SW3-7	CnG1	Operation
OFF	Open/short	Normal operation
ON	Open	Cooling
	Short	Heating

Note (1) SW-7 is at OFF and CnG1 is open at the shipping from factory.

(18) Indoor unit connection number protection

If the number of indoor units on the connection exceeds the number as listed below, the compressor stops with the error stop.

Item \ model	All model
Number of units on connection	20 units

Note (1) They are the numbers of units used for judgement of error for the purpose of control and not equal to the numbers of units which can be connected.

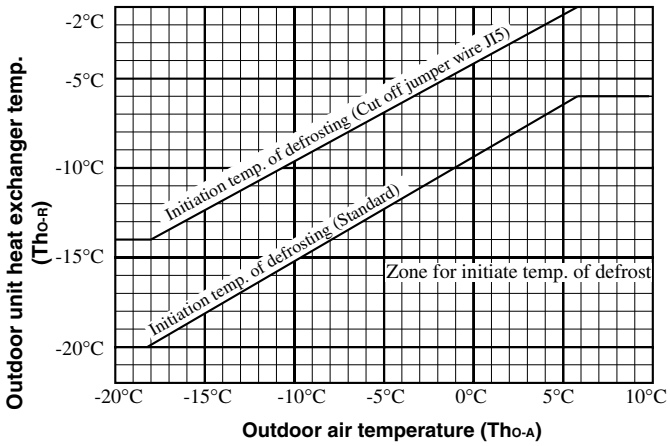
(19) Defrosting

(a) Temperature condition defrosting

(i) Conditions for starting defrosting

When all the following conditions are met, the defrosting operation will start.

1) The cumulative operating time of the compressor comes up to 33 minutes after completion of a defrosting operation, or it comes up to 33 minutes after a heating operation starts (the remote controller is turned on).
2) If 8 minutes have passed after the compressor goes ON after it has gone OFF.
3) If 8 minutes have passed after one outdoor unit fan goes ON after all outdoor fans have gone OFF.
4) After all the above conditions are satisfied, when the temperature at the outdoor heat exchanger thermistor (Tho-R) and outdoor temperature thermistor is below the defrost initiation temperature in the above graph continuously for 3 minutes.



(ii) Conditions for finishing defrosting

- Standard (J14: shorted)
  1) When the increase of the temperature of the heat exchanger thermistor (Tho-R1 or Tho-R2) is greater than 9ºC.
  2) When 12 minutes have passed since defrosting started.
- With operation Judgment Function (J14: Open)
  1) If Tho-R1 and R2 are ≧ 9ºC, after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 2 minutes and 30 seconds have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.
  2) If Tho-R1 or R2 are < 9ºC after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 5 minutes have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.

(b) Time condition defrosting (oil return)

(i) Defrosting start conditions

1) Defrosting starts when the heating mode is in effect at the 1st compressor start following a power ON, and when the heating mode is in effect after 2 hours of cumulative operation time. However, if mode switching from cooling to heating occurred, defrosting starts 33 minutes after CM1 operation begins.
2) If there was 5 minutes or more of temperature condition defrosting before time condition defrosting, the 10-hour timer for time condition defrosting is reset.
3) The "time condition defrosting" time is the point when the detected oil rise amount reaches the setting value (following 2 hours of cumulative compressor operation time counting from the 1st compressor start after power ON), or the point when 10 hours elapse, whichever comes first.
4) When the 10-hour timer period elapses, time condition defrosting occurs at the completion of the previous temperature condition defrosting operation, or after 33 minutes, whichever comes first.

(ii) Defrosting end conditions

If either of the following conditions is satisfied, the defrosting end operation starts.

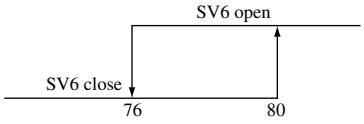
1) If defrosting continues for 5 minutes and the temperature sensed by Tho-R1 and Tho-R2 becomes 9ºC or higher.
2) If 12 minutes has passed since defrosting started.

(20) Oil separator solenoid valve (SV6) control

(a) If the inverter compressor starts, solenoid valve SV6 opens (goes ON), then 15 seconds later, it starts.

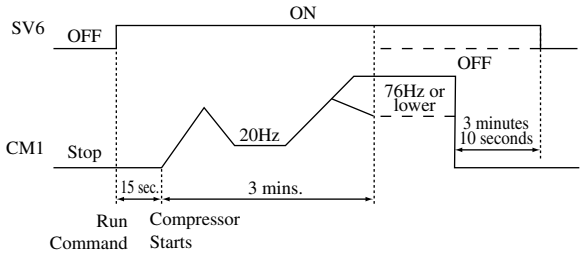
(b) SV6 stays open (ON) for 3 minutes, until 4-way valve switching assurance and compressor protective start are completed.

(c) If the compressor operating frequency becomes 80Hz or higher, SV6 opens (goes ON) and it goes off if the frequency is 76Hz or lower.



Actual compressor frequency (Hz)

(d) If the inverter compressor goes off after SV6 opens (goes ON), SV6 remains open (ON) for 3 minutes and 10 seconds, then closes (goes OFF).



(21) Unit protective maintenance related devices

(a) Test operation mode

1) Outdoor unit test operation mode operation is started by the DIP switches SW5-1 and 5-2 on the outdoor unit control board.

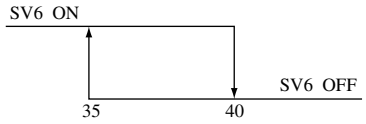
Switch functions

SW5-1	ON	**SW5-2**	OFF	Heating Test Operation
			ON	Cooling Test Operation
	OFF	Normal or Test Operation End		

Notes (1) Leave all DIP Switches except 5-1 and 5-2 OFF.
(2) This operation takes priority over other options such as the center console. It sets the options in the operating state.

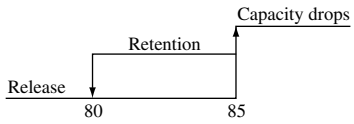
(b) Under-dome temperature control

1) The oil separator solenoid valve (SV6) are controlled in accordance with the temperature at the under-dome thermistor (Tho-C) installed on the compressor.



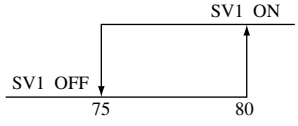
Unde-dome temperature (°C)

2) The compressor's capacity is controlled in accordance with the under-dome temperature (Tho-C).



Unde-dome temperature (°C)

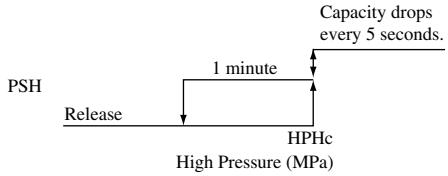
3) The cooling solenoid (SV1) is controlled in accordance with the under-dome temperature (Tho-C).



Unde-dome temperature (°C)

(c) Cooling high pressure protective control

1) During cooling and dehumidifying operation, if the high pressure sensor (PSH) exceeds the cooling high pressure upper limit value while the compressor is ON. However, this is not valid until the frequency reaches 20 Hz after the inverter starts.



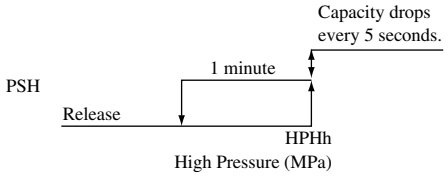
Cooling high pressure upper limit value HPHc (MPa)
3.50

2) When the high pressure exceeds the cooling high pressure upper limit value, the compressor's capacity drops, then after 5 seconds pass, if the cooling high pressure upper limit is still exceeded, the capacity is lowered still further.
3) If the high pressure drops below the cooling high pressure upper limit value, and that condition continues for 1 minute. After that, control returns to cooling normal control.

(d) Heating high pressure protective control

(i) Compressor capability control by high pressure

1) During heating, if the high pressure sensor (PSH) exceeds the heating high pressure upper limit value while the compressor is ON. However, this is not valid until the frequency reaches 20 Hz after the inverter starts.

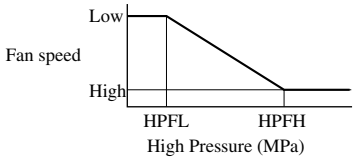


Heating high pressure upper limit value HPHh (MPa)
3.00

2) When the high pressure exceeds the heating high pressure upper limit value, the compressor's capacity drops, then after 5 seconds pass, if the heating high pressure upper limit is still exceeded, the capacity is lowered still further.
3) If the high pressure drops below the heating high pressure upper limit value, and that condition continues for 1 minute. After that, control returns to heating normal control.

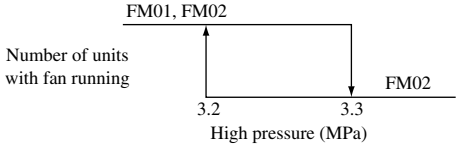
(ii) Outdoor unit fan speed control in accordance with high pressure

1) The outdoor fan is controlled during heating operation so that the high pressure (sensed by PSH) is at the bottom stage high pressure (HPFL) or higher.



Low level side high pressure (HPFL)	3.0MPa
High level side high pressure (HPFH)	3.2MPa

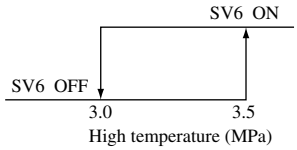
2) However, if the high pressure (sensed by PSH) becomes higher than 3.3 MPa, the outdoor unit fan FMO1 stops.



3) Under the following conditions, outdoor unit fan speed control is ended.
   - When the mode has been switched from heating operation to another mode.
   - If the compressor stops.
   - If the high pressure (sensed by PSH) becomes lower than the low side high pressure (HPFL).

(iii) Solenoid Valve (SV6) Control

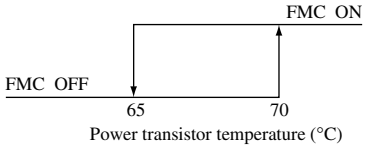
1) The solenoid valve (SV6) goes ON when the high pressure (sensed by PSH) rises to 3.5 MPa or higher during heating operation.



2) Under the following conditions, solenoid valve (SV6) control is ended.
   - When the mode has been switched from heating operation to another mode.
   - If the compressor stops.
   - If the high pressure (sensed by PSH) becomes lower than 3.0 MPa.

(e) Inverter cooling fan control

(i) Inverter power transistor temperature rises are controlled by the cooling fan (FMC) in accordance with the temperature sensed by the power transistor temperature thermistor (Tho-P) after the inverter starts.

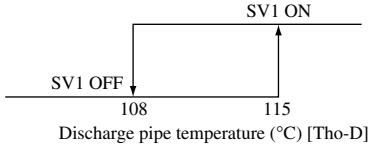


(ii) A cooling fan ON status is maintained for 3 minutes 10 seconds if the cooling fan (FMC) is ON when the compressor is switched from ON to OFF.

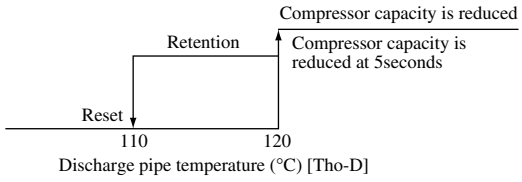
(f) Discharge pipe temperature control

If the discharge pipe temperature (sensed by Tho-D) exceeds the set value, the compressor cooling solenoid valve (SV1) goes ON, the indoor expansion valve opens and the compressor's capacity is controlled, thus suppressing rises in the discharge pipe temperature. If the temperature rises even further, the compressor stops.

(i) Compressor Cooling Solenoid Valve (SV1) Control

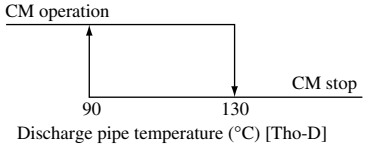


(ii) Compressor control



(iii) Discharge pipe temperature error

- When the discharge pipe temperatures (Tho-D detection) rise beyond 130°C and is maintained for 2 seconds, the compressors are stopped but it will be reset if the temperatures drop below 90°C.



- If the discharge pipe temperature (Tho-D detection) occurs twice within 60 minutes or the condition higher than 130 °C has continued for 60 minutes including the duration of time of compressor stop, the unit operation is stopped with the error stop.

Note (1) Unless the temperature of 90 °C or under is maintained for 45 minutes after the discharge pipe error, the unit cannot be started again. (Reset the power supply to clear.)

(g) Current safe control

(i) The compressor speed is reduced if the inverter inlet's input voltage (converter inlet L3-phase) exceeds the setting value. If the input voltage still remains above the setting value, the speed is reduced again.

(ii) This control ends when the input voltage drops below the setting value for 3 continuous minutes.

(h) Current cut control

Cuts an inverter overcurrent. When the current exceeds the setting value, the inverter is immediately stopped, and is then automatically restarted 3 minutes later. If 4 overcurrent cuts occur within a 15-minute period, 52C1 is switched OFF, and an error stop status is established.

(i) Abnormal high pressure increase protection

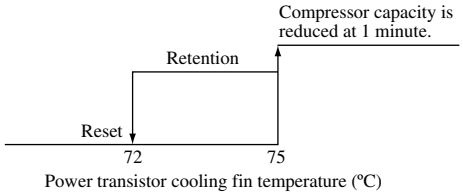
If the high pressure side pressure switch [63H1: 3.8 Open / 2.9 Closed MPa] operates 5 times within 60 minutes or operates for 60 minutes, an abnormal stop is performed.

However, when first operated, the compressor is stopped, then after a 3-minute delay, normal operation is resumed.

(j) Power transistor temperature control

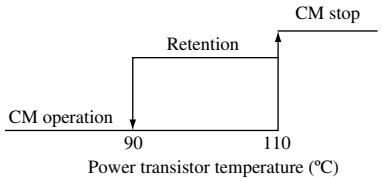
If the temperature of the power transistor cooling fins (sensed by Tho-P) exceeds the set value, the compressor's capacity is controlled to keep the power transistor's temperature from rising. If it rises still higher, the compressor is stopped.

1) Compressor control



2) Power transistor temperature abnormal

- If the temperature sensed by the power transistor temperature thermistor rises to 110ºC or higher, the compressor is stopped.

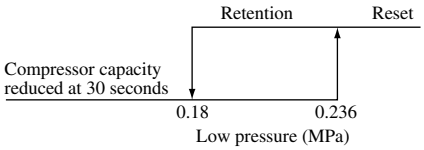


- If the power transistor's temperature is abnormal 5 times within 60 minutes, or if the temperature is 110ºC or higher for 60 minutes continuously, including when the compressor is stopped, an abnormal stop is performed.

(k) Low pressure protective control

If the low pressure (sensed by PSL) drops below the set value, the compressor's capacity is controlled to prevent the low level pressure from dropping. If it drops still further, the compressor is stopped.

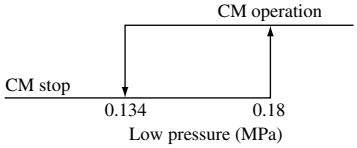
1) Compressor control



Note (1) Starting Conditions
- 1 minutes and 45 seconds have passed since starting.
- Sensed continuously for 10 seconds

2) Low pressure abnormal

- If the low pressure (sensed by PSL) drops to 0.134 MPa or lower continuously for 30 seconds, the compressor is stopped and if a pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is automatically reset. If this occurs 2 times within 60 minutes, an abnormal stop is performed.



- A low pressure (sensed by PSL) of 0.18 MPa or lower while the compressor is stopped, or sensed continuously for 30 seconds while the compressor is operating, is prohibited.
- First cooling operation after the power is turned on
  If a low pressure of 0.003 MPa or lower is detected continuously for 60 seconds after 4-way valve switching assurance, the compressor is stopped, and if a low pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is restarted automatically, but if an abnormal pressure is detected again, an abnormal stop is performed. It is possible to reset the system only by turning the power off, then turning it on again.

3) Heating electronic expansion valve (EEVH1, 2) opening angle control when heating operation is stopped
   - If heating operation is stopped, the pulse to the heating electronic expansion valves (EEVH1, 2) is changed to 100 if the low pressure is less than 0.236 MPa.
   - After that, if the low pressure rises to 0.246 MPa or higher while operation is stopped, the heating electronic expansion valves (EEVH1, 2) are opened fully.

(l) Open phase protection

If open phase in the primary side L3 phase is detected continuously for 2 seconds, an abnormal stop is performed.

(m) Antiphase protection and open L2 phase at 52C1 primary side

This function monitors the phase order on the primary side of 52C1 (whenever power is furned ON) and judges L1→ L3 → L2 → L3 as the antiphase (monitors simultaneously also open phase of L2 phase at the primary side). If the antiphase continues for 2 seconds, the compressor is stopped with the error stop.

(n) Outdoor fan motor (DC) abnormal protection

(i) DC fan speed down control

1) Control description
   a) When the commanded speed for an outdoor fan motor (FM_{o1} or FM_{o2}) exceeds 400min^{-1}, an error is detected, and an error check is performed at the fan motor every 10 seconds, with the commanded speed being reduced by the amount of 100min^{-1}.
   b) If the error is not detected for a continuous period of 60 seconds, the speed is increased 100min^{-1} every 60 seconds until the target speed is reached. The 100min^{-1} correction is stopped, however, if the commanded speed for the outdoor fan motor (FM_{o1} or FM_{o2}) with the higher speed is 400min^{-1} or less.

2) Control termination conditions
   a) When the fan speed is less than 400min^{-1} before being corrected.
   b) When the amount of speed reduction correction that occurred is recovered.

(ii) DC fan overcurrent error detection

1) DC fan1 error detection
   An error occurs when any one of the following occurs.
   i) When 52C1 is ON, and the FM_{o1} commanded speed ≦ 400min^{-1}, and an overcurrent error status has been detected at DC fan1 for 10 continuous seconds.
   ii) When an FM_{o1} actual speed of 100min^{-1} or less has continued for 30 seconds following an "FM_{o1} commanded speed > 0min^{-1}" status that continued for 120 seconds. (Fan motor lock detection)

2) DC fan2 error detection
   An error occurs when any one of the following occurs.
   i) When 52C1 is ON, and the FM_{o2} commanded speed ≦ 400min^{-1}, and an overcurrent error status has been detected at DC fan2 for 10 continuous seconds.
   ii) When an FM_{o2} actual speed of 100min^{-1} or less has continued for 30 seconds following an "FM_{o2} commanded speed > 0min^{-1}" status that continued for 120 seconds. (Fan motor lock detection)
   iii) If an item (ii) a) or b) error is detected, all outdoor units are stopped, and are then automatically restarted after 3 minutes.
   iv) An error stop occurs if an item (ii) a) or b) error occurs 5 times in 1 hour at any of the units.
   v) A power supply reset is required to recover from an error stop.
   vi) An error stop occurs if a fan speed error occurs within 45 minutes following power ON.
   vii) When a stop occurs due to an error detection, both 52C1 and 52C2 are switched OFF.

(o) Compressor protective control

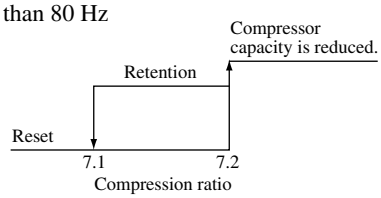
If the inverter's actual frequency is 30 Hz or higher and the low pressure (sensed by PSL) is 0.18 MPa or higher, and the high pressure (sensed by PSH) is 3.52 MPa or lower 10 minutes or more after the compressor starts, the compressor's frequency is controlled in accordance with the compression ratio.

Compressor Frequency	Compression Ratio Control Valve	Compression Ratio Cancel Value
30 Hz or higher but less than 80 Hz	7.2	7.1
80 Hz or higher	6.0	5.9

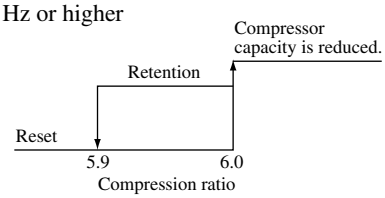
1) Control Contents

When the frequency is higher than the compression ratio control value, the compressor's capacity is lowered. After 60 seconds have passed, the compressor's capacity is lowered yet again if the frequency is greater than the compression ratio control valve. The bottom limit capacity is 20 Hz.

• Less than 80 Hz



• 80 Hz or higher



2) End Conditions

If the low pressure (PSL) is less than 0.18 MPa or the high pressure (PSH) exceeds 3.52 MPa and is less than the compression ratio cancel value, this control ends.

(22) Pump down control

Pump down operation can be performed through operation of DIP switches (SW5-1, 2, 3). (Pump down operation cannot be done during indoor unit operation, backup operation or during an abnormal stop.)

(a) Pump down procedure

1) Close the liguid side service valve on the outdoor unit.
2) Turn SW5-2 (test operation operating mode) ON (cooling).
3) Turn SW5-3 (pump down switch) ON.
4) Turn SW5-1 (test operation switch) ON. This will start the pump down operation.

(b) Control

1) The compressor operates in cooling mode with 62Hz as the upper frequency limit.
2) The red and green (LED's) on the outdoor control PCB flashs together continuously and "PoS" is displayed in the 7-segment display.
3) Except for low pressure control, all the protective and abnormal sensing controls are activated.
4) Test operation commands are sent to the indoor units.
5) The sub cooling coil electronic expansion valve (EEVSC) closes fully during pump down control.

(c) Ending

If any of the following conditions exists, pump down operation ends.

1) If a low pressure (sensed by PSL) of ≦ 0.01 MPa is detected continuously for 5 seconds.
   a) The displays are as follows.
      · Red LED: Lights up continuously · Green LED: flashing
      · 7-segment LED display: PoE · Remote controller: Stop
   b) It is possible for operation to restart if the low pressure (sensed by PSL) becomes > 0.01 MPa.
2) If operation is stopped by abnormal sensing control.
3) If the cumulative compressor operation time totals 15 minutes.
   a) The displays are as follows.
      · Red LED: Off · Green LED: flashing
      · 7-segment LED display: No display · Remote controller: Stop
4) If any one of DIP switches SW5-1, 2 or 3 is turned OFF during the pump down operation.

(23) External input operation

External input: From CnS1, operation permission/prohibition control; From CnS2: Demand control/normal operation switching.

- J13: Switches between CnS1 and CnS2 input method.

  J13 short circuit: Level input by CnS1 and CnS2.

  J13 open: Pulse input by CnS1 and CnS2.

(a) From CnS1, operation permission/prohibition control

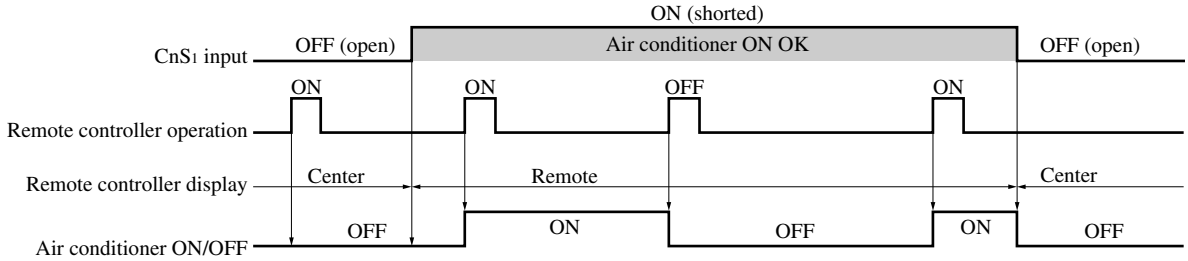
Input : CnS1	CnS1 input method change: J13	CnS1 : Operation permission/ Prohibition mode change
Short circuit / Disconnection	J13; Short circuit Lever input	Operation prohibition mode ⟶ Operation permission mode
	J13; Disconnection Pulse input	Operation permission/Prohibition model change (Reversal)
Short circuit / Disconnection	J13; Short circuit	Operation permission mode ⟶ Operation prohibition mode
	J13; Disconnection	— (NOP)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

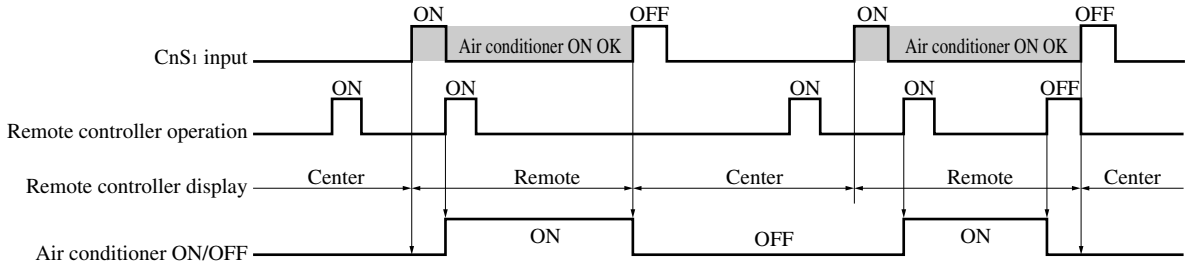
2) CnS1, performs the following operations by the changing of jumper wire J1 from short circuit to open circuit.

   If pulse input, the pulse duration is 500 ms or more.

① Opreation with J13 short circuit



② Opreation with J13 disconnection



(b) From CnS2, operation permission/prohibition control

Input : CnS2	CnS2 input method Formula switching: J13	CnS2 : Demand control/normal operating switching
Short circuit / Open circuit	J13; Short circuit Level input	Demand control ⟶ Normal operation
	J13; Open circuit Pulse input	Normal operation/Demand control switching (Reversal)
Short circuit / Open circuit	J13; Short circuit	Normal operation ⟶ Demand control
	J13; Open circuit	— (NOP)

Note (1) The factory settings are: J13 - short circuit; CnS2 - short circuit (short pin connection)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

2) Demand control

It is possible to switch the demand using DIP switch SW4-5, 6.

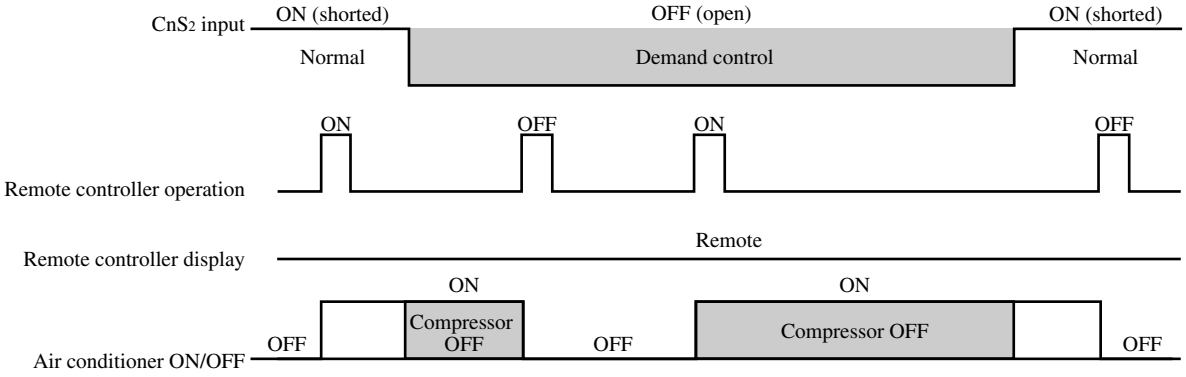
SW45	SW4-6	Compressor upper limit frequency (Hz) FDCA335HKXE4	Compressor output (%)
0	0	95	80
1	0	70	60
0	1	48	40
1	1	OFF	0

Note (1) 0: Open, 1: Shorted

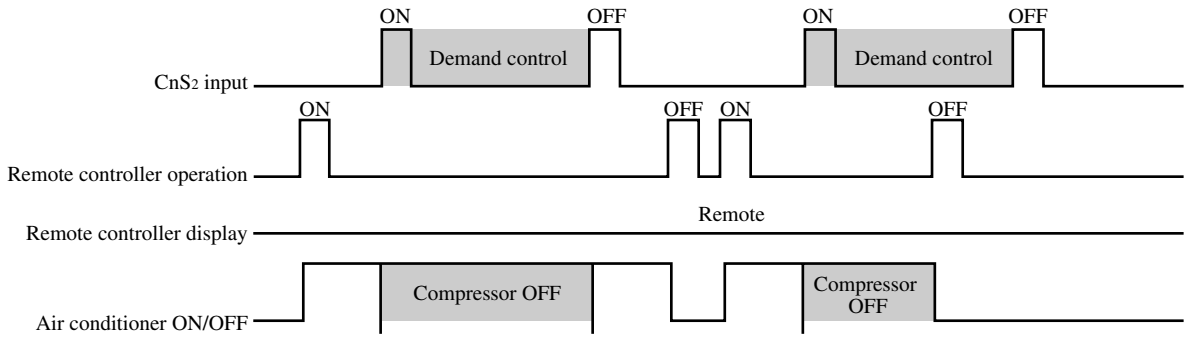
3) CnS2, performs the following operations by the changing of jumper wire J13 from short circuit to open circuit.

If pulse input, the pulse duration is 500 ms or more.

① J13 - Short circuit



② J13 - Open circuit



(24) 7-Segment display

The data in the following table can be displayed using the display select switch (SW8: 1's digit; SW9: 10's digit).

Code No.	Contents of display	Data display range	Minimum units	Remarks
–	Unusual cade Pump down Check mode Outdoor unit setup	–	–	E?? PoE, PoS CH? OPE??
00	CM1 operating frequency	0~130	1Hz	
02	Tho-A Outdoor air temp.	L,-20~43	1˚C	[L] is indicated when the temperature is -20˚C or below and the actual temperature is indicated when it is higher than -20˚C and up to 43˚C.
03	Tho-R1 Heat exchanger temp. 1 (Exit. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
04	Tho-R2 Heat exchanger temp. 2 (Exit. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
05	Tho-R3 Heat exchanger temp. 3 (Entrance. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
06	Tho-R4 Heat exchanger temp. 4 (Entrance. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
07	Tho-D1 Discharge pipe temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
10	Tho-C1 Under-dome temp.	L,5~90	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
12	Tho-P1 Power transistor temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
14	Tho-SC Sub-cooling coil temp.1	L,18~73	1˚C	[L] is indicated when the temperature is 18˚C or below and the actual temperature is indicated when it is higher than 18˚C and up to 73˚C.
15	Tho-SC Sub-cooling coil temp.2	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
16	Tho-S Suction pipe temp.	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
17	Cooling operation super cooling	0~50	0.1˚C	
18	Super heate	0~50	0.1˚C	
19	Superheat of sub-cooling coil	0~50	0.1˚C	
20	CT1 Current	0~50	1A	
22	EEVH1 Heating expansion valve opening angle	0~500	1 Pulse	
23	EEVH2 Heating expansion valve opening angle	0~500	1 Pulse	
24	Opening angle of EEVSC overcooling coil expansion valve	0~500	1 Pulse	
26	FM01 Number of rotations	0~999	10 min^{-1}	
27	FM02 Number of rotations	0~999	10 min^{-1}	
28	PSH High pressure sensor	0~5.00	0.01MPa	
29	PSL Low pressure sensor	0~2.00	0.01MPa	
30	FMC1 Cooling fan Crankcase heater	0,1	–	Order of 100 : FMC1 Order of 10 : CH1 Order of 1 : – (0: OFF, 1: ON)
31	63H1	0,1	–	Order of 100 : 63H1 Order of 10 : – (0: Close, 1: Open)
32	SV1	0.1	–	Order of 100 : SV1 Order of 10 : – Order of 1 : – (0: Close, 1: Open)

Code No.	Contents of display	Data display range	Minimum units	Remarks
33	SV6	0,1	–	Order of 100 : SV6 Order of 10 : – Order of 1 : – (0: Close, 1: Open)
34	20S	0,1	–	Order of 100 : 20S, Order of 10 : – Order of 1 : – (0: close, 1: open)
35	Compressor stop causes ①	0,1	–	Order of 100 : Defective outdoor temperature thermistor Order of 10 : Defective outdoor unit heat exchanger thermistor 1 Order of 1 : Defective outdoor unit heat exchanger thermistor 2 (0:Normal, 1: Abnormal)
36	Compressor stop causes ②	0,1	–	Order of 100 : Defective outdoor unit heat exchanger thermistor 3 Order of 10 : Defective outdoor unit heat exchanger thermistor 4 Order of 1 : Defective discharge pipe thermistor (0:Normal, 1: Abnormal)
37	Compressor stop causes ③	0,1		Order of 100 : – Order of 10 : Defective Sub cooling coil thermistor 1 Order of 1 : Defective Sub cooling coil thermistor 2 (0:Normal, 1: Abnormal)
38	Compressor stop causes ④	0,1	–	Order of 100 : Defective suction pipe thermistor Order of 10 : Defective low pressure sensor Order of 1 : Defective high pressure sensor (0:Normal, 1: Abnormal)
39	Compressor stop causes ⑤	0,1	–	Order of 100 : Abnormal in inverter 1 Order of 10 : – Order of 1 : Abnormal high pressure (0:Normal, 1: Abnormal)
40	Compressor stop causes ⑥	0,1	–	Order of 100 : Abnormal low pressure Order of 10 : Abnormal discharge pipe thermistor Order of 1 : – (0:Normal, 1: Abnormal)
41	Compressor stop causes ⑦	0,1	–	Order of 100 : Defect CM starting Order of 10 : – Order of 1 : Rota lock (0:Normal, 1: Abnormal)
42	Compressor stop causes ⑧	0,1	–	Order of 100 : – Order of 10 : CM Current cut Order of 1 : – (0:Normal, 1: Abnormal)
43	Compressor stop causes ⑨	0,1	–	Order of 100 : Power transistor overheating Order of 10 : – Order of 1 : Abnormalities in DC fun1 (0:Normal, 1: Abnormal)
44	Compressor stop causes ⑩	0,1	–	Order of 100 : Abnormalities in DC fun2 Order of 10 : Stop command from indoor Order of 1 : Operation mode charge (0:Normal, 1: Abnormal)
45	Compressor stop causes ⑪	0,1	–	Order of 100 : Dilute protection Order of 10 : Demand control 0% Order of 1 : 0 (0:Normal, 1: Abnormal)
46	Control status	0,1	–	Order of 100 : During equal oil control Order of 10 : During oil return control Order of 1 : During defrost (0:Non-operation, 1: Operation)
47	Control status	0,1	–	Order of 100 : During Td control Order of 10 : During HP control Order of 1 : During CS control (0:Non-operation, 1: Operation)
48	Control status	0,1	–	Order of 100 : During LP control Order of 10 : During PT control Order of 1 : Under cooling low pressure control (0:Non-operation, 1: Operation)
49	Control status	0,1	–	Order of 100 : Cooling high pressure protection control Order of 10 : High pressure power ratio Order of 1 : Under heating low pressure control (0:Non-operation, 1: Operation)
50	Number of connected indoor unit	0~50	1	
51	Number of operation indoor unit	0~50	1	
52	Required Hz tota	0~999	1Hz	
53	Target Fk	0~999	1Hz	
54	Compressor cumulative operating time (CM1)	0~655	100h	
56	Discharge pressure saturation temperature	-50~70	0.1˚C	1˚C at –10 or lower
57	Air inlet pressure saturation temperature	-50~70	0.1˚C	1˚C at –10 or lower
58	Target cooling low pressure	0.00~2.00	0.01MPa	
59	Target heating high pressure	1.60~4.15	0.01MPa	
63	Inverter 1 operating frequency command	0~130	1Hz	
66	Control status	0,1	–	Order of 100 : During silent mode Order of 10 : During capacity measurement mode Order of 1 : During test operation (0:Non-operation, 1: Operation)
67	Control status	0,1	–	Order of 100 : Unmatch Order of 10 : Indoor EEV check Order of 1 : – (0:Non-operation, 1: Operation)

Code No.	Contents of display	Data display range	Minimum units	Remarks
68	Control status	0,1	–	Order of 100 : Piping cleaning Order of 10 : Under-dome temperature control Order of 1 : Compession ratio protection control (0:Non-operation, 1: Operation)
70	Operation priority switching	0,1	–	0: Prior press priority (when shipped) 1: After press priority
71	High pressure control of cooling	2.2, 2.5	0.01MPa	0: Snow protection fan control deactivated 1: Snow protection fan control activated
72	low pressure control of cooling	-0.05~+0.05	0.01MPa	2.2: Factory setting 2.5: Alternate setting
73	Heating high pressure compensation	0.00~0.30	0.01MPa	0.00: Factory setting
74	Low pressure of heating	0.80, 0.90	–	0.00: Factory setting
75	Snow protection fan control	0,1	–	0.80: Factory setting 0.90: Alternate setting
77	Data reset	---, dEL	–	
78	Figure language sub version	–	–	(Example: 730)
79	Figure language logic version	–	–	(Example: 126)
80	Counter · Thermistor disconnection	0~2	–	
81	Counter · Inverter 1 communications error	0~3	–	
82	Counter · High pressure protection	0~4	–	
83	Counter · Compressor 1 starting failure	0,1	–	
84	Counter · Abnormal low pressure ① (Under stop)	0~4	–	
85	Counter · Abnormal low pressure ② (Immediately after starting)	0,1	–	
86	Counter · Abnormal low pressure ③ (Under operation)	0~4	–	
87	Counter · Motor lock of compressor 1	0~3	–	
88	Counter · Overheating of power transistor 1	0~4	–	
89	Counter · Abnormal temp. of discharge pipe 1	0,1	–	
91	Counter · Current cut (CM1)	0~3	–	
93	Counter · Indoor-outdoor communications error	0~255	–	
94	Counter · Outdoor inverter communications error 2	0~255	–	
95	Counter · CPU reset	0~255	–	
96	Counter · Abnormal FM01	0~255	–	
97	Counter · Abnormal FM02	0~255	–	
98	Program version	–	–	
99	Auto send display	–	–	

(25) Saving of Operation Data

Operating data for a period of 30 minutes prior to the time when trouble occurs are recorded, and these data can be fetched to a personal computer through the RS232C connector on the control board. Data are updated continuously, and when there is an abnormal stop, data updates stop at that point. Pressing DIP switch SW7 for 3 seconds causes the data to be erased. Data can also be sampled at 1 ~ 60 second intervals during operation and fetched to a personal computer.

• Data is transmitted from a personal computer upon demand.

Data	Data Range	Example
Software version	ASCII 15-byte	KD4C270######## (#: NULL)
PID (program ID)	ASCII 2-byte	D8
Outdoor unit capacity	ASCII 3-byte	280
Power supply frequency	ASCII 2-byte	60
Outdoor address	ASCII 2-byte	00 ~ 3F
Indoor address × 16 units	ASCII 2-byte × 16 units	40 ~ 7F
Indoor capacity × 16 units	ASCII 3-byte × 16 units	022 ~ 280

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
00	Abnormal cord	00~99		1	00: No abnormality, outdoor unit all abnormalities ???
01	Address of unit where trouble occurred	00~FF	–	1	0~3F: Outdoor unit side, 40~6F: Indoor unit side
02	Operation mode	0~2	–	1	0 Stop 2 Cooling 4 Heating
03	High pressure sensor	0.00~5.00	A/D value	1	
04	Low pressure sensor	0.00~2.00	A/D value	1	
05	Heat exchanger temp. 1 (Exit, Front)	-35~75	A/D value	2	Cooling liquid side
06	Heat exchanger temp. 2 (Exit, Rear)	-35~75	A/D value	2	Cooling liquid side
07	Heat exchanger temp. 3 (Entrance, Front)	-35~75	A/D value	2	Cooling gas side
08	Heat exchanger temp. 4 (Entrance, Rear)	-35~75	A/D value	2	Cooling gas side
09	Tho-D Discharge pipe temp.	20~140	A/D value	1	
11	Tho-C Under-dome temp.	-15~90	A/D value	1	
13	Tho-A Outdoor air temp.	-20~43	A/D value	1	
14	Tho-P Power transistor temp. (Heat dissipation fin)	20~140	A/D value	1	
16	Tho-SC Sub cooling coil temp. 1	18~73	A/D value	1	Liquid pipe side
17	Tho-H Sub cooling coil temp. 2	-35~75	A/D value	2	Suction pipe side
18	Tho-S Suction pipe temp.	-35~75	A/D value	2	
19	Cooling operation super cooling	0~50	A/D value	1	
20	Super heat	0~50	A/D value	1	
21	Super heat of sub-cooling coil	0~50	A/D value	1	
22	CT1 Current	0~50	A/D value	1	

Code No.	Write-in contents	Record data					
		Data write-in range	Write-in unit	Number of bytes	Contents		
24	Power source voltage	180~500	A/D value	1			
25	Pressure switch	–	–	1	Bit0	63H1	0: open, 1: close
26	Solenoid valve	–	–	1	Bit0	20S	0:OFF, 1:ON
					Bit2	SV1	0:OFF, 1:ON
					Bit4	SV6	0:OFF, 1:ON
27	Crankcase heater etc.	–	–	1	Bit0	CH1	0:OFF, 1:ON
					Bit2	FM1,2	0:OFF, 1:ON
28	FM01 Number of rotations	0~65535	10 min^{-1}	2			
29	FM02 Number of rotations	0~65535	10 min^{-1}	2			
30	EEVH1 opening angle	0~65535	1pulse	2			
31	EEVH2 opening angle	0~65535	1pulse	2			
32	EEVSC opening angle	0~65535	1pulse	2			
34	Indoor unit connection number	0~255	1 unit	1			
35	Indoor unit connection capacity	0~65535	–	2			
36	Indoor unit thermostat ON number	0~255	1 unit	1			
37	Indoor unit thermostat ON capacity	0~65535	–	2			
38	Required Hz total	0~65535	1Hz	2			
39	Target FK	0~65535	1Hz	2			
40	Inverter CM1 operation frequency	0~255	1Hz	1			
42	Answer Hz total	0~65535	1Hz	2			
43	Compressor cumulative operating time (estimate)	0~65535	1 h	2			
45	Compressor start times	0~65535	20 times	2			
47	Compressor stop causes			1	Bit0	Defective outdoor temperature thermistor	
					Bit1	Defective outdoor unit heat exchanger 1 thermistor	
					Bit2	Defective outdoor unit heat exchanger 2 thermistor	
					Bit3	Defective outdoor unit heat exchanger 3 thermistor	
					Bit4	Defective outdoor unit heat exchanger 4 thermistor	
					Bit5	Defective discharge pipe thermistor	
					Bit7	Defective sub-cooling coil thermistor 1	
48	Compressor stop causes	–	–	1	Bit0	Defective sub-cooling coil thermistor 2	
					Bit1	Defective suction pipe thermistor	
					Bit2	Defective low pressure sensor	
					Bit3	Defective high pressure sensor	
					Bit4	Inverter 1 abnormal communication	
					Bit6	Abnormal high pressure	
					Bit7	Abnormal Low pressure	
49	Compressor stop causes	–	–	1	Bit0	Td1 Abnormal discharge pipe temp.	
					Bit2	CM starting defect	
					Bit4	Rota lock of CM	
					Bit6	Current cut of CM	

Code No.	Write-in contents	Record data				
		Data write-in range	Write-in unit	Number of bytes	Contents	
50	Compressor stop causes	–	–	1	Bit0	Power transistor 1 overheating
					Bit1	Power transistor 2 overheating
					Bit2	FM01 abnormal
					Bit3	FM02 abnormal
					Bit4	Compressor stop command from indoor unit
					Bit6	Dilution rate protection
					Bit7	Demand control 0%
51	Control status	0~180	1 second	1	CM 3-minute delay timer	
53	Discharge pressure saturation temperature	-50~70	0.1˚C	2		
54	Intake pressure saturation temperature	-50~70	0.1˚C	2		
55	Control status oil retu	0,1	–	1	0	None
					1	Under control
56	Control status oil retu	0~2	–	1	0	None
					1	Waiting for oil return
					2	Under oil return
57	Control status defrost conditions	0~3	–	1	0	None
					1	Temperature conditions
					2	Strengthening temperature conditions
					3	Time conditions
			–			
58	Control status defrost status	0~4	–	1	0	None
					1	Defrosting status 1
					2	Defrosting status 2
					3	Defrosting status 3
			–		4	Defrosting status 4
59	Control staus Td	0~2	–	1	0	None
					1	Frequency down
					2	Under. control
60	Control staus	0, 1	–	1	Td1 error counter	
62	Control staus HP	0~2	–	1	0	None
					1	Frequency down
					2	Under high pressure control
63	Control staus	0~1	–	1	HP error (63H1) counter	
64	Control staus CS	0~2	–	1	0	None
					1	Frequency down
					2	Under CS control
65	Control staus LP	0~2	–	1	0	None
					1	Frequency down
					2	Under low pressure control
66	Control staus	0~3	–	1	LP error (when stopped) counter	
67	Control staus	0~4	–	1	LP error (when started) counter	
68	Control staus	0,1	–	1	LP error (when driving) counter	
69	Control staus PT	0~2	–	1	0	None
					1	Frequency down
					2	Under PT control
70	Check operation status	–	–	1	Bit0	Unmatch check
					Bit1	Indoor side EEV check
					Bit3	Piping cleaning
71	Control staus	0~360	1 minutes	2	CH compressor protection timer	
72	Control status CH compressor protective start	0~15	–	1	15	Protective start end
					0~14	During protective start
73	Switch etc.	–	–	1	Bit0	External operation (CnS1)
						0: Operation prohibition
						1: Operation permission
					Bit1	Demand (CnS2)
						0: None
						1: Under control
					Bit2	Forced cooling, heating (CnG1)
						0: None
						1: Under control
					Bit3	Silent mode (CnG2)
						0: None
						1: Under control

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
					Bit4: Back up operation 0: None 1: Back up operation Bit5: Hz cancel operation 0: None 1: Under control
74	Control staus	0~3	–	1	Current cut abnormality counter
75	Control staus	0~4	–	1	Power transistor overheating abnormality counter
76	Control staus	0~3	–	1	Rotor lock abnormality counte
77	Control status	0~1	–	1	Starting failure counter
78	Control status	0~3	–	1	Communications abnormality counter
79	Control status	0~3	–	1	Current cut abnormality counter
84	Control status	0~1	–	1	DC fan motor 1 error counter
85	Control status	0~1	–	1	DC fan motor 2 error counter
86	Control status	0~2	–	1	Sensor disconnection counter
87	Control status	0~255	–	1	Communications error counter
88	Registered indoor units 1~8 operation mode	0~4	–	8	0 AUTO 1 DRY 2 COOL 3 FAN 4 HEAT
89	Registered indoor units 1~8 required Hz	0~255	1Hz	8	
90	Registered indoor units 1~8 answer Hz	0~255	1Hz	8	
91	Operation priority switching	0~1	–	1	0 Prior press priority 1 After press priority
92	High pressure control of cooling	2.2,2.5	0.01MPa	1	
93	Cooling low pressure compensation	-0.05~+0.05	0.01MPa	1	
94	Low pressure control of heating	0.8,0.9	0,01MPa	1	
95	Snow protection fan control	0~1	–	1	0 With 1 None
96	CM1 frequency command	0~130	1Hz	1	
98	Target cooling low pressure	0.00~2.00	0.01MPa	1	
99	Control status TC	0~2	–	1	0 None 1 Frequency down 2 Under-dome temperature control
100	Target heating high pressure	1.60~4.15	0.01MPa	1	1.60MPa It shifts and outputs.
101	Heating high pressure compensation	0.00~0.30	0.01MPa	1	
102	Control / status SCR	0~2	–	1	0 None 1 Frequency down 2 Under compression ratio protection control

◆ **Models FDCA400HKXE4, 450HKXE4**

(1) Operations of major functional items under each operation mode

Functional item \ Operation mode	Cooling		Fan	Heating			Dehumidify
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Defrost	
Indoor unit fan	Remote controller command	Remote controller command	Remote controller command	Remote controller command	Intermittent operation	○→×	○/×
Indoor unit electronic expansion valve	Overheating control response	Fully closed	Fully closed	Overheating control response	60 pulse	Model-specific aperture opening angle	Overheating Control Response
Compressor [CM1]	○	×	×	○	×	○	○/×
Magnetic contactor CM1 [52C1]	○	○	×/○	○	○	○	○
Compressor [CM2]	○/×	×	×	○/×	×	○	○/×
Magnetic contactor CM2 [52C2]	○	○	×	○	○	○	○
Outdoor unit fan [FMo-1]	○/×	×	×/○	○/×	×	○→×	○/×
Outdoor unit fan [FMo-2]	○	×	×/○	○	×	○→×	○/×
Inverter cooling fan [FMC1, 2]	○/×	○/×	×	○/×	○/×	○/×	○/×
4 way valve	×	×	×	○	○	○→×	×
Electronic expansion valve for heating [EEVH1, 2]	Fully open	Fully open	Fully closed	Opening angle control	Fully closed	Fully closed / Fully open	Fully open
Electronic expansion valve for sub-cooling [EEVSC]	Opening angle control	Fully closed	Fully closed	Fully closed	Fully closed	Fully closed	Opening angle control
Solenoid valve [SV1]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV2]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV6]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV7]	○/×	×	×	○/×	×	○/×	○/×
Crankcase heater [CM1,2]	○/×	○/×	○/×	○/×	○/×	○/×	○/×

Notes(1) ○ : ON, × : OFF, ○/× : ON or OFF

(2) Compressor starting order and load classes

(a) The starting order of compressors 1 and 2 is switched each time an outdoor unit stop occurs.

(b) The loads and corresponding operation frequencies for each compressor are shown in the table below (the table shows CM1 being started first. When CM2 is started first, the CM1 frequency indicated for load class 1 applies to CM2 instead.)

Load Class	0	1	2
CM1	0Hz	20 to 80Hz	42 to 120Hz
CM2	0Hz	0Hz	42 to 120Hz

(3) Starting the compressor

As shown in the following table, compressor starts occur in accordance with the amount of elapsed time from power ON, and in accordance with the number of starts that have occurred. However, during defrost control, oil return control, and equal oil control, starts occur in accordance with those controls.

Condition	Start Method
① 1st start occurs 45 minutes or more after power ON, and subsequent starts occur after a power ON that follows a compressor stop of 45 minutes or longer.	After 4-way valve switching assurance, perform compressor protective start sequence "A" in accordance with the crankcase heater ON time. (See page 160)
② 1st start occurs less than 45 minutes after power ON.	After 4-way valve switching assurance, perform compressor protective start sequence "A" in accordance with the crankcase heater ON time. (See page 160)
③ Starts other than ① and ② above.	After 4-way valve switching assurance, perform a compressor protective start sequence.

(a) 4-way valve switching assurance

When the compressor (CM1, CM2) is switching from the stopped state to the start state, after the compressor start control functions, there is an increase in frequency from 10Hz (synchronous operation).

(i) 0-20Hz Operation

It operates in the range of 0 – 20Hz. However, in this operation, the compressor cannot be operated with the current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. control, unde-dome temp. control or compression ratio protection controls.

(ii) 20 – 40Hz (48) Operation

Maximum frequency is determined based on the temperature detected with the outdoor air temperature thermistor (Tho-A).

1) If the temperature is 0 °C or lower, after starting with 48Hz as the maximum frequency, it stops at 48Hz.
2) If the temperature is higher than 0°C, after starting with 40Hz as the maximum frequency, it stops at 40Hz. However, if the starting conditions for current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls or compession ratio protection controls are satisfied during this time, this control ends and control according to current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls , unde-dome temp. control or compession ratio protection controls commences, and if the compressor's frequency is determined and cancelled, operation returns to normal operation.

(b) Compressor protective start

The compressor's speed is as follows regardless of the target frequency.

1) Up to 1 minute and 45 seconds after the compressor starts, operation is at 20Hz.
2) When 1 minute and 45 seconds has passed since starting, operation is in accordance with the target speed.

(c) Compressor protective starting sequence A, in accordance with the amount of time power to the crank-case heater has been on.

The amount of time the power to the heater has been on since the power was switched ON is calculated, and if 45 or more minutes have passed and it is the first start, or if 45 or more minutes have passed and the compressor has been stopped, then the power turned on again, and the cumulative number of starts is 2 times or more, starting is done according to this control sequence.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 15-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 15-minute period becomes the inverter's start completion point (10Hz).
3) If the inverter is stopped within a 15-minute period after a compressor start, this control increases the frequency 5Hz per minute for 15 minutes when the compressor starts again.

(d) Compressor protective starting sequence B, in accordance with the amount of time power to the crank-case heater has been on.

Power on time is calculated after the power is turned ON, and the first compressor start if less than 45 minutes have passed is according to this control.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 18-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 18-minute period becomes the inverter's start completion point (10Hz).
3) The frequency is increased 5Hz per minute through the 18-minute to 24-minute period, and this control ends when 24 minutes is reached.
4) After this control ends 1 time, the system reverts to protective start "A" control from the 2nd time, or after 45 minutes have elapsed.
5) If the inverter is stopped for 24 minutes following a compressor start, a protective start is performed when started again, and protective start sequence "B" control increases the frequency for a period of 24 minutes. However, the system reverts to protective start sequence "A" control when started again if 45 minutes or more have elapsed since the inverter stop.

(4) Compressor pre-start control

(a) The following control occurs from the point when the compressor ON conditions are satisfied.

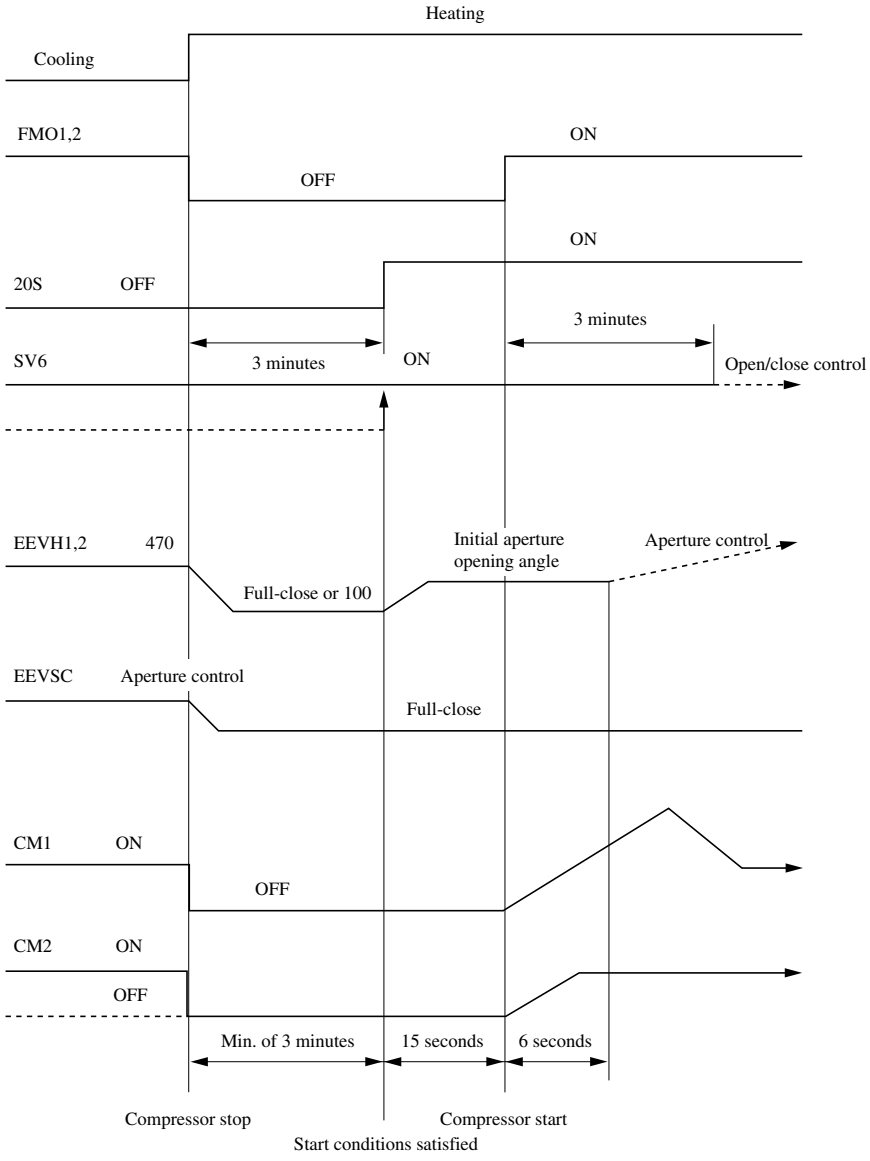
(i) Pre-start control when operation mode is the same as at the previous operation:

1) If in the "cooling / dehumidifying" mode, the 4-way valve switches OFF. If in the "heating" mode, it switches ON. However, When in the same mode as at the previous operation, with the prescribed power ON condition (see above item) established, the 4-way valve's power ON status continues as it is

2) Solenoid valves SV6 and SV7 switch ON.

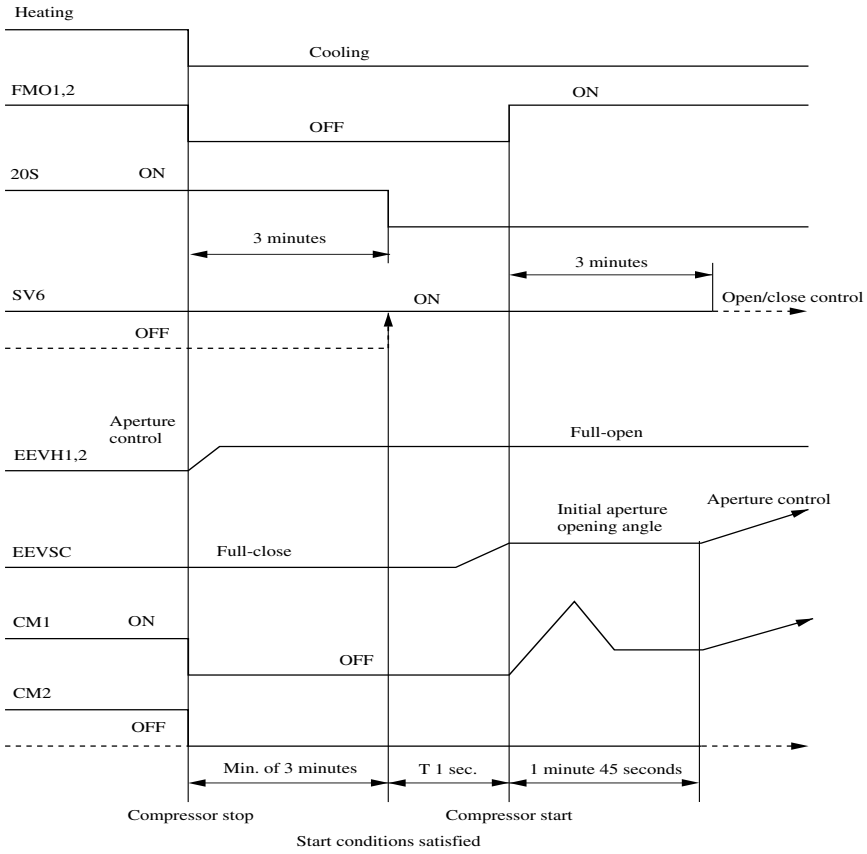
3) The apertures of the heating mode's EEVH1, 2, and the sub cooling coil's EEVSC are set to their initial opening angles. The EEVH1 and 2 expansion valves are started first, and after their operation is completed, the EEVSC expansion valve operation begins.

◆Cooling → Heating



4) Fan motors FMo1, FMo2, and the compressor start 15 seconds after the compressor ON conditions are satisfied.

◆**Heating → Cooling**



(5) Indoor unit refrigerant recovery control

When a refrigerant shortage occurs due to a heating overload, the indoor unit's expansion valve is opened in accordance with the outdoor unit inlet's superheat level and operation pressure, to permit a refrigerant recovery.

(a) Control activation conditions

This control is activated when any one of the following conditions are satisfied.

(i) Superheat control temperature ≧ 15°C, and heating electronic expansion valve 1 (front) [EEVH1] ≥ 470 pulses

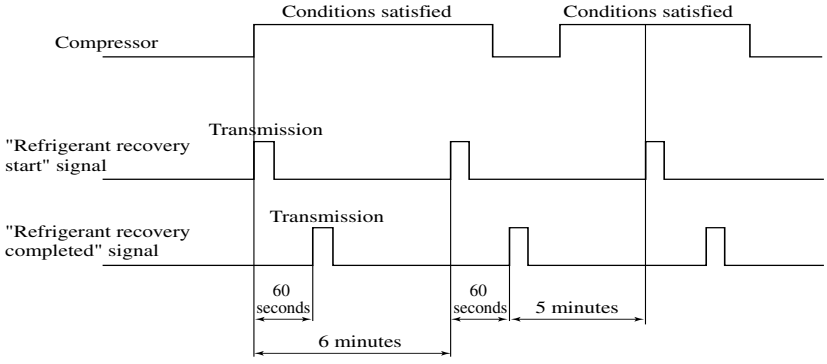
(ii) Superheat control temperature ≧ 15°C, and heating electronic expansion valve 2 (back) [EEVH2] ≥ 470 pulses

(iii) Discharge pipe temperature (Tho-D1 or D2) ≥ 120°C

(b) Control description

(i) When the control activation conditions are satisfied, refrigerant recovery occurs at 6-minute intervals.
Following the "refrigerant recovery completed" signal transmission, another "refrigerant recovery start" signal is not transmitted again for 5 minutes even if the control activation conditions are satisfied.

(ii) If defrost or low frequency protection conditions are satisfied during this 5-minute period, the refrigerant recovery for those operations takes precedence, and the 6-minute timer is cleared.



(6) Crankcase heater control

The crankcase heater (CH1) is switched OFF and ON in accordance with the under-dome temperature thermistor (Tho-C1).

(a) Under-dome temperature thermistor (Tho-C1) ≤ low-pressure sensor (LPS) detected pressure saturation temperature (°C) + 20°C ⇨ crankcase heater (CH1) ON.

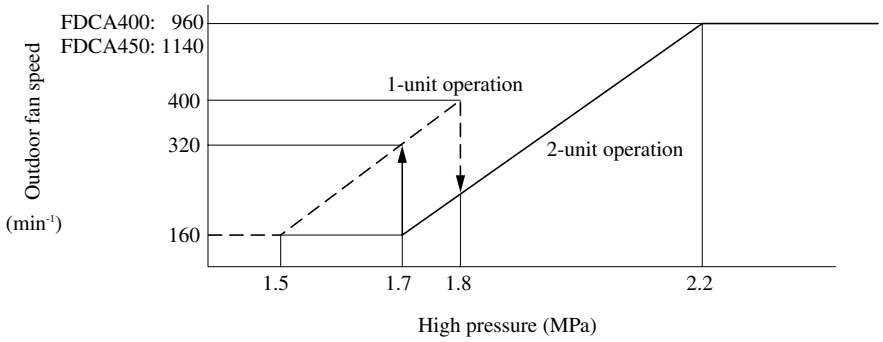
(b) Under-dome temperature thermistor (Tho-C1) ≥ low-pressure sensor (LPS) detected pressure saturation temperature (°C) + 25°C ⇨ crankcase heater (CH1) OFF.

(c) Under-dome temperature thermistor (Tho-C1) ≤ -40°C or less, and compressor (CM1) is running.
⇨ crankcase heater (CH1) OFF.

(7) Cooling high pressure control

High pressure is controlled by the outdoor fan speed during cooling and dehumidifying operations, and this control is activated when the high pressure is less than 2.20MPa at 1 minute 45 seconds after a compressor protective start completion. Moreover, the outdoor fan speed is determined by the high pressure level, and outdoor fans are switched between 2-unit operation and 1-unit operation accordingly.

High level side setting pressure (HPH)	Pressure classification	2-unit operation	1-unit operation
2.2	Low level side high pressure (HPL1)	1.7	1.5
	High level side high pressure (HPH1)	2.2	1.8



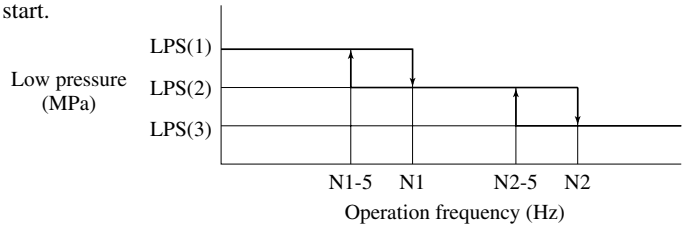
Control termination conditions

1) When a mode other than cooling or dehumidifying is selected.
2) When compressor stops
3) When high pressure is 2.20MPa or more

(8) Cooling low pressure control

During cooling and dehumidifying operations, a constant low pressure is maintained by compressor frequency control.

(a) Compressor frequency control occurs as shown below, 1 minute 45 seconds after the completion of a compressor protective start.



Model	LPS (1)	LPS (2)	LPS (3)	N1	N2	N1-5	N2-5
FDCA400	0.80	0.77	0.73	70Hz × 1	50Hz × 2	65Hz × 1	45Hz × 1
FDCA450	0.81	0.79	0.75	70Hz × 1	54Hz × 2	65Hz × 1	49Hz × 1

(b) Control termination conditions

(i) When a mode other than cooling or dehumidifying is selected.

(ii) When the compressor stops.

(9) Heating high pressure control

During heating operation, a constant high pressure is maintained by compressor frequency control.

(a) Control activation condition

1 minute 45 seconds have elapsed since the completion of a compressor protective start.

(b) Control description

The compressor frequency is controlled to maintain a high pressure of 2.75Mpa.

(c) Control termination conditions

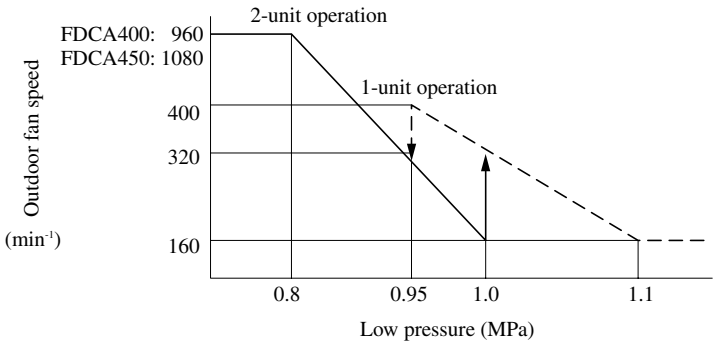
(i) When a mode other than heating is selected.

(ii) When the compressor stops.

(10) Heating low pressure control

Low pressure is controlled by the outdoor fan speed during heating operation, and this control is activated when the low pressure is 0.80MPa or higher at 1 minute 45 seconds after a compressor protective start completion. Moreover, the outdoor fan speed is determined by the low pressure level, and outdoor fans are switched between 2-unit operation and 1-unit operation accordingly.

Low level side setting pressure (LPL)	Pressure classification	2-unit operation	1-unit operation
0.8	Low level side high pressure (LPL1)	0.80	0.95
	High level side high pressure (LPH1)	1.00	1.10



Control termination conditions

1) When a mode other than heating is selected.

2) When the compressor stops.

(11) Sub cooling coil control

(a) Control activation condition

Control is activated 6 seconds after a compressor start occurs during cooling and dehumidifying operations.

(b) Control description

(i) The specified sub cooling coil outlet superheat is maintained by controlling the overcooling coil's electronic expansion valve.

(ii) Sub cooling coil superheat feed-forward control

(Applied when a sudden change occurs in the compressor frequency)

1) The cooling coil's expansion valve (EEVSC) closes at a rate of –4 pulses/sec. if the superheat control value (SHS) reaches 5°C or lower.

2) Superheat PI control is resumed when the superheat control value (SHS) subsequently returns to 8°C or higher.

(c) Control termination conditions

(i) When a mode other than heating is selected.

(ii) When the compressor stops.

(d) Changing the sub cooling coil's target superheat level

(i) Control activation conditions

Control occurs when all the following conditions are satisfied.

1) When 10 minutes are more have elapsed since the compressor start.

2) When the high pressure (HP) is 1.1MPa or lower.

(ii) Control description

1) The sub cooling coil outlet's target temperature (SHC) is changed to 5.0°C.

2) The sub cooling coil's expansion valve (EEVSC) closes at a rate of –4 pulses/sec. if the superheat control value (SHS) reaches 3°C or lower.

3) Superheat PI control is resumed when the superheat control value (SHS) subsequently returns to 4°C or higher.

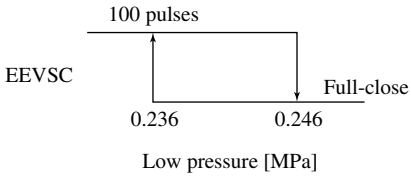
(iii) Control termination conditions

1) When the compressor stops.

2) When the target low pressure (LPS) reaches 0.246Mpa or higher.

(e) When the control termination conditions are satisfied, the following overcooling coil's expansion valve (EEVSC) apertures are adopted:

100 pulses if the low pressure (LPS) is less than 0.236Mpa when stopped. Full-open (0 pulse) at all other times. If the low pressure (LPS) subsequently reaches 0.246Mpa or higher when stopped, the overcooling coil's expansion valve (EEVSC) is fully closed.



(12) Outdoor fan control

(a) DC fan motor control

The outdoor fan tap has 0 speed to 4nd speed assigned as the regular speed depending on the model and operation mode. Under normal operation, 1st speed and 4nd speed is used, and in each outdoor fan control, control is stepless between 1st speed and 4nd speed.

(b) Outdoor fan tap

Unit: min^{-1}

Fan tap	FDCA400				FDCA450				Remarks
	Cooling		Heating		Cooling		Heating		
	FM_{O1}	FM_{O2}	FM_{O1}	FM_{O2}	FM_{O1}	FM_{O1}	FM_{O2}	FM_{O1}	
0th speed	0	0	0	0	0	0	0	0	Stop
1th speed	0	160	0	160	0	160	0	160	1-unit operation min. speed
2th speed	0	400	0	400	0	400	0	400	1-unit operation max. speed
3th speed	160	160	160	160	160	160	160	160	2-unit operation min. speed
4th speed	960	960	960	960	1080	960	1080	1080	2-unit operation max. speed

(c) When operation is starting, operation is at 4nd speed.

(d) Judgment of whether or not to start the DC fan motor

(i) If the outdoor fan starts after stopping, the fan speed is checked and start control is performed.

(ii) If the unit is stopped (free-running state) and the fan speed is in reverse, either FM_{O1} or FM_{O2} is 700 min^{-1} or higher, it is not started, and if both FM_{O1} and FM_{O2} is under 700 min^{-1} for 3 seconds, it is started.

(iii) The compressor is started regardless of the state of the outdoor fan, and the above contents are sensed 5 seconds or more after the time that 52C1 goes ON.

(13) Snow protection fan control

(a) This control is enabled/disabled by the selector switch at the 7-segment display.

① Set the Code No. to "75".

② "0" or "1" displays at the data display area.

0: Outdoor fan control disabled (factory setting)

1: Outdoor fan control enabled

③ Press SW7 continuously for 3 seconds.

④ "0" or "1" blinks every 0.5 seconds at the data display area.

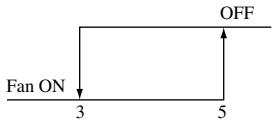
⑤ Press SW8 to toggle between the blinking "0" and "1" displays.

⑥ If SW7 is pressed for 3 seconds or longer while "0" and "1" is blinking, the blinking stops, and that enabled/disabled setting is registered. If enabled, fan control occurs as described below.

⑦ Outdoor fan control occurs in accordance with the information stored in memory, even if the power is turned OFF and back ON again.

(b) Control description

(i) If the outside temperature drops to 3°C or lower when all units are stopped, or during an error stop, the outdoor fan runs at level 4 speed once every 10 minutes.



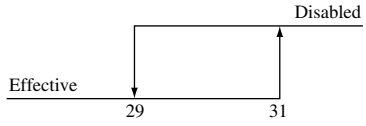
(ii) The outdoor fan runs for 30 seconds.

(iii) During this snow protection control, the compressor's magnetic contactor (52C1) is ON.

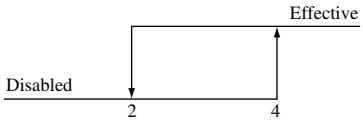
(14) Silent mode control

(a) If the silent mode start signal is received from an indoor unit or CnG2 (with short pin) is shorted, if the outdoor temperature is within the following range, operation is performed in the silent mode.

• Cooling



• Heating



(b) Outdoor fan maximum speed & maximum compressor operation frequency (excluding the 30-second period after a start, and defrost operations)

1) The maixmum outdoor fan speed is 500min^{-1}.

2) Maximum compressor operation frequency Max. Operation Frequency (Hz)

Model	(Hz)
FDCA400	46 × 2
FDCA450	52 × 2

(15) Compression ratio protection control

The frequency is reduced in accordance with the compressor's compression ratio.

(a) Control activation conditions

This control is activated when all the following conditions are satisfied.

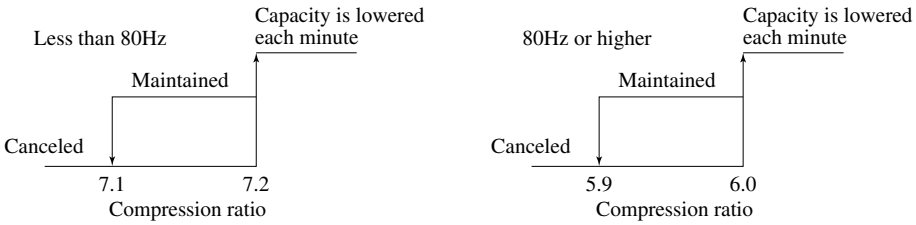
(i) When 10 minutes or more have elapsed since the compressor start.

(ii) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

(iii) When the inverter frequency is 30Hz or higher.

Note (1) The above does not apply for a 10-minute period following a defrost, or when pump-down control is in progress.

(b) Control description



(c) Control termination conditions

Control ends when any one of the following conditions is satisfied.

(i) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

(ii) When the compression ratio falls below the cancel value.

(16) Oil return control

When in the cooling or dehumidifying mode, this control occurs every 10 hours (after an initial 2 hours of cumulative compressor operation time counting from the 1st compressor start after power ON), or when the oil rise amount reaches the setting value.

Note (1) The operation time count begins at the point when heating-to-cooling switching occurs.

(a) Control description

(i) Oil return control occurs at units where the operation, thermostat is OFF, at units that are blowing, and at stopped and emergency stopped units.

(ii) The oil return operation frequencies are shown below.

Model \ Item	Frequency (Hz)
FDCA400	62 × 2
FDCA450	60 × 2

(b) Control termination conditions

Control ends when any one of the following conditions occurs.

(i) When 5 minutes have elapsed since the compressor reached the oil return operation frequency.

(ii) When, 60 seconds after all compressors reached the oil return operation frequency, the compressor inlet superheat SH was 4°C or less for 10 continuous seconds.

(17) Forced heating/cooling operation

With this control, SW3-7 on the outdoor unit PCB is turned on and CnG1 (equipped with short circuit pin) is shorted or opened so as to forcibly determine whether the indoor unit is operated for cooling or heating. If any operation mode other than the forcible mode is commanded from the indoor unit, the mode unmatch message is displayed on the remote controller or others and the operation enters in the blowing mode.

SW3-7	CnG1	Operation
OFF	Open/short	Normal operation
ON	Open	Cooling
	Short	Heating

Note (1) SW-7 is at OFF and CnG1 is open at the shipping from factory.

(18) Indoor unit connection number protection

If the number of indoor units on the connection exceeds the number as listed below, the compressor stops with the error stop.

Item \ model	All model
Number of units on connection	48 units

Note (1) They are the numbers of units used for judgement of error for the purpose of control and not equal to the numbers of units which can be connected.

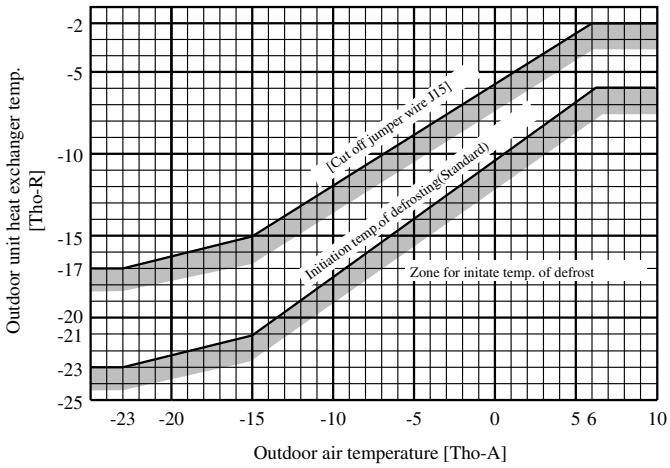
(19) Defrosting

(a) Temperature condition defrosting

(i) Conditions for starting defrosting

When all the following conditions are met, the defrosting operation will start.

1) The cumulative operating time of the compressor comes up to 33 minutes after completion of a defrosting operation, or it comes up to 33 minutes after a heating operation starts (the remote controller is turned on).
2) If 8 minutes have passed after the compressor goes ON after it has gone OFF.
3) If 8 minutes have passed after one outdoor unit fan goes ON after all outdoor fans have gone OFF.
4) After all the above conditions are satisfied, when the temperature at the outdoor heat exchanger thermistor (Tho-R) and outdoor temperature thermistor is below the defrost initiation temperature in the above graph continuously for 3 minutes.



(ii) Conditions for finishing defrosting

- Standard (J14: shorted)
  1) When the increase of the temperature of the heat exchanger thermistor (Tho-R1 or Tho-R2) is greater than 9ºC.
  2) When 12 minutes have passed since defrosting started.
- With operation Judgment Function (J14: Open)
  1) If Tho-R1 and R2 are ≧ 9ºC, after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 2 minutes and 30 seconds have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 9ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.
  2) If Tho-R1 or R2 are < 9ºC after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 5 minutes have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.

(b) Time condition defrosting (oil return)

(i) Defrosting start conditions

1) Defrosting starts when the heating mode is in effect at the 1st compressor start following a power ON, and when the heating mode is in effect after 2 hours of cumulative operation time. However, if mode switching from cooling to heating occurred, defrosting starts 33 minutes after CM1 operation begins.
2) If there was 5 minutes or more of temperature condition defrosting before time condition defrosting, the 10-hour timer for time condition defrosting is reset.
3) The "time condition defrosting" time is the point when the detected oil rise amount reaches the setting value (following 2 hours of cumulative compressor operation time counting from the 1st compressor start after power ON), or the point when 10 hours elapse, whichever comes first.
4) When the 10-hour timer period elapses, time condition defrosting occurs at the completion of the previous temperature condition defrosting operation, or after 33 minutes, whichever comes first.

(ii) Defrosting end conditions

If either of the following conditions is satisfied, the defrosting end operation starts.

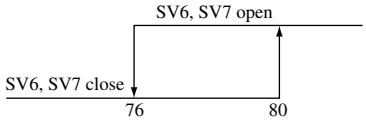
1) If defrosting continues for 5 minutes and the temperature sensed by Tho-R1 and Tho-R2 becomes 9ºC or higher.
2) If 12 minutes has passed since defrosting started.

(20) Oil separator solenoid valve (SV6, 7) control

(a) If the inverter compressor (CM1, 2) starts, solenoid valve SV6, 7 opens (goes ON), then 15 seconds later, it starts.

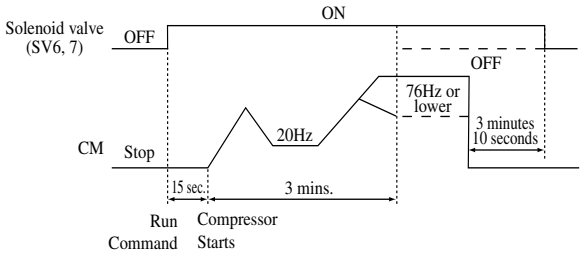
(b) SV6, 7 stays open (ON) for 3 minutes, until 4-way valve switching assurance and compressor protective start are completed.

(c) If the compressor operating frequency becomes 80Hz or higher, SV6, 7 opens (goes ON) and it goes off if the frequency is 76Hz or lower.

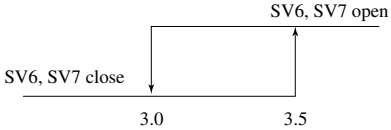


Actual compressor frequency (Hz)

(d) If the inverter compressor goes off after SV6, 7 opens (goes ON), SV6, 7 remains open (ON) for 3 minutes and 10 seconds, then closes (goes OFF).



(e) During heating operations, The SV6 and SV7 valves switch ON when the high pressure is 3.5MPa or higher, and switch OFF when the high pressure is 3.0MPa or lower.



High pressure (MPa)

(21) Emergency stop control

When an indoor unit's external input (optional: refrigerant leakage, etc.) indicates a refrigerant leak, that information is transmitted to the outdoor unit, stopping operation. An emergency stop error is then transmitted to all indoor units that are running.

(a) Error stop occurs when the "emergency stop" command is received from the indoor unit.

(b) Error code E63 occurs, and the "emergency stop" command is transmitted to all indoor units.

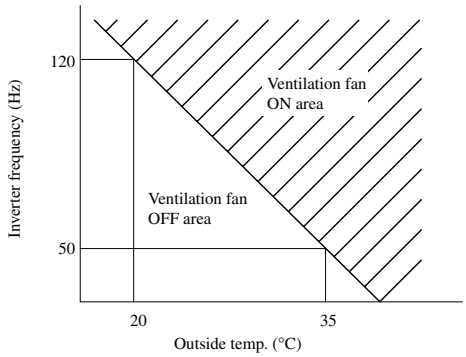
(c) When a "emergency stop clear" command is received from the indoor unit, the outdoor unit's error status is cleared, and an "emergency stop clear" command is transmitted to all the indoor units.

(22) Ventilation fan control

(a) Control activation conditions

When either compressor 1 or compressor 2 is running.

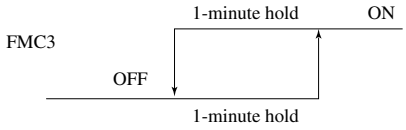
Control description



(i) The ventilation fan (FMC3) switches ON when the outdoor air temperature (Tho-A detected temp.) and the inverter frequency (the higher of the compressor 1 & 2 frequencies) relationship is in the "ventilation fan ON area" shown in the above figure.

(ii) Linear interpolation occurs for frequencies beyond the outside temperature range shown above.

(iii) Once the ON or OFF area is entered, the ON or OFF status can be changed after a 1-minute status hold.



(b) Control termination conditions

Control ends when compressors stop in all units.

(c) Control termination conditions

(i) When a mode other than the heating mode is selected.

(ii) When all compressors stop.

(iii) When none of the start conditions are satisfied.

(23) Automatic backup operation

When one or more compressors fail, operation occurs using only the normal compressors.

(a) Automatic backup operation is only enabled when SW3-2 is ON (alternate setting) at the master unit.

(b) The following error status are disabled and not detected at failed compressors.

① T-phase "missing phase" error (E32)
② Discharge pipe temperature error (E36)
③ Heat exchanger thermistor disconnection (E37)
④ Outdoor temperature thermistor disconnection (E38)
⑤ Discharge pipe temperature sensor (E39)
⑥ High pressure error (E40)
⑦ Power transformer overheat (E41)
⑧ Current cut (E42)
⑨ Inverter PCB communication error (E45)
⑩ DC fan error (E48)
⑪ Low-pressure error (E49)
⑫ Power transformer overheat (continuous) (E51)
⑬ Inlet pipe sensor disconnection (E53)
⑭ Compressor start error (E59)
⑮ Compressor rotor lock error (E60)

(c) If any of the item (b) errors shown above occur while a compressor is running, that compressor is stopped, but other compressors continue running as usual.

(d) After recovering from the error, with start conditions satisfied, the compressors (CM1, 2) which are capable of running at the minimum frequency are started.

(e) An automatic recovery does not occur if a thermistor disconnection/severed wire occurs 3 times within 40 minutes. (Unit is stopped.)

(f) When a failure-recovered compressor is started, the other compressors revert back to their usual control.

(24) Unit protective maintenance related devices

(a) Test operation mode

1) Outdoor unit test operation mode operation is started by the DIP switches SW5-1 and 5-2 on the outdoor unit control board.

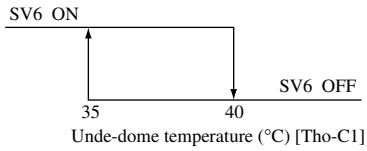
Switch functions

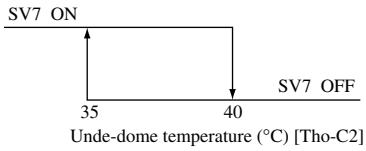
SW5-1	ON	**SW5-2**	OFF	Heating Test Operation
			ON	Cooling Test Operation
	OFF	Normal or Test Operation End		

Notes (1) Leave all DIP Switches except 5-1 and 5-2 OFF.
(2) This operation takes priority over other options such as the center console. It sets the options in the operating state.

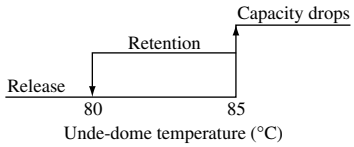
(b) Under-dome temperature control

1) The oil separator solenoid valve (SV6, 7) are controlled in accordance with the temperature at the under-dome thermistor (Tho-C) installed on the compressor.

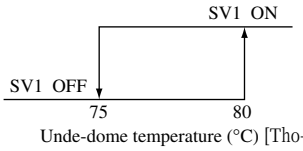


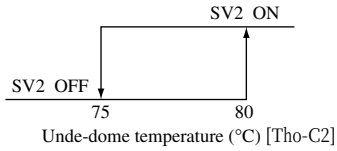


2) The compressor's capacity is controlled in accordance with the under-dome temperature (Tho-C1, 2).



3) The cooling solenoid (SV1, 2) is controlled in accordance with the under-dome temperature (Tho-C).



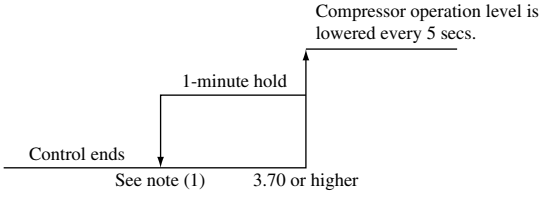


(c) High pressure protective control

During cooling and heating operations, high pressure is detected by the high pressure sensor (PSH), and the compressor and outdoor fan are controlled to prevent the pressure from rising.

1) Cooling

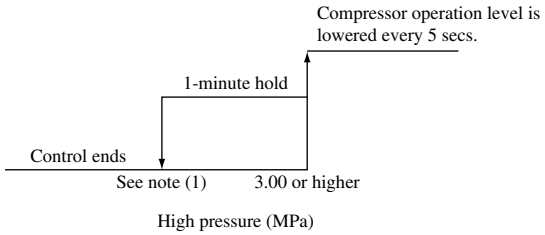
High pressure based compressor control



Note (1) High pressure of less than 3.70MPa continues for 1 minute

2) Heating

a) High pressure based fan speed control



Note (1) High pressure of less than 3.00MPa continues for 1 minute

b) High pressure based fan speed control

i) Control activation conditions

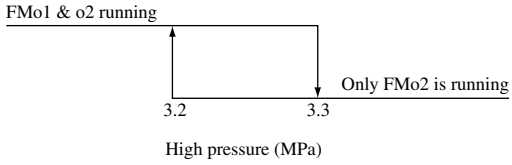
When a high pressure of 3.0MPa or higher occurs 1 minute 45 seconds after a compressor protective start completion.

ii) Control description

① The fan speed is kept within a 160~960 (1080) min-1 range.
Both fan motors (Fmo1 & 2) run at the same speed.

Note (1) Values shown in parentheses apply to the FDCA450 model.

② The FMo1 fan motor (right side) stops if the high pressure exceeds the value shown below.



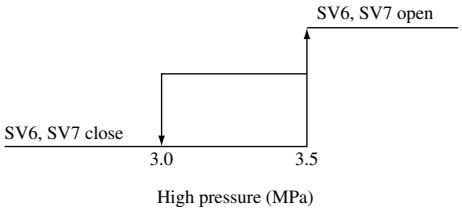
iii) Control termination conditions

① When a mode other than heating is selected.

② When the compressor stops.

③ When the high pressure becomes less than 3.0MPa.

3) Solenoid valves SV6 & SV7 open (ON) when the high pressure reaches 3.5MPa or higher.



(d) Compressor protective start control

1) Compressor protection at low frequency

a) 30Hz operation is performed for 1 minute when a 29Hz or lower operation has continued for 20 minutes.

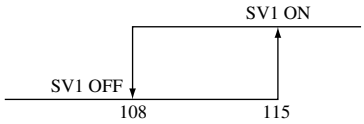
2) Compressor start delay (3-minute timer)

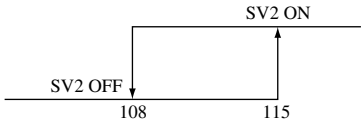
The inverter compressor (CM1) does not start again for 3 minutes after being stopped by cooling/heating thermostat control, by the remote controller, or by an error.

(e) Discharge pipe temperature control

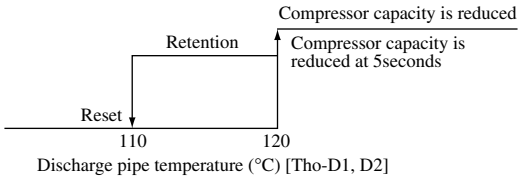
If the discharge pipe temperature (sensed by Tho-D1, D2) exceeds the set value, the compressor cooling solenoid valve (SV1, 2) goes ON, the indoor expansion valve opens and the compressor's capacity is controlled, thus suppressing rises in the discharge pipe temperature. If the temperature rises even further, the compressor stops.

(i) Compressor Cooling Solenoid Valve (SV1, 2) Control



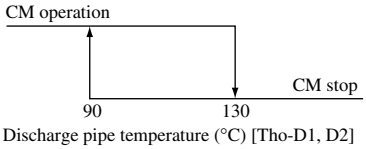


(ii) Compressor control



(iii) Discharge pipe temperature error

- When the discharge pipe temperatures (Tho-D1, D2 detection) rise beyond 130°C and is maintained for 2 seconds, the compressors are stopped but it will be reset if the temperatures drop below 90°C.



- Compressors are counted individually if a discharge pipe temperature (Tho-D1, D2 detection) error occurs 2 times within 60 minutes.
- Control description

  An error stop occurs if the automatic backup operation is disabled (SW3-ON).

  If the automatic backup operation is enabled (SW3-OFF, factory setting), the compressor remains stopped, but an error stop does not occur.

Note (1) Unless the temperature of 90 °C or under is maintained for 45 minutes after the discharge pipe error, the unit cannot be started again. (Reset the power supply to clear.)

(f) Current safe control

(i) The compressor speed is reduced if the inverter inlet's input voltage (converter inlet L3-phase) exceeds the setting value while the compressor is running at a speed of 20Hz or higher. If the setting value is still exceeded after the speed reduction, the speed is reduced again.

(ii) This control ends when the input voltage drops below the setting value for a continuous period of 3 minutes, and the speed protection cancel operation begins.

(g) Current cut control

This control prevents overcurrent conditions at the inverter. The inverter is immediately stopped when the current exceeds the setting value, and is then automatically restarted 3 minutes later. If the current control is activated 4 times within 15 minutes, 52C1 and 52C2 are switched OFF, and an error stop occurs.

(h) Abnormal high pressure increase protection

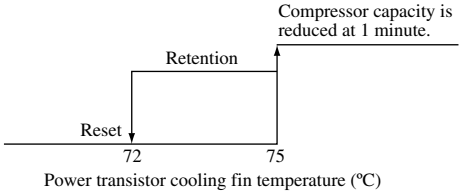
If the high pressure side pressure switch [63H1-1, 63H1-2: 4.15 Open / 3.15 Closed MPa] operates 5 times within 60 minutes or operates for 60 minutes, an abnormal stop is performed.

However, when first operated, the compressor is stopped, then after a 3-minute delay, normal operation is resumed.

(i) Power transistor temperature control

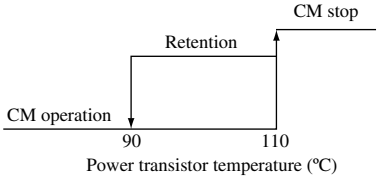
If the temperature of the power transistor cooling fins (sensed by Tho-P) exceeds the set value, the compressor's capacity is controlled to keep the power transistor's temperature from rising. If it rises still higher, the compressor is stopped.

1) Compressor control



2) Power transistor temperature abnormal

- If the temperature sensed by the power transistor temperature thermistor rises to 110ºC or higher, the compressor (CM1, 2) is stopped.

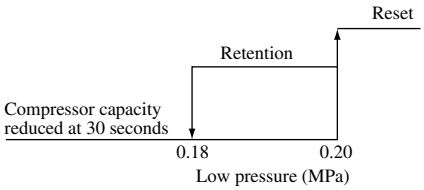


- If the power transistor's temperature is abnormal 5 times within 60 minutes, or if the temperature is 110ºC or higher for 15 minutes continuously, including when the compressor is stopped, an abnormal stop is performed.

(j) Low pressure protective control

If the low pressure (sensed by PSL) drops below the set value, the compressor's capacity is controlled to prevent the low level pressure from dropping. If it drops still further, the compressor is stopped.

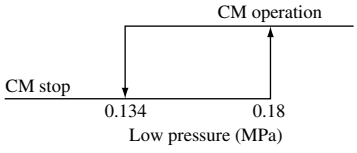
1) Compressor control



Note (1) Starting Conditions
- 10 minutes have passed since starting.
- Compressor operating frequency: greater than 20 Hz
- Sensed continuously for 10 seconds

2) Low pressure abnormal

- If the low pressure (sensed by PSL) drops to 0.134 MPa or lower continuously for 30 seconds, the compressor is stopped and if a pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is automatically reset. If this occurs 2 times within 60 minutes, an abnormal stop is performed.



- A low pressure (sensed by PSL) of 0.18 MPa or lower while the compressor is stopped, or sensed continuously for 30 seconds while the compressor is operating, is prohibited.
- First cooling operation after the power is turned on

  If a low pressure of 0.003 MPa or lower is detected continuously for 60 seconds after 4-way valve switching assurance, the compressor is stopped, and if a low pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is restarted automatically, but if an abnormal pressure is detected again, an abnormal stop is performed. It is possible to reset the system only by turning the power off, then turning it on again.

3) Heating Electronic Expansion Valve (EEVH1, 2) Opening Angle Control when Heating Operation is Stopped
   - If heating operation is stopped, the pulse to the heating electronic expansion valves (EEVH1, 2) is changed to 100 if the low pressure is less than 0.236 MPa.
   - After that, if the low pressure rises to 0.246 MPa or higher while operation is stopped, the heating electronic expansion valves (EEVH1, 2) are opened fully.

(k) Open phase protection

If open phase in the primary side L3 phase is detected continuously for 2 seconds, an abnormal stop is performed.

(l) Antiphase protection and open L2 phase at 52C1 primary side

This function monitors the phase order on the primary side of 52C1 (whenever power is furned ON) and judges L1→ L3 → L2 → L3 as the antiphase (monitors simultaneously also open phase of L2 phase at the primary side). If the antiphase continues for 2 seconds, the compressor is stopped with the error stop.

(m) Outdoor fan motor (DC) abnormal protection

(i) DC fan speed down control

1) Control activation conditions

   When the commanded speed for an outdoor fan motor (FMo1 or FMo2) exceeds 400min^{-1}, the DC Fan1 and DC Fan2 error counters are checked every second, and an error stop occurs if the count is 3 or higher. (A count of 2 or less is judged as noise related.)

2) Control description
   a) If an error status exists, the commanded speed is reduced by 100min^{-1}, and a start condition check then occurs every 10 seconds.
   b) If an error status is still detected at each check, the item i) operation above is repeated. If the higher of the FMo1 and FMo2 commanded speeds drops to 400min^{-1} or less, the 100min^{-1} speed reduction no longer occurs.
   c) If an error is not detected for a period of 60 continuous seconds, the speed is increased 100min^{-1} every 60 seconds until the target speed is reached. The 100min^{-1} correction is stopped, however, if the higher of the FMo1 and FMo2 commanded speeds is 400min^{-1} or less.

3) Control termination conditions
   a) When the fan speed is less than 400min-1 before being corrected.
   b) When the amount of speed reduction correction that occurred is recovered.

(ii) DC fan overcurrent error detection

1) DC fan1 error detection

   An error occurs when any one of the following occurs.
   i) When 52C1 is ON, and the FM_{o1} commanded speed ≤ 400min^{-1}, and an overcurrent error status has been detected at DC fan1 for 10 continuous seconds.
   ii) When an FM_{o1} actual speed of 100min^{-1} or less has continued for 30 seconds following an "FM_{o1} commanded speed > 0min^{-1}" status that continued for 60 seconds. (Fan motor lock detection)

2) DC fan2 error detection

   An error occurs when any one of the following occurs.
   i) When 52C1 is ON, and the FM_{o2} commanded speed ≤ 400min^{-1}, and an overcurrent error status has been detected at DC fan2 for 10 continuous seconds.
   ii) When an FM_{o2} actual speed of 100min^{-1} or less has continued for 30 seconds following an "FM_{o2} commanded speed > 0min^{-1}" status that continued for 60 seconds. (Fan motor lock detection)
   iii) If an item (ii) a) or b) error is detected, all outdoor units are stopped, and are then automatically restarted after 3 minutes.
   iv) An error stop occurs if an item (ii) a) or b) error occurs 5 times in 1 hour at any of the units.
   v) A power supply reset is required to recover from an error stop.
   vi) An error stop occurs if a fan speed error occurs within 45 minutes following power ON.
   vii) When a stop occurs due to an error detection, both 52C1 and 52C2 are switched OFF.

(n) Compressor Protective Control

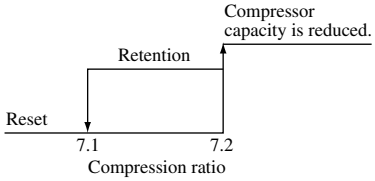
If the inverter's actual frequency is 30 Hz or higher and the low pressure (sensed by PSL) is 0.18 MPa or higher, and the high pressure (sensed by PSH) is 3.52 MPa or lower 10 minutes or more after the compressor starts, the compressor's frequency is controlled in accordance with the compression ratio.

Compressor Frequency	Compression Ratio Control Valve	Compression Ratio Cancel Value
30 Hz or higher but less than 80 Hz	7.2	7.1
80 Hz or higher	6.0	5.9

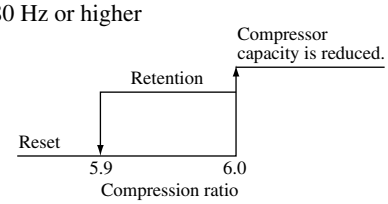
1) Control Contents

When the frequency is higher than the compression ratio control value, the compressor's capacity is lowered. After 60 seconds have passed, the compressor's capacity is lowered yet again if the frequency is greater than the compression ratio control valve. The bottom limit capacity is 20 Hz.

• Less than 80 Hz



• 80 Hz or higher



2) End Conditions

If the low pressure (PSL) is less than 0.18 MPa or the high pressure (PSH) exceeds 3.52 MPa and is less than the compression ratio cancel value, this control ends.

(25) Pump down control

Pump down operation can be performed through operation of DIP switches (SW5-1, 2, 3). (Pump down operation cannot be done during indoor unit operation, backup operation or during an abnormal stop.)

(a) Pump down procedure

1) Close the liguid side service valve on the outdoor unit.
2) Turn SW5-2 (test operation operating mode) ON (cooling).
3) Turn SW5-3 (pump down switch) ON.
4) Turn SW5-1 (test operation switch) ON. This will start the pump down operation.

(b) Control

1) The compressor operates in cooling mode with 80 (FDCA450: 46) Hz as the upper frequency limit.
2) The red and green (LED's) on the outdoor control PCB flashs together continuously and "PoS" is displayed in the 7-segment display.
3) Except for low pressure control, all the protective and abnormal sensing controls are activated.
4) Test operation commands are sent to the indoor units.
5) The sub cooling coil electronic expansion valve (EEVSC) closes fully during pump down control.

(c) Ending

If any of the following conditions exists, pump down operation ends.

1) If a low pressure (sensed by PSL) of ≦ 0.01 MPa is detected continuously for 5 seconds.
   a) The displays are as follows.
      · Red LED: Lights up continuously · Green LED: flashing
      · 7-segment LED display: PoE · Remote controller: Stop
2) If operation is stopped by abnormal sensing control.
3) If the cumulative compressor operation time totals 15 minutes.
   a) The displays are as follows.
      · Red LED: Off · Green LED: flashing
      · 7-segment LED display: No display · Remote controller: Stop
4) If any one of DIP switches SW5-1, 2 or 3 is turned OFF during the pump down operation.

(26) External input operation

External input: From CnS1, operation permission/prohibition control; From CnS2: Demand control/normal operation switching.

- J13: Switches between CnS1 and CnS2 input method.

  J13 short circuit: Level input by CnS1 and CnS2.

  J13 open: Pulse input by CnS1 and CnS2.

(a) From CnS1, operation permission/prohibition control

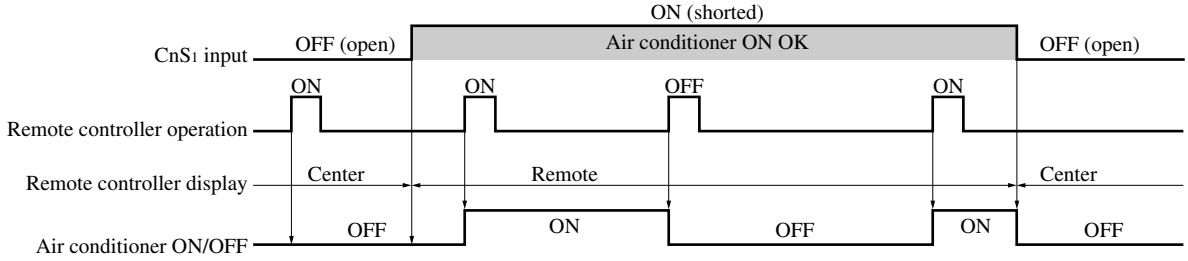
Input : CnS1	CnS1 input method change: J13	CnS1 : Operation permission/ Prohibition mode change
Short circuit / Disconnection	J13; Short circuit Lever input	Operation prohibition mode ⟶ Operation permission mode
	J13; Disconnection Pulse input	Operation permission/Prohibition model change (Reversal)
Short circuit / Disconnection	J13; Short circuit	Operation permission mode ⟶ Operation prohibition mode
	J13; Disconnection	— (NOP)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

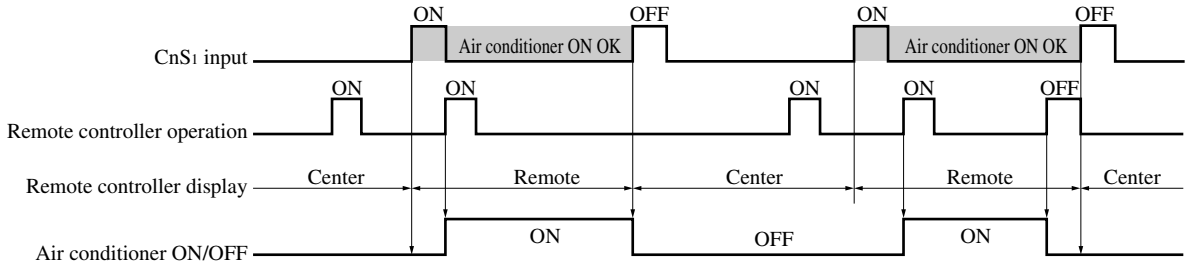
2) CnS1, performs the following operations by the changing of jumper wire J1 from short circuit to open circuit.

   If pulse input, the pulse duration is 500 ms or more.

① Opreation with J13 short circuit



② Opreation with J13 disconnection



(b) From CnS2, operation permission/prohibition control

Input : CnS2	CnS2 input method Formula switching: J13	CnS2 : Demand control/normal operating switching
Short circuit / Open circuit	J13; Short circuit Level input	Demand control ⟶ Normal operation
	J13; Open circuit Pulse input	Normal operation/Demand control switching (Reversal)
Short circuit / Open circuit	J13; Short circuit	Normal operation ⟶ Demand control
	J13; Open circuit	— (NOP)

Note (1) The factory settings are: J13 - short circuit; CnS2 - short circuit (short pin connection)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

2) Demand control

It is possible to switch the demand using DIP switch SW4-5, 6.

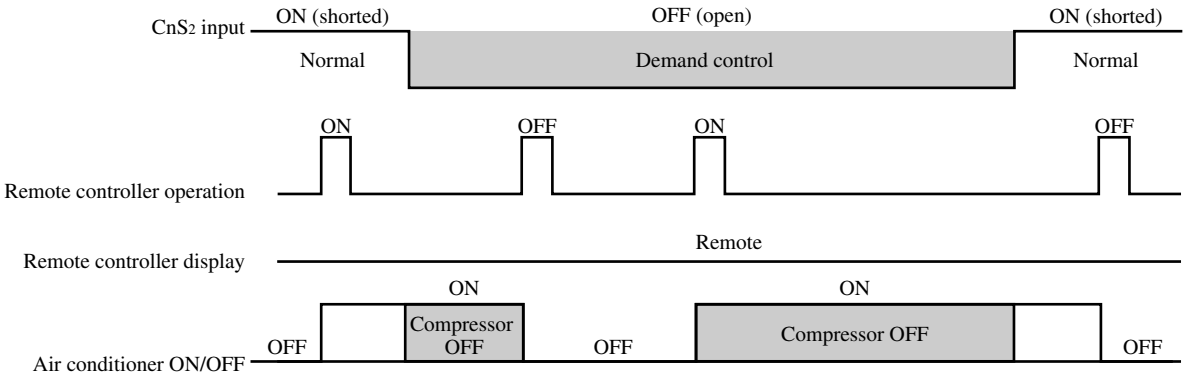
SW45	SW4-6	Compressor upper limit frequency (Hz)		Compressor output (%)
		FDCA400HKXE4	FDCA450HKXE4	
0	0	54	60	80
1	0	78	46	60
0	1	54	31	40
1	1	OFF	OFF	0

Note (1) 0: Open, 1: Shorted

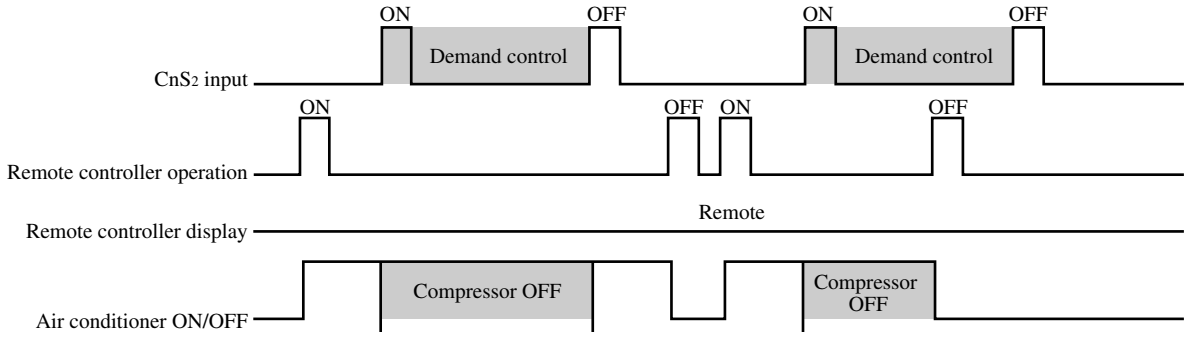
3) CnS2, performs the following operations by the changing of jumper wire J13 from short circuit to open circuit.

If pulse input, the pulse duration is 500 ms or more.

① J13 - Short circuit



② J13 - Open circuit



(27) 7-Segment display

The data in the following table can be displayed using the display select switch (SW8: 1's digit; SW9: 10's digit).

Code No.	Contents of display	Data display range	Minimum units	Remarks
–	Unusual cade Pump down Check mode Outdoor unit setup	–	–	E?? PoE, PoS CH? OPE??
00	CM1 operating frequency	0~130	1Hz	
01	CM2 operating frequency	0~130	1Hz	
02	Tho-A Outdoor air temp.	L,-20~43	1˚C	[L] is indicated when the temperature is -20˚C or below and the actual temperature is indicated when it is higher than -20˚C and up to 43˚C.
03	Tho-R1 Heat exchanger temp. 1 (Exit. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
04	Tho-R2 Heat exchanger temp. 2 (Exit. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
05	Tho-R3 Heat exchanger temp. 3 (Entrance. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
06	Tho-R4 Heat exchanger temp. 4 (Entrance. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
07	Tho-D1 Discharge pipe temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
08	Tho-D2 Discharge pipe temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
10	Tho-C1 Under-dome temp.	L,5~90	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
11	Tho-C2 Under-dome temp.	L,5~90	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
12	Tho-P1 Power transistor temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
13	Tho-P2 Power transistor temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
14	Tho-SC Sub-cooling coil temp.1	L,18~73	1˚C	[L] is indicated when the temperature is 18˚C or below and the actual temperature is indicated when it is higher than 18˚C and up to 73˚C.
15	Tho-SC Sub-cooling coil temp.2	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
16	Tho-S Suction pipe temp.	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
17	Cooling operation super cooling	0~50	0.1˚C	
18	Super heate	0~50	0.1˚C	
19	Superheat of sub-cooling coil	0~50	0.1˚C	
20	CT1 Current	0~70	1A	
21	CT2 Current	0~70	1A	
22	EEVH1 Heating expansion valve opening angle	0~500	1 Pulse	
23	EEVH2 Heating expansion valve opening angle	0~500	1 Pulse	
24	Opening angle of EEVSC overcooling coil expansion valve	0~500	1 Pulse	
26	FM01 Number of rotations	0~1500	10 min^{-1}	

Code No.	Contents of display	Data display range	Minimum units	Remarks
27	FM02 Number of rotations	0~1500	10 min^{-1}	
28	PSH High pressure sensor	0~5.00	0.01MPa	
29	PSL Low pressure sensor	0~2.00	0.01MPa	
30	FMC1 Cooling fan Crankcase heater	0,1	–	Order of 100 : FMC1, 2 Order of 10 : CH1 Order of 1 : CH2 (0: OFF, 1: ON)
31	63H1-1 63H1-2	0,1	–	Order of 100 : 63H1-1, 2 Order of 10 : – (0: Close, 1: Open)
32	SV1 SV2	0,1	–	Order of 100 : SV1 Order of 10 : SV2 Order of 1 : – (0: Close, 1: Open)
33	SV6 SV7	0,1	–	Order of 100 : SV6 Order of 10 : SV7 Order of 1 : – (0: Close, 1: Open)
34	20S	0,1	–	Order of 100 : 20S, Order of 10 : – Order of 1 : – (0: close, 1: open)
35	Compressor stop causes ①	0,1	–	Order of 100 : Defective outdoor temperature thermistor Order of 10 : Defective outdoor unit heat exchanger thermistor 1 Order of 1 : Defective outdoor unit heat exchanger thermistor 2 (0:Normal, 1: Abnormal)
36	Compressor stop causes ②	0,1	–	Order of 100 : Defective outdoor unit heat exchanger thermistor 3 Order of 10 : Defective outdoor unit heat exchanger thermistor 4 Order of 1 : Defective discharge pipe thermistor 1 (0:Normal, 1: Abnormal)
37	Compressor stop causes ③	0,1		Order of 100 : Defectived discharge pipe thermistor 2 Order of 10 : Defective Sub cooling coil thermistor 1 Order of 1 : Defective Sub cooling coil thermistor 2 (0:Normal, 1: Abnormal)
38	Compressor stop causes ④	0,1	–	Order of 100 : Defective suction pipe thermistor Order of 10 : Defective low pressure sensor Order of 1 : Defective high pressure sensor (0:Normal, 1: Abnormal)
39	Compressor stop causes ⑤	0,1	–	Order of 100 : Abnormal in inverter 1 Order of 10 : Abnormal in inverter 2 Order of 1 : Abnormal high pressure (0:Normal, 1: Abnormal)
40	Compressor stop causes ⑥	0,1	–	Order of 100 : Abnormal low pressure Order of 10 : Abnormal discharge pipe thermistor 1 Order of 1 : Abnormal discharge pipe thermistor 2 (0:Normal, 1: Abnormal)
41	Compressor stop causes ⑦	0,1	–	Order of 100 : Defect CM1 starting Order of 10 : Defect CM2 starting Order of 1 : Rota lock CM1 (0:Normal, 1: Abnormal)
42	Compressor stop causes ⑧	0,1	–	Order of 100 : Rota lock CM2 Order of 10 : CM1 Current cut Order of 1 : CM2 Current cut (0:Normal, 1: Abnormal)
43	Compressor stop causes ⑨	0,1	–	Order of 100 : Power transistor 1 overheating Order of 10 : Power transistor 2 overheating Order of 1 : Abnormalities in DC fun1 (0:Normal, 1: Abnormal)
44	Compressor stop causes ⑩	0,1	–	Order of 100 : Abnormalities in DC fun2 Order of 10 : Stop command from indoor Order of 1 : Operation mode charge (0:Normal, 1: Abnormal)
45	Compressor stop causes ⑪	0,1	–	Order of 100 : Dilute protection Order of 10 : Demand control 0% Order of 1 : 0 (0:Normal, 1: Abnormal)
46	Control status	0,1	–	Order of 100 : During equal oil control Order of 10 : During oil return control Order of 1 : During defrost (0:Non-operation, 1: Operation)
47	Control status	0,1	–	Order of 100 : During Td control Order of 10 : During HP control Order of 1 : During CS control (0:Non-operation, 1: Operation)
48	Control status	0,1	–	Order of 100 : During LP control Order of 10 : During PT control Order of 1 : Under cooling low pressure control (0:Non-operation, 1: Operation)
49	Control status	0,1	–	Order of 100 : Cooling high pressure protection control Order of 10 : High pressure power ratio Order of 1 : Under heating low pressure control (0:Non-operation, 1: Operation)
50	Number of connected indoor unit	0~50	1	
51	Number of operation indoor unit	0~50	1	
52	Required Hz tota	0~999	1Hz	
53	Target Fk	0~999	1Hz	
54	Compressor cumulative operating time (CM1)	0~655	100h	

Code No.	Contents of display	Data display range	Minimum units	Remarks
55	Compressor cumulative operating time (CM2)	0~655	100h	
56	Discharge pressure saturation temperature	-50~70	0.1˚C	1˚C at –10 or lower
57	Air inlet pressure saturation temperature	-50~30	0.1˚C	1˚C at –10 or lower
58	Target cooling low pressure	0.00~2.00	0.01MPa	
59	Target heating high pressure	1.60~4.15	0.01MPa	
60	Counter · Compressor 2 starting failure	0, 1	–	
61	Counter · Motor lock compressor 2	0~3	–	
62	Power transistor 2 overheating	0~4	–	
63	Inverter 1 operating frequency command	0~130	1Hz	
64	Inverter 2 operating frequency command	0~130	1Hz	
65	Counter · Inverter 2 communications error	0~3	–	
66	Control status	0,1	–	Order of 100 : During silent mode Order of 10 : During capacity measurement mode Order of 1 : During test operation (0:Non-operation, 1: Operation)
67	Control status	0,1	–	Order of 100 : Unmatch Order of 10 : Indoor EEV check Order of 1 : – (0:Non-operation, 1: Operation)
68	Control status	0,1	–	Order of 100 : Piping cleaning Order of 10 : Under-dome temperature control Order of 1 : Compession ratio protection control (0:Non-operation, 1: Operation)
70	Operation priority switching	0,1	–	0: Prior press priority (when shipped) 1: After press priority
71	High pressure control of cooling	2.2, 2.5	0.01MPa	0: Snow protection fan control deactivated 1: Snow protection fan control activated
72	low pressure control of cooling	-0.05~+0.05	0.01MPa	2.2: Factory setting 2.5: Alternate setting
73	Heating high pressure compensation	0.00~0.30	0.01MPa	0.00: Factory setting
74	Low pressure of heating	0.80, 0.90	–	0.00: Factory setting
75	Snow protection fan control	0,1	–	0: Snow protection fan control deactivated 1: Snow protection fan control activated
77	Data reset	---, dEL	–	
78	Figure language sub version	–	–	(Example: 730)
79	Figure language logic version	–	–	(Example: 126)
80	Counter · Thermistor disconnection	0~2	–	
81	Counter · Inverter 1 communications error	0~3	–	
82	Counter · High pressure protection	0~4	–	
83	Counter · Compressor 1 starting failure	0,1	–	
84	Counter · Abnormal low pressure ① (Under stop)	0~4	–	

Code No.	Contents of display	Data display range	Minimum units	Remarks
85	Counter · Abnormal low pressure ② (Immediately after starting)	0,1	–	
86	Counter · Abnormal low pressure ③ (Under operation)	0~4	–	
87	Counter · Motor lock of compressor 1	0~3	–	
88	Counter · Overheating of power transistor 1	0~4	–	
89	Counter · Abnormal temp. of discharge pipe 1	0,1	–	
90	Counter · Abnormal temp. of discharge pipe 2	0,1	–	
91	Counter · Current cut (CM1)	0~3	–	
92	Counter · Current cut (CM2)	0~3	–	
93	Counter · Indoor-outdoor communications error	0~255	–	
94	Counter · Outdoor inverter communications error 2	0~255	–	
95	Counter · CPU reset	0~255	–	
96	Counter · Abnormal FM01	0~255	–	
97	Counter · Abnormal FM02	0~255	–	
98	Program version	–	–	
99	Auto send display	–	–	

(28) Saving of Operation Data

Operating data for a period of 30 minutes prior to the time when trouble occurs are recorded, and these data can be fetched to a personal computer through the RS232C connector on the control board. Data are updated continuously, and when there is an abnormal stop, data updates stop at that point. Pressing DIP switch SW7 for 5 seconds causes the data to be erased. Data can also be sampled at 1 ~ 60 second intervals during operation and fetched to a personal computer.

• Data is transmitted from a personal computer upon demand.

Data	Data Range	Example
Software version	ASCII 15-byte	KD3C218######## (#: NULL)
PID (program ID)	ASCII 2-byte	5D
Outdoor unit capacity	ASCII 3-byte	As shown in table at right
Power supply frequency	ASCII 2-byte	60
Outdoor address	ASCII 2-byte	00 ~ 3F
Indoor address × 16 units	ASCII 2-byte × 16 units	40 ~ 7F
Indoor capacity × 16 units	ASCII 3-byte × 16 units	022 ~ 280

Outdoor capacity data	Remarks
Ex: 16PS or S16	S: Horsepower display

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
00	Abnormal cord	00~99	–	1	00: No abnormality, outdoor unit all abnormalities ???
01	Address of unit where trouble occurred	00~FF	–	1	0~3F: Outdoor unit side, 40~6F: Indoor unit side
02	Operation mode	0~2	–	1	0 Stop 1 Cooling 2 Heating
03	High pressure sensor	0.00~5.00	A/D value	1	
04	Low pressure sensor	0.00~2.00	A/D value	1	
05	Heat exchanger temp. 1 (Exit, Front)	-35~75	A/D value	2	Cooling liquid side
06	Heat exchanger temp. 2 (Exit, Rear)	-35~75	A/D value	2	Cooling liquid side
07	Heat exchanger temp. 3 (Entrance, Front)	-35~75	A/D value	2	Cooling gas side
08	Heat exchanger temp. 4 (Entrance, Rear)	-35~75	A/D value	2	Cooling gas side
09	Tho-D1 Discharge pipe temp.	20~140	A/D value	1	
10	Tho-D2 Discharge pipe temp.	20~140	A/D value	1	
11	Tho-C1 Under-dome temp.	-15~90	A/D value	1	
12	Tho-C2 Under-dome temp.	-15~90	A/D value	1	
13	Tho-A Outdoor air temp.	-20~43	A/D value	1	
14	Tho-P1 Power transistor temp. (Heat dissipation fin)	20~140	A/D value	1	
15	Tho-P2 Power transistor temp. (Heat dissipation fin)	20~140	A/D value	1	
16	Tho-SC Sub cooling coil temp. 1	18~73	A/D value	1	Liquid pipe side
17	Tho-H Sub cooling coil temp. 2	-35~75	A/D value	2	Suction pipe side
18	Tho-S Suction pipe temp.	-35~75	A/D value	2	
19	Cooling operation super cooling	0~50	A/D value	1	
20	Super heat	0~50	A/D value	1	

Code No.	Write-in contents	Record data					
		Data write-in range	Write-in unit	Number of bytes	Contents		
21	Super heat of sub-cooling coil	0~50	A/D value	1			
22	CT1 Current	0~50	A/D value	1			
23	CT2 Current	0~50	A/D value	1			
24	Power source voltage	180~500	A/D value	1			
25	Pressure switch	–	–	1	Bit0	63H1	0: open, 1: close
26	Solenoid valve	–	–	1	Bit0	20S	0:OFF, 1:ON
					Bit2	SV1	0:OFF, 1:ON
					Bit3	SV2	0:OFF, 1:ON
					Bit4	SV6	0:OFF, 1:ON
					Bit5	SV7	0:OFF, 1:ON
27	Crankcase heater etc.	–	–	1	Bit0	CH1	0:OFF, 1:ON
					Bit1	CH2	0:OFF, 1:ON
					Bit2	FM1,2	0:OFF, 1:ON
28	FM01 Number of rotations	0~65535	10 min^{-1}	2			
29	FM02 Number of rotations	0~65535	10 min^{-1}	2			
30	EEVH1 opening angle	0~65535	1pulse	2			
31	EEVH2 opening angle	0~65535	1pulse	2			
32	EEVSC opening angle	0~65535	1pulse	2			
34	Indoor unit connection number	0~255	1 unit	1			
35	Indoor unit connection capacity	0~65535	–	2			
36	Indoor unit thermostat ON number	0~255	1 unit	1			
37	Indoor unit thermostat ON capacity	0~65535	–	2			
38	Required Hz total	0~65535	1Hz	2			
39	Target FK	0~65535	1Hz	2			
40	Inverter CM1 operation frequency	0~255	1Hz	1			
41	Inverter CM2 operation frequency	0~255	1Hz	1			
42	Answer Hz total	0~65535	1Hz	2			
43	Compressor 1 cumulative operating time (estimate)	0~65535	1 h	2			
44	Compressor 2 cumulative operating time (estimate)	0~65535	1 h	2			
45	Compressor 1 start times	0~65535	20 times	2			
46	Compressor 2 start times	0~65535	20 times	2			
47	Compressor stop causes	–	–	1	Bit0	Defective outdoor temperature thermistor	
					Bit1	Defective outdoor unit heat exchanger 1 thermistor	
					Bit2	Defective outdoor unit heat exchanger 2 thermistor	
					Bit3	Defective outdoor unit heat exchanger 3 thermistor	
					Bit4	Defective outdoor unit heat exchanger 4 thermistor	
					Bit5	Defective discharge pipe thermistor 1	
					Bit6	Defective discharge pipe thermistor 2	
					Bit7	Defective sub-cooling coil thermistor 1	

Code No.	Write-in contents	Record data				
		Data write-in range	Write-in unit	Number of bytes	Contents	
48	Compressor stop causes	–	–	1	Bit0	Defective sub-cooling coil thermistor 2
					Bit1	Defective suction pipe thermistor
					Bit2	Defective low pressure sensor
					Bit3	Defective high pressure sensor
					Bit4	Inverter 1 abnormal communication
					Bit5	Inverter 2 abnormal communication
					Bit6	Abnormal high pressure
					Bit7	Abnormal Low pressure
49	Compressor stop causes	–	–	1	Bit0	Td1 Abnormal discharge pipe temp.
					Bit1	Td2 Abnormal discharge pipe temp.
					Bit2	CM1 starting defect
					Bit3	CM2 starting defect
					Bit4	Rota lock of CM1
					Bit5	Rota lock of CM2
					Bit6	Current cut of CM1
					Bit7	Current cut of CM2
50	Compressor stop causes	–	–	1	Bit0	Power transistor 1 overheating
					Bit1	Power transistor 2 overheating
					Bit2	FM01 abnormal
					Bit3	FM02 abnormal
					Bit4	Compressor stop command from indoor unit
					Bit6	Dilution rate protection
					Bit7	Demand control 0%
51	Control status	0~180	1 second	1	CM1 3-minute delay timer	
52	Control status	0~180	1 second	1	CM2 3-minute delay timer	
53	Discharge pressure saturation temperature	-50~70	0.1˚C	2		
54	Intake pressure saturation temperature	-50~70	0.1˚C	2		
55	Control status oil retu	0,1	–	1	0	None
					1	Under control
56	Control status oil retu	0~2	–	1	0	None
					1	Waiting for oil return
					2	Under oil return
57	Control status defrost conditions	0~3	–	1	0	None
					1	Temperature conditions
					2	Strengthening temperature conditions
					3	Time conditions
			–			
58	Control status defrost status	0~4	–	1	0	None
					1	Defrosting status 1
					2	Defrosting status 2
					3	Defrosting status 3
			–		4	Defrosting status 4
59	Control staus Td	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under Td control
60	Control staus	0~1	–	1	Td1 error counter	
61	Control staus	0, 1	–	1	Td2 error counter	
62	Control staus HP	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under high pressure control
63	Control staus	0~1	–	1	HP error (63H1) counter	
64	Control staus CS	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under CS control
65	Control staus LP	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under low pressure control
66	Control staus	0~3	–	1	LP error (when stopped) counter	
67	Control staus	0~4	–	1	LP error (when started) counter	

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
68	Control staus	0,1	–	1	LP error (when driving) counter
69	Control staus PT	0~2	–	1	0: None 1: Frequency down 2, 3: Under PT control
70	Check operation status	–	–	1	Bit0: Unmatch check Bit1: Indoor side EEV check Bit3: Piping cleaning
71	Control staus	0~360	1 minutes	2	CH compressor protection timer
72	Control status CH compressor protective start	0~15	–	1	15: Protective start end 0~14: During protective start
73	Switch etc.	–	–	1	Bit0: External operation (CnS1) 0: Operation prohibition 1: Operation permission Bit1: Demand (CnS2) 0: None 1: Under control Bit2: Forced cooling, heating (CnG1) 0: None 1: Under control Bit3: Silent mode (CnG2) 0: None 1: Under control Bit4: Back up operation 0: None 1: Back up operation Bit5: Hz cancel operation 0: None 1: Under control
74	Control staus	0~3	–	1	Current cut abnormality counter (INV1)
75	Control staus	0~4	–	1	Power transistor overheating abnormality counter (INV1)
76	Control staus	0~3	–	1	Rotor lock abnormality counte (INV1)
77	Control status	0~1	–	1	Starting failure counter (INV1)
78	Control status	0~3	–	1	Communications abnormality counter (INV1)
79	Control status	0~3	–	1	Current cut abnormality counter (INV2)
80	Control status	0~4	–	1	Power transistor overheating abnormality counter (INV2)
81	Control status	0~3	–	1	Rotor lock abnormality counte (INV2)
82	Control status	0~1	–	1	Starting failure counter (INV2)
83	Control status	0~3	–	1	Communications abnormality counter (INV2)
84	Control status	0~1	–	1	DC fan motor 1 error counter
85	Control status	0~1	–	1	DC fan motor 2 error counter
86	Control status	0~2	–	1	Sensor disconnection counter
87	Control status	0~255	–	1	Communications error counter (INV)
88	Registered indoor units 1~8 operation mode	0~4	–	8	0: AUTO 1: DRY 2: COOL 3: FAN 4: HEAT

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
89	Registered indoor units 1~8 required Hz	0~255	1Hz	8	
90	Registered indoor units 1~8 answer Hz	0~255	1Hz	8	
91	Operation priority switching	0~1	–	1	0 Prior press priority 1 After press priority
92	High pressure control of cooling	2.20,2.50	0.01MPa	1	
93	Cooling low pressure compensation	-0.05~0.05	0.01MPa	1	
94	Low pressure control of heating	0.80,0.90	0,01MPa	1	
95	Snow protection fan control	0~1	–	1	0 With 1 None
96	CM1 frequency command	0~130	1Hz	1	
97	CM2 frequency command	0~130	1Hz	1	
98	Target cooling low pressure	0.00~2.00	0.01MPa	1	
99	Control status TC	0~2	–	1	0 None 1 Frequency down 2, 3 Under-dome temperature control
100	Target heating high pressure	1.60~4.15	0.01MPa	2	
101	Heating high pressure compensation	0.00~0.30	0.01MPa	1	
102	Control / status SCR	0~2	–	1	0 None 1 Frequency down 2, 3 Under compression ratio protection control

5 APPLICATION DATA

SAFETY PRECAUTIONS

• Please read these "Safety Precautios" first then accurately execute the installation work.

• Though the precautionary points indicated herein are divided under two headings, ⚠WARNING and ⚠CAUTION, those points which are related to the strong possibility of an installation done in error resulting in death or serious injury are listed in the ⚠WARNING section. However, there is also a possibility of serious consequences in relationship to the points listed in the ⚠CAUTION section as well.

In either case, important safety related information is indicated, so by all means, properly observe all that is mentioned.

• After completing the installation, along with confirming that no abnormalities were seen from the operation tests, please explain operating methods as well as maintenance methods to the user (customer) of this equipment, based on the owner's manual. Moreover, ask the customer to keep this sheet together with the owner's manual.

⚠ WARNING

- Installation should be performed by the dealer or a company speciallizing in this type of installarion. If you install the equipment yourself, installation errors could result in water leaks, electric shock, and/or a fire, as well as other hazards.
- Conduct installation work in accordance with the instructions in this installation manual. Installation errors could result in water leaks, electric shock, or fire.
- Sling the unit at the specified points with ropes property reted for the weight in liftting it for portage. An improper manner of portage can result in a fail of the unit resulting in an accident invoiving personal death or injury.
- When installing a unit in a small rooms, take measure so that if the refrigerant leaks, it does not exceed the concertration limit. For information regarding measures to prevent the concertration limit from being exceed, please contact the dealer.
- It refrigerant leaks and the concentration limit is exceeded, suffocation could occur.
- Install the equipment in a location that can sufficiently support the weight of the equipment. If the area is not strong enough, an accident could result from the unit falling.
- Install the equipment in a location that can withstand strong winds, such as typhoons, and earthquakes. If the installation is not secure, an accident could result from the unit falling.
- Always turn off power before work is performed inside the unit such as for installation or servicing. A failure to observe this instruction can cause a danger or electric shock.
- Electrical work should be done by a licensed electrician who shall do the work in accordance with the Technical Standards Regarding Electrical Equipment. Indoor Wiring Provisions, and this installation manual. The electrician shall use specified circus for the equipment. If the power supply circuit capacity is insuficient or the work is not done correcty, it could result in electric shock or a fire.
- For wiring, the specified cable should be used, the connections should be secure, and the fixtures shall be strong enough to prevent cabies from being pulted out from the terminal connections. Incorrect connections or work fixtures could result in heat generation or a fire.
- In cabling, arrange cables suitably so that they may not get off their support and then fix the service panel securely. Improper installation can cause heat generation and a resultant fire. Please prevent any substance other than the specified refrigerant (R410A) such as air from entering the refrigerant cycle in installing or moving the air conditioning system. Contamination by air or a foreign substance can cause an abnormal pressure build-up inside the refrigerant cycle and a resultant explosion and personaly injury.
- Use only parts supplied with the unit and specified supply parts for installation. The use of unauthorized parts may cause the leaking of water or electricitly causing a danger of electric shock or a fire, a refrigerant leak, performance degradation, and control failures.
- Do not open operation valves (either liquid or gas or both) until refrigerant piping, an air-tightness test and an air purge are completed. When a leak of refrigerant gas occurs during piping work, stop brazing pipes and ventilate the room. Refrigerant gas, when it comes into contact with bare fire, can generate a toxic gas.
- When installation is completed, check for refrigerant gas leaks. If the refrigerant gas leaks indoors, it could come in contact with a tan heater, burner, or hot plate, which could generate a poisonous gas.

⚠ CAUTION

- Ground the equipment. Do not connect the ground wire to gas piping, water piping, a lightning rod, or telephone ground wires. It grounding is not performed correctly electric shock could occur.
- Depending on the installation location, a circuit breaker may need to be installed. It a circuit breaker is not installed, electric shock may occur.
- Please follow this manual faithfully in performing installation work. Improper installation work can cause abnormal vibrations and noise generation.
- Do not install the equipment in areas where there is danger of flammable gas leaks. It such gas does leak it could collect around the units and cause a fire.
- Install the drain piping in accordance with the installation manual so that it properly discharges waste water and is maintained at a temperature that prevents condensation.
- Do not install the outdoor unit where winds from its dan blow directly onto a plant, etc. Winds can affect adversely to the plant, etc.
- Secure a space for inspection and maintenance as specified in the manual. An insufficient space can result in an accident such as a fall from the installation point and a resultant personal injury.
- When the outdoor unit is installed on a roof or at an elevated point, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.
- In tightening a flare nut, use a double spanner and observe the specified tightening torque. Care must be taken so as not to overtighten a nut and damage the flare part. (Please refer to the tightening torque) The loosening or damage of the flare part can cause a refrigerant gas leak and a resultant lack-of-oxygen accident.
- Please dress the refrigerant piping with a heat insulation material for prevention of dew condensation. Improper heat insulation for prevention of dew condensation can cause the leaking or dripping of water and a resultant soaking of household effects.
- When refrigerant piping is completed, check its air-tighteness with nitrogen gas to make sure it does not have a leak. A leak of refrigerant gas in a narrow room beyond the safety limit concentration can cause a lack-of oxygen accident.

5.1 Installation of indoor unit

(1) Ceiling recessed type (FDT)

(a) Selection of installation location

1) Select location where the space above ceiling is larger than those mentioned below and perfect draining can be assured.

Model	Space above ceiling (h)
FDT28, 36, 45, 56, 71	Over 290mm
FDT90	Over 315mm
FDT112, 140	Over 385mm

2) With the customer's consent, select a location with following suitable conditions.
   a) Where cool air or hot air can easily pass through.
      If the height of the location exceeds 3 m, hot air will gather in the ceiling. Suggest to the customer to also install a circulator.
   b) Where water can be completely drained. A sloping location for drainage.
   c) Where there are no wind disturbances to the suction inlet and blowing outlet, where the fire alarm will not be set off erroneosly, where no short circuits occur.
   d) Where there is no direct sunlight.
   e) Where the dew point temperature is below 28°C and the relative humidity is below 80%.

   (The unit has been tested according to JIS dew point conditions and has been confirmed to operate without any problems. However, if the unit is operated in an environment with the humidity higher than the above limit, water condensation may occur. Accordingly, all pipes and drain pipes should be further covered with insulation materials of 10 - 20 mm thick.)

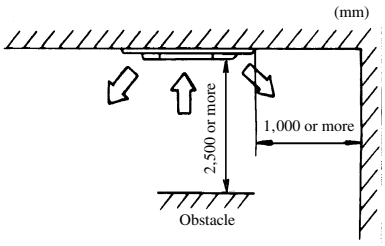
3) Consider the supporting strength of the location. If the strength is not sufficient to sustain the unit weight, use reinforcing materials.

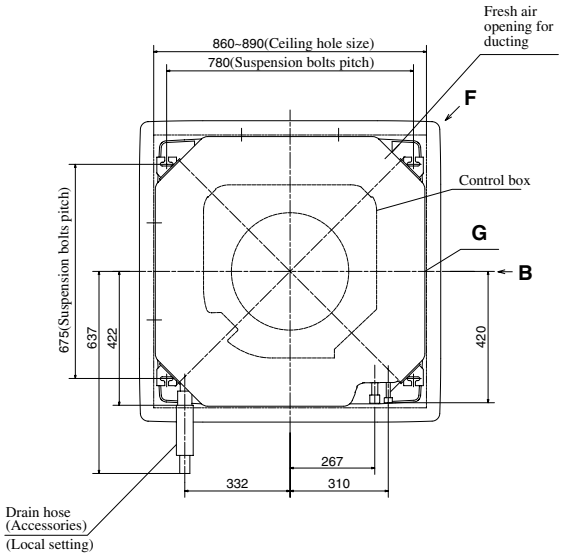
(b) Installation space for unit

a) When a sufficient interval cannot be secured between the unit and a wall or another unit, shut up diffusers on that side to block winds and make sure that no short-circuiting is occurring. (A wind blocking material is available as an optional part)
   • Do not use the unit in the "LO" wind mode, when winds are blown into two or three directions.

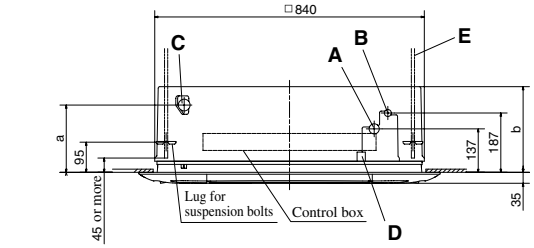
b) When the unit has 2500 mm or less clearance, attach a fan guard (option part) on the intake side of the fan.

• Installtation space





A	Gas tube connecting port
B	Liquid tube connecting port
C	Drain line connecting port
D	Power intake
E	Hanging bolt
F	OA intake
G	Blowout branch duct connecting port
H	Humidifer connecting port



Model	a	b
FDT 28~71	212	270
FDT 90	212	295
FDT 112, 140	269	365

(c) Suspension

- Please arrange four sets of a hanging bolt (M10 or M8), a nut matching the bolt, a flat washers and a spring washer on the installation site.

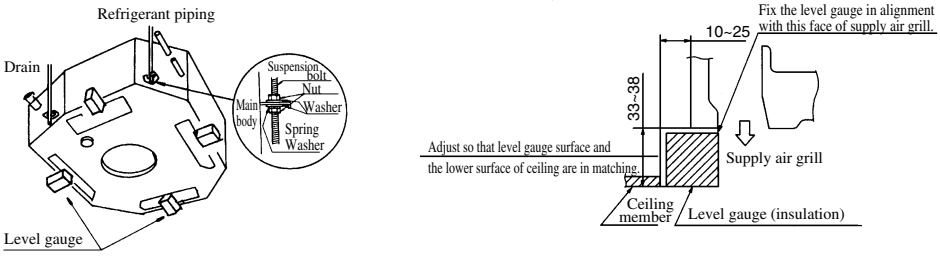
When suspension from the ceiling

1) In the case of the standard series: Cut and openign of □860 ~ □890.

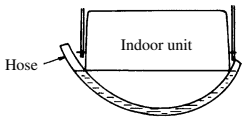
   In cutting an operating on the ceiling, use the unit's cardboard container for shipment as a reference of the size of opening.

   - The center of the opening on the ceiling must accord with the center of the unit.

2) Determine the positions of suspension bolts (675×780).
3) Use four suspension bolts, each fastened in such a manner that it can withstand pull force of 50 kgf.
4) Make suspension bolts to the length that leaves approximately 70 mm of them above the ceiling.
5) After hoisting in the unit, attach level gauges supplied as accessories and determine the unit position (height).



6) Use a transparent tube with water filled inside to check the level of the unit. (A tolerable height difference at an end of the unit is within 3 mm)



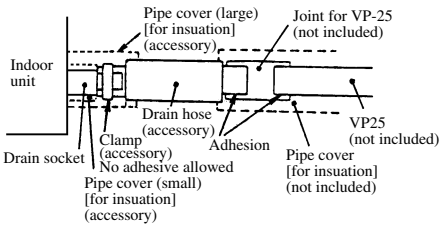
When embedded into ceiling

1) Determine the positions of hanging bolts (675×780).
   - The pitch center of a hanging bolt must accord with the center of the unit.
2) Use four suspension bolts, each fastened in such a manner that it can withstand pull force of 50 kgf.
3) In cutting an opening on the ceiling, use the unit's cardboad container for shipment as a reference of the size of opening.
4) Fix the unit as per A-5 and 6 above.
   - The unit's cardboard container for shipment can be used to cover the indoor unit.

Note (1): When a hanging bolt exceeds 1.3 m in length, use an M10 bolt and give it reinforcements such as braces.

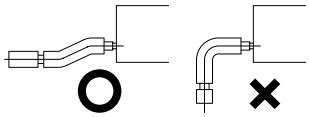
(d) Drain Piping

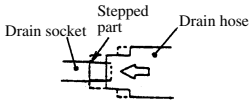
1) Glue the drain hose supplied as an accessory and a VP-25 joint before lifting the unit.
2) The drain hose is to provide a buffer to absorb a slight dislocation of the unit or the drain piping during installation work. If it is subject to abuse such as being bent or pulled deliberately, it may break, which will result in a water leak.
3) Care must be taken so as not to allow an adhesive to run into the drain hose. When it is hardened, it can cause a breakage of a flexible part, if the flexible part receives stress.



4) Use VP-25 general-purpose hard PVC pipes for drain piping.

5) Insert the drain hose supplied as an accessory (soft PVC end) to the stepped part of the unit's drain socket and then fasten it with the clamp also supplied as an accessory.



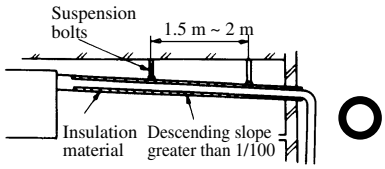


6) Adhesive must not be used.

a) Glue a VP-25 joint (to be procured locally) to joint it with the drain hose (hard PVC end) and then glue a VP-25 (to be procured locally) to the joint.

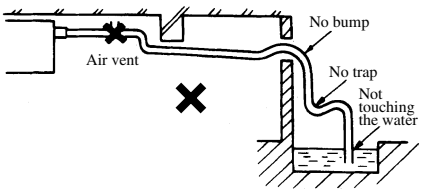
b) Give the drain piping a descending grade (1/50-1/100) and never create a bump to go over or a trap.

c) In connecting drain pipes, care must be taken so as not to apply force to the unit side piping and fix the pipe at a point as close to the unit as possible.



d) Do not create an air vent under any circumstances.

e) When drain piping is implemented for more than one unit, provide a collecting main about 100 mm below the units' drain outlets from which it collects drain. Use a VP-30 or larger pipe for a collecting main.

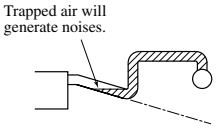


f) Do not fail to provide heat insulation at the following two points because they can cause dew condensation and a resultant water leak.

7) Drain socket

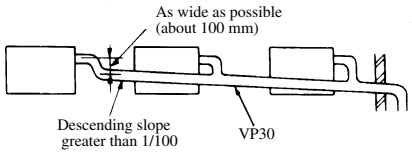
After a drain test is completed, apply a pipe cover (small: accessory) onto the drain socket, cover the pipe cover (small), the clamp and part of the drain hose with a pipe cover (large: accessory) and wrap it with a tape completely without leaving any gaps.

(Cut pipe covers into appropriate shapes)



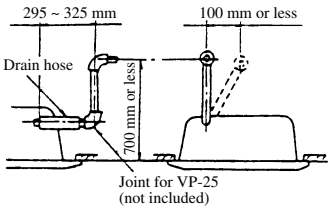
8) Hard PVC pipes laid indoor

a) Since a drain pipe outlet can be raised up to 700 mm from the ceiling, use elbows, etc. to install drain pipes, it there are obstacles preventing normal drain pipe arrangement. When the drain pipe is raised at a point far from a unit, it can cause an overflow due to a back flow of drain upon stoppage, so arrange piping to keep the dimensions specified in the illustration shown on the left.



b) Install the drain pipe outlet where no odor is likely to be generated.

c) Do not lead the drain pipe into a ditch where the generation of harmful gas such as sulfuric gas or flammable gas is expected. A failure to observe this instruction may cause such harmful or flammable gas to flow into the room.



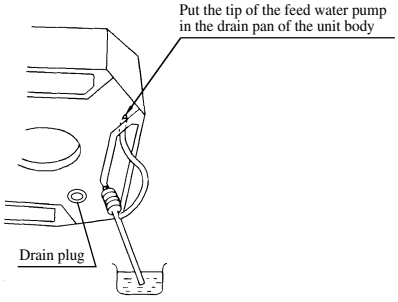
Drainage test

① Check that water is draining thoroughly during test run, and that there are no water leaks from the joints and the drain pan.

② The test has to be performed even if the unit is installed in the season when the unit is used for healting.

③ In a new house, perform the test before the ceiling is fitted.

- Using a water pump, pour about 1000 cc of water to the drain pan through the blowing outlet.
- Check the transparent drain-out section of the drain hose for normal flow of drainage.
  * While observing the noise from the drain motor, test drain operation.
- Take off the drain plug to release the water. After the water is drained, place the drain pulg back where it was..
  * While observing the noise from the drain motor, test drain operation.



Forced drain pump operation

◆ Set up from a unit side.

① Turn on DIP switch 5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain connections of the pipe)

◆ Setup from a remote controller side.

Drain pump operation from a recomte controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation.
   ① Press the TEST button for three seconds or longer.
   The display will change from "SELECT ITEM"→ " SET"→ " TEST RUN ▼ "
   ② Press the ▼ button once while " TEST RUN ▼ " is displayed, and cause "DRAIN PUMP ⬍" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display: " DRAIN PUMP RUN"→ " → STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

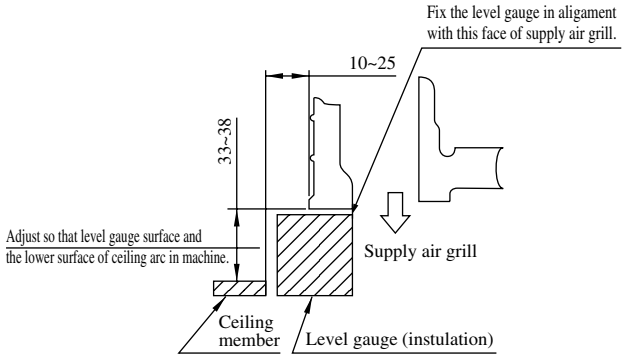
(e) Panel installation

1) Accessories

Name	Quantity	Remarks
Air inlet grille	1	
Air filter	1	
Suspension bolts	4	For panel installation

2) Confirm the unit's installation level.

- Make sure from the level gauge (insulation) packed with the air conditioner unit that the installation height of the unit and the dimensions of the opening in the ceiling are correct.
- Confirm the installation level of the air conditioner unit and ceiling material.
- Affix the level gauge included with the air conditioner unit and fix the unit's installation height.
- Remove the level gauge before installing the unit.
- The unit's installation height can be minutely adjusted by means of the corner openings after the panel is installed. (For details, see 6) "Installing the Panel.")



Note (1) : If the installation level of the air conditioner unit and ceiling material exceed the proper range, it will cause an undue load to be borne during installation of the panel and could cause damage.

3) Unit installation direction and panel and air inlet grille direction

(a) The unit and panel installation orientation is directional.
- Match up the outlet (small) parts with the refrigerant piping direction.
- Make sure of the motor and switch connector connection directions. (For details, see 6) "Installing the Panel.")

(b) The panel and air inlet grille installation orientation is not directional.
If you are changing the direction of the air inlet grille, change the panel's striker installation position to the "Pull" character position direction on the surface of the grille.

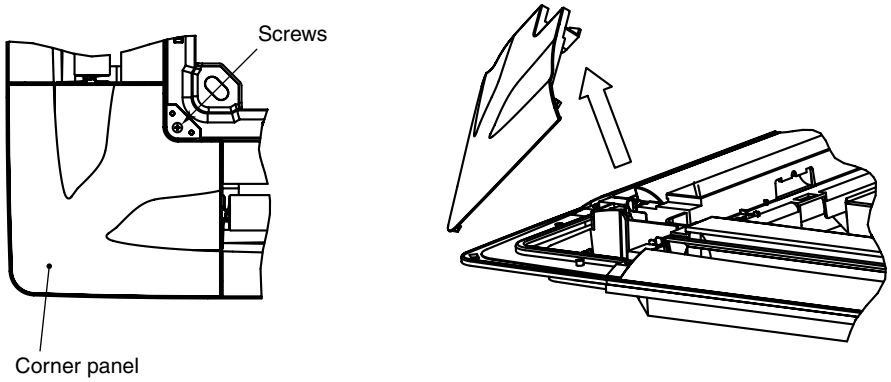
4) Removing the air inlet grille

① Raise up the notched portion of the air inlet grille and open it.

② With the air inlet grille open, remove the air inlet grille hinge from the decorator panel.

5) Removing the corner panel

• Take out the screw in the corner, then lift up the corner panel in the arrow direction and remove it.



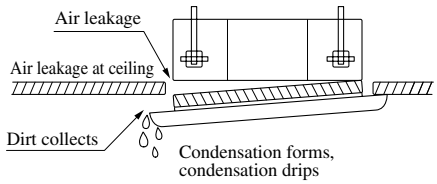
6) Panel installation

① Screw in lightly 2 of the 4 air conditioner unit suspension bolts in opposite corners from each other by about 5 mm. (Fasten the drain piping side and the opposite corner temporarily.)

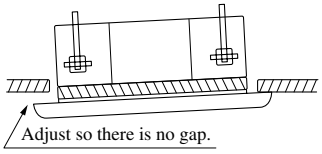
② Hang the panel on the two suspension bolts to install it temporarily.

③ Install the two remaining suspension bolts and tighten all four of the bolts.

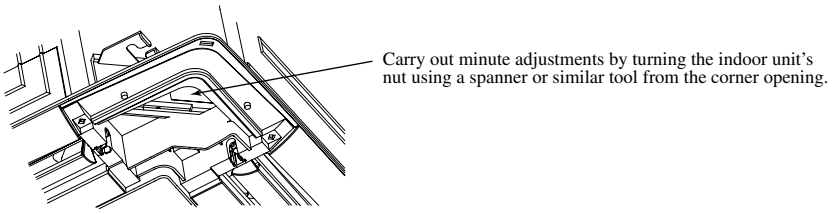
Notes (1) : If the suspension bolts are not tightened sufficiently, it could cause the following trouble, so tighten the bolts securely.



(2) : If there is still a gap between the ceiling and the decorator panel even after the suspension bolts are tightened, readjust the height of the indoor unit.



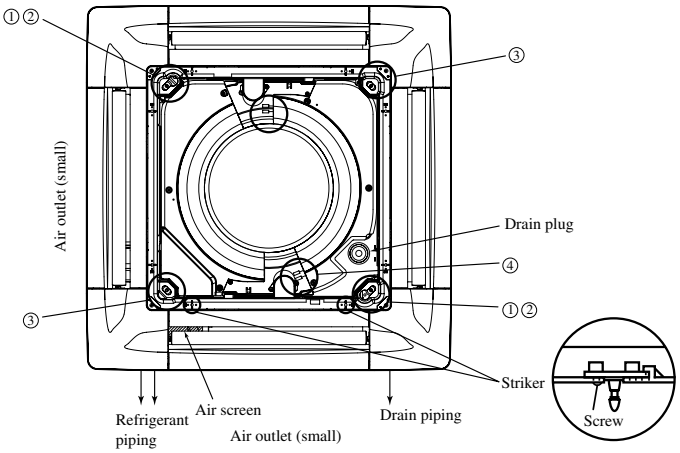
(3) : The unit's installation height can be minutely adjusted with the decorator panel as is as long as the indoor unit is level and drain piping are not affected.



④ Connect the (white, 5p) louver motor connector.

⑤ Place each of the connectors inside the control box.

Note (1) : If the air outlet louver does not operate using the remote controller, check the connector's connection, then turn the main power supply OFF for 10 seconds or longer and turn the power ON again.



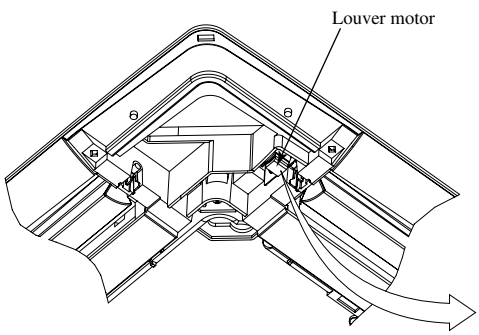
7) If the vertical air-flow direction is fixed

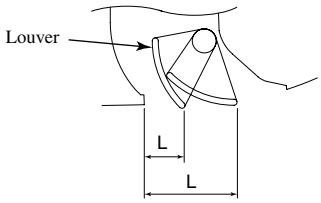
- This decorator panel is designed so that you can fix the vertical air-flow direction at each air outlet to match the environment at your installation location. Set it as required by the customer. Furthermore, when the vertical air-flow direction is fixed, remote control operation and all automatic controls are disabled. The actual setting may also differ from the LCD display in the remote controller.

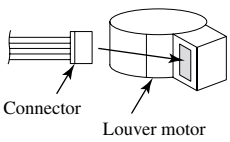
① Turn off the main power supply (turn it off at the ground fault circuit breaker).

② Disconnect the connector to the louver motor at the air outlet you want to fix the position of.
Wrap vinyl electrical tape around the disconnected connector to insulate it.

③ Slowly move the vertical air-flow louver you want to fix the position of by hand and set the vertical air-flow direction so that it is within the range shown in the table below.







<Setting Range>

Vertical air-flow direction criterion	Horizontal 30º	Downward 70º
L Dimension (mm)	36.5	22.5

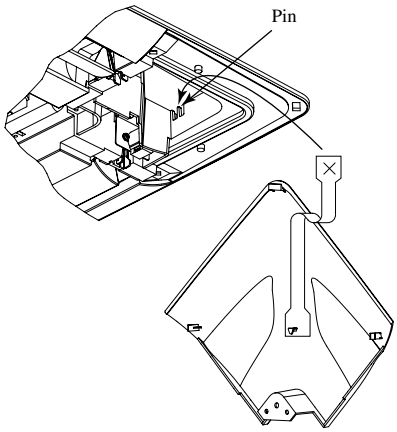
* It can be set anywhere desires as long as it is within a range of 22.5 and 36.5 mm.

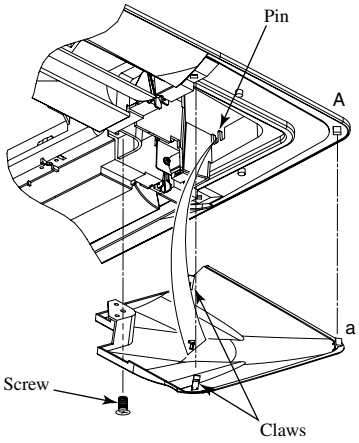
Note (1) : Do not set the position outside this range.
Doing so causes condensate to drip and to form as well as dirtying of the ceiling surface, and could cause abnormal operation.

8) Corner panel installation

① Hook the corner panel strap to the pin on the decorator panel as shown in the figure.

② Insert part a on the corner panel in part A on the decorator panel, then fit the 2 claws and fasten the corner panel screw.





9) Installing the air inlet grille

- Install the air inlet grille by following the removal procedure (item 4) in reverse order.

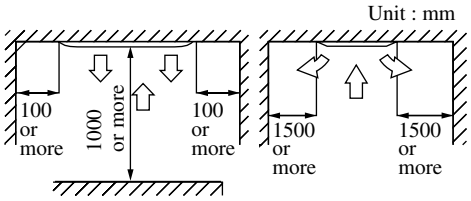
Note (1) : Match up the installation position of the panel's striker and the "Pull" character position direction on the surface of the grille. If these do not match, the striker could be damaged.

(2) 2-way outlet ceiling recessed type (FDTW)

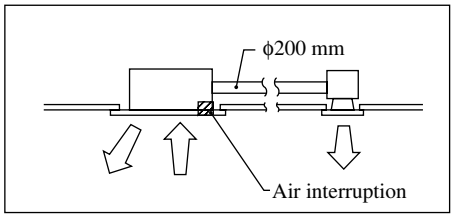
(a) Selection of installation location

1) This unit is a ceiling surface direct return air and direct supply air type.
Install the unit a place the allows air to reach every part of the room, in accordance with the shape and heigh of the room.

- **Installation space**



2) This unit permits connecting a branch duct (ϕ200 mm) according to the method shown in the figure below so that air disribution may be improved to the shape of the room. (For the connecting port of the duct, refer to the exterior dimension on page 40 ~ 42.)



3) Cold air throw

Unit : m

Item \ Models	FDTW28, 45, 56	FDTW71, 90	FDTW112	FDTW140
Standerd	4.0	4.5	4.7	5.0
UHi	4.5	5.0	5.2	5.5

Note (1) The cold air throw is the same in 2 directions.
Conditions:
1.Unit height: 3.0 m above the floor
2.Fan speed: Hi
3.Location: Freee space without obstacle
4.The throw is as the per the table above.
5.Air velocity at the throw: 0.3(m/s)

4) Places where chilied or heated air circulates freely. When the installation heiht exceeds 3.5m, warmed air stays close to the ceiling. In such cases, suggest your client users to install air circulators.
5) Places where perfect drainage can be prepared and sufficient drainage gradient is available.
6) Places free from air disturbances to the return air port and supply hole of the indoor unit, places where the fire alarm may not malfunction to short circuit.
7) Places with the environmental dew-point temperature is lower than 28°C and the relative humidity is less than 80%. (When installing at a place under a high humidity environment, pay suffcient attention to prevention of dewing such as thermally insulating the unit properly.)

8) Places exposed to oil splashes or steam (e.g. kitchens and machine plants.)

Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.

9) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains.

Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.

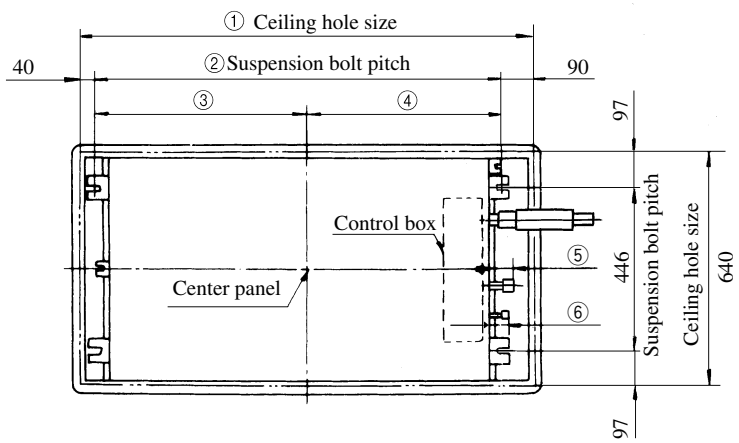
10) Place adjacent to equipment generating electromagnetic waves or high-frquency waves such sa in hospitals. Generated noise may cause malfunctioning of the controller.

(b) Preparations for installation

1) Ceiling hole and suspension bolt positions

a) The pattern sheet shrinks or expands as humidity changes, so check the actual size before use.

b) The ceiling hole sizes and suspension bolt sizes are shown in the following figure.



Dimension table

Unit : mm

Mark / Models	①	②	③	④	⑤	⑥
FDTW28, 45, 56	1015	885	468	417	70	60
FDTW71, 90	1260	1130	590	540	87.5	65
FDTW112, 140	1730	1600	825	775	80.5	70

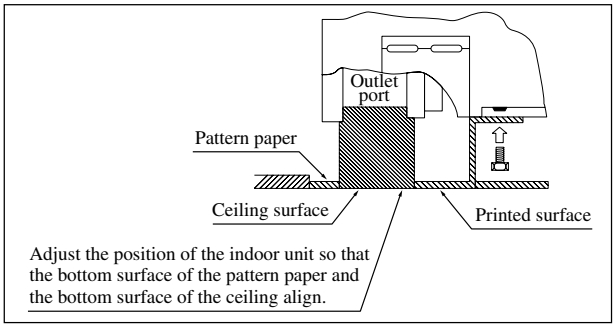
(c) Installation

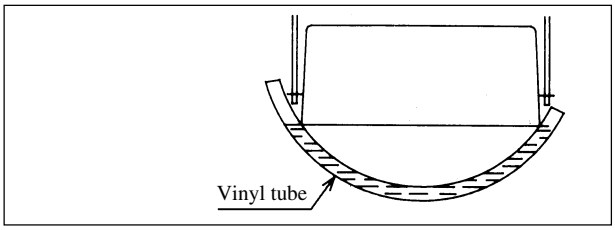
For the suspension bolt, use four M10 or W 3/8 bolts and secure so that each bolt can withstand a 50 kg/f pullout load.

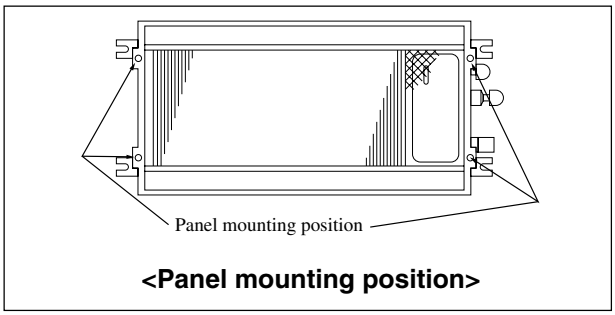
Use a suspension bolt length that extends approximately 95 mm for the ceiling surface.

A. If there is a ceiling

1) Open the hole in the installation location to the ceiling opening dimensions.
2) Install the suspension bolts (procured locally) at the designated locations.
   (Use care as the center of the spacing for the suspension bolts is not at the center of the panel.)
3) Hang the unit, use the four bolts to mount the pattern paper provided to the panel mounting section and adjust the height.
4) Use a level or transparent hose with water in it to confirm that the unit is level. If the unit is not level, problems such as water leakage or improper operation of the float switch could occur.
5) After confirming the above, secure the unit in position.



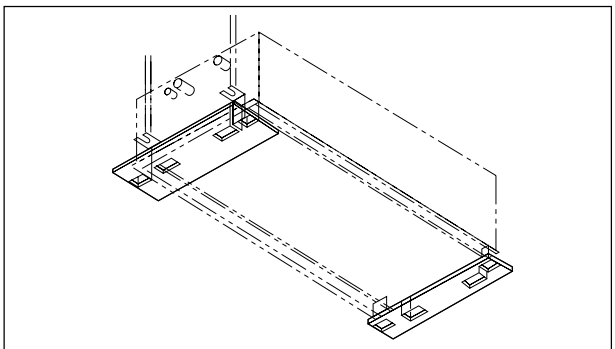




<Panel mounting position>

B. If ceiling is to be installed later

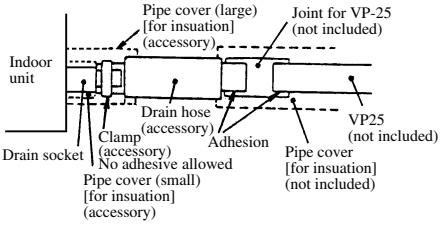
1) Follow steps A2 to A4 in the previous section "A. If there is a ceiling" to install the unit and mount the pattern paper.
2) When the ceiling is installed, the outer perimeter of the pattern paper can be referred to for making the opening in the ceiling.
3) After checking the height and that the unit is level, secure the unit in position.



<Pattern paper mounting configuration>

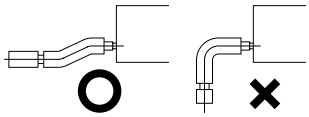
(d) Drain Piping

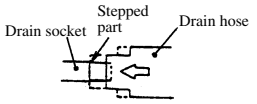
1) Glue the drain hose supplied as an accessory and a VP-25 joint before lifting the unit.
2) The drain hose is to provide a buffer to absorb a slight dislocation of the unit or the drain piping during installation work. If it is subject to abuse such as being bent or pulled deliberately, it may break, which will result in a water leak.
3) Care must be taken so as not to allow an adhesive to run into the drain hose. When it is hardened, it can cause a breakage of a flexible part, if the flexible part receives stress.



4) Use VP-25 general-purpose hard PVC pipes for drain piping.

5) Insert the drain hose supplied as an accessory (soft PVC end) to the stepped part of the unit's drain socket and then fasten it with the clamp also supplied as an accessory.





6) Adhesive must not be used.

   a) Glue a VP-25 joint (to be procured locally) to joint it with the drain hose (hard PVC end) and then glue a VP-25 (to be procured locally) to the joint.

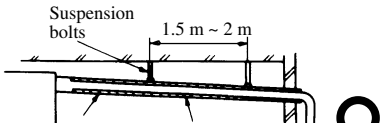
   b) Give the drain piping a descending grade (1/50-1/100) and never create a bump to go over or a trap.

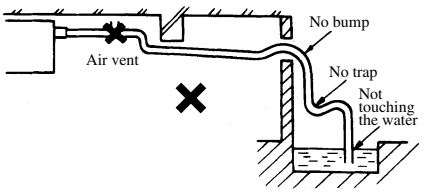
   c) In connecting drain pipes, care must be taken so as not to apply force to the unit side piping and fix the pipe at a point as close to the unit as possible.

   d) Do not create an air vent under any circumstances.

   e) When drain piping is implemented for more than one unit, provide a collecting main about 100 mm below the units' drain outlets from which it collects drain. Use a VP-30 or larger pipe for a collecting main.

   f) Do not fail to provide heat insulation at the following two points because they can cause dew condensation and a resultant water leak.

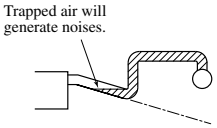




7) Drain socket

   After a drain test is completed, apply a pipe cover (small: accessory) onto the drain socket, cover the pipe cover (small), the clamp and part of the drain hose with a pipe cover (large: accessory) and wrap it with a tape completely without leaving any gaps.

   (Cut pipe covers into appropriate shapes)

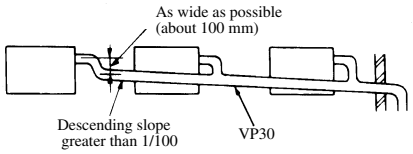


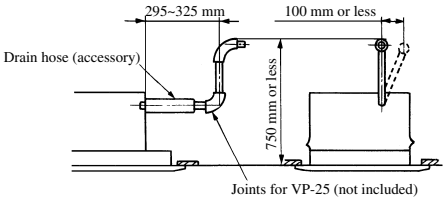
8) Hard PVC pipes laid indoor

   a) Since a drain pipe outlet can be raised up to 750 mm from the ceiling, use elbows, etc. to install drain pipes, it there are obstacles preventing normal drain pipe arrangement. When the drain pipe is raised at a point far from a unit, it can cause an overflow due to a back flow of drain upon stoppage, so arrange piping to keep the dimensions specified in the illustration shown on the left.

   b) Install the drain pipe outlet where no odor is likely to be generated.

   c) Do not lead the drain pipe into a ditch where the generation of harmful gas such as sulfuric gas or flammable gas is expected. A failure to observe this instruction may cause such harmful or flammable gas to flow into the room.





When using a natural drain port

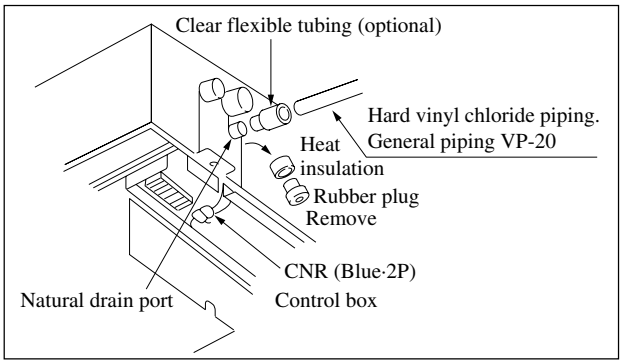
1) Remove the heat insulating material and rubber plug of the natural drain port.

2) By using the natural drain connecting tube (option), connect the drain pipe (VP-20) and completely clamp it with a clamp.

   Note (1) If the drain pipe is directly connected to the natural drain port, the drain pan becomes unremovable.

3) Disconnect the connector CNR (blue, 2P) for the drain motor.

Note (1) If the connector remains connected, drain water is discharged from the standard pipe connecting port, leading to water leakage.



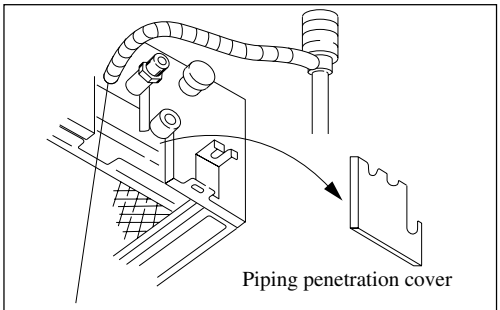
Drainage test

When using the standard drain port, execute a drainage test after completion of electric work.

① During the test run, make sure that drain flows properly through the piping and that no water leaks from connections.

② Be sure to conduct this test even when the unit is installed in the heating season.

③ In case of a new building, conduct the test before it is furnished with the ceiling.



Insert the tip of the supply water pump approximately 50 mm in a downward direction.

1) Inject about 1,000cc by using a feed water pump from the grommet on the drain pump side.

2) At the drain port (transparent portion), check if drainage is performed.

3) After completion of the drain test, completely perform heat insulation fot the drain pipe up to the indoor unit.

Forced drain pump operation

◆Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

◆ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation
   ① Press the TEST button for three seconds or longer.
   The display will change from "SELECT ITEM"→ "SET"→" TEST RUN ▼ "
   ② Press the ▼ button once while " TEST RUN ▼ " is displayed, and cause "DRAIN PUMP ⬍" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display:"DRAIN PUMP RUN"→ "○ → STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

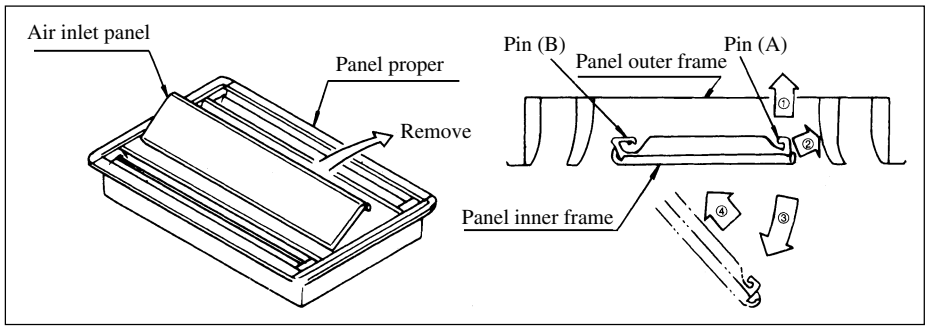
(g) Fixing of Panel (The panel fixing bolts are attached on the panel.)

Note (1) Care should be exercised in handling the supply air port on the panel because it is easily depressed by finger nail.

1) Check with the accessory level gauges that the indoor unit height and the size of ceiling hole are correct.

Notes (1) Remove the level gauge from the indoor unit befroe fixing the panel.
(2) Remove the Air inlet panel from the panel proper.

Procedure for dismounting the air inlet panel



a) Remove the panel from the pin (A) in the order of the arrows ① and ②.

b) Open the panel slightly as shown by the arrow ③ and move it to the arrow ④. Then remove it from the pin (B).

2) Screw two bolts out of four accessory bolts less than 5mm in the panel diagonally.

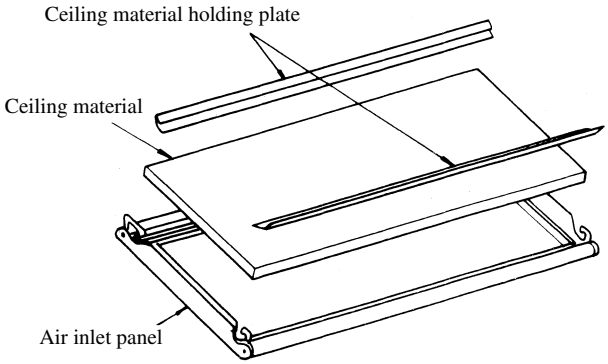
3) Hook the panel on the two bolts and set it temporarily.

4) Tighten the bolts fixed temporarily and the remaining two bolts.

5) Connect the louver motor connector (white, 3P) and the limit switch connector (white, 2P) to the panel respectively.

6) When the louver motor cannot be operated by remote controller operation, check the connector connections and turn off the power suppy for 10 sceonds or more for restting.

For ceiling material inlaid panel



● Ceiling material dimensions

Unit : mm

Item \ Models	FDTW28, 45, 56	FDTW71, 90	FDTW112, 140
Width	300	300	300
Length	970	1215	1685

① Remove the air inelt panel from panel proper.

② Remove the ceiling holding plates (2 sheets) temporarily set on the suction panel with screws.

③ Install the ceiling material on the air intel panel and fix it with the ceiling holding plates so as not to produce any play.

Note (1) Use a ceiling material with a thickness of 6-15mm and a side length of 300mm or more.

Ceiling material thickness : 6-10 mm 10 ~ 15 mm

Ceiling material instaling direction

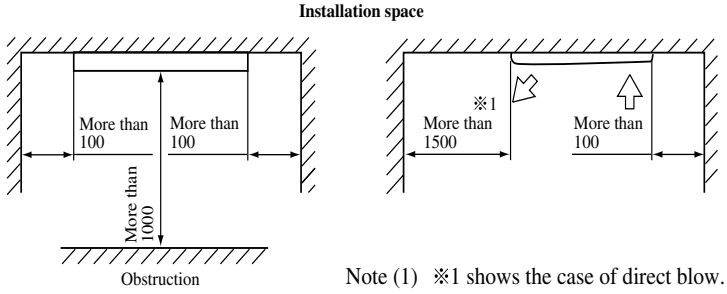
(3) Ceiling recessed single air supply port type (FDTQ)

(a) Avoid the following locations for installation and uses

1) Locations where oil splashes and moisture are abundant (e.g., kitchens, mechanical workshops).
   These locations may result in corrosion and lower performance of the heat exchanger and cause damage to plastic parts.
2) Locations with corrosive gases (such as sulfurous acid gas), flammable gases (such as thinners, gasoline) and areas where there are possibilities of gas accumulation. These locations can result in corrosion of the heat exchanger and damage plastic parts. Also, the flammable gas could cause a fire.
3) Locations near medical equipment radiating electromagnetic waves in hospitals or other facilities, and around appliances emitting high frequencies. The electromagnetic noise may cause the controller to malfunction.
4) Locations exposed to sea breezes (seaside areas). Sea breezes may cause corrosion of the outer frame and the heat exchanger.

(b) Installation space for the indoor unit

Unit : mm



Note (1) ※1 shows the case of direct blow.

1) With the customer's consent, select a suitable location according to the following conditions.
   - Where cool air or hot air can easily pass through.
     If the height of the location exceeds 3 m, hot air will gather below the ceiling. Suggest to the customer to also install a circulation fan.
   - Where wiring and plumbing to outdoor areas may easily be conducted.
   - Where water can be completely drained. A sloping location for drainage.
   - Where there is no wind disturbance to the suction inlet and blowing outlet, the fire alarm will not be set off erroneously, and no short circuits occur.
   - Where there is no direct sunlight.
   - Where the ambient dew point temperature is below 28°C and the relative humidity is below 80%.

   (The unit has been tested according to JIS dew point conditions and has been confirmed to operate without any problems. However, if the unit is operated in an environment with a humidity higher than the above limit, condensation may occur. Accordingly, all pipes and drain pipes should be further covered with insulation materials 10 - 20 mm thick.)
2) Consider the supporting strength of the location. If the strength is not sufficient to sustain the unit weight, use reinforcing materials.

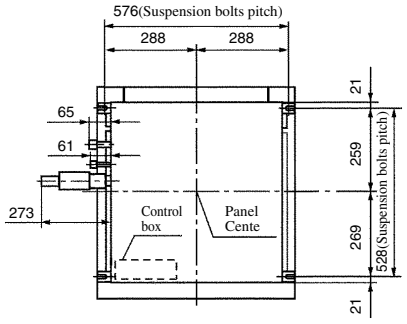
(c) Suspension the unit

Use four (4) M10 or W3/8 suspension bolts. Secure them firmly so that each can withstand a pull-out load of 50 kg/f.

Adjust their length to approximately 40 mm from the ceiling.

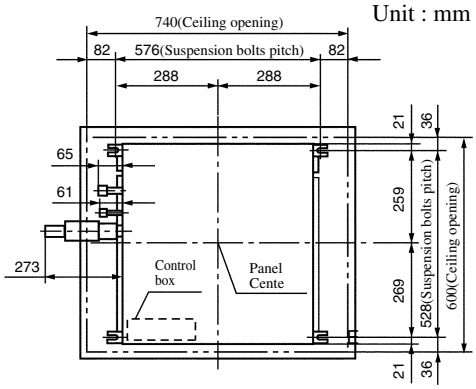
- For TQ-PSA-13W-E panel

Unit : mm



- For TQ-PSB-13W-E panel

Unit : mm



1) When hanging from the ceiling

a) The panel has two types: for 2 × 2 grid ceiling and for conventional ceiling.

① When installing on a 2 × 2 grid ceiling, put in the unit on an angle, or hang the unit with the T bar temporarily removed.

When installing on a conventional ceiling, cut an installation opening (740 mm × 600 mm) in the ceiling, and hang the unit.

b) Set the suspension bolts (to be prepared at job site) in place.

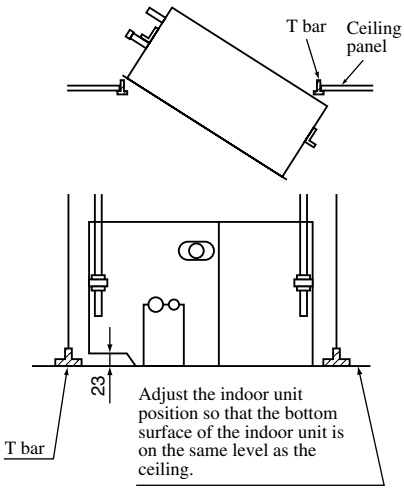
c) Adjust the unit's height so that the bottom surface of the unit is on the same level as the ceiling (bottom surface of the T bar). (The blow outlet is contained in the ceiling.)

The allowable difference in height between the bottom surface of the ceiling and that of the indoor unit is when the indoor unit face is no higher than 5 mm.

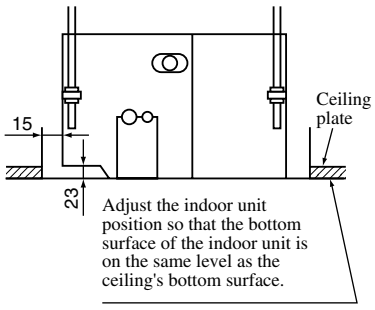
Caution

Do not install the indoor unit lower than the bottom surface of the ceiling.

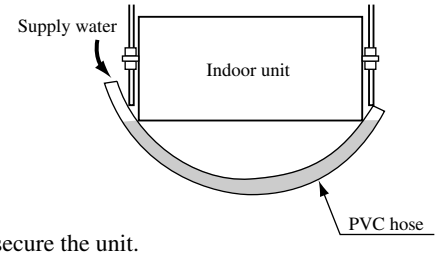
- For TQ-PSA-13W-E panel



- For TQ-PSB-13W-E panel



d) Level the unit using a hose filled with water. If the unit is out of level, water leaks or malfunctioning of the floating switch may occur.



e) After ensuring the above, secure the unit.

2) When embedded into ceiling

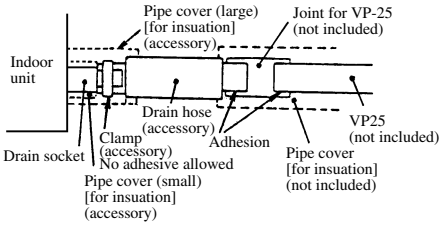
a) Install the unit following steps b) and c) of the above part 1).

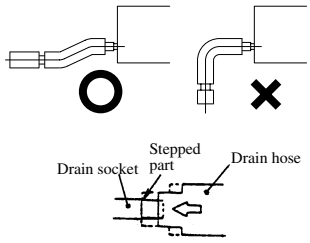
b) When installing on a conventional ceiling, cut an installation opening (740 mm X 600 mm) in the ceiling.

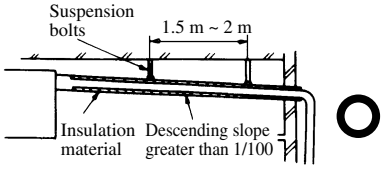
c) Check the installation height and level, and after that, secure the unit.

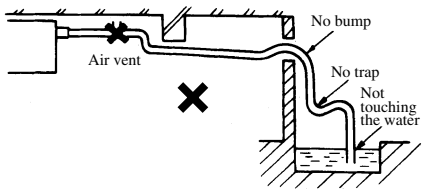
(d) Drain Piping

1) Glue the drain hose supplied as an accessory and a VP-25 joint before lifting the unit.
2) The drain hose is to provide a buffer to absorb a slight dislocation of the unit or the drain piping during installation work. If it is subject to abuse such as being bent or pulled deliberately, it may break, which will result in a water leak.
3) Care must be taken so as not to allow an adhesive to run into the drain hose. When it is hardened, it can cause a breakage of a flexible part, if the flexible part receives stress.
4) Use VP-25 general-purpose hard PVC pipes for drain piping.
5) Insert the drain hose supplied as an accessory (soft PVC end) to the stepped part of the unit's drain socket and then fasten it with the clamp also supplied as an accessory.
6) Adhesive must not be used.
   a) Glue a VP-25 joint (to be procured locally) to joint it with the drain hose (hard PVC end) and then glue a VP-25 (to be procured locally) to the joint.
   b) Give the drain piping a descending grade (1/50-1/100) and never create a bump to go over or a trap.
   c) In connecting drain pipes, care must be taken so as not to apply force to the unit side piping and fix the pipe at a point as close to the unit as possible.
   d) Do not create an air vent under any circumstances.
   e) When drain piping is implemented for more than one unit, provide a collecting main about 100 mm below the units' drain outlets from which it collects drain. Use a VP-30 or larger pipe for a collecting main.
   f) Do not fail to provide heat insulation at the following two points because they can cause dew condensation and a resultant water leak.





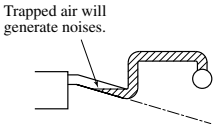




7) Drain socket

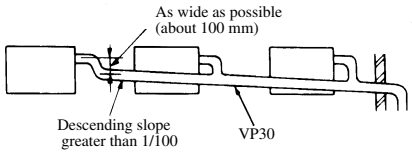
After a drain test is completed, apply a pipe cover (small: accessory) onto the drain socket, cover the pipe cover (small), the clamp and part of the drain hose with a pipe cover (large: accessory) and wrap it with a tape completely without leaving any gaps.

(Cut pipe covers into appropriate shapes)



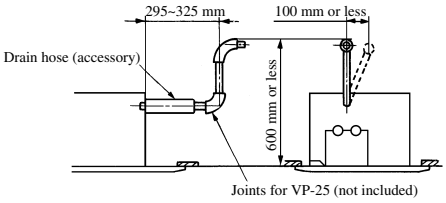
8) Hard PVC pipes laid indoor

a) Since a drain pipe outlet can be raised up to 600 mm from the ceiling, use elbows, etc. to install drain pipes, it there are obstacles preventing normal drain pipe arrangement. When the drain pipe is raised at a point far from a unit, it can cause an overflow due to a back flow of drain upon stoppage, so arrange piping to keep the dimensions specified in the illustration shown on the left.



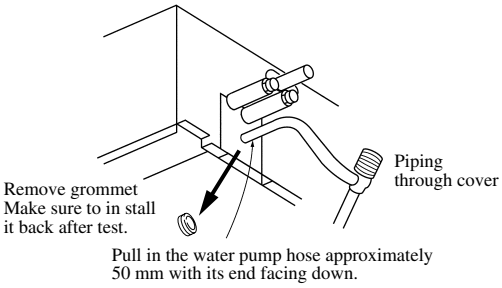
b) Install the drain pipe outlet where no odor is likely to be generated.

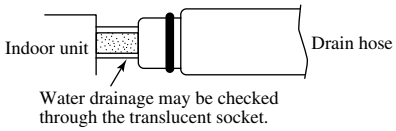
c) Do not lead the drain pipe into a ditch where the generation of harmful gas such as sulfuric gas or flammable gas is expected. A failure to observe this instruction may cause such harmful or flammable gas to flow into the room.



(e) Drain test (Perform the drain test after the electrical wiring work has been finished.)

- Check that water is draining thoroughly during the test run, and that there are no water leaks from the joints.
- The test has to be performed even if the unit is installed in a season when the unit is used for heating.
- In a new house, perform the test before the ceiling is fitted.





1) Remove the grommet, and using a water pump, pour about 1000cc of water, from the position shown in the left figure.

   Caution

   When pour water, be sure to perform the drain pump forced operation.

2) Check the drain-out section (transparent section) for normal flow of drainage.

3) Take off the drain plug to release the water. After water release has been confirmed, replace the drain plug as it was.

   ※ Be careful not to get splashed when pulling the drain plug.

4) After the drain test, thoroughly insulate the drain pipe, up to the main unit.

Forced drain pump operation

◆Setup from a unit side.

- Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump will operates continuously.
- After the drain test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

◆ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation
   ① Press the TEST button for three seconds or longer.
   The display will change from "SELECT ITEM"→ "SET"→ "TEST RUN ▼ "
   ② Press the ▼ button once while "TEST RUN ▼ " is displayed, and cause "DRAIN PUMP ▲▼" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display:"DRAIN PUMP RUN"→ "→ STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop
   The air conditioning system will become OFF.

(f) Panel installation (Panel installing bolts are attached to the panel.)

① Check that the indoor unit's height and opening dimensions in the ceiling are co

② Check that level is ensured.

③ Open the suction grill.

④ Screw in two of the four suspension bolts attached to the panel, on the piping side and at its opposite angle, by a little less than 5 mm (● marks).

⑤ Hook the panel into two of the suspension bolts to pre-install it.
With pre-installation is performed, first hook the panel to bolt A, then to bolt B while rotating the panel.
(Take care so that the unit does not rotate during pre-installation.)

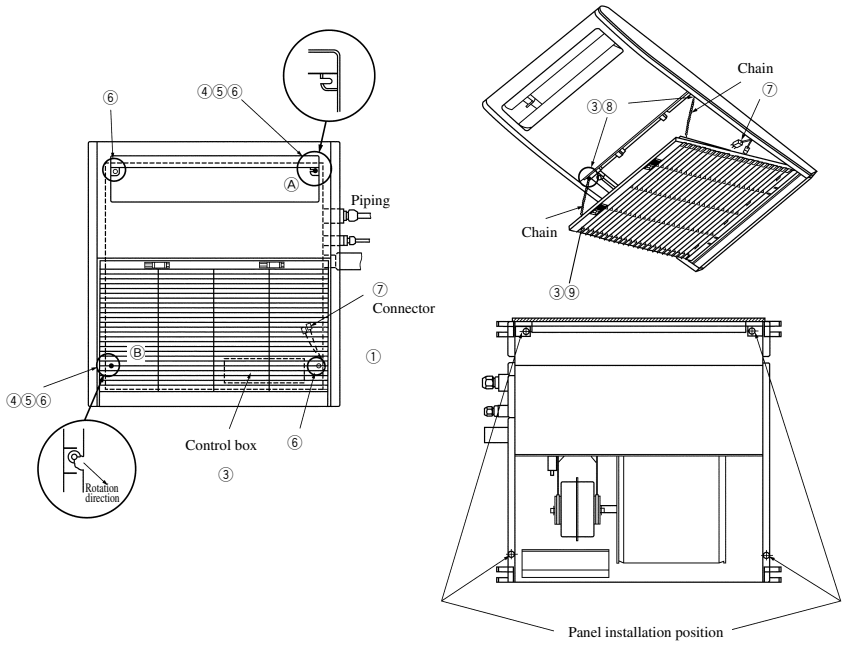
⑥ Tighten the pre-installed suspension bolts and two remaining suspension bolts.

⑦ Attach the louver motor connector (white, 4P) and the limit switch connector (white, 2P).

⑧ Use the provided screws to tighten chains to the panel. Chain installing screws is contained in the same bag as suspension bolts.

⑨ Close the suction grill. Now installation is complete.

⑩ When the louver motor does not operate with the remote control, check connections of the connectors, turn off the power for more than 10 seconds and reset.



(g) Indoor unit repair procedure for duct connection

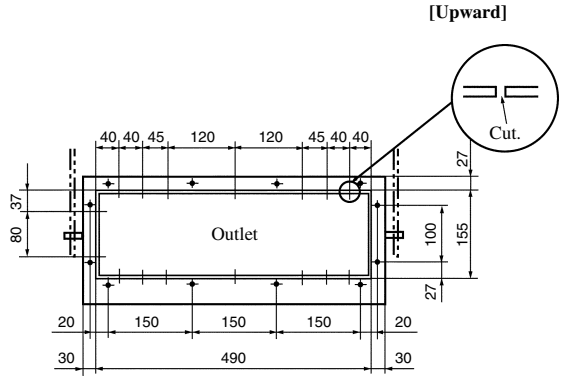
1) Drill hole for duct

a) While referring to the following dimensions, notch the insulation. (The insulation is equipped with the marks in advance.)

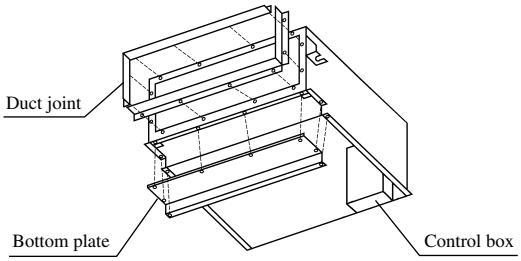
b) Cut joints for the hole, and drill hole.

c) Connect the duct joint using screws attached to the panel.

Unit : mm



d) Connect the bottom plate using screws attached to the panel.



e) Blower fan tap switch

The following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

① Set SW9-4 provided on the indoor unit PCB to ON.

② By means of function setting from the remote control unit, set the setting ⓒ of "I/U FUNCTION ▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap) as shown below.

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

For the details of operating procedures, please refer to the installation manual of your remote control unit.

f) LOUVER switch disabled setting

By means of function setting from the remote control unit, set the setting ⓒ of "▤ FUNCTION ▲" (remote control unit function) to "LOUVER INVALID" (LOUVER switch disabled) as shown below.

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
07	LOUVER S/W	LOUVER INVALID

For the details of operating procedures, please refer to the installation manual of your remote control unit.

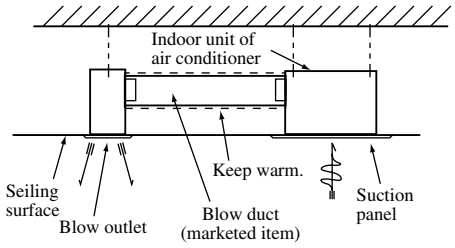
2) Duct work

a) Calculate air capacity and the outside static pressure to select the duct's length and shape, and blow outlet.

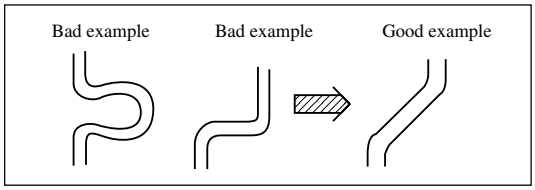
Caution

Take care that the outside static pressure does not exceed 30 Pa.

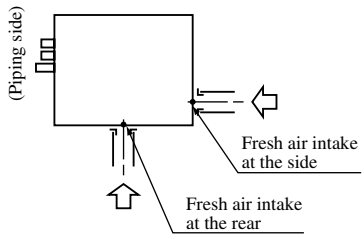
The unit has condensation owing to the decrease in air capacity, possibly causing the ceiling and household goods to become wet.



b) Reduce the number of bends as much as possible. (Corner R should be as larger as possible.)



c) Connecting the air inlet duct



d) Fresh air intake

- Use the intake, which is easier for work, either at the rear or the side.

e) Duct connection

- Connect the 125 mm diameter round duct, using the air inlet/exhaust duct flange separately sold (for connecting the 125 mm diameter round duct). (Band clamp)
- Keep the duct warm to protect from condensation.

f) Checking of indoor unit installation level

1) There are two kinds of panel, which are TQ-PSA-13W-E panel and TQ-PSB-13W-E panel. When installing to the existing ceiling, check that opening dimensions in the ceiling are correct.

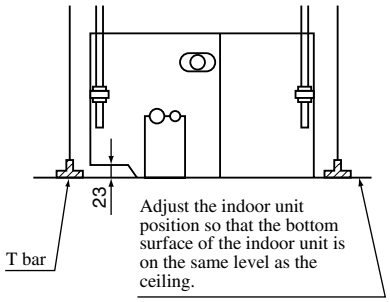
   Check the installation level of the air-conditioner indoor unit and the ceiling members.

2) Adjust the air-conditioner indoor unit height so that the under surface of the indoor unit and the under surface of the ceiling agree with each other. (The blowout port shall be housed in the ceiling.)

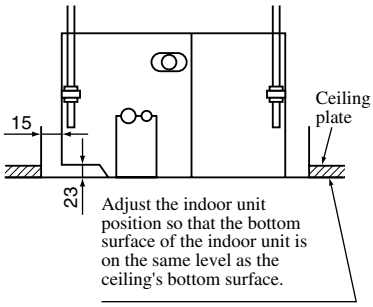
3) The allowable height difference between the under surface of the ceiling and the under surface of the indoor unit is less than 5 mm upward shift of the indoor unit.

   Do not install the indoor unit lower than the bottom surface of the ceiling.

● For TQ-PSA-13W-E panel



● For TQ-PSB-13W-E panel



g) Panel installation

① Insert a flat head screw driver, etc. into the slot on the blowout port cover of the panel to remove the cover from the panel.

② Open suction grill.

③ Screw in two of the four suspension bolts attached to the panel, on the piping side and at its opposite angle, by a little less than 5 mm (● marks).

④ Hook the panel into two of the suspension bolts to pre-install it.

With pre-installation is performed, first hook the panel on the bolt A Then to the bolt B .While rotating the panel. (Take care so that the unit does not rotate during pre-installation.)

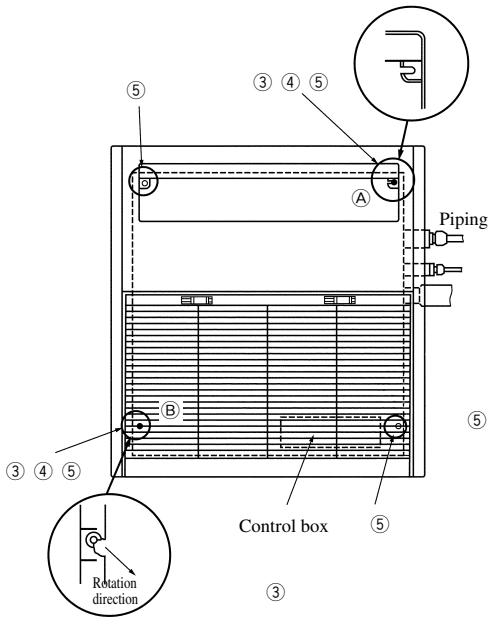
⑤ Tighten the pre-installed suspension bolts and tow remaining suspension bolts.

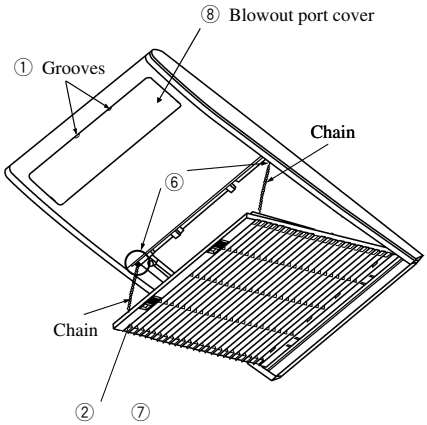
⑥ Use the provided screws to tighten chains to the panel. Chain installing screws is contained in the same bag as suspension bolts.

⑦ Close the suction grill. (Check whether the chain is installed securely.)

⑧ Push the blow outlet cover into place from the bottom of the panel, and fit it as it was.

Check that the blow outlet cover is securely fitted and does not fall.

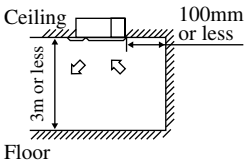
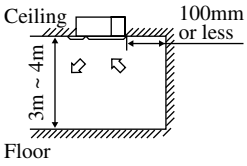




(4) 1-way outlet ceiling recessed type (FDTS)

Preparation of indoor unit

It can be installed by either one of the following methods. Select the most adequate method for your particular case.

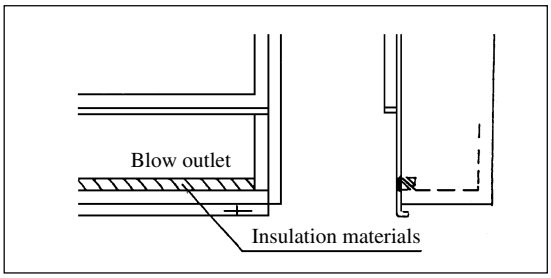
	Ⓐ Standard installation	Ⓑ Higher ceiling
Installation example and limitation		

Note (1) In the case of installing on the high ceiling, part of indoor unit requires some modification.

Procedures of rework

Installation on higher ceiling

Adhere the insulation materials attached to the direct blow panel on the blow outlet of indoor unit.



(a) Selection of installation location

1) Where cool and hot air will be distributed sufficiently.

Where the installation heigh exceeds 3m, warmed air is likely to concentrate close to the ceiling. In such case, you should install also a circulator.

Reference **• Cold air throw**

Unit : m

Item / Models	Reaching distance	
	Standard	Higher ceiling
All models	7	

[Conditions] 1. Unit heigh

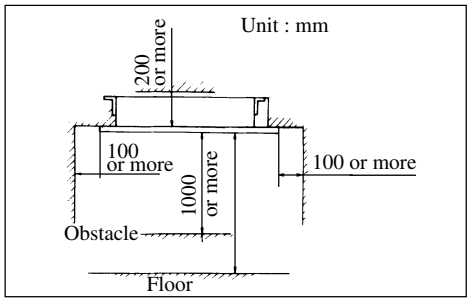
Standard ceiling: 2.4--3.0(m) above floor Higher ceiling: 3.0--4.0(m) above floor

2. Kind of operation: Hi
3. Place: Free space without obstruction;
4. Reaching distance means the horizontal distance for the wind to reach the floor.
5. Wind velocity at the reaching distance: 0.5m/s

Note (1) Wind capacity is UHi in case of a higher ceiling. It is value of Hi for other cases.

2) Where the ceiling has sufficient rigidity.
3) Where there is no obstacles in front of the suction intel and blow outlet.
4) It should be avoided such places as kitchen, machine factory, etc. where there profuse liquid splashes or thick steam.
5) Where the height of ceiling exceeds 200mm.

6) Where a space as shown below can be secured.



7) It should be avoided where a machine generating high frequency waves is installed.

8) Select a place to branch the piping so that same distance will be a obtained for each of one way piping.

9) Where humidity may exceed 80% behind the ceiling or the dew point may exceed 28°C, adhere polyurethane foam materials (t 10 or more) over the insulation materials on the external plate.

10) Where it is convenient for the piping and wiring to the outdoor.

11) Where protected from direct exposure to sun beams.

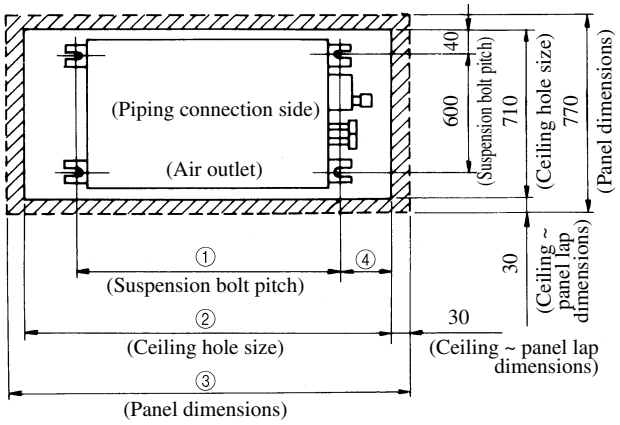
12) Where it is free from volatile gas generation.

(b) Standard location

1) Installation

a) Ceiling hole size and position of suspension bolt

Unit : mm

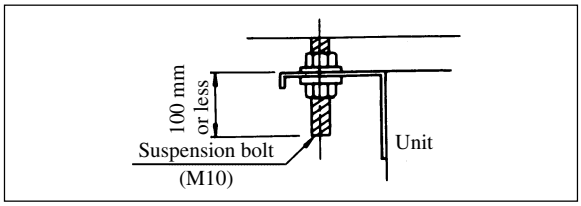


Unit : mm

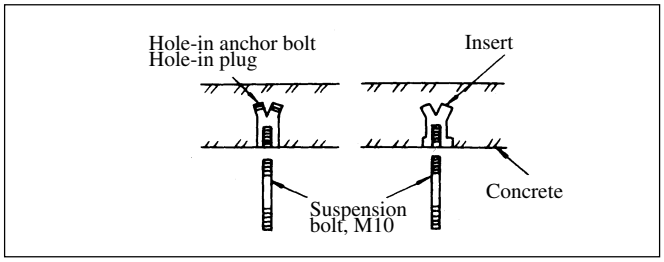
Models \ Mark	①	②	③	④
FDTS22, 28, 36, 45	990	1230	1290	180
FDTS71	1250	1440	1500	145

b) Length of fixed suspension bolt (customer orderd parts M10)

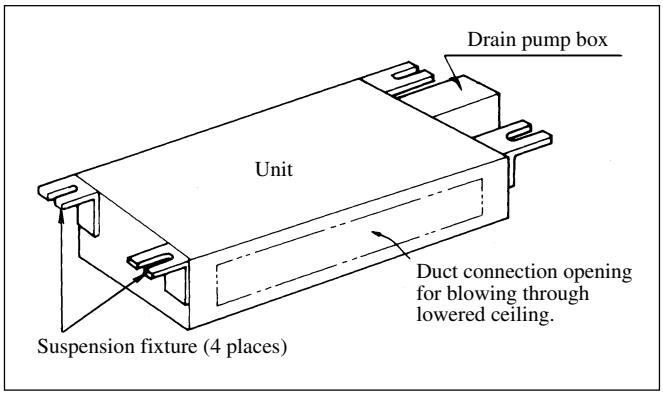
[Reference] Suspension bolt pitch is adjustable within ± 10mm in sidewise direction. Since there is no adjustment allowance in back and forth direction, determine the position exactly with a measure. (Lap margin between ceiling and panel is 30mm.)



c) Fixing of Suspension bolt. Fix the bolts securely as shown below or by any other adequate means.



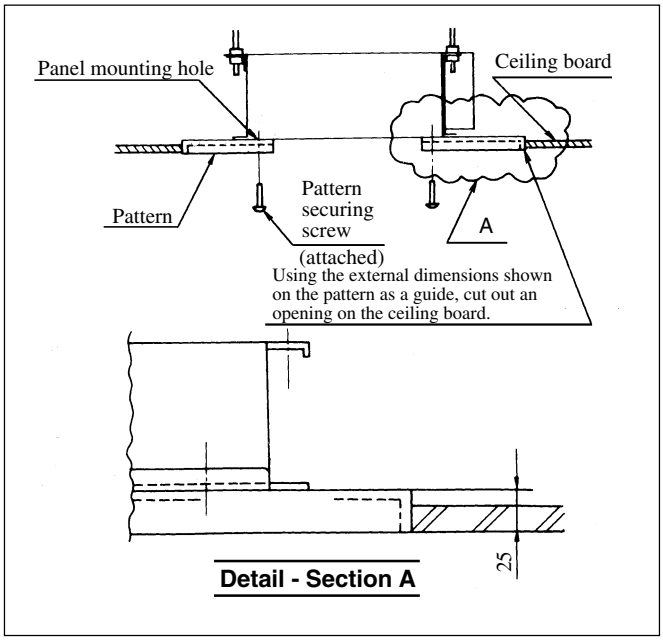
d) Installation



Procedures

① Install nuts on the Suspension bolts at onside. Suspension the suspension fixtures on the Suspension bolts first and then insert the remaining fixtures on the remaining Suspension bolts at and lock them with nuts.

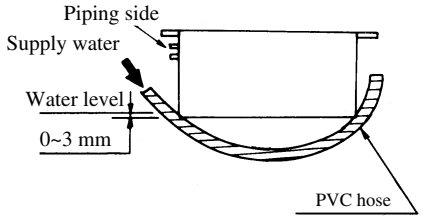
② Since the indoor unit and the panel height cannot be adjusted, adjust the height using an attached pattern before fixing the indoor unit.



Check of levelness

Check the levelness as follows. Use a level gauge or adjust the levelness with the following method.

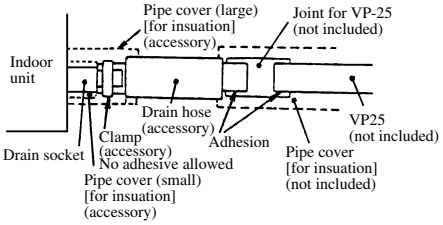
- Adjust the bottom of indoor unit and the water level as shown below.

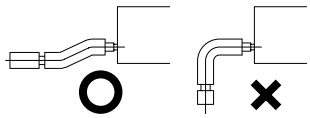


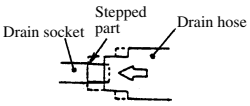
Slightly lower the piping side

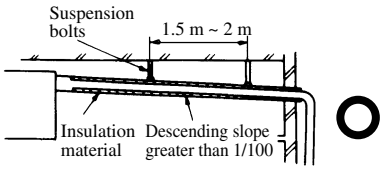
2) Drain Piping

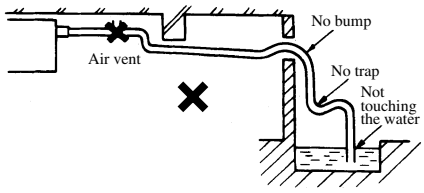
1) Glue the drain hose supplied as an accessory and a VP-25 joint before lifting the unit.
2) The drain hose is to provide a buffer to absorb a slight dislocation of the unit or the drain piping during installation work. If it is subject to abuse such as being bent or pulled deliberately, it may break, which will result in a water leak.
3) Care must be taken so as not to allow an adhesive to run into the drain hose. When it is hardened, it can cause a breakage of a flexible part, if the flexible part receives stress.
4) Use VP-25 general-purpose hard PVC pipes for drain piping.
5) Insert the drain hose supplied as an accessory (soft PVC end) to the stepped part of the unit's drain socket and then fasten it with the clamp also supplied as an accessory.
6) Adhesive must not be used.
   a) Glue a VP-25 joint (to be procured locally) to joint it with the drain hose (hard PVC end) and then glue a VP-25 (to be procured locally) to the joint.
   b) Give the drain piping a descending grade (1/50-1/100) and never create a bump to go over or a trap.
   c) In connecting drain pipes, care must be taken so as not to apply force to the unit side piping and fix the pipe at a point as close to the unit as possible.
   d) Do not create an air vent under any circumstances.
   e) When drain piping is implemented for more than one unit, provide a collecting main about 100 mm below the units' drain outlets from which it collects drain. Use a VP-30 or larger pipe for a collecting main.
   f) Do not fail to provide heat insulation at the following two points because they can cause dew condensation and a resultant water leak.
7) Drain socket
   After a drain test is completed, apply a pipe cover (small: accessory) onto the drain socket, cover the pipe cover (small), the clamp and part of the drain hose with a pipe cover (large: accessory) and wrap it with a tape completely without leaving any gaps.
   (Cut pipe covers into appropriate shapes)

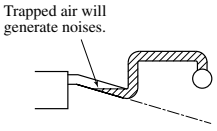










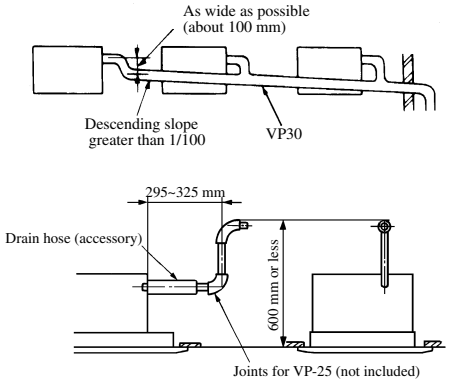


8) Hard PVC pipes laid indoor

a) Since a drain pipe outlet can be raised up to 600 mm from the ceiling, use elbows, etc. to install drain pipes, it there are obstacles preventing normal drain pipe arrangement. When the drain pipe is raised at a point far from a unit, it can cause an overflow due to a back flow of drain upon stoppage, so arrange piping to keep the dimensions specified in the illustration shown on the left.

b) Install the drain pipe outlet where no odor is likely to be generated.

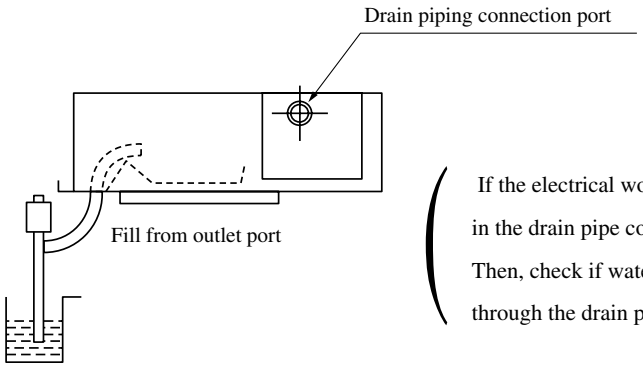
c) Do not lead the drain pipe into a ditch where the generation of harmful gas such as sulfuric gas or flammable gas is expected. A failure to observe this instruction may cause such harmful or flammable gas to flow into the room.

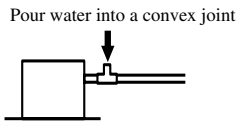


Drain test

[Perform this before installing the ornament panel]

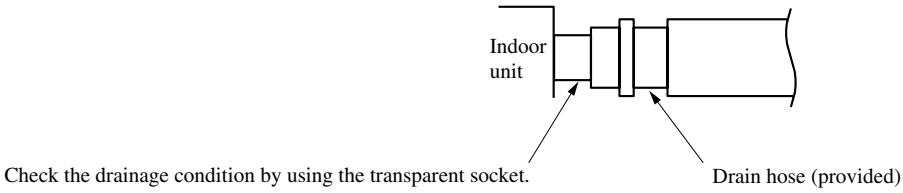
- Perform this upon completion of electrical work.
- Gradually introduce 2,000~3,000cc of water as shown below.





(If the electrical work has not been completed, connect a convex joint in the drain pipe connection to provide a water inlet. Then, check if water leaks from the piping system and that drain flows through the drain pipe normally.)

- Connect the remote control switch and set to cooling operation. The drain pump will operate with the compressor on.
- Test whether or not the water is draining while listening to the operating sounds of the electric motor for the drain water.



- Check that water is draining smoothly and that there is no water dripping from the connections or other areas.

Forced drain pump operation

◆Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

◆ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation

   ① Press the TEST button for three seconds or longer.

   The display will change from "◆ SELECT ITEM"→ "○ SET"→ "✳ TEST RUN ▼ "

   ② Press the ▼ button once while "✳ TEST RUN ▼" is displayed, and cause "DRAIN PUMP ◆" to be displayed.

   ③ When the SET button is pressed, a drain pump operation will start.

   Display: "DRAIN PUMP RUN"→ "○ → STOP"

2. To cancel a drain pump operation.

   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.

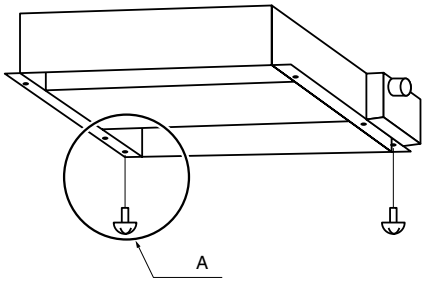
   The air conditioning system will become OFF.

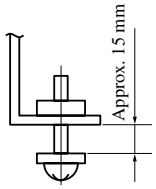
Mounting the Panel

① Open the inlet grille and remove the air block panel from the inside.

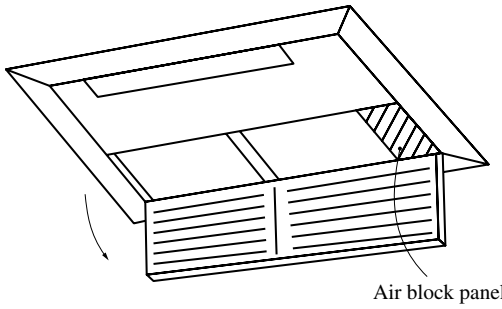
(Remove the 2 screws.)

② Mount the two (M5 x 35) panel mounting screws to the indoor unit



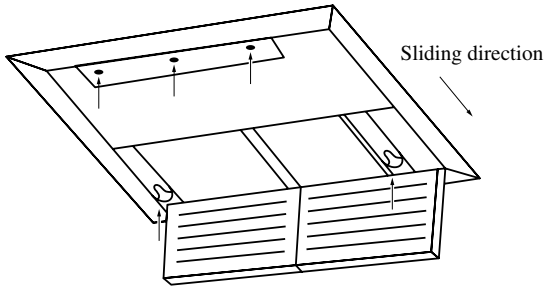


Detail of Section A

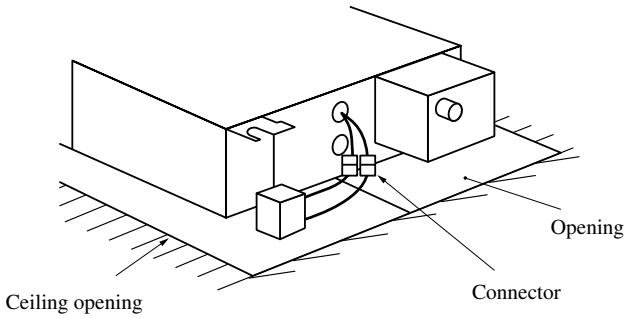


③ Hang the panel on the two mounting screws on the indoor unit by using the two keyhole shaped holes. Slide the panel approximately 10 mm.

Use the 5 panel mounting screws to secure the panel.



④ Use the opening to connect the connectors for the louver motor and limit switches.



⑤ Reinstall the wind shield plate.

(c) Installation on higher ceiling

Adhere the insulation materials on the blow outlet of the indoor unit. All others are same as the standard installation.

(5) Cassetteria type (FDR)

(a) Preparation of indoor unit

Before of during the installation of the unit, assemble necessary optional panel, etc. depending on the specific type.

(b) Select places for installation satisfying following conditions and, at the same time, obtain the consent on the part of your client user.

1) Places where chilled or heated air circulates freely.

When the installation height exceeds 3 m, warmed air stays close to the ceiling. In such cases, suggest your client users to install air circulators.

2) Places where perfect drainage can be prepared and sufficient drainage.

3) Places free from air disturbances to the suction port and blowout hole of the indoor unit, places where the fire alarm may not malfunction or short-circuit.

4) Places with the environmental dew-point temperature is lower that 28°C and the relative humidity is less than 80%.

(When installing at a place under a high humidity environment, pay sufficient attention the prevention of dewing such as thermal insulation of the unit prperly.)

(c) Avoid installation and use at those place listed below.

1) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).

Installation and use at such places incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic vesin parts.

2) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc) in generated or remains.

Installation and use at such places cause corrosion in the heat exchanger and damage in molded synthetic resin parts.

3) Places adjacent to equipment generating electromagnetic waves or high-frequency waves such as in hospitals.

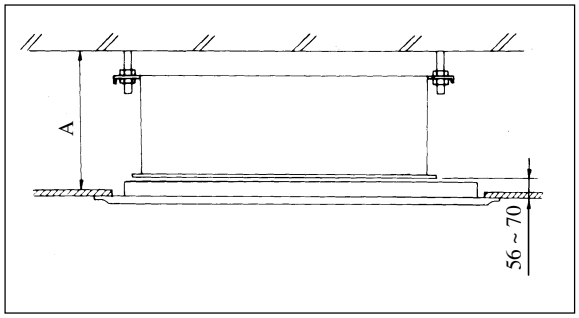
Generated noise may cause malfunctioning of the controller.

(d) Preparation for installation

1) Selection of suspension pattern

When the unit is hanged from ceiling, select one of following patterns depending on the dimensions of the ceiling.

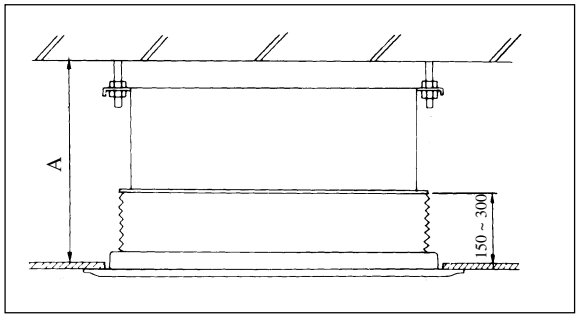
< Combination with silent panel >



Unit : mm

Models \ Mark	A
FDR22, 28, 45, 56, 71, 90	365 or more
FDR112, 140	416 or more

< Combination with canvas panel >



Unit : mm

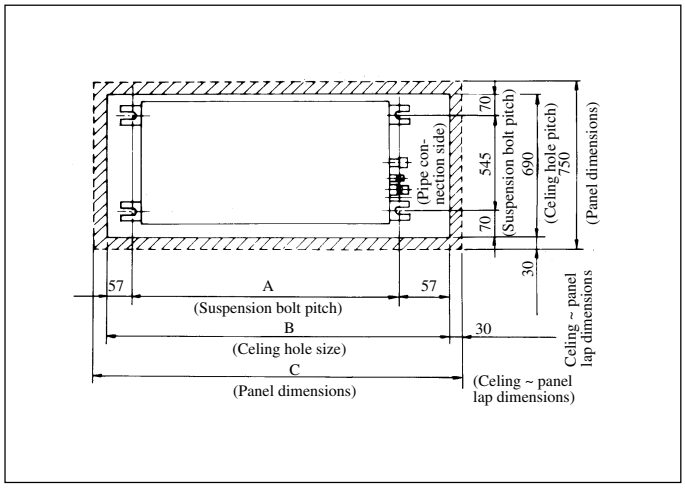
Models \ Mark	A
FDR22, 28, 45, 56, 71, 90	495 or more
FDR112, 140	510 or more

2) Ceiling hole size and position of suspersion bolt

When boring at the ceiling, use the pattern sheet included in the accessory of the unit.

Leave the pattern sheet on the unit till decorative panel is installed.

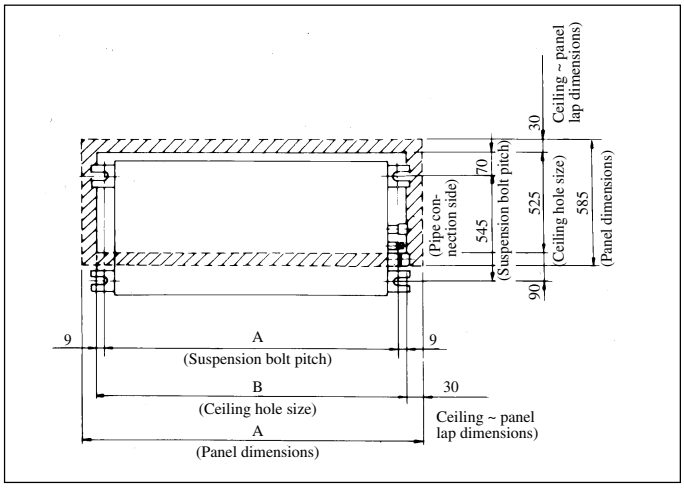
< Combination with silent panel >



Unit : mm

Mark / Models	A	B	C
FDR22, 28, 45, 56	786	980	1040
FDR71, 80	986	1180	1240
FDR112, 140	1406	1600	1660

< Combination with canvas panel >



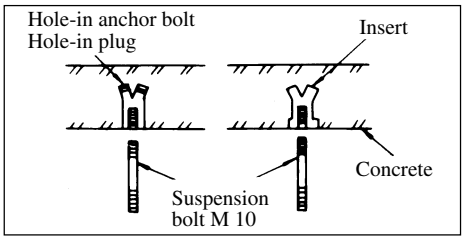
Unit : mm

Mark / Models	A	B	C
FDR22, 28, 45, 56	786	804	864
FDR71, 80	986	1004	1064
FDR112, 140	1406	1424	1484

3) Suspension bolts installation

- Locate the suspension bolts position by using the pattern sheet

  (Use care of the piping direction when the unit is installed)

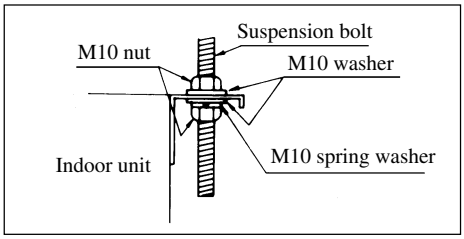


(e) Installation of indoor unit

1) Fix the indoor unit to the suspension bolts.

   If required, it is possible to suspend the unit to the beam, etc.

   Directly by use of the bolts without using the suspension bolts.

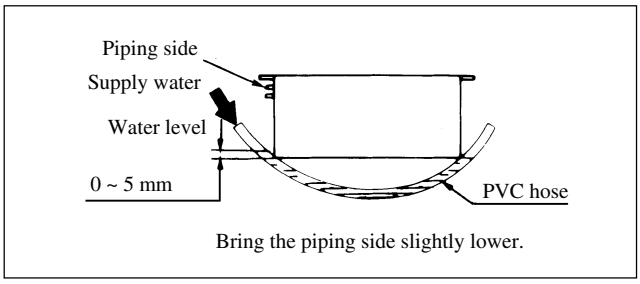


Note (1) When the dimensions of indoor unit and ceiling holes does not match, it can be adjusted with the slot holes of mounting bracket.

2) Adjusting the unit's levelness

① Adjust the out-of levelness using a level vial or by following method.

- Make adjustment so that the relation between the lower surface of the indoor unit proper and water level in the hose becomes as given below.



② Unless the adjustment to the levelness is made properly, malfunctioning or failure of the float switch may occur.

3) Blower fan tap switch

The following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

① Set SW9-4 provided on the indoor unit PCB to ON.

② By means of function setting from the remote control unit, set the setting Ⓒ of "I/U FUNCTION ▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap) as shown below.

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

For the details of operating procedures, please refer to the installation manual of your remote control unit.

(f) Installation of decorative panel

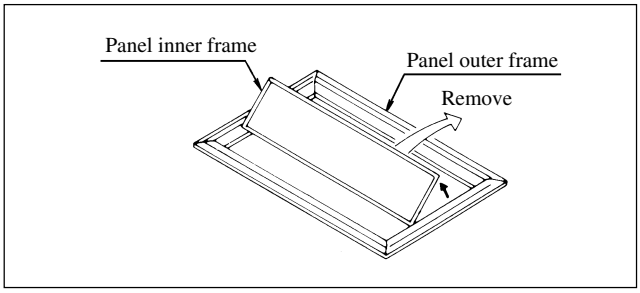
1) Case of silent panel

a) Accessory

Name	Q'ty	Position
Round head machine screw (M5 x 35) 	4 pcs.	Securing the panel

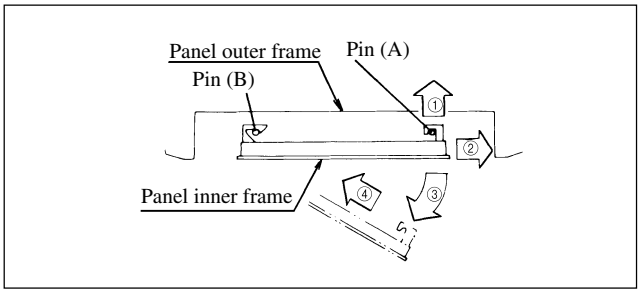
b) Installation procedures

① Remove the inner frame of panel

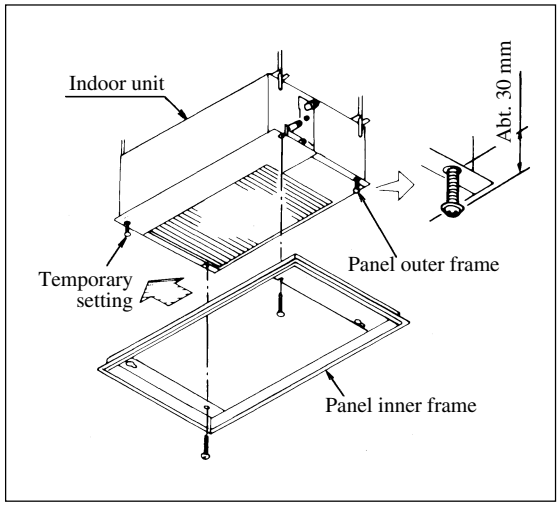


< How to remove the panel inner frame >

- Detach from pins (A) in the order of arrow ① → ②
- Open slightly as the arrow ③ and move toward the arrow ④ and detach from pin (B)



② **Install the panel outer frame on the Indoor unit.**



Procedures of installation

① Secure the panel tentatively with 2 of 4 panel set screws (panel accessory) as shown above.

② When the panel is supported with a pair of set screws, slide it in the arrow direction.

Note (1) Panel outer frame has the orientation.

③ Lock the former 2 and remaining 2 set screws.

④ Install the panel inner frame in the reverse order of removal.

2) Case of canvas panel

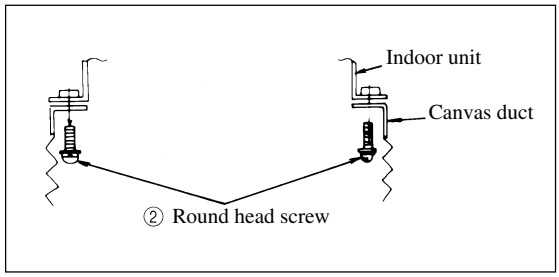
(Canvas duct (option) is necessary to install the canvas panel.)

a) Accessory

Symbol	Name	Q' ty	Position
①	Round head machine screw (M4 x 16)	4	Panel securing
②	Round head machine screw (M5 x 16)	8	Canvas duct securing
③	Round head machine screw (M5 x 25)	4	Chain securing
④	Holder	4	
⑤	Chain	4	

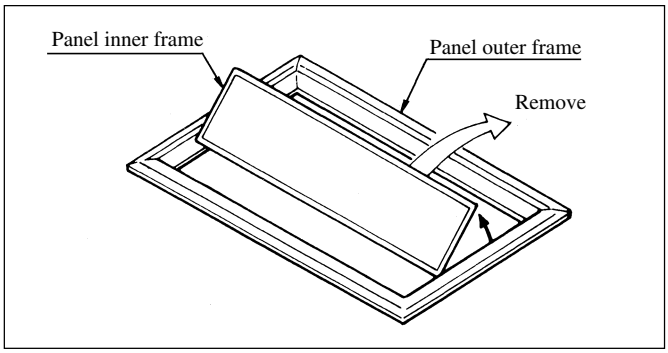
b) Mounting procedures

① **Install the canvas duct (option, 4 places) on the Indoor unit.**

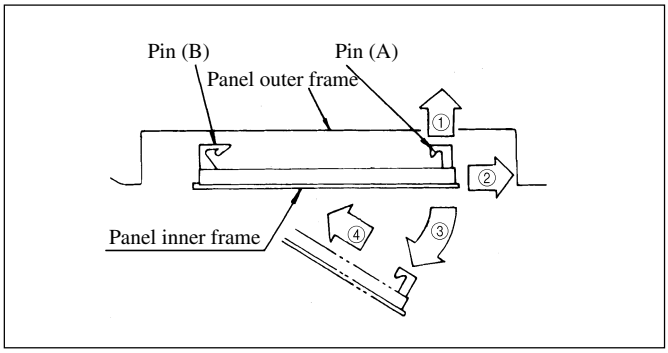


② **Remove the panel inner frame.**

It can be removed same as the silent panel.

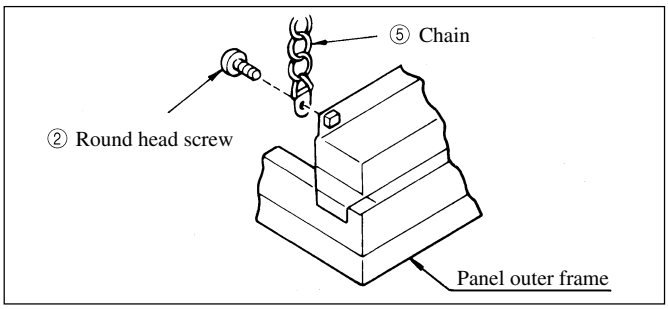


< How to remove the panel inner frame >



- Detach from pins (A) in the order of arrow ① → ②
- Open slightly as shown by the arrow ③. move in the ④ arrow direction and detach from pin (B).

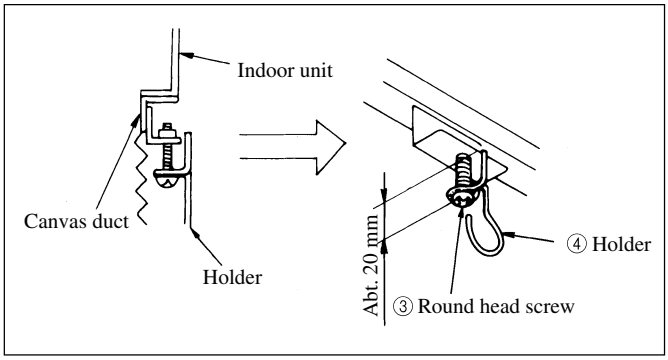
③ **Install the chains on the panel outer frame. (4 places)**



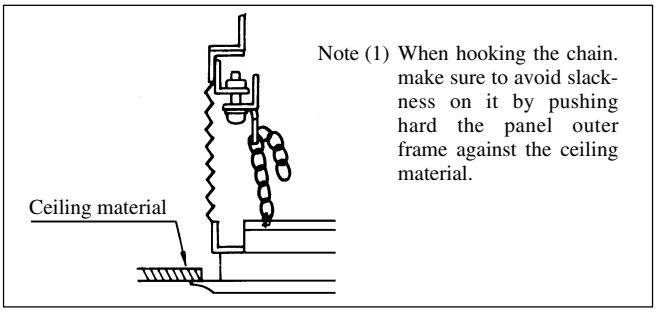
④ **Install the panel outer frame.**

Procedures of installation

- Secure the holder tentatively as shown below. (4 places)

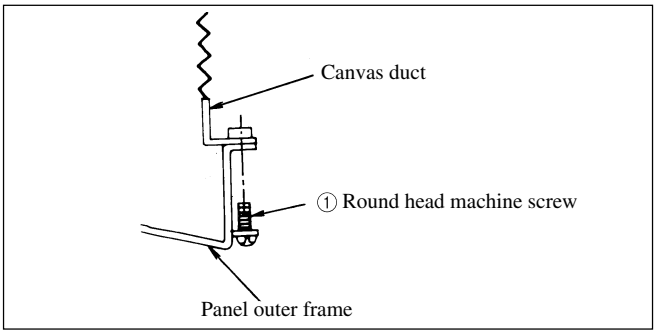


● Hook the chain of panel outer panel on the holder.



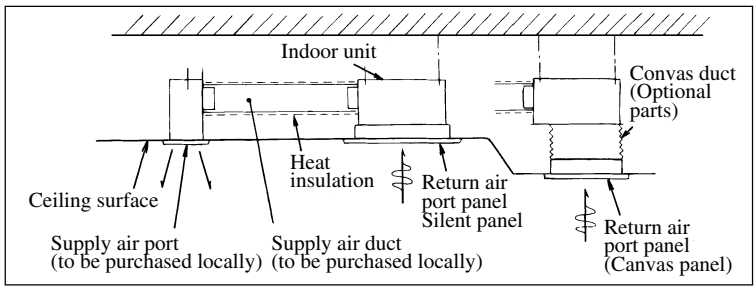
● Tighten ③ screw in the step ① till the panel outer frame contacts closely with the ceiling material.

● Secure the canvas duct and the panel outer frame with screws.



⑤ Remove the panel inner frame and install in the reverse order of removal.

⑥ Cautions for duct installation work



Calculate the draft and external static pressure and select the length, shape and blowout.

◆ **Supply air duct**

● 1-spot, 2-spot, 3-spot and 4-spot with ø200 type duct are the standard specifications. Determine the number of spots based on following table.

FDR22	FDR28, 45, 56	FDR71, 90	FDR112, 140
1-spot	2-spot	2 ~ 3-spot (1)	3 ~ 4-spot (1)

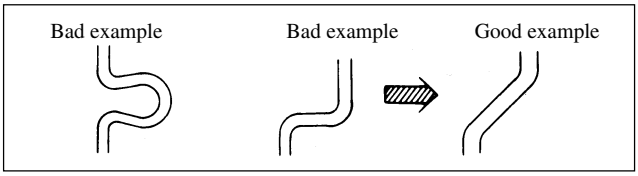
Notes (1) Shield the central supply air port for 2-spot.

(2) Shield the supply air port around the center for 3-spot.

● Limit the difference in length between spots at less than 2:1.

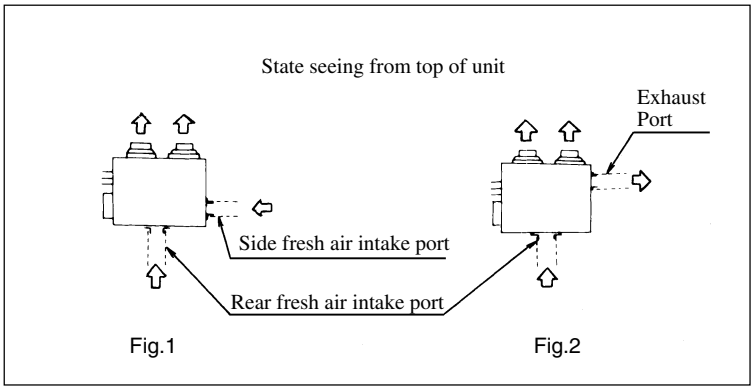
● Reduce the length of duct as much as possible.

● Reduce the number of bends as much as possible. (Corner R should be as larger as possible.)



- Use a band, etc. to connect the indoor unit and the supply air duct flange.
- Conduct the duct installation work before finshing the ceiling.

(g) Connection of air inteke and exhaust ducts.



1) Duct connecting position

a) Fresh air intake

- Inlet can be selected from the side or rear faces depending on the working conditions.
- Use the rear fresh air inlte when the simultaneous intake and exhaust is conducted. (Side inlet cannot be used.)

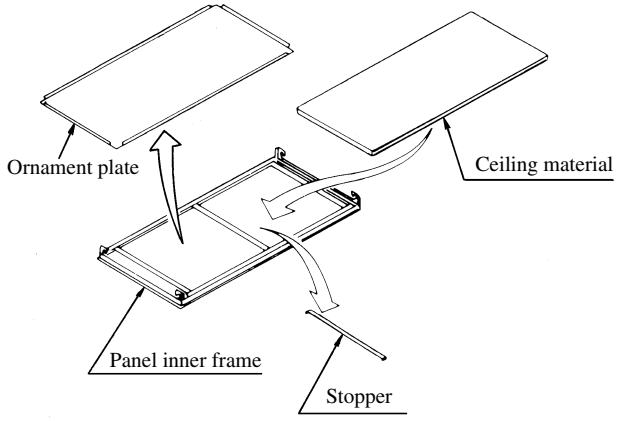
b) Exhaust (Make sure to use also the air intake.)

Use the side exhaust port.

Attachment of ceiling material

Ceiling material can be attached to the panel innern frame.

(Plate thickness max. 15mm)



Attachment procedures

① Remove the stopper.

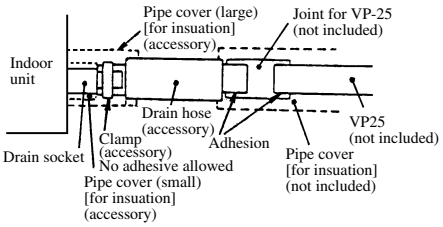
② Remove the ornament plate and attach the ceiling material.

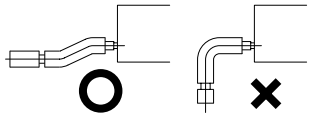
③ Hold down the ceiling material and return the stopper in position.

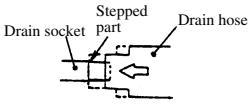
Note (1) If the ceiling material is attached, the ornament plate is not used.

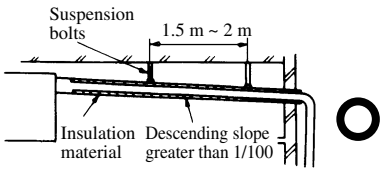
(h) Drain Piping

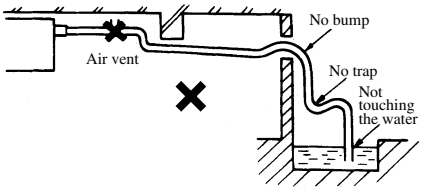
1) Glue the drain hose supplied as an accessory and a VP-25 joint before lifting the unit.
2) The drain hose is to provide a buffer to absorb a slight dislocation of the unit or the drain piping during installation work. If it is subject to abuse such as being bent or pulled deliberately, it may break, which will result in a water leak.
3) Care must be taken so as not to allow an adhesive to run into the drain hose. When it is hardened, it can cause a breakage of a flexible part, if the flexible part receives stress.
4) Use VP-25 general-purpose hard PVC pipes for drain piping.
5) Insert the drain hose supplied as an accessory (soft PVC end) to the stepped part of the unit's drain socket and then fasten it with the clamp also supplied as an accessory.
6) Adhesive must not be used.
   a) Glue a VP-25 joint (to be procured locally) to joint it with the drain hose (hard PVC end) and then glue a VP-25 (to be procured locally) to the joint.
   b) Give the drain piping a descending grade (1/50-1/100) and never create a bump to go over or a trap.
   c) In connecting drain pipes, care must be taken so as not to apply force to the unit side piping and fix the pipe at a point as close to the unit as possible.
   d) Do not create an air vent under any circumstances.
   e) When drain piping is implemented for more than one unit, provide a collecting main about 100 mm below the units' drain outlets from which it collects drain. Use a VP-30 or larger pipe for a collecting main.
   f) Do not fail to provide heat insulation at the following two points because they can cause dew condensation and a resultant water leak.
7) Drain socket
   After a drain test is completed, apply a pipe cover (small: accessory) onto the drain socket, cover the pipe cover (small), the clamp and part of the drain hose with a pipe cover (large: accessory) and wrap it with a tape completely without leaving any gaps.
   (Cut pipe covers into appropriate shapes)
8) Hard PVC pipes laid indoor
   a) Since a drain pipe outlet can be raised up to 650 (600: Canvas panel) mm from the ceiling, use elbows, etc. to install drain pipes, it there are obstacles preventing normal drain pipe arrangement. When the drain pipe is raised at a point far from a unit, it can cause an overflow due to a back flow of drain upon stoppage, so arrange piping to keep the dimensions specified in the illustration shown on the left.
   b) Install the drain pipe outlet where no odor is likely to be generated.
   c) Do not lead the drain pipe into a ditch where the generation of harmful gas such as sulfuric gas or flammable gas is expected. A failure to observe this instruction may cause such harmful or flammable gas to flow into the room.

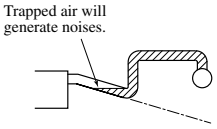


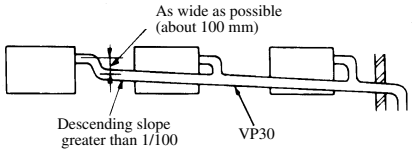


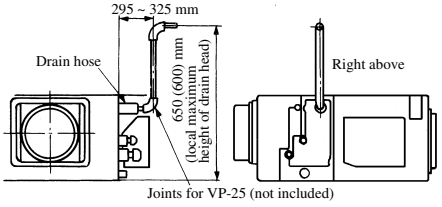










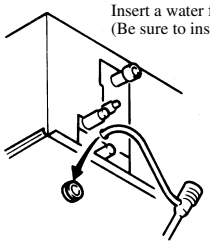


9) Drainage test

a) During trial operation, make sure that drainage is properly execued and check that leakage is not found at connections.

b) Be sure to carry out a drainage test when installing the system during a heating season.

c) When installing the system in a building under construction, carry out the drainage test before ceiling tiles are installed.



① Supply approx 1000cc of water through the outlet of the unit using a feed water pump.

② Make sure that drainage is proceeding properly at the see-through outlet of the unit.

*Also confirm the revolving sound of the condensate motor when checking the drainage.

③ Then remove the drain plug at lower section of the unit to drain water off. After making sure water is not left, restore the drain plug to the original position.

Forced drain pump operation

◆Setup from a unit side.

① Turn on DIP switch 5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

◆ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation
   ① Press the TEST button for three seconds or longer.
   The display will change from "SELECT ITEM"→ " SET"→ " TEST RUN ▼"
   ② Press the ▼ button once while " TEST RUN ▼" is displayed, and cause "DRAIN PUMP ⬍" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display: "DRAIN PUMP RUN"→ " → STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

10)Drainage from the lower drain socket

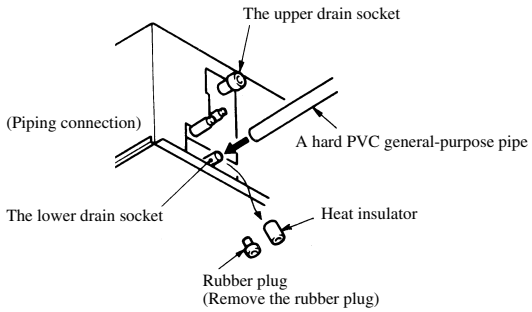
Only if the drain pipe can be installed in a downhill grade (1/50-1/100), the lower drain socket can be used for connecting to the drain pipe as illustrated.

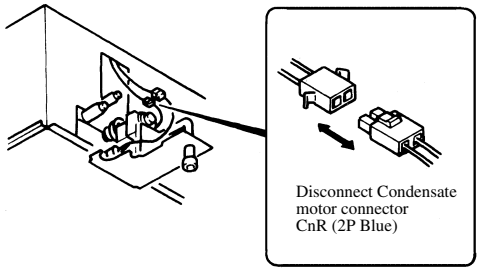
(Disconnect the connector for the drain motor)

As shown in the sketch to the right, disconnect the drain motor connector CnR (blue color coding).

Caution:

If the system is started with this connector connected as is, drain water is discharged out of the upper drain socket causing a heavy water lekage.





(6) Medium static pressure ducted type (FDQM)

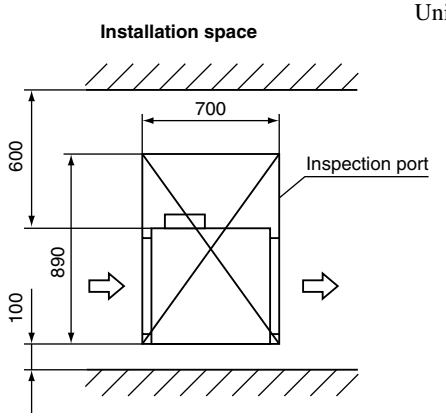
(a) Selection of installation location

1) Avoid installation and use at those places listed below.
   a) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
      Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.
   b) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is gnerated or remains. Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.
   c) Places adjacent to equipment generating electromagnetic waves or high-frequency waves such as in hospitals. Generated noise may cause malfunctioning of the controller.

2) Select places for installation satisfying the following conditions and, at the same time, obtain the consent on the part of your client user,.
   a) Places where chilled or heated air circulates freely. When the installation height exceeds 3m, warmed air stays close to the ceiling. In such cases, suggest your client users to install air circulators.
   b) Places where perfect drainage can be prepared and sufficient drainage gradient is available.
   c) Places free from air disturbances to the return air port and supply hole of the indoor unit, places where the fire alarm may not malfunction to short circuit.
   d) Places with the environmental dew-point temperature is lower than 28˚C and the relative humidity is less than 80%.
      (When installing at a place under a high humidity environment, pay sufficient attention to prevention of dewing such as thermally insulating the unit properly.)

3) Check if the selected place for installation is rigid enough to stand the weight of thew unit.
   Otherwise, apply reinforcement using boards and beams before starting the installation work.

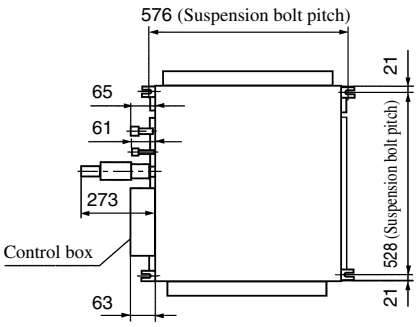
Unit : mm



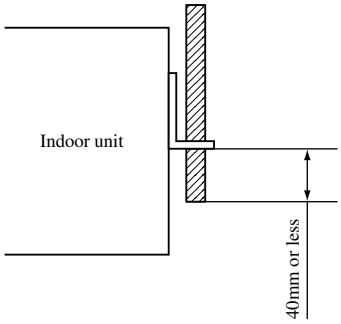
(b) Suspension the Unit

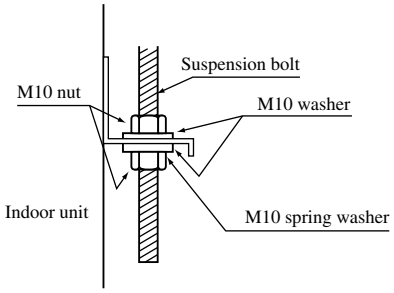
Use four (4) M10 or W3/8 suspension bolts. Secure them firmly so that each can withstand a pull-out load of 50 kg/f.

Unit : mm



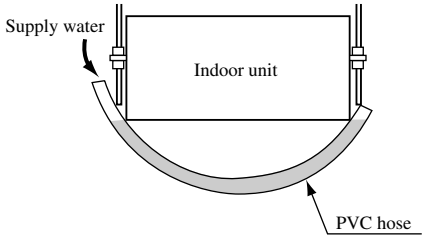
1) Adjust suspension bolts length to the following dimension.





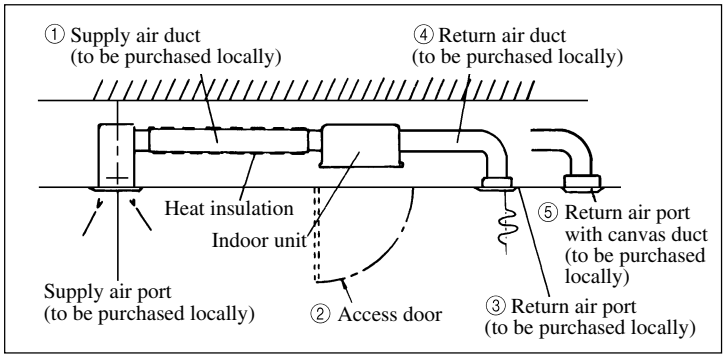
2) Set the suspension bolts (to be prepared at job site) in place.

3) Level the unit using a level or a hose filled with water. If the unit is out of level, water leaks or malfunctioning of the floating switch may occur.

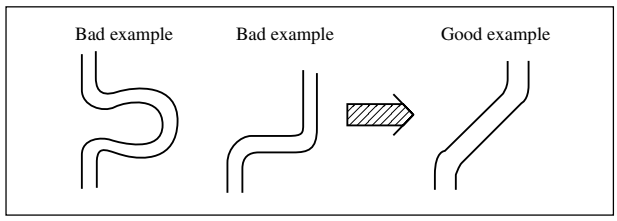


4) After ensuring the above, secure the unit.

(c) Duct installation



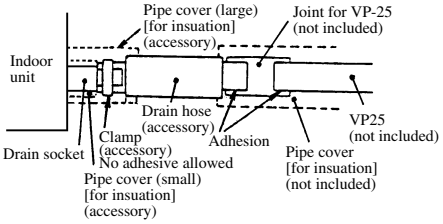
1) Calculate air capacity and the outside static pressure to select the duct's length and shape, and blow outlet.
   Caution
   Take care that the outside atatic pressure does not exceed 30 Pa. The unit has condensation owing to the decrease in air capacity, possibly causing the ceiling and household goods to become wet.
2) The indoor unit is not provided with an air filter. Assemble it into the suction grill for which cleaning is easy.
3) Make the duct the shortest in length.

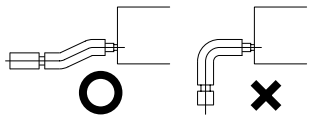


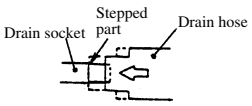
4) Bend a lot less abruptly. (Make the bend radius a lot larger.)
5) When connecting the indoor unit to the duct flange of the blow outlet, attach the insulation material to the fixed portion to protect it from condensation.
6) Conduct the duct work before ceiling attachment.
7) Make sure to keep the suction duct warm to protect it from condensation.
8) Install the blowout hole where air can flow all over the room.
9) Make sure to install the inspection opening in the ceiling. It is needed for the maintenance of electrical parts, the motor and other parts.

(d) Drain Piping

1) Glue the drain hose supplied as an accessory and a VP-25 joint before lifting the unit.
2) The drain hose is to provide a buffer to absorb a slight dislocation of the unit or the drain piping during installation work. If it is subject to abuse such as being bent or pulled deliberately, it may break, which will result in a water leak.
3) Care must be taken so as not to allow an adhesive to run into the drain hose. When it is hardened, it can cause a breakage of a flexible part, if the flexible part receives stress.
4) Use VP-25 general-purpose hard PVC pipes for drain piping.
5) Insert the drain hose supplied as an accessory (soft PVC end) to the stepped part of the unit's drain socket and then fasten it with the clamp also supplied as an accessory.
6) Adhesive must not be used.
   a) Glue a VP-25 joint (to be procured locally) to joint it with the drain hose (hard PVC end) and then glue a VP-25 (to be procured locally) to the joint.







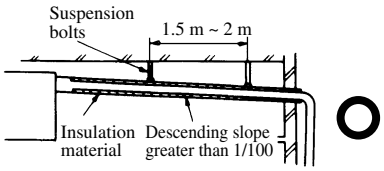
b) Give the drain piping a descending grade (1/50-1/100) and never create a bump to go over or a trap.

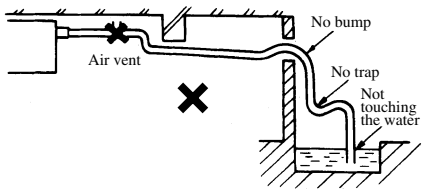
c) In connecting drain pipes, care must be taken so as not to apply force to the unit side piping and fix the pipe at a point as close to the unit as possible.

d) Do not create an air vent under any circumstances.

e) When drain piping is implemented for more than one unit, provide a collecting main about 100 mm below the units' drain outlets from which it collects drain. Use a VP-30 or larger pipe for a collecting main.

f) Do not fail to provide heat insulation at the following two points because they can cause dew condensation and a resultant water leak.

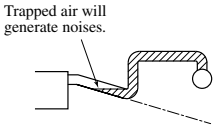




7) Drain socket

After a drain test is completed, apply a pipe cover (small: accessory) onto the drain socket, cover the pipe cover (small), the clamp and part of the drain hose with a pipe cover (large: accessory) and wrap it with a tape completely without leaving any gaps.

(Cut pipe covers into appropriate shapes)

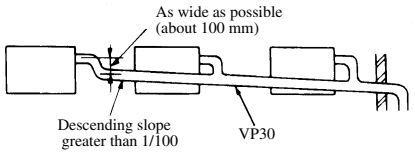


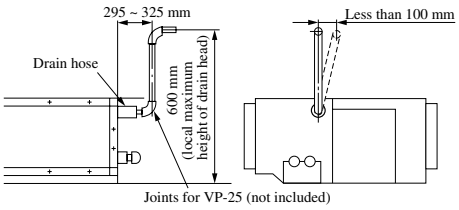
8) Hard PVC pipes laid indoor

a) Since a drain pipe outlet can be raised up to 600 mm from the ceiling, use elbows, etc. to install drain pipes, it there are obstacles preventing normal drain pipe arrangement. When the drain pipe is raised at a point far from a unit, it can cause an overflow due to a back flow of drain upon stoppage, so arrange piping to keep the dimensions specified in the illustration shown on the left.

b) Install the drain pipe outlet where no odor is likely to be generated.

c) Do not lead the drain pipe into a ditch where the generation of harmful gas such as sulfuric gas or flammable gas is expected. A failure to observe this instruction may cause such harmful or flammable gas to flow into the room.





(e) Drain test (Perform the drain test after the electrical wiring work has been finished.)

- Check that water is draining thoroughly during the test run, and that there are no water leaks from the joints.
- The test has to be performed even if the unit is installed in a season when the unit is used for heating.
- In a new house, perform the test before the ceiling is fitted.

Forced drain pump operation

◆ Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

◆ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation

① Press the TEST button for three seconds or longer.

The display will change from "◆ SELECT ITEM"→ " ○ SET"→ " TEST RUN ▼ "

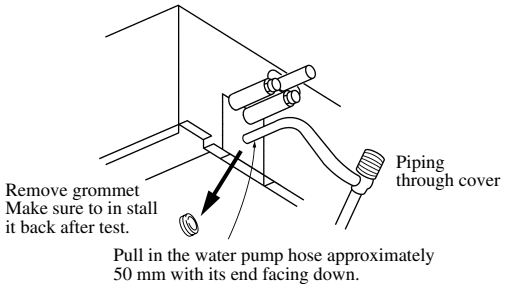
② Press the ▼ button once while " TEST RUN ▼ " is displayed, and cause [DRAIN PUMP ◆" to be displayed.

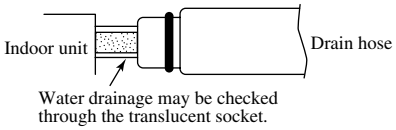
③ When the SET button is pressed, a drain pump operation will start.

Display: "DRAIN PUMP RUN"→ " ○ → STOP"

2. To cancel a drain pump operation.

① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
The air conditioning system will become OFF.





1) Remove the piping through cover, and using a water pump, pour about 1000cc of water, from the position shown in the left figure.
   Caution
   When pour water, be sure to perform the drain pump forced operation.
2) Check the drain-out section (transparent section) for normal flow of drainage.
3) Take off the drain plug to release the water. After water release has been confirmed, replace the drain plug as it was.
   ※ Be careful not to get splashed when pulling the drain plug.
4) After the drain test, thoroughly insulate the drain pipe, up to the indoor unit.

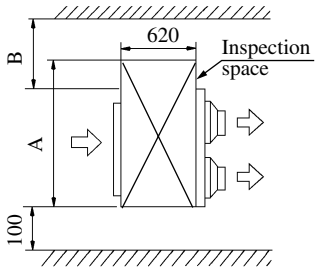
(7) Satellite ducted type (FDUM)

(a) Selection of installation location

1) Avoid installation and use at those places listed below.
   a) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
      Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.
   b) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is gnerated or remains. Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.
   c) Places adjacent to equipment generating electromagnetic waves or high-frequency waves such as in hospitals. Generated noise may cause malfunctioning of the controller.

2) Select places for installation satisfying the following conditions and, at the same time, obtain the consent on the part of your client user,.
   a) Places where chilled or heated air circulates freely. When the installation height exceeds 3m, warmed air stays close to the ceiling. In such cases, suggest your client users to install air circulators.
   b) Places where perfect drainage can be prepared and sufficient drainage gradient is available.
   c) Places free from air disturbances to the return air port and supply hole of the indoor unit, places where the fire alarm may not malfunction to short circuit.
   d) Places with the environmental dew-point temperature is lower than 28˚C and the relative humidity is less than 80%.
      (When installing at a place under a high humidity environment, pay sufficient attention to prevention of dewing such as thermally insulating the unit properly.)

3) Check if the selected place for installation is rigid enough to stand the weight of thew unit.
   Otherwise, apply reinforcement using boards and beams before starting the installation work.



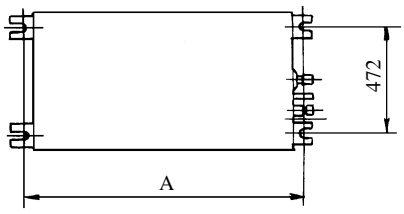
Unit : mm

Models \ Mark	A	B
FDUM36, 45, 56	1100	630
FDUM71, 90	1300	830
FDUM112, 140	1720	1250

(b) Suspension

Be sure to observe the finished length of the suspension bolts given below.

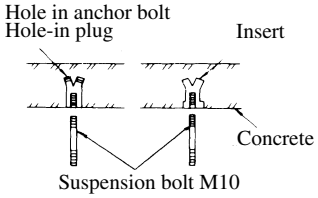
Unit : mm

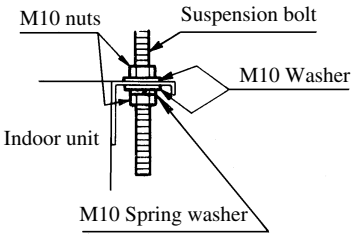


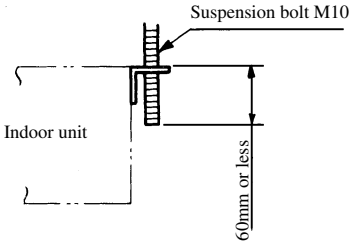
Models \ Mark	A
FDUM36, 45, 56	786
FDUM71, 90	986
FDUM112, 140	1406

1) Fixing the suspension bolt (customer ordered parts M10)

Securely fix the suspension bolt as illustrated below or in another way.



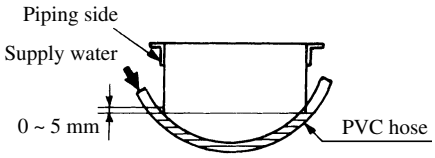




2) Adjusting the unit's levelness

a) Adjust the out-levelness using a level vial or by the following method.

- Make adjustment so that the relation between the lower surface of the indoor unit proper and water level in the hose becomes given below.



Bring the piping side slightly lower

b) Unless the levelness is adjusted properly, the malfunction of the float switch will occur.

3) Blower fan tap switch

The following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

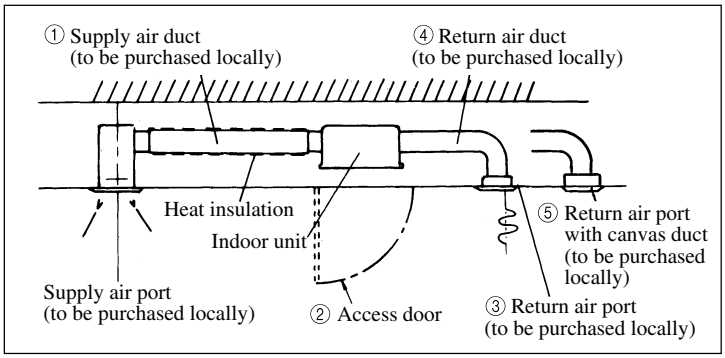
① Set SW9-4 provided on the indoor unit PCB to ON.

② By means of function setting from the remote control unit, set the setting Ⓒ of "I/U FUNCTION ▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap) as shown below.

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

For the details of operating procedures, please refer to the installation manual of your remote control unit.

(c) Duct installation



① Supply air duct

Same as FDR series. Refer to page 221.

② Access door

Access door must be provided without fail.

● Dimensions of access door and service space

(See exterior dimensions in page 58 to 60.)

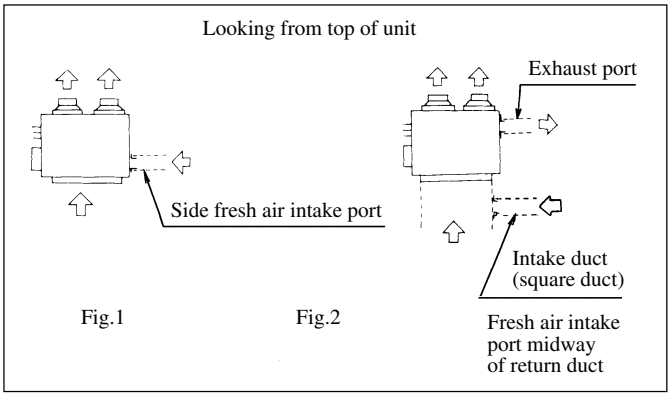
③ Return air port

An air filter is not included in the indoor unit. Use the return air port with air filter.

④ Return air duct: Use square duct.

⑤ Return air port with canvas duct

1) Connection of intake and exhaust ducts.



2) Duct connecting position.

< Fresh air intake >

a) Use side air intake port.

b) In case of simultaneous intake and exhaust, the side air intake port cannot be used, therefore, take air from the midway air intake port along the intake duct.

< Exhaust > Make sure to use suction as well.

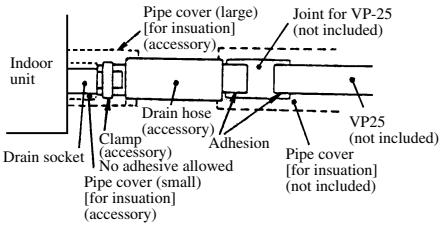
c) Use a side exhaust port.

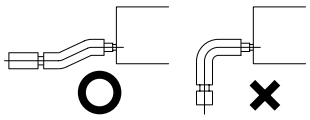
3) Duct connection

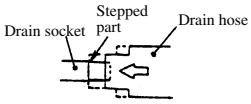
Use intake and exhaust duct flange of separately sold (for connection of ø125mm round duct) to connect ø125mm round duct. The duct clamped by bands must be thermally insulated to prevent dew condensation.

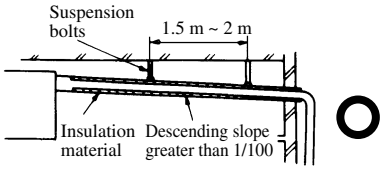
(d) Drain Piping

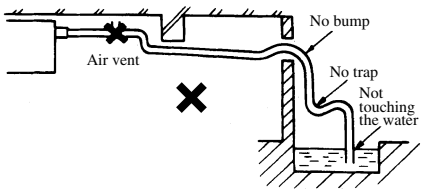
1) Glue the drain hose supplied as an accessory and a VP-25 joint before lifting the unit.
2) The drain hose is to provide a buffer to absorb a slight dislocation of the unit or the drain piping during installation work. If it is subject to abuse such as being bent or pulled deliberately, it may break, which will result in a water leak.
3) Care must be taken so as not to allow an adhesive to run into the drain hose. When it is hardened, it can cause a breakage of a flexible part, if the flexible part receives stress.
4) Use VP-25 general-purpose hard PVC pipes for drain piping.
5) Insert the drain hose supplied as an accessory (soft PVC end) to the stepped part of the unit's drain socket and then fasten it with the clamp also supplied as an accessory.
6) Adhesive must not be used.
   a) Glue a VP-25 joint (to be procured locally) to joint it with the drain hose (hard PVC end) and then glue a VP-25 (to be procured locally) to the joint.
   b) Give the drain piping a descending grade (1/50-1/100) and never create a bump to go over or a trap.
   c) In connecting drain pipes, care must be taken so as not to apply force to the unit side piping and fix the pipe at a point as close to the unit as possible.
   d) Do not create an air vent under any circumstances.
   e) When drain piping is implemented for more than one unit, provide a collecting main about 100 mm below the units' drain outlets from which it collects drain. Use a VP-30 or larger pipe for a collecting main.
   f) Do not fail to provide heat insulation at the following two points because they can cause dew condensation and a resultant water leak.
7) Drain socket
   After a drain test is completed, apply a pipe cover (small: accessory) onto the drain socket, cover the pipe cover (small), the clamp and part of the drain hose with a pipe cover (large: accessory) and wrap it with a tape completely without leaving any gaps.
   (Cut pipe covers into appropriate shapes)
8) Hard PVC pipes laid indoor
   a) Since a drain pipe outlet can be raised up to 600 mm from the ceiling, use elbows, etc. to install drain pipes, it there are obstacles preventing normal drain pipe arrangement. When the drain pipe is raised at a point far from a unit, it can cause an overflow due to a back flow of drain upon stoppage, so arrange piping to keep the dimensions specified in the illustration shown on the left.
   b) Install the drain pipe outlet where no odor is likely to be generated.
   c) Do not lead the drain pipe into a ditch where the generation of harmful gas such as sulfuric gas or flammable gas is expected. A failure to observe this instruction may cause such harmful or flammable gas to flow into the room.

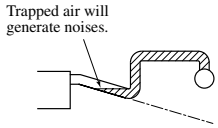


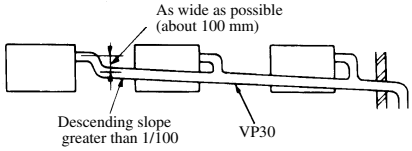


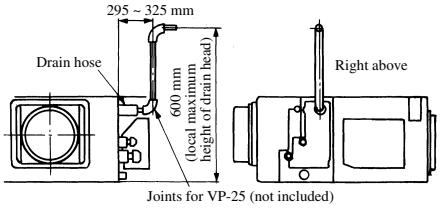










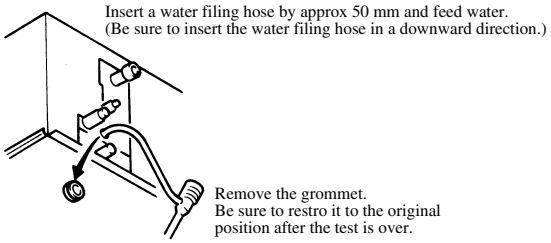


9) Drainage test

a) During trial operation, make sure that drainage is properly execued and check that leakage is not found at connections.

b) Be sure to carry out a drainage test when installing the system during a heating season.

c) When installing the system in a building under construction, carry out the drainage test before ceiling tiles are installed.



① Supply approx 1000cc of water through the outlet of the unit using a feed water pump.

② Make sure that drainage is proceeding properly at the see-through outlet of the unit.

* Also confirm the revolving sound of the condensate motor when checking the drainage.

③ Then remove the drain plug at lower section of the unit to drain water off. After making sure water is not left, restore the drain plug to the original position.

Forced drain pump operation

◆ Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

◆ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation

   ① Press the TEST button for three seconds or longer.

   The display will change from "◆ SELECT ITEM"→ " ○ SET"→ "✳ TEST RUN ▼"

   ② Press the ▼ button once while " ✳ TEST RUN ▼" is displayed, and cause "DRAIN PUMP ◆" to be displayed.

   ③ When the SET button is pressed, a drain pump operation will start.

   Display: "DRAIN PUMP RUN"→ " ○ → STOP"

2. To cancel a drain pump operation.

   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.

   The air conditioning system will become OFF.

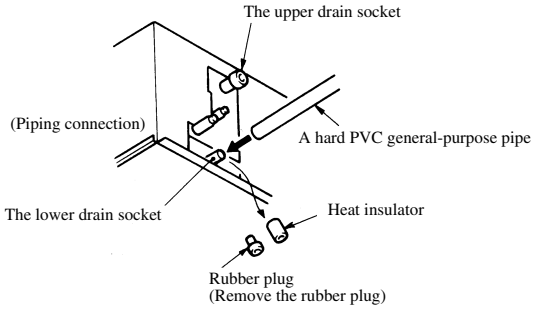
10) Drainage from the lower drain socket

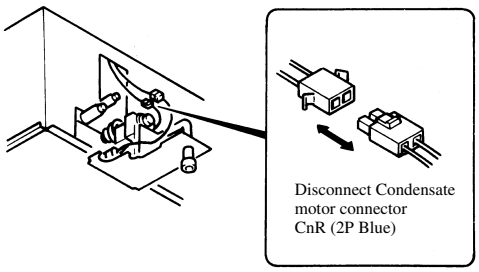
Only if the drain pipe can be installed in a downhill grade (1/50-1/100), the lower drain socket can be used for connecting to the drain pipe as illustrated.

(Disconnect the connector for the drain motor)

As shown in the sketch to the right, disconnect the drain motor connector CnR (blue color coding).

If the system is started with this connector connected as is, drain water is discharged out of the upper drain socket causing a heavy water lekage.





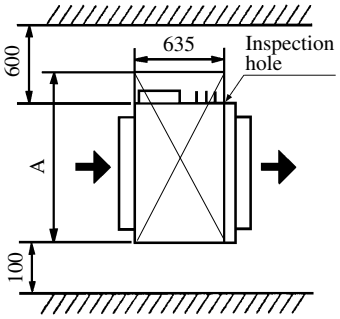
(8) Ceiling mounted duct type (FDUR)

(a) Selection of installation location

1) Avoid installation and use at those places listed below.
   a) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
      Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.
   b) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is gnerated or remains. Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.
   c) Places adjacent to equipment generating electromagnetic waves or high-frequency waves such as in hospitals. Generated noise may cause malfunctioning of the controller.

2) Select places for installation satisfying the following conditions and, at the same time, obtain the consent on the part of your client user,.
   a) Places where chilled or heated air circulates freely. When the installation height exceeds 3m, warmed air stays close to the ceiling. In such cases, suggest your client users to install air circulators.
   b) Places where perfect drainage can be prepared and sufficient drainage gradient is available.
   c) Places free from air disturbances to the return air port and supply hole of the indoor unit, places where the fire alarm may not malfunction to short circuit.
   d) Places with the environmental dew-point temperature is lower than 28˚C and the relative humidity is less than 80%.
      (When installing at a place under a high humidity environment, pay sufficient attention to prevention of dewing such as thermally insulating the unit properly.)

3) Check if the selected place for installation is rigid enough to stand the weight of thew unit.
   Otherwise, apply reinforcement using boards and beams before starting the installation work.

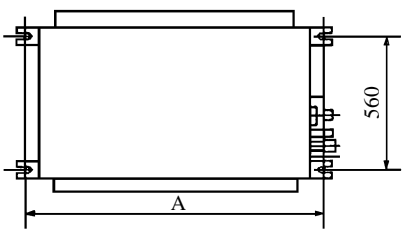


Unit : mm

Models \ Mark	A
FDUR45, 56, 71	1200
FDUR90, 112, 140	1720

(b) Suspension

Be sure to observe the finished length of the suspension bolts given below.

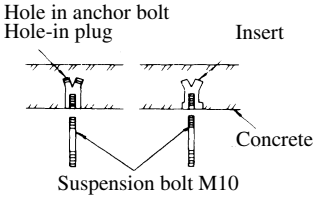


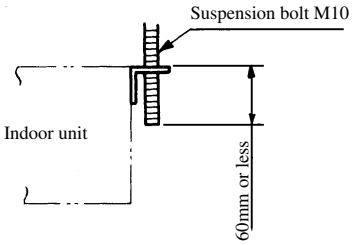
Unit : mm

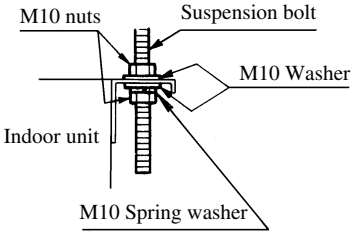
Models \ Mark	A
FDUR45, 56, 71	886
FDUR90, 112, 140	1406

1) Fixing the suspension bolt (customer ordered parts M10)

Securely fix the suspension bolt as illustrated below or in another way.





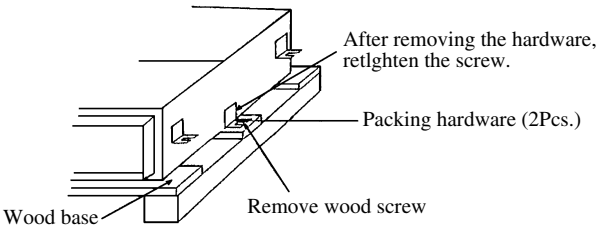


(c) Installation of indoor unit

Packing hardware

Two pieces of packing handware are uesd.

Discard them after unpacking.



- Fix the indoor unit to the hanger bolts.

  If required, it is possible to suspend the unit to the beam,etc.

  Directly by use of the bolts without using the hanger bolts.

- When installing the unit, heed must be taken that the side touching the wood frame is the top surface of the unit.

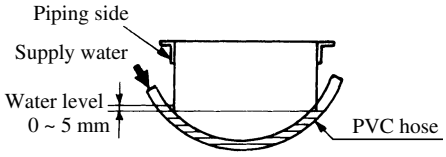
Note

When the dimensions of indoor unit and ceiling holes does not match, it can be adjusted with the slot holes of hanging bracket.

1) Adjusting the unit's levelness

a) Adjust the out-levelness using a level vial or by the following method.

- Make adjustment so that the relation between the lower surface of the unit proper and water level in the hose becomes given below.



Bring the piping side slightly lower

b) Unless the levelness is adjusted properly, the malfunction of the float switch will occur.

2) Blower fan tap switch

The following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

② By means of function setting from the remote control unit, set the setting ⓒ of "I/U FUNCTION ▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap) as shown below.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

Function number Ⓐ	Function description Ⓑ	Setting ⓒ
01	Hi CEILING SET	Hi CEILING 1

For the details of operating procedures, please refer to the installation manual of your remote control unit.

Unit : Pa

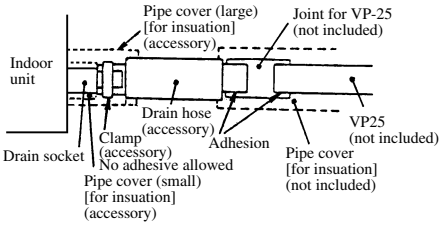
Static Pressure / Models	Standard tap	High tap
FDUR45, 56, 71	50	85
FDUR90, 112, 140	50	130

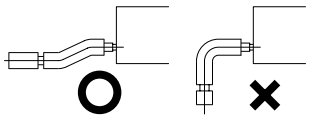
⚠ CAUTION

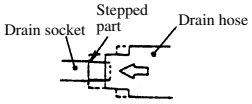
- Taps should not be used under static pressure outside the unit mentioned above. Dew condensation may occur with the unit and wet the ceiling or furniture.
- Do not use under static pressure outside the unit of 50Pa or less. Water drops may be blown from the diffuser outlet of the unit and wet the ceiling or furniture.

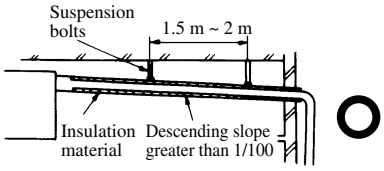
(d) Drain Piping

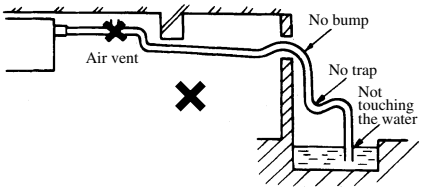
1) Glue the drain hose supplied as an accessory and a VP-25 joint before lifting the unit.
2) The drain hose is to provide a buffer to absorb a slight dislocation of the unit or the drain piping during installation work. If it is subject to abuse such as being bent or pulled deliberately, it may break, which will result in a water leak.
3) Care must be taken so as not to allow an adhesive to run into the drain hose. When it is hardened, it can cause a breakage of a flexible part, if the flexible part receives stress.
4) Use VP-25 general-purpose hard PVC pipes for drain piping.
5) Insert the drain hose supplied as an accessory (soft PVC end) to the stepped part of the unit's drain socket and then fasten it with the clamp also supplied as an accessory.
6) Adhesive must not be used.
   a) Glue a VP-25 joint (to be procured locally) to joint it with the drain hose (hard PVC end) and then glue a VP-25 (to be procured locally) to the joint.
   b) Give the drain piping a descending grade (1/50-1/100) and never create a bump to go over or a trap.
   c) In connecting drain pipes, care must be taken so as not to apply force to the unit side piping and fix the pipe at a point as close to the unit as possible.
   d) Do not create an air vent under any circumstances.
   e) When drain piping is implemented for more than one unit, provide a collecting main about 100 mm below the units' drain outlets from which it collects drain. Use a VP-30 or larger pipe for a collecting main.
   f) Do not fail to provide heat insulation at the following two points because they can cause dew condensation and a resultant water leak.
7) Drain socket
   After a drain test is completed, apply a pipe cover (small: accessory) onto the drain socket, cover the pipe cover (small), the clamp and part of the drain hose with a pipe cover (large: accessory) and wrap it with a tape completely without leaving any gaps.
   (Cut pipe covers into appropriate shapes)
8) Hard PVC pipes laid indoor
   a) Since a drain pipe outlet can be raised up to 600 mm from the ceiling, use elbows, etc. to install drain pipes, it there are obstacles preventing normal drain pipe arrangement. When the drain pipe is raised at a point far from a unit, it can cause an overflow due to a back flow of drain upon stoppage, so arrange piping to keep the dimensions specified in the illustration shown on the left.
   b) Install the drain pipe outlet where no odor is likely to be generated.
   c) Do not lead the drain pipe into a ditch where the generation of harmful gas such as sulfuric gas or flammable gas is expected. A failure to observe this instruction may cause such harmful or flammable gas to flow into the room.

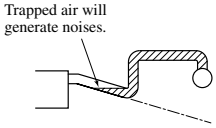


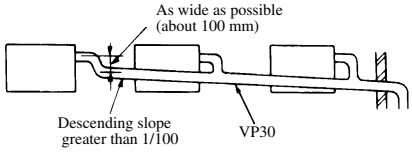


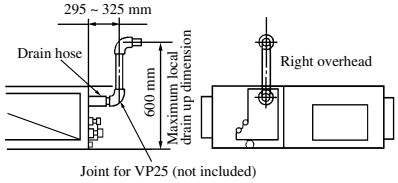












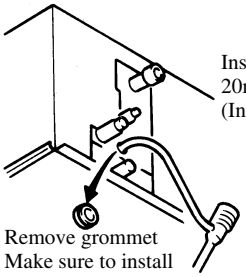
9) Drainage test

1) Conduct a drainage test after completion of the electrical work.
2) During the trial, make sure that drain flows properly through the piping and that no water leaks from connections.
3) In case of a new building, conduct the test before it is furnished with the ceiling.
4) Be sure to conduct this test even when the unit is installed in the heating season.

Procedures

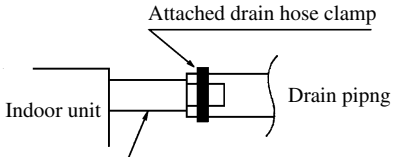
① Supply about 1000 cc of water to the unit through ghe air outlet by using a feed water pump.

② Check the drain while cooling operation.

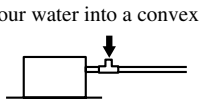


Insert water supply hose for 20mm ~ 30mm to suply water. (Insert hose facing toward bottom.)

Remove grommet
Make sure to install it back after test.



Drain situation can be checked with transparent socket.



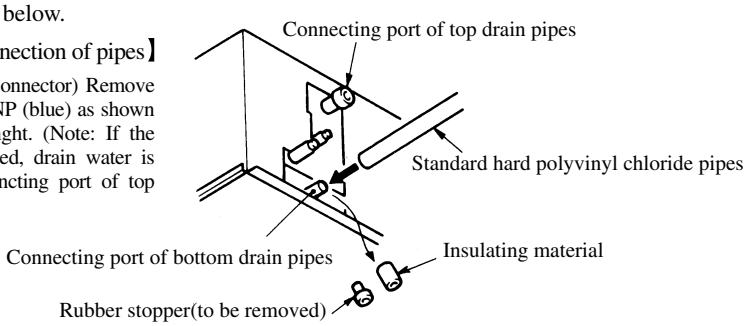
(If the electrical work has not been completed, connect a convex joint in the drain pipe connection to provide a water inlet.
Then, check if water leaks from the piping system and that drain flows through the drain pipe normally.)

10) Outline of bottom drain piping work

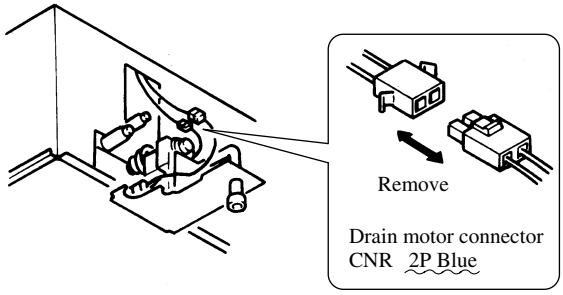
a) If the bottom drain piping can be done with a descending gradient (1/50-1/100), it is possible to connect the pipes as shown in the drawing below.

【Connection of pipes】

(Removing drain motor connector) Remove drain motor connector CNP (blue) as shown in the drawing on the nght. (Note: If the connector is left connected, drain water is discharged from the conncting port of top pipes, causing leakage.)



b) Do not use acetone-based adhesives to connect to the drain socket.



Forced drain pump operation

◆ Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

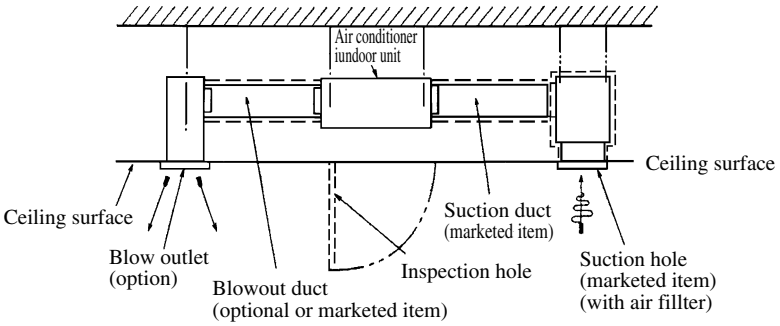
(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

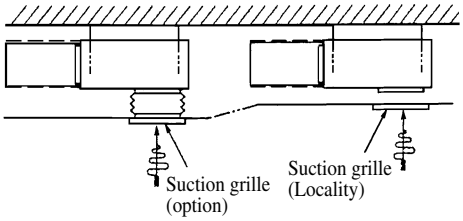
◆ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

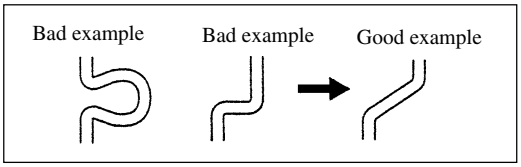
1. To start a forced drain pump operation
   ① Press the TEST button for three seconds or longer.
   The display will change from "◆ SELECT ITEM"→ " ○ SET]→ " ✳ TEST RUN ▼ "
   ② Press the ▼ button once while " ✳ TEST RUN ▼" is displayed, and cause "DRAIN PUMP ◆" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display: "DRAIN PUMP RUN"→ " ○ → STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

(e) Duct work



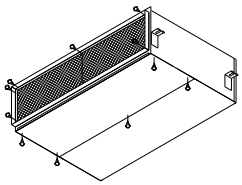


1) A corrugated board (for preventing sputtering) is attached to the main body of the air conditioner (on the outlet port). Do not remove it until connecting the duct.
   a) An air filter is provided on the main body of the air conditioner (on the inlet port). Remove it when connecting the duct on the inlet port.
2) Blowout duct
   a) Reduce the length of duct as much as possible.
   b) Reduce the number of bends as much as possible.
   c) (Corner R should be as larger as possible.)

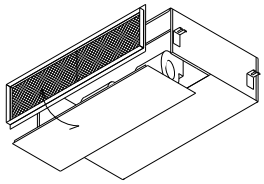


   d) Conduct the duct installation work before finishing the ceiling.

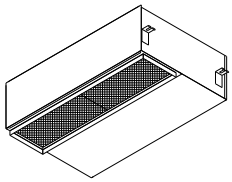
3) Inlet port
   a) When shipped, the inlet port lies on the back.
   b) When connecting the duct to the inlet port, remove the air filter fitted to the inlet port.
   c) When placing the inlet port to carry out suction from the bottom side, use the following procedure to replace the suction duct joint and the bottom plate.
4) Make sure to insulate the duct to prevent dewing on it.
5) Location and form of blow outlet should be selected so that air from the outlet will be distributed all over the room, and equipped with a device to control air volume.
6) Make sure provide an inspection hole on the ceiling. It is indispensable to service electric equipment, motor, functional components and cleaning of heat exchanger.



● Remove the screws which fasten the bottom plate and the duct joiht on the inlet port side of the unit.

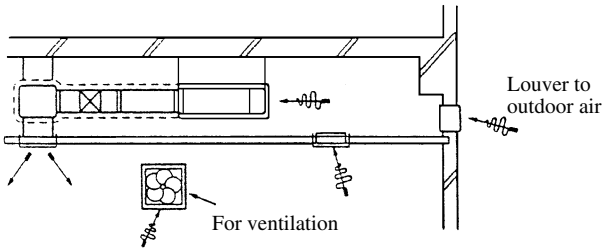


● Replace the removed bottom plate and duct joint



● Fit the duct joint with a screw, fit the bottom plate.

Bad example of duct work

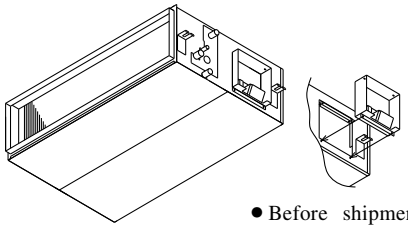


7) If a duct is not provided at the suction side but it is substituted with the space over the ceiling, humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing against the out door air louver, weather (rainy day) and others.
   a) Moisture in air is likely to condense over the external plates of the unit and to drip on the ceiling.
      Unit should be operated under the conditions as listed in the above table and within the limitation of wind volume.
      When the building is a concrete structure, especially immediately after the construction, humidity tends to rise even if the space over the ceiling is not substituted in place of a duct.
      In such occasion, it is necessary to insulate the entire unit with glass wool (25mm). (Use a wire net or equivalent to hold the glass wool in place.)
   b) It may run out the allowable limit of unit operation (Example: When outdoor air temperature is 35˚C DB, suction air temperature is 27˚C WB) and it could result in such troubles as compressor overload, etc..
   c) There is a possibillty that the blow air volume may exceed the allowable range of operation due to the capacity of ventilation fan or strength of wind blowing against external air louver so that drainage from be heat exchanger may fail to reach the drain pan but leak outside (e. g. drip on to the ceiling) with consequential water leakage in the room.

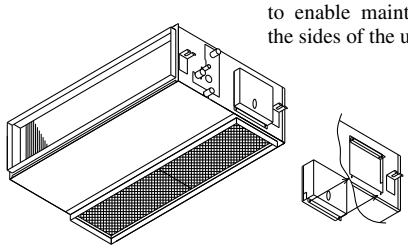
(f) Control box (Only case of FDUR90, 112, 140)

- During bottom side suction, the orientation of the control box can be changed to allow the control box to be maintained from the inlet port.

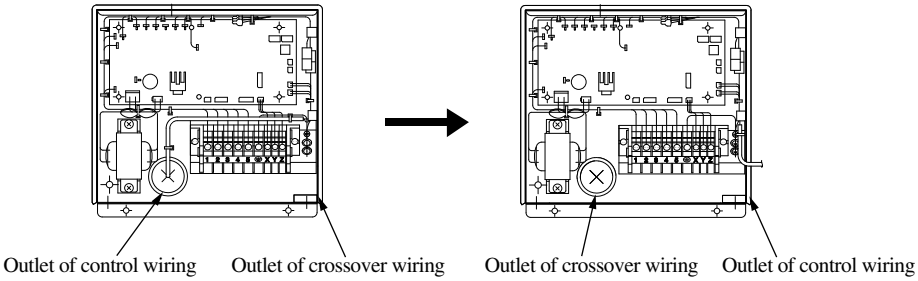
1) Remove the bottom plate (on the inlet port side), and all wiring connectors from the control box.



- Before shipment from the plant, arrangements are made to enable maintenance from the sides of the unit.



2) Remove the three screws that fasten the cabinet inside the control box.
3) Pull the control box toward the outside of the unit.
4) Change the ejection of the wiring inside the control box.
5) Fit the control box from the inside of the unit.
6) Fit the three screws that fasten the cabinet.
7) Correctly connect all wiring connectors.



(9) Ceiling suspension type (FDE)

(a) Selection of installation location

1) A place where good air circulation and delivery can be obtained.

Cold air throw

Unit : m

Models	FDE36, 45	FDE56, 71	FDE112, 140
Air throw	7.5	8	9

Conditions

(1) Installation height: 2.4 ~ 3.0 m above the floor

(2) Fan speed: Hi

(3) Location: Free space without obstacles

(4) Distance of reach indicates the horizontal distance after the wind touched down the floor.

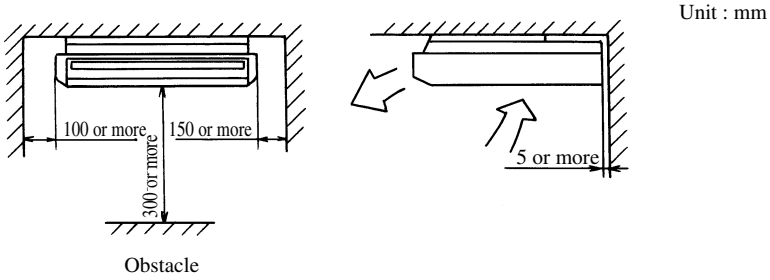
(5) Air velocity at the throw: 0.5 (m/sec.)

2) A place where ceiling has enough strength to support the unit.
3) A place where there is no obstruction to the return air inlet and supply air outlet ports.
4) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.

5) A place where the space shown below may be secured.

Ceiling mouting installation

Unit : mm

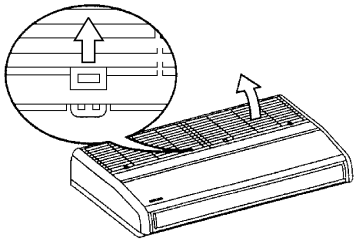


6) This unit uses a microcomputer as a control device. Therefore avoid installing the unit near the equipment that generates strong electromagnetic waves and noise.

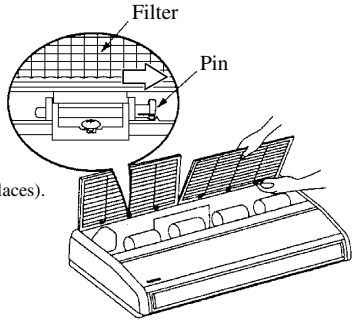
(b) Installation preparation

1) Remove the air inlet grille.

Slide the stoppers (4 places).

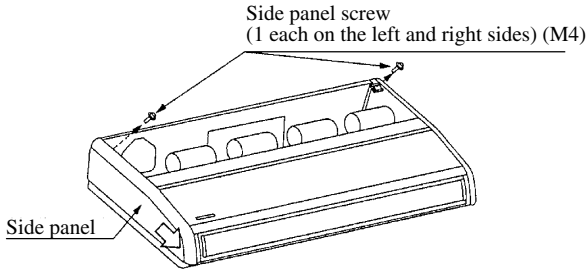


Take out the pins (4 or 6 places).



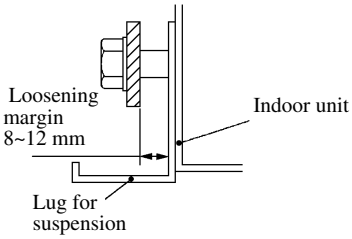
2) Remove the side panels.

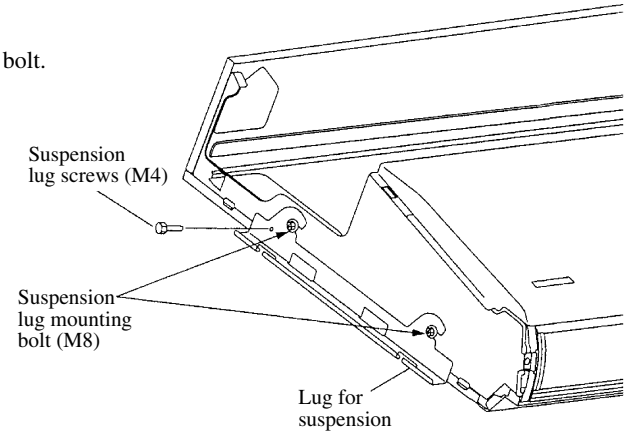
Take out the screws, then slide the side panels in the arrow direction to remove them.



3) Remove the suspension lug.

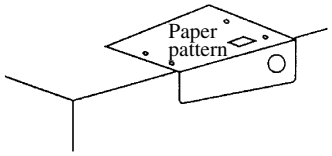
Take out the screws, then loosen the installation bolt.



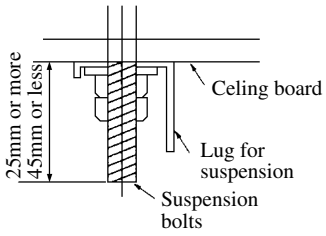


4) Suspension Bolt Position

a) Using the paper pattern supplied as an accessory as a criterion, select suspension bolt positions and piping hole positions, then install the suspension bolts and make holes for piping. After positioning, remove the paper pattern.

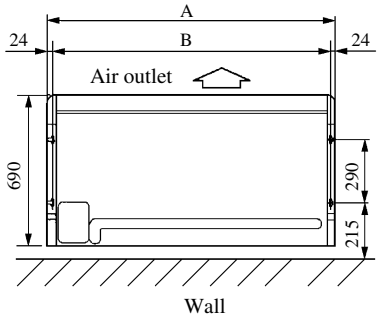


b) Keep strictly to the suspension bolt lengths specified below.



Unit : mm

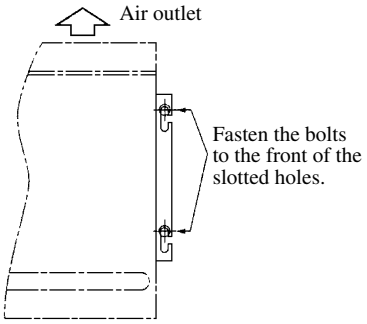
Model	A	B
FDE 36, 45	1070	1022
FDE 56, 71	1320	1272
FDE 112,140	1620	1572

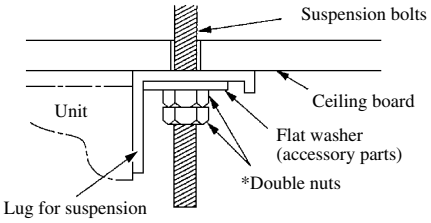


(c) Installation

1) Fasten the suspension lugs to the suspension bolts.

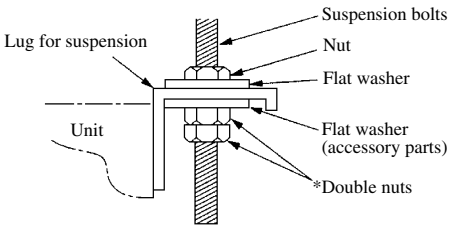
<If there is ceiling material>





*Fasten it securely with double nuts.

<If there is no ceiling material>

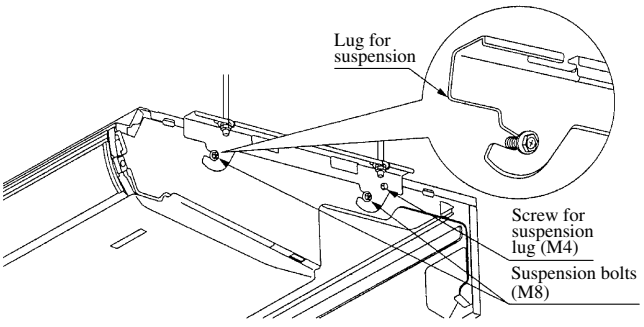


2) Attach the unit to the suspension lugs.

① Slide the unit onto the suspension lugs from the front, hanging it on the bolts.

② Fasten the unit securely on the left and right sides with 4 suspension bolts (M8).

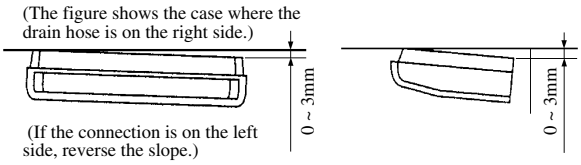
③ Tighten the 2 screws (M4) on the left and right sides.



⚠ After sliding the side panels on from the front to rear, fasten them securely with the screws.

3) IN order to make it easier for water to drain out. install the unit so that the water drain side slopes downward.

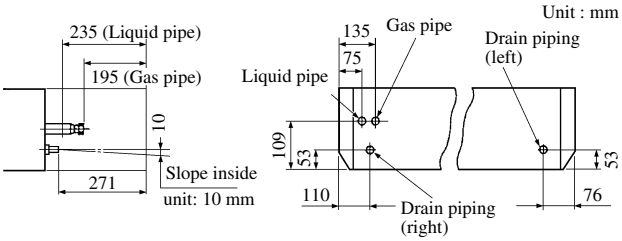
● Left-right direction **● Front-rear direction**



⚠ If the slope is reversed, there is danger of water leaking out.

(c) Refrigerant Piping

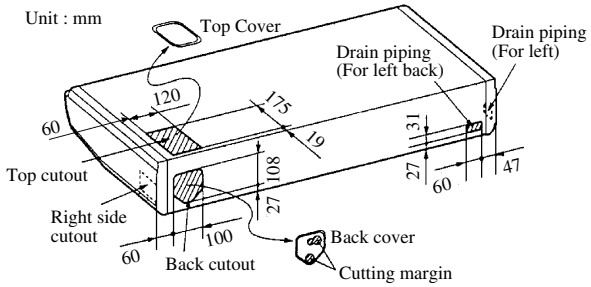
1) Piping Position



2) Piping Connection Position

Piping can be connection from 3 different directions. Remove the cutout from hole where the piping will be connected using side cutters or similar tool. Cut a hole for the piping connection in the back cover according to the cutting margin shown. Cut a hole in the ceiling side in accordance with the position of the piping. Also, after the piping is installed, seal the space around the piping with putty, etc. to keep dust from getting inside the unit.

(In order to prevent damage to wires from the edges, be sure to use the back and top covers.)



(d) Drain Piping

1) Drain piping can be connected from the back, right and left sides.

2) When installing drain piping, be sure to use the insulating material supplied for the drain hose and drain hose clamp.

a) Connect the drain hose fully all the way to the base of the fitting.

b) Fasten the hose securely with the drain hose clamp.

c) Keep strictly within the lengths specified below for the suspension bolts.

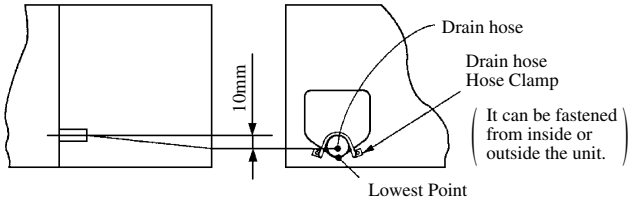
3) If drain piping is installed on the left side, change the rubber plug and insulating material (tubular) from the left side piping connection port to the right side.

⚠ Be careful that water doesn't pour out when the drain plug is removed.

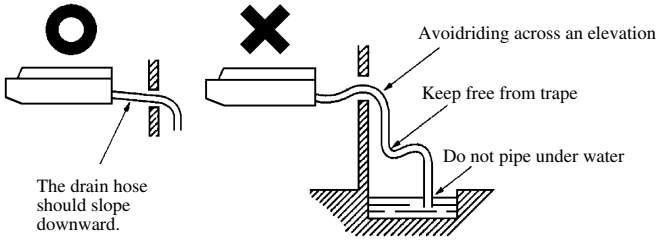
⚠WARNING

Use the fitting supplied with the unit to connect the drain hose, fastening it at the lowest point so that there is no slack, and establishing a 10 mm drain slope.

* Keep electrical wiring from running beneath the drain hose.



⚠ Be sure to fasten the drain hose down with a clamp.
There is danger of water overflowing the drain hose.

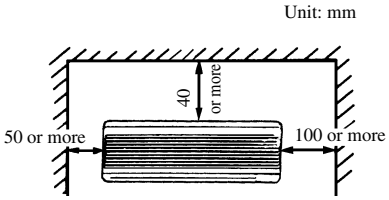


After piping has been installed, check to make sure water drains well and that there is no overflow.

(10) Wall mounted type (FDK)

Models FDKA22~56KXE4

(a) Selection of installation location



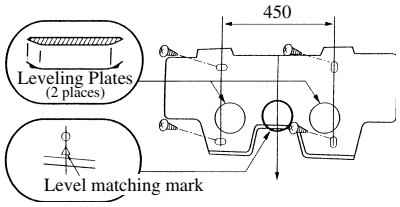
1) Select the installation location that meets the following conditions and obtain the customer's consent.
   a) Location where cold and warm air spread all over the room
   b) Location where piping and wiring to the outdoors can easily be laid down.
   c) Location where the drain can be discharged completely.
   d) Location where the wall to mount the unit is rigid.
   e) Location where there is no wind obstruction to the return air and supply air grills.
   f) Location not exposed to direct sunshine.
   g) Avoid the location exposed to oil splash or vapor.
   h) Avoid the location near to the machine emitting high-frequency radio wave.
   i) Avoid the location where the receiver of remote control is subject to strong illumination.
   j) Select the location where the unit can securely be operated by the wireless remote controller referring to the Article “Effective distance of wireless remote controller” indicated at the backside.
   k) Secure the space for inspection and maintenance work.

(b) Attaching of mounting plate

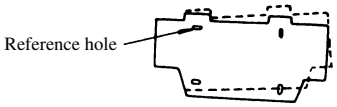
1) The indoor unit weighs approx, FDKN22~56 model : 12kg. Therefore, check whether the portion to install the unit can bear the weight of unit. If it seems to be danger, reinforce the portion by a plate or a beam before installing the unit. It is not allowed to install the unit directly on the wall. Whenever you install the unit, use the attached mounting plate.

2) Find structural members (Intermediate pillar, etc.) suitable for mounting the unit, then install the unit firmly while checking levelness.

Unit: mm



3) Adjust the level of mounting plate under the condition that four screws are tightened temporarily.



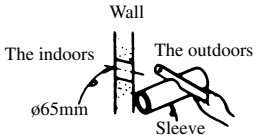
4) Turn the mounting plate around the reference hole to adjust the levelness.

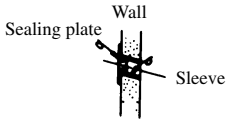
⚠WARNING

Install the unit where it can bear the weight with sufficient strength margin. In the case of insufficient strength or insufficient installation work, the unit may fall and cause injury.

(c) Procedure for making hole on the wall

- Make a downgrade (5°) from the indoors toward the outdoors.

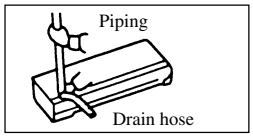




(d) Forming of piping and drain hose

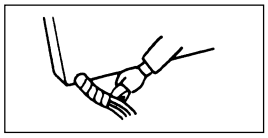
1) Rear take out case

a) Forming of piping



- Hold the root portion of piping, change the direction then expand and make forming.

b) Tape winding

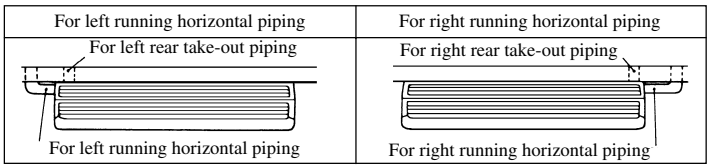


- Wind the tape on the portion which passes through the hole on the wall.
- Always make taping on the wiring which crosses with the piping, if any.

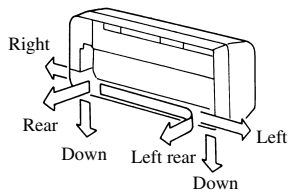
Note(1) After forming of piping and before tape winding, confirm that the connecting wire is securely fixed to the terminal block.

2) Cautions for left take-out and rear take-out case

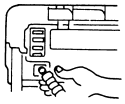
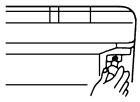
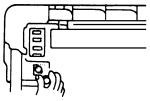
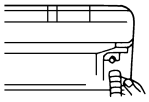
a) Looking down



b) The piping can be taken out from the rear, left, left rear, right and down.

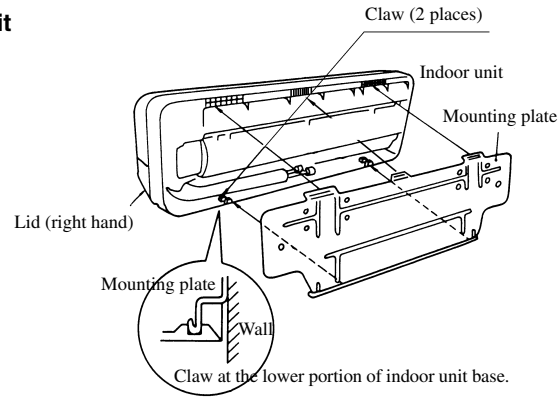


b) Procedure for changing drain hose

1. Remove the drain hose.	2. Remove the drain cap.	3. Insert the drain cap.	4. Connect the drain hose.
			
• Pull the drain hose off while turning the end around.	• Remove by hand or pliers.	• Insert the drain cap which was removed in procedure 2 securely using a hexagonal wrench, etc. Note(1) When it is not inserted securely, water leakage may occur.	• Push the end of the drain hose onto the fitting while turning it around. Note(1) When it is not inserted securely, water leakage may occur.

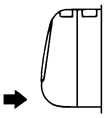
(e) Installation of unit

- To remove the unit from the mounting plate, remove the right and left lids then remove the claw at the lower portion of base.



Installation work procedure

(1) Hang the upper portion of indoor unit on the mounting plate.



(2) The indoor unit can be fixed with one action by pushing its lower portion slightly.

(f) Drain piping

1) Lay the drain piping with downgrade to facilitate flow of drain,and do not make a trap or chevron-shaped bend. (The drain piping can be taken out from the unit to the left, right, rear and down direction.)
2) Wrap the thermal insulator on the hard vinyl chloride pipe (VP-16) laid in the room.
3) Run the drain piping in a place where there is no fear of abnormal odors being generated at the end of the drain hose.
4) Do not run the drain piping directly into a sewer where sulfur-based poisonous or flammable gases are generated. There is danger of poisonous or flammable gases penetrating into the building through the drain piping.
5) Pour water into the drain pan below the heat exchanger to chech that water is drained outdoors.

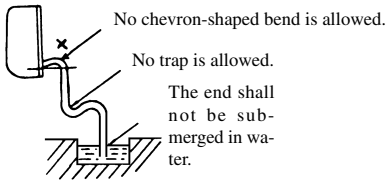
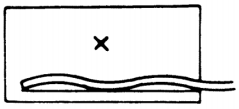


Illustration showing the end of drain hose

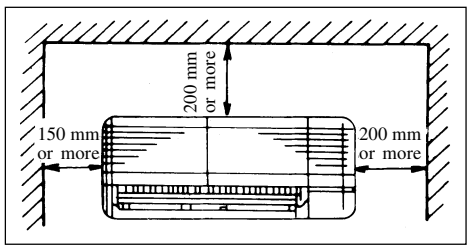


Model FDKA71KXE4

(a) Selection of installation location

1) Select the best position and direction depending on the shape of room and height of ceiling to ensure that the cooled or warmed air will be circulated sufficiently.

• Cold air throw	Unit : m
Item \ Models	FDK71
Air throw	8



[Conditions]

a) Fan speed: Hi

b) Location: Free space without obstacles

c) Distance of reach indicates the horizontal distance after the wind touched down the floor.

d) Air yelocity at the throw:0.5 (m/sec.)

2) Where there is no obstacle around the air inlet port or air outlet port.

3) Where a sufficient space can be reserved for the service of air filter and the attachment/removal of panels.

4) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).

Installation and use at such place will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.

5) Where pipes and wires can be arranged conveniently.

6) On the solid floor

7) Where the unit is not exposed directly to sun light.

8) Place where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains.

Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.

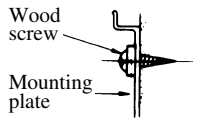
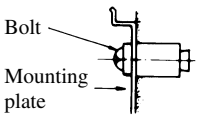
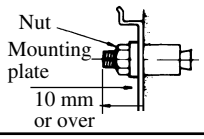
9) Where a complete draining can be assured.

10) Where a sufficient space can be reserved for service.

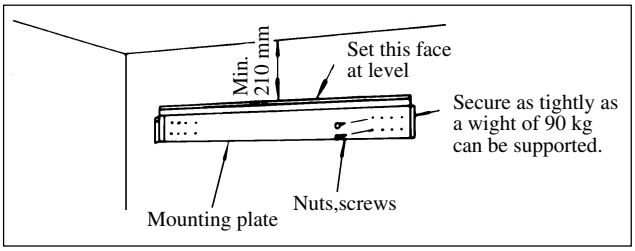
(b) Method to install the mounting plate

1) Indoor unit weighs about 20 kgs. Be sure to check closely the installation place and, if any risk is expected, provide a sufficient reinforcement with plates or beams. Indoor unit cannot be secured directly on the wall, etc.

Attached mounting plate must be used.

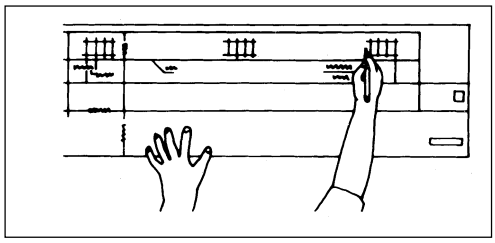
Wooden wall	Concrete wall (Use marketed anchors (M6)	
	Example of nut anchor	Example of bolt anchor
		

2) When installing a mounting plate on the wall, adjust it at level precisely and fix securely. Use the marketed anchor bolts (M6) when the wall is made of concrete.

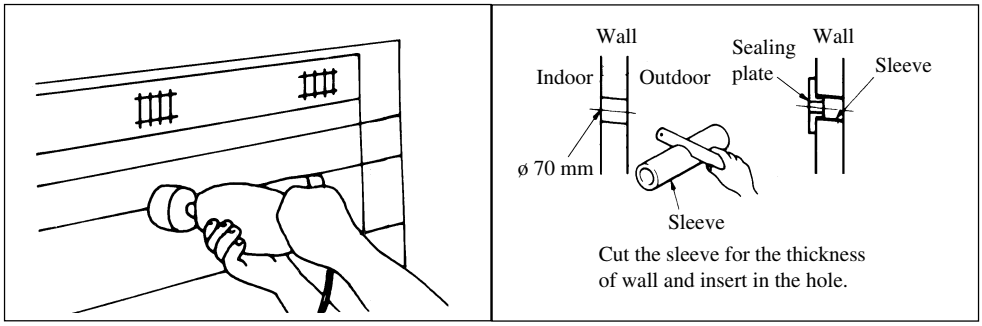


(c) Installation

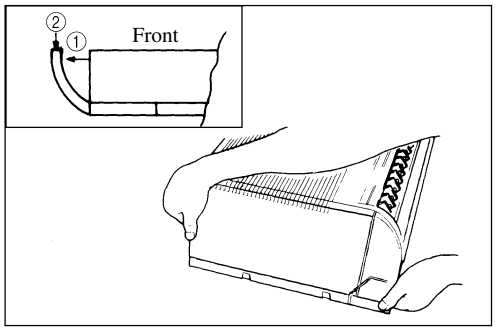
1) Use an attached pattern sheet and mark the position of screws to attach the mounting plate.



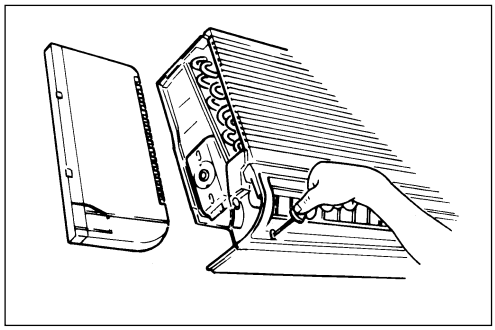
2) Determine the direction to lead the pipe and bore a through hole on the wall aligning with the pipe hole of unit.



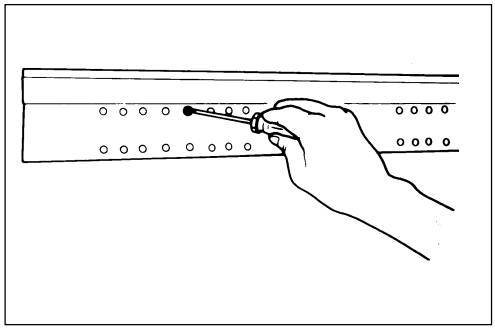
3) Remove screws (2 pcs.) and remove the right and left panels from the Indoor unit. (Remove screws first, move slightl to remove.)



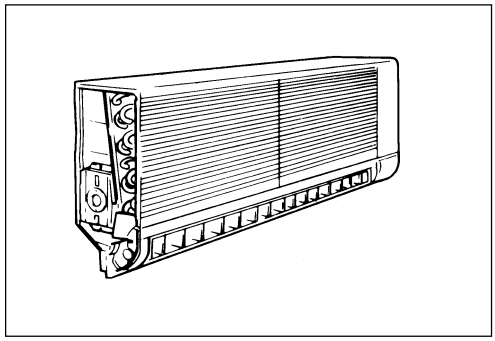
4) Remove the lower panel from the Indoor unit. It can be remove if 3 screws are loosened but not removed.



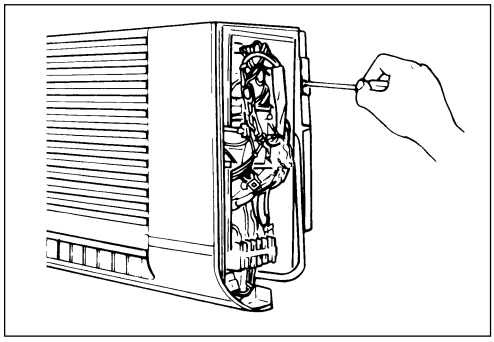
5) Secure the mounting plate with screws at a selected place on the wall. When the wall is made of concrete, use the marketed anchor bolts (M6)



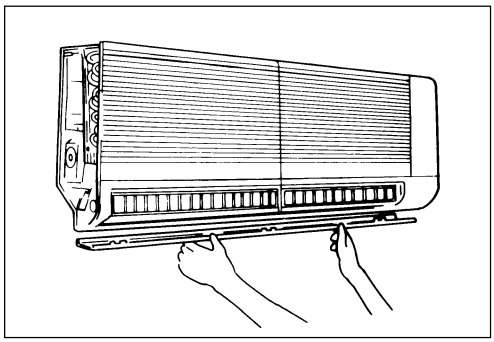
6) Hook and install the indoor unit on the mounting plate from top. Hook slightly at left at first and return to right.



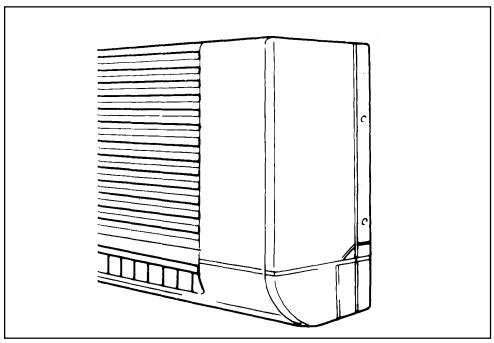
7) Fix the indoor unit on the mounting plate with a screw.



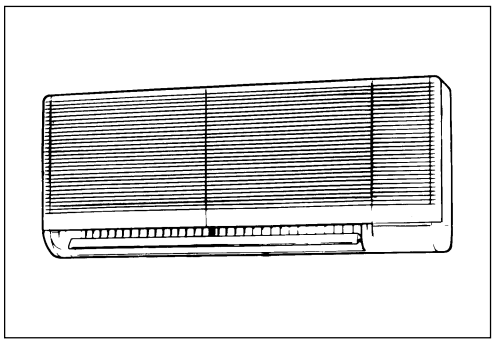
8) Install the lower panel at the original position.



9) Install the right and left side panels at their original position.



10) This is all for the installation.



(11) Floor standing exposed type (FDFL)

(a) Selection of installation location

1) A place where good air circulation and delivery can be obtained.

● Cold air throw Unit : m

Models	All models
Air throw	**4**

[Conditions]

(1) Fan speed: Hi

(2) Location: Free space without obstacles

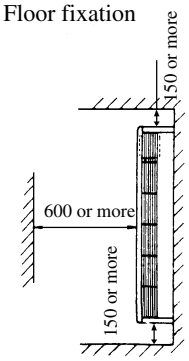
(3) Distance of reach indicates the horizontal distance after the wind touched down the floor.

(4) Air velocity at the throw: 0.5 (m/sec.)

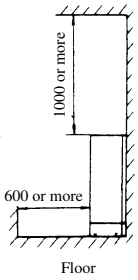
2) Where there is no obstacle around the Air inlet port or Air outlet port.
3) Where a sufficient space can be reserved for the service of air filter and the attachment/removal of panels.
4) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
   Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.
5) Where pipes and wires can be arranged conveniently.
6) On the solid floor
7) Where the unit is not exposed directly to sun light.
8) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains.
   Installation and use at such place will cause corrosion in the heat exchanger and damage in molded synthtic resin parts.
9) Where a complete draining can be assured.
10) Where a sufficient space can be reserved for service.

Floor standing installation

• Floor fixation



• Wall fixation

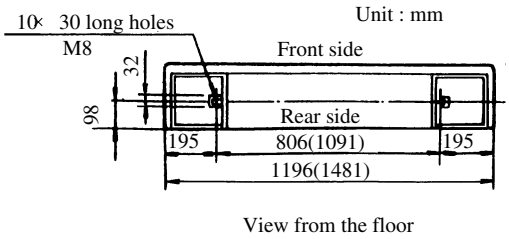


Unit : mm

(b) Bolt positions

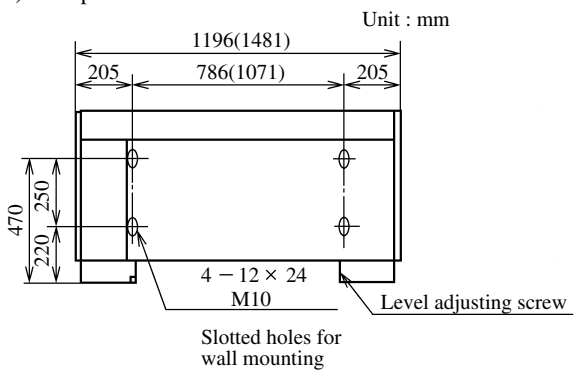
1) Bolt positions for metal settings used for floor fixation.

• Metal fitting used for floor fixation (accessories).



Note (1) Value in ( ) indicates 71 type.

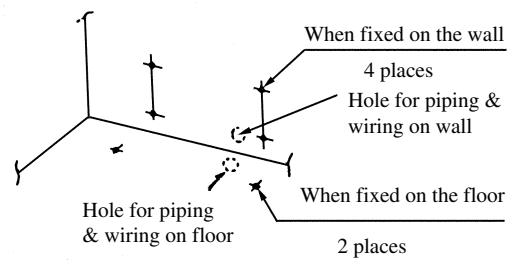
2) Bolt positions for wall fixation

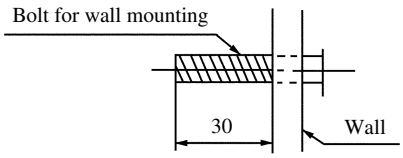


(c) Installation of unit

1) Floor standing installation

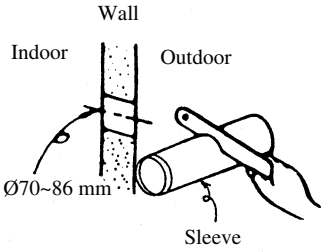
a) Position of mounting bracket fixing bolts Drill holes by referring to figures below.

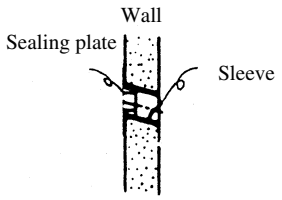




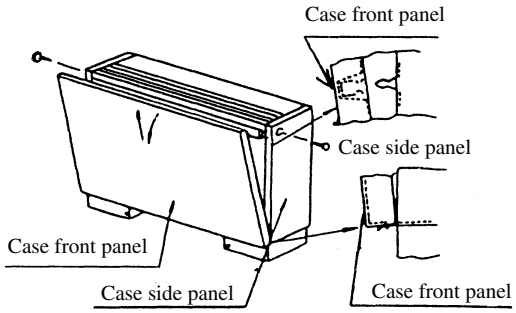
Note (1) Be sure to use a bolt of the length for wall mouning.

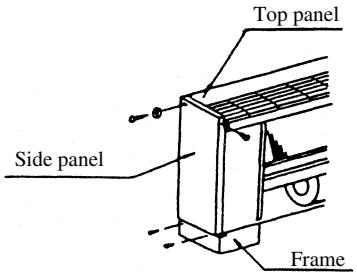
b) The methed of drilling the wall is as follows.





c) Remove the front and side panels.

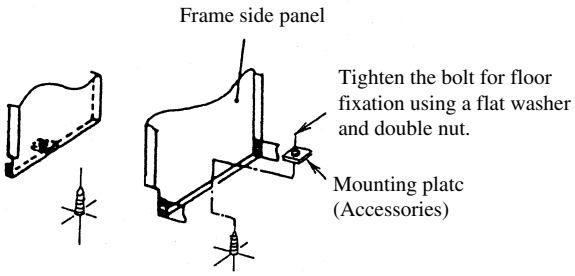




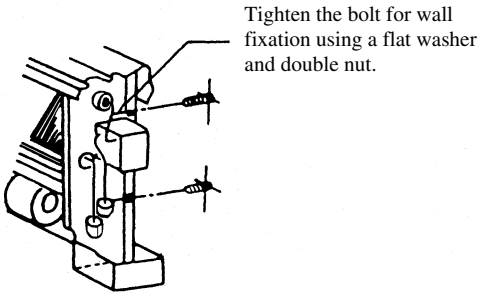
d) Level the unit using the level adjusting screw. Installation will be complrted after attaching side and front panel.

e) Exceute fixation following the directions described below.

● When fixed on the floor



● When fixed on the wall



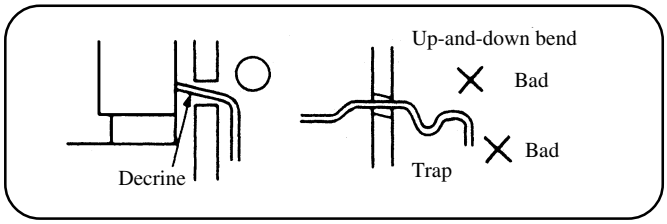
(d) Drain piping

The drain piping can be directed to the floor or rear sides as follows.

(a) Connect a drain piping to the drain outlet and fix it by use of tigghening band.

(b) Indoor side drain piping must be thermally insulated.

(c) After finishing the drain piping, check the drainage by pouring some water in the drain pan.



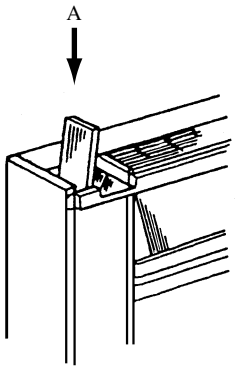
(e) Installation of remote controller (on the indoor unit)

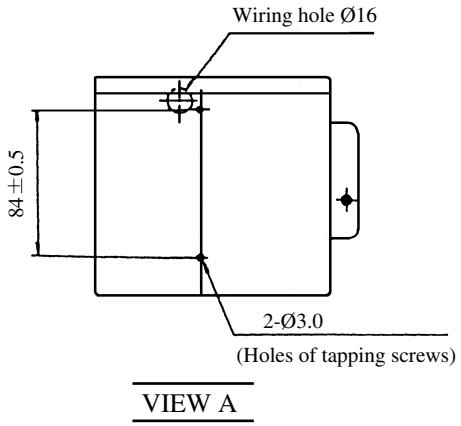
Attached remote controller may be installed on the indoor unit as shown below. The work can be done on the spot when the customer asks so or by other reasons.

Refer to the page 256 when it is installed on the wall.

1) Detach the front panel.

Unit: mm





2) Remote controller installation.

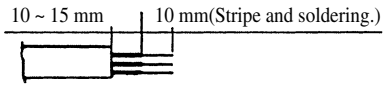
- Attach the lower case with the screws (M4 × 128) accessory.

3) Remote controller wiring.

a) Connect the terminals between the remote controller and the control box as per these wire color codes:[(X) (red). (Y) (white), (Z) (black)], using the wires included in the kit.

b) The wires should have a surplus length of approximately 30 cm. (Necessary when servicing with the front panel detached.)

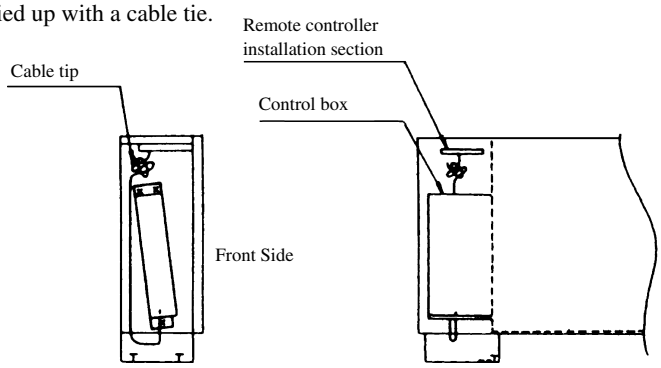
c) Strip and solder as shown below when cutting the wire. (Omitting the soldering process may cause looseness of the wiring.)



4) Wiring route.

a) Wire from the wiring hole through the rear side of the control box to the terminal block.

b) Any suplus wires should be tied up with a cable tie.



(12) Floor standing hidden type (FDFU)

(a) Selection of installation hidden location

1) A place where good air circulation and delivery can be obtained.

• Cold air throw

Unit : m

Models	All models
Air throw	**4**

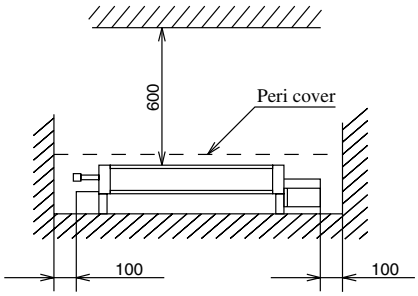
[Conditions]

(1) Fan speed: Hi
(2) Location: Free space without obstacles
(3) Distance of reach indicates the horizontal distance after the wind touched down the floor.
(4) Air velocity at the throw: 0.5 (m/sec.)

2) Where there is no obstacle around the Air inlet port or Air outlet port.
3) Where a sufficient space can be reserved for the service of air filter and the attachment/removal of panels.
4) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.
5) Where pipes and wires can be arranged conveniently.
6) On the solid floor
7) Where the unit is not exposed directly to sun light.
8) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains.
Installation and use at such place will cause corrosion in the heat exchanger and damage in molded synthtic resin parts.
9) Where a complete draining can be assured.
10) Where a sufficient space can be reserved for service.

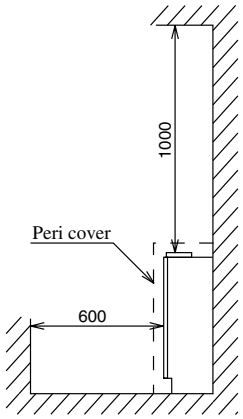
Floor standing installation

• Floor fixation



• Wall fixation

Unit : mm



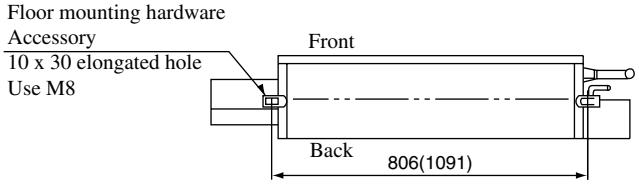
(b) Bolt positions

1) Bolt positions for metal settings used for floor fixation.

• Metal fitting used for floor fixation (accessories).

Unit : mm

Bolt positions for floor mounting hardware

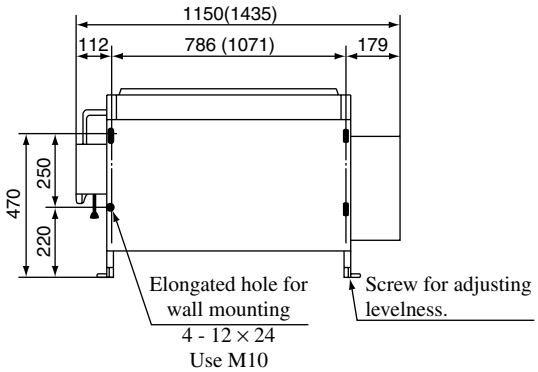


As viewed from floor side.

Note (1) Value in ( ) indicates 71 type.

2) Bolt positions for wall fixation

Unit : mm

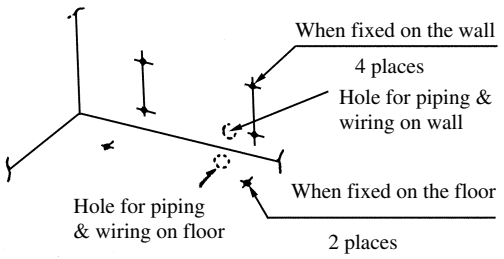


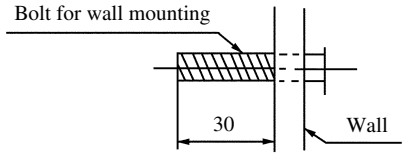
(c) Installation of unit

1) Floor standing installation

a) Position of mounting bracket fixing bolts

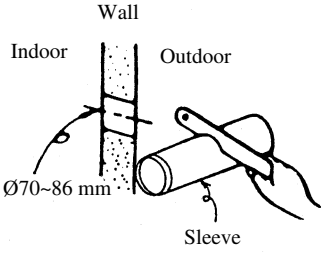
Drill holes by referring to figures below.

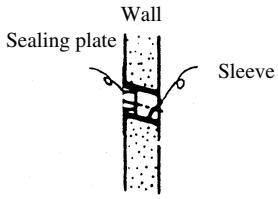




Note (1) Be sure to use a bolt of the length for wall mouning.

b) The methed of drilling the wall is as follows.

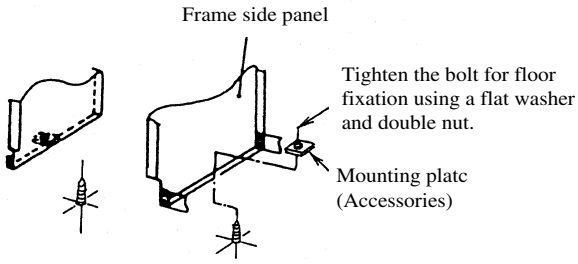




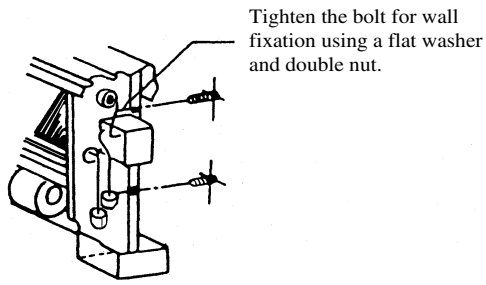
c) Level the unit using the level adjusting screw. Installation will be complrted after attaching side and front panel.

d) Exceute fixation following the directions described below.

● When fixed on the floor



● When fixed on the wall



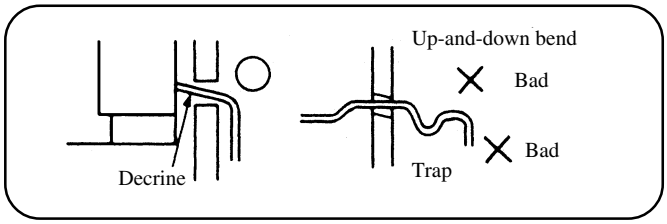
(d) Drain piping

The drain piping can be directed to the floor or rear sides as follows.

(a) Connect a drain piping to the drain outlet and fix it by use of tigghening band.

(b) Indoor side drain piping must be thermally insulated.

(c) After finishing the drain piping, check the drainage by pouring some water in the drain pan.



5.2 Installation of remote controller (Optional parts)

(a) Selection of installation location

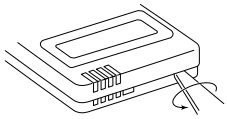
Avoid the following locations

1) Direct sunlight.
2) Close to heating device.
3) Highly humid or water splashing area.
4) Uneven surface.

(b) Installation procedure

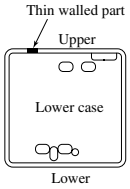
a) Exposed fiting

1) Open the remote controller case.



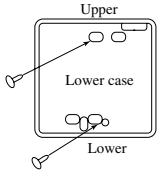
- Put a screw driver (flat-head) into the concavity made on the upper part of a remote controller unit and twist it lightly to open the casing.

2) The cord of a remote controller unit can only be pulled out in the upward direction.



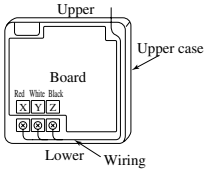
- Cut off with nippers or a knife a thin walled part made on the upper end of the rmote controller unit's bottom casing, and then remove burrs with a file or the like.

3) Fix the remote controller unit's bottom casing onto a wall with two wood screws supplied as accessories.



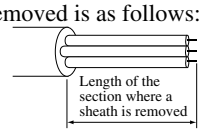
4) Connect the remote controller to the terminal block. Connect the terminals of the remote controller to the indoor unit with the same numbers. Because the terminal block has polarity, the device becomes inoperative if there are wrong connections.

Terminals: ⓧRed wire, ⓨWhite wire, ⓩBlack wire



- Use a cord of 0.3mm^2 (recommended) - 0.5mm^2 (maximum) for a remote controller unit cord. Remove a sheathe of the remote control unit cord for the section laid within the remote controller unit casing.

The length of each wire that should be left after a sheath is removed is as follows:

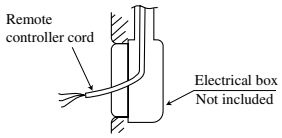


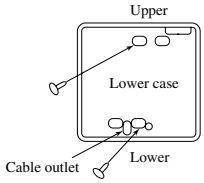
Black: 195mm, White: 205mm, Red: 5125mm

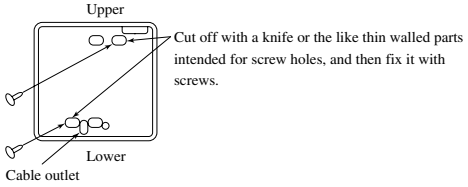
5) Replace the top casing as before.
6) Use a cord clamp to attach the remote controller cord to the wall.
7) Set the functions according to the types of indoor unit. See Section "Function Setting".

(b) Recessed fitting

1) The Electrical box and remote controller (shield wire must be use in case of extension) are first embedded.





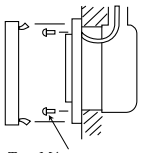


2) Remove the upper case to the remote controller.
3) Attach the lower case to the Electricl box with two M4 screws. (Head diameter must be 8 mm). Choose either of the following two positions in fixing it with screws.
4) Connect the remote cord to the remote controller.

Refer to [Exposed Fitting].

5) Installation work is completed by replacing the top casing onto the bottom casing as before.
6) Set the fnction switch according to the type of the indoor unit.

Refer to [Function setting].



Precation in Extending the Remote controller cord

▶ Maximum total extension 600m.

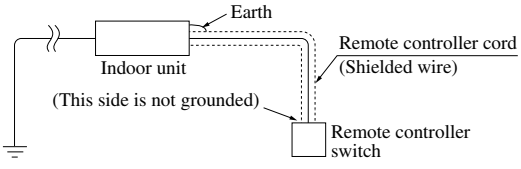
The cord should be a shielded wire.

● For all types : 0.3mm^2 × 3 cores

Note (1) Use cables up to 0.5mm^2 (maximum) for those laid inside the remote controller unit casing and connect to a different size cable at a vicinity point outside the remote controller unit, if necessary.

Within 100-200m····· 0.5 mm^2 × 3 cores
Within 300m····· 0.75 mm^2 × 3 cores
Within 400m····· 1.25 mm^2 × 3 cores
Within 600m····· 2.0 mm^2 × 3 cores

● The shielded wire should be grounded at one side only.



5.3 Installation of outdoor unit

(1) Selecting the installation location

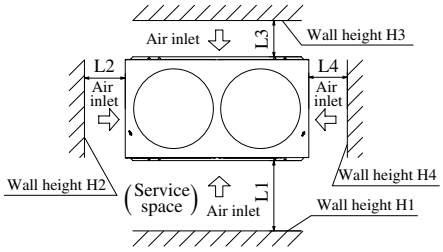
(a) Where air is not trapped.
(b) Where the installation fittings can be firmly installed.
(c) Where wind does not hinder the intake and outlet pipes.
(d) Out the heat range of other heat sources.
(e) Where it is safe for the drain water to be discharged.
(f) Where noise and hot air will not bother neighboring residents.
(g) Where snow will not accumulate.
(h) Where strong winds will not blow against the outlet pipe.

Notes (1) A four-sided enclosure cannot be used. Leave a space of at least 1m above the unit.
(2) If there is a danger of a short-circuit, then install a wind direction variable adapter.
(3) When installing multiple units, provide sufficient intake space so that a short-circuit does not occur.
(4) In areas where there is snowfall, install the unit in a frame or under a snow hood to prevent snow from accumulating on it.
(Inhibition of collective drain discharge in a snowy country)
(5) Do not install the equipment in areas where there is a danger of flammable gas leaks.
∗ Please ask your distributor about optional parts such as wind vane adapters, snow guard hoods, etc.

(2) Installation space (service space) example

Please secure sufficient clearance (room for maintenance work, passage, draft and piping). (If your installation site does not fulfill the installation condition requirements set out on this drawing, please consult with your distributor or the manufacturer)

(a) When one unit is installed

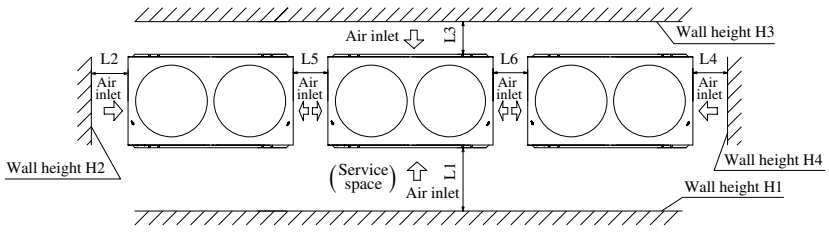


Installation space

Unit: mm

Dimensions \ Example installation	Ⅰ	Ⅱ
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	–
H2	No limit	No limit
H3	1000	No limit
H4	No limit	–

(b) When more than one unit are installed.



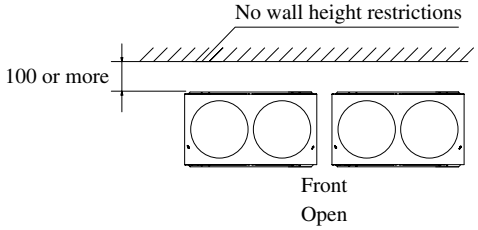
Installation space

Unit: mm

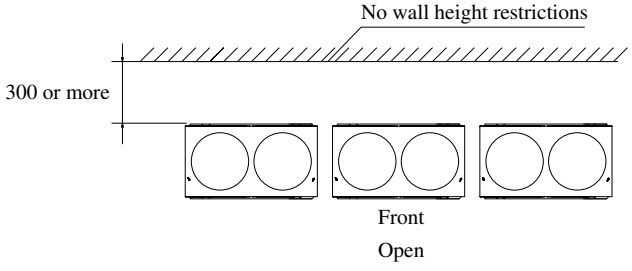
Dimensions \ Example installation	Ⅰ	Ⅱ
L1	500	Open
L2	10	200
L3	100	300
L4	10	Open
L5	10 (0)	400
L6	10 (0)	400
H1	1500	No limit
H2	No limit	No limit
H3	1000	No limit
H4	No limit	No limit

(c) Example with multiple units

① 3-face inlet example 1 (2 units)

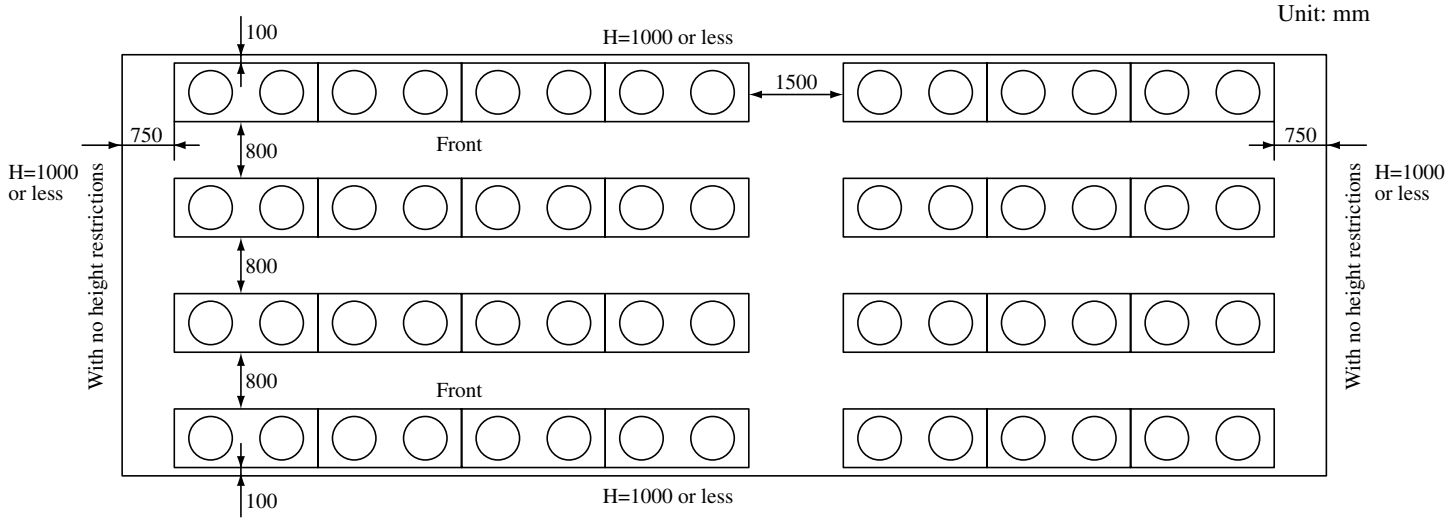


② 3-face inlet example 2 (3 units)

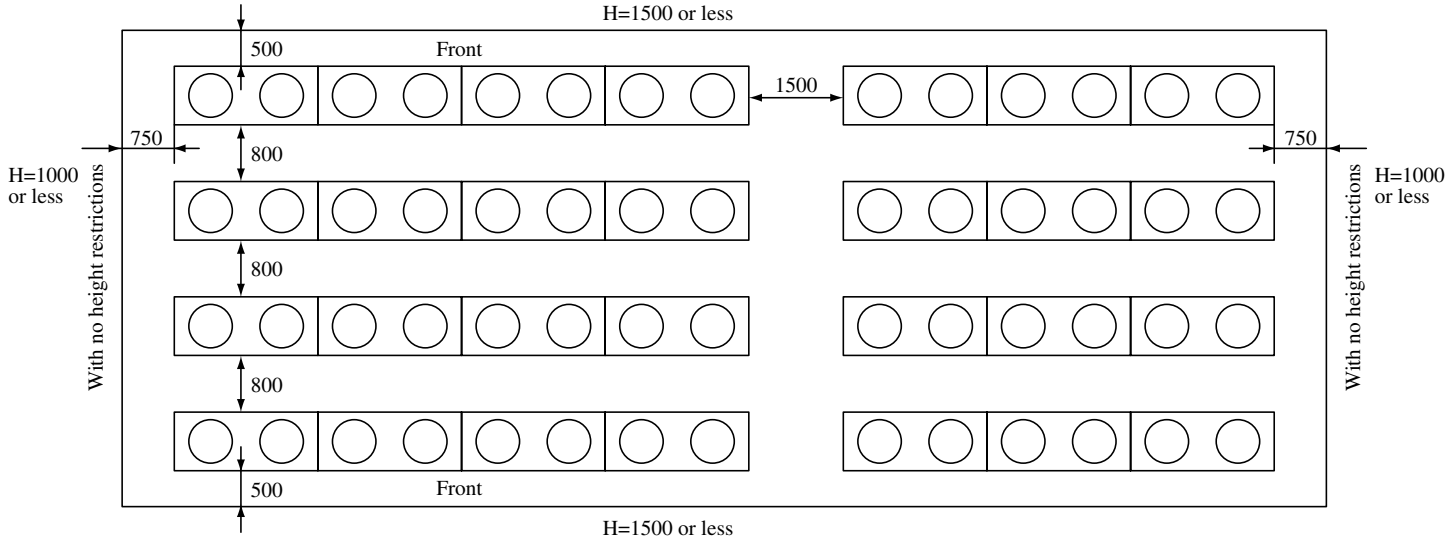


③ [Ex.1] Multiple units installed in vertical and horizontal rows

Unit: mm



④ [Ex.2] Multiple units installed in vertical and horizontal rows

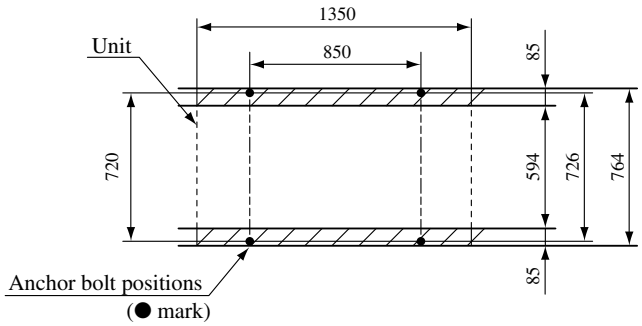


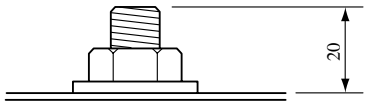
(3) Notabilia for installation

(a) Anchor bolt positions

- Use four anchor bolts (M10) to fix an outdoor unit's anchoring legs at all times. Ideally, an anchor bolt should protrude 20mm.

Unit : mm

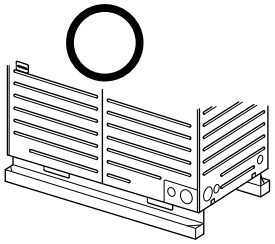




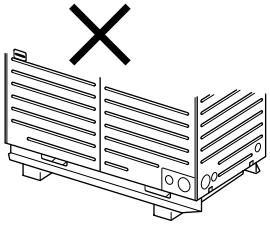
(b) Base

1) Please install a unit after ascertaining that the bases have been made to sufficient strength and level to ensure the unit against vibration or noise generation.

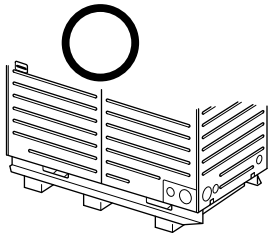
2) Please construct a base to the size of a shadowed area (the entire bottom area of an outdoor unit's anchoring leg) shown on the above drawing or larger.



Normally, it is desirable that a base as specified in the drawing above is provided.



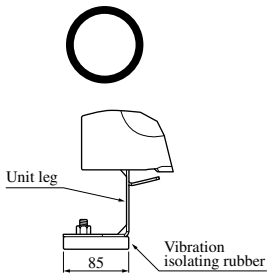
A base used for a former model is wrongly oriented and not acceptable.



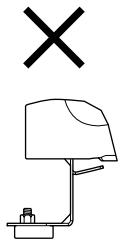
Please use it for renewal installation. (Please add a base on the center)

(c) Vibration isolating rubber

1) A vibration isolating rubber must support an outdoor unit's anchoring leg by its entire bottom area.



Install a vibration isolating rubber in such a manner that the entire bottom area of an outdoor unit's anchoring leg will rest on it.



Do not install an outdoor unit in such a manner that a part of the bottom area of its anchoring leg is off a vibration isolating rubber.

5.4 Refrigerant piping

(1) Restrictions on the use of pipes

(a) Maximum length (from an outdoor unit to the farthest indoor unit)
..... 160 m or less as actual pipe length (185 m or less as equivalent pipe length)
(When an actual pipe length exceeds 90 m, however, it is necessary to change the pipe size. Please determine the main pipe size by consulting with the Main Selection Reference Table set out in Section (3). (b))

(b) Total pipe length ..... 510 m or less

(c) Main pipe length ..... 130 m or less

(d) Allowable pipe length from the first branching ..... 40 m or less

(e) Allowable elevation difference (head difference)
1) When an outdoor unit is installed above ..... 50 m or less
2) When an outdoor unit is installed below ..... 40 m or less
3) Difference in the elevation of indoor units in a system ..... 15 m or less

(f) Restrictions on piping applicable to the section between an outdoor unit and an outdoor unit side branching pipe (combination unit)
1) Differenching in the elevation ..... 1 m or less
2) Distance between an outdoor unit and an outdoor unit side branching pipe ..... 5 m or less

(2) Piping material selection

(a) please use pipes clean on both the inside and outside and free from contaminants harmful to operation such as sulfur, oxides, dust, chips, oil, fat and water.

(b) Use the following material for refrigerant piping.
Material: phosphorus deoxidized seamless copper pipe (C1120T-0, 1/2H, JIS H3300)
Use C1220T-1/2H for ø19.05 or larger, or C1220T-0 for ø15.88 or smaller

(c) Do not use ø28.58 × t1.0 and ø31.8 × t1.1 as a bent pipe.

(d) Thickness and size: Please select proper pipes according to the pipe size selection guideline.
(Since this used R410A, always use 1/2H pipes of a specified minimum thickness or thicker for all pipes of ø19.05 or langer, because the pressure resistance requirement is not satisfied with O-type pipes).

(e) For branching pipes, use a genuine branching pipe set or header set at all times. (optional parts)

(f) For the handling of service valves, please refer to Section (4). (d): Handling of service valves.

(g) In installing pipes, observe the restrictions on the use of pipes set out in Section (1) (Maximum length, total pipe length, allowable pipe length from the first branching, allowable elevation difference (head difference)) without fail.

(h) Install a branching pipe set, playing attention to the direction of attachment, after your have perused through the installation manual supplied with it..

(3) Pipe size selection

(a) Connecting pipe size table

Capacity		Gas pipe	Liquid pipe
Indoor unit	22, 28	ø 9.52 × t 0.8	ø 6.35 × t 0.8
	36, 45, 56	ø 12.7 × t 0.8	
	71, 80, 90, 112, 140	ø 15.88 × t 1.0	ø 9.52 × t 0.8
Outdoor unit	335	ø 25.4 × t 1.0	ø 12.7 × t 0.8
	400		
	450	ø 28.58 × t 1.0	

(b) Main (Outdoor unit side branching pipe – Indoor unit side first branching pipe)
If the longest distance (measured between the outdoor unit and the farthest indoor unit) is 90m or longer (equivalent length), please change the main pipe size according to the table below.

Outdoor unit	Main pipe (normal)		Pipe size for an actual length of 90m or longer	
	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
335	ø 25.4 × t 1.0	ø 12.7 × t 0.8	ø 25.4 × t 1.0	ø 12.7 × t 0.8
400			ø 28.58 × t 1.0	
450	ø 28.58 × t 1.0		ø 31.8 × t 1.1	

(c) Indoor unit side first branching pepe – Indoor unit side branching pipe

Please choose from the table below an appropriate pipe size as determined by the total capacity of indoor units connected downstream, provided, however, that the pipe size for this section should not exceed the main size .

Total capacity of indoor units	Gas pipe	Liquid pipe
Less than 101	ø 12.7 × t 1.0	ø 9.52 × t 0.8
101 or more but less than 180	ø 15.88 × t 1.0	
180 or more but less than 371	ø 19.05 × t 1.0	ø 12.7 × t 0.8
371 or more but less than 540	ø 25.4 × t 1.0	ø 15.88 × t 1.0
540 or more but less than 700	ø 28.58 × t 1.0	

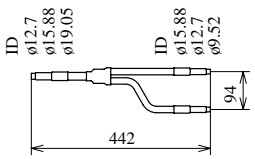
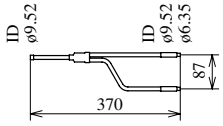
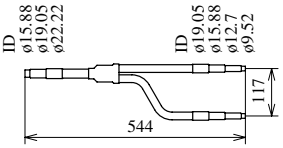
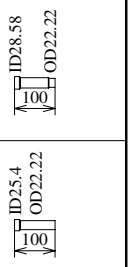
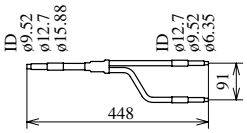
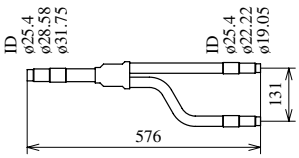
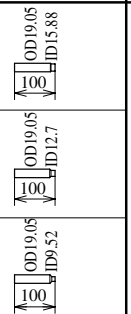
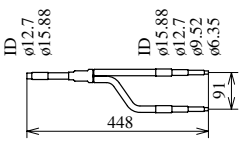
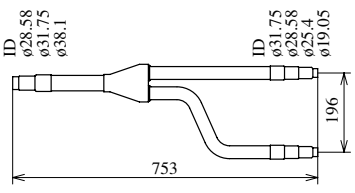
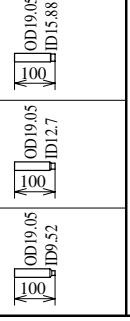
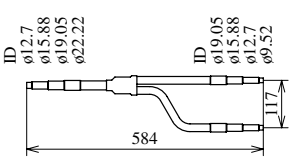
(d) Method of selecting a branching pipe set

- As an appropriate branching pipe size varies with the connected capacity (total capacity connected downstream), determine a size from the following table.

Total capacity downstream	Branching pipe set
Less than 180	DIS-22-1
180 or more but less than 371	DIS-180-1
371 or more but less than 540	DIS-371-1
540 or more	DIS-540-1

- Branch pipe set shapes

Unit: mm

Model	Item	Branch pipe	Reducer	Item	Branch pipe	Reducer
DIS-22-1	Gas line		——	Liquid line		——
DIS-180-1	Gas line			Liquid line		——
DIS-371-1	Gas line			Liquid line		——
DIS-540-1	Gas line			Liquid line		

Notes: (1) Insulation is provided with the branch pipes.
(2) Pipes should be cut to the installation site requirements, with the pipe being severed at the center part of the desired diameter.
(3) Branch joints (gas & liquid) must be installed as either a "horizontal branch" or a "vertical branch".

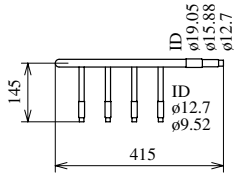
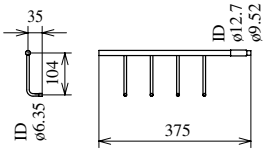
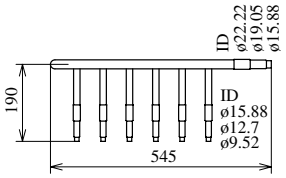
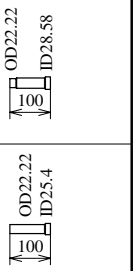
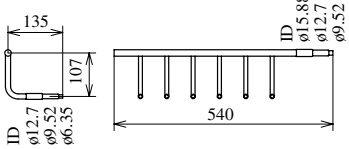
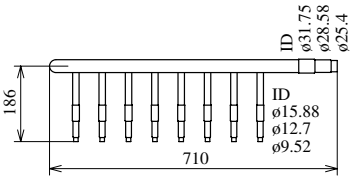
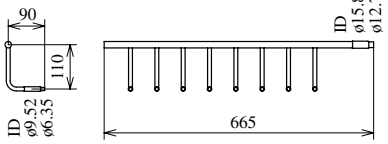
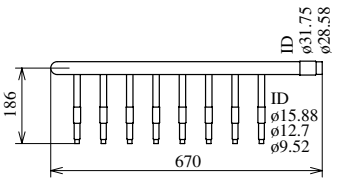
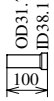
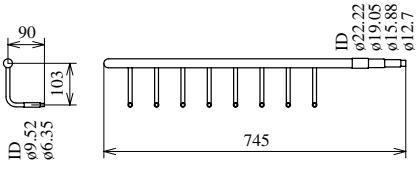
(e) Header Method

- Depending on the number of units connected, connect plugged pipes (to be procured on the installer's part) at a branching point (on the indoor unit connection side).
- For determination of appropriate header, different diameter pipe joint and blind pipe sizes, please refer to "Header Set," (which can be purchased separately).

Total capacity downstream	Header set model type	Number of branches
Less than 180	HEAD4-22-1	4 branches at the most
180 or more but less than 371	HEAD6-180-1	6 branches at the most
371 or more but less than 540	HEAD8-371-1	8 branches at the most
540 or more	HEAD8-540-1	8 branches at the most

- Header pipe set shapes

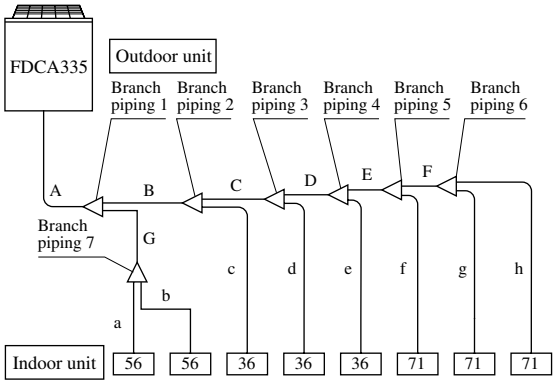
Unit: mm

Model	Item	Header pipe	Reducer	Item	Header pipe
HEAD4-22-1	Gas line		———	Liquid line	
HEAD6-180-1	Gas line			Liquid line	
HEAD8-371-1	Gas line		———	Liquid line	
HEAD8-540-1	Gas line			Liquid line	

Notes: (1) Insulation is provided with both gas and liquid pipes, and should be used.
(2) Pipes should be cut to the installation site requirements, with the pipe being severed at the center part of the desired diameter.
(3) Headers (gas & liquid) must be installed as a "horizontal branch".

Example of piping

■ Branch system
Outdoor unit: FDCA335HKXE4
Indoor unit: Combination of 8 units
[Branch pipe set : DIS-371-1 × 1 set, DIS-180-1 × 4 set, DIS-22-1 × 2 set]
[Total capacity: 433 (43300W)]



• Selecting piping size

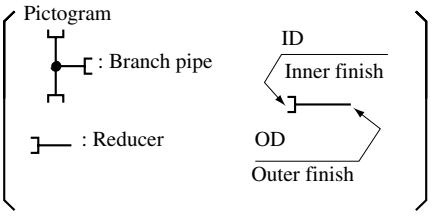
Item	Selection procedure	Piping size (mm)	
		Gas line	Liquid line
A	Same as the outdoor unit piping size	ø25.4	ø12.7
B	Total capacity of the connected indoor units 321	ø19.05	ø12.7
C	Total capacity of the connected indoor units 285	ø19.05	ø12.7
D	Total capacity of the connected indoor units 249	ø19.05	ø12.7
E	Total capacity of the connected indoor units 213	ø19.05	ø12.7
F	Total capacity of the connected indoor units 142	ø15.88	ø9.52
G	Total capacity of the connected indoor units 112	ø15.88	ø9.52
a	Indoor unit piping size (56).	ø12.7	ø6.35
b	Indoor unit piping size (56).	ø12.7	ø6.35
c	Indoor unit piping size (36).	ø12.7	ø6.35
d	Indoor unit piping size (36).	ø12.7	ø6.35
e	Indoor unit piping size (36).	ø12.7	ø6.35
f	Indoor unit piping size (71).	ø15.88	ø9.52
g	Indoor unit piping size (71).	ø15.88	ø9.52
h	Indoor unit piping size (71).	ø15.88	ø9.52

• Selection of branch piping size.

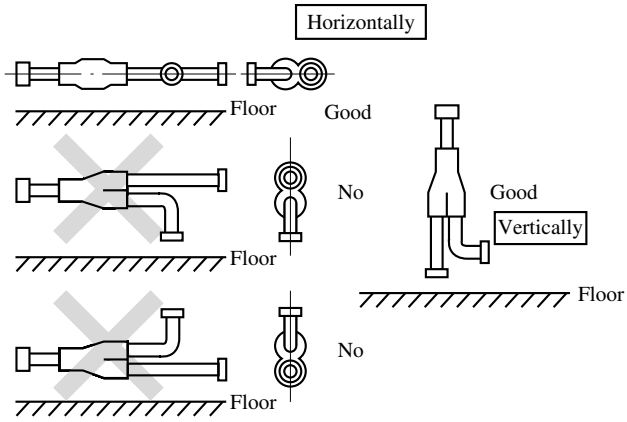
Item	Selection procedure	Branch piping set
Branch piping 1	Total capacity of the connected indoor units 433	DIS-371-1
Branch piping 2	Total capacity of the connected indoor units 321	DIS-180-1
Branch piping 3	Total capacity of the connected indoor units 285	DIS-180-1
Branch piping 4	Total capacity of the connected indoor units 249	DIS-180-1
Branch piping 5	Total capacity of the connected indoor units 213	DIS-180-1
Branch piping 6	Total capacity of the connected indoor units 142	DIS-22-1
Branch piping 7	Total capacity of the connected indoor units 112	DIS-22-1

Notes (1) Make the selection based on the size of each piping for branch piping sets with different size connections.
(2) If diameter adjustment is need for branch connection and on the indoor unit side, always makes the adjustment at the branch connection.

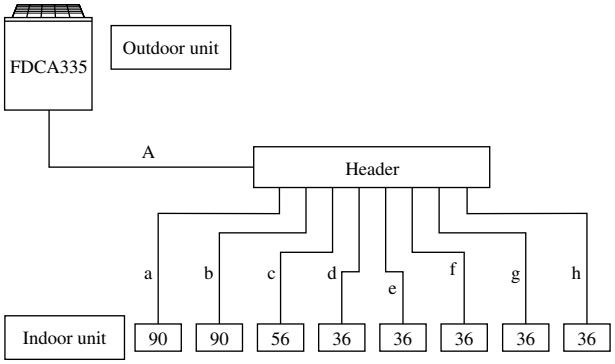
Reference: The shape of the flow divider pipe and reducer is shown on the 261 page.



Notes (1) Use the designated piping size for the piping between the outdoor unit and the first branch.
(2) Choose the appropriate sized reducer for piping between the branch pipe and the indoor unit.
The size of reducer should match the piping size of the indoor unit.
(3) Locate the branch pipe horizontally or vertically as illustrated to the right.



■ Header system
Outdoor unit: FDCA335HKXE4
Indoor unit: Combination of 8 units
[Header pipe set : HEAD8-371-1 × 1 set]
[Total capacity: 416 (41600W)]



• Selecting piping size

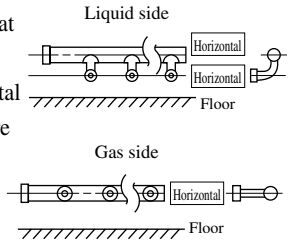
Item	Selection procedure	Piping size (mm)	
		Gas line	Liquid line
A	Same as the outdoor unit piping size	ø22.22	ø9.52
a	Indoor unit piping size (90)	ø15.88	ø9.52
b	Indoor unit piping size (90)	ø15.88	ø9.52
c	Indoor unit piping size (56)	ø12.7	ø6.35
d	Indoor unit piping size (36)	ø12.7	ø6.35
e			
f			
g			
h			

• Selection header pipe size

Item	Selection point	Model
Header	Total indoor unit capacity	HEAD8-371-1

Notes(1) Select the appropriate size of each pipe for the offset pipe joints included with the header set.
(2) If it is necessary to adjust the diameter of the header and indoor unit side piping, be sure to do so on the header side.

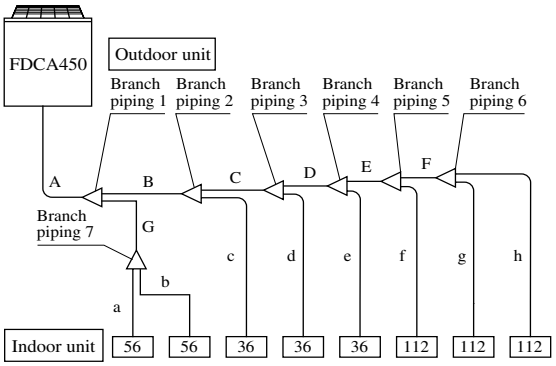
Remarks1. Install the header so that both the gas pipe and liquid pipe are horizontal and so that branches are horizontal.



2. It is not necessary to install a trap in the stand pipe.

Example of piping

■ Branch system (When piping length exceeds 90m)
Outdoor unit: FDCA450HKXE4
Indoor unit: Combination of 8 units
[Branch pipe set : DIS-540-1 × 1 set, DIS-371 × 3 set, DIS-180 × 2 set, DIS-22-1 × 1 set]
[Total capacity: 556 (55600W)]



• Selecting piping size

Item	Selection procedure	Piping size (mm)		
		Gas line	Liquid line	
	Same as the outdoor unit piping size	ø31.8	ø12.7	
	Total capacity of the connected indoor units 444	ø25.4	ø12.7	※1
	Total capacity of the connected indoor units 408	ø25.4	ø12.7	※2
	Total capacity of the connected indoor units 372	ø25.4	ø12.7	※3
	Total capacity of the connected indoor units 336	ø19.05	ø12.7	
	Total capacity of the connected indoor units 224	ø19.05	ø12.7	
	Total capacity of the connected indoor units 112	ø15.88	ø9.52	
	Indoor unit piping size (56).	ø12.7	ø6.35	
	Indoor unit piping size (56).	ø12.7	ø6.35	
	Indoor unit piping size (36).	ø12.7	ø6.35	
	Indoor unit piping size (36).	ø12.7	ø6.35	
	Indoor unit piping size (36).	ø12.7	ø6.35	
	Indoor unit piping size (112).	ø15.88	ø9.52	
	Indoor unit piping size (112).	ø15.88	ø9.52	
	Indoor unit piping size (112).	ø15.88	ø9.52	

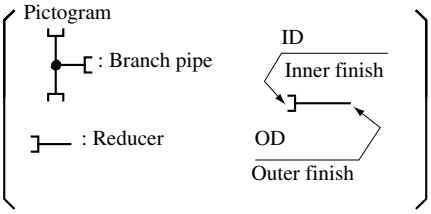
Note (1) Piping sizes for ※1, ※2, ※3 are as follows: When the total indoor unit capacity is 444 for ※1, 408 for ※2, and 372 for ※3, the gas side will be f25.4 and the liquid side will be f15.88. Because the upstream liquid side is ff12.7, however, an adjustment must be made upstream.

• Selection of branch piping size.

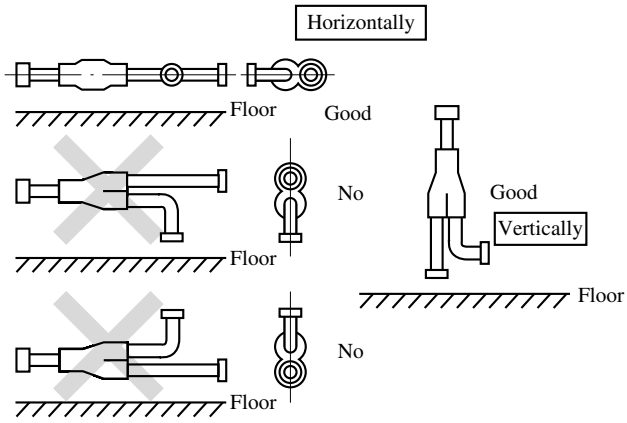
Item	Selection procedure	Branch piping set
Branch piping 1	Total capacity of the connected indoor units 556	DIS-540-1
Branch piping 2	Total capacity of the connected indoor units 444	DIS-371-1
Branch piping 3	Total capacity of the connected indoor units 408	DIS-371-1
Branch piping 4	Total capacity of the connected indoor units 372	DIS-371-1
Branch piping 5	Total capacity of the connected indoor units 336	DIS-180-1
Branch piping 6	Total capacity of the connected indoor units 224	DIS-180-1
Branch piping 7	Total capacity of the connected indoor units 112	DIS-22-1

Notes (1) Make the selection based on the size of each piping for branch piping sets with different size connections.
(2) If diameter adjustment is need for branch connection and on the indoor unit side, always makes the adjustment at the branch connection.

Reference: The shape of the flow divider pipe and reducer is shown on the 261 page.



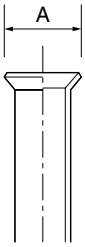
Notes (1) Use the designated piping size for the piping between the outdoor unit and the first branch.
(2) Choose the appropriate sized reducer for piping between the branch pipe and the indoor unit.
The size of reducer should match the piping size of the indoor unit.
(3) Locate the branch pipe horizontally or vertically as illustrated to the right.



(4) Piping work

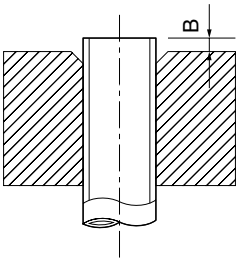
(a) On-site piping work

1) Important
a) Please take care so that installed pipes may not touch components within a unit.
b) Keep service valves closed white pipe installation work is underway.
c) Give sufficient protections (compressed and brazed or by an adhesive tape) to pipe ends so that any water or foreign matters enter the pipes.
d) In bending a pipe, bend it to the largest possible radius (at least four times the pipe diameter). Do not bend a pipe repeatedly to corrent its from.
e) An outdoor unit's liquid pipe and liquid refrigerant piping are to be flare connected. Flare a pipe after engaging a flare nut onto it. A flare size for R410A is different from that for conventional R470C. Although we recommend the use of flaring tools developed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
f) As it is a unit designed for R410A, the use of ester oil as flare joint oil is recommended.
g) Tighten a flare joint securely with double spanners. Observe flare nut tightening torque specified in the table below.



Flared pipe end: A (mm)

Copper pipe outer diameter	A $^{0}_{-0.4}$
ø6.35	9.1
ø9.52	13.2
ø12.7	16.6
ø15.88	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
ø6.35	0~0.5	1.0~1.5
ø9.52		
ø12.7		
ø15.88		

Tightening torque	
ø6.35	14 ~ 18N·m (1.4 ~ 1.8 kg·m)
ø9.52	34 ~ 42N·m (3.4 ~ 4.2 kg·m)
ø12.7	49 ~ 61N·m (4.9 ~ 6.1 kg·m)
ø15.88	68 ~ 82N·m (6.8 ~ 8.2 kg·m)

h) Pipes are to be blazed to connect an outdoor unit's gas pipe with refrigerant piping or refrigerant piping with a branching pipe set.

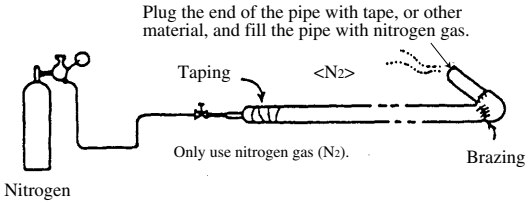
i) Blazing must be performed under a nitrogen gas flow. Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.

j) Brazing of the service valve and the pipes should be performed while cooling the valve body with a wet towel.

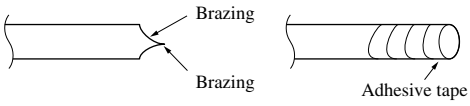
k) Perform flushing. To flush the piping, charge nitrogen gas at about 0.5 MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).

2) Operation procedure

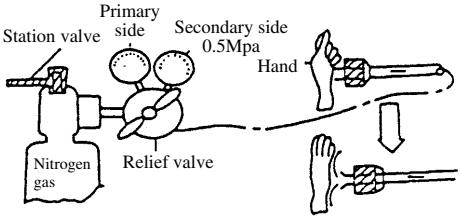
a) Blazing must be performed under a nitrogen gas flow. Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.



b) Give sufficient protection to a pipe end (compressed and blazed)



c) Perform flushing. To flush the piping. charge nitrogen gas at about 0.02 MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).



d) In laying pipes on the installation site, keep the service valves shut all the time.

e) In brazing an service valve and a pipe, braze them by cooling the valve main body with a wet towel or the like.

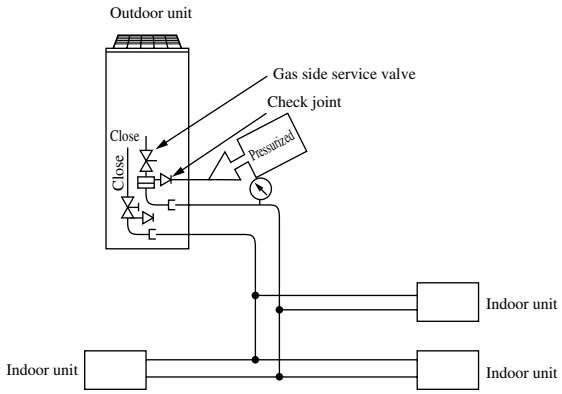
f) As the unit is designed for R410A, we recommend the use of ester oil as flare joint oil.

(b) Air tightness test

1) Although an outdoor unit itself has been tested for air tightness at the factory, please check the connected pipes and indoor units for air tightness from the check joint of the service valve on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
2) Since refrigerant piping is pressurized to the design pressure of a unit with nitrogen gas for testing air tightness, please connect instruments according the drawing below.

   Under no circumstances should chorine-based refrigerant, oxygen or any other combustible gas be used to pressurize a system keep the service valve shut all the time. Do not open it under any circumstances.

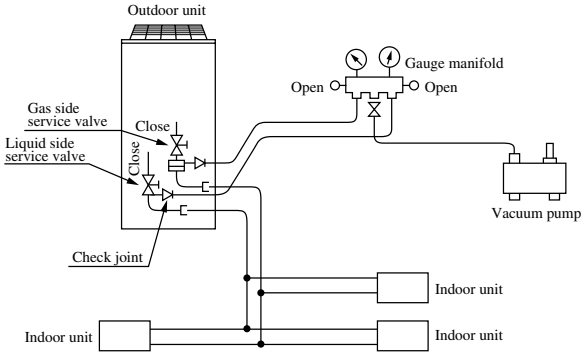
   Pressurize all of the liquid and gas pipes.
3) In pressurizing the piping, do not apply the specified level of pressure all at once, but gradually raise pressure.
   a) Raise the pressure to 0.5 MPa, and stop. Leave it for five minutes to see if the pressure drops.
   b) Then raise the pressure to 1.5 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 specifed level and left for about one day, It is acceptable. When the ambient temperature changes 1˚C, the pressure also changes 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.
4) Always evacuate the pipes after the airtightness test.



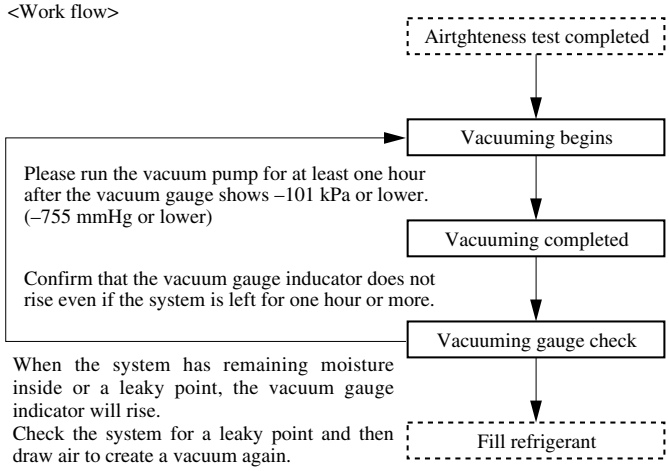
(c) EVACUATION

Please pull air from the check joints of the service valves on both liquid and gas sides.

Please also pull air from the oil equalizing pipe. (Please pull air separately from the rest of the piping by using the oil equalizing valve check jpint)



<Work flow>



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

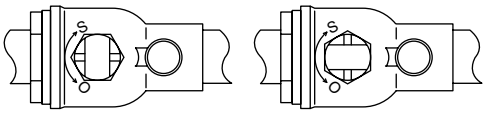
○ To prevent a different oil from entering, please assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R470C, etc.).

○ Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

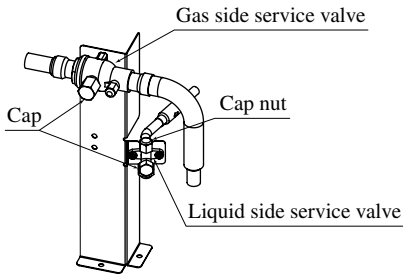
(d) Method of operating service valves

Method of opening/closing a valve

1) Remove the cap, turn the gas pipe side until comes to the "Closed" position as indicated in the drawing on the right.
2) For the liquid side pipe, turn with a hexagonal wrench until the shaft stops. If excessive force is applied, the valve main body can be damaged. Always use a dedicated special tool.
3) Tighten the cap securely.
   For tightening torque, refer to the table below.



Closed position Opened position



	Tightening torque N · m		
	Shaft (valve main body)	Cap (lid)	Cap nut (check joint section)
For gas pipes	7 or less	30 or less	13
For liquid pipes	7.85 (MAX 15.7)	29.4 (MAX 39.2)	8.8 (MAX 14.7)

For flare nut tightening torque, please refer to Section (4)–(a) Piping work on the installation site.

(e) Additional refrigerant charge

Charge additional refrigerant in the liquid state.

Be sure to use a scale to measure the filling amount when adding refrigerant. If you cannot charge all refrigerant with the outdoor unit lying idle, charge it with the unit running in the test run mode. If operated for a long time with insufficient refrigerant the compressor will be damaged. (In particular, when adding refrigerant during operation, complete the job within 30 min.)

Fill this unit only with the standard amount of refrigerant (piping length 0 m fill quantity).

Determine the amount of refrigerant to be charged additionally using the following formula and put down the amount of refrigerant added on the refrigerant charge volume recording plate provided on the back of the side panel.

1) Additional charge amount

Item / Model	Additional charge amount per 1 m of liquid pipe						Factory charge amount at time of shipment	
	ø22.2	ø19.05	ø15.88	ø12.7	ø9.52	ø6.35	Outdoor unit	Remarks
FDCA335HKXE4	0.35 kg/m	0.25 kg/m	0.17 kg/m	0.11 kg/m	0.054 kg/m	0.022 kg/m	14.2 kg	Additional refrigeramt Charge is not required
FDCA400HKXE4 FDCA450HKXE4							17.0 kg	

Calculation of amount of refrigerant to be charged in local piping

The amount refrigerant additionally charged in local piping depends on connection pipe size but not on indoor unit type.

[Amount of refrigerant to be charged in the local piping = Actual length of liquid pipe Amount of refrigerant additionally charged per meter of liquid pipe]

[Example] Amount of refrigerant additionally charged = (ℓ 1 × 0.35) + (ℓ 2 × 0.25) + (ℓ 3 × 0.17) + (ℓ 4 × 0.11) + (ℓ 5× 0.054) + (ℓ 6 × 0.022)

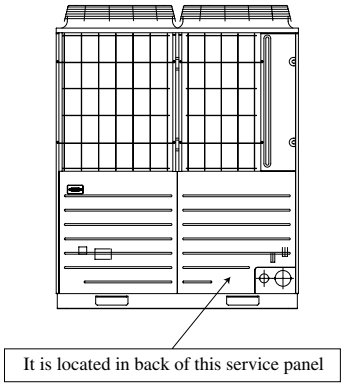
ℓ 1: Overall length (m) of ø22.22 liquid pipe
ℓ 2: Overall length (m) of ø19.05 liquid pipe
ℓ 3: Overall length (m) of ø15.88 liquid pipe
ℓ 4: Overall length (m) of ø12.7 liquid pipe
ℓ 5: Overall length (m) of ø9.52 liquid pipe
ℓ 6: Overall length (m) of ø6.35 liquid pipe

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

- To prevent a different oil from entering, please 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, R470C, etc.).
- Do not use a charge cylinder under any circumstances. There is a danger that the composition of the refrigerant will change when R410A is transferred to a cylindser.
- When charging refrigerant, use liquid refrigrent from a cylinder. If refrigerant is charged in a gas form, the composition may change considerably.

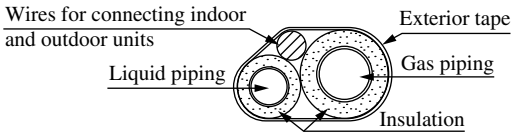
Please note

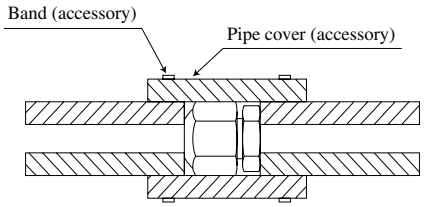
Put down on the refrigerant charge volume recording plate provided on the back of the side panel the amount of refrigerant calculated from the pipe length.



(f) 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.
   a) The gas pipe can cause during a cooling operation dew condensation, which will become drain water causing a possible water-leak accident, or reach during a heating operation as high a temperature as 60˚C to 110˚C, posing a risk of bums, when touched accidentally. So, do not fail to dress it with a heat insulation material.
   b) Warp indoor unit's flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
   c) 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 warp them together with a connecting cable by a dressing tape.
   d) Although this air conditioning unit has been tested under the JIS condensation test conditions, the dripping of water may occur when it is operated in a high-humidity atmosphere (23˚C or a higher dew point temperature). In such a case, apply an additional heat insulation material of 10 to 20 mm thick to dress an indoor unit body, piping and drain pipes.





5.5 Electric wiring

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.

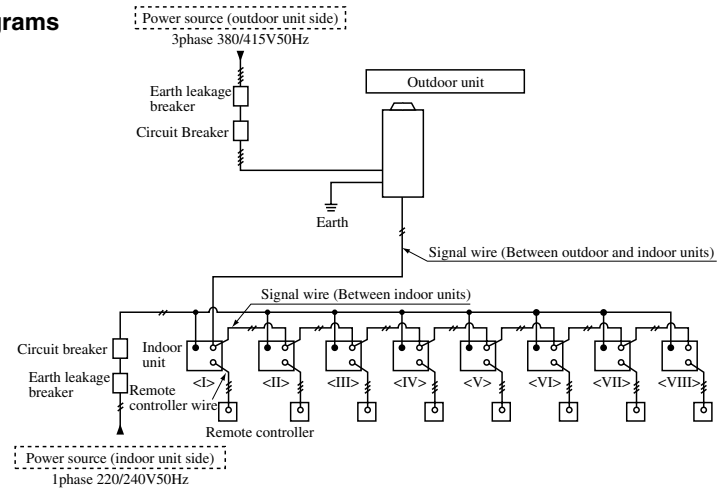
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

⚠ Please install an earth leakage breaker without fail. The installation of an earth leakage breaker is compulsory in order to prevent electric shocks or fire accidents.

Please note

① Use only copper wires.
Do not use any supply cord lighter than one specified in parentheses for each type below.
• braided cord (cde 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).
Please do not use anything lighter than polychloroprene sheathed flexible cord (cord designation 60245 IEC 57) for supply cords of parts of appliances for outdoor use.
② Use separate power supplies for the indoor and outdoor units.
③ Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If improperly grounded, an electric shock or malfunction may result.
④ A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
⑤ The installation of an impulse withstanding type earth leakage breaker is neccessary. A failure to install an earth leakage breaker can result in an accident such as an electric shock or a fire. Do not turn on the power until the electrical work is completed. Be sure to turn off the power when servicing.
⑥ Please do not use a condensive capacitor for power factor improvement under any circumstances. (It does not improve power factor, while it can cause an abnormal overheat accident)
⑦ For power supply cables, use conduits.
⑧ Please do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in malfunctioning or a failure of the unit due to electric noises.
⑨ Power cables and signaling wires must always be connected to the power cable terminal block and secured by cable fastening clamps provided in the unit.
⑩ Fasten cable so that they may not touch the piping etc.
⑪ When cables are connected, please 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.)
⑫ A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.

(1) Wiring system diagrams



(2) Method of connecting power cables

(a) Method of leading out cables

1) Cables can be laid through the front, right, left or bottom casing.
2) In wiring on the installation site, cut off a half-blank (ø50) covering a penetration of the casing with nippers.

(b) Notabilia in connecting power cables

Power cables must always be connected to the power cable terminal block and clamped outside the electrical component box.
In connecting to the power cable terminal block, use round solderless terminals.

1) Use specified wires in wiring, and fasten them securely in such a manner that the terminal blocks are not subject to external force.
2) In fastening a screw of a terminal block, use a correct-size drive.
Fastening a screw of a terminal block with excessive force can break the screw.
3) When electrical installation work is completed, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection.

(c) Outdoor unit power supply specifications

Model	Power source	Cable size for power source (mm²)	Wire length (m)	Moulded-case circuit breaker (A)		Earth leakage breaker	Earth wire	
				Rated current	Switch capacity		Size (mm²)	Screw type
335	3-phase 4 wire 380/415V 50Hz	5.5	54	40	50	60A100mA less than 0.1 sec	3.5	M5
400		14	76	60	60	60A100mA less than 0.1 sec	5.5	M5
450		14	76	60	60	60A100mA less than 0.1 sec	5.5	M5

Please note

① The method of laying cables has been determined pursuant to the japanese indoor wiring regulations (JEAC8001). (Please adapt it to the regulations in effect in each country)

② In the case of distributed, separate power supply system, the listed data represent those of an outdoor unit.

③ For details, please refer to the installation manual supplied with the indoor.

(d) Indoor unit power supply specifications

Combined total capacity of indoor units	Cable size for power source (mm²)	Wire length (m)	Moulded-case circuit breaker (For ground fault, overload and short circuit protection)	Signal wire size (mm²)	
				Outdoor-Indoor	Indoor-Indoor
Less than 7A	2	21	20A100mA less than 0.1 sec	2cores × 0.75-2.0	2cores × 0.75-2.0
Less than 11A	3.5	21	20A100mA less than 0.1 sec		
Less than 12A	5.5	33	20A100mA less than 0.1 sec		
Less than 16A	5.5	24	30A100mA less than 0.1 sec		
Less than 19A	5.5	20	40A100mA less than 0.1 sec		
Less than 22A	8	27	40A100mA less than 0.1 sec		
Less than 28A	8	21	50A100mA less than 0.1 sec		

Please note

① The method of laying cables has been determined pursuant to the japanese indoor wiring regulations (JEAC8001). (Please adapt it to the regulations in effect in each country)

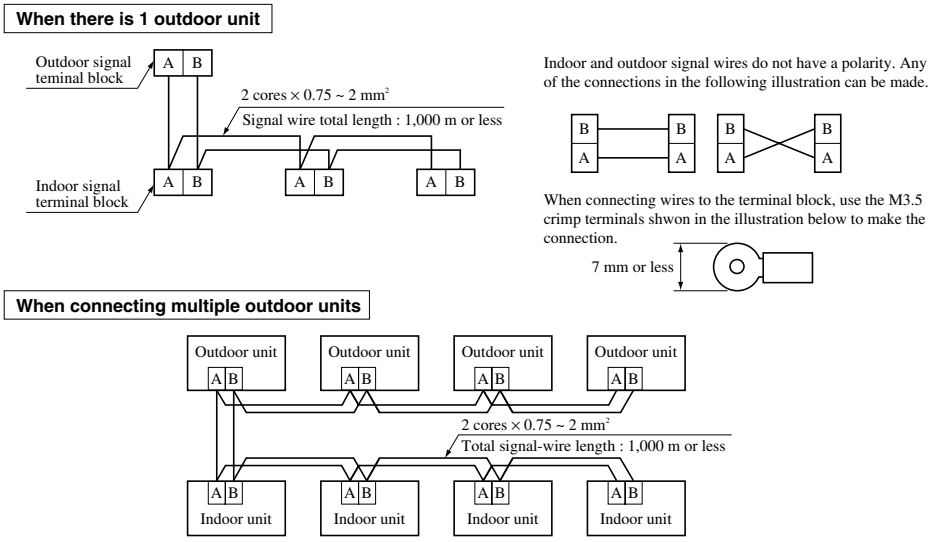
② Wire length in the table above is the value for when the indoor unit is connect to the power cable in series also the wire size and minimum length when the power drop is less than 2% are shown. If the current exceeds the value in the table above, change the wire size according to the indoor wiring regulations. (Please adapt it to the regulations in effect in each country)

③ For details, please refer to the installation manual supplied with the indoor unit.

(3) Method of connecting signaling wires

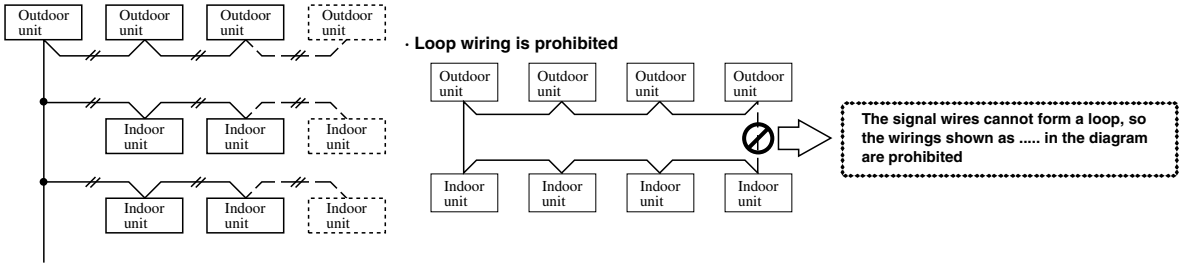
- The signal wires are 5VDC, so absolutely do not connect them to a 220/240V wire. If such a connection is mistakenly made, all the printed circuit boards will be burned out. Signal wires do not have a polarity. Connect them between the indoor and outdoor units, between indoor units, between indoor units, and between the same terminal Nos. (Connection between (A) and (A), (B) and (B).)
- Please use shielded cords for signaling wires. (For grounding of a shielded cord, find a point of connection to the metal casing in the proximity of the terminal block for the AB lines)

Indoor and outdoor signal wires



(a) The maximum number of indoor units that can be connected in a system is 48 and it is possible toconfigre outdoor units and/or indoor units as an outdoor or indoor unit group connected with each other with two connecting wires.

(b) The signal wires can also be connected using the method shown below.



(4) Remote controller wiring specifications

(a) For the remote controller the standard wire is 0.3mm^2 × 3 cores. The max. length is up to 600m. When the wire is more than 100m long, use the wire shown in the following table.

Length (m)	Wire size
100 to 200	0.5mm^2 × 3 cores
To 300	0.75mm^2 × 3 cores
To 400	1.25mm^2 × 3 cores
To 600	2.0mm^2 × 3 cores

(b) When the remote controller wire runs parallel to another power supply wire or when it is subject to outside noise, such as from a high-frequency device, use shielded wire. (Be sure to ground only one end of the shielded wire.)

(5) Address setting

○ 3 methods are available for setting the address, automatic address setting, remote controller address setting and manual address setting, by using a combination of the address switches for indoor and outdoor units (see the table below).

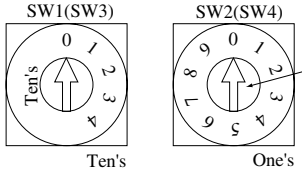
○ Change the switches with the power supply off. Do not use these methods together.

Address setting method	Outdoor unit	Indoor unit	
	Outdoor unit No.	Outdoor unit No.	Indoor unit No.
Outdoor unit	49	49	49
Outdoor unit No.	00 ~ 47	49	49
Indoor unit	00 ~ 47	00 ~ 47	00 ~ 47

○ Address No. setting

Set the setting SW1 to 4 on the indoor printed circuit board and the setting SW1 to 2 on the outdoor printed circuit board as described in the following table.

Indoor printed circuit board	SW1, 2 (blue)	For setting indoor No. (The one's and ten's)
	SW3, 4 (green)	For setting outdoor No. (The one's and ten's)
Outdoor printed circuit board	SW1, 2 (blue)	For setting outdoor No. (The one's and ten's)



SW1 (SW3) Ten's \ SW2 (SW4) One's	0	1	2	3	4	5	6	7	8	9
0	00	01	02	03	04	05	06	07	08	09
1	10	11	12	13	14	15	16	17	18	19
2	20	21	22	23	24	25	26	27	28	29
3	30	31	32	33	34	35	36	37	38	39
4	40	41	42	43	44	45	46	47	48	49

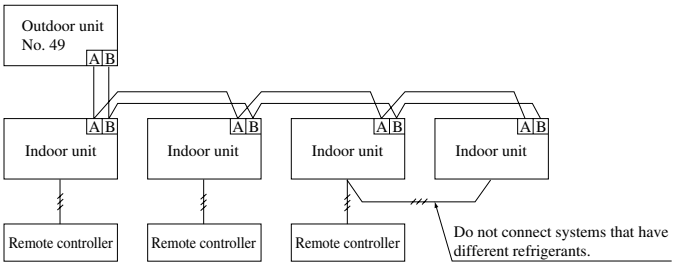
48 and 49 are used as the automatic address

(a) An outdoor unit number is indicated on the outdoor unit PCB and the indoor unit PCB it is a number showing which outdoor unit is connected to which indoor unit, so give the same number to outdoor and indoor units connected with each other by a refrigerant pipe.

(b) The indoor unit No. is provided to discriminate between the indoor units. Be sure to avoid any duplication.

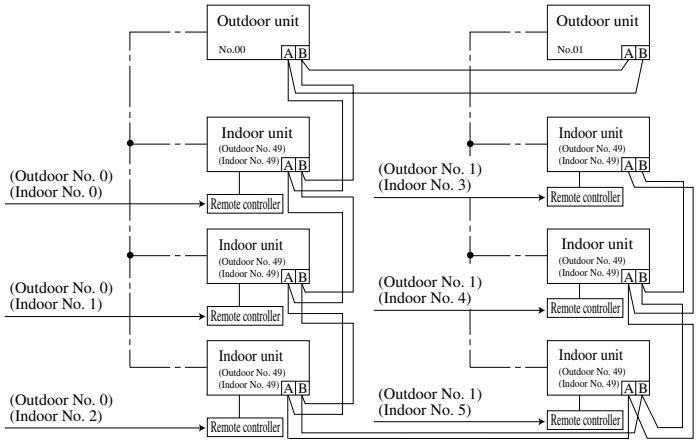
1) Automatic address setting

This feature is available when cabling system is based on an outdoor unit.



a) Set the address switch of the outdoor unit at 49. (it was set at 49 on shipment).
b) Set the address switch of the indoor unit at 49. (it was set at 49 on shipment).
c) Turn on the power in the following order: outdoor-indoor. The addresses will be set automatically. The auto-addres can be set will indoor/outdoor power sources ON. Because the remote controller displays "Outdoor No." if only the indoor unit power source is ON, the outdoor power source should be turned on as well.
d) The numbers can be set after the power is turned on for 1 minute.
e) After setting, the address of the indoor units can be displayed by pushing the checking switch of the remote controller. The outdoor unit numbers are not displayed.
f) In the case where 1 remote controller is used for multi-unit control, the auto-address can be set. However, do not connect systems that have different refrigerants.
g) Once the address has been set, it is stored in the microcomputer even when the power is turned off.
h) Even if electrical wiring of the outdoor units is done unit by unit, it is possible to perform remote controller address and manual settings.

2) Remote controller addres setting



The unit Nos. in parentheses are address Nos. set with the following procedure using a remote controller.
The chain line represents the refrigerant piping.

Setting of remote controller addresses is possible under the following conditions.

① If there are multiple outdoor units, the indoor units are wired by a super link and there is one remote controller connected to each indoor unit.

② If the outdoor unit's address switch is No. 0 ~ 47 before the power is turned ON, and the indoor unit's address switch is 48 or 49 for both the outdoor No. and indoor No. (factory setting).

<Address Setting Method>

a) Set the outdoor unit's address at 00 ~ 47, being careful that it does not overlap with that of another outdoor unit.
b) Leave the address set with address switch on the indoor unit's PCB at the factory setting of 49.
c) Turn the power ON.
d) After the " WAIT " message is displayed on the remote controller, enter the address setting mode. The display will change to "O/U No. SET ◆" → "O/U No. — — ▲" (flashing).

* If the outdoor unit's power is OFF, or if communications with the outdoor unit are being confirmed, the message "POWER O/U ON" will be displayed. The display will change to "O/U No. — — ▲" at the point when communications with the outdoor unit are established.

e) Set the outdoor unit No. Each time the ▲ button is pressed, the outdoor No. increases, as in 00 ~ 01 ~ 02, etc. Pressing the ▼ button causes the No. to decrease each time it is pressed, as in 47 ~ 46 ~ 45. Stop pressing the button when the displayed No. reaches the No. of the outdoor unit.

f) Pressing the SET button causes the outdoor unit No. to change from flashing to lighted continuously. This indicates that the outdoor unit No. is set. Next, the "I/U No. SET ◆" message is displayed.

* Here, if you would like to change the set outdoor unit No., press the RESET button once. The "O/U No." will start flashing again and the address can be changed.

g) Set the indoor unit No. in the same way as the outdoor unit No., using the ▲ or ▼ button to display the number of the unit to be set.

h) After setting is completed, press the SET button to complete setting of the outdoor unit No. and indoor unit No. The set "I/U No., O/U No." are displayed for 2 seconds, then the remote controller returns to the stopped state.

i) That completes the address setting procedure.

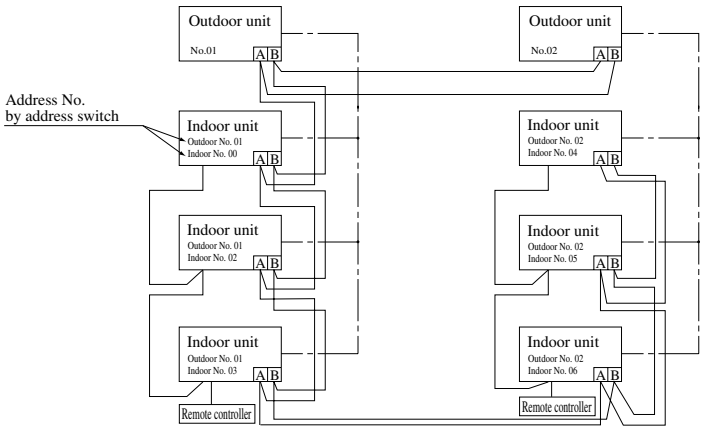
- Changes after address setting is completed
  Once the addresses have been set, they are stored in microcomputer memory even when the power is turned OFF. However, if you press the AIR CON No. button continuously for 3 seconds or longer, the display changes to "O/U No. SET ◆" → "O/U No. — — ▲" (flashing), then new addresses can be set in the same way as described in the above procedure. Addresses can be set only while the units are stopped.
- If a remote controller's address setting is invalid (if the indoor and outdoor unit address settings and the remote controller's address setting form an impossible combination), pressing AIR CON No. continuously for 3 seconds or longer causes the "☝ INVALID OPER" message to be displayed (lights up for 3 seconds).
- Clearing set addresses from address memory in the remote controller
  Press the FAN SPEED. button while holding down the CHECK button and TIMER button on the remote controller. The address settings will be cleared from memory. Afterward, if the indoor and outdoor units' power is turned OFF, the status returns to the condition where no addresses are set, and you can select from 3 different address setting methods depending on the combination of address switches used.

3) Manual address setting

a) Set the outdoor address No. between 0-47 with the address switch (green) on the printed circuit board of the outdoor unit so that the same No. which has already been set for another outdoor unit is not assigned.

b) Set the address switch (green) on the printed circuit board of the indoor unit so that the same outdoor unit No. with the outdoor unit connected by the refrigerant pipe is assigned.

c) Set the indoor unit address No. between 0-47 with the address switch (blue) of the ibdoor unit so that the same No. which has already been set for the another outdoor unit is no assigned.



5.6 Setting functions using the remote controller

(1) The default settings of this unit's functions are as follows: If you want to charge a setting, follow the procedure found in the installation manual and set to your desired setting.

For the method of setting, please refer to the installation manual of a remote controller.

Remote control unit functions (FUNCTION ▼)

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ	Default setting
01	GRILLE SET (Grille lift panel setting)	INVALID	○
		50Hz AREA ONLY	
		60Hz AREA ONLY	
02	AUTO RUN SET	AUTO RUN ON	✻
		AUTO RUN OFF	
03	TEMP S/W	VALID	○
		INVALID	
04	MODE S/W	VALID	○
		INVALID	
05	ON/OFF S/W	VALID	○
		INVALID	
06	FANSPEED S/W	VALID	○
		INVALID	
07	LOUVER S/W	VALID	✻
		INVALID	
08	TIMER S/W	VALID	○
		INVALID	
09	SENSOR SET (Remote control sensor setting)	SENSOR OFF (Invalid)	○
		SENSOR ON (Valid)	
10	POWER FAILURE COMPENSATION SET	INVALID	○
		VALID	
11	VENTI SET	NO VENTI	○
		VENTI LINK SET	
		NO VENTI LINK	
12	TEMP RANGE SET	DISP CHANGE	○
		NO DISP CHANGE	
13	I/U FAN SPEED (Indoor unit fan speed setting)	3 FAN SPEED	✻
		2 FAN SPEED	
		1 FAN SPEED	
14	MODEL TYPE	HEAT PUMP	✻
		COOLING ONLY	
15	EXTERNAL CONTROL SET	INDIVIDUAL OPERATION	○
		SAME OPERATION FOR ALL UNITS	
16	ERROR DISP SET	ERROR DISP	○
		NO ERROR DISP	
17	POSITION (Louver control setting)	FIX (1 OF 4) (4 position stop)	○
		IN MOTION (Free stop)	
18	˚C/˚F SET	˚C	○
		˚F	

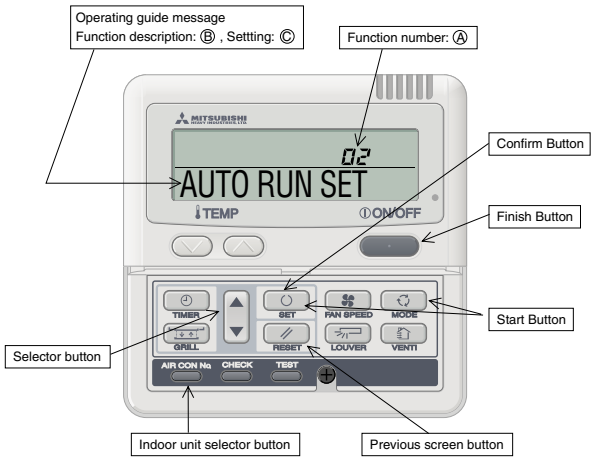
Notes(1) Setting marked with [○] are the default setting.
(2) Setting marked with [✻] are those that are set automatically according to an indoor unit or an outdoor unit connected. Please check default settings with the indoor unit's installation manual.
(3) When Item 17 : "POSITION" is changed, please also change Item 04 "POSITION" setting found in "Indoor unit functions".

Indoor unit functions (I/U FUNCTION ▲)

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ	Default setting
01	Hi CEILING SET	STANDARD	✻
		Hi CEILING 1	
03	FILTER SIGN SET	NO DISPLAY	✻
		AFTER 180H	
		AFTER 600H	
		AFTER 1000H	
		1000H→STOP	
04	POSITION (Louver control setting)	FIX (1 OF 4) (4 positiion stop)	○
		IN MOTION (Free stop)	
05	EXTERNAL INPUT SET	LEVEL INPUT	○
		PULSE INPUT	
06	OPERATION PERMISSION PROHIBITED	NORMAL OPERATION	○
		VALID	
07	ROOM TEMP OFFSET (Heating room temperature offset)	NORMAL OPERATION	○
		TEMP SHIFT +3˚C	
08	FAN CONTROL (Heating fan control)	LOW FAN	✻
		STOP→LOW FAN (Intermittent operation)	
09	FREEZE PREVENT TEMP	TEMP Hi	
		TEMP Lo	○
10	FREEZE PREVENT CONTROL	FAN CONTROL ON	○
		FAN CONTROL OFF	
11	ELECTR DUST COLLEOR	FAN CONTROL OFF	○
		FAN CONTROL ON	
12	HUMIDI CONTROL	DM LINK OFF	○
		DM LINK ON	

Notes(1) Setting marked with [○] are the default setting.
(2) Setting marked with [✻] are those that are set automatically according to an indoor unit or an outdoor unit connected. Please check default settings with the indoor unit's installation manual.

(2) Function setting method



1) Stop the air conditioner
2) Press the SET and MODE buttons simultaneously for 3 seconds or longer.
   The screen display will be switched as follows:
   "SELECT ITEM" → " SET" →
   "FUNCTION SET ▼ "

3) Press the SET button.
   The unit will enter the function setting mode. The screen display will charge to " FUNCTION ▼".
4) Check which category your desired setting belongs to, " FUNCTION ▼ (Remote controller unit function)" or " I/U FUNCTION ▲" (Indoor unit function).
5) Press either ▲ or ▼ button.
   Select either " FUNCTION ▼ " or "I/U FUNCTION ▲".

6) Press the SET button.

When " FUNCTION▼ " is selected.

① "DATA LOADING" (blinking)→ " FUNCTION"→ "01 GRILLE ↑↓ SET" (Function number: Ⓐ, Function description: Ⓑ)
   The screen display will be switched like this.

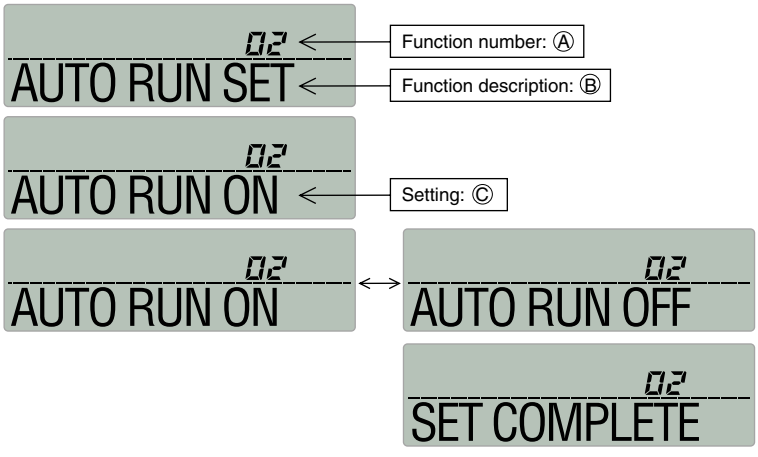
② Press either ▲ or ▼ button.
   "Function number: Ⓐ, Function description: Ⓑ "from the list of remote controller unit functions will be displayed one by one. Select a desired function.

③ Press the SET button.
   The screen display will be switched as follows:
   " SETTING" → "Setting: Ⓒ" (ex. "AUTO RUN ON")

④ Press either ▲ or ▼ button.
   A list of "Settings: Ⓒ" will be displayed one by one. Select your desired setting.

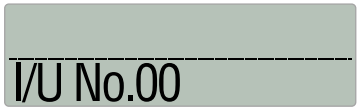
⑤ Press the SET button.
   The selected setting is displayed for 2 seconds, then followed by "SET COMPLETE" and the function setting process is completed. Then the screen display will be swiched to "Function number: Ⓐ, Function description: Ⓑ," so if you want to continue to set another function, repeat the steps as explained above.
   To finish the function setting process, please proceed to Step (c).

* When "02 AUTO RUN SET " is selected.



When "I/U FUNCTION ▲" is selected.

① The screen display will be switched as follows:
"◆☝ I/U SELECT"→ "○☝ SET"→ "I/U No.00" (blinking)

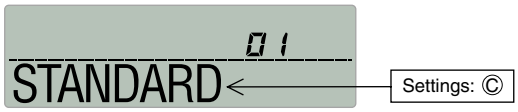


② Press either ▲ or ▼ button.
Select the indoor unit number that you want to change settings. If only one indoor unit is connected, the indoor unit number will not charge, so please proceed to Step ③.
If "ALL I/U ▼ " is selected while indoor group control is in effect, you can set all units to the same settings.

③ Press the SET button.
Indoor unit number indication will change from blinking to lit continuously, The screen display will be switched as follows:
"DATA LOADING" (blinking for about 2 to 23 seconds)→ "◆☝ FUNCTION"→ "01 Hi CEILING SET" (Function number: Ⓐ, Function description: Ⓑ)
* When "01 Hi CEILING SET" is selected.

④ Press either ▲ or ▼ button.
"Function number: Ⓐ, Function description: Ⓑ" from the list of indoor unit functions will be displayed one by one. Select a desired function.

⑤ Press the SET button.
The screen display will be switched as follows: "◆☝ SETTING" → "Setting: Ⓒ" (ex. "STANDARD")



⑥ Press either ▲ or ▼ button.
A list "Setting: Ⓒ" will be displayed one by one. Select your desired setting.

⑦ Press the SET button.
The selected setting is displayed for 2 seconds, then followed by "SET COMPLETE" and the function setting process is completed.
Then the screen display will be switched to "Function number: Ⓐ, Function description: Ⓑ" so if you want to continue to set another function, repeat the stepa as explained above. To finish the function setting process, please proceed to Step 8.

⑧ Press AIR CON No. button.
The screen display will go back to the indoor unit selection screen (ex. " I/U No.00").
If you want to continue to set another indoor unit, please follow the steps explained above.

(3) Press the ON/OFF button.

This ends a function setting process. Even if a function setting process is not completed, this ends the process. Please note that any setting that is not completed will become void.

- **Pressing the RESET button during a function setting process will allow you to go back the previous step. Please note that any setting that is not completed will become void.**
- **Method of checking the current setting**
  While following the above mentioned step, the setting that appears when the SET button is pressed for each "Function number: Ⓐ, Function description: Ⓑ" is the current setting "Stting: Ⓒ". (When "ALL I/U ▼" is selected, the setting of the indoor unit with the lowest number is displayed)
- **Settings are stored in the controller and not lost even a power outage occurs.**

(4) Changing the remote controller's temperature setting range

1) The temperature setting range of the remote controller can be changed.
   Through remote controller button operations, the upper limit and lower limit set temperature values can be changed individually.
   During heating operation, the changed upper limit value becomes valid and at times other than during heating operation, (during cooling, dehumidification, auto and fan operation), the changed lower limit value becomes valid.
   Range of Possible Changes
   Upper Limit Value: 22~30ºC (valid during heating) Lower Limit Value: 18 ~ 26ºC (valid at times other than during heating)
2) Operation
   a) With the remote controller in the stopped state, press the SET and MODE buttons simultaneously for 3 seconds or longer. The display will changed from "SELECT ITEM"→ " SET"→ "FUNCTION SET ▼"
   b) Press the ▼ button once. The display will change to TEMP RANGE ▲ .
   c) Press the SET button to enter the temperature range setting mode.
   d) Using the ▲ or ▼ button, select "Hi LIMIT SET ▼" or "Lo LIMIT SET ▲", the press the SET button.
   e) If "Hi LIMIT SET" is selected,
      ① The display changes from " SET UP" → "Hi LIMIT 22ºC " (flashing).
      ② Using the button, select the upper limit value. Display example: "Hi LIMIT 22ºC " (flashing)
      ③ Press the SET button to fix the setting. Display example: "Hi LIMIT 22ºC" (lighted up)
   f) If "Lo LIMIT SET" is selected,
      ① The display changes from " SET UP"→ "Lo LIMIT 26ºC " (flashing).
      ② Using the button, select the upper limit value. Display example: "Lo LIMIT 26ºC " (flashing)
      ③ Press the SET button to fix the setting. Display example: "Lo LIMIT 26ºC" (lighted up)
   g) Press the ON/OFF button to end the setting procedure.
      (The procedure also ends if the ON/OFF button is pressed during the setting operation. However, settings which have not been fixed become invalid, so exercise caution.)

- If the RESET button is pressed during a setting operation, the display returns to the previously displayed setting screen. However, settings which have not been fixed become invalid, so exercise caution.
  * If "NO DISP CHANGE" is selected in No. 12, "TEMP RANGE SET" of the remote controller's functions, of the function setting modes, the remote controller's display does not change even if the temperature range has been changed.

(Example) If the upper limit is set at 28˚C

Function No. A	Function Contents B	Setting Contents C	Control Contents
12	TEMP RANGE SET	DISP CHANGE	The remote controller's display and sent data upper limit changes to 28ºC.
		NO DISP CHANGE	The remote controller's display upper limit remains at 30ºC and only the upper limit of the sent data is changed to 28ºC.

5.7 Pump down operation

A pump down operation occurs when specified by Dip Switch settings (SW5-1, 2, 3). (Pump down operation is not possible when indoor units are running.) Connected units should be controlled from the master unit.

(1) Pump down procedure

(a) Close the outdoor unit's liquid side control valve.
(b) Turn SW5-2 (trial run mode) ON (cooling).
(c) Turn SW5-3 (pump down switch) ON.
(d) Turn SW5-1 (trial run switch) ON.
(e) The red and green LEDs on the outdoor control PCB begin to blink continuously, and "PoS" displays at the 7-segment display.

Cautions regarding refrigerant recovery by pump down operation

- All refrigerant is not recovered even if a pump down operation is performed. Depending on the piping length or the temperature, some refrigerant will not be recovered, although the residual level will be such that less time is required for a final refrigerant recovery by the recovery unit.
- As a general guideline, a refrigerant recovery is possible by performing a 20kg pump down at 12~16 horsepower.

5.8 Test run

(1) Before begining operation

(a) Measure the electric component terminal and ground with a 500 V megger to check that it is more than 1 MΩ .

(b) Be sure to turn on the power to the crank case heater 6 hours before operation.

(c) Confirm that the bottom of the compressor has become warm.

(d) Be sure to fully open the service valves (liquid, and gas) for the outdoor unit.
Operating the outdoor unit with the valves closed may damage the compressor.

(e) Check that the power to all indoor units has been turned on. If not, water leakage may occur.

(2) Test operation

(a) Test run from an outdoor unit.

Whether CnS1 is ON or OFF, you can perform a test run from the outdoor unit by using SW5-1 and SW5-2 provided on te outdoor unit board (in case of a combined installation, that of the master unit).

SW5-1 Test operation (ON) ⟷Normal (OFF)	Turning on the switch operates all the connected indoor units. Set the cooling and heating using the SW5-2 input.	Turning this off makes it possible to perform operation from the remote controller or by external input.
SW5-2	Turn this on makes it possible to perform the cooling operation when SW5-1 is turned on.	Turning this off makes it possible to conduct heating operation when SW5-1 is turned on.

After the test operation, set SW5-1 to OFF.

(b) Carry out the following test operation procedure using the remote controller.

1) Starting the Cooling Test Operation

① Press the ON/OFF button to start operation.

② Press the MODE button and select "✳ (COOL)".

③ Press the TEST button continuously for 3 seconds or longer.
The display changes from "⬍ SELECT ITEM" → "○ SET" → "✳ TEST RUN ▼" .

④ When "✳ TEST RUN ▼ " is displayed, press the SET button to begin the cooling test operation. The display shows "✳ TEST RUN."

2) Canceling the Cooling Test Operation

Pressing the ON/OFF button or the TEMP ⌄ ⌃ button ends the cooling test operation.

The "✳ TEST RUN" display is cleared.

Checking Operation Data

Operation data can be checked with remote controller operation.

① Press the CHECK button.
The display change from "⬍ SELECT ITEM" → "○ SET"→ "OPERATION DATA ▼".

② Press the SET button while "OPERATION DATA ▼" is displayed.

③ The display will change to "I/U No. 00 ▲" (blinking indication).
Select the indoor unit number you want to have data displayed with the ▲ ▼ button.
(When only one indoor unit is connected, the indoor unit number displayed on the screen will not change)

④ Determine the indoor unit number with the SET button.
(The indoor unit number changes from blinking indication to continuous indication)
"DATA LOADING" (A blinking indication appears while data is loaded)
↓
"OPERATION DATA ⬍" appears and data number 01 is displayed.

⑤ Upon operation of the ▲ ▼ button, the current operation data is displayed in order from Data number 01.
The items displayed are as follows.
* Depending on models, the items that do not have corresponding data are not displayed.

⑥ 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.

⑦ Pressing the ON/OFF button will stop displaying data.

Pressing the RESET button during remote controller operation will undo your last operation and allow you to go back to the previous screen.

Number		Data item
01	✳	(Operation mode)
02	SET TEMP	
03	RETURN AIR	
04	I/U HEAT EXCH 1	(Indoor unit heat exchanger temperature 1)
05	I/U HEAT EXCH 2	(Indoor unit heat exchanger temperature 2)
07	I/U FAN	(Indoor unit fan speed)
11	TOTAL I/U RAN	(Indoor unit operation hours)
21	OUTDOOR	(Outside ir temperature)
22	O/U HEAT EXCH 1	(Outdoor unit heat exchanger temperature 1)
23	O/U HEAT EXCH 2	(Outdoor unit heat exchanger temperature 2)
24	COMP HERTZ	
27	DISCHARGE	(Discharge pipe temperature)
28	DOME BOTTOM	
29	CT	
31	O/U FAN	(Outdoor unit fan speed)
32	SILENT MODE ON/OFF	
34	63H1 ON/OFF	
35	DEFROST ON/OFF	
36	TOTAL COMP RUN	(Compressor operation hours)
37	EEV 1	(Expansion valve opening 1)
38	EEV 1	(Expansion valve opening 2)

5.9 Notabilia as a unit designed for R410A

1) Do not use any refrigerant other than R410A.
   R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant.
2) 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 miatake. 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 toola listed in the table on the right before installing or servicing this unit.
3) Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to charge, which results in performance degradation.
4) In charging refrigerant, always take it out from a cylinder in the liquid phase.
5) All indoor units must be models designed exclusively for R410A. Please 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)	Protrucsion control copper pipe gauge
g)	Vaccum pump adapter
h)	Gas leak detector

6 MAINTENANCE DATA

(1) Before starting troubleshooting

(a) Confirmation of the error code on the remote controller (by pressing the inspection switch) and the inspection display and normal display lamps on PCBs (Printed circuit board) of indoor/outldoor units

The microcomputer detects errors on electrical components, which include the microcomputer itself, errors on the power supply line and errors (overload, etc.) on the refrigerant circuit and the location of trouble is displayed (with the commbination of error symbols of remote controller, normal (green) and inspection (red) display LED on PCBs of indoor/outdoor units). When any error occurs, check first the inspection display. It will guide you to trouble point and assist you to complete the repair work quickly.

Error code of the remote controller is recorded on microcomputer after the trouble has been reset automatically so that, if you press the inspection switch of remote controller, the error code and the number of unit in trouble are displayed for 10sec.. The inspection display lamp on the indoor/outdoor unit PCB keeps flashing (glowing) even after the trouble was reset automatically. Inspection lamp on the indoor unit PCB is turned off if the remote controller is reset.

1) Inspection/normal: List of power display

Section	Display Section	Display	Contents of display
Remote controller	Power supply display	LCD	At power ON : Displays always the return air temperature and Center/Remote.
	Error code	LCD	At error : Displays E1 ~ E63 or blank depending on the kings of error.
	Inspection display	Red-LED	At error : Flash continuously (indicates the occurence of error).
Indoor/outdoor unit	Normal display	Green-LED2	At power ON (normal) : Flash continuously. At error : Off or continuous glowing or irregular illumination.
	Error display	Red-LED1	At error : Flash 1 ~ 3 times/5 sec for indoor unit depending on the kinds of error, continuous flash, irregular illumination or off. At error : Flash 1 ~ 6 times/10 sec for outdoor unit depending on the kinds of error, continuous flash, irregular illumination or off.
Invertes	Normaly display	Green-LED	At power ON (normal) : Flash continuously. At error : Off or continuous glowing or irregular illumination.
	Error display	Red-LED	1 time flashes: Current cut (power transistor over-current) • Short-circuited compressor wiring • Trouble on inverter PCB • Trouble on power transistor • Compressor motor neutral line disconnected. 2 time flashes: Power transistor overheat • Fastening of the power transistor to the heat dissipation fins (tighten the screws, apply silicone) is insufficient. • Power transistor is defective. 3 time flashes: Compressor rotor lock • Compressor breakdown • Inverter board breakdown 4 time flashes: Compressor starting is defective. • Compressor breakdown • Inverter board breakdown • Power transistor breakdown Lights up : Transmission error between inverter and outdoor unit • Connectors CN11 or CN12 is disconnected or beoken wire between connectors • Error on outdoor control PCB • Error on inverter PCB

2) Check Indicator Table

Whether a failure exists or not on the indoor unit and outdoor unit can be know by the contents of remote controller eroor code, indoor/outdoor unit green LED (power pilot lamp and microcomputer normality pilot lamp) or red LED (check pilot lamp).

Remote controller error code	Indoor unit LED		Outdoor unit LED		Cause
	Green	Red	Green	Red	
No-indication	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Normal
	Stays OFF	Stays OFF	Stays OFF	Stays OFF	Power OFF, T phase wiring is open, power source failure
	Keeps flashing	*3 time flash	Keeps flashing	Stays OFF	Remote controller wires X and Y are reversely connected. *For wire breaking at power ON, the LED is OFF. Remote controller wire is open. (X wire breaking : A beep is produced and no indication is made. Z wire breaking : No beep and no indication) The remote controller wires Y and Z are reversely connected.
E1	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	The remote controller wires are connected to A and B on the terminal block. The indoor/outdoor signal wire are connected in loop form. The indoor unit micro-computer runs away.
	Stay OFF or Lights continuously	Stay OFF or Lights continuously	Keeps flashing	Stays OFF	Indoor unit PCB fault
	Keeps flashing	*3 time flash	Keeps flashing	Stays OFF	Remote control wire breakage (signal) *For wire breaking at power ON, the LED is OFF.
E2	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	No. duplication at indoor unit addressing. More than 49 indoor unit are connected.
E3	Keeps flashing	2 time flash	Stays OFF	Stays OFF	Outdoor unit power supply OFF (detected only during operation)
	Keeps flashing	2 time flash	Keeps flashing	Stays OFF	The corresponding outdoor unit address No. is not found. (Detected only during operation)
	Keeps flashing	2 time flash	Irregular illumination	Stays OFF or Lights continuously	Outdoor unit power OFF (Detected only during operation)
E5	Keeps flashing	2 time flash	Keeps flashing	Stays OFF	Indoor / outdoor transmission error. Wire A and B swapping after power ON.
	Keeps flashing	2 time flash	Stays OFF	Stays OFF	Outdoor power unit failure (when the indoor power supply is different from the outdoor one).
	Keeps flashing	2 time flash	Irregular illumination	Stays OFF or Lights continuously	Outdoor unit microcomputer failure
E6	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Indoor unit heat exchanger thermistor failure
E7	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Indoor unit return air thermistor failure
E9	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	The float SW operates (with FS only). Drain up kit wiring fault.
E10	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	When multi-unit control by remote controller is performed, the number of units is over (more than 17 units). Two remote controller are provided for one controller is perfirmed.
E11	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Addresses setting for plural remote controllers
E12	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Addresses No. combination error or addressing is performed with the following combinations.
					Outdoor No, / Indoor No,
					0~47 / 48, 49
					48, 49 / 0~47
E16 (1)	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Defect of fan motor.
E28	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Remote controller thermistor failure

Note (1) In the case of FDT112, 140 or FDK22~56 type.

Remote controller error code	Indoor unit LED		Outdoor unit LED		Outdoor LED 7-Segment	Cause
	Green	Red	Green	Red		
E30	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E30	Unmatched indoor/outdoor connection
E31	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E31	Duplication outdoor unit address No. Outdoor unit address setting error.
E32	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E32	L3-phase wiring is open phase or reversal phose
E36	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E36-1	Discharge temperature (Tho-D1) abnormality.
				2 time flash	E36-2	Discharge temperature (Tho-D2) abnormality.
E37	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E37-1	Outdoor unit heat exchanger thermistor (Tho-R1) failure
				2 time flash	E37-2	Outdoor unit heat exchanger thermistor (Tho-R2) failure
				3 time flash	E37-3	Outdoor unit heat exchanger thermistor (Tho-R3) failure
				4 time flash	E37-4	Outdoor unit heat exchanger thermistor (Tho-R4) failure
				5 time flash	E37-5	Outdoor unit heat exchanger thermistor (Tho-SC) failure
				6 time flash	E37-6	Outdoor unit heat exchanger thermistor (Tho-H) failure
E38	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E38	Outdoor air temperature thermistor failure
E39	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E39-1	Discharge temperature thermistor (Tho-D1) failure
				2 time flash	E39-2	Discharge temperature thermistor (Tho-D2) failure
E40	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E40	High pressure error
E41	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E41-1	Power transistor (CM1) overheat
				2 time flash	E41-2	Power transistor (CM2) overheat
E42	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E42-1	Abnormal current cut of compressor (CM1)
				2 time flash	E42-2	Abnormal current cut of compressor (CM2)
E43	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E43	The number of connectable units is exceeded.
E45	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E45-1	Transmission error between inverter and outdoor unit control PCB (CM1)
				2 time flash	E45-2	Transmission error between inverter and outdoor unit control PCB (CM2)
E46	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	—	Automatic address setting and remote controller address setting coexists in the same network.
E48	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E48-1	Abnormalities in an outdoor fan motor FM01
				2 time flash	E48-2	Abnormalities in an outdoor fan motor FM02
E49	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E49	Low pressure error
E51	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E51-1	Power transistor overheating (CM1) (15 minute continuation) FDCA400, 450 only
				2 time flash	E51-2	Power transistor overheating (CM2) (15 minute continuation)
E53	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E53	Suction pipe temperature thermistor failure
E54	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E54-1	Low pressure sensor disconnection/output error
	Keeps flashing	Stays OFF	Keeps flashing	2 time flash	E54-2	High pressure sensor disconnection/output error
E59	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E59-1	Compressor startup error (CM1)
				2 time flash	E59-2	Compressor startup error (CM2)
E60	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E60-1	Compressor loader position detection error (CM1)
				2 time flash	E60-2	Compressor loader position detection error (CM2)
E63	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E63	Emergency stop of indoor unit

3) Display sequence of error, inspection display lamp

a) One kind error

Display corresponding to the error is shown.

b) More than one errors.

Section	Display section
Error code of remote controller	• Displays the error of higher priority (When plural errors are persisting) E1>E10>E11>E2>E3>E5>E7>E9>E12 ..... E63 • Displays the present errors. (When a new error has occurred after the former error was reset.)
Inspection LED (red) of indoor unit PCB	
Inspection LED (red) of outdoor unit PCB	

c) Timing of error detection

- **Indoor unit side.**

Error detail	Error code	Timing of error detection
Transmission error of remote controller indoor unit	E1	When the transmission error continuously for 2 min.
CPU is out of control		Resetting was performed at the rate of 1 time per second. An abnormal stop occured 32-sec time flash.
Transmission error between indoor/outdoor units	E5	A check was made once every 20 second. An abnormal stop occured 7 time running.
Broken wire of heat exchanger thermistor	E6	After a compressor ON command, this failure was detected for 5 second in the period of 2 minutes to 2 minutes and 20 seconds.
Broken wire of indoor unit return air thermistor	E7	This failure was detected continuously for 5 seconds.
Drain error (float switch motion)	E9	At all times from 31 seconds after power ON.

- **Outdoor unit side.**

Error detail	Error code	Timing of error detection
Discharge temperature abnormality	E36	A stop occurs when this abnormality occurs for 2 seconds running at 130°C. After a stop for 3 minutes, an recovery is automatically made. An abnormal stop occurs when this abnormality occurs 2 times for 60 minutes. (The abnormal state is held for 45 minutes.)
Broken wire of heat exchanger thermister	E37	This failure is detected when it occurs for 5 seconds running in the period of 2 minutes to 2 minutes and 20 seconds with the compressor ON. An abnormal stop occurs when this failure occurs 3 times for 40 minutes.
Broken wire of outdoor temperature thermistor	E38	
Broken wire of discharge thermistor	E39	This failure is detected when it occurs for 5 seconds running in the period of 10 minutes to 10 minutes and 20 seconds with the compressor ON. An abnormal stop occurs when this failure occurs 3 times for 40 minutes.
High pressure cut	E40	An abnormal stop occurs when this abnormality occurs 5 times for 60 minutes.
Power transistor overheat	E41	Stops at 110ºC or higher, recovers automatically at 90°C or lower, abnormal stop if this occurs 5 times in 60 minutes.
Current cut	E42	An abnormal stop occurs when this abnormality occurs 4 times for 15 minutes.
Excessive number of indoor and outdoor units	E43	This error is detected when the number of connectable units is set over the specified value at remote control addressing.
Transmission error between inverter and outdoor unit PCB	E45	With a delay of 3 minutes, a recovery is automatically made. An abnormal stop occurs when this errors occurs 4 times for 15 minutes.
Broken wire of low pressures sensor	E54	This failure is detected when it occurs for 5 seconds running in the period of 2 minutes to 2 minutes and 20 seconds with the compressor ON. An abnormal stop occurs when this failure occurs 3 times for 40 minutes.
Broken wire of high pressures sensor		

d) Recording and reset of error

Error display	Memory	Reset
Error code	• Saves in memory the mode (1) of higher priority	• Stop the unit operation by pressing the ON/OFF switch of remote controller. • Operation can be started again if the error has been reset. (2)
Indoor unit inspection lamp (red)	• Cannot save in memory	
Outdoor unit inspection lamp (red)	• Saves in memory the mode (1) of higher priority	

Notes (1) Priority is in the order of E1 > ... > E10 > ... > 63.
(2) Reset is disabled for 45min. at the error of outdoor unit or compressor overcurrent or the discharge gas temperature error.

e) Reset of error code in memory (when the error has been reset.)

Indoor unit: Press the Timer switch and the Stop switch while the Inspection switch of wired remote controller is held down or detach the power supply connector (CnW2) of indoor unit PCB and connect again or turn OFF the power.

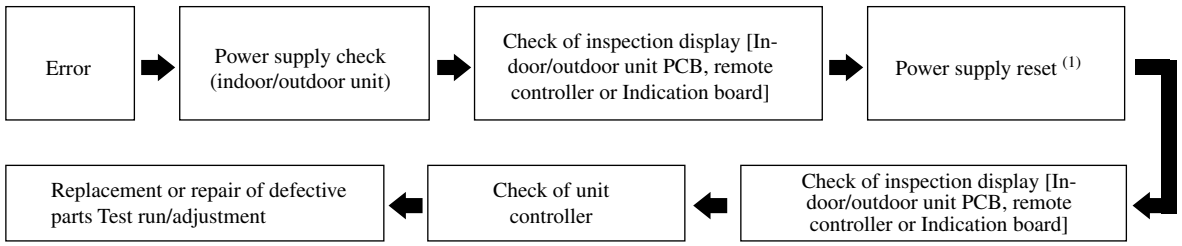
Outdoor unit: Detach the power supply connector (CNA2) of outdoor unit PCB and connect again or turn OFF the power supply or turn on and off the SW3-1.

4) Indications with 7-segement indicator

Refer to page 152, 179.

(2) Procedures of trouble diagnosis

When any error occurs, inspect in following sequence. Detailed explanation on each step is given later in this text.

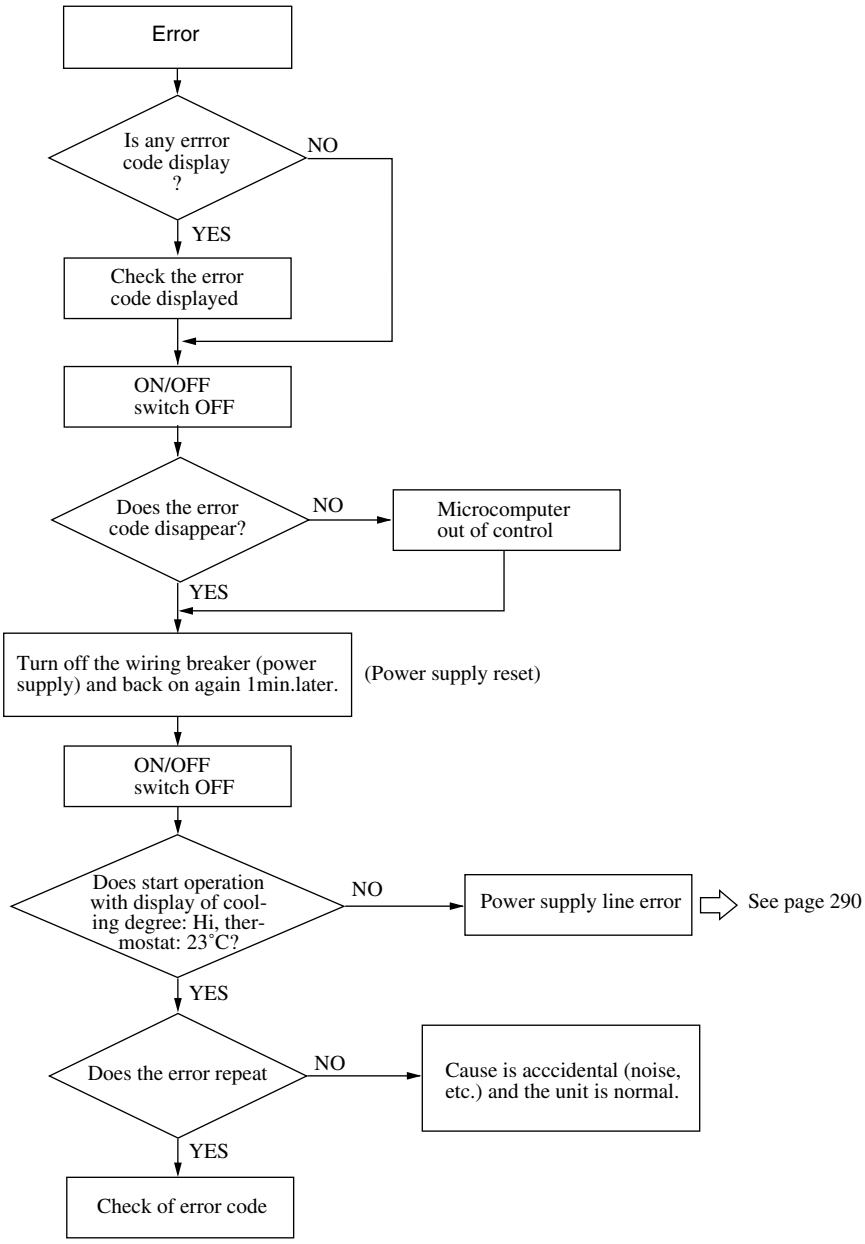


Note (1) It means the operation to turn off the power and back on again more than 1 min. later in order to reset the malfunction of microcomputer due to the effect of power supply conditions or accidental noise.

(a) Diagnosis by the power supply reset

When any error occurs, reset the power supply as described below to see if it is the result of accidental noise, etc.

Check at the indoor unit side.



Errors due to external noise, etc.

Error code may be displayed or the error may not be displayed normally even if the controller is normal because of external noise source(1) or joined or parallel arrangement of power cables and singal wires. It is because the wire of remote controller, wired remote controller signal wires for multiple units or the network signal wires may be influenced by external noises whitch are judged as signals by the microcomputer whitch reacts mistakenly.

When there is any noise source, it is necessary to the shield wire for the remote controller and signal wires.

Note (1) High frequency medical machine, rectifier motor application device, thyristor, broadcast transmission tower, power transmission line, power line of electric train, automatic door motor, elevator (voltage drop), wireless telephone, high voltage power distribution line, computer, personal computer and their cables. These do not necessarily always cause problems but they can be a source of electrical noise.

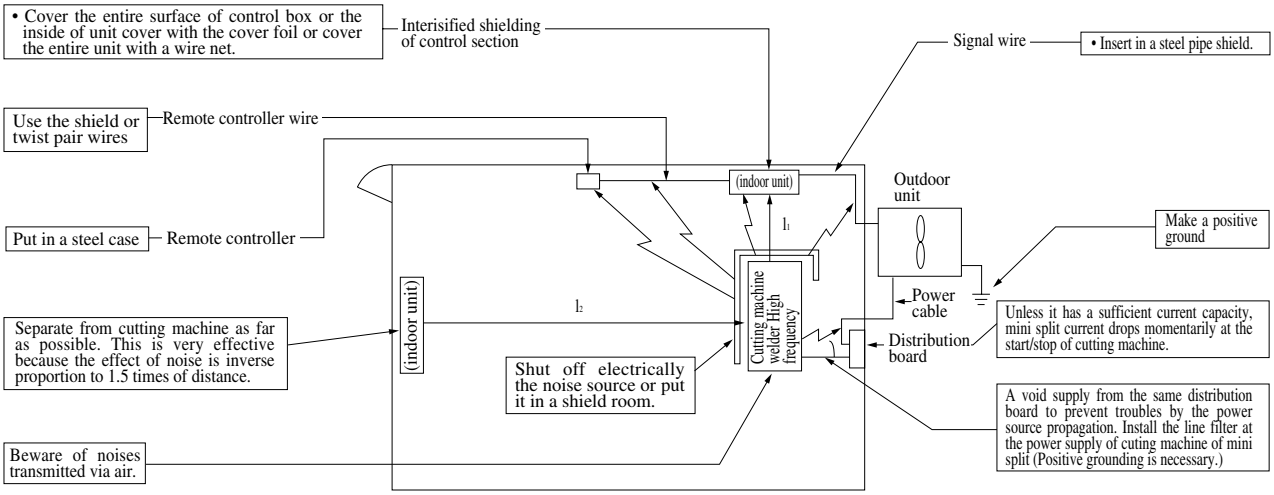
(2) Reference Effect of noise

- When noises inturude into remote controller.

  Abnormal or irregular display such as the flashing of irrelevant display (lamp) (for example, LEDs of cooling and heating illuminated simultaneously or the like) is observed even if the remote controller is not operated or the remote or the remote controller and, as the result, the operation of units may be disabled or similar abnormal phenomenons are observed.

- When noises intruded into the microcomputer of printed circuit board; State of operation becomes abnormal such as the units perform irregular operation while the remote controller is not operated, the operation cannot be stopped with the remote controller, etc.

Electro magnetic noise prevention (example)



(b) Error diagnosis procedures at the indoor unit side

To diagnose the error, measure the voltage (AC,DC), resistance, etc. at each connector around the printed circuit board of indoor unit PCB on the inspection display or the operation state of unit (no operation of comressor or blower, no switching of 4-way valve, etc.). If any defective parts are discovered, replace with the assembly of parts as shown below.

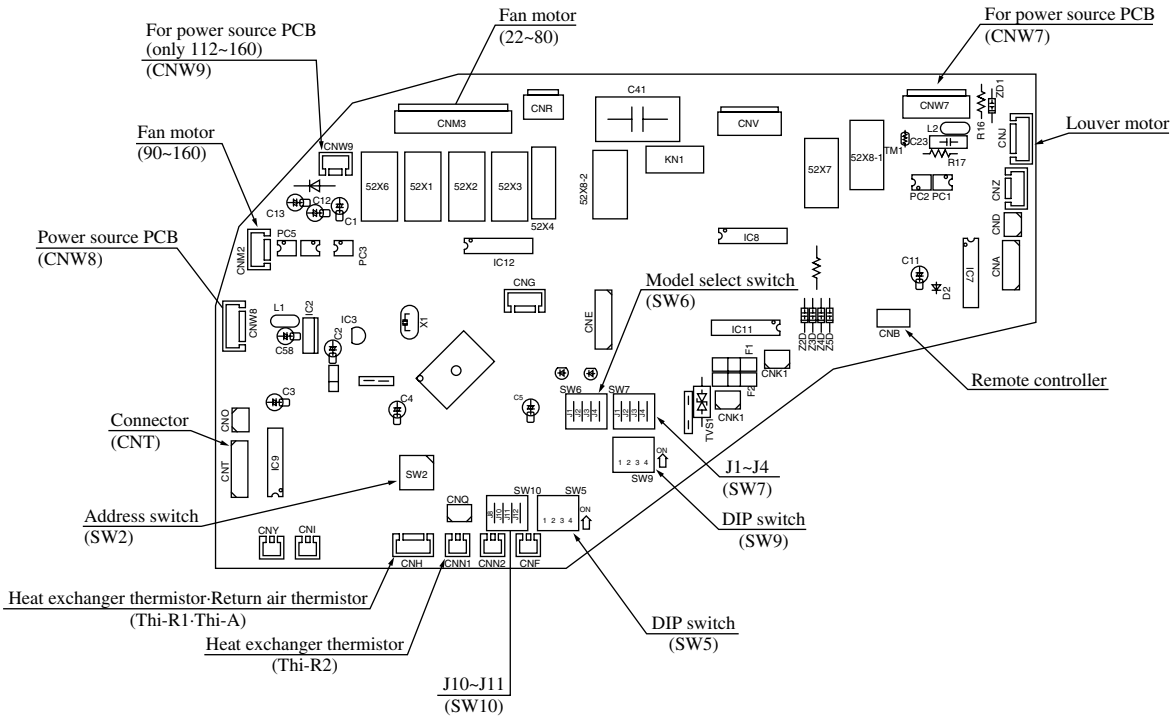
(i) Unit of replacement parts releated to indoor unit printed circuit board (Electric components on and around the microcomputer)

Indoor unit printed circuit board, thermistor (Return air, heat exchanger), remote controller switch, limit switch, transformer, fuse

Note (1) Judges the troubles on the parts of driving power circuit or cooling cycle with the ordinary check method.

(ii) Parts layout on the indoor unit printed circuit board

- The control board in the following figure shows for the FDT type.



- Function of jumper wires

Name			Function
J1 (SW7-1)		With	Filter sign: Valid
		None (1)	Filter sign: Invalid
J2 (SW7-2)		With	Normal operation operable
		None (1)	Operation permission prohibited
J3 (SW7-3)	With	J4 (SW7-4) With	Heating thermostat OFF: Intermittenet operation
		J4 (SW7-4) None (1)	Heating thermostat OFF: Lo operation
	None (1)	J4 (SW7-4) With	Heating thermostat OFF: Stop
		J4 (SW7-4) None (1)	Heating thermostat OFF: —
J10 (SW10-2)	With	J11 (SW10-3) With	Remote controller air flow: 3 speed
		J11 (SW10-3) None (1)	Remote controller air flow: 1 speed
	None (1)	J11 (SW10-3) With	Remote controller air flow: 2 speed
		J11 (SW10-3) None (1)	Remote controller air flow: —

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

- Function of DIP switches (SW5, 9)

Switch		Function
SW5-1	ON	Test run of condensate pump motor
	OFF	Normal
SW5-2	ON	Test run: Heating
	OFF	Test run: Cooling
SW5-3	ON	Input signal: Reverse Invalid
	OFF	Input signal: Run stop
SW5-4	ON	Emergency stop signal: Invalid
	OFF	Emergency stop signal: Valid
SW9-3	ON	Louver stop: Normal
	OFF	Louver stop: Louver Range
SW9-4	ON	Fan control: UH, H, M
	OFF	Fan control: H, M, L

Note (1) All OFF under load condition.

- **Replacement procedure of indoor unit micrcomputer printed circuit board**

Microcomputer printed circuit board can replaced with following procedure.

1) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

Parts No.	Model	Parts No.	Model
PJA505A127ZG	FDTA28~90	**PJA505A132ZC**	FDQM, FDUM, FDTW, FDR, FDFL, FDFU, FDUR
PJA505A127ZF	FDTA112, 140	**PJA505A132ZD**	FDTQ, FDTS, FDKA71
PJA505A129ZH	FDE	**PHA505A020ZB**	FDKA22~56

- Model select switch (SW6)

Switch \ Model	22	28	36	45	56	71	90	112	140
SW6-1	OFF	ON	OFF	ON	OFF	ON	ON	OFF	ON
SW6-2	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
SW6-3	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
SW6-4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON

(iii) Check method when the error code is displayed

Remote controller or Indication board: Inspection LED, error code
Indoor unit PCB: Red LED (inspcetion display), Green LED (CPU. normal display)
Outdoor unit PCB: Red LED (inspcetion display), Green LED (CPU. normal display)

(iv) Check procedure depending on indication lamps (For the indoor unit)

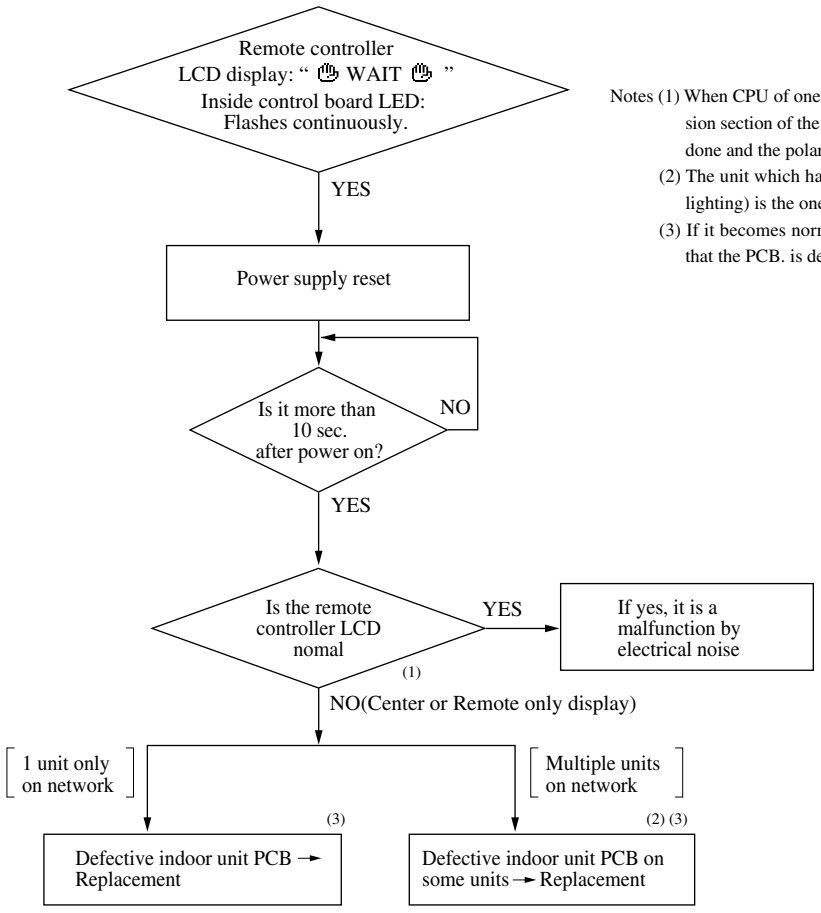
The next page error diagnosis is applicable to cases where only 1 unit is installed in a network unless stated otherwise but the check method is same even if there are multiple units on the network. Except the network occupation state due to out of control indoor unit CPU, the error display indicates the state of respective units. Check each unit specified by the error display as explained on next page.

1 **Error display : No display**
LCD display : No display

[Polarity determination trouble]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

- When the LCD display (Center/Remote, temperature display, etc.) of remote controller flashes, it means the polarity on the unit is not yet determined. Polarity determination is completed within a few seconds after the power on. If it is not completed in time, CPU out of cotnrol, etc. is suspected.

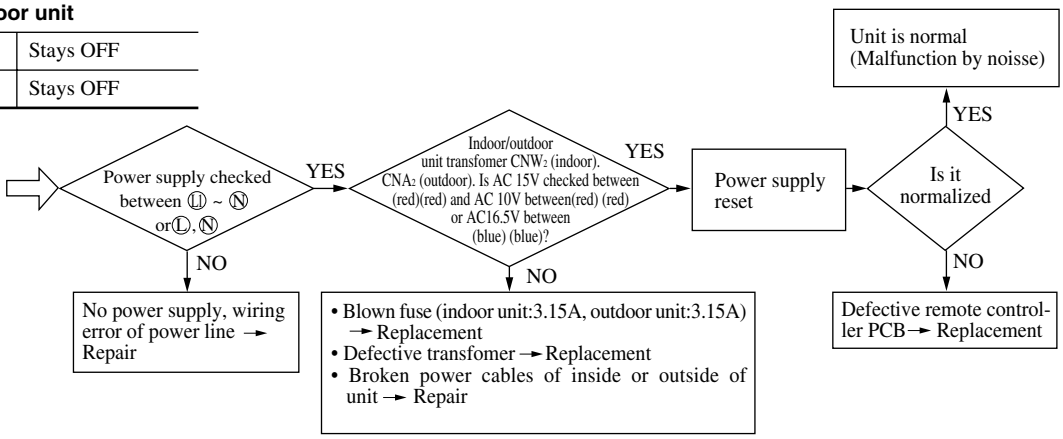


Notes (1) When CPU of one unit goes out of control, it occuping the transmission section of the network, so the transmission of other units are not done and the polarity of the whole network will not be determined.
(2) The unit which has its indoor and green LED keeps flashing (or no lighting) is the one with a defective indoor unit PCB.
(3) If it becomes normal after replacing the PCB. it can be considered that the PCB. is defective (defective network transmission circuit).

2 Error display : No display / LCD display : No display [Power supply line error]

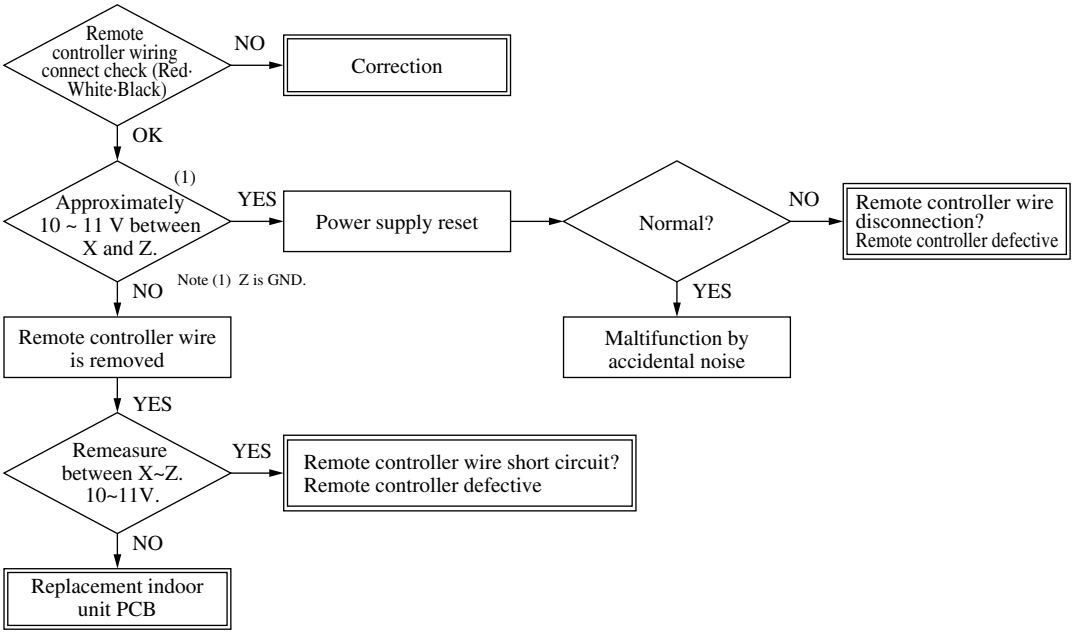
Outdoor unit	
Red LED	Stays OFF
Green LED	Stays OFF

Indoor unit	
Red LED	Stays OFF
Green LED	Stays OFF



Indoor unit		Outdoor unit	
Red LED	3 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

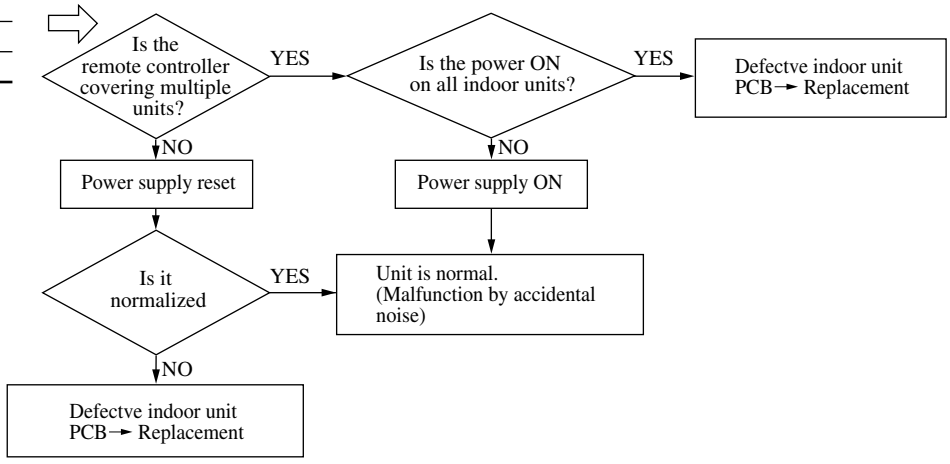
Flash of green LED means CPU is normal.



3 Error display : E1 [Communication error between remote controller~Indoor unit]

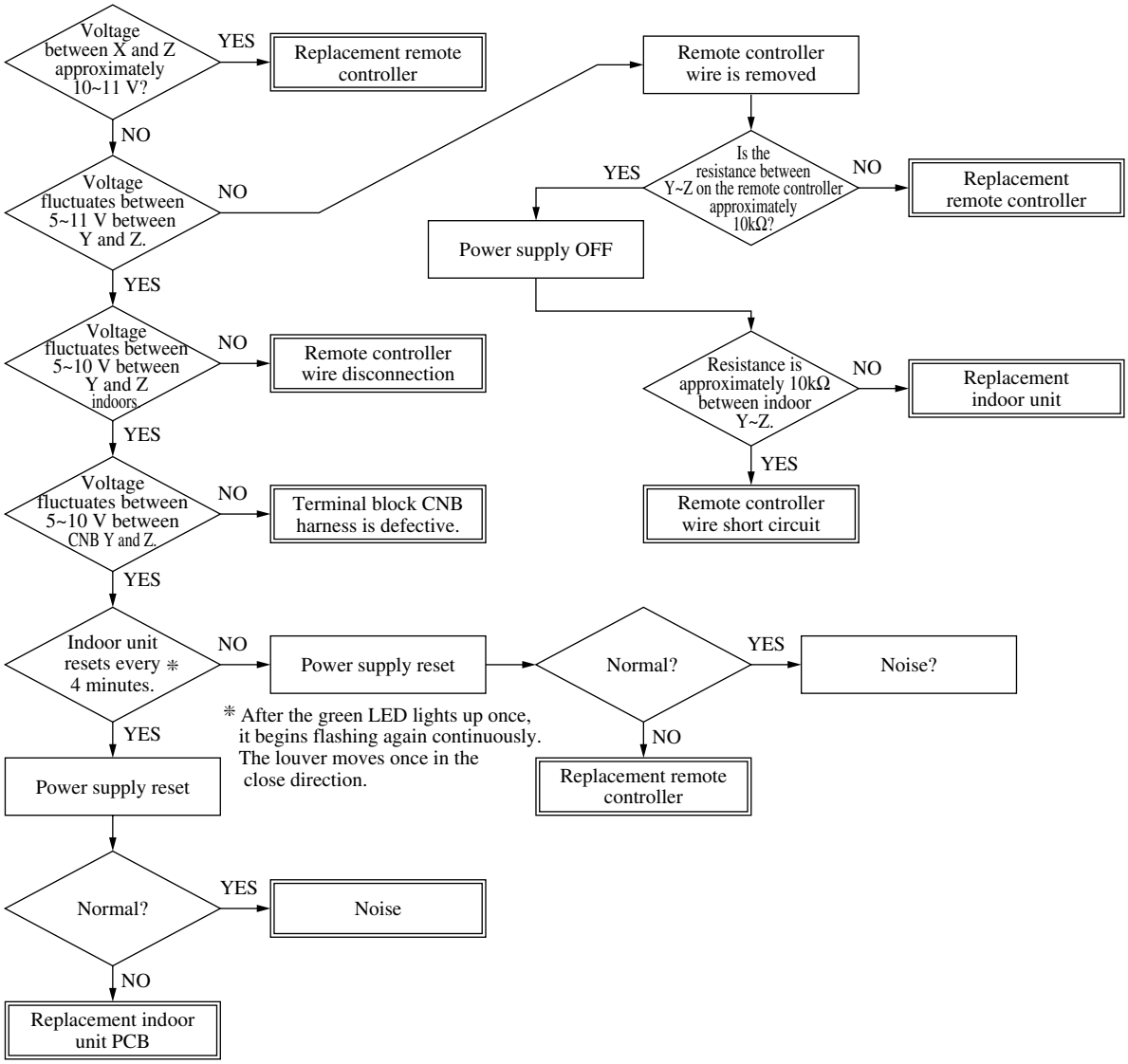
Indoor and outdoor unit	
Red LED	Stays OFF
Green LED	Keeps flashing (1)

Note (1) With the separate power supplies for indoor/outdoor units, the outdoor unit green LED may flash in some cases.

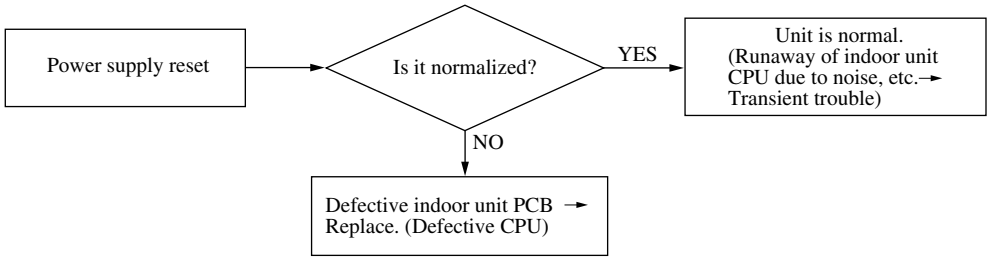


Indoor unit		Outdoor unit	
Red LED	*3 times flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

* Lamp OFF if remote controller wire is broken at power ON.

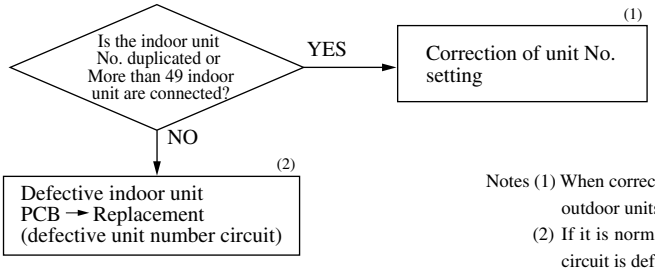


Indoor unit		Outdoor unit	
Red LED	Stays OFF or Lights continuously	Red LED	Stays OFF
Green LED	Stays OFF or Lights continuously	Green LED	Keeps flashing



4 Error display : E2 [Duplicated indoor unit No. or More than 49 indoor unit are connected.]

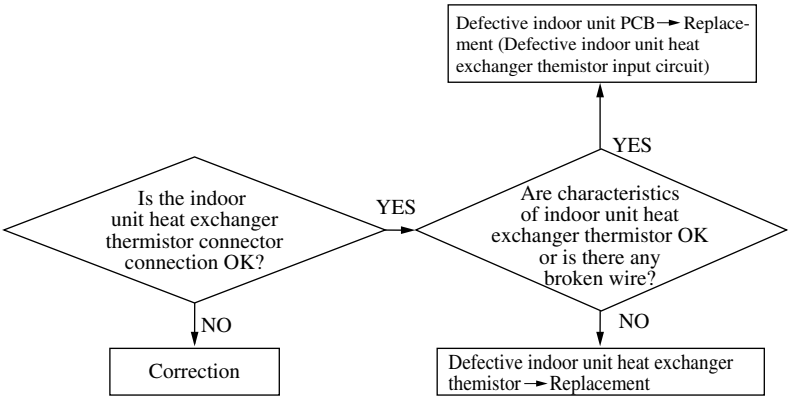
Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



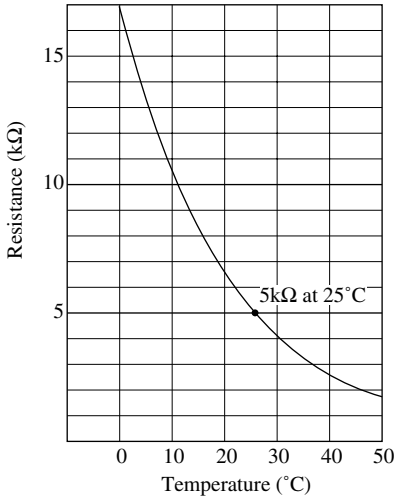
Notes (1) When correcting the unit number, check again the pairing of indoor/outdoor units (same Number assigned to coupled units) is correct.
(2) If it is normalized by changing PCB, judge the unit number input circuit is defective.

5 Error display : E6 [Defective indoor unit heat exchanger thermistor]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



Return air thermistor (Th_{I}-A)
Indoor unit heat exchanger thermistor (Th_{I}-R1, R2, R3)
Resistance temperature characteristics



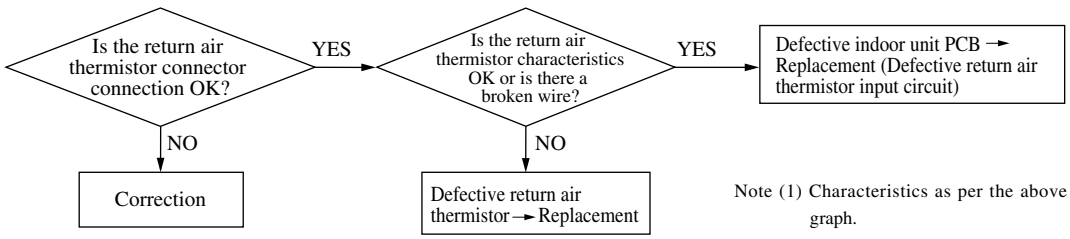
Note (1) 22.5 kΩ at -6˚C

● Display condition

If a temperature of –40ºC or lower is detected by the thermistor continuously for 5 seconds.

6 Error display : E7 [Detective Return air thermistor]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



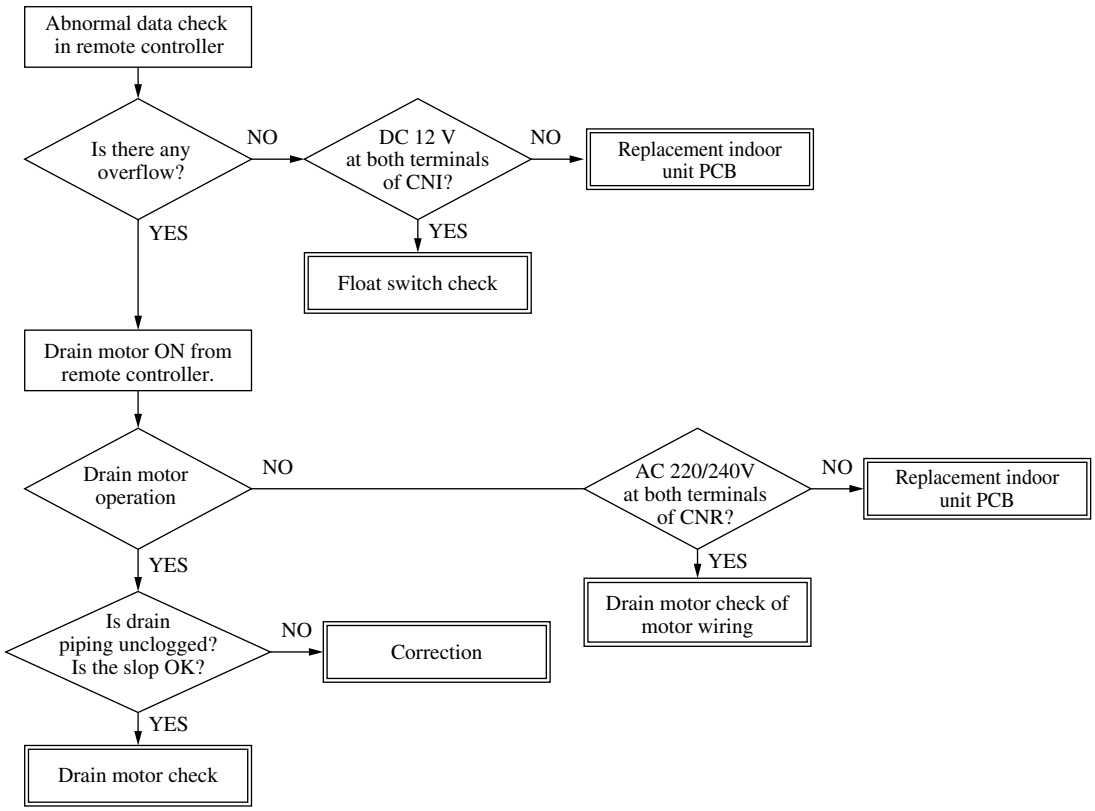
Note (1) Characteristics as per the above graph.

● Display Condition

If a temperature of –20ºC or lower is detected by the thermistor continuously for 5 seconds.

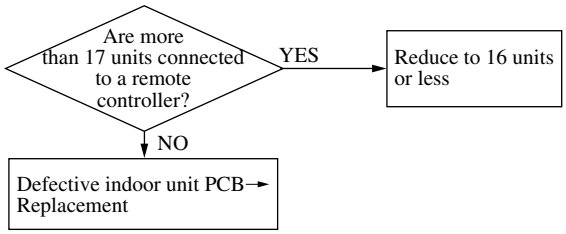
7 Error display : E9 [Drain trouble]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



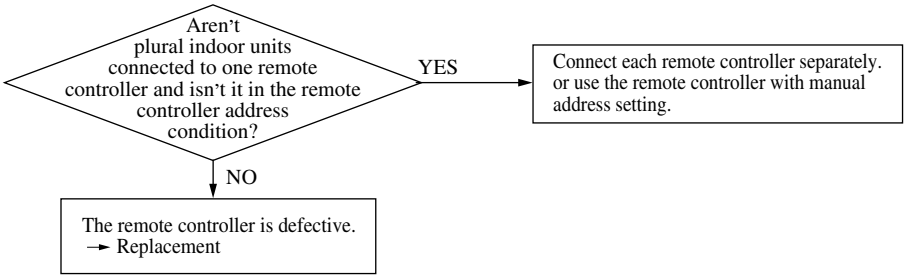
8 Error display : E10 [Control of 1 remote controller VS multiple units — Excessive number of units (more than 17 units)]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



9 Error display : E11 [Addresses setting for plural remote controllers]

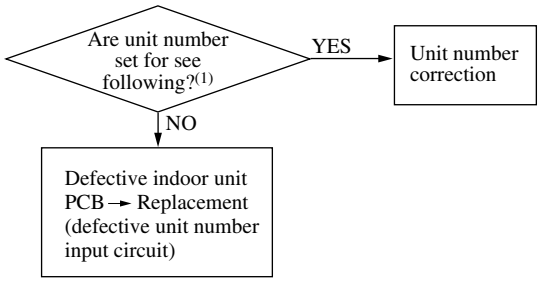
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



10 Error display : E12

[Address No. combination eroor or addressing is preformed with the following combinations.]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



Note (1)

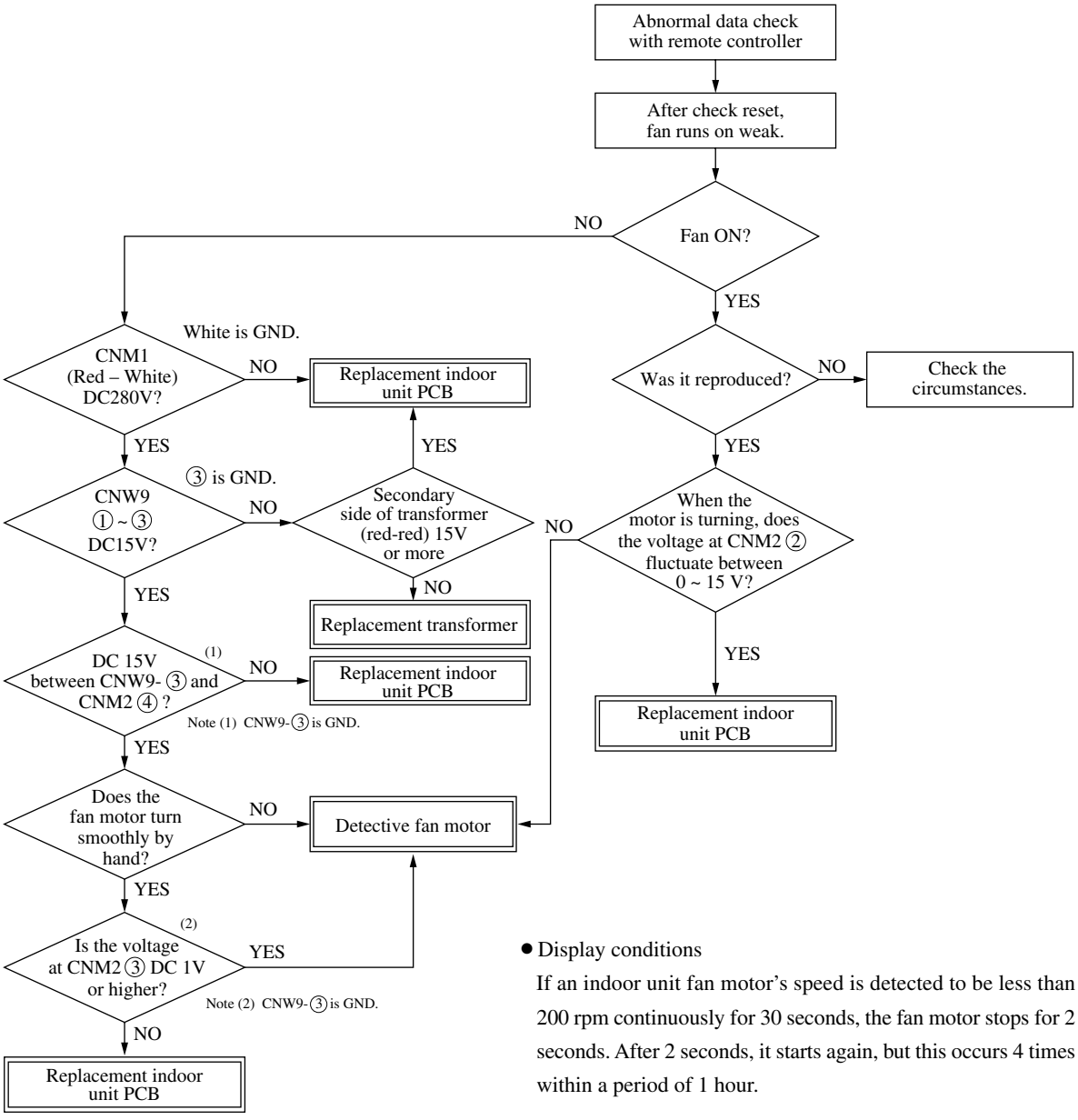
Outdoor unit address No.	Indoor unit address No.
00 ~ 47	48, 49
48, 49	00 ~ 47

11 Error display : E16

[Indoor unit fan motor abnormal]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

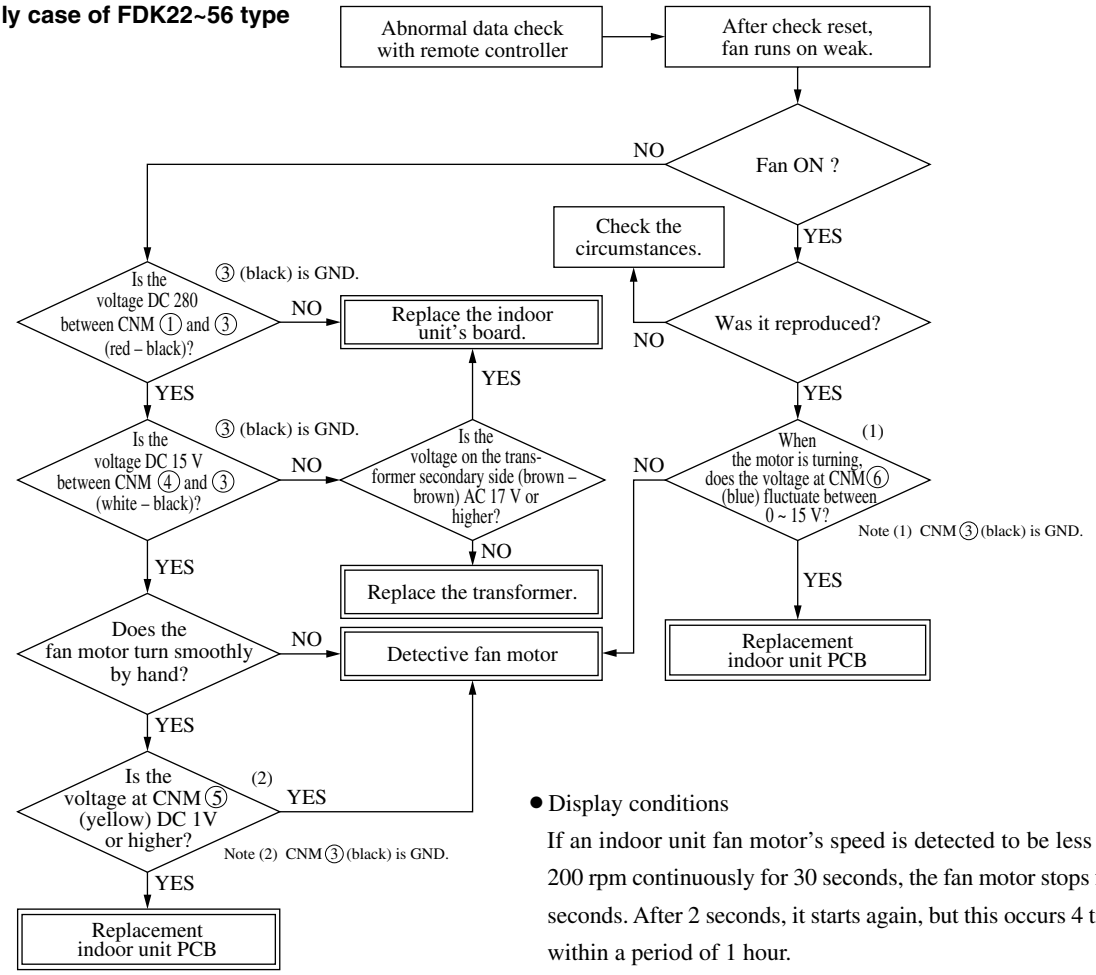
◆ **Only case of FDT112, 114 type**



● Display conditions

If an indoor unit fan motor's speed is detected to be less than 200 rpm continuously for 30 seconds, the fan motor stops for 2 seconds. After 2 seconds, it starts again, but this occurs 4 times within a period of 1 hour.

◆ **Only case of FDK22~56 type**



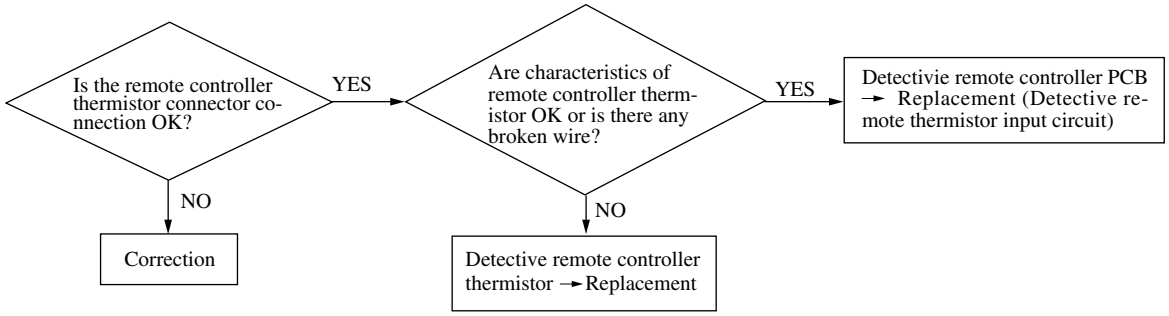
● Display conditions

If an indoor unit fan motor's speed is detected to be less than 200 rpm continuously for 30 seconds, the fan motor stops for 2 seconds. After 2 seconds, it starts again, but this occurs 4 times within a period of 1 hour.

---

12 Error display : E28 [Directive remote controller thermistor.]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



Resistance-temperature characteristic of remote controller thermister

Temperrature(°C)	Resistance value (kΩ)	Temperrature(°C)	Resistance value (kΩ)	Temperrature(°C)	Resistance value (kΩ)	Temperrature(°C)	Resistance value (kΩ)
0	65	14	33	30	16	46	8.5
1	62	16	30	32	15	48	7.8
2	59	18	27	34	14	50	7.3
4	53	20	25	36	13	52	6.7
6	48	22	23	38	12	54	6.3
8	44	24	21	40	11	56	5.8
10	40	26	19	42	9.9	58	5.4
12	36	28	18	44	9.2	60	5.0

(c) Error diagnosis procedures at the outdoor unit side

At the error diagnosis related to the outdoor unit, check at first the error code of remote controller and the illumination patterns of norma 1 and inspection display lamps in the same manner as the case of indoor unit.

Then estimate the outline, the cause and the location of error based on the pattern and proceed to the inspcetion and repair.

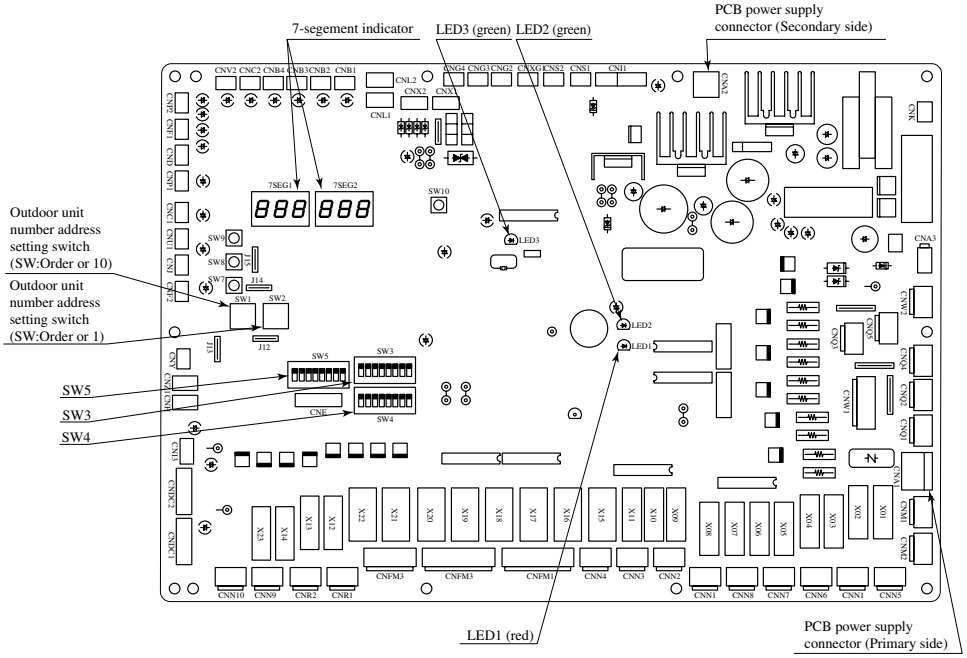
Since the self diagnosis function by means of the microcomputers of indoor/outdoor units provide the judgement of error of microcomputers them selves irregularity power supply line, overload, etc. caused by the installation space, inadequate volume of refrigerant etc., the location and cause of trouble will be discovered without difficulty.

In addition, the display lamps error code of indoor/outdoor unit is kept flashing, (except when the power supply is iterrupted) after the irregularity is automatically recovered to give irregularity information to the service presonnel. If any mode of higher priority than the error retained in memory occurs after the reset of error, it is switched to that mode and saved in the memory.

(i) Replacement parts assembly related to the outdoor unit PCB

Outdoor unit PCB, outdoor unit inverter PCB, power transistor module, diode module, capacitor, reactor, noise filter, thermistor, (heat exchanger, discharge pipe, outdoor temperature etc.), fuse, transformer, etc.

(ii) Parts layout on the outdoor unit PCB



• Function of DIP switch

Name		Function
SW3-1	ON	Inspection LED reset
	OFF	Normal
SW3-2	ON	Backup operation-With
	OFF	Backup operation-None
SW3-3	ON	Renewal
	OFF	Normal
SW3-7	ON	Forced cooling/heating
	OFF	Normal
SW3-8	ON	Test mode
	OFF	Normal
SW5-1	ON	Test run operatopm
	OFF	Normal
SW5-2	ON	Test run operation Cooling
	OFF	Test run operation - Heating
SW5-3	ON	Pump down
	OFF	Normal

SW4-1	SW4-2	SW4-3	SW4-4	Models
OFF	ON	OFF	OFF	**FDCA335HKXE4**
OFF	OFF	ON	OFF	**FDCA400HKXE4**
ON	OFF	ON	OFF	**FDCA450HKXE4**

• Function of jumper wire

Name		Function
J13	With	External input level
	None (1)	External input pulse
J14	With	Defrosting temp. - Strengthening
	None (1)	Defrosting temp. - Normal
J15	With	Defrosting time - Cold weather region
	None (1)	Defrosting time - Normal

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut.

Name				Function
SW4-6	ON	SW4-5	ON	Demando change (Compressor capabilicy) 0%
			OFF	Demando change (Compressor capabilicy) 40%
	OFF		ON	Demando change (Compressor capabilicy) 60%
			OFF	Demando change (Compressor capabilicy) 80%

● **Replacement procedure of outdoor unit control printed circuit board.**

Micromputer printed circuit board can replaced with following procedure.

1) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

Parts No.	Model
PCB505A042MC	FDCA335HKXE4
PCB505A042MF	FDCA400HKXE4, FDCA450HKXE4

(iii) Parts layout on the outdoor unit inverter PCB

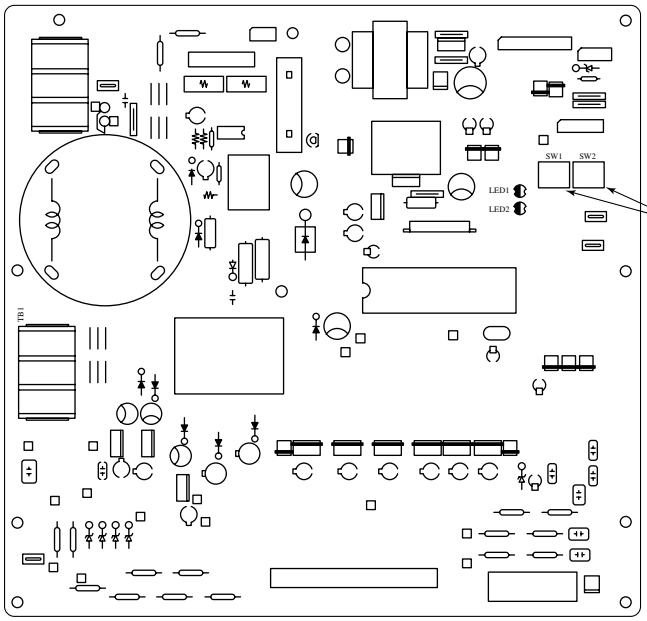
● **Replacement procedure of outdoor unit inverter printed circuit board**

Inverter printed circuit board can replaced with following procedure.

1) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

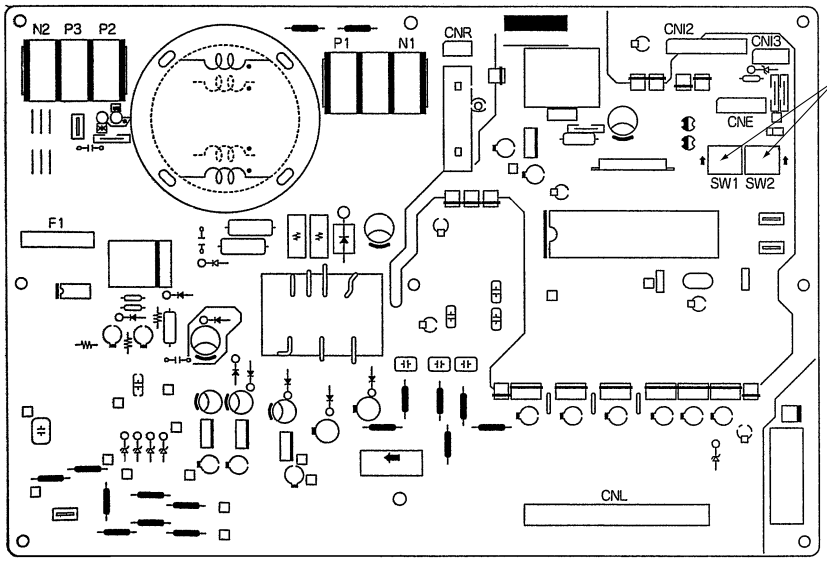
Parts No.	Model
PCB505A044ZA	FDCA335HKXE4
PCB505A044ZB	FDCA400HKXE4, 450HKXE4

Model FDCA335HKXE4



SW1,2
(It is OFF besides
SW2-1 (ON) entirely)

Model FDCA400HKXE4, 450HKXE4

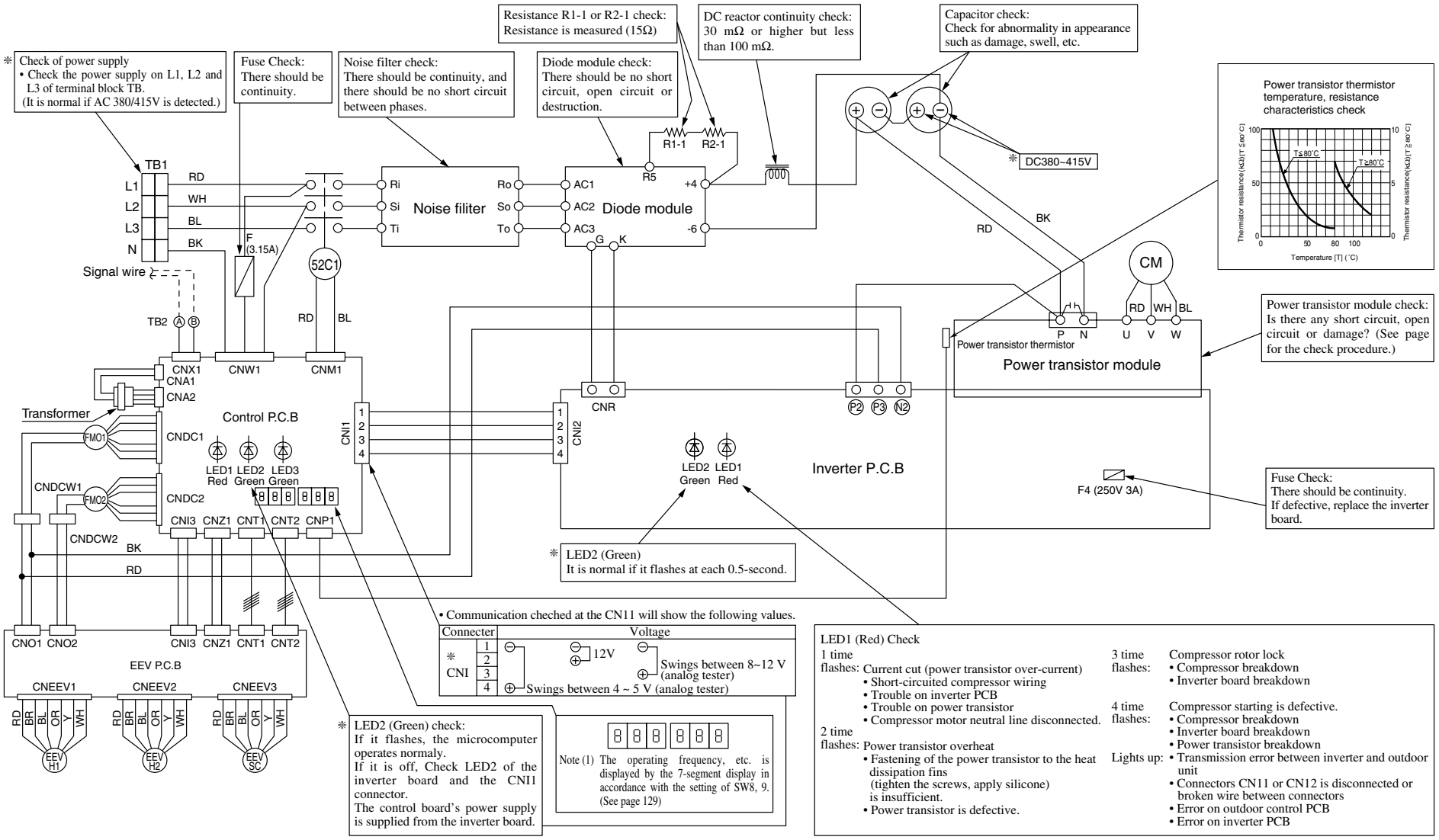


SW1,2
(It is OFF besides
SW2-1 (ON) entirely)

● Check points of inverter outdoor unit

▷ Check with power ON at the points marked with ✳.

This figure applies to the FDCA335HKXE4. The FDCA400HKXE4, and 450HKXE4 have 2 inverter related systems.



(iv) Check procedure depending on indication lamps (For the outdoor unit)

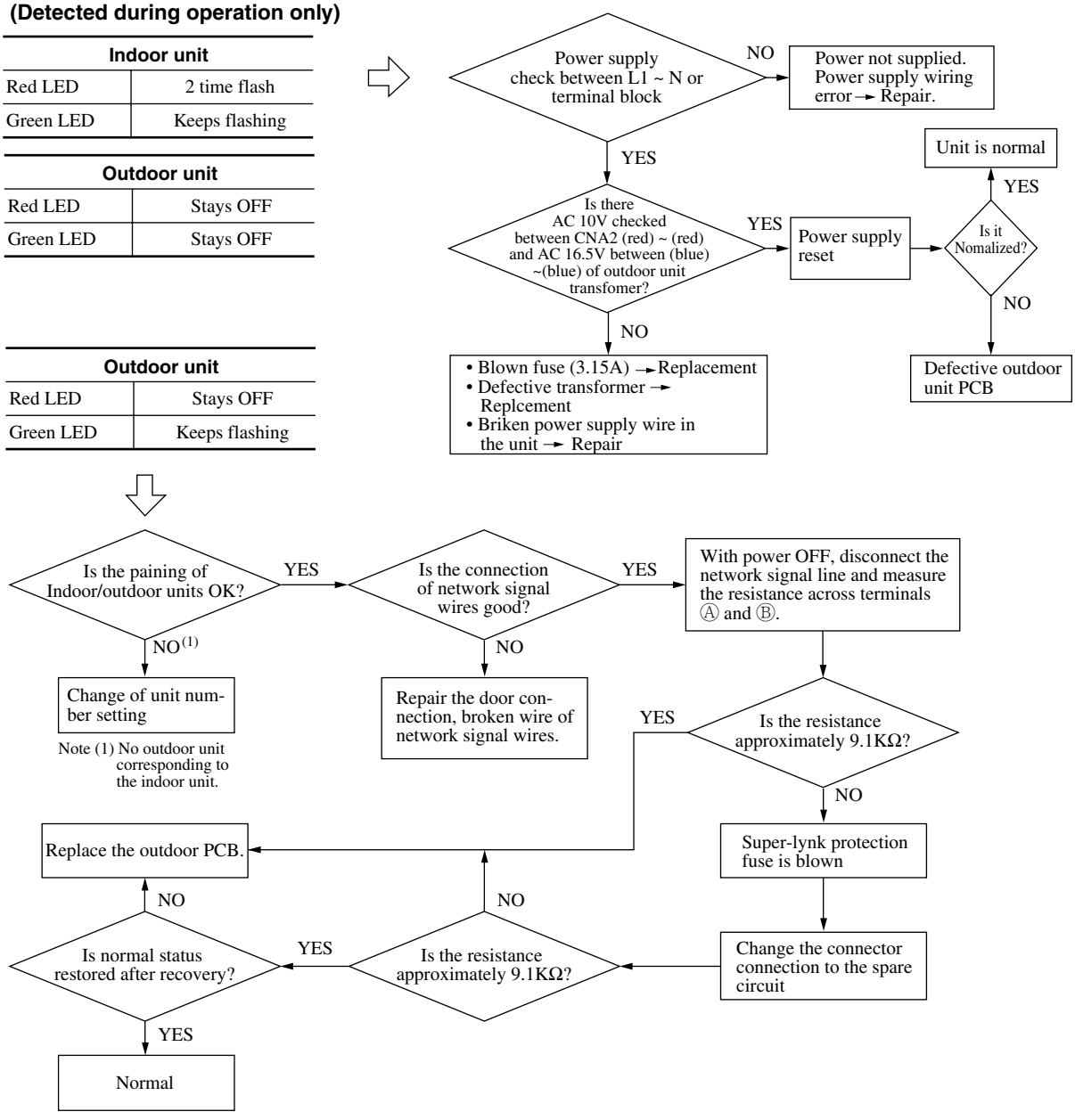
1 **Error display : E3** **[Error on the outdoor unit signal line]**

(Detected during operation only)

Indoor unit	
Red LED	2 time flash
Green LED	Keeps flashing

Outdoor unit	
Red LED	Stays OFF
Green LED	Stays OFF

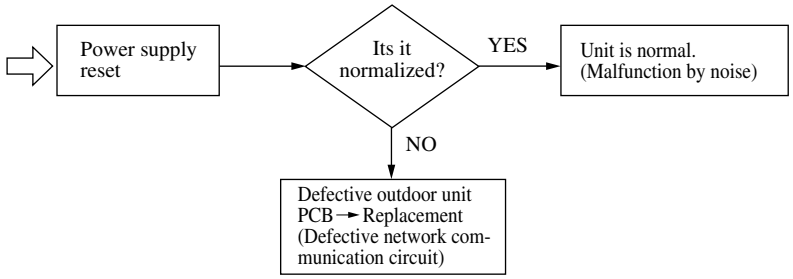
Outdoor unit	
Red LED	Stays OFF
Green LED	Keeps flashing



Error display : E3 **[Error on the outdoor unit signal line]**

(Detection at the power on)

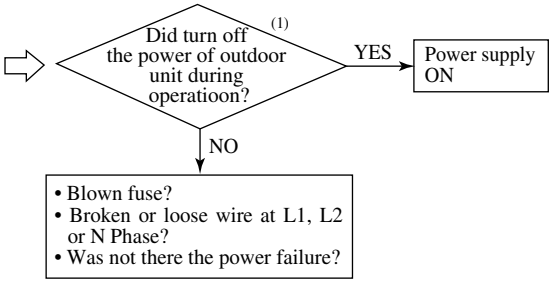
Outdoor unit	
Red LED	Stays OFF or Lights continuously
Green LED	Irregular illumination



2 Error display : E5 [Outdoor unit signal line error, power supply error]

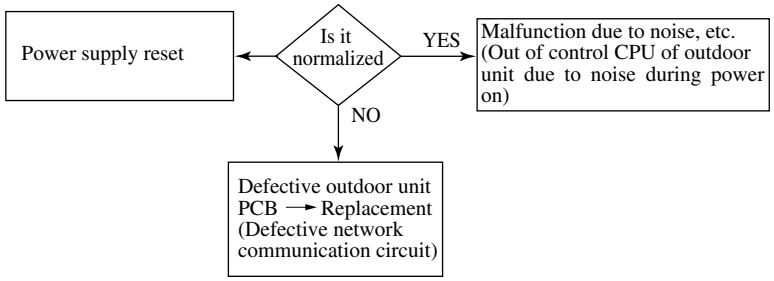
Indoor unit	
Red LED	2 time flash
Green LED	Keeps flashing

Outdoor unit	
Red LED	Stays OFF
Green LED	Stays OFF

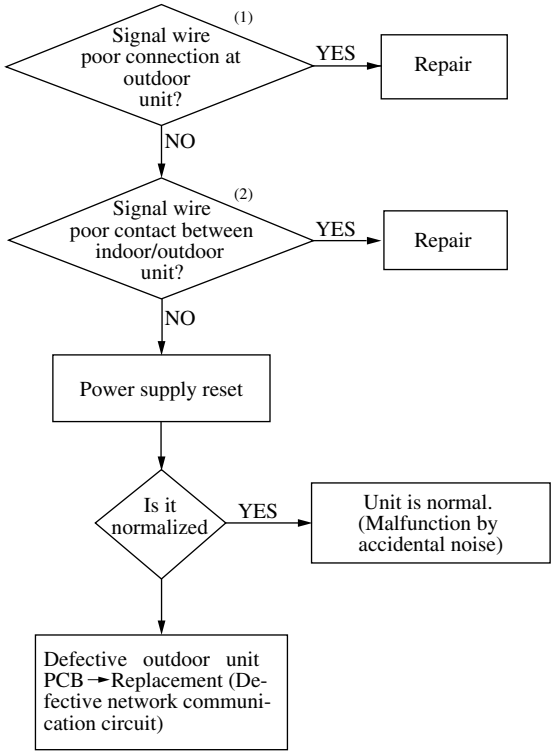


Note (1) This case is limited to the separate power supplies to indoor/outdoor units. (Combination of (indoor unit) red LED 2 time flash and (outdoor unit) green LED stays off means that the power supply to the outdoor unit has been interrupted during operation.)

Outdoor unit	
Red LED	Stays OFF or Keeps flashing
Green LED	Irregular illumination



Outdoor unit	
Red LED	Stays OFF
Green LED	Keeps flashing

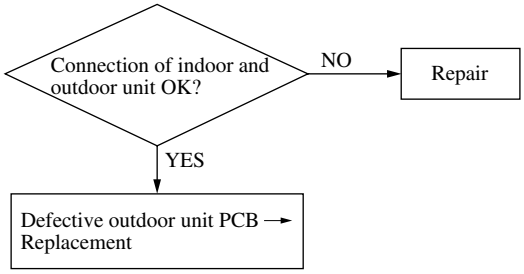


Notes (1) Check for poor connection (looseness, misconnection) at outdoor unit terminal block and droken signal wires between outdoor units.

(2) Check the poor connection or broken signal wires between indoor/outdoor units.

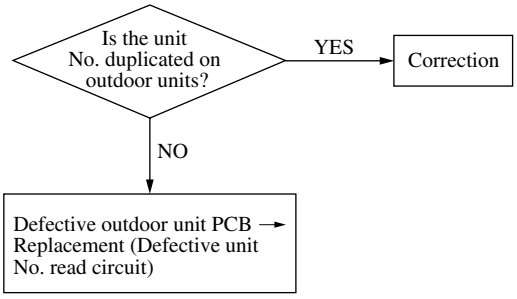
3 Error display : E30 / 7-segment display : E30 [Connection error indoor and outdoor unit]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



4 Error display : E31 / 7-segment display : E31 [Duplicated unit No. of outdoor units]

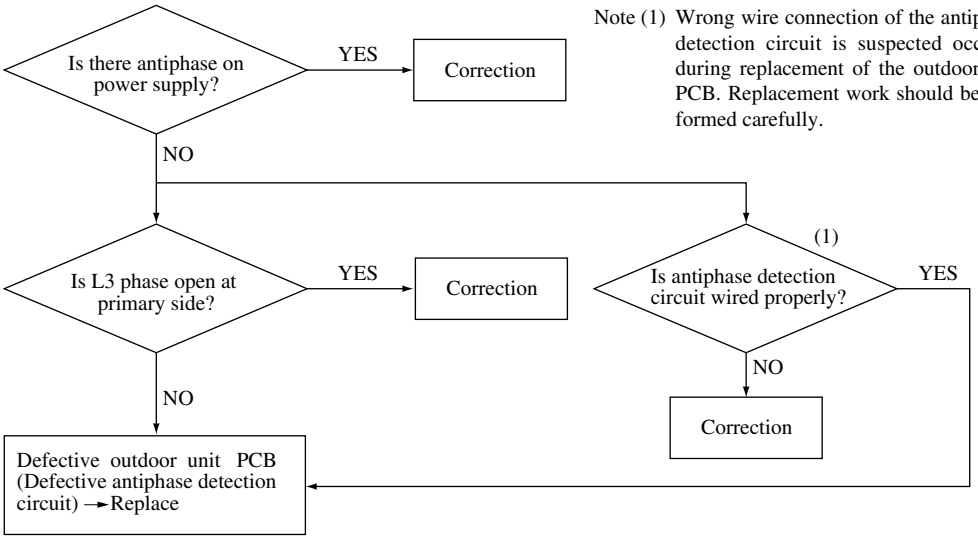
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



5 Error display : E32 / 7-segment display : E32-1 [Antiphase on power supply or open 52C L3 phase (primary side) on power supply]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates FM01 and double flashing indicates FM02.



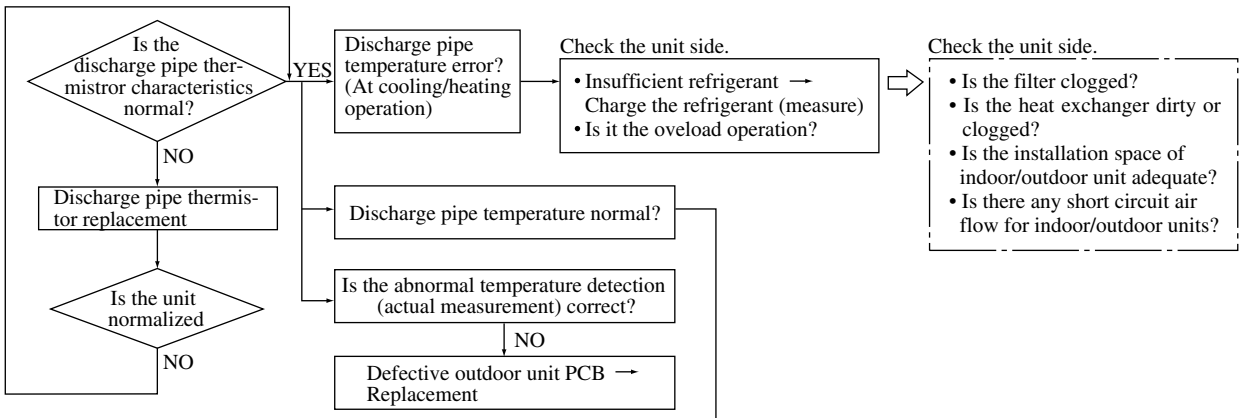
Note (1) Wrong wire connection of the antiphase detection circuit is suspected occured during replacement of the outdoor unit PCB. Replacement work should be performed carefully.

6 Error display : E36 [Discharge temperature error]

7-segment display : E36-1 / E36-2

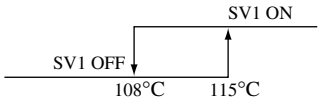
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1): Single flashing ofoutdoor unit LED indicates Tho-D1 and double flashing indicates Tho-D2.

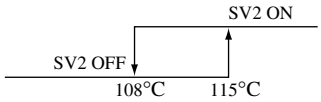


If the discharge pipe (Tho-D1, 2) temperature (Tho-D1, 2) exceeds the set value the compressor cooling solenoid valve (SV1, 2) control and the capacity of the compressor are controlled to restrict the rise in the discharge pipe temperature.

◆ Compressor cooling solenoid valve (SV1, 2) control

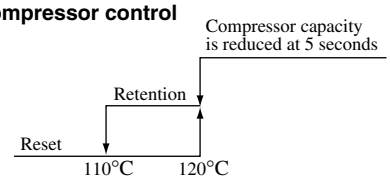


Discharge pipe temp. (Tho-D1)



Discharge pipe temp. (Tho-D2)

◆ Compressor control



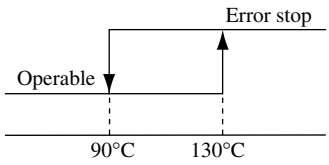
Discharge pipe temp.

● Display conditions

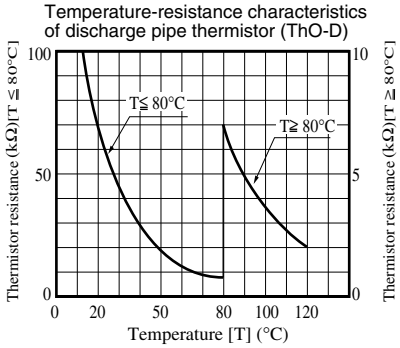
If the discharge pipe temperature becomes 130˚C or higher for 2 seconds, the compressor stops.

If it drops to 90˚C or lower, the compressor restarts, but, if this operation occurs 2 times within 60 minutes.

● Abnormal temperature detection



Discharge pipe temp.



9

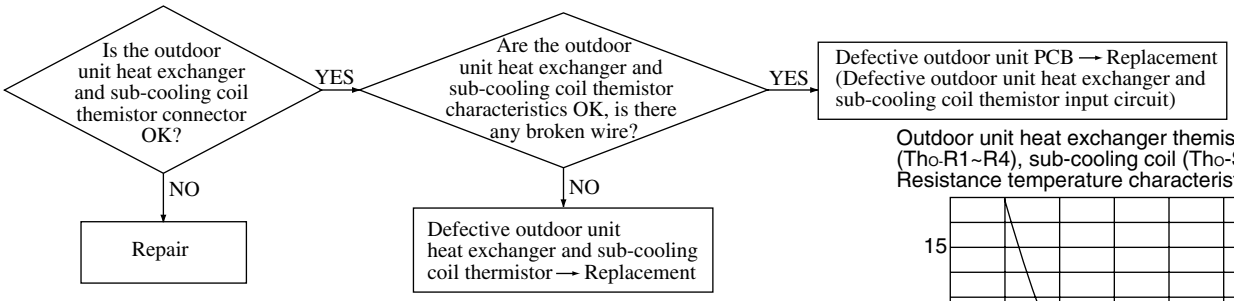
Error display : E37

7-segment display : E37-1, E37-2, E37-3, E37-4, E37-5, E37-6

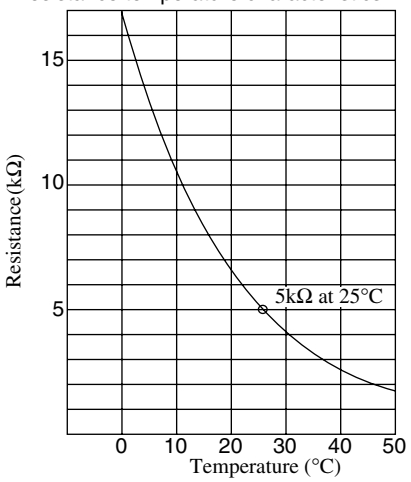
[Defective outdoor unit heat exchanger and sub-cooling coil thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Tho-R1 flashes 1 time, Tho-R2 flashes 2 times, Tho-R3 flashes 3 times, Tho-R4 flashes 4 times, Tho-SH2 flashes 5 times, Tho-H flashes 6 times.



Outdoor unit heat exchanger themistor (Tho-R1~R4), sub-cooling coil (Tho-SC, H) Resistance temperature characteristics



● Display conditions

If the temperature sensed by the thermistor is –50˚C or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 minutes.

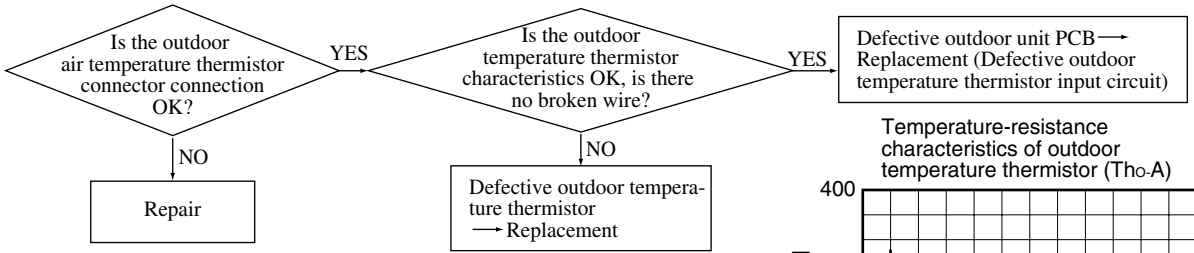
10

Error display : E38

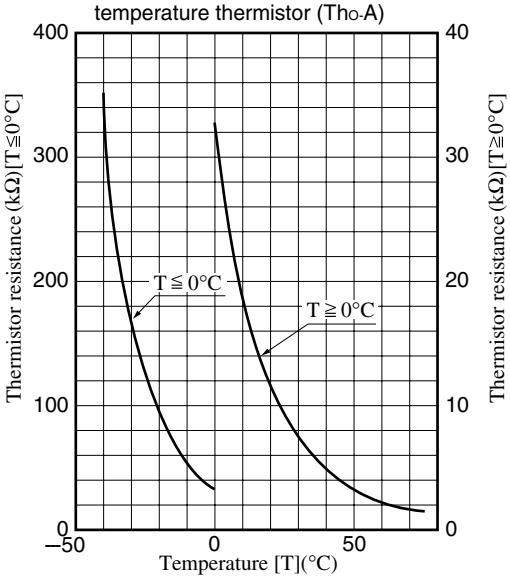
7-segment display : E38

[Defective outdoor temperature thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



Temperature-resistance characteristics of outdoor temperature thermistor (Tho-A)



● Display Conditions

If the temperature detected by the thermistor is –30˚C or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this condition is detected 3 times within 40 minutes.

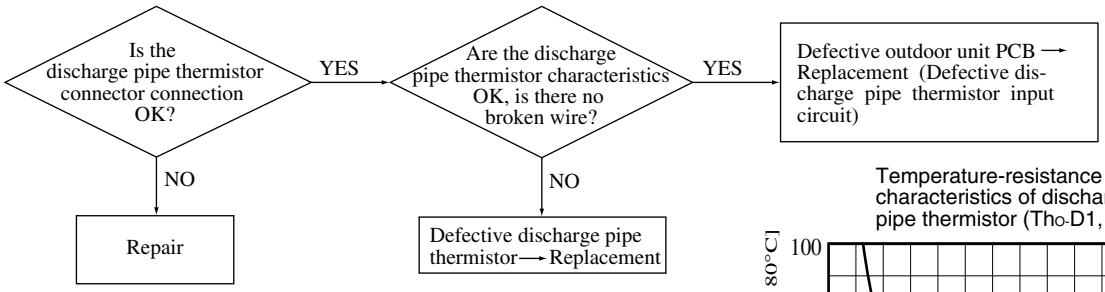
11

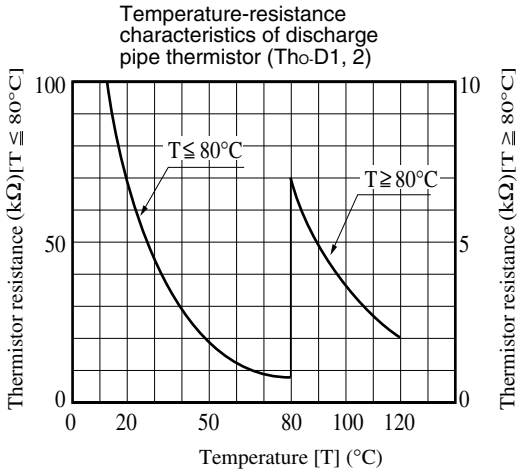
Error display : E39
7-segment display : E39-1 E39-2

[Defective discharge pipe thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates Tho-D1 and double flashing indicates Tho-D2.





● Display conditions

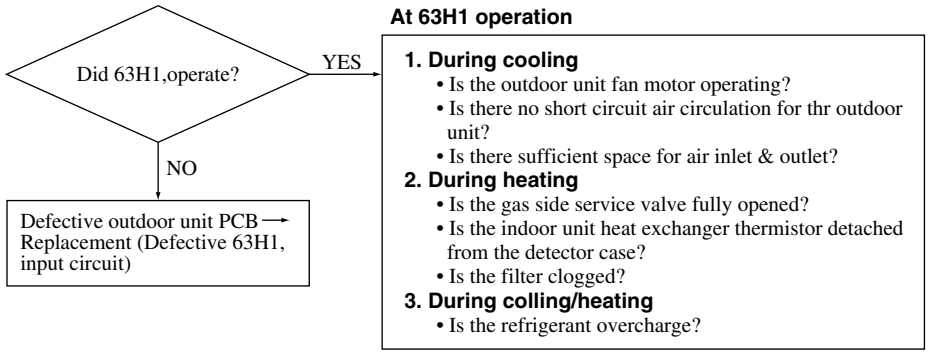
If the temperature sensed by the thermistor is 3˚C or lower continuously for 5 seconds between 10 minutes and 10 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 minutes.

12

Error display : E40
7-segment display : E40

[63H1, motion]

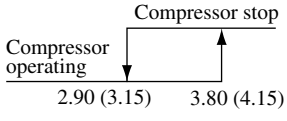
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



● Display conditions

If the 63H1 goes OFF (open), the compressor stops. After a 3 minute delay, the compressor restarts. If this condition is detected 5 times within 60 minutes, or if the (open) state continues for 60 minutes without interruption.

● Abnormal pressure detection



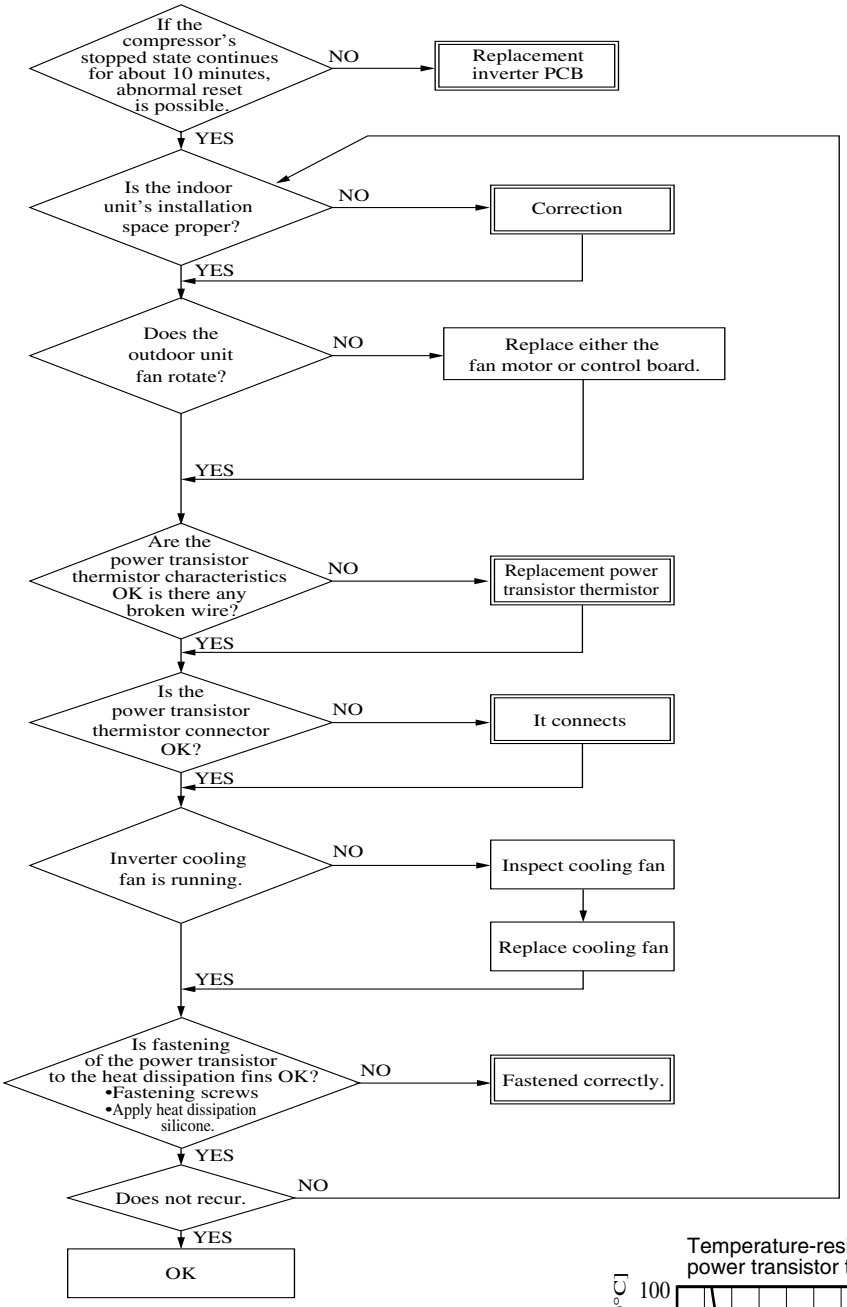
Note (1): Values in ( ) show for the case of the FDCA400, 450 models.

13 Error display : E41 [Power transistor overheating]

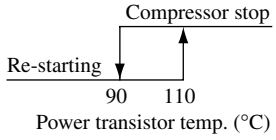
7-segment display : E41-1 / E41-2

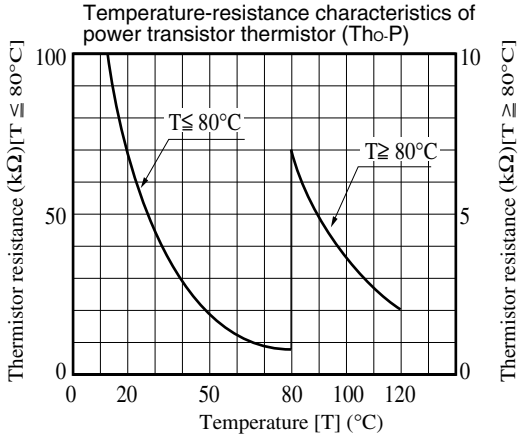
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates power transistor (CM1) overheat and double flashing indicates power transistor (CM2) overheat.



- Display conditions
  If the power transistor's temperature exceeds the set value, the compressor stops.
  When the temperature drops to 90˚C or lower, the compressor restarts, but if this occurs 5 times within 1 hour, or if this condition continues uninterrupted for 1 hour.
- Abnormal temperature detection.





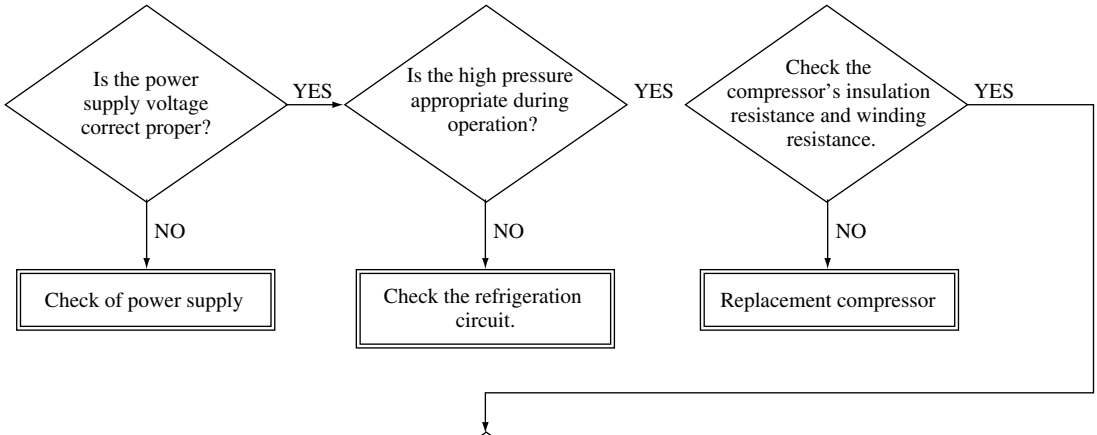
14

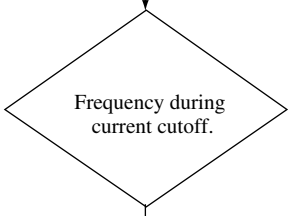
Error display : E42 **[Current cut]**

7-segment display : E42-1 / E42-2

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates current cut (CM1) and double flashing indicates current cut (CM2).

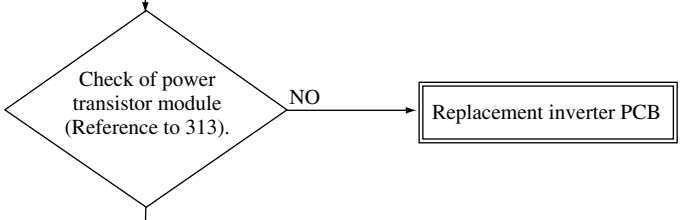




Starts when the frequency is less than 60 Hz.

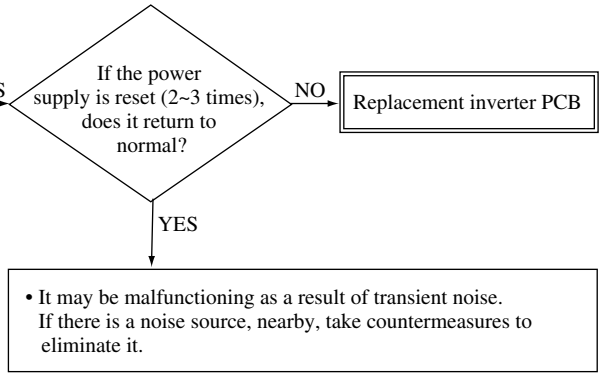
● Display Conditions

The compressor stops if the inverter's output current exceeds the set value.
After a 3-minute delay, the compressor restarts. If this operation repeats 4 times in 15 minutes.



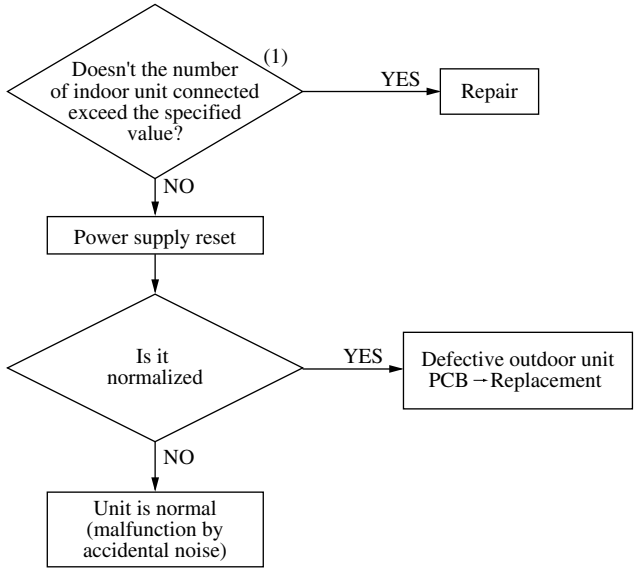
OK

- Is installation space for the indoor and outdoor units appropriate?
- Is there any short circuits in the indoor/outdoor units?
- During Cooling: Is FM0 operaing?
- At heating:
  - Is FM1 operaing?
  - Is the service valve (gas side) opened fully?
  - Is the filter clogged?
- Is liquid flowing back to the compressor?
  Is overheating level control normal?
  Is the low pressure sensor normal?
- Is the compressor emitting an abnormal noise?



15 Error display : E43 / 7-segment display : E43 [Excessive number of indoor units connected]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

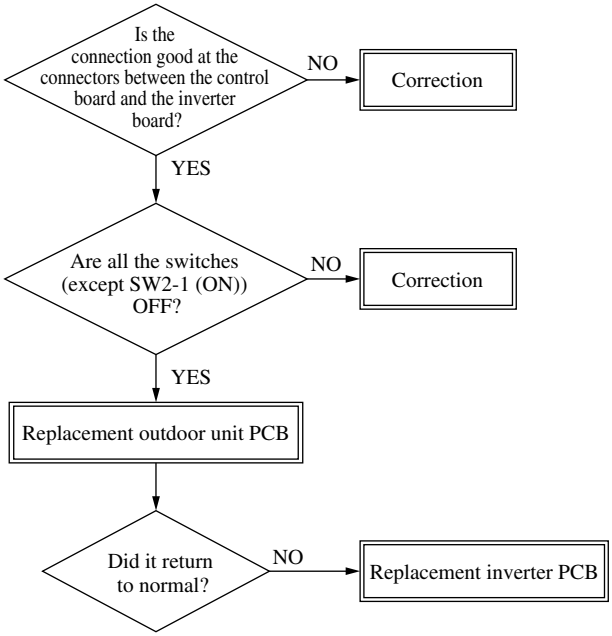


Notes (1) The maximum number of connectable units of each model is as follows : FD335, 400, 450 type 20.
(2) Outdoor No. setting check for indoor units (to see if outdoor No. is of other system)
(3) In case of auto addressing erase the addresses stored in memory and perform re-setting

16 Error display : E45 / 7-segment display : E45-1 E45-2 [Transmission error between inverter and Outdoor unit PCB]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates transmission error bitween inverter and outdoor unit PCB (CM1).
Double flashing of outdoor unit LED indicates transmission error bitween inverter and outdoor unit PCB (CM2).

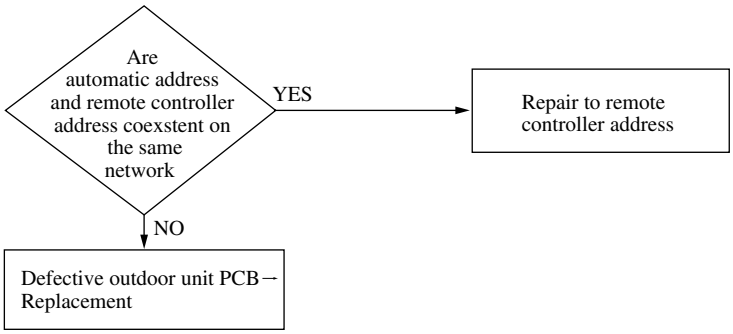


17

Error display : E46
7-segment display : ——

Automatic address setting and remote controller address setting coexstents in the same network

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



18

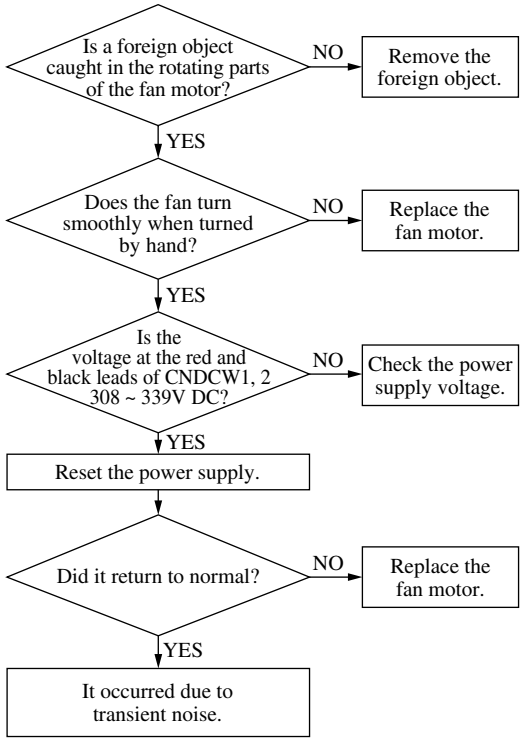
Error display : E48
7-segment display : E48-1 E48-2

[Abnormalities in an outdoor fan motor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates FM01 and double flashing indicates FM02.

• When outdoor unit is running

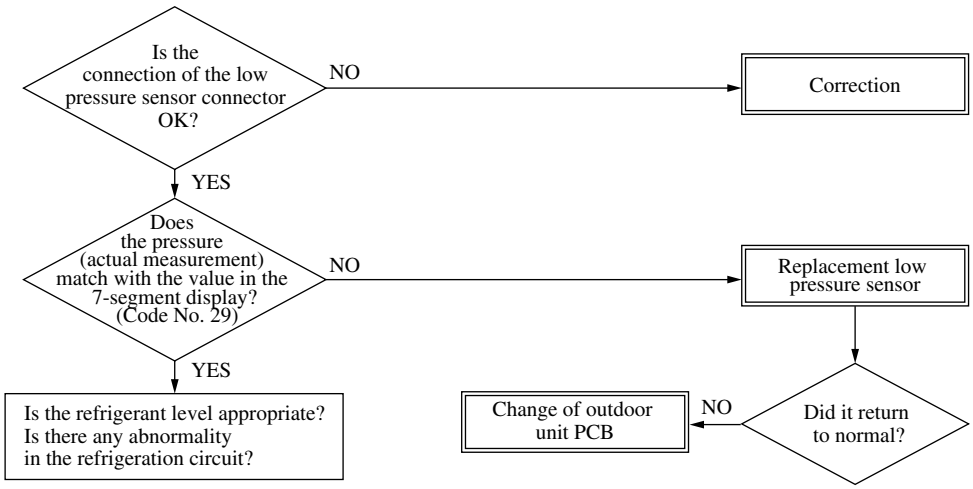


- Display Conditions

  If an overcurrent or overheating signal is received from the outdoor fan motors (FMO1, 2), the compressor and outdoor fans stop. They start again after 3 minutes, but if this same trouble occurs 5 times (separately for FMO1, 2) again within 1 hour, or once within 45 minutes of the power being turned ON, an abnormal stop occurs.

19 Error display : E49 / 7-segment display : E49 [Low pressure abnormal]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

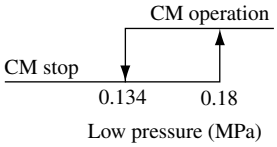


● Display conditions

- If the low pressure sensed by the low pressure sensor is 0.134 MPa or lower, the compressor stops. After a 3 minute delay, the compressor restarts. If this occurs 2 times within 60 minutes.
- If the pressure sensed by the low pressure sensor while the compressor is stopped is 0.18 MPa or lower. If this occurs 5 times within 60 minutes.

Note (1) It recovers only if there is a power supply reset.

● Abnormal pressure detection



20

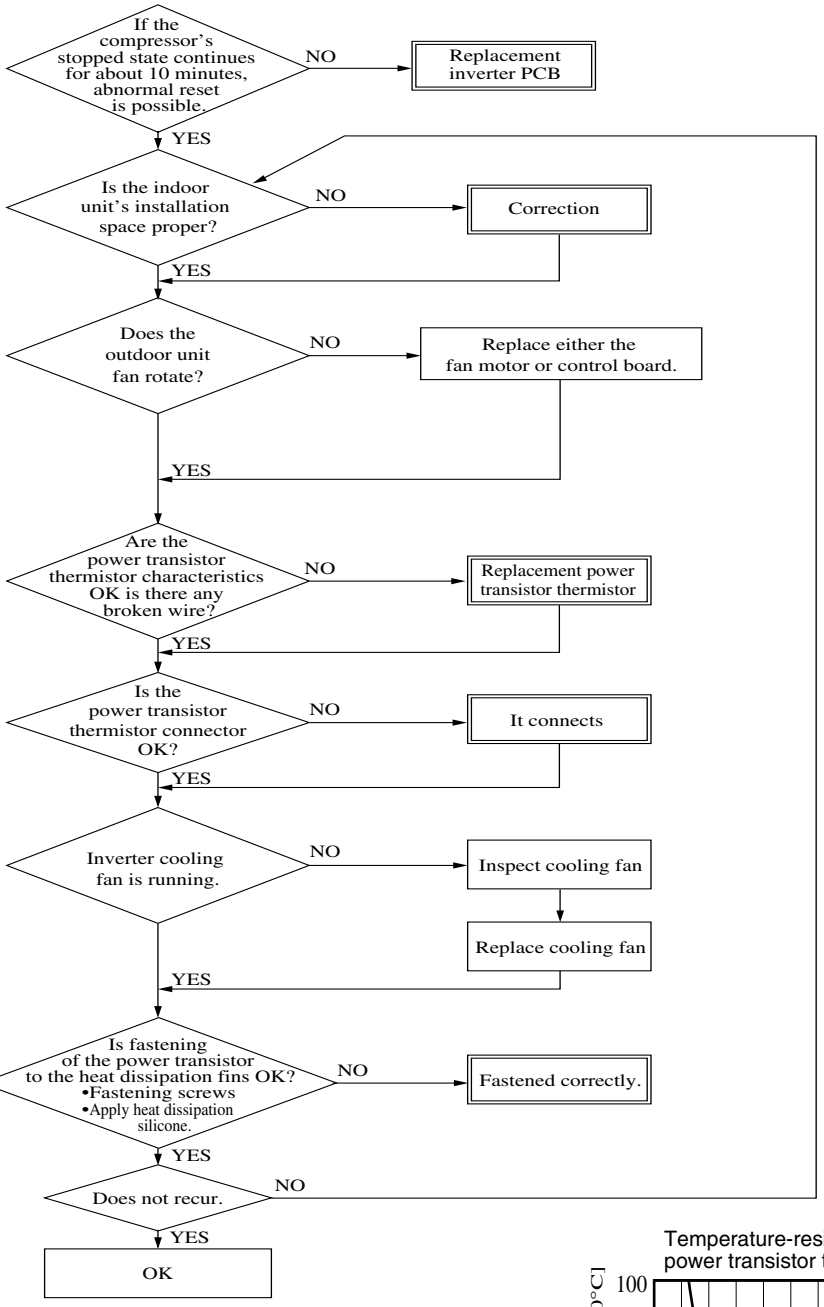
Error display : E51

7-segment display : E51-1 / E51-2

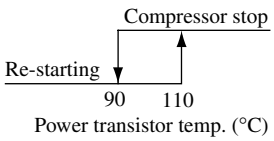
[Power transistor overheating (15 minute continuation)]

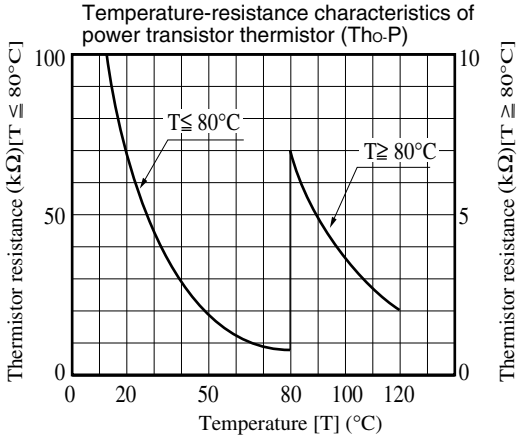
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing of outdoor unit LED indicates power transistor (CM1) overheat and double flashing indicates power transistor (CM2) overheat.



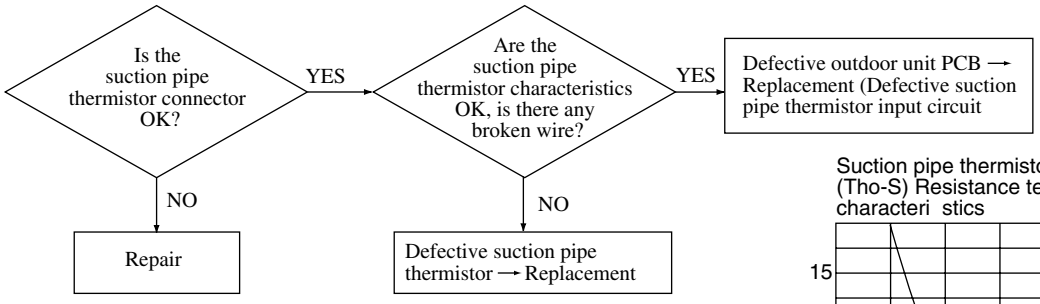
- Display conditions
  A power transistor temperature error occurs when a temperature of 110°C or higher continues for 15 minutes, including compressor stops.
- Abnormal temperature detection.

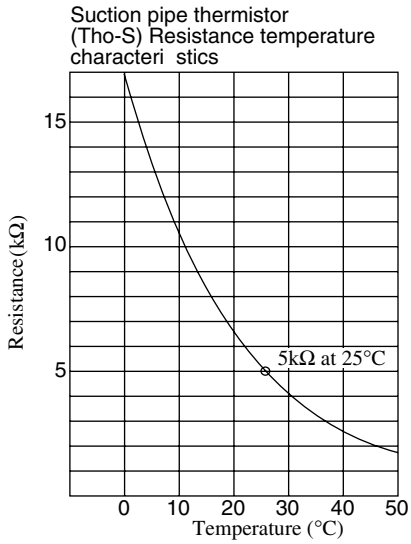




21 Error display : E53 / 7-segment display : E53 [Defective suction pipe temperature thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing





● Display conditions

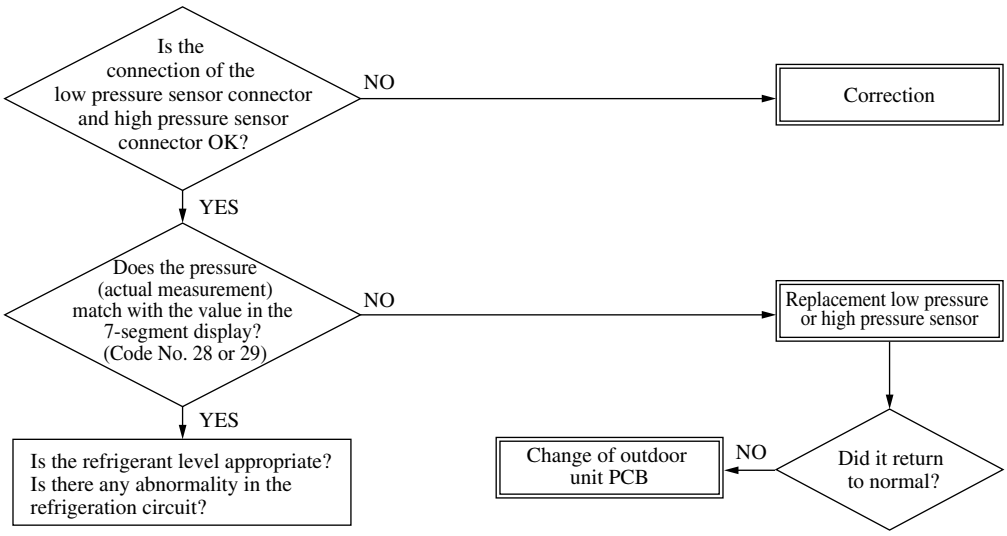
If the temperature detected by the thermistor is –50˚C or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this condition is detected 3 times within 40 minutes.

---

22 Error display : E54 / 7-segment display : E54-1 E54-2 [Defective low pressure and high pressure sensor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing indicates PSL and double flashing indicates PSH.



● Display conditions

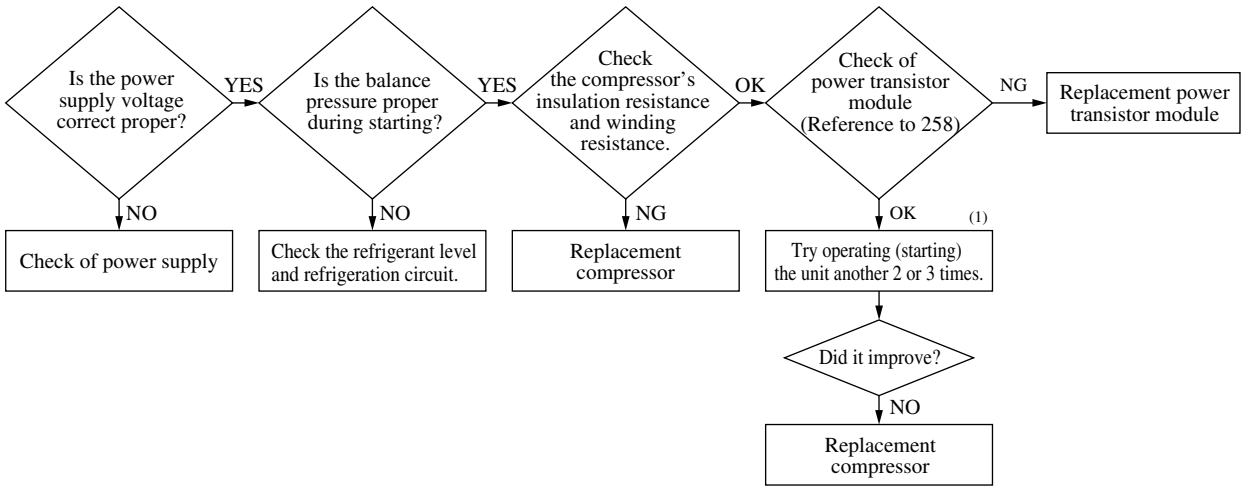
If the voltage detected by the sensor is 0V or lower or 3.49 V or higher continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this condition is detected 3 times within 40 minutes.

23 Error display : E59 [Abnormalities in compressor starting]

7-segment display : E59-1 / E59-2

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (2)
Green LED	Keeps flashing	Green LED	Keeps flashing

Notes (1) Check if the power supply system is normal.
(2) Single flashing of outdoor unit LED indicates abnormalities in compressor (CM1) starting and double flashing indicates abnormalities in compressor (CM2) starting.



Note (1) While attempting to restart the compressor 2 or 3 times, the liquid refrigerant inside the compressor may be dispelled to outside the compressor and the starting abnormality may improve and recover.

● Display conditions

(1) If it can't be started 2 times in 7 attempts.

(2) A remote control reset is possible after 3 minutes passes.

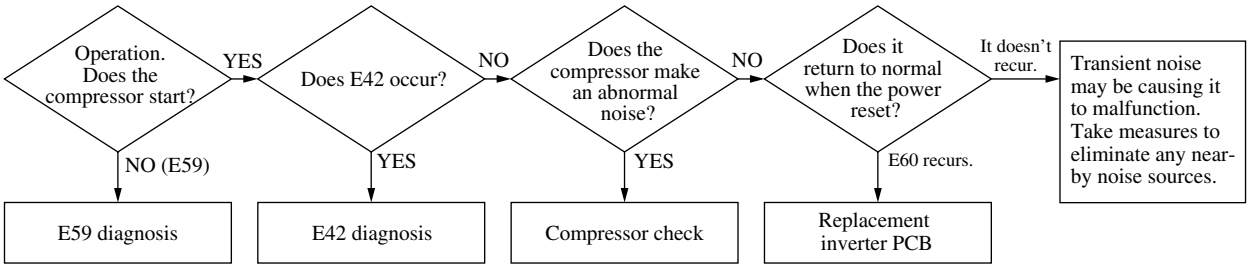
---

24 Error display : E60 [Compressor loader position detection error]

7-segment display : E60-1 / E60-2

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (2)
Green LED	Keeps flashing	Green LED	Keeps flashing

Notes (1) Check if the power supply system is normal.
(2) Single flashing of outdoor unit LED indicates compressor (CM1) loader position detection error and double flashing indicates compressor (CM2) loader position detection error.



● Display conditions

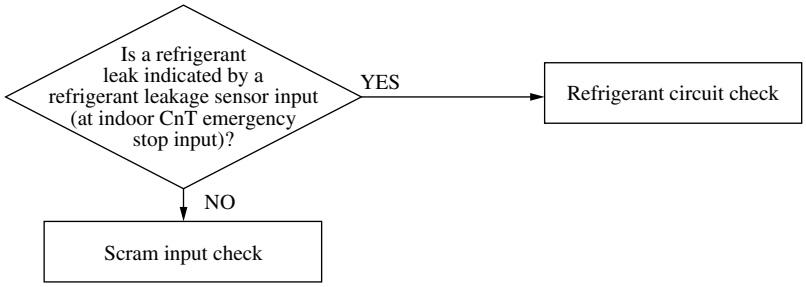
(1) After rotor position detection operation, if the rotor's position cannot be detected again (4 times in 15 minutes), an error is displayed.

(2) A remote control reset is possible after 3 minutes passes.

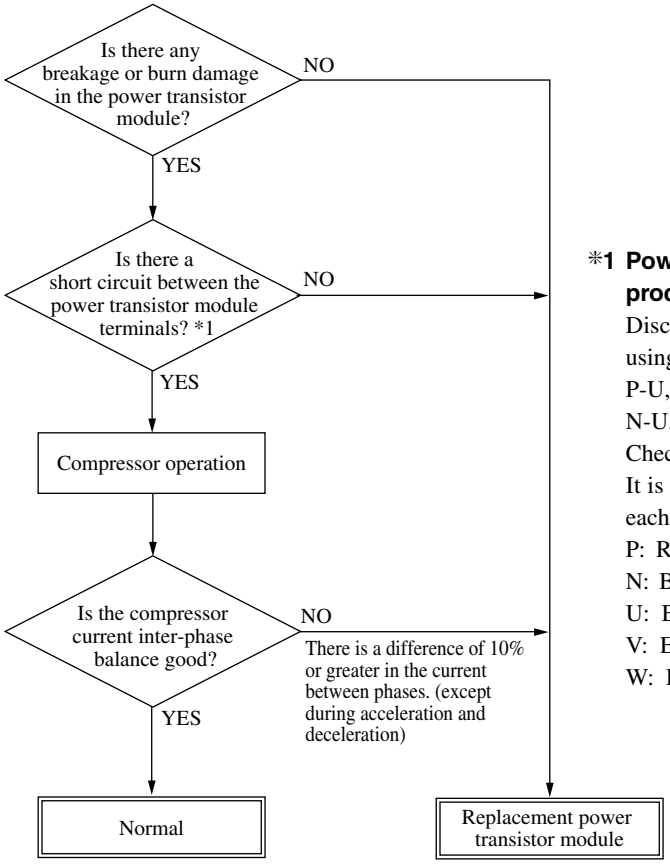
25 **Error display : E63** **[Scram]**
7-segment display : E63-1

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Check if the power supply system is normal.



Checking the power transistor module (including the drive circuit)



***1 Power transistor module terminal short circuit check procedure**

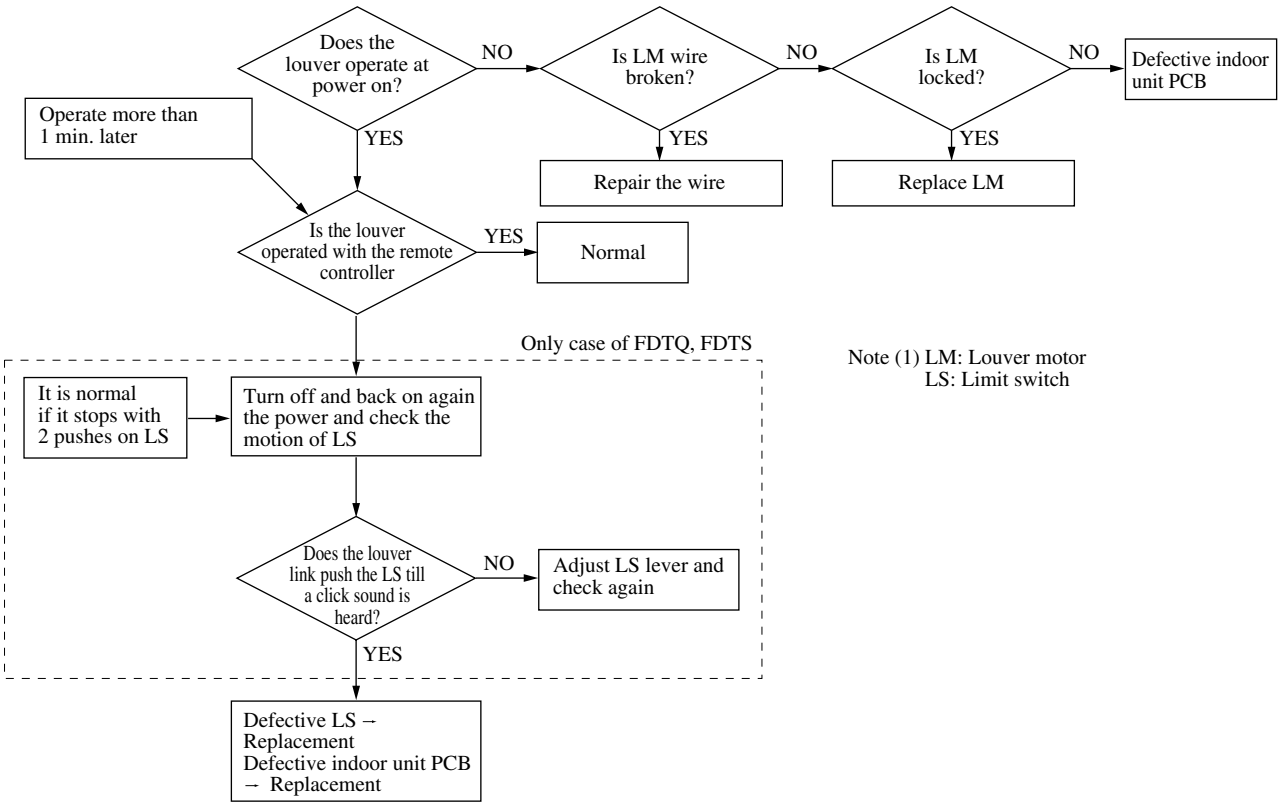
Disconnect the compressor wiring, then check for short circuits using a tester.
P-U, P-V, P-W
N-U, N-V, N-W
Check between the P and N terminals.
It is easy to make tester contact with the following locations on each of the terminals.
P: Red harness side of the power transistor module terminal block.
N: Blue harness side of the power transistor module terminal block.
U: End of red harness to the compressor.
V: End of white harness to the compressor
W: End of blue harness to the compressor

(d) How to advance checks for each faulty symptom

(i) Inspection method when there is no error display

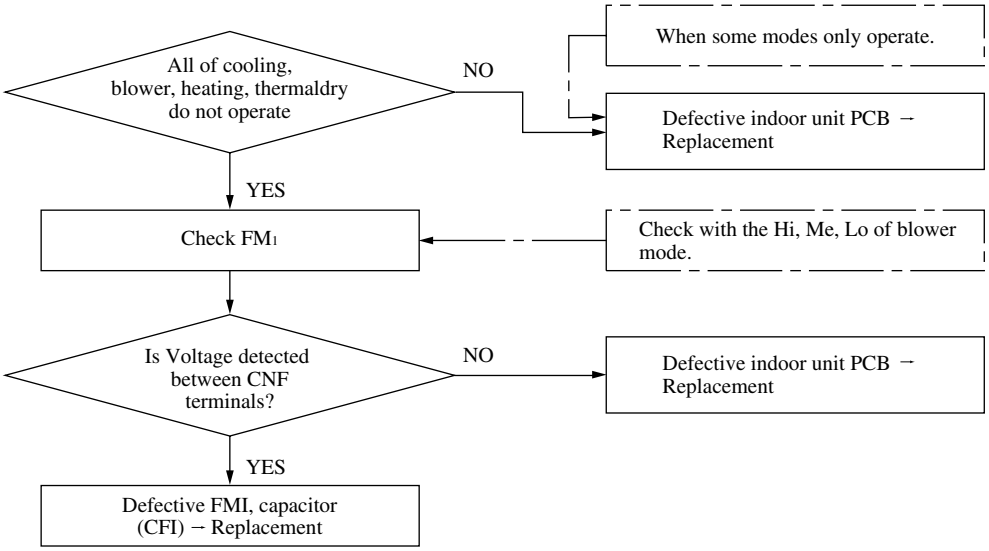
1) Louver motor does not operate

▶Inspect at the indoor unit side.

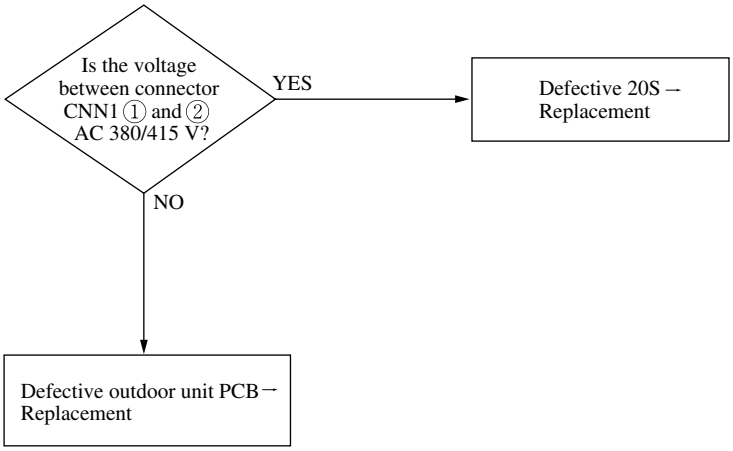


2) When the indoor unit blower does not operate

▶Inspect at the indoor unit side.



3) Four way valve does not switch during heating operation



(ii) When the cooling (heating) effect is felt insufficient. (Check also the refrigeration cycle for the refrigerant quantity, etc. in addition to the following.)

1) When the cooling effect is insufficient.

- Check if the protective function has tripped and, as a result, the compressor operation frequency has dropped below the specified frequency
- Does the indoor expansion valve operate properly? Is it clogged?
- Is the frosting prevention function operated?

Check method of the indoor unit electronic expansion valve

Check the indoor controller output to the expansion valve with the following procedures.

▶ Check how much volt is detected at the expansion valve (SM) connector and at the pin at control side of the connector CnA (white, 7P (5 cores)), and measure also how many seconds the voltages are applied.

White~Brown
Yellow~Brown
Orange~Brown
Blue~Brown

} Approx. DC 5V(2) is detected for approx. 15 seconds(1) at the power on.

▶ The indoor controller is normal if the seconds and voltages as indicated at left are confirmed.
When the expansion valve does not operate while the voltages are detected (operating sound is not heard), the expansion valve is defective.

▶ If the thermostat setting is changed, the expansion valve will operate approx. 20 seconds later. Then, approx. 5V will be confirmed at the CnA same as above.

Notes (1) 5V is maintained for 8 seconds after the power on, then it drops momentarily and recovers 5V for approx. 7 seconds.
(2) When measured with a digital multi-tester, voltages of approx. 6~3V are output one after another.

(e) Check Abnormal Operation Data with the Remote Controller

Operation data are recorded when there is an abnormal state and these data can be displayed in the remote controller by operating the remote controller buttons.

(1) Press the CHECK button.
The display will change from " FUNCTION" → " SET" → "OPERATION DATA ▼"

(2) Press the ▼ button once. The display will change to "ERROR DATA ▲".

(3) Press the SET button to enter the abnormal operation data display mode.

(4) If there are abnormalities from the past, they will be displayed by an error code and unit No.
(Example) "E8" (Lighted up)
"I/U No. 00 ▲" (Flashing)

(5) Using the ▲ or ▼ button, select the indoor unit No. you want to display the error data for.
If only one indoor unit is connected, the indoor unit No. does not change.

(6) Fix the selection using the SET button. (The displayed indoor unit No. will change from flashing to light up continuously.)
(Example) "E8"
"DATA LOADING" (This message flashes while data are being read.)
↓
"E8"
"ERROR DATA "
The data are then displayed beginning with item No. 01.
Displayed items are as shown below.

(7) Display the other data for when the error occurred in order from the currently displayed operation data No. 01 using the ▲ or ▼ button.
* Depending on the model, items for which corresponding data do not exist are not displayed.

(8) To change the indoor unit, press the AIR CON No. button and return to the indoor unit selection display.

(9) Press the ON/OFF button to end the abnormal operation data check.

If you press the RESET button during the settings, the display returns to the previous setting screen.

No.	Data item	
01	* (Operation mode)	
02	SET TEMP.	27°C
03	RETURN AIR	28°C
04	I/U HEAT EXCH1	6°C
05	I/U HEAT EXCH2	5°C
06	I/U HEAT EXCH3	4°C
07	I/U FAN	Hi
08	REQUIRED HERTZ	45Hz
09	SELECTED HERTZ	45Hz
10	EEV	480PULS
11	TOTAL I/U RUN	10500H
21	OUTDOOR	35°C
22	O/U HEAT EXCH1	55°C
24	COMP HERTZ	85.0Hz
25	Hi PRESSURE	2.0MPa
26	Lo PRESSURE	0.40MPa
27	DISCHARGE	98°C
28	DOME BOTTOM	56°C
29	CT	26A
31	O/U FAN	Hi
32	SILENT MODE ON	
35	DEFROST OFF	
36	TOTAL COMP RUN	8500H
37	EEV1	480PULS
38	EEV2	480PULS

INVERTER DRIVEN MULTI-INDOOR-UNIT CLIMATE CONTROL SYSTEM

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