

## TECHNICAL MANUAL

### Collection data

## MULTI-TYPE PACKAGED AIR-CONDITIONER

(Split system, Air to air heat pump type)

### (OUTDOOR UNIT)

FDCA301HEN  
301HES  
401HEN  
401HES  
501HES  
601HES  
801HES  
1001HES

### (INDOOR UNIT)

FDTA151	FDENA151
201	201
251	251
301	301
401	401
501	501
FDKNA151	FDURA201
201	251
251	301
301	401
	501

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# 1 GENERAL INFORMATION

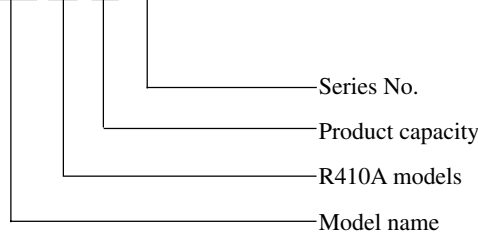
## 1.1 Specific features

Ideal for the installation conditions characteristic of larger rooms and L-shaped or other non-standard-shaped rooms, the Multi-Type V series allows an extensive degree of flexibility in the selection of indoor units. Specifically, the selection of indoor units with differing capacities and differing or similar types is supported, as is the selection of indoor units with similar capacities and differing types. Furthermore, a maximum of up to four individual indoor units can be operated in synchrony with a single outdoor unit.

- (1) A new refrigerant, R410A, which causes no damage to the earth's ozone layer, is used. R410A is a pseudoazeotropic refrigerant, so there is little formation of separate vapor and liquid layers, and it is possible to add refrigerant on-site.
- (2) Less refrigerant charge amount due to use of double phase refrigerant flow system. The total refrigerant charge amount has been reduced by more than 50%.
- (3) The microcomputer chip is installed in the indoor unit and outdoor unit. There is no need for the unit to communicate between the outdoor and indoor units so the unit is more resistant to electromagnetic noise thus the incidence of microcomputer malfunction has been reduced. The compressor in the outdoor unit has its own self protection function, that reacts according to abnormal high pressure and excessive high temperature.
- (4) There are only three power lines between the outdoor and indoor unit. One cable with 3 wires encased in one sheath is enough for conducting the wiring work between the outdoor unit and the indoor unit. This contributes to simpler wiring work in the field.
- (5) All air supply ports have auto swing louvers. (Only case of FDT, FDEN and FDKN models). The indoor fan motor has three speeds of high, medium and low.
- (6) All models have service valves protruding from the outdoor unit for faster flare connection (FDCA801, 1001: Only a gas side is brazing) work in the field.

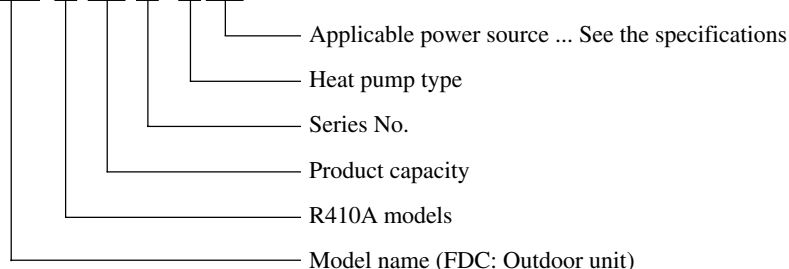
## 1.2 How to read the model name

Example: **FDT A 25 1**



- FDT : Ceiling recessed type unit with wired remote controller
- FDEN : Ceiling suspension type unit with wireless remote controller
- FDKN : Wall mounted type unit with wireless remote controller
- FDUR : Ceiling mounted duct type unit with wired remote controller

Example: **FDC A 30 1 H EN**



### 1.3 Table of models

Model \ Capacity	151	201	251	301	401	501
Ceiling recessed type (FDT)	○	○	○	○	○	○
Ceiling suspension type (FDEN)	○	○	○	○	○	○
Wall mounted type (FDKN)	○	○	○	○		
Ceiling mounted duct type (FDUR)		○	○	○	○	○
Outdoor unit to be combined (FDC)	FDCA301HEN (3 Horse Power) FDCA301HES (3 Horse Power) FDCA401HEN (4 Horse Power) FDCA401HES (4 Horse Power) FDCA501HES (5 Horse Power) FDCA601HES (6 Horse Power) FDCA801HES (8 Horse Power) FDCA1001HES (10 Horse Power)					

### 1.4 Table of system combinations

Outdoor unit	Type	Indoor unit assembly capacity	Branch pipe set (Optional)
FDCA301HEN FDCA301HES	Twin	151+151	DIS-WA1
		201+201	
		251+251	
FDCA601HES	Twin	301+301	DIS-TA1
	Triple	201+201+201	
	Double twin	151+151+151+151	
FDCA801HES	Twin	401+401	DIS-WB1
		301+501	
	Triple	301+301+301	DIS-TB1
	Double twin	201+201+201+201	DIS-WA1 × 2set DIS-WB1 × 1set
FDCA1001HES	Twin	501+501	DIS-WB1
		301+501	
	Triple	201+401+401	DIS-TB1
		251+251+501	
		301+301+401	
Double twin	251+251+251+251	DIS-WA1 × 2set DIS-WB1 × 1set	

Notes (1) It is possible to use different models (FDT, FDUR, FDEN) when combining indoor units.

(2) Always use the branch piping set (optional) at branches in the refrigerant piping.

## 2 SELECTION DATA

### 2.1 Specifications

#### (1) Indoor unit

##### (a) Ceiling recessed type (FDT)

Models FDTA151, 201, 251

Model		FDTA151	FDTA201	FDTA251
Nominal cooling capacity <sup>(1)</sup>	W	4000	5000	5600
Nominal heating capacity <sup>(1)</sup>	W	4500	5400	6700
Power source		1 Phase, 220/230V 50Hz		
Noise level	dB(A)	Powerful mode Hi: 36 Me : 33 Lo: 32 Mild mode Hi: 33 Me : 32 Lo: 31		Powerful mode Hi: 38 Me : 35 Lo: 33 Mild mode Hi: 35 Me : 33 Lo: 31
Exterior dimensions Height × Width × Depth	mm	Unit: 270 × 840 × 840 Panel: 35 × 950 × 950		
Net weight	kg	31 (Unit: 24 Panel: 7)		
Refrigerant equipment Heat exchanger		Louver fine & inner grooved tubing		
Refrigerant control		—		
Air handling equipment Fan type & Q'ty		Turbo fan × 1		
Motor	W	14 × 1		
Starting method		Line starting		
Air flow(Standard)	CMM	Powerful mode Hi: 18 Me : 15 Lo: 14 Mild mode Hi: 15 Me : 14 Lo: 13		Powerful mode Hi: 20 Me : 17 Lo: 15 Mild mode Hi: 17 Me : 15 Lo: 13
Fresh air intake		Available		
Air filter, Q'ty		Long life filter × 1 (Washable)		
Shock & vibration absorber		Rubber sleeve (for fan motor)		
Operation control Operation switch		Wired remote control switch (Optional: RC-E1) Wireless remote control switch (Optional: RCN-T-W-E)		
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: φ6.35 (1/4") 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	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation					
Cooling	27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating	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 or Wireless kit (Optional)

Item	Panel Part No.	Wireless kit
Model FDTA151, 201, 251	T-PSA-34W-E	RCN-T-W-E

## Models FDTA301, 401

Model		FDTA301	FDTA401
<b>Item</b>			
<b>Nominal cooling capacity<sup>(1)</sup></b>	<b>W</b>	<b>7200</b>	<b>10000</b>
<b>Nominal heating capacity<sup>(1)</sup></b>	<b>W</b>	<b>7300</b>	<b>11200</b>
<b>Power source</b>		<b>1 Phase, 220/230/240V 50Hz</b>	
Noise level	dB(A)	Powerful mode Hi: 38 Me: 35 Lo: 33 Mild mode Hi: 35 Me: 33 Lo: 31	Powerful mode Hi: 46 Me: 43 Lo: 41 Mild mode Hi: 43 Me: 41 Lo: 38
<b>Exterior dimensions Height × Width × Depth</b>	<b>mm</b>	<b>Unit:295 × 840 × 840 Panel:35 × 950 × 950</b>	
<b>Net weight</b>	<b>kg</b>	<b>31 (Unit:24 Panel:7)</b>	<b>33 (Unit:26 Panel:7)</b>
Refrigerant equipment Heat exchanger		Louver fine & inner grooved tubing	
Refrigerant control		—	
Air handling equipment Fan type & Q'ty		Turbo fan × 1	
<b>Motor</b>	<b>W</b>	<b>20×1</b>	<b>40×1</b>
Starting method		Line starting	
<b>Air flow(Standard)</b>	<b>CMM</b>	<b>Powerful mode Hi: 20 Me: 17 Lo: 15 Mild mode Hi: 17 Me: 15 Lo: 13</b>	<b>Powerful mode Hi: 25 Me: 22 Lo: 20 Mild mode Hi: 22 Me: 20 Lo: 18</b>
Fresh air intake		Available	
Air filter, Q'ty		Long life filter × 1 (Washable)	
Shock & vibration absorber		Rubber sleeve (for fan motor)	
Operation control Operation switch		Wired remote control switch (Optional: RC-E1) Wireless remote control switch (Optional: RCN-T-W-E)	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat.	
<b>Installation data Refrigerant piping size</b>	<b>mm(in)</b>	<b>Liquid line:φ9.52 (3/8") Gas line: φ15.88 (5/8")</b>	
<b>Connecting method</b>		<b>Flare piping</b>	
Drain hose		Connectable with VP25	
Insulation for piping		Necessary (both Liquid & Gas lines)	
<b>Accessories</b>		Mounting kit. Drain hose	
<b>Optional parts</b>		Decorative Panel	

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

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation					
Cooling	27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating	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 or Wireless kit (Optional)

Model	Item	Panel Part No.	Wireless kit
FDTA301, 401		T-PSA-34W-E	RCN-T-W-E

**Model FDTA501**

Model		FDTA501
<b>Item</b>		
<b>Nominal cooling capacity<sup>(1)</sup></b>	<b>W</b>	<b>12500</b>
<b>Nominal heating capacity<sup>(1)</sup></b>	<b>W</b>	<b>13600</b>
<b>Power source</b>		<b>1 Phase, 220/230/240V 50Hz</b>
Noise level	dB(A)	Powerful mode Hi: 48 Me: 45 Lo: 43 Mild mode Hi: 45 Me: 43 Lo: 40
<b>Exterior dimensions</b> Height × Width × Depth	<b>mm</b>	<b>Unit:365 × 840 × 840</b> <b>Panel:35 × 950 × 950</b>
<b>Net weight</b>	<b>kg</b>	<b>38 (Unit:31 Panel:7)</b>
Refrigerant equipment Heat exchanger		Louver fine & inner grooved tubing
Refrigerant control		—
Air handling equipment Fan type & Q'ty		Turbo fan × 1
<b>Motor</b>	<b>W</b>	<b>120 × 1</b>
Starting method		Line starting
<b>Air flow(Standard)</b>	<b>CMM</b>	<b>Powerful mode Hi: 32 Me: 29 Lo: 26</b> <b>Mild mode Hi: 29 Me: 26 Lo: 23</b>
Fresh air intake		Available
Air filter, Q'ty		Long life filter × 1 (Washable)
Shock & vibration absorber		Rubber sleeve (for fan motor)
Operation control Operation switch		Wired remote control switch (Optional: RC-E1) Wireless remote control switch (Optional: RCN-T-W-E)
Room temperature control		Thermostat by electronics
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat.
<b>Installation data</b> <b>Refrigerant piping size</b>	<b>mm(in)</b>	<b>Liquid line:φ9.52 (3/8") Gas line: φ15.88 (5/8")</b>
<b>Connecting method</b>		<b>Flare piping</b>
Drain hose		Connectable with VP25
Insulation for piping		Necessary (both Liquid & Gas line)
<b>Accessories</b>		Mounting kit. Drain hose
<b>Optional parts</b>		Decorative Panel

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

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation					
Cooling	27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating	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 or Wireless kit (Optional)

Model	Item	Panel Part No.	Wireless kit
FDTA501		T-PSA-34W-E	RCN-T-W-E

**(b) Ceiling suspension type (FDEN)**  
**Models FDENA151, 201, 251**

Item		Model	FDENA151	FDENA201	FDENA251
Nominal cooling capacity <sup>(1)</sup>	W		3800	5000	5600
Nominal heating capacity <sup>(1)</sup>	W		4500	5400	6700
Power source			1 Phase, 220/230/240V 50Hz		
Noise level	dB(A)		Powerful mode Hi: 42 Me : 39 Lo: 38 Mild mode Hi: 39 Me : 38 Lo: 37		Powerful mode Hi: 44 Me : 41 Lo: 39 Mild mode Hi: 41 Me : 39 Lo: 38
Exterior dimensions Height × Width × Depth	mm		210 × 1070 × 690		210 × 1320 × 690
Net weight	kg		30		36
Refrigerant equipment Heat exchanger			Louver fine & inner grooved tubing		
Refrigerant control			—		
Air handling equipment Fan type & Q'ty			Multiblade centrifugal fan × 2		Multiblade centrifugal fan × 4
Motor	W		25 × 1		25 × 2
Starting method			Line starting		
Air flow(Standard)	CMM		Powerful mode Hi: 12 Me : 11 Lo: 9 Mild mode Hi: 11 Me : 9 Lo: 7		Powerful mode Hi: 20 Me : 18 Lo: 14 Mild mode Hi: 18 Me : 14 Lo: 12
Fresh air intake			Unavailable		
Air filter, Q'ty			Polypropylene net × 2 (Washable)		
Shock & vibration absorber			Rubber sleeve (for fan motor)		
Operation control Operation switch			Wireless remote control switch (Optional: RCN-E1) Wired 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: φ6.35 (1/4") Gas line: φ15.88 (5/8")
Connecting method			Flare piping		
Drain hose			Connectable with VP20		
Insulation for piping			Necessary (both Liquid & Gas line)		
Accessories			Mounting kit. Drain hose		
Optional parts			—		

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

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation Cooling	27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating	20℃	—	7℃	6℃	

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



**Models FDENA301, 401**

Model		FDENA301	FDENA401
<b>Item</b>			
<b>Nominal cooling capacity<sup>(1)</sup></b>	<b>W</b>	<b>6400</b>	<b>10000</b>
<b>Nominal heating capacity<sup>(1)</sup></b>	<b>W</b>	<b>7100</b>	<b>11200</b>
<b>Power source</b>		<b>1 Phase, 220/230/240V 50Hz</b>	
Noise level	dB(A)	Powerful mode Hi: 44 Me: 41 Lo: 39 Mild mode Hi: 41 Me: 39 Lo: 38	Powerful mode Hi: 46 Me: 44 Lo: 41 Mild mode Hi: 44 Me: 41 Lo: 39
<b>Exterior dimensions Height × Width × Depth</b>	<b>mm</b>	<b>210 × 1320 × 690</b>	<b>250 × 1620 × 690</b>
<b>Net weight</b>	<b>kg</b>	<b>36</b>	<b>46</b>
Refrigerant equipment Heat exchanger		Louver fine & inner grooved tubing	
Refrigerant control		—	
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 4	
<b>Motor</b>	<b>W</b>	<b>25×2</b>	<b>30×2</b>
Starting method		Line starting	
<b>Air flow(Standard)</b>	<b>CMM</b>	<b>Powerful mode Hi: 20 Me: 18 Lo: 14 Mild mode Hi: 18 Me: 14 Lo: 12</b>	<b>Powerful mode Hi: 29 Me: 26 Lo: 23 Mild mode Hi: 26 Me: 23 Lo: 21</b>
Fresh air intake		Unavailable	
Air filter, Q'ty		Polypropylene net × 2 (Washable)	
Shock & vibration absorber		Rubber sleeve (for fan motor)	
Operation control Operation switch		Wireless remote control switch (Optional: RCN-E1) Wired remote control switch (Optional: RC-E1)	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
<b>Installation data Refrigerant piping size</b>	<b>mm(in)</b>	<b>Liquid line: φ9.52 (3/8") Gas line: φ15.88 (5/8")</b>	
<b>Connecting method</b>		<b>Flare piping</b>	
Drain hose		Connectable with VP20	
Insulation for piping		Necessary (both Liquid & Gas lines)	
<b>Accessories</b>		Mounting kit. Drain hose	
<b>Optional parts</b>		—	

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

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation					
Cooling	27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating	20℃	—	7℃	6℃	

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

**Model FDENA501**

Item	Model	FDENA501
Nominal cooling capacity <sup>(1)</sup>	W	12600
Nominal heating capacity <sup>(1)</sup>	W	13300
Power source		1 Phase, 220/230/240V
Noise level	dB(A)	Powerful mode Hi: 48 Me: 46 Lo: 44 Mild mode Hi: 46 Me: 44 Lo: 43
Exterior dimensions Height × Width × Depth	mm	250 × 1620 × 690
Net weight	kg	46
Refrigerant equipment Heat exchanger		Louver fine & inner grooved tubing
Refrigerant control		—
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 4
Motor	W	33×2
Starting method		Line starting
Air flow(Standard)	CMM	Powerful mode Hi: 31 Me: 29 Lo: 26 Mild mode Hi: 29 Me: 26 Lo: 23
Fresh air intake		Unavailable
Air filter, Q'ty		Polypropylene net × 2 (Washable)
Shock & vibration absorber		Rubber sleeve (for fan motor)
Operation control Operation switch		Wireless remote control switch (Optional: RCN-E1) Wired 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.

Operation	Item	Indoor air temperature		Outdoor air temperature		Standards
		DB	WB	DB	WB	
Cooling		27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating		20℃	—	7℃	6℃	

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

**(c) Wall mounted type (FDKN)**  
**Models FDKNA151, 251**

Item		Model	FDKNA151	FDKNA201
Nominal cooling capacity <sup>(1)</sup>	W		4000	5000
Nominal heating capacity <sup>(1)</sup>	W		4500	5400
Power source			1 Phase, 220/230/240V 50Hz	
Noise level	dB(A)		Powerful mode Hi: 44 Me: 42 Lo: 40 Mild mode Hi: 42 Me: 40 Lo: 37	Powerful mode Hi: 47 Me: 44 Lo: 41 Mild mode Hi: 44 Me: 41 Lo: 38
Exterior dimensions Height × Width × Depth	mm		298 × 840 × 240	
Net weight	kg		12	
Refrigerant equipment Heat exchanger			Slitted fins & inner grooved tubing	
Refrigerant control			—	
Air handling equipment Fan type & Q'ty			Tangential fan × 1	
Motor	W		33 × 1	
Starting method			Line starting	
Air flow(Standard)	CMM		Powerful mode Hi: 12 Me: 11 Lo: 10 Mild mode Hi: 11 Me: 10 Lo: 9	Powerful mode Hi: 13 Me: 12 Lo: 11 Mild mode Hi: 12 Me: 11 Lo: 9
Fresh air intake			Unavailable	
Air filter, Q'ty			Long life filter × 2 (Washable)	
Shock & vibration absorber			Rubber sleeve (for fan motor)	
Operation control Operation switch			Wireless remote control switch (Optional: RCN-E1) Wired 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 VP16	
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	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation					
Cooling	27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating	20℃	—	7℃	6℃	

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

**Models FDKNA251, 301**

Model		FDKNA251	FDKNA301
<b>Item</b>			
<b>Nominal cooling capacity<sup>(1)</sup></b>	<b>W</b>	<b>5600</b>	<b>6700</b>
<b>Nominal heating capacity<sup>(1)</sup></b>	<b>W</b>	<b>6300</b>	<b>7300</b>
<b>Power source</b>		<b>1 Phase, 220/230/240V 50Hz</b>	
Noise level	dB(A)	Powerful mode Hi: 48 Me: 45 Lo: 42 Mild mode Hi: 45 Me: 42 Lo: 39	Powerful mode Hi: 49 Me: 46 Lo: 43 Mild mode Hi: 46 Me: 43 Lo: 40
<b>Exterior dimensions Height × Width × Depth</b>	<b>mm</b>	<b>298 × 840 × 240</b>	<b>298 × 1155 × 196</b>
<b>Net weight</b>	<b>kg</b>	<b>12</b>	<b>13.5</b>
Refrigerant equipment Heat exchanger		Slitted fins & inner grooved tubing	Louver fins & inner grooved tubing
Refrigerant control		—	
Air handling equipment Fan type & Q'ty		Tangential fan × 1	
<b>Motor</b>	<b>W</b>	<b>33 × 1</b>	<b>40 × 1</b>
Starting method		Line starting	
<b>Air flow(Standard)</b>	<b>CMM</b>	<b>Powerful mode Hi: 14 Me: 13 Lo: 11 Mild mode Hi: 13 Me: 11 Lo: 10</b>	<b>Powerful mode Hi: 21 Me: 18 Lo: 15 Mild mode Hi: 18 Me: 15 Lo: 13</b>
Fresh air intake		Unavailable	
Air filter, Q'ty		Long life filterter × 2 (Washable)	
Shock & vibration absorber		Rubber sleeve (for fan motor)	
Operation control Operation switch		Wireless remote control switch (Optional: RCN-E1) Wired remote control switch (Optional: RC-E1)	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat.	
<b>Installation data Refrigerant piping size</b>	<b>mm(in)</b>	<b>Liquid line: φ6.35 (1/4") Gas line: φ15.88 (5/8")</b>	<b>Liquid line: φ9.52 (3/8") Gas line: φ15.88 (5/8")</b>
<b>Connecting method</b>		<b>Flare piping</b>	
Drain hose		Connectable with VP16	
Insulation for piping		Necessary (both Liquid & Gas lines)	
<b>Accessories</b>		Mounting kit. Drain hose	
<b>Optional parts</b>		—	

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

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation					
Cooling	27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating	20℃	—	7℃	6℃	

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

**(d) Ceiling mounted duct type (FDUR)**  
**Models FDURA201, 251**

Item		Model	FDURA201	FDURA251
Nominal cooling capacity <sup>(1)</sup>		W	5000	5600
Nominal heating capacity <sup>(1)</sup>		W	5400	6400
Power source			1 Phase 220/230/240V 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	40
Refrigerant equipment Heat exchanger			Louver fine & inner grooved tubing	
Refrigerant control			—	
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			Wired 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: $\phi 6.35$ (1/4") Gas line: $\phi 12.7$ (1/2")	Liquid line: $\phi 6.35$ (1/4") Gas line: $\phi 15.88$ (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			Suction grille	

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

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation					
Cooling	27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating	20℃	—	7℃	6℃	

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

**Models FDURA301, 401**

Item	Model	FDURA301		FDURA401	
Nominal cooling capacity <sup>(1)</sup>	W	6700		10000	
Nominal heating capacity <sup>(1)</sup>	W	7100		11200	
Power source		1 Phase, 220/230/240V 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 fine & inner grooved tubing			
Refrigerant control		—			
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: 20		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		Wired 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		Suction grille			

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

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation					
Cooling	27℃	19℃	35℃	24℃	ISO-T1,JIS B8616
Heating	20℃	—	7℃	6℃	

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

**Model FDURA501**

Item	Model	FDURA501
Nominal cooling capacity <sup>(1)</sup>	W	12500
Nominal heating capacity <sup>(1)</sup>	W	13600
Power source		1 Phase, 220/230/240V 50Hz
Noise level	dB(A)	Hi: 43 Lo: 38
Exterior dimensions Height × Width × Depth	mm	350 × 1370 × 650
Net weight	kg	65
Refrigerant equipment Heat exchanger		Louver fine & inner grooved tubing
Refrigerant control		—
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 2
Motor	W	460 × 1
Starting method		Line starting
Air flow(Standard)	CMM	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		Wired 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: $\phi$ 9.52 (3/8") Gas line: $\phi$ 15.88 (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		Suction grille

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

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Operation					
Cooling	27℃	19℃	35℃	24℃	ISO-T1, JIS B8616
Heating	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 FDCA301HEN, 301HES**

Item	Model	FDCA301HEN	FDCA301HES
<b>Power source</b>		<b>1 Phase, 220/230/240V 50Hz</b>	<b>3 Phase, 380/400/415V 50Hz</b>
<b>Nominal cooling capacity<sup>(1)</sup></b>	<b>W</b>	<b>7200</b>	
<b>Nominal heating capacity<sup>(1)</sup></b>	<b>W</b>	<b>7300</b>	
Noise level	dB(A)	53	
<b>Exterior dimensions Height × Width × Depth</b>	<b>mm</b>	<b>845 × 880 × 340</b>	
<b>Net weight</b>	<b>kg</b>	<b>75</b>	
Refrigerant equipment compressor type & Q'ty		ZP26K3E-PFJ × 1	ZP26K3E-TFD × 1
<b>Motor</b>	<b>kW</b>	<b>2.5</b>	
Starting method		Line starting	
Crankcase heater	W	33	
Heat exchanger		Slitted fines & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
<b>Refrigerant</b>		<b>R410</b>	
<b>Quantity</b>	<b>kg</b>	<b>3.15 (Pre-charged up to the piping length of 30m)</b>	
<b>Refrigerant oil</b>	<i>ℓ</i>	<b>1.12 (3 MAW POE)</b>	
Defrost control		MC controlled de-icer	
Air handling equipment Fan type & Q'ty		Propeller fan × 1	
<b>Motor</b>	<b>W</b>	<b>55 × 1</b>	
Starting method		Line starting	
<b>Air flow(Standard)</b>	<b>CMM</b>	<b>46</b>	
Shock & vibration absorber		Rubber mount (for compressor)	
Safety equipment		Internal thermostat for motor. Abnormal discharge temperature protection.	
<b>Installation data Refrigerant piping size</b>	<b>mm(in)</b>	<b>Liquid line: φ9.52 (3/8") Gas line: φ15.88 (5/8")</b>	
<b>Connecting method</b>		<b>Flare piping</b>	
Drain		Hole for drain(φ20 × 3pcs.)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
<b>Accessories</b>		<b>Edging</b>	

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.



**Models FDCA401HEN, 401HES**

Item	Model	FDCA401HEN	FDCA401HES
<b>Power source</b>		<b>1 Phase, 220/230/240V 50Hz</b>	<b>3 Phase, 380/400/415V 50Hz</b>
<b>Nominal cooling capacity<sup>(1)</sup></b>	<b>W</b>	<b>10000</b>	
<b>Nominal heating capacity<sup>(1)</sup></b>	<b>W</b>	<b>11200</b>	
Noise level	dB(A)	54	
<b>Exterior dimensions Height × Width × Depth</b>	<b>mm</b>	<b>1050 × 920 × 340</b>	
<b>Net weight</b>	<b>kg</b>	<b>92</b>	
Refrigerant equipment compressor type & Q'ty		ZP41K3E-PFJ × 1	ZP41K3E-TFD × 1
<b>Motor</b>	<b>kW</b>	<b>3.0</b>	
Starting method		Line starting	
Crankcase heater	W	33	
Heat exchanger		Slitted fines & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
<b>Refrigerant</b>		<b>R410</b>	
<b>Quantity</b>	<b>kg</b>	<b>3.9 (Pre-charged up to the piping length of 30m)</b>	
<b>Refrigerant oil</b>	<i>ℓ</i>	<b>1.24 (3 MAW POE)</b>	
Defrost control		MC controlled de-icer	
Air handling equipment Fan type & Q'ty		Propeller fan × 2	
<b>Motor</b>	<b>W</b>	<b>40 × 2</b>	
Starting method		Line starting	
<b>Air flow(Standard)</b>	<b>CMM</b>	<b>64</b>	
Shock & vibration absorber		Rubber mount (for compressor)	
Safety equipment		Internal thermostat for fan motor. Abnormal discharge temperature protection.	
<b>Installation data Refrigerant piping size</b>	<b>mm(in)</b>	<b>Liquid line: φ9.52 (3/8") Gas line: φ15.88 (5/8")</b>	
<b>Connecting method</b>		<b>Flare piping</b>	
Drain		Hole for drain (φ20 × 3pcs.)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
<b>Accessories</b>		<b>Edging</b>	

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.

**Models FDCA501HEN, 601HES**

Item	Model	FDCA501HES	FDCA601HES
<b>Power source</b>		<b>3 Phase, 380/400/415V 50Hz</b>	
<b>Nominal cooling capacity<sup>(1)</sup></b>	<b>W</b>	<b>12600</b>	<b>14200</b>
<b>Nominal heating capacity<sup>(1)</sup></b>	<b>W</b>	<b>13300</b>	<b>15900</b>
Noise level	dB(A)	56	57
<b>Exterior dimensions Height × Width × Depth</b>	<b>mm</b>	<b>1300 × 970 × 370</b>	
<b>Net weight</b>	<b>kg</b>	<b>112</b>	<b>126</b>
Refrigerant equipment compressor type & Q'ty		ZP54K3E-TFD × 1	ZP57K3E-TFD × 1
<b>Motor</b>	<b>kW</b>	<b>3.75</b>	<b>4.5</b>
Starting method		Line starting	
Crankcase heater	W	40	
Heat exchanger		Slitted fines & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
<b>Refrigerant</b>		<b>R410A</b>	
<b>Quantity</b>	<b>kg</b>	<b>3.2</b> <b>(Pre-charged up to the piping length of 30m)</b>	<b>3.9</b> <b>(Pre-charged up to the piping length of 30m)</b>
<b>Refrigerant oil</b>	<i>ℓ</i>	<b>1.95 (3 MAW POE)</b>	<b>1.66 (3 MAW POE)</b>
Defrost control		MC controlled de-icer	
Air handling equipment Fan type & Q'ty		Propeller fan × 2	
<b>Motor</b>	<b>W</b>	<b>55 × 2</b>	
Starting method		Line starting	
<b>Air flow(Standard)</b>	<b>CMM</b>	<b>100</b>	
Shock & vibration absorber		Rubber mount (for compressor)	
Safety equipment		Internal thermostat for fan motor. Abnormal discharge temperature protection.	
<b>Installation data Refrigerant piping size</b>	<b>mm(in)</b>	<b>Liquid line: φ9.52 (3/8") Gas line: φ15.88 (5/8")</b>	
<b>Connecting method</b>		<b>Flare piping</b>	
Drain		Hole for drain (φ20 × 3pcs.)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
<b>Accessories</b>		<b>Edging</b>	

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.

**Models FDCA801HES, 1001HES**

Item	Model	FDCA801HES	FDCA1001HES
<b>Power source</b>		<b>3 Phase, 380/400/415V 50Hz</b>	
<b>Nominal cooling capacity<sup>(1)</sup></b>	<b>W</b>	<b>20000</b>	<b>25000</b>
<b>Nominal heating capacity<sup>(1)</sup></b>	<b>W</b>	<b>22400</b>	<b>28000</b>
Noise level	dB(A)	57	
<b>Exterior dimensions Height × Width × Depth</b>	<b>mm</b>	<b>1690 × 1350 × 720</b>	
<b>Net weight</b>	<b>kg</b>	<b>210</b>	<b>225</b>
Refrigerant equipment compressor type & Q'ty		GU-C5176MS56 × 1	GU-C5192MS56 × 1
<b>Motor</b>	<b>kW</b>	<b>6.0</b>	<b>6.7</b>
Starting method		Line starting	
Crankcase heater	W	40	
Heat exchanger		Straight fins & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
<b>Refrigerant</b>		<b>R410A</b>	
<b>Quantity</b>	<b>kg</b>	<b>6.6</b> <b>(Pre-charged up to the piping length of 5m)</b>	<b>7.9</b> <b>(Pre-charged up to the piping length of 5m)</b>
<b>Refrigerant oil</b>	<i>ℓ</i>	<b>1.9 (MA32R)</b>	
Defrost control		MC controlled de-icer	
Air handling equipment Fan type & Q'ty		Propeller fan × 2	
<b>Motor</b>	<b>W</b>	<b>100 × 2</b>	
Starting method		Line starting	
<b>Air flow(Standard)</b>	<b>CMM</b>	<b>Cooling: 220, Heating: 180</b>	
Shock & vibration absorber		Rubber mount (for compressor)	
Safety equipment		Internal thermostat for fan motor. Abnormal discharge temperature protection.	
<b>Installation data Refrigerant piping size</b>	<b>mm(in)</b>	<b>Liquid line: φ 9.52 (3/8")</b> <b>Gas line: φ 25.4 (1")</b>	<b>Liquid line: φ 12.7 (1/2")</b> <b>Gas line: φ 25.4 (1")</b>
<b>Connecting method</b>		<b>Liquid line: Flare piping, Gas line: Brazing</b>	
Drain		Hole for drain (φ20 × 6pcs.)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
<b>Accessories</b>		-	

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.

**(3) Operation chart**

The Multi series is a system that allows for different models and capacities of indoor units to be combined so the individual operating characteristics of the indoor and outdoor are provided. Use the procedure shown in Item (c) to calculate the combined operating characteristics.

**(a) Operating characteristic of outdoor unit**

(230 V)

Item		Model	FDCA301HEN	FDCA401HEN
Cooling input	kW		2.15	3.31
Heating input			2.06	3.08
Cooling running current	A		9.8	15.3
Heating running current			9.5	13.8
Inrush current (L.R.A)	A		63	97
Cooling power factor	%		95	94
Heating power factor			94	97

(400 V)

Item		Model	FDCA301HES	FDCA401HES	FDCA501HES	FDCA601HES
Cooling input	kW		2.15	3.16	4.29	4.35
Heating input			2.06	2.98	3.58	4.44
Cooling running current	A		3.6	5.5	7.4	7.2
Heating running current			3.5	5.1	6.1	7.0
Inrush current (L.R.A)	A		34	46	67	77
Cooling power factor	%		86	83	84	87
Heating power factor			85	84	85	92

(400 V)

Item		Model	FDCA801HES	FDCA1001HES
Cooling input	kW		6.79	7.29
Heating input			6.69	7.24
Cooling running current	A		11.0	11.4
Heating running current			11.0	11.6
Inrush current (L.R.A)	A		58	58
Cooling power factor	%		86	89
Heating power factor			85	87

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**

(230 V)

Item	Model	FDT Series					
		151	201	251	301	401	501
Power input (kW)		0.06		0.07		0.13	0.15
Running current (A)		0.3		0.3		0.6	0.7

**FDEN Series**

(230 V)

Item	Model	FDEN Series					
		151	201	251	301	401	501
Power input (kW)		0.05		0.10		0.13	0.15
Running current (A)		0.2		0.4		0.5	0.6

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.

### FDKN Series

(230 V)

Item	Model	FDKN Series			
		151	201	251	301
Power input (kW)		0.02		0.03	0.08
Running current (A)		0.2		0.2	0.5

### FDUR Series

(230 V)

Item	Model	FDUR Series				
		201	251	301	401	501
Power input (kW)		0.19	0.22	0.24	0.37	0.45
Running current (A)		0.9	1.0	1.3	1.7	2.0

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 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) /  $\sqrt{3}$   $\times$  Total running current (A)  $\times$  Power source]  $\times$  100

Total operation characteristics = Operation characteristic value of outdoor unit + Operation characteristic value of indoor unit

[Example]

(Conditions)      Operation Voltage ..... Indoor unit: 230 V, 50 Hz  
   Outdoor unit: 400 V, 50 Hz  
   Operation mode ..... Cooling and Heating  
   Unit..... Outdoor unit: FDCA801HES  $\times$  1 unit  
   Indoor unit: FDTA301  $\times$  1 units, FDTA501  $\times$  1 units

### Operation characteristics of each unit

(Cooling/Heating)

Item	Model	FDCA801HES	FDTA301	FDTA501
Power input (kW)		6.79/6.69	0.07/0.07	0.15/0.15
Running current (A)		11.0/11.0	0.3/0.3	0.7/0.7

#### ① Total power input (kW)

(Cooling) 6.79 + 0.07 + 0.15 = 7.01 (kW)

(Heating) 6.69 + 0.07 + 0.15 = 6.91 (kW)

#### ② Total running current (A)

(Cooling)  $11.0 + (0.3 + 0.7 \times \frac{2}{3}) = 11.7$  (A)

(Heating)  $11.0 + (0.3 + 0.7 \times \frac{2}{3}) = 11.7$  (A)

#### ③ Total power factor (%)

(Cooling)  $\frac{7.01 \times 1000}{\sqrt{3} \times 11.0 \times 400} \times 100 = 86$  %

(Heating)  $\frac{6.91 \times 1000}{\sqrt{3} \times 11.0 \times 400} \times 100 = 85$  %

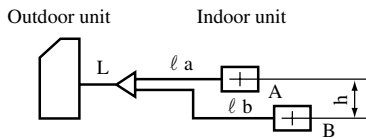
## 2.2 Range of usage & limitations

Model		FDCA301~601	FDCA801, 1001
<b>Item</b>			
<b>Indoor return air temperature (Upper, lower limits)</b>		Refer to the selection chart	
<b>Outdoor air temperature (Upper, lower limits)</b>			
<b>Indoor unit atmosphere (behind ceiling) temperature and humidity</b>		Dew point temperature: 28°C or less, relative humidity: 80% or less	
<b>Refrigerant line (one way) length <sup>(1)</sup></b>		Max. 50m	Max. 70m
<b>Vertical height difference between outdoor unit and indoor unit</b>		Max. 30m (Outdoor unit is higher) Max. 15m (Outdoor unit is lower)	
<b>Difference in after branch piping lengths between indoor units</b>		Max. 20m	Max. 10m
<b>Difference in height between indoor units</b>		Max. 0.5m	
<b>Power source voltage</b>		Rating ± 10%	
<b>Voltage at starting</b>		Min. 85% of rating	
<b>Compressor ON - OFF Frequency</b>	<b>Cycle Time</b>	6 minutes or more (from ON to ON) or (from OFF to OFF)	
	<b>Stop Time</b>	3 minutes or more	

Note (1) Refer to the next page for details of common pipe length.

## Height and length restrictions for refrigerant piping

### Twin type



#### FDCA301HEN, 301HES, 401HEN, 401HES, 501HES, 601HES

One-way pipe length (m)  $L + l a + l b \leq 50$

Branch pipe length (m)  $|l a - l b| \leq 10, l a \leq 20, l b \leq 20$

Difference in height between indoor units (m)  $h=0.5$  or less

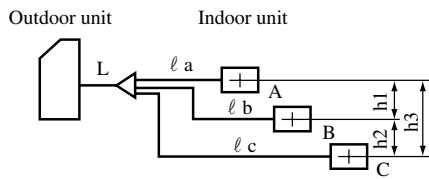
#### FDCA801HES, 1001HES

One-way pipe length (m)  $L + l a \leq 70, L + l b \leq 70$

Branch pipe length (m)  $|l a - l b| \leq 10, l a \leq 30, l b \leq 30$

Difference in height between indoor units (m)  $h=0.5$  or less

### Triple type



#### FDCA601HES

One-way pipe length (m)  $L + l a + l b + l c \leq 50$

Branch pipe length (m)  $|l a - l b| \leq 10, |l a - l c| \leq 10, |l b - l c| \leq 10$   
 $l a \leq 20, l b \leq 20, l c \leq 20$

Difference in height between indoor units (m)  $h1=0.5$  or less,  $h2=0.5$  or less,  $h3=0.5$  or less

#### FDCA801HES, 1001HES

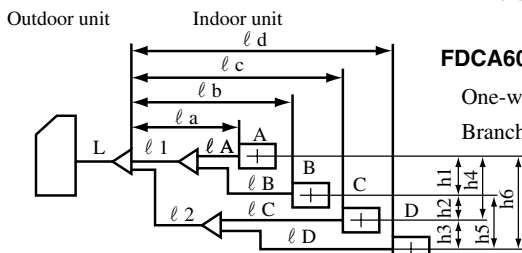
One-way pipe length (m)  $L + l a \leq 70, L + l b \leq 70, L + l c \leq 70$

Branch pipe length (m)  $|l a - l b| \leq 10, |l a - l c| \leq 10, |l b - l c| \leq 10$

$l a \leq 30, l b \leq 30, l c \leq 30$

Difference in height between indoor units (m)  $h1=0.5$  or less,  $h2=0.5$  or less,  $h3=0.5$  or less

### Double-twin type



#### FDCA601HES

One-way pipe length (m)  $L + l a + l b + l c + l d \leq 50$

Branch pipe length (m)  $|l a - l b| \leq 10, |l a - l c| \leq 10, |l b - l c| \leq 10$   
 $|l a - l d| \leq 10, |l b - l d| \leq 10, |l c - l d| \leq 10$   
 $l a \leq 20, l b \leq 20, l c \leq 20, l d \leq 20$   
 $l A + l B \leq 15, l C + l D \leq 15$

Difference in height between indoor units (m)  $h1=0.5$  or less,  $h2=0.5$  or less  
 $h3=0.5$  or less,  $h4=0.5$  or less  
 $h5=0.5$  or less,  $h6=0.5$  or less

#### FDCA801HES, 1001HES

One-way pipe length (m)  $L + l a \leq 70, L + l b \leq 70, L + l c \leq 70, L + l d \leq 70$

Branch pipe length (m)  $|l a - l b| \leq 10, |l a - l c| \leq 10, |l b - l c| \leq 10$

$|l a - l d| \leq 10, |l b - l d| \leq 10, |l c - l d| \leq 10$

$l a \leq 30, l b \leq 30, l c \leq 30, l d \leq 30$

$l A + l B \leq 15, l C + l D \leq 15$

Difference in height between indoor units (m)  $h1=0.5$  or less,  $h2=0.5$  or less  
 $h3=0.5$  or less,  $h4=0.5$  or less  
 $h5=0.5$  or less,  $h6=0.5$  or less

In the illustration the L is main piping and  $l a, l b, l c,$  and  $l d$  are branch piping.

### Request

- When the capacity of the indoor unit to be connected is 151, 201 and 251 or less, be sure to use a pipe diameter of  $\phi 9.52$  for the size of the liquid piping of branch piping (between branch and indoor units). (for double-twin only) For connections to indoor units (liquid piping side dia.  $\phi 6.35$ ) use the different diameter adapter coupling that is included in the branch piping kit.
- Check to make sure the following pipe length limits are followed.  
Refer to the above illustration.
- For the branch be sure to select the specified branch pipe set (sold separately) and then to follow the directions of the instruction manual included in the branch pipe set when installing the piping. Be sure to install the branch piping so that the branch is level.

## 2.3 Exterior dimensions

### (1) Indoor unit

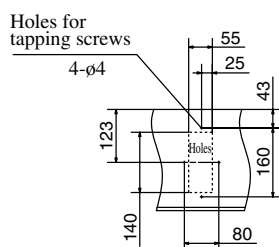
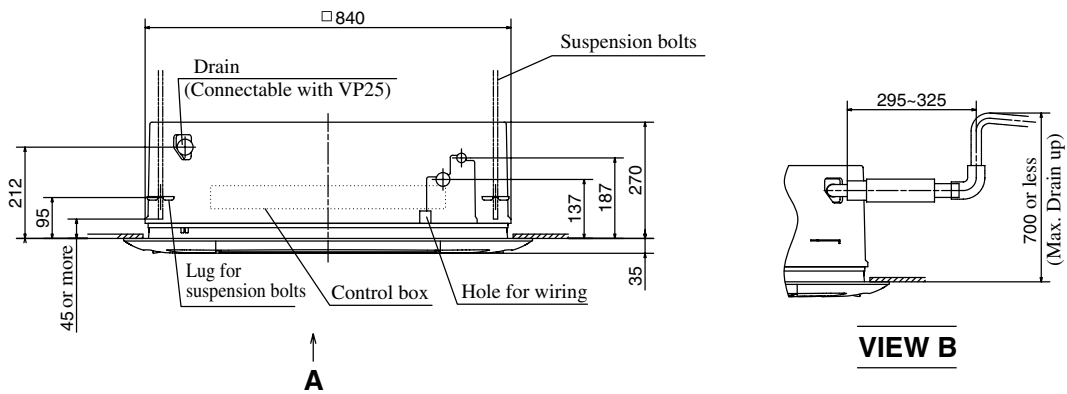
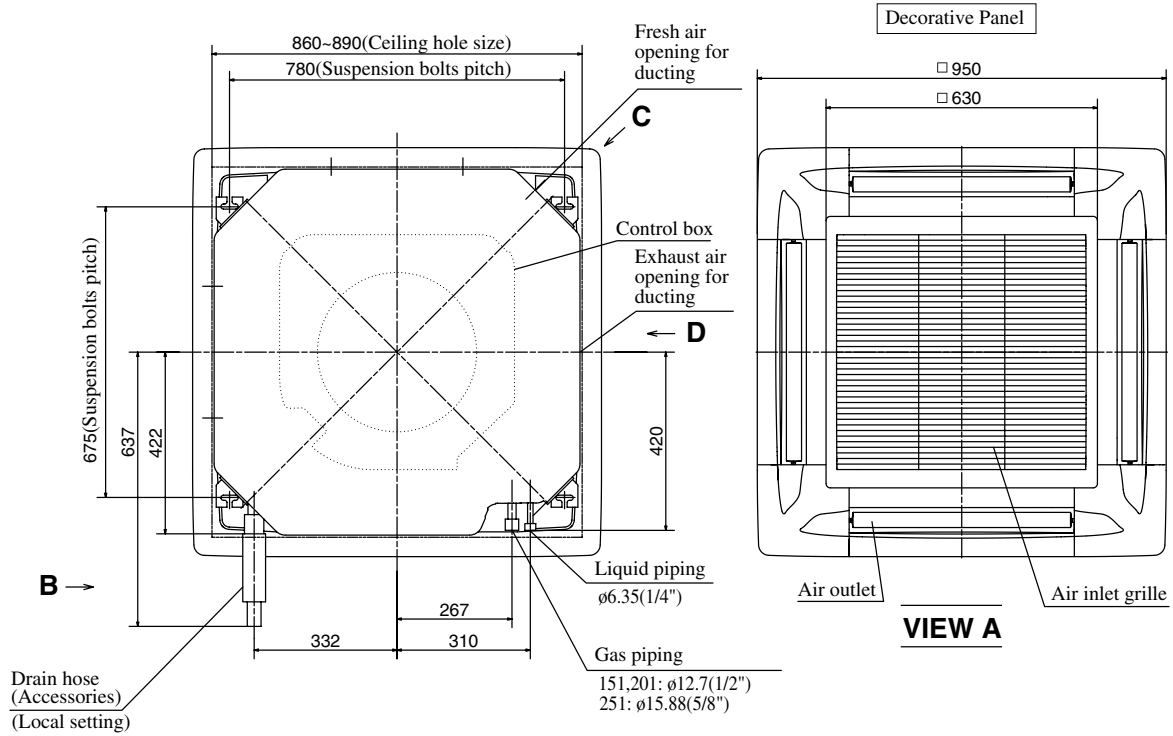
#### (a) Ceiling recessed type (FDT)

#### Models FDTA151, 201, 251

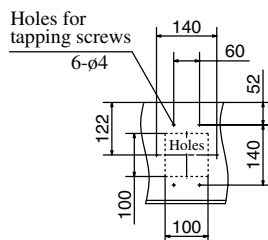
Notes (1) If the twin, triple or double twin 151 or 201 units are used, be sure to use  $\phi 9.52$  piping for the liquid pipe on the branch piping (branch fitting to indoor unit).

Use the irregular diameter joint supplied in the branch piping set for connection to the indoor unit.

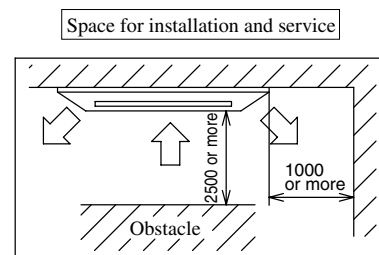
unit : mm



**VIEW C**



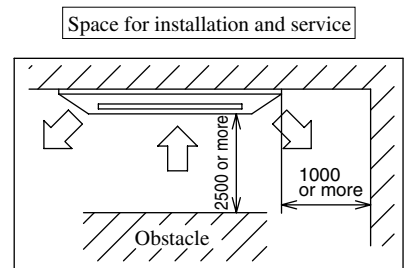
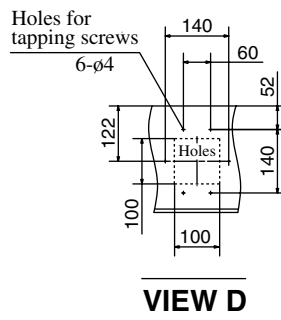
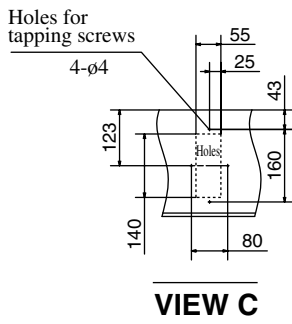
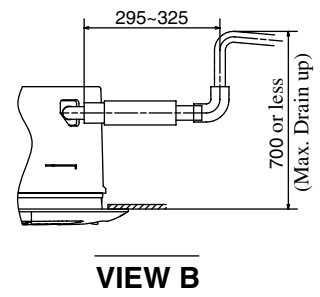
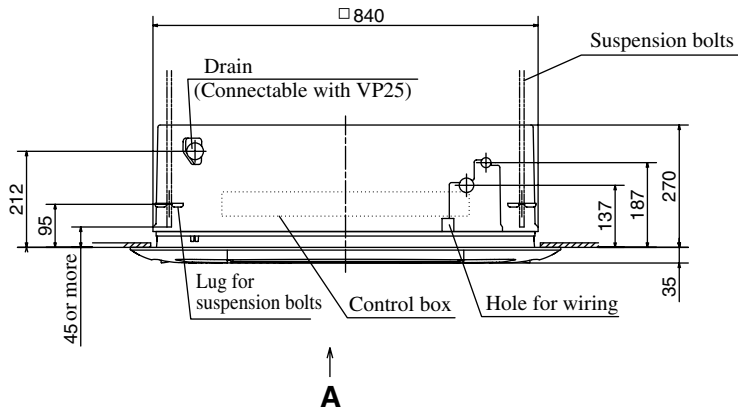
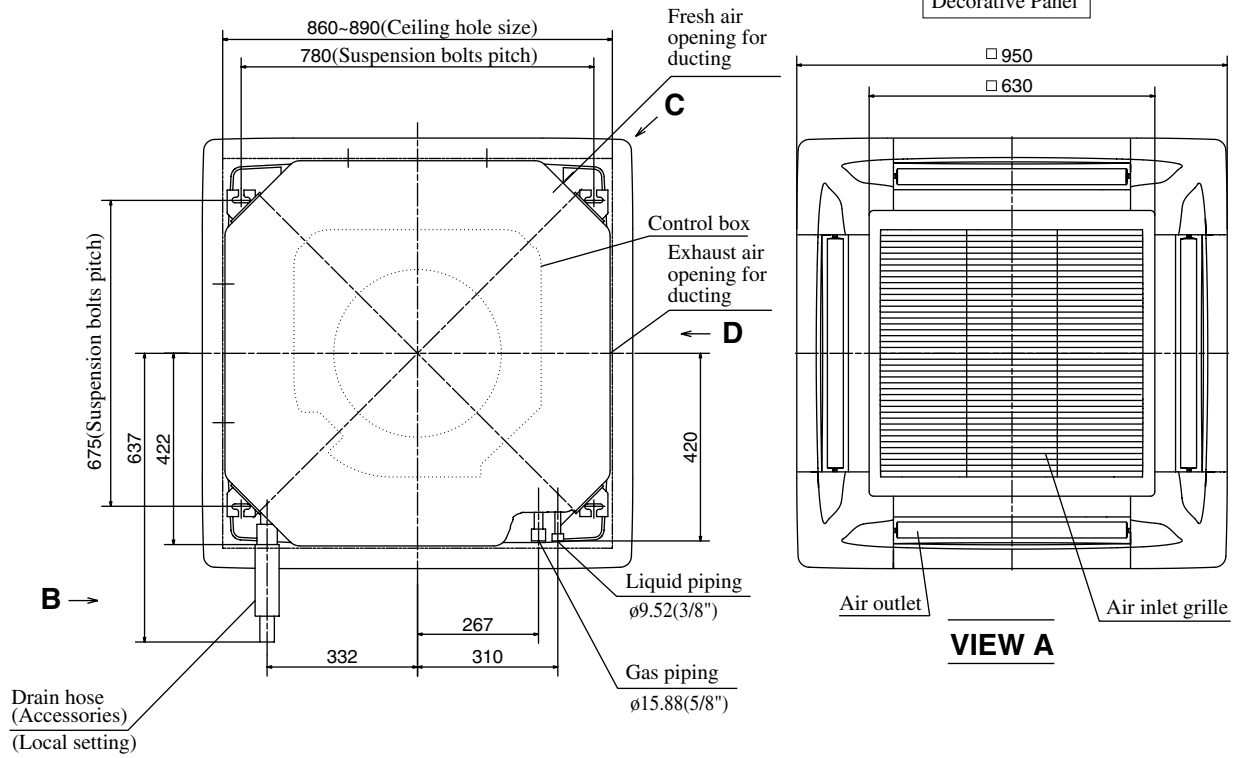
**VIEW D**





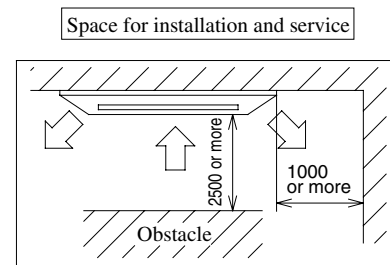
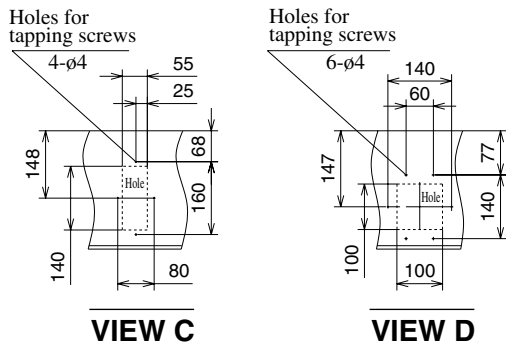
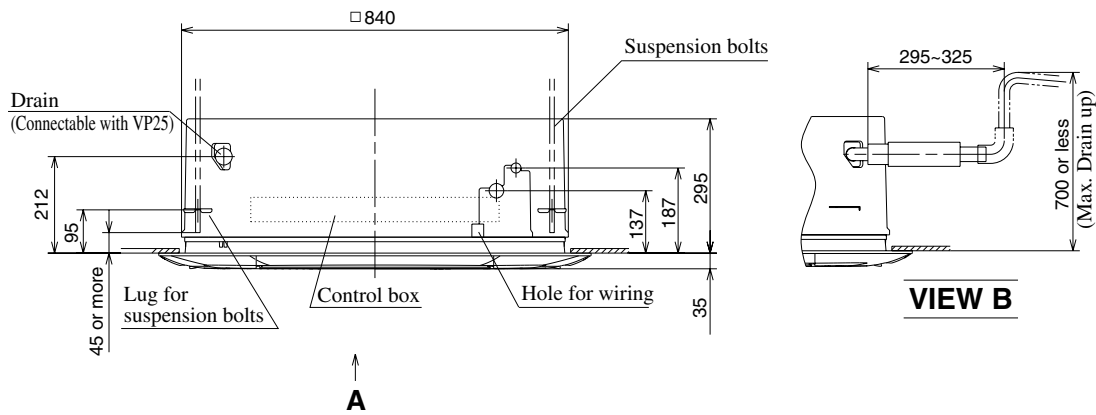
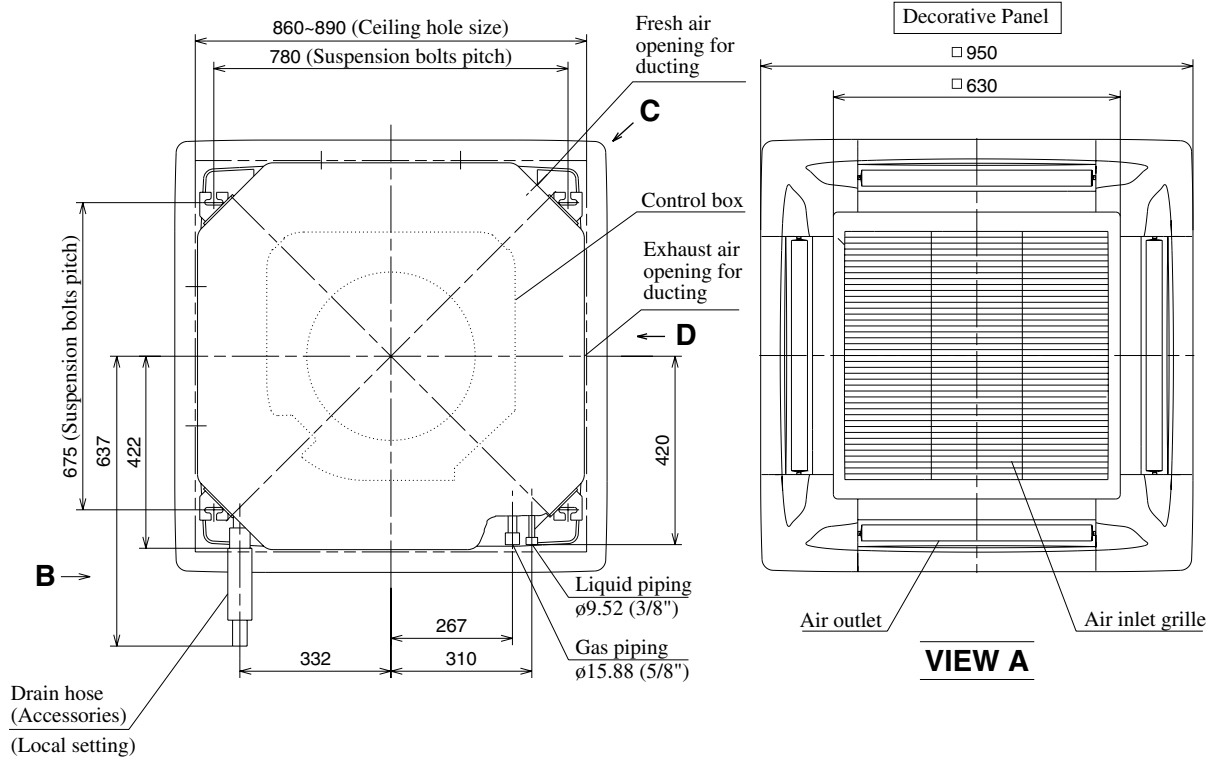
**Model FDTA301**

unit : mm



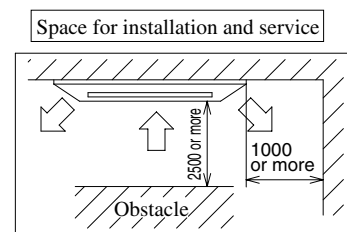
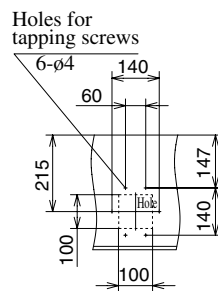
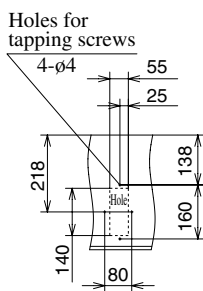
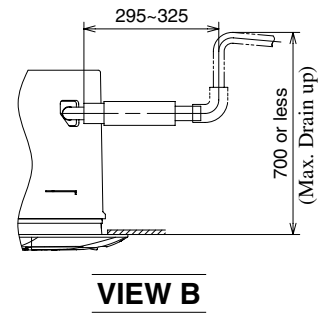
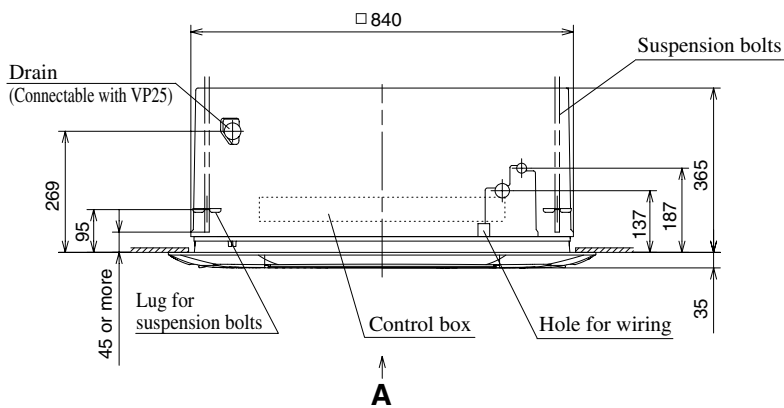
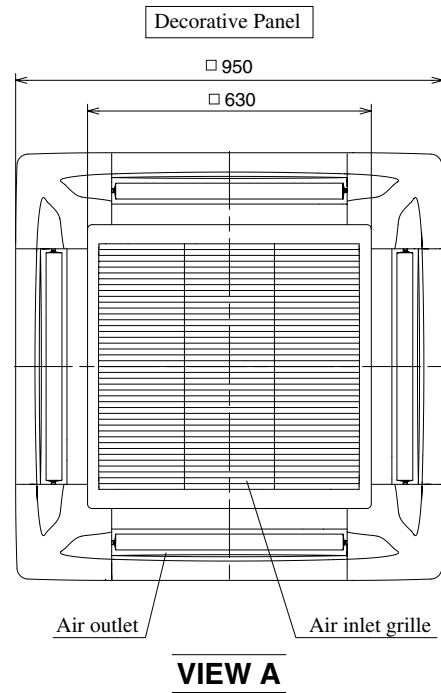
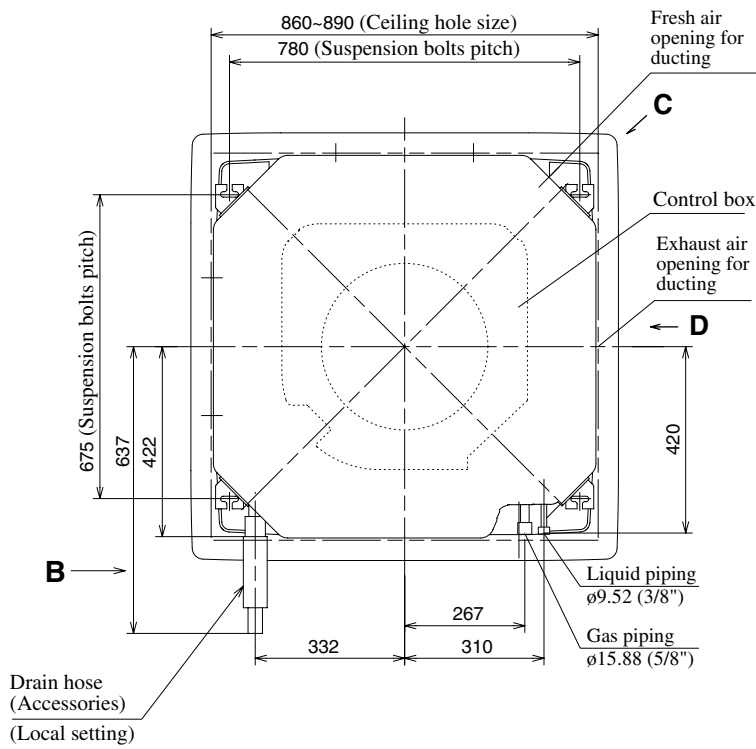
**Model FDTA401**

unit : mm



**Model FDTA501**

unit : mm



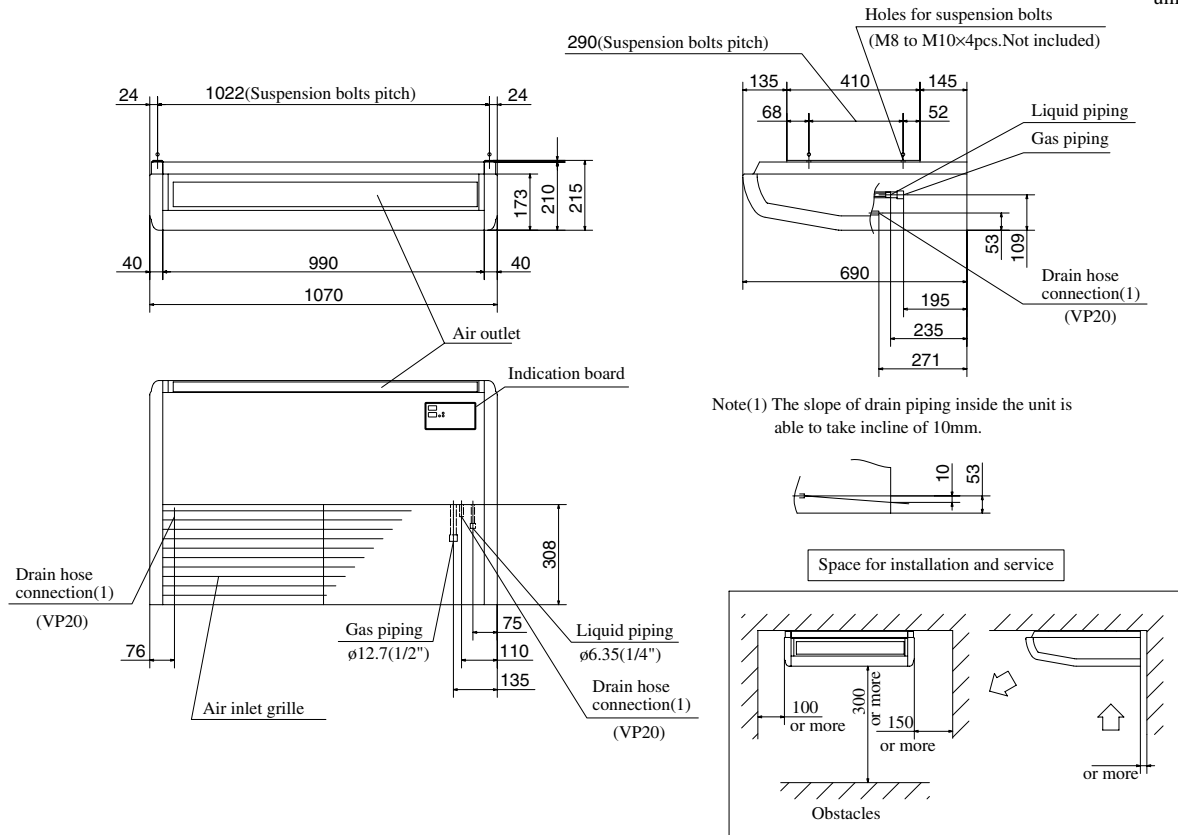
**(b) Ceiling suspension type (FDE)**

**Models FDENA151, 201**

Notes (1) If the twin, triple or double twin 151 or 201 units are used, be sure to use  $\phi 9.52$  piping for the liquid pipe on the branch piping (branch fitting to indoor unit).

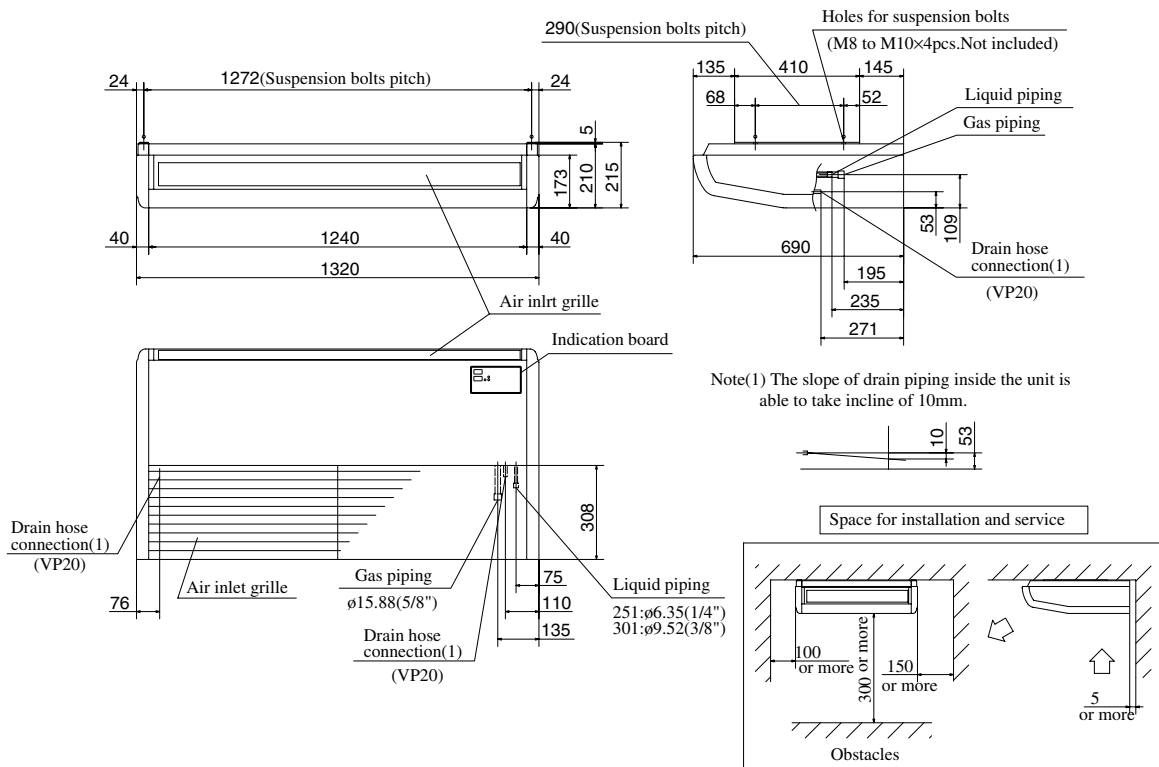
Use the irregular diameter joint supplied in the branch piping set for connection to the indoor unit.

unit : mm



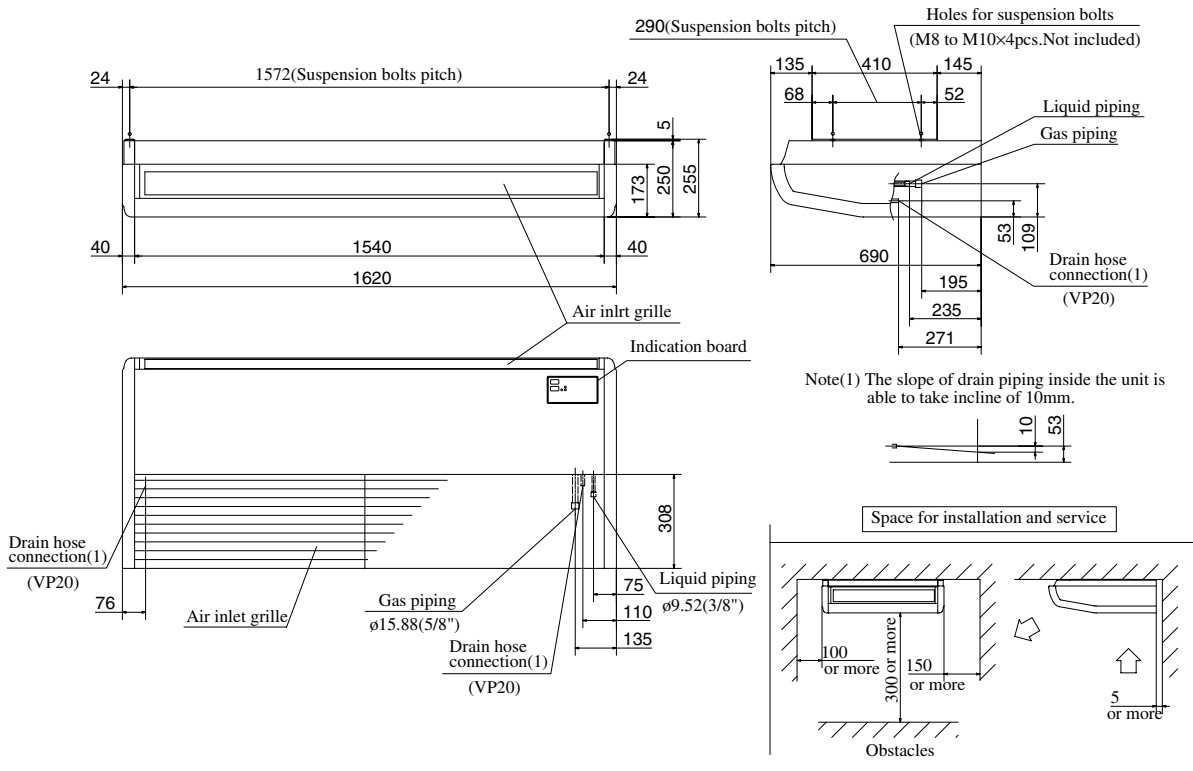
**Model FDENA251, 301**

Unit : mm



**Models FDENA401, 501**

Unit : mm

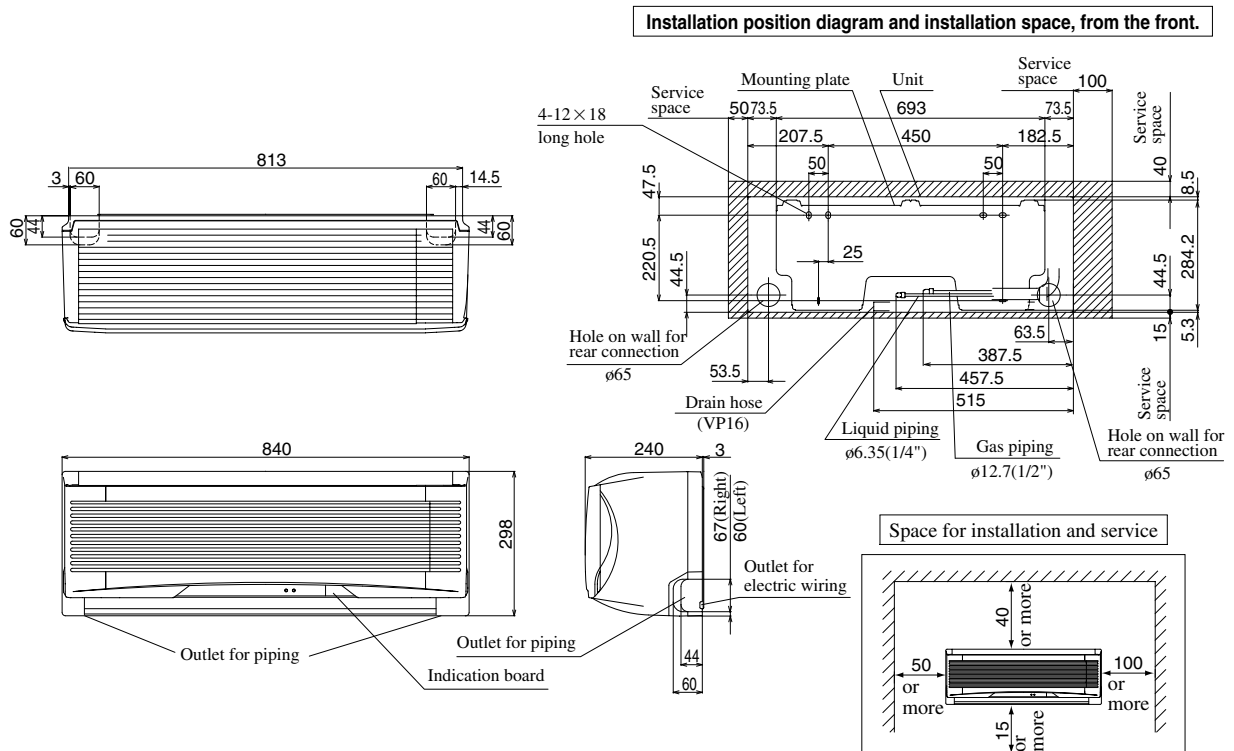


**(c) Wall mounted type (FDK)**

**Models FDKNA151, 201**

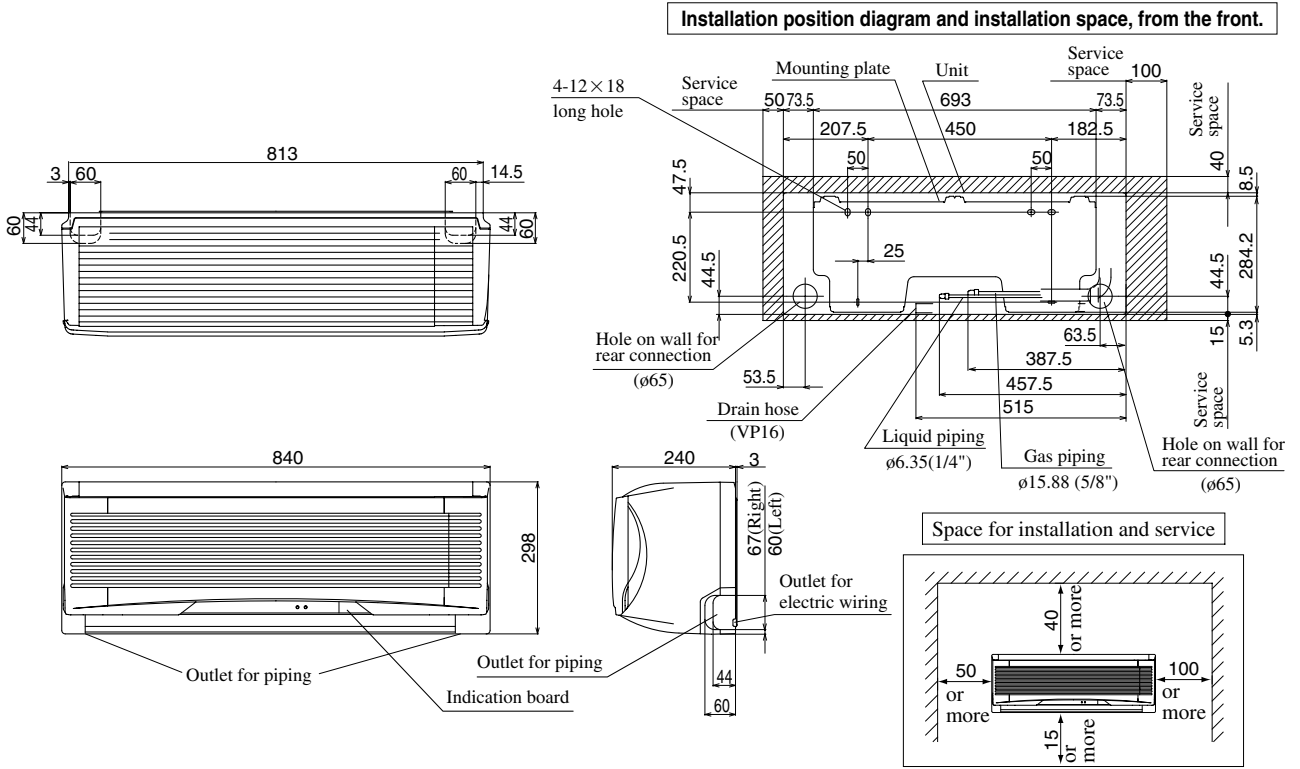
Notes (1) If the twin, triple or double twin 151 or 201 units are used, be sure to use  $\phi 9.52$  piping for the liquid pipe on the branch piping (branch fitting to indoor unit).  
Use the irregular diameter joint supplied in the branch piping set for connection to the indoor unit.

unit : mm



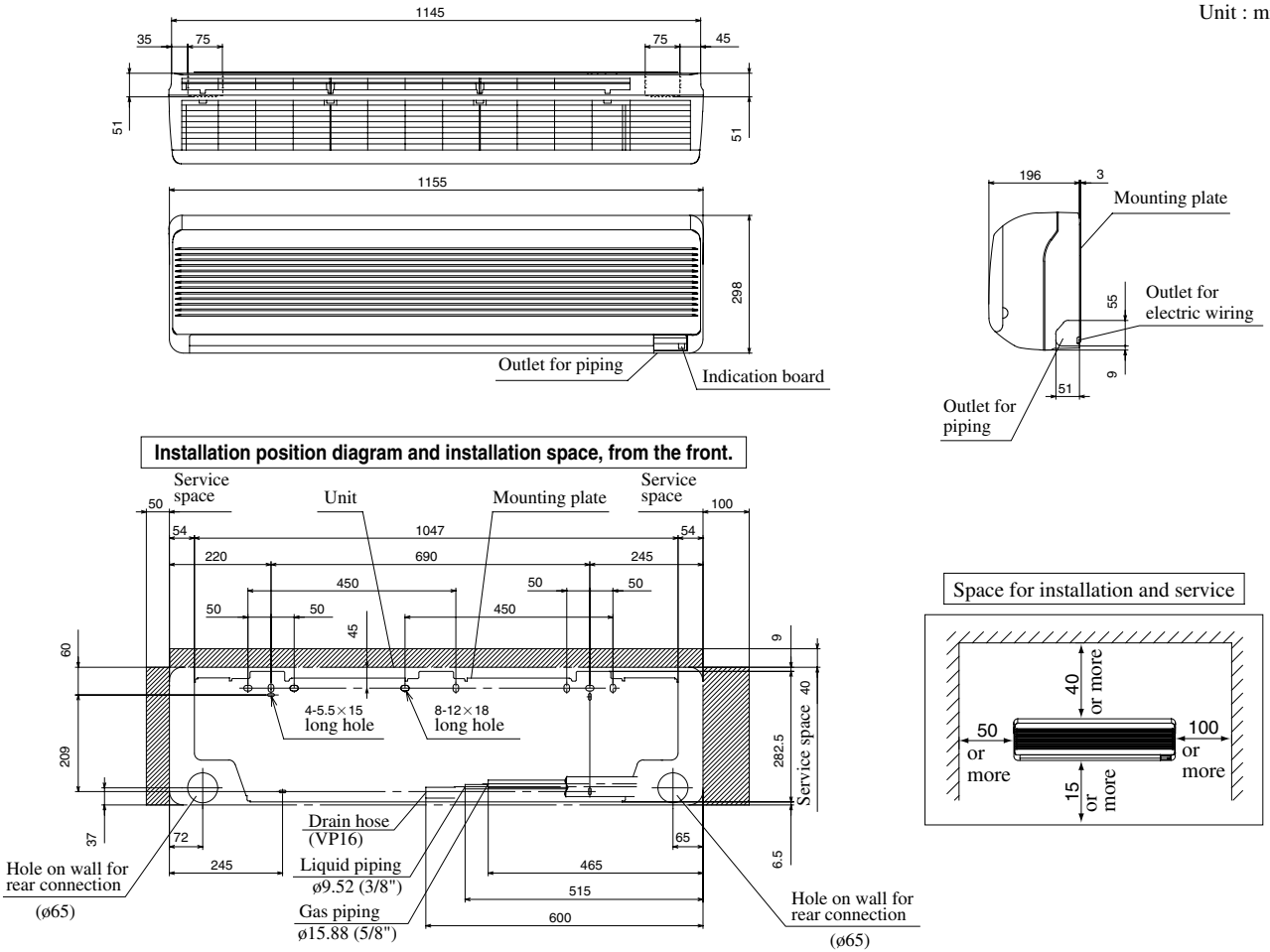
**Model FDKNA251**

Unit : mm



**Model FDKNA301**

Unit : mm

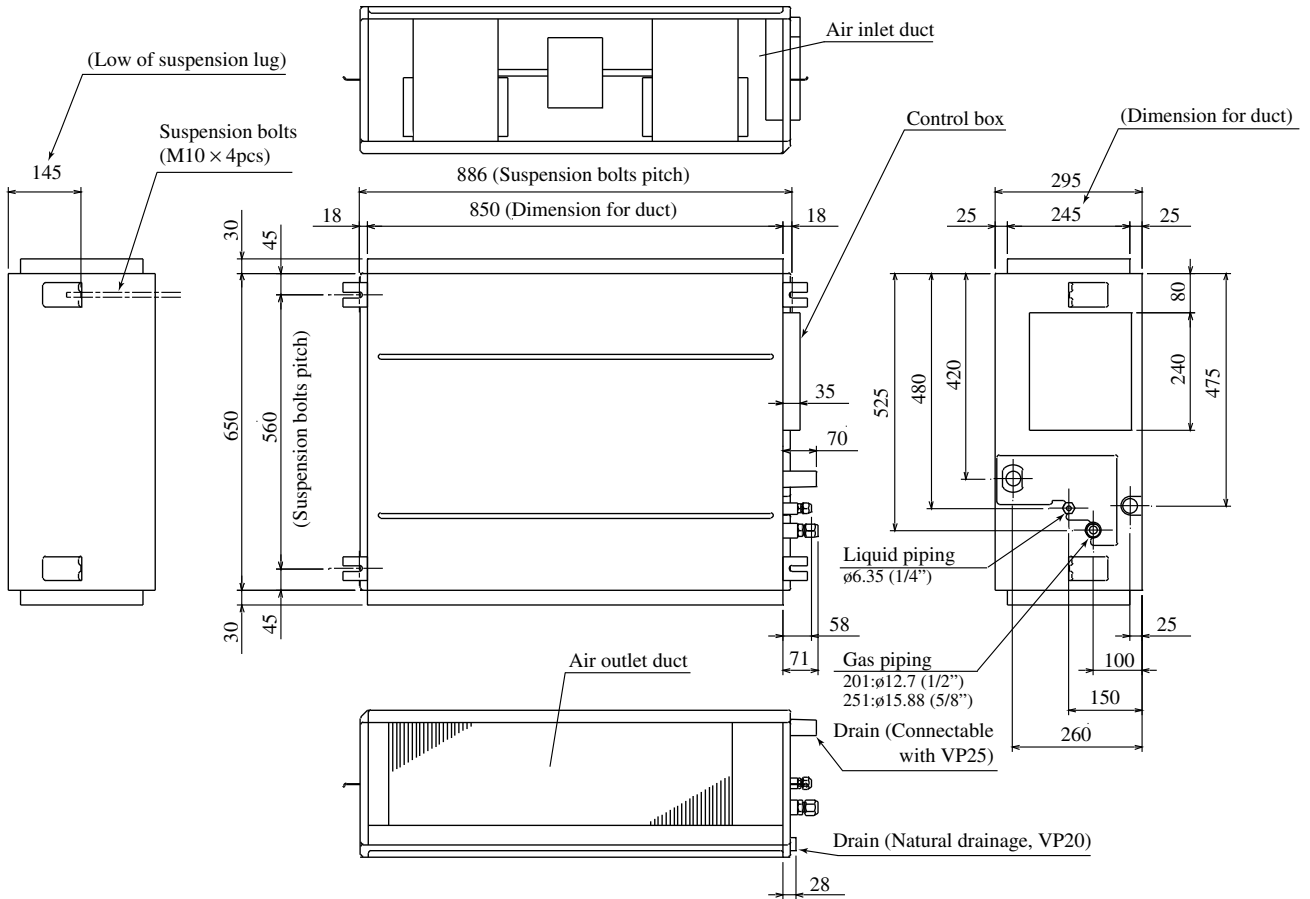


**(d) Ceiling mounted duct type (FDUR)**

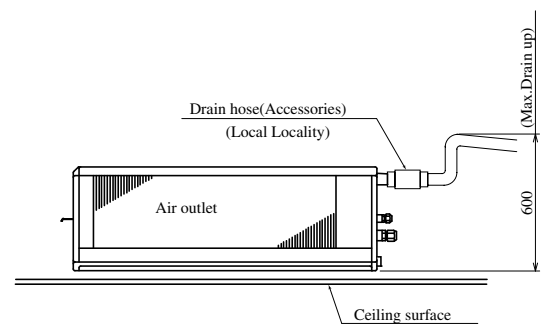
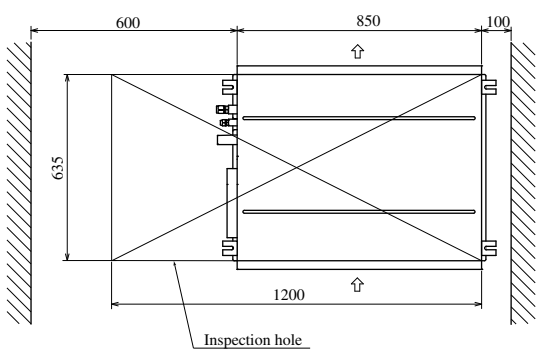
**Models FDURA201, 251**

Notes (1) If the twin, triple or double twin 201 units are used, be sure to use  $\phi 9.52$  piping for the liquid pipe on the branch piping (branch fitting to indoor unit).  
Use the irregular diameter joint supplied in the branch piping set for connection to the indoor unit.

Unit : mm

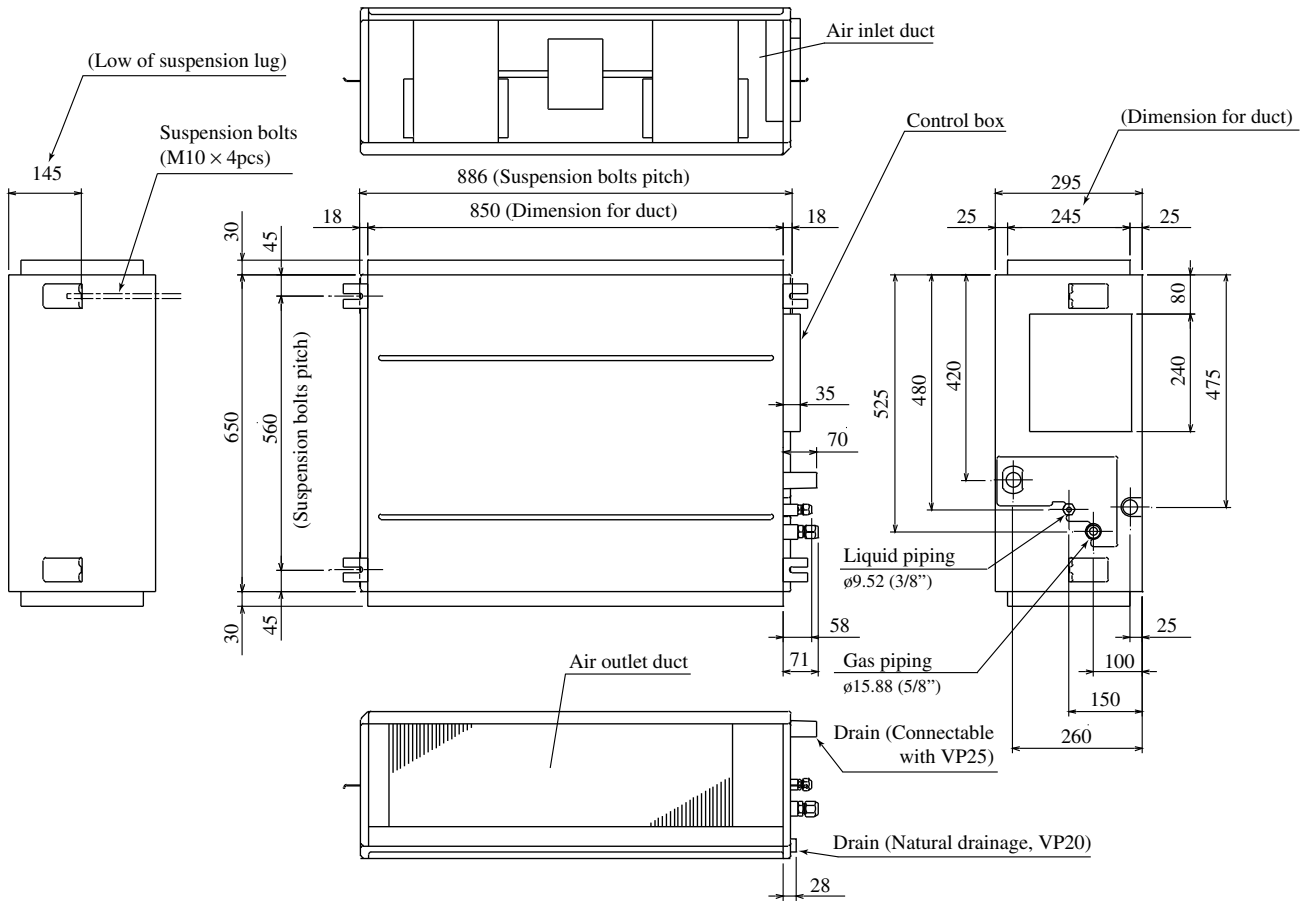


**Space for installation and service**

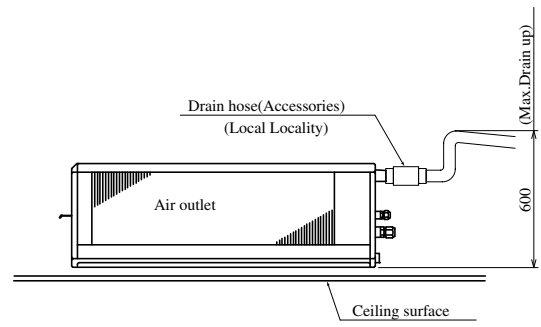
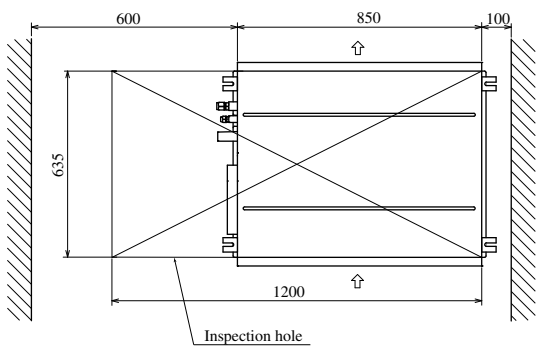


**Model FDURA301**

Unit : mm



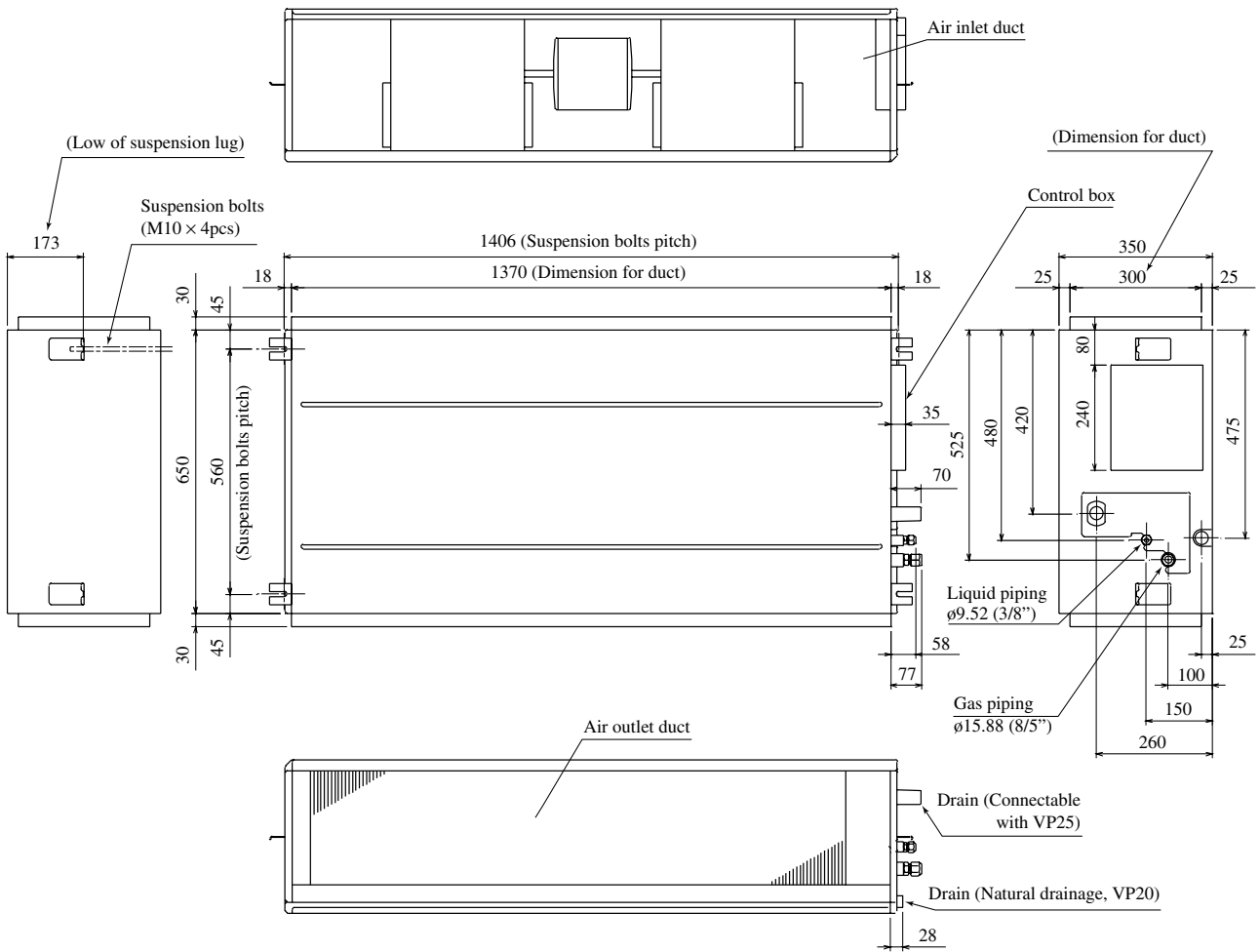
**Space for installation and service**



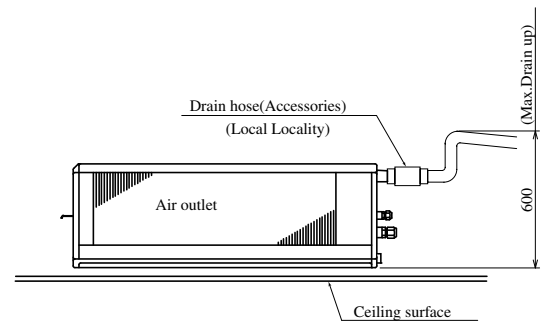
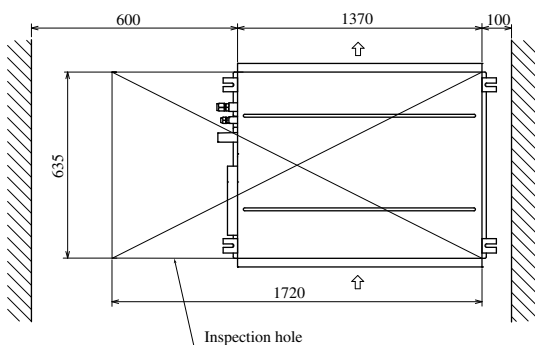


**Models FDURA401, 501**

Unit : mm



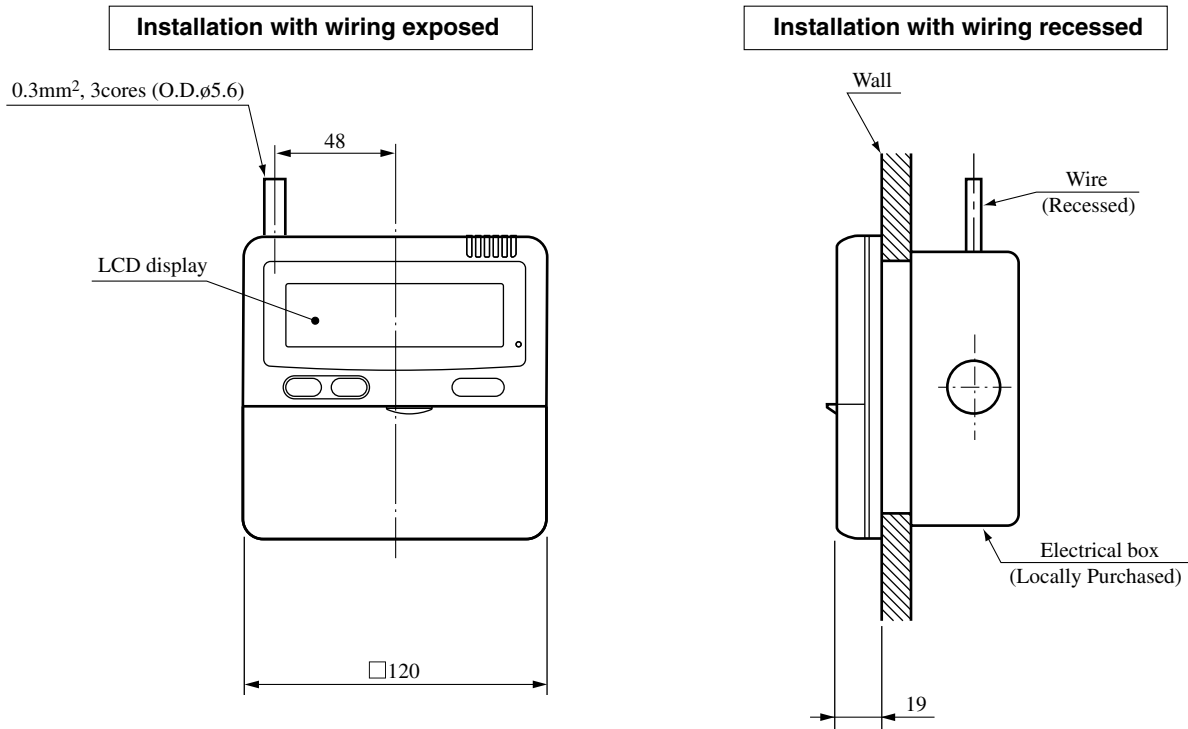
**Space for installation and service**



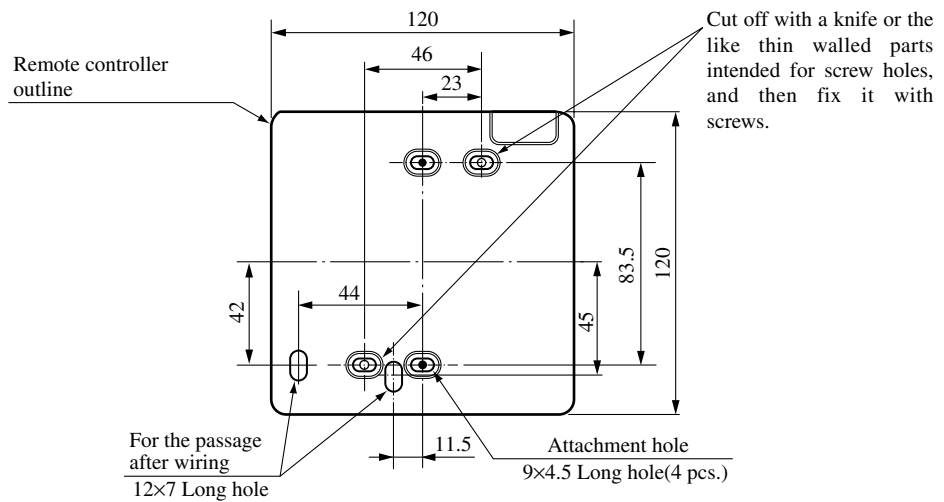
**(2) Remote controller (Optional parts)**

**(a) Wired remote controller**

Unit : mm



**Remote controller mounting dimensions**



**Precaution in Extending the Remote control cord**

▶ Maximum total extension 600m.

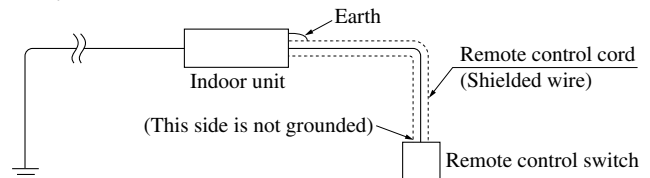
The cord should be a shielded wire.

● For all types : 0.3mm<sup>2</sup> × 3 cores

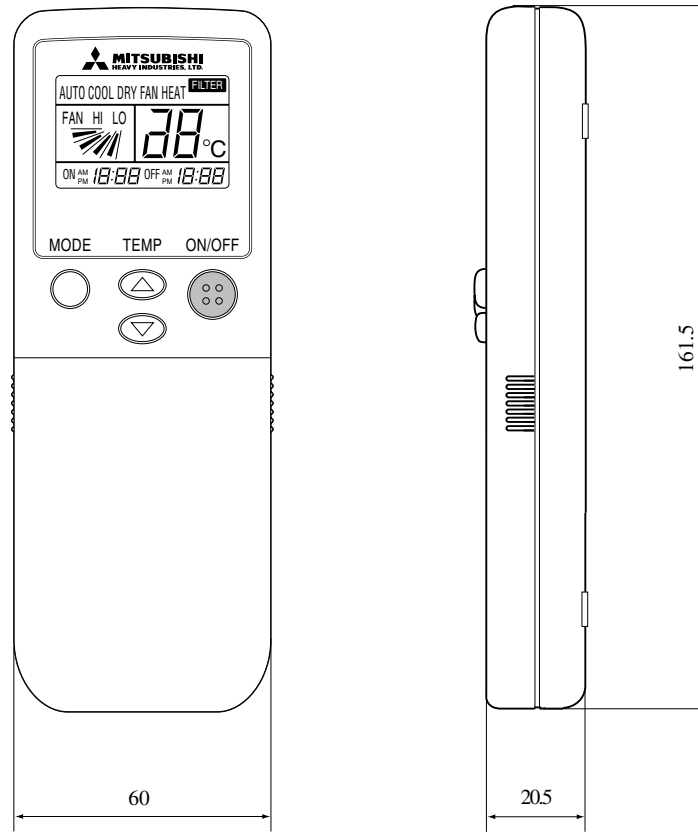
Note: (1) Use cables up to 0.5mm<sup>2</sup> (maximum) for those laid inside the remote control unit casing and connect to a different size cable at a vicinity point outside the remote control unit, if necessary.

Within 100-200m.....	0.5 mm <sup>2</sup> × 3 cores
Within 300m.....	0.75 mm <sup>2</sup> × 3 cores
Within 400m.....	1.25 mm <sup>2</sup> × 3 cores
Within 600m.....	2.0 mm <sup>2</sup> × 3 cores

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



(b) Wireless remote controller (Optional parts)

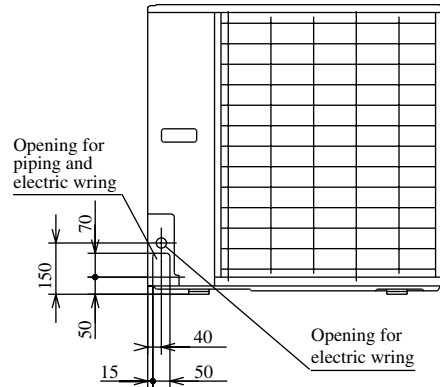
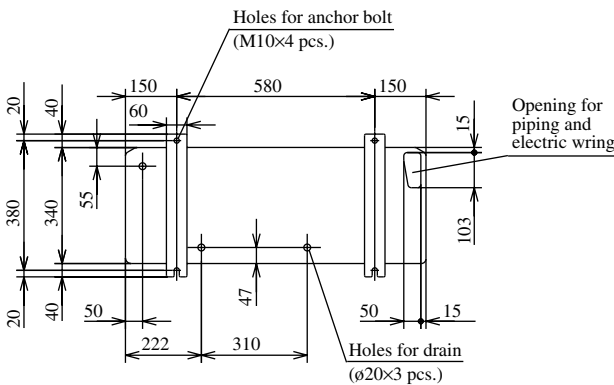
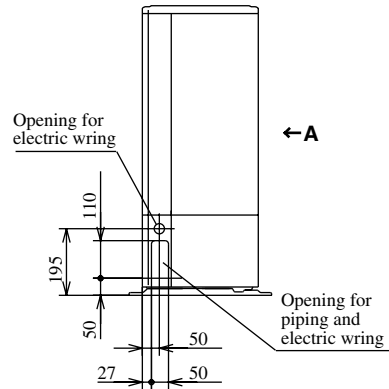
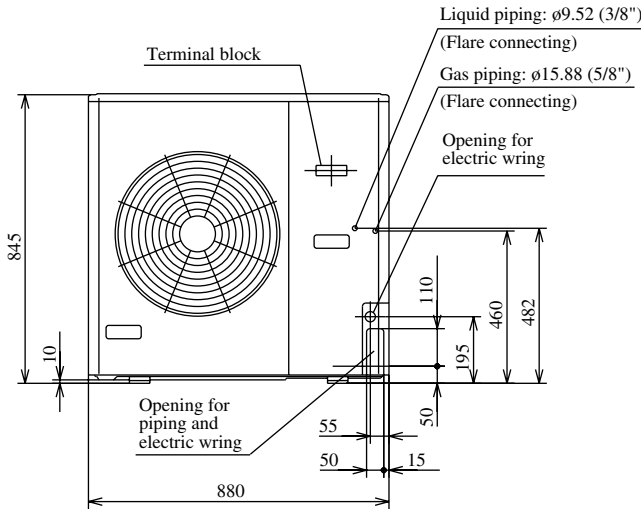
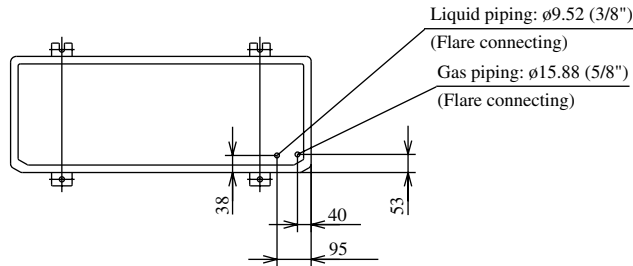


Unit: mm

**(3) Outdoor unit**

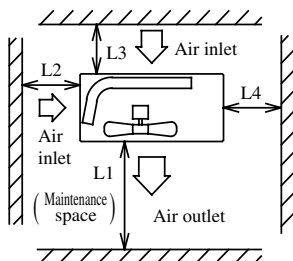
**Models FDCA301HEN, 301HES**

Unit: mm



**VIEW A**

**Required space for maintenance and air flow**



**Minimum allowable space to the obstacles**

Unit: mm

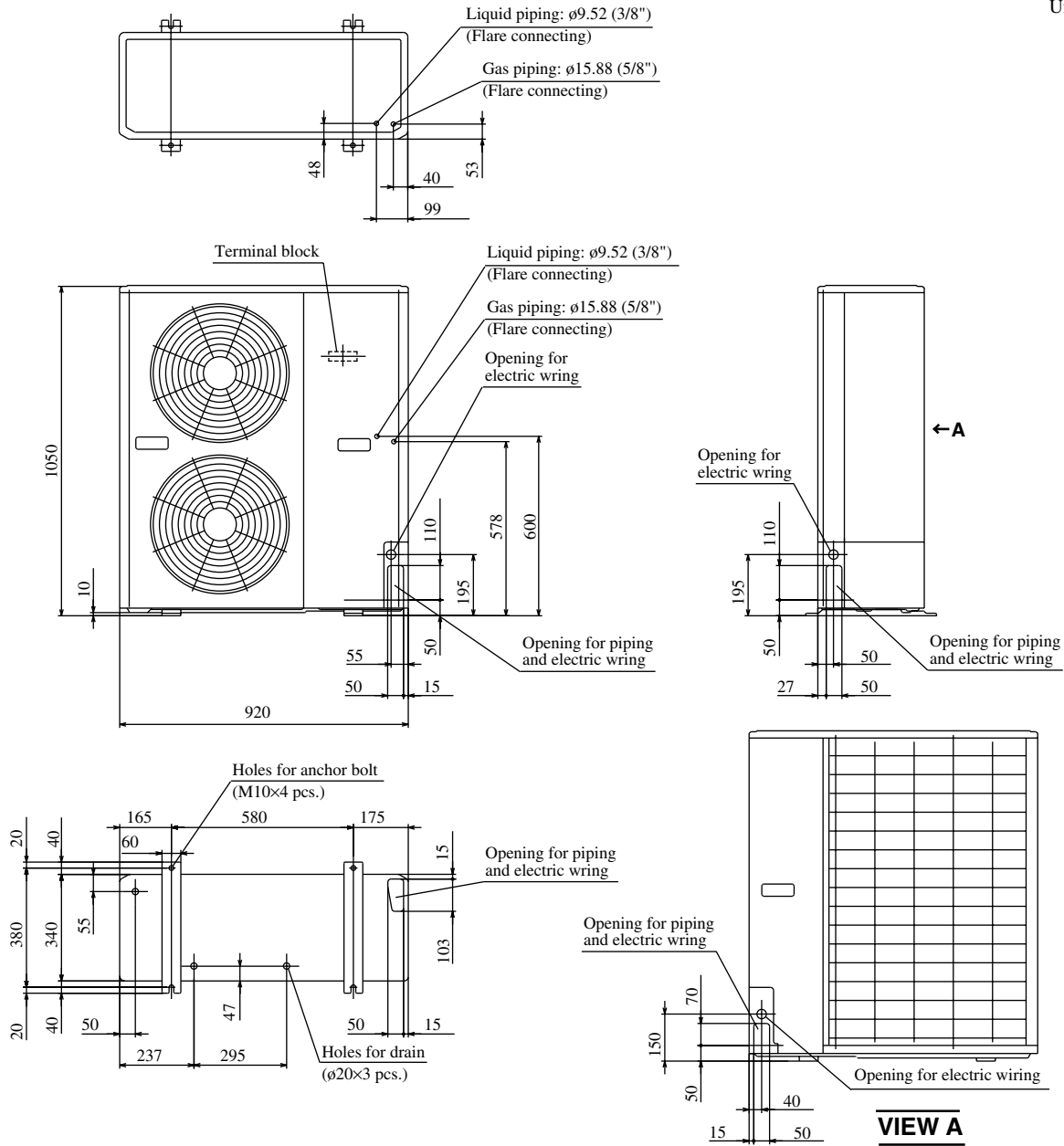
Mark	Installation type	Unit: mm		
		I	II	III
L1	Open	Open	Open	500
L2	300	5	Open	Open
L3	100	150	100	100
L4	5	5	5	5

**Notes**

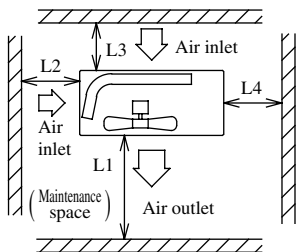
- (1) It is prohibited to install in a space enclosed with walls at four sides.
- (2) Unit must be secured with anchor bolts. Anchor bolt should not protrude more than 15 mm above the surface.
- (3) Where strong winds blow, the blow outlet must be oriented at right angle against the wind direction.
- (4) Secure a space of 1 m or more above the unit.
- (5) Barrier standing in front of the blow outlet must be lower than the height of unit.

**Models FDCA401HEN, 401HES**

Unit: mm



**Required space for maintenance and air flow**



**Minimum allowable space to the obstacles**

Unit:mm

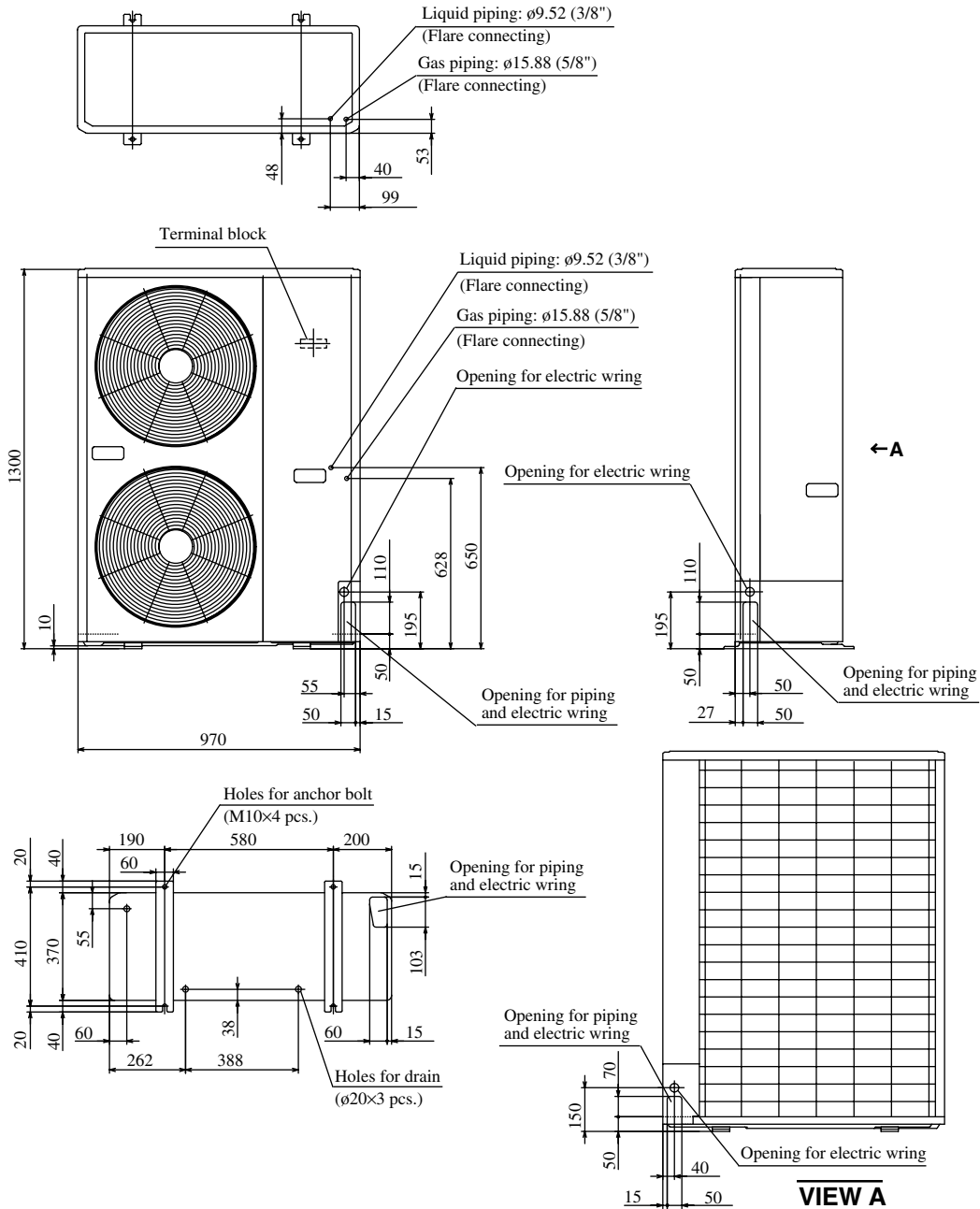
Mark	Installation type	Unit:mm		
		I	II	III
L1	Open	Open	Open	500
L2	300	5	Open	Open
L3	150	300	150	150
L4	5	5	5	5

**Notes**

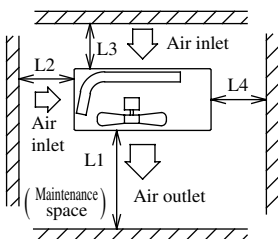
- (1) It is prohibited to install in a space enclosed with walls at four sides.
- (2) Unit must be secured with anchor bolts. Anchor bolt should not protrude more than 15 mm above the surface.
- (3) Where strong winds blow, the blow outlet must be oriented at right angle against the wind direction.
- (4) Secure a space of 1 m or more above the unit.
- (5) Barrier standing in front of the blow outlet must be lower than the height of unit.

**Model FDCA501HES**

Unit: mm



**Required space for maintenance and air flow**



**Minimum allowable space to the obstacles**

Unit:mm

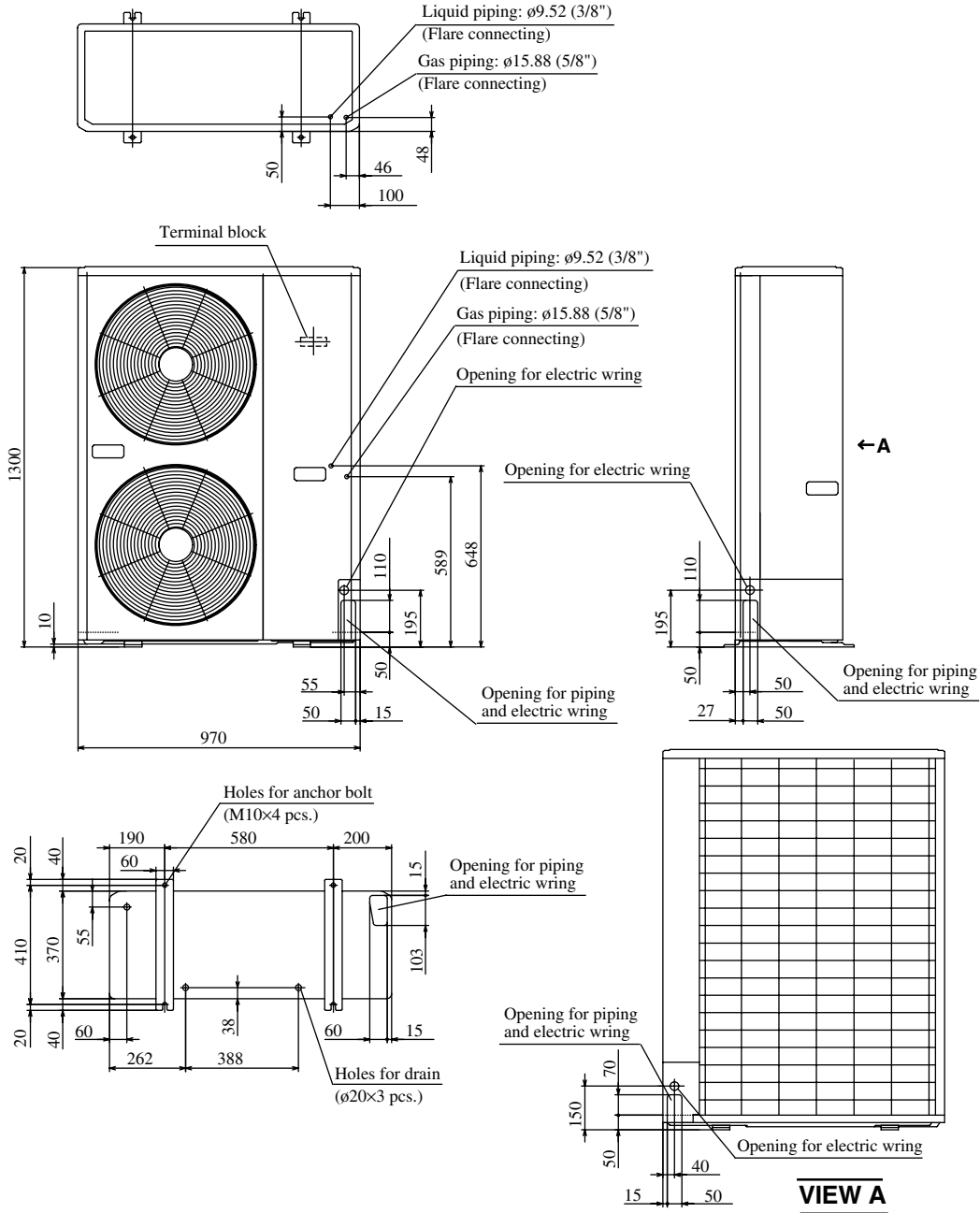
Mark	Installation type	Unit:mm		
		I	II	III
L1	Open	Open	Open	500
L2	300	5	Open	Open
L3	150	300	150	150
L4	5	5	5	5

**Notes**

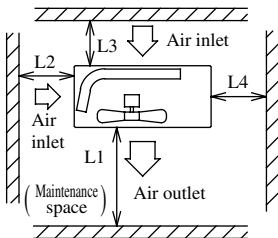
- (1) It is prohibited to install in a space enclosed with walls at four sides.
- (2) Unit must be secured with anchor bolts. Anchor bolt should not protrude more than 15 mm above the surface.
- (3) Where strong winds blow, the blow outlet must be oriented at right angle against the wind direction.
- (4) Secure a space of 1 m or more above the unit.
- (5) Barrier standing in front of the blow outlet must be lower than the height of unit.

**Model FDCA601HES**

Unit: mm



**Required space for maintenance and air flow**



**Minimum allowable space to the obstacles**

Unit:mm

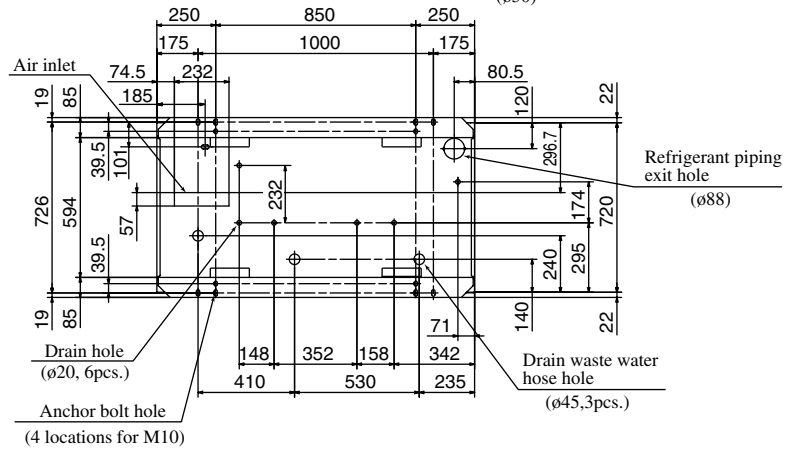
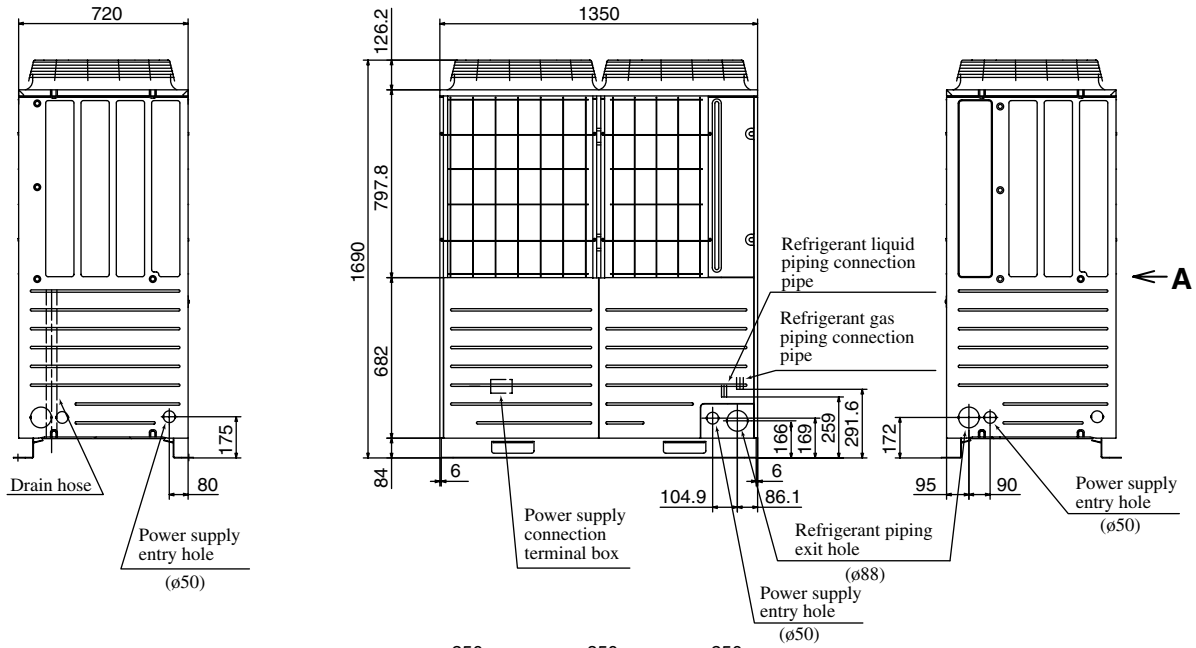
Mark	Installation type	Installation type		
		I	II	III
L1	Open	Open	Open	500
L2	300	5	Open	
L3	150	300	150	
L4	5	5	5	

**Notes**

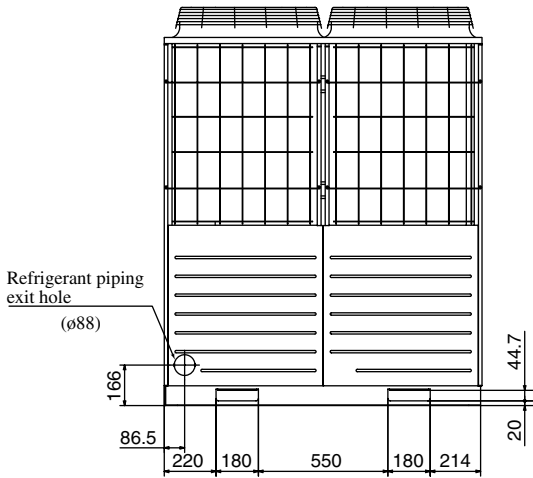
- (1) It is prohibited to install in a space enclosed with walls at four sides.
- (2) Unit must be secured with anchor bolts. Anchor bolt should not protrude more than 15 mm above the surface.
- (3) Where strong winds blow, the blow outlet must be oriented at right angle against the wind direction.
- (4) Secure a space of 1 m or more above the unit.
- (5) Barrier standing in front of the blow outlet must be lower than the height of unit.

Models FDCA801HES, 1001HES

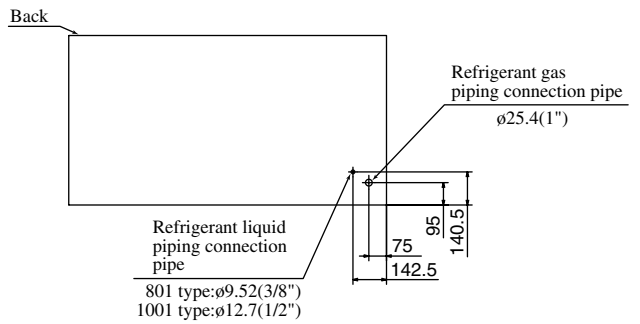
Unit : mm



Dimensions after connecting included refrigerant piping (Top view)

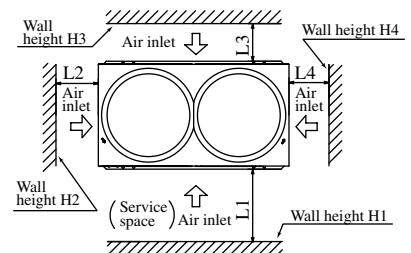


VIEW A



Unit:mm

Dimensions	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	—



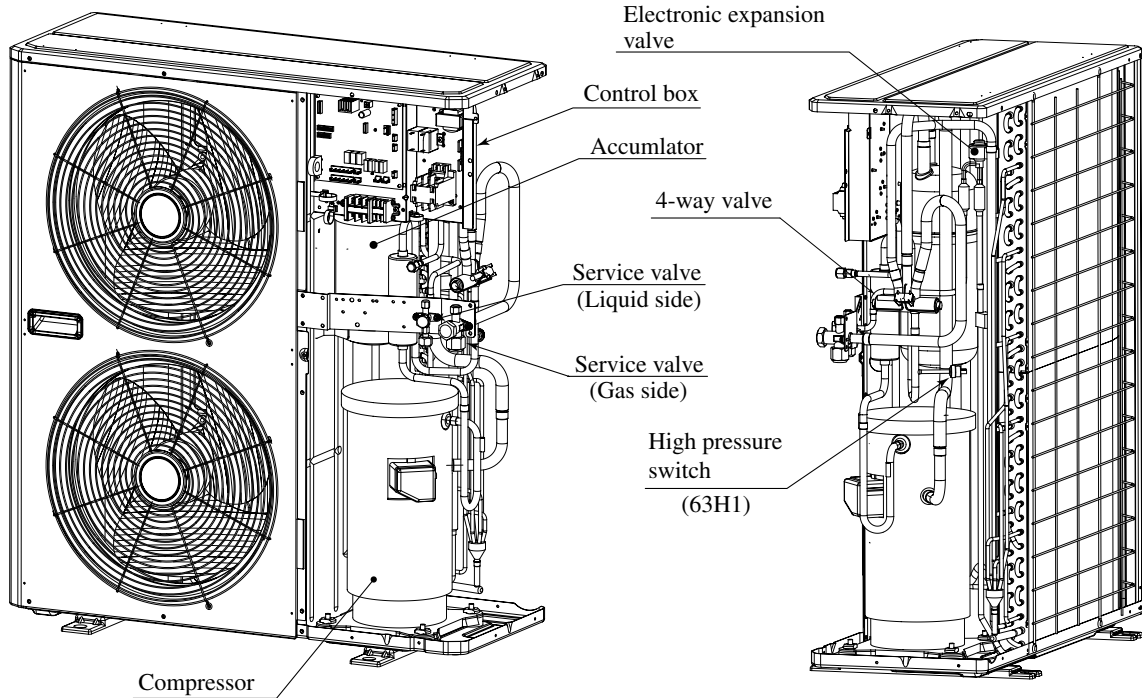


## 2.4 Inside view

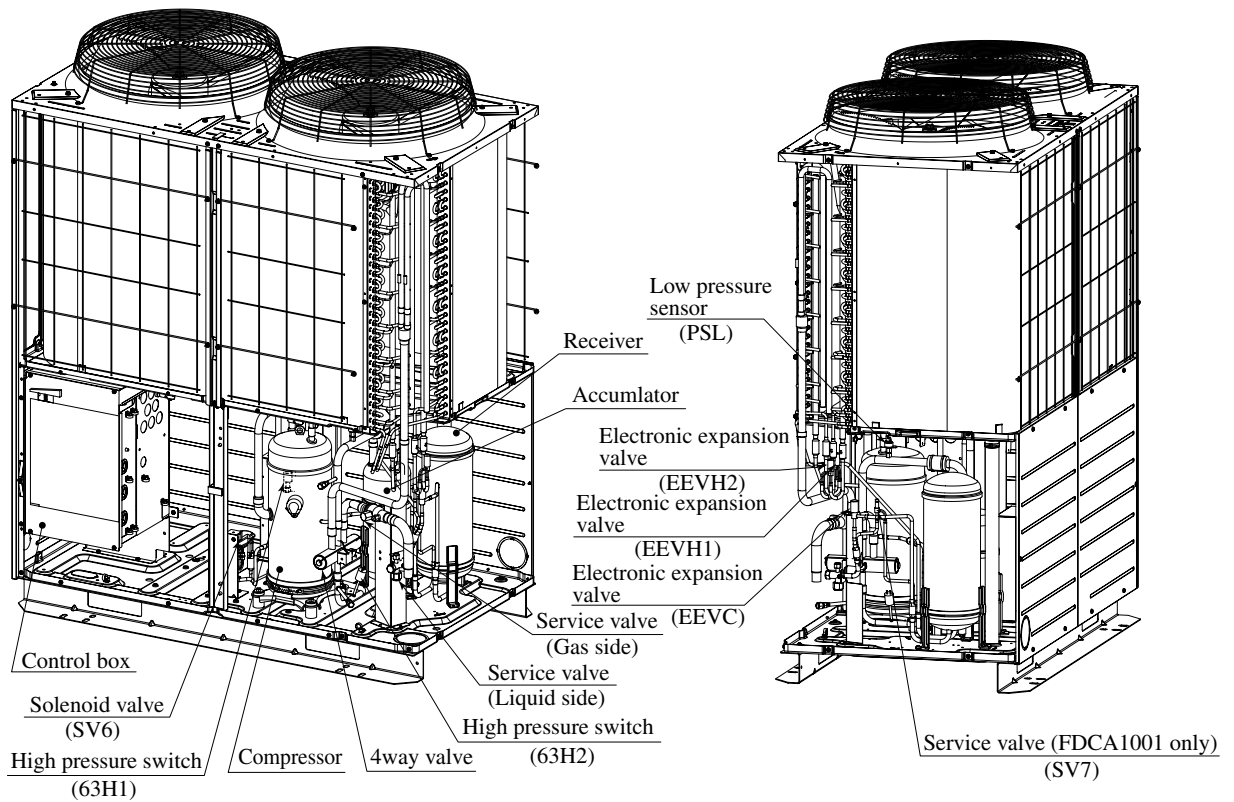
### (1) Outdoor unit

Models FDCA401HEN,401HES

unit : mm



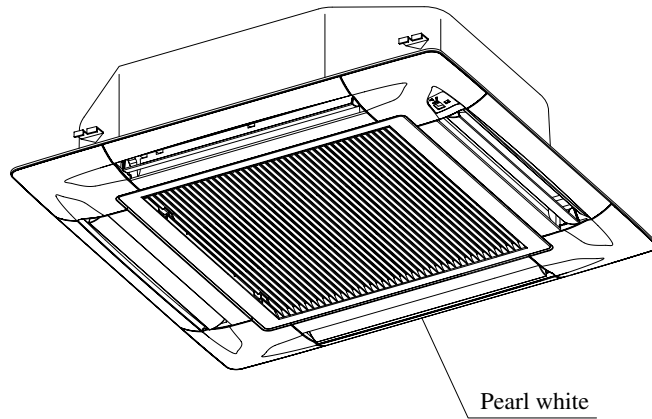
Models FDCA801HES, 1001HES



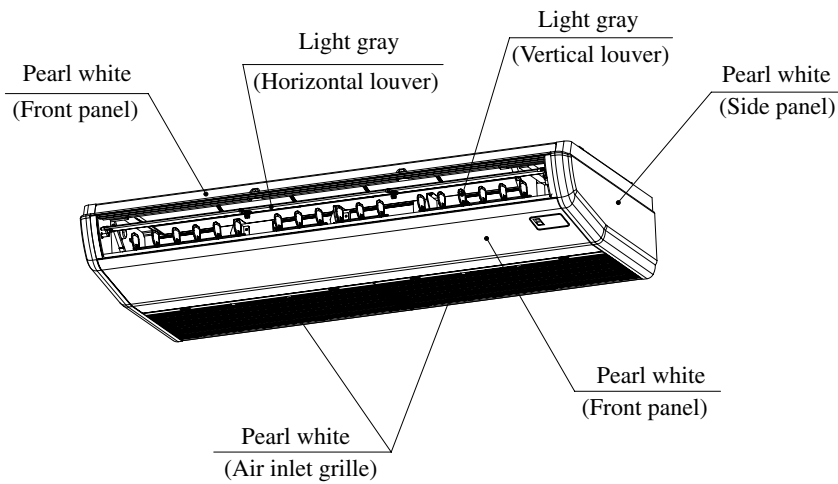
## 2.5 Exterior appearance

### (1) Indoor unit

#### (a) Ceiling recessed type (FDT)

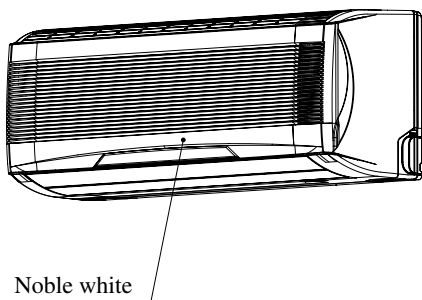


#### (b) Ceiling suspension type (FDEN)



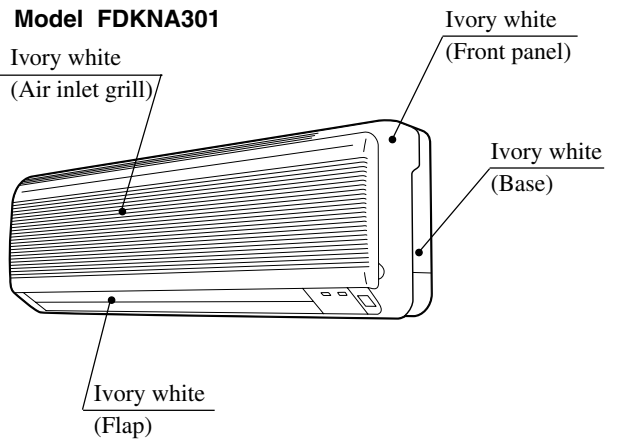
#### (c) Wall mounted type (FDKN)

Models FDKNA151,201,251



Model FDKNA301

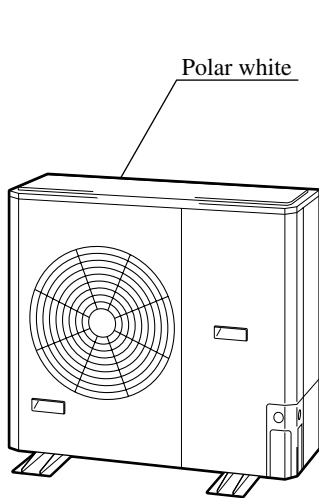
Ivory white  
(Air inlet grill)



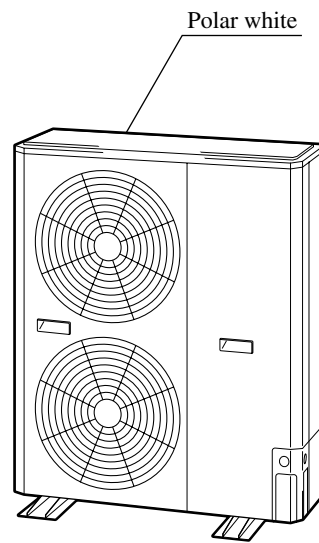
#### (d) Ceiling mounted duct type (FDUR) ..... Zinc steel plate

**(2) Outdoor unit**

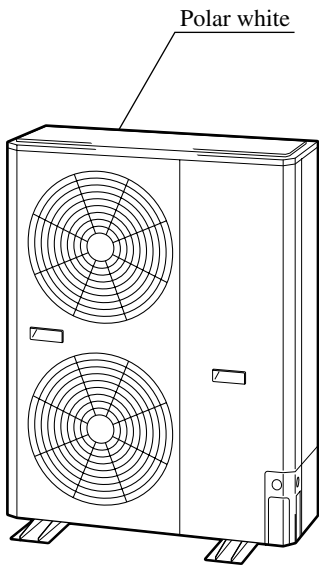
**Models FDCA301HEN, 301HES**



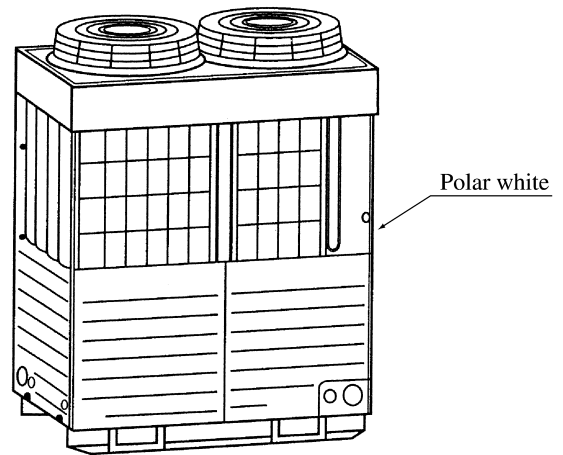
**Models FDCA401HEN, 401HES**



**Models FDCA501HES, 601HES**



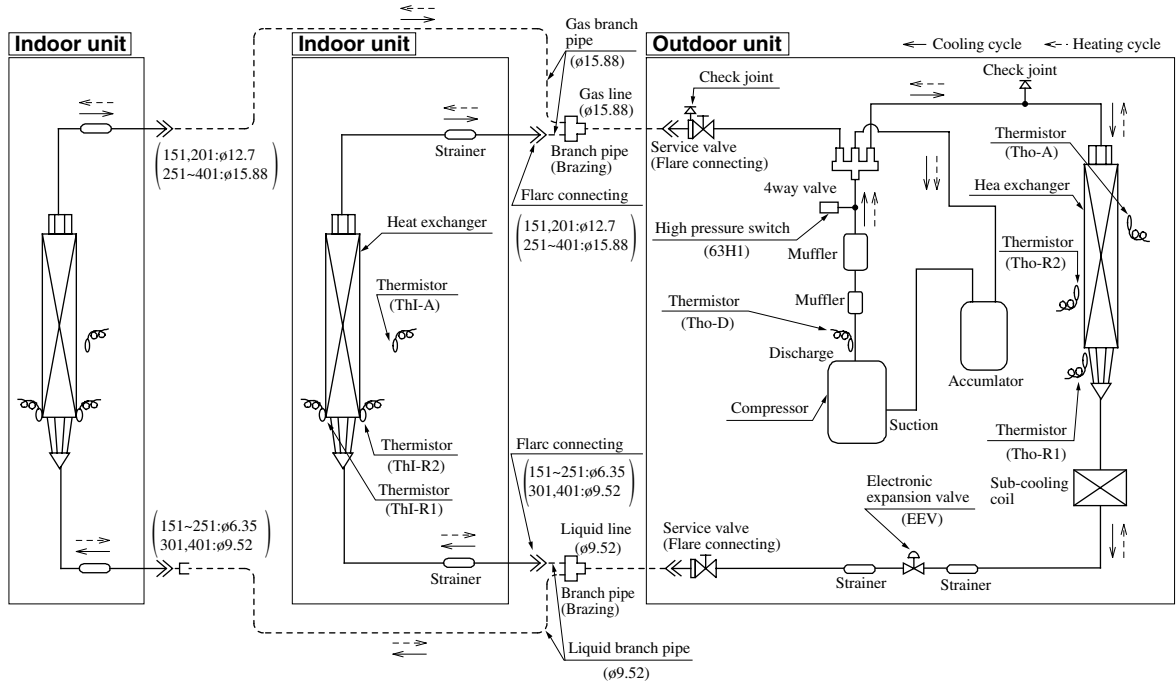
**Models FDCA801HES, 1001HES**



## 2.6 Piping system

### (1) Twin type

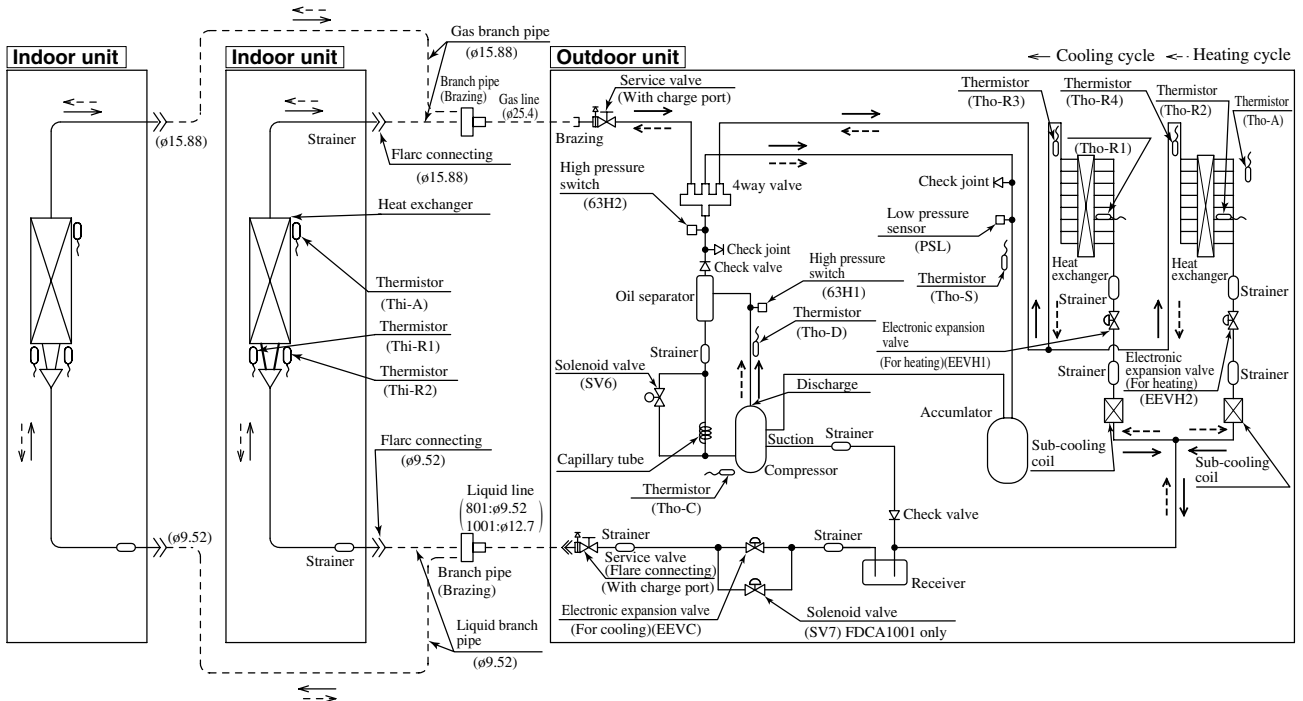
Models FDCA301HEN, 301HES, 401HEN, 401HES, 501HES, 601HES



Note (1) A FDEN type strainer only should be used for the indoor unit.

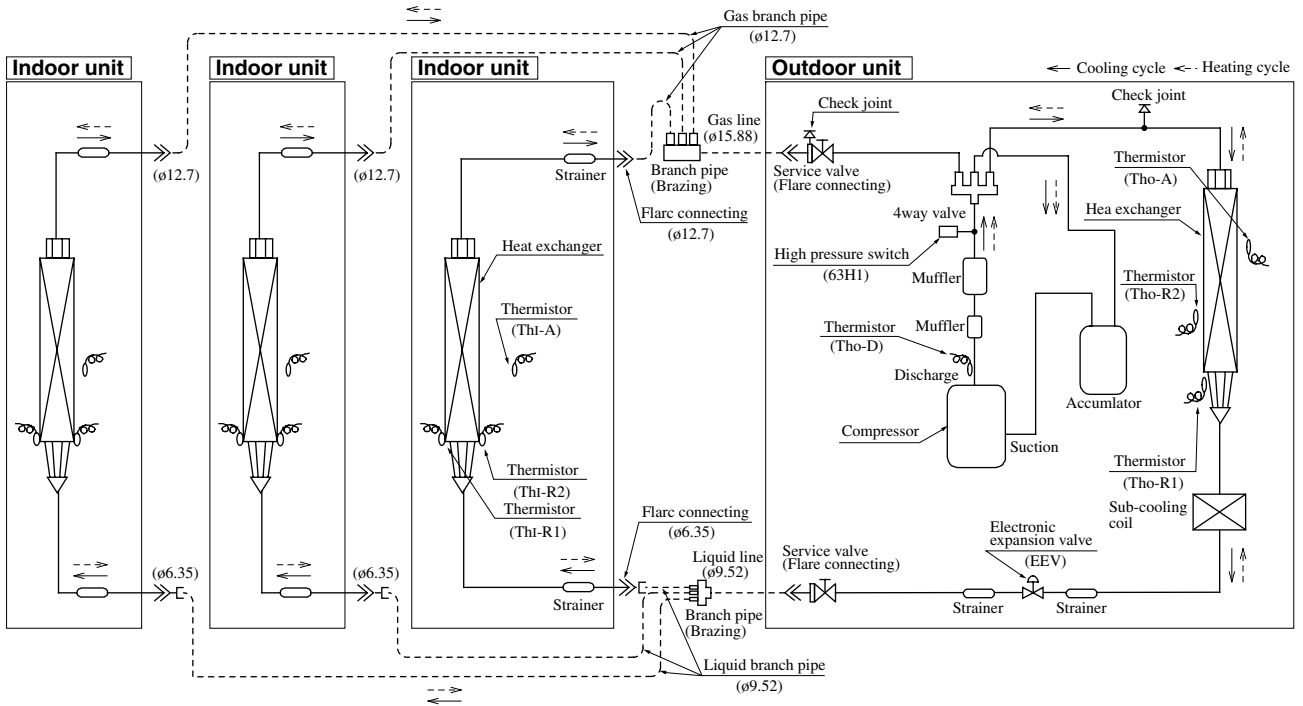
(2) If used in combination with 151~251 Series indoor units, make the fluid pipe size on the branch piping (branch to indoor unit) ø9.52.

Models FDCA801HES, 1001HES



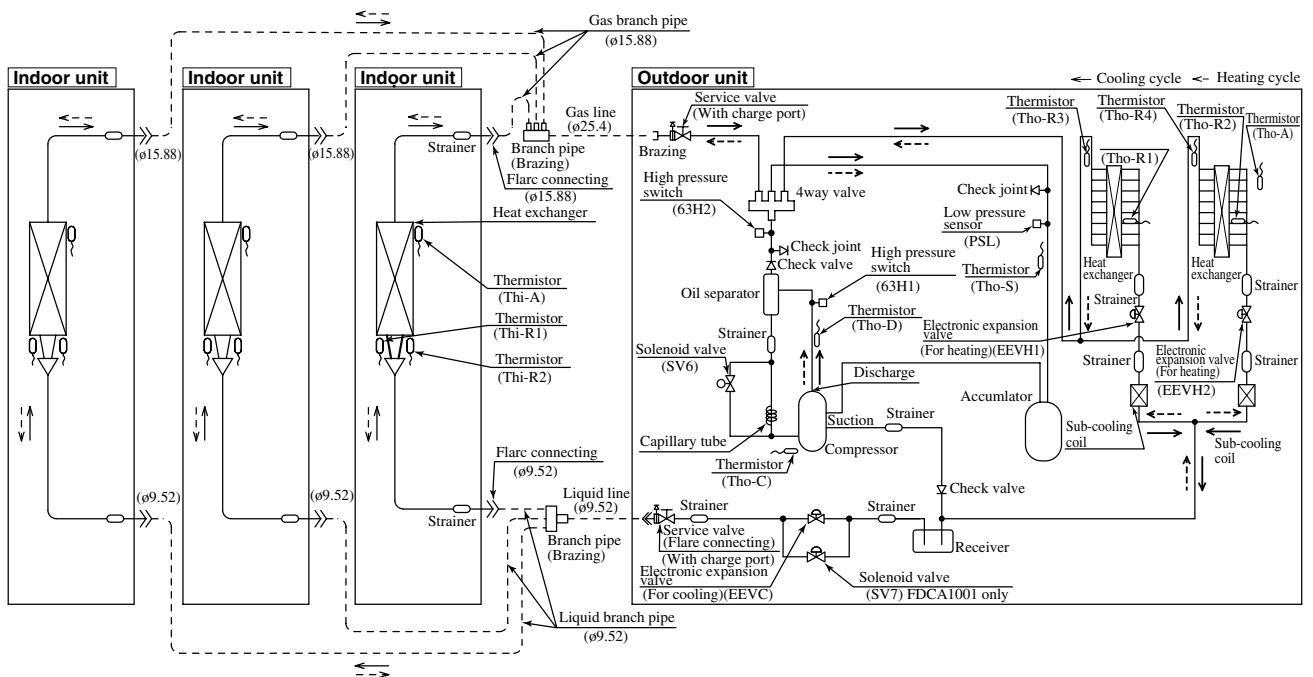
Note (1) A FDEN type strainer only should be used for the indoor unit.

**(2) Triple type**  
**Model FDCA601HES**



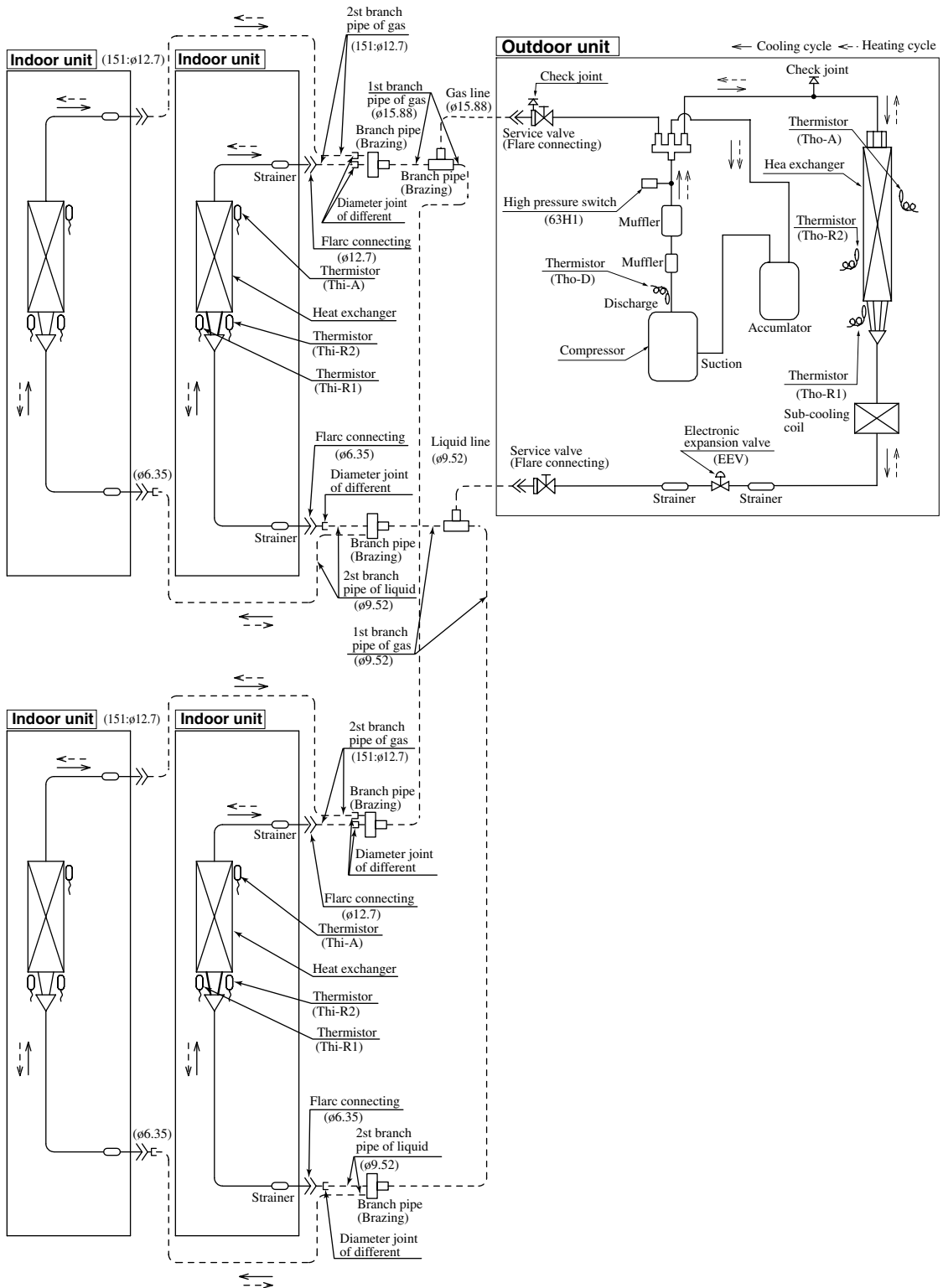
- Note (1) A FDE type strainer only should be used for the indoor unit.
- (2) Make the fluid pipe size on the branch piping (branch to indoor unit) ø 9.52.

**Model FDCA801HES**



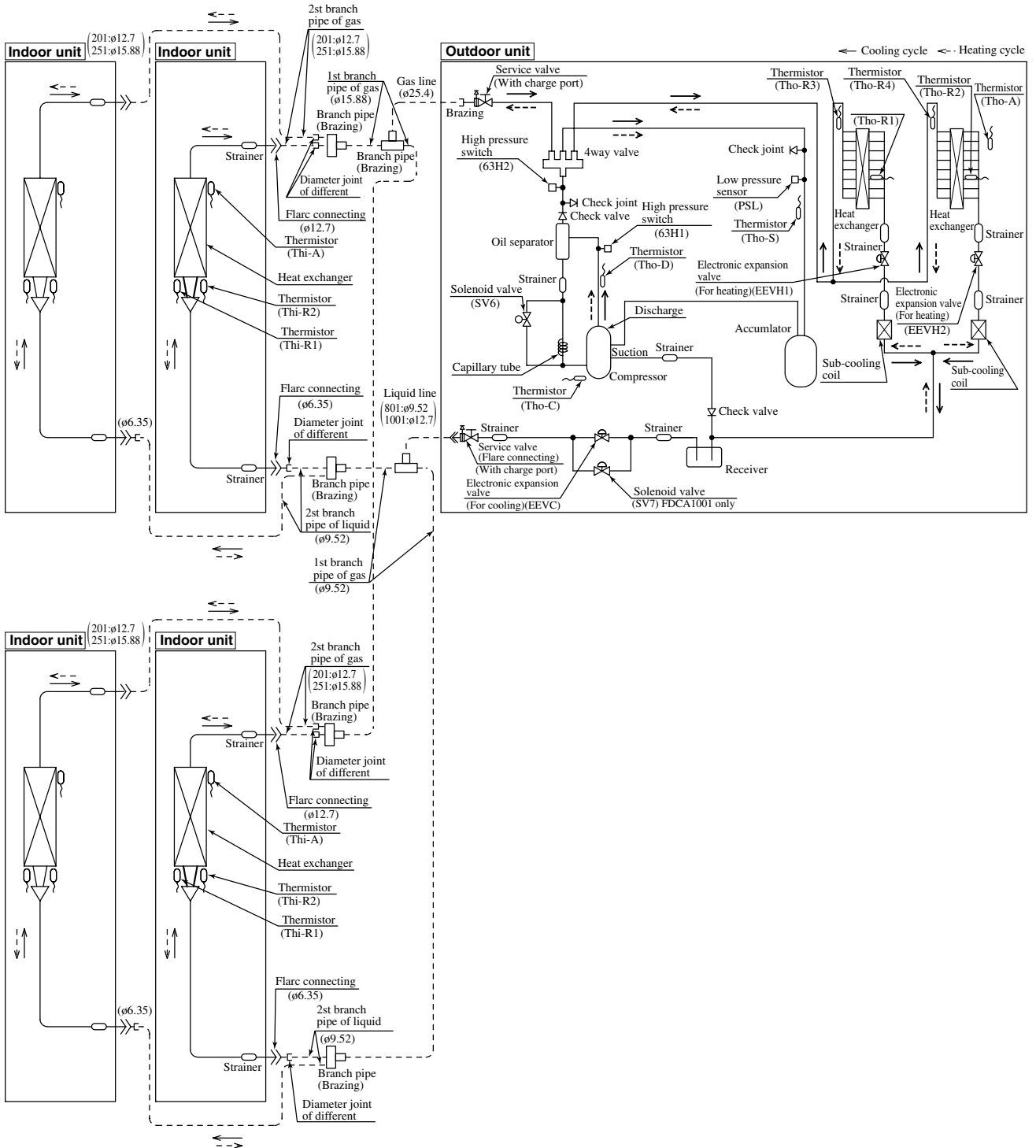
- Note (1) A FDE type strainer only should be used for the indoor unit.

**(3) Double twin type**  
**Model FDCA601HES**



- Note (1) A FDEN type strainer only should be used for the indoor unit.  
 (2) Make the fluid pipe size on the branch piping (branch to indoor unit)  $\phi 9.52$ .

**Models FDCA801HES,1001HES**



- Note (1) A FDEN type strainer only should be used for the indoor unit.  
 (2) Make the fluid pipe size on the branch piping (branch to indoor unit) ø 9.52.

## Preset point of the protective devices

Parts name	Mark	Equipped unit	FDCA301, 401, 501, 601 models	FDCA801, 1001 models
Thermistor (for protection over-loading in heating)	Th-R	Indoor unit	ON 63°C OFF 56°C	
Thermistor (for frost prevention)			ON 1.0°C OFF 10°C	
Thermistor (for detecting discharge pipe temp.)	Tho-D	Outdoor unit	ON 121°C OFF 80°C	ON 135°C OFF 90°C
High pressure switch (for protection)	63H1	Outdoor unit	Open 4.15MPa Closed 3.15MPa	



## 2.7 Selection chart

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

**Net capacity = Capacity shown on specification × Correction factors as follows.**

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

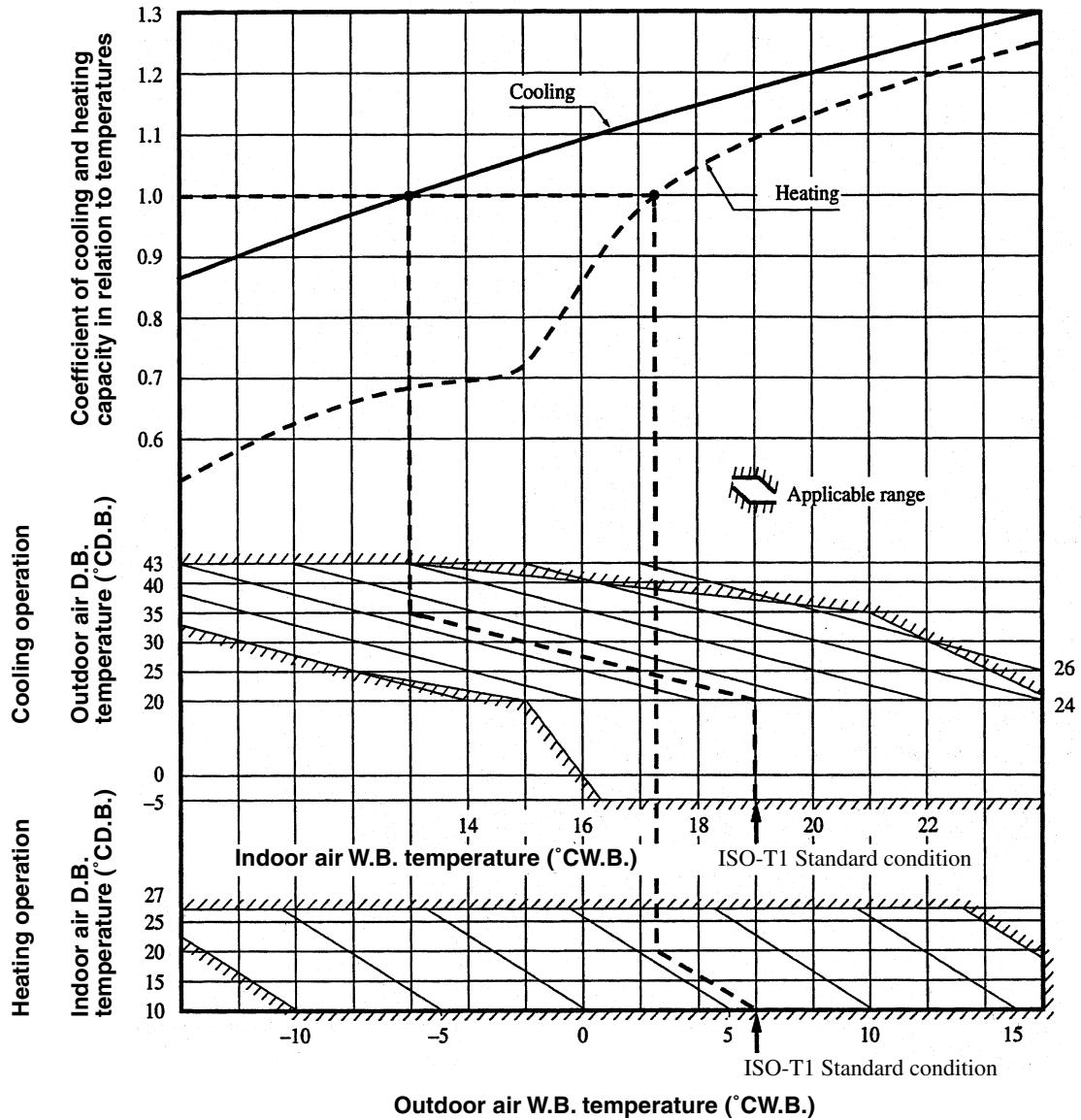


Table of bypass factor (FDT, FDEN, and FDKN series figures show the bypass factor when in the Powerful mode.)

#### Model FDT type

Item	Model	FDTA151, 201	FDTA251, 301	FDTA401	FDTA501
	Air flow	Hi	0.186	0.040	0.027
Me		0.160	0.031	0.021	0.021
Lo		0.151	0.025	0.018	0.017

#### Model FDEN type

Item	Model	FDENA151, 201	FDENA251, 301	FDENA401	FDENA501
	Air flow	Hi	0.017	0.026	0.020
Me		0.014	0.022	0.016	0.020
Lo		0.009	0.015	0.013	0.016

**Model FDKN type**

		Model	FDKNA151, 201	FDKNA251	FDKNA301
		Item			
Air flow	Hi		0.056	0.063	0.043
	Me		0.041	0.048	0.034
	Lo		0.028	0.034	0.025

**Model FDUR type**

		Model	FDURA201	FDURA251	FDURA301	FDURA401	FDURA501
		Item					
Air flow	Hi		0.111	0.053	0.069	0.106	0.050
	Lo		0.083	0.037	0.049	0.079	0.034

**(2) Correction of cooling and heating capacity in relation to air flow rate control (fan speed)**

**Coefficient: 1.00 at High, 0.95 at Low**

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

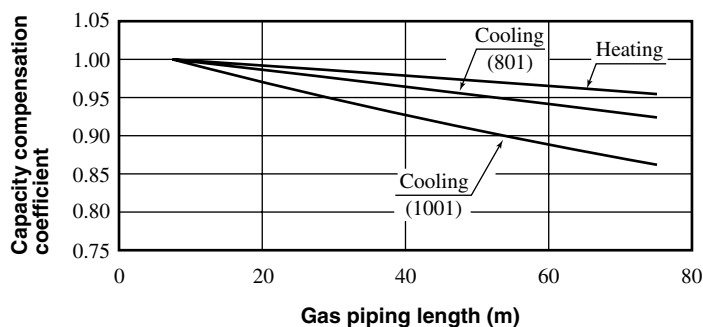
It is necessary to correct the cooling and heating capacity in relation to the one way equivalent piping length between the indoor and outdoor units.

**Models FDCA301~601**

Equivalent piping length <sup>(1)</sup> m		7.5	10	15	20	25	30	35	40	45	50	55
Heating		1	0.995	0.992	0.990	0.987	0.984	0.981	0.978	0.975	0.972	0.970
Cooling	FDCA301 model	1	0.996	0.989	0.982	0.974	0.967	0.959	0.952	0.945	0.937	0.930
	FDCA401 model	1	0.995	0.986	0.976	0.967	0.957	0.948	0.938	0.929	0.919	0.910
	FDCA501 model	1	0.994	0.982	0.969	0.957	0.945	0.933	0.921	0.908	0.896	0.884
	FDCA601 model	1	0.993	0.978	0.963	0.948	0.933	0.918	0.903	0.888	0.873	0.858

**Models FDCA801, 1001**

Equivalent piping length <sup>(1)</sup> m		7.5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
Heating		1	0.998	0.992	0.986	0.980	0.974	0.968	0.962	0.956	0.951	0.945	0.939	0.933	0.927	0.921
Cooling	FDCA801 model	1	0.997	0.984	0.972	0.960	0.949	0.937	0.926	0.916	0.906	0.896	0.886	0.877	0.869	0.860
	FDCA1001 model	1	0.998	0.995	0.991	0.988	0.984	0.981	0.977	0.974	0.970	0.967	0.963	0.960	0.956	0.953



Note (1) Calculate the equivalent length using the following formula.

However, install the piping so that the equivalent length is within +5 m of the piping distance limit (actual length) for each respective piping system.

- Equivalent Length = Actual Length + (equivalent length of bends x number of bends in the piping)

Equivalent Length for 1 Bend

Gas Pipe Diameter (mm)	ø9.52	ø12.7	ø15.88	ø19.05	ø25.4
Bend Equivalent Length	0.15	0.20	0.25	0.30	0.40

- (4) 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 subtracted from the values in the above table.

Height difference between the indoor unit and outdoor unit in the vertical height difference	5m	10m	15m	20m	25m	30m
Adjustment coefficient	0.01	0.02	0.03	0.04	0.05	0.06

#### Piping length limitations

Item	Model	FDCA301~601 models	FDCA801, 1001 models
Max. one way piping length		50m	70m
Max. vertical height difference		Outdoor unit is higher 30m	Outdoor unit is lower 15m

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

#### How to obtain the cooling and heating capacity

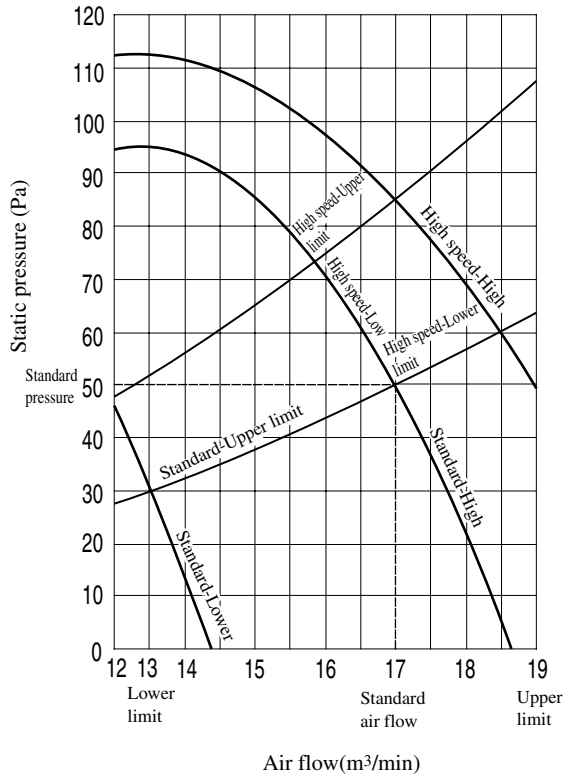
Example : The net cooling capacity of the model FDCA301HEN with the air flow "High", the piping length of 15m, the outdoor unit located 5m lower than the indoor unit, indoor wet-bulb temperature at 19.0 °C and outdoor dry-bulb temperature 35 °C is

$$\text{Net cooling capacity} = \frac{7200}{\text{FDCA301HEN}} \times \frac{1.00}{\text{Air flow "High"}} \times \frac{(0.989 - 0.01)}{\text{Length 15m. Height difference 5 m}} \times \frac{1.0}{\text{Factor by air temperatures}} = 7049 \text{ w}$$

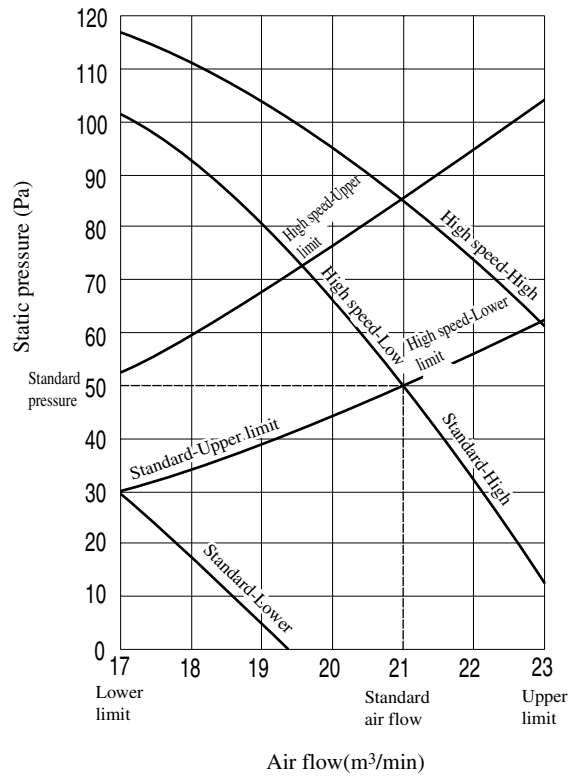
## 2.8 Characteristics of fan

### (1) Ceiling mounted duct type (FDUR)

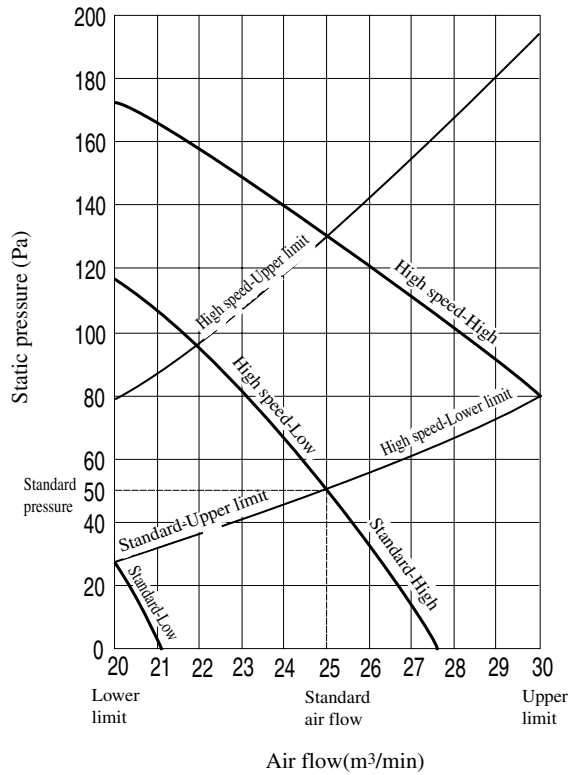
Model FDURA201



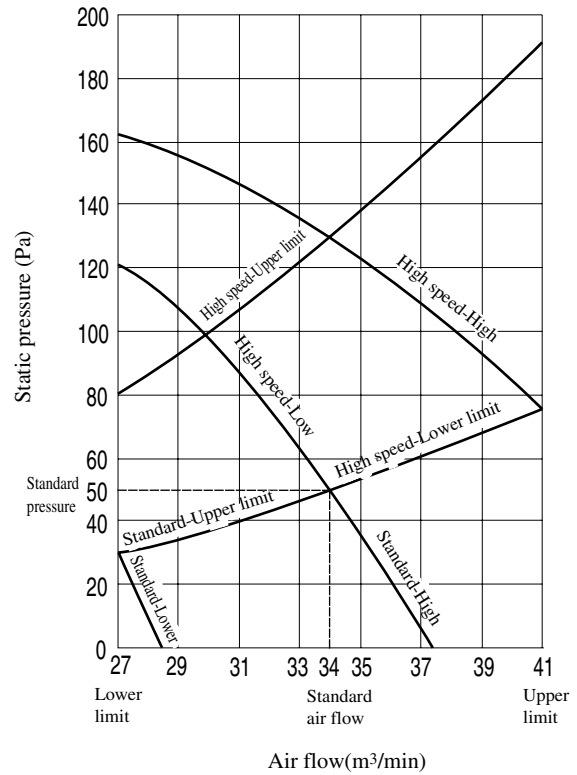
Model FDURA251



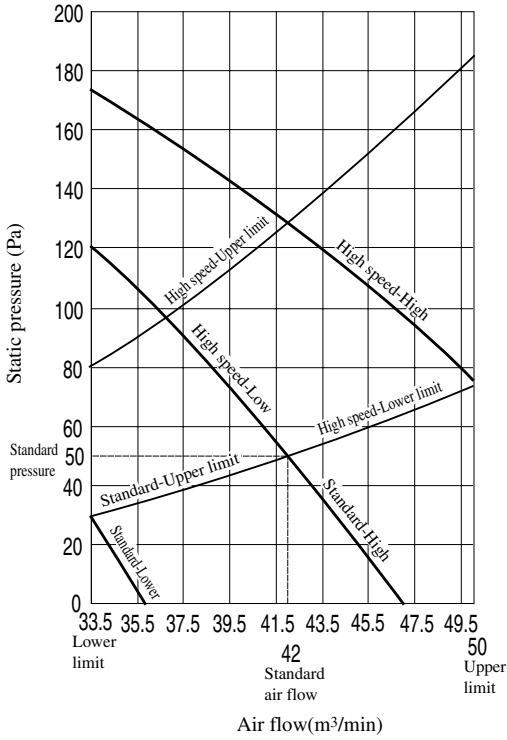
Model FDURA301



Model FDURA401



**Model FDURA501**



**2.9 Noise level**

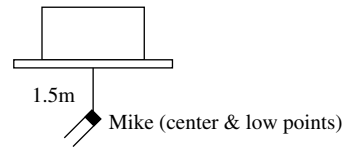
- Notes (1) The data are based on the following conditions.  
 Ambient air temperature: Indoor unit 27°C DB, 19°C WB. Outdoor unit 35°C DB.  
 (2) The data in the chart are measured in an anechoic room.  
 (3) The noise levels measured in the field are usually higher than the data because of reflection.  
 (4) Noise levels for the FDT, FDEN and FDKN series show the noise level when in the Powerful mode.

**(1) Indoor unit**

**(a) Ceiling recessed type (FDT)**

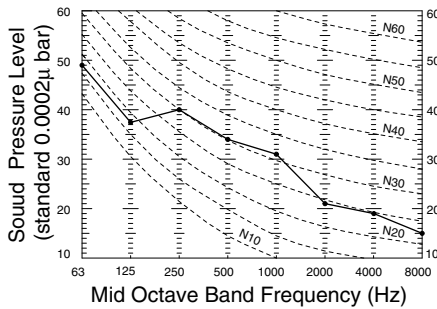
Measured based on JIS B 8616

Mike position as right



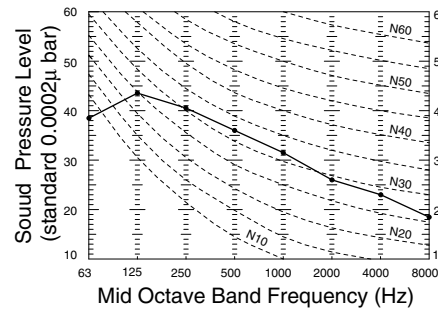
**Models FDTA151, 201**

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



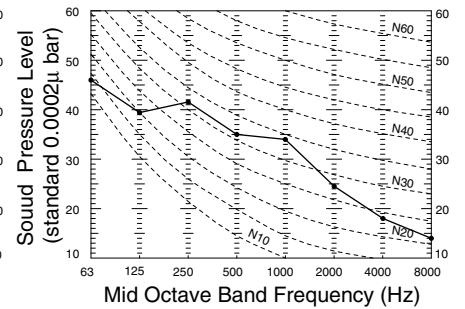
**Model FDTA251**

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



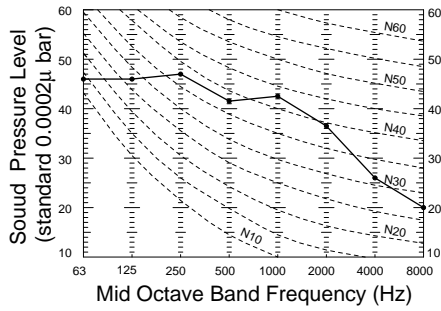
**Model FDTA301**

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



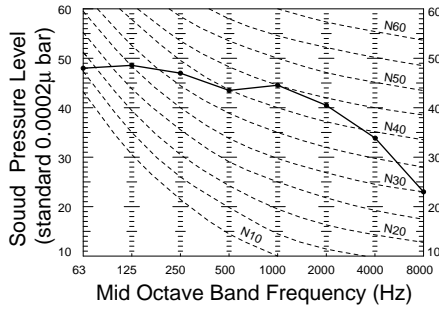
**Model FDTA401**

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



**Model FDTA501**

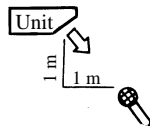
**Noise level** 48 dB (A) at HIGH  
 45 dB (A) at MEDIUM  
 43 dB (A) at LOW



**(b) Ceiling suspension type (FDEN)**

Measured based on JIS B 8616

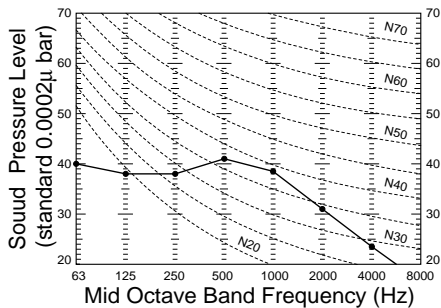
Mike position as right



Mike (front & at low point)

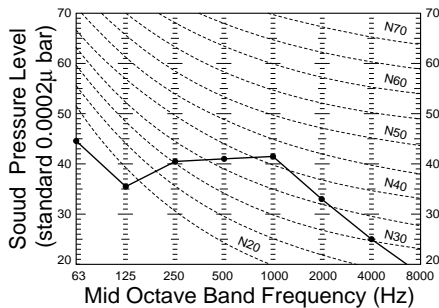
**Models FDENA151, 201**

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



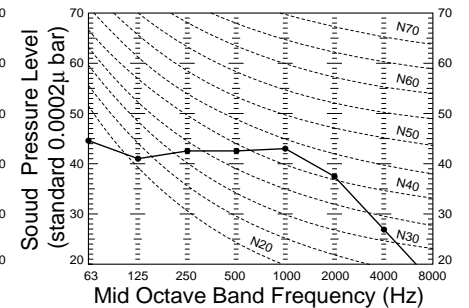
**Models FDENA251, 301**

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



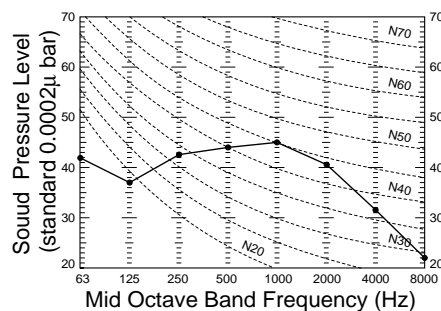
**Model FDENA401**

**Noise level** 46 dB (A) at HIGH  
 44 dB (A) at MEDIUM  
 41 dB (A) at LOW



**Model FDENA501**

**Noise level** 48 dB (A) at HIGH  
 46 dB (A) at MEDIUM  
 44 dB (A) at LOW



**(c) Wall mounted type (FDKN)**

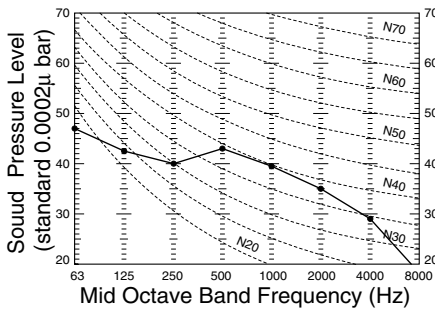
Measured based on JIS B 8616

Mike position as right



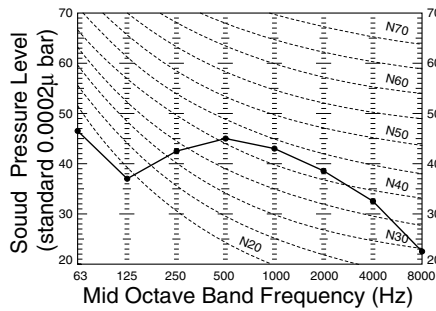
**Model FDKNA151**

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



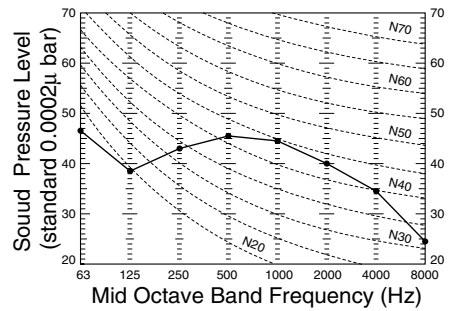
**Model FDKNA201**

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



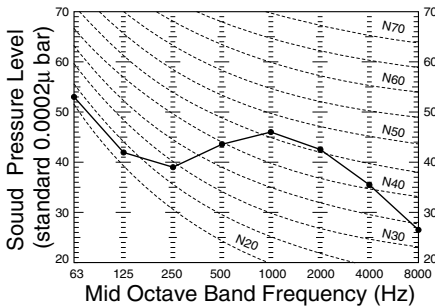
**Model FDKNA251**

Noise level 48 dB (A) at HIGH  
45 dB (A) at MEDIUM  
42 dB (A) at LOW



**Model FDKNA301**

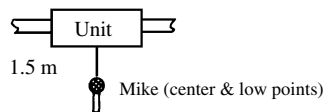
Noise level 49 dB (A) at HIGH  
46 dB (A) at MEDIUM  
43 dB (A) at LOW



**(d) Ceiling mounted duct type (FDUR)**

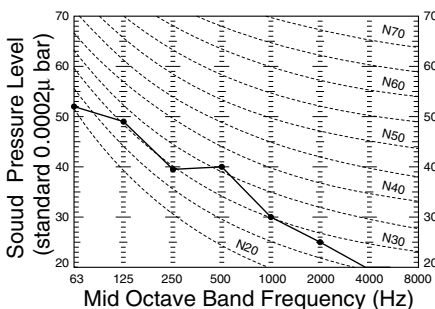
Measured based on JIS B 8616

Mike position as right



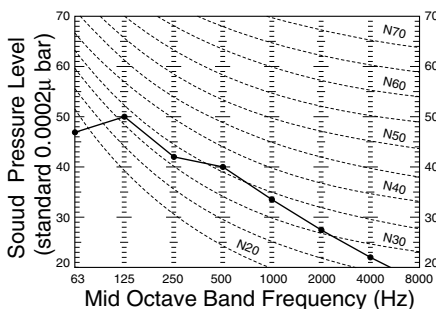
**Model FDURA201**

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



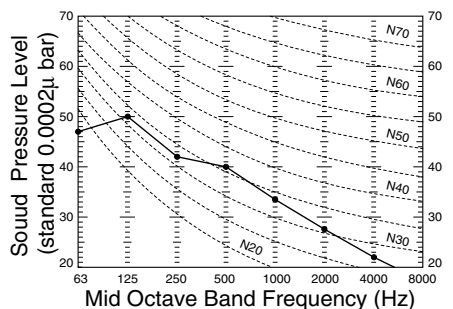
**Model FDKN251**

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



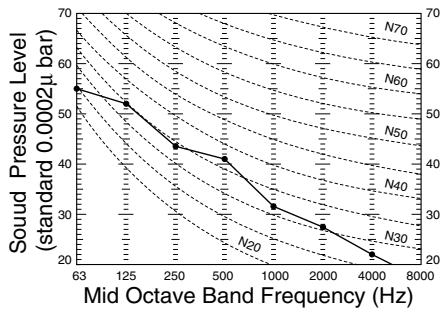
**Model FDKN301**

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



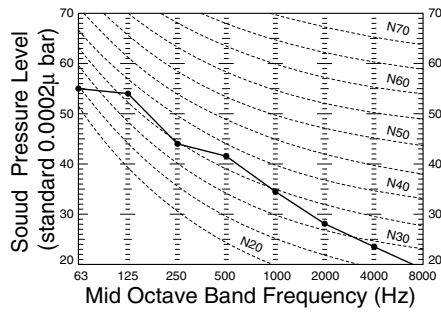
**Model FDURA401**

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



**Model FDURA501**

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



**(2) Outdoor unit**

Measured based on JIS B 8616

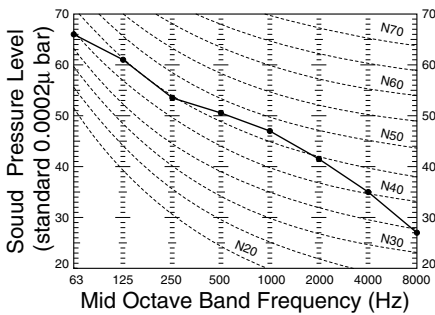
Mike position: at highest noise level in position as below

Distance from front side 1m

Height 1m

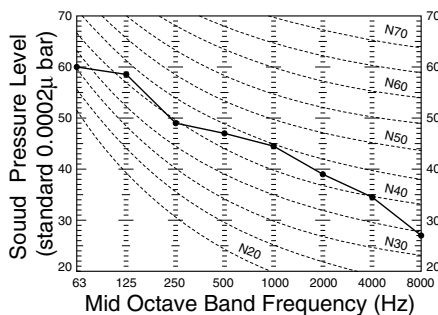
**Models FDCA301HEN, 301HES**

Noise level 53 dB (A)



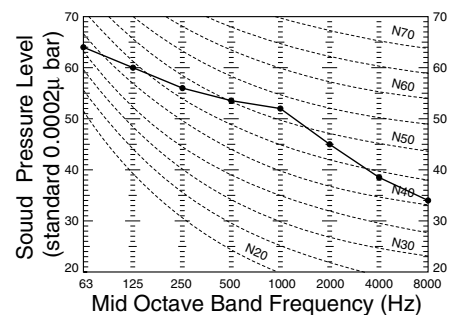
**Models FDCA401HEN, 401HES**

Noise level 54 dB (A)



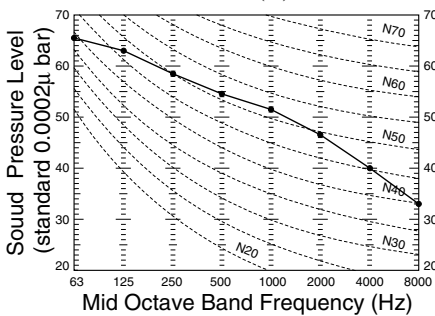
**Model FDCA501HES**

Noise level 56 dB (A)



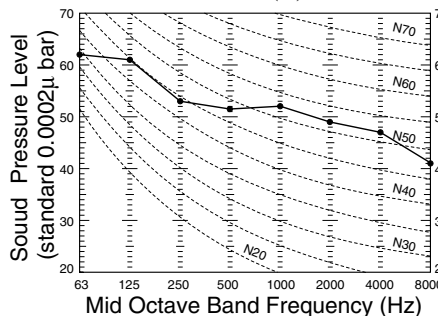
**Model FDCA601HES**

Noise level 57 dB (A)



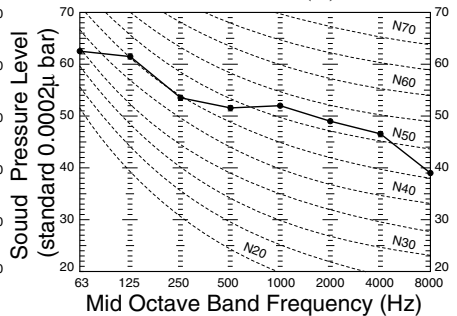
**Model FDCA801HES**

Noise level 57 dB (A)



**Model FDCA1001HES**

Noise level 57 dB (A)





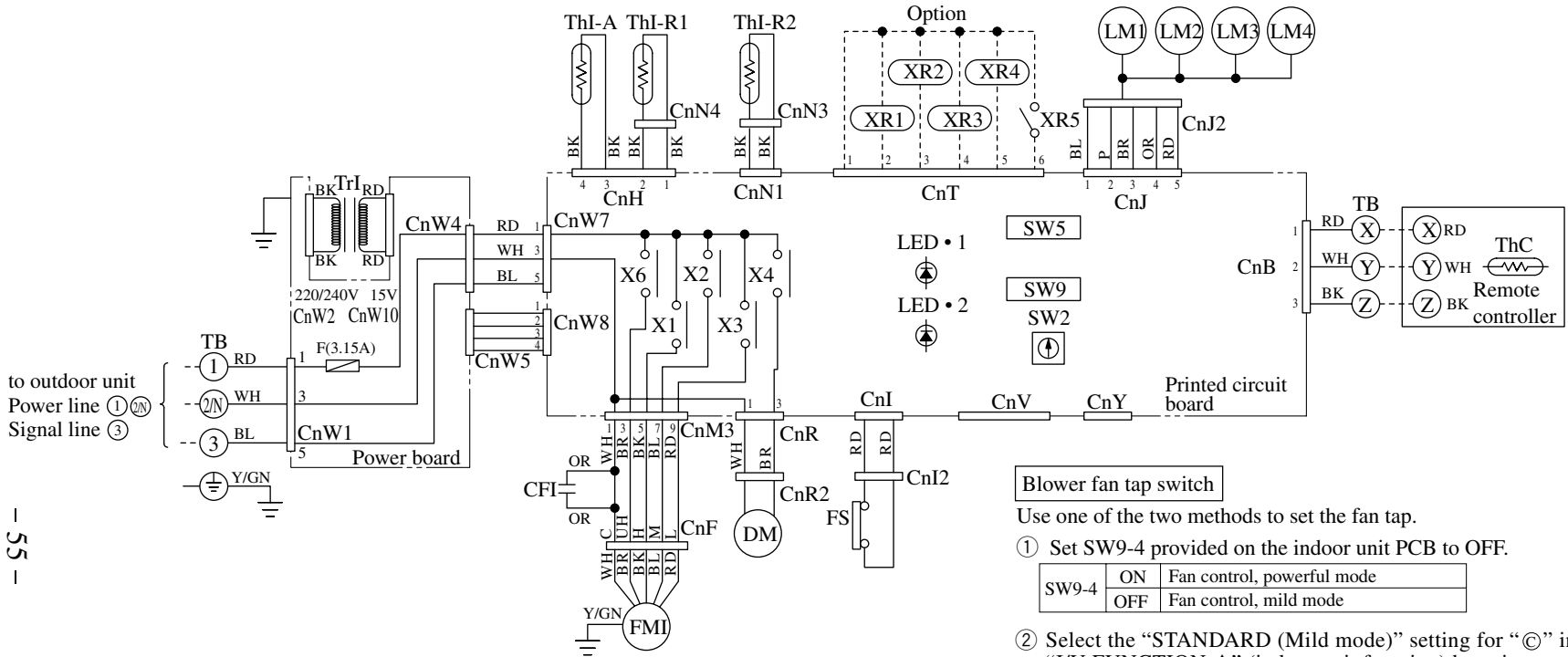
# 3 ELECTRICAL DATA

## 3.1 Electrical wiring

(1) Indoor unit

(a) Ceiling recessed type (FDT)

Models FDTA151, 201, 251, 301, 401



### Blower fan tap switch

Use one of the two methods to set the fan tap.

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

SW9-4	ON	Fan control, powerful mode
	OFF	Fan control, mild mode

② Select the "STANDARD (Mild mode)" setting for "©" in #01 of "I/U FUNCTION ▲" (indoor unit function) by using remote controller function setting.

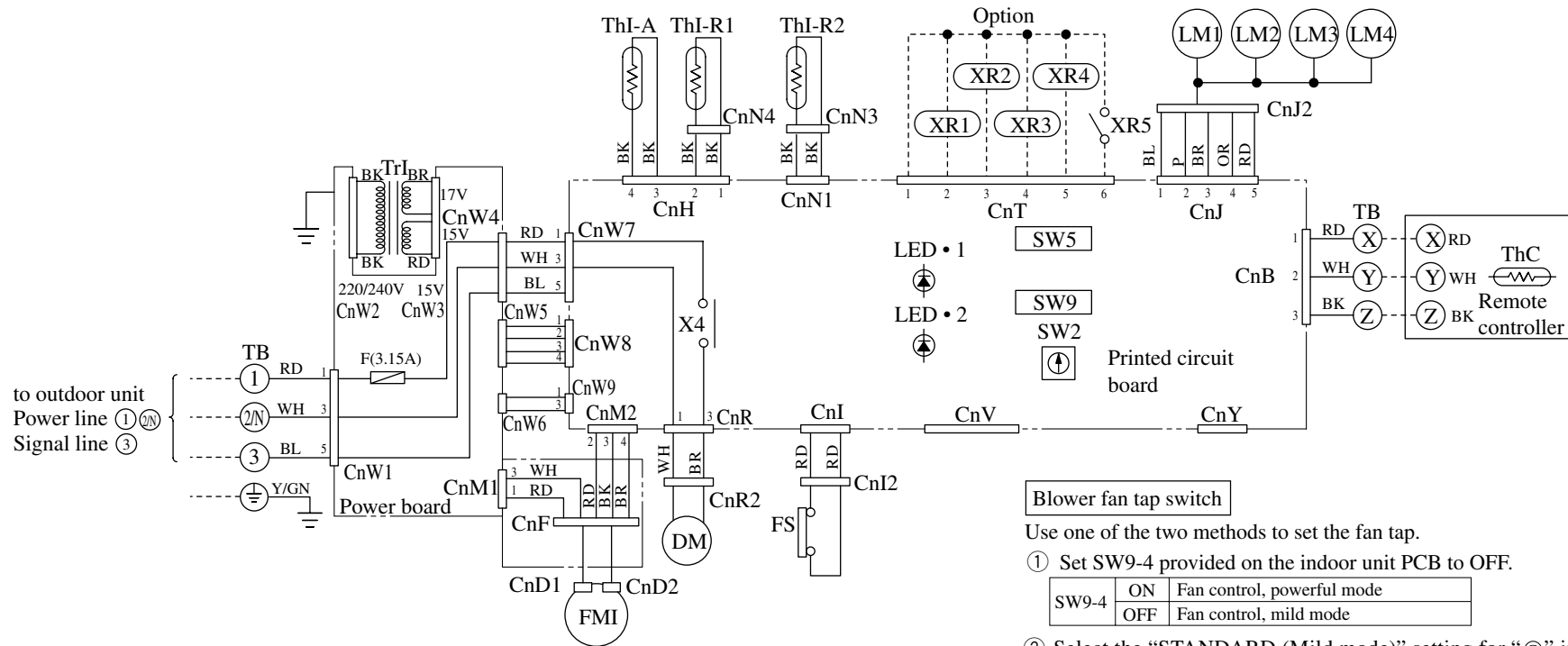
Function number (A)	Function description (B)	Setting (C)
01	Hi CEILING SET	STANDARD (Mild mode)

### Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	SW5-3,4	Filter sign	XR5	Remote operation input(volt-free contact)
CFI	Capacitor for FMI	SW9-3	Emergency operation	X1,2,3,6	Auxiliary relay(For FM)
DM	Drain motor	TrI	Transformer	X4	Auxiliary relay(For DM)
FS	Float switch	F	Fuse	TB	Terminal block(○ mark)
LM1~4	Louver motor	LED1	Indication lamp(Red)	CnB-Z	Connector
ThI-A	Thermistor	LED2	Indication lamp(Green)	■mark	Closed-end connector
ThI-R1	Thermistor	XR1	Operation output(DC12V output)		
ThI-R2	Thermistor	XR2	Heating output(DC12V output)		
ThC	Thermistor	XR3	Thermo ON output(DC12V output)		
SW2	Remote controller communication address	XR4	Inspection output(DC12V output)		

### Color marks

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



**Blower fan tap switch**

Use one of the two methods to set the fan tap.

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

SW9-4	ON	Fan control, powerful mode
	OFF	Fan control, mild mode

- ② Select the “STANDARD (Mild mode)” setting for “⊙” in #01 of “I/U FUNCTION ▲” (indoor unit function) by using remote controller function setting.

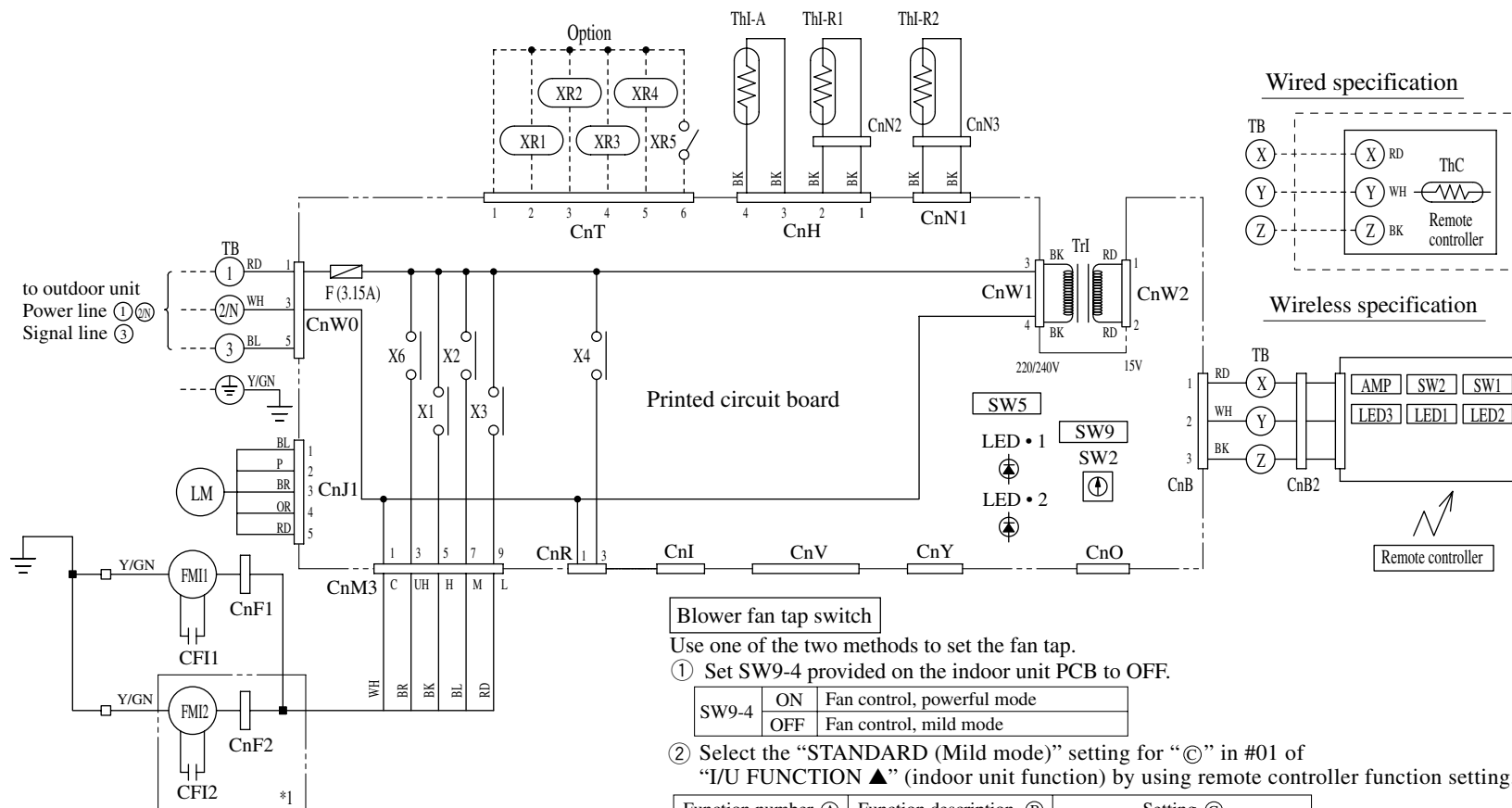
Function number (A)	Function description (B)	Setting (C)
01	Hi CEILING SET	STANDARD (Mild mode)

**Meaning of marks**

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	SW9-3	Emergency operation	X4	Auxiliary relay(For DM)
DM	Drain motor	TrI	Transformer	TB	Terminal block(○ mark)
FS	Float switch	F	Fuse	CnB~Z	Connector
LM1~4	Louver motor	LED1	Indication lamp(Red)	■mark	Closed-end connector
ThI-A	Thermistor	LED2	Indication lamp(Green)		
ThI-R1	Thermistor	XR1	Operation output(DC12V output)		
ThI-R2	Thermistor	XR2	Heating output(DC12V output)		
ThC	Thermistor	XR3	Thermo ON output(DC12V output)		
SW2	Remote controller communication address	XR4	Inspection output(DC12V output)		
SW5-3,4	Filter sign	XR5	Remote operation input(volt-free contact)		

**Color marks**

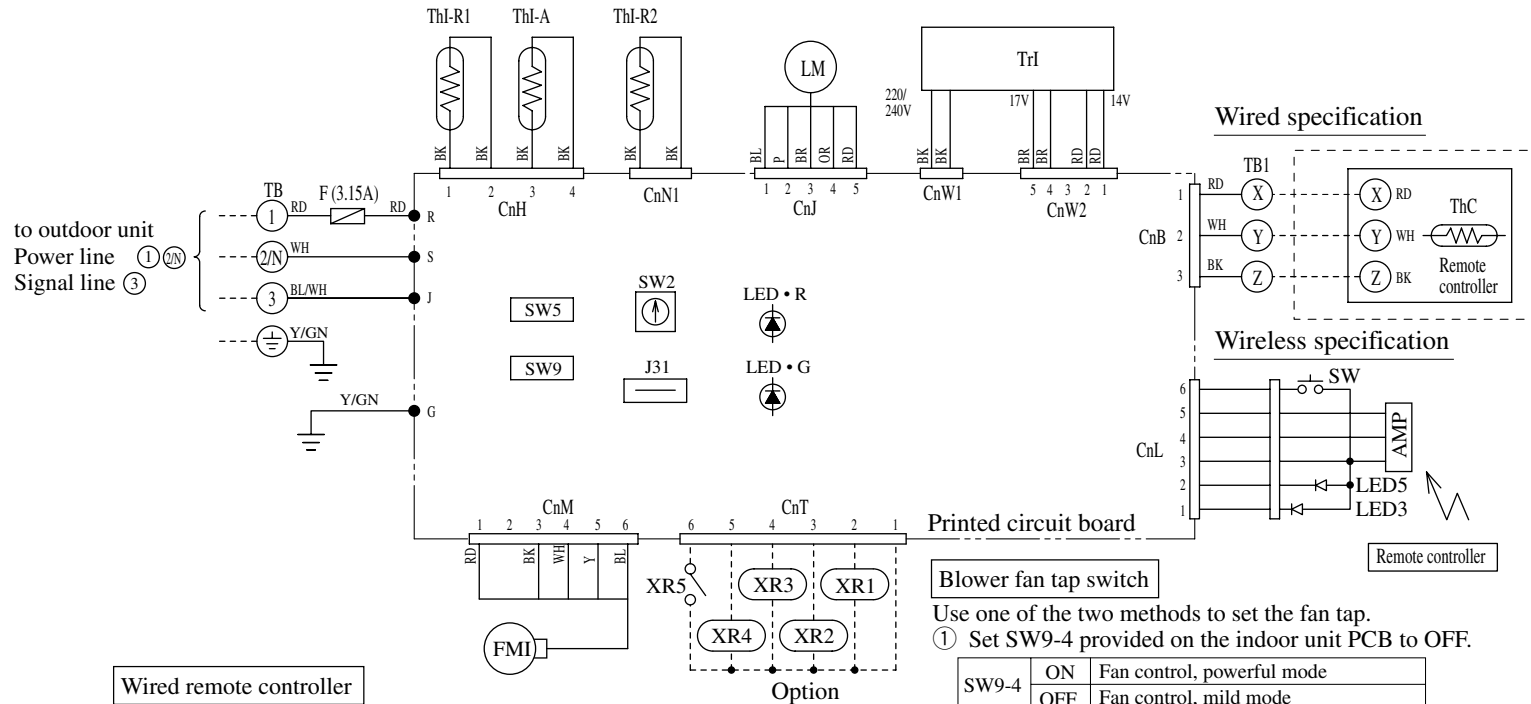
Mark	Color
BK	Black
BL	Blue
BR	Brown
OR	Orange
P	Pink
RD	Red
WH	White
Y	Yellow
Y/GN	Yellow/Green



Note(1) \*1. FMI2 is equipped only for 251,301,401,501,601.

**Meaning of marks**

Mark	Parts name	Mark	Parts name	Mark	Parts name	Mark	Color
<b>FMI1,2</b>	Fan motor	<b>F</b>	Fuse	<b>mark</b>	Closed-end connector	<b>BK</b>	Black
<b>CFI1,2</b>	Capacitor for FMI	<b>LED1</b>	Indication lamp(Red)	<b>LED•1</b>	Indication lamp(Green-Operation)	<b>BL</b>	Blue
<b>LM</b>	Louver motor	<b>LED2</b>	Indication lamp(Green)	<b>LED•2</b>	Indication lamp(Yellow-Timer/Check)	<b>BR</b>	Brown
<b>ThI-A</b>	Thermistor	<b>XR1</b>	Operation output(DC12V output)	<b>LED•3</b>	7-segment indicator(For check)	<b>OR</b>	Orange
<b>ThI-R1</b>	Thermistor	<b>XR2</b>	Heating output(DC12V output)	<b>SW1</b>	Switch(For setting)	<b>P</b>	Pink
<b>ThI-R2</b>	Thermistor	<b>XR3</b>	Thermo ON output(DC12V output)	<b>SW2</b>	Backup switch(Operation/Stop)	<b>RD</b>	Red
<b>ThC</b>	Thermistor	<b>XR4</b>	Inspection output(DC12V output)			<b>WH</b>	White
<b>SW2</b>	Remote controller communication address	<b>XR5</b>	Remote operation input(volt-free contact)			<b>Y</b>	Yellow
<b>SW5-3,4</b>	Filter sign	<b>X1,2,3,6</b>	Auxiliary relay(For FM)			<b>Y/GN</b>	Yellow/Green
<b>SW9-3</b>	Emergency operation	<b>TB</b>	Terminal block(○ mark)				
<b>TrI</b>	Transformer	<b>CnB-Z</b>	Connector				



**Wired remote controller**

When a wired remote controller is connected, none J31 provided on the indoor unit PCB.

J31	With	Wireless remote controller
	None	Wired remote controller

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut.

**Printed circuit board**

**Blower fan tap switch**

Use one of the two methods to set the fan tap.

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

SW9-4	ON	Fan control, powerful mode
	OFF	Fan control, mild mode

- Select the "STANDARD (Mild mode)" setting for "©" in #01 of "I/U FUNCTION ▲" (indoor unit function) by using remote controller function setting.

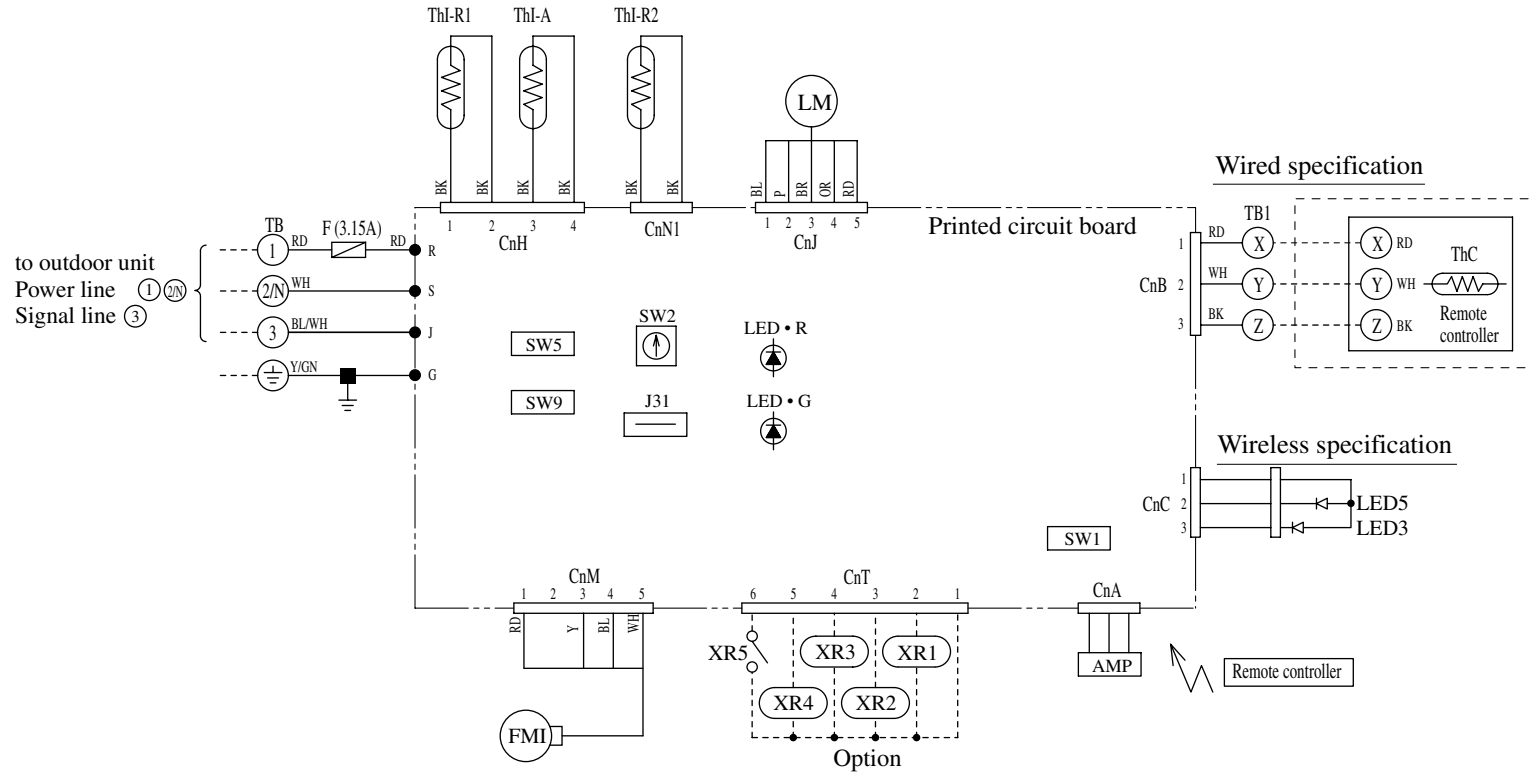
Function number (A)	Function description (B)	Setting (C)
01	Hi CEILING SET	STANDARD (Mild mode)

**Meaning of marks**

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	SW9-3	Emergency operation	XR3	Thermo ON output(DC12V output)
LM	Louver motor	LED3	Indication lamp(Green-Run)	XR4	Inspection output(DC12V output)
ThI-A	Thermistor	LED5	Indication lamp(Yellow-Inspection alert)	XR5	Remote operation input(volt-free contact)
ThI-R1	Thermistor	TrI	Transformer	TB	Terminal block(○ mark)
ThI-R2	Thermistor	F	Fuse	CnA~Z	Connector
ThC	Thermistor	LED•R	Indication lamp(Red)	AMP	Wireless receiver
SW	Backup switch(ON/OFF)	LED•G	Indication lamp(Green)		
SW2	Remote controller communication address	XR1	Operation output(DC12V output)		
SW5-3,4	Filter sign	XR2	Heating output(DC12V output)		

**Color marks**

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



Wired specification

Wireless specification

Blower fan tap switch

Use one of the two methods to set the fan tap.  
 ① Set SW9-4 provided on the indoor unit PCB to OFF.

SW9-4	ON	Fan control, powerful mode
	OFF	Fan control, mild mode

② Select the "STANDARD (Mild mode)" setting for "©" in #01 of "I/U FUNCTION ▲" (indoor unit function) by using remote controller function setting.

Function number ①	Function description ②	Setting ③
01	Hi CEILING SET	STANDARD (Mild mode)

Wired remote controller

When a wired remote controller is connected, none J31 provided on the indoor unit PCB.

J31	With	Wireless remote controller
	None	Wired remote controller

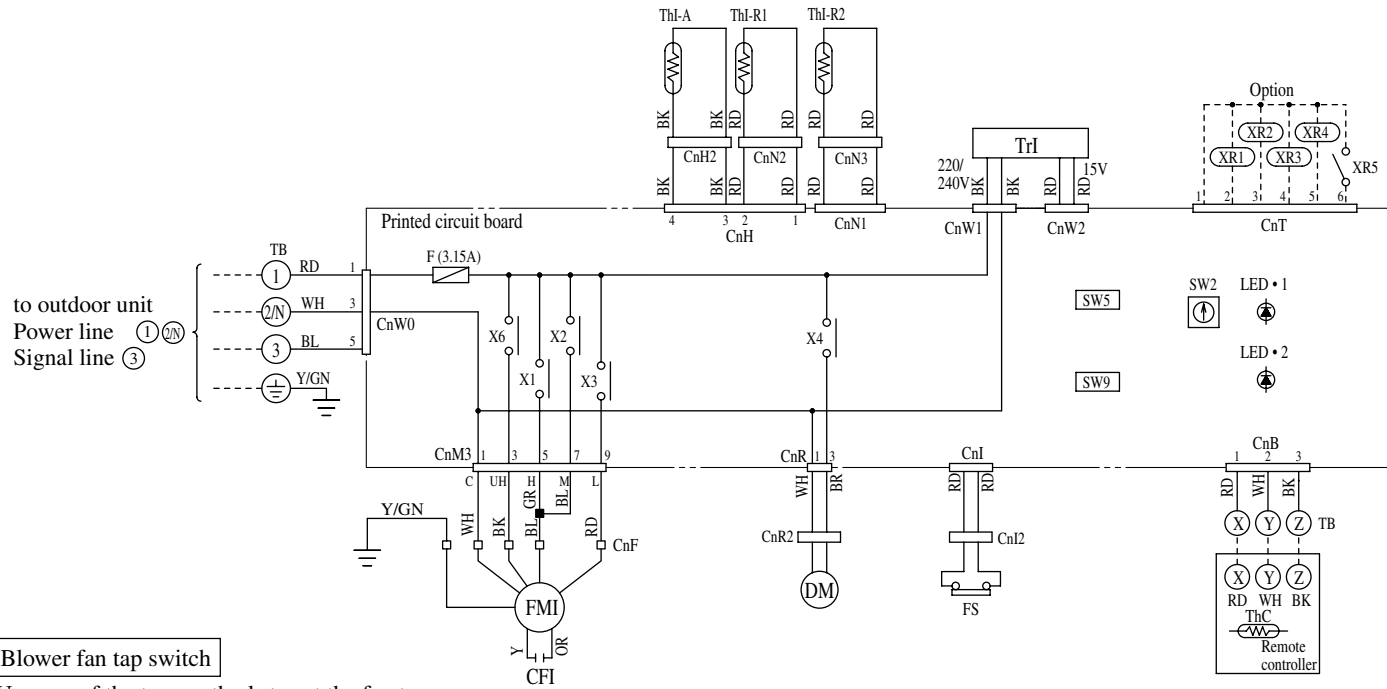
Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut.

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	SW5-3,4	Filter sign	XR2	Heating output(DC12V output)
LM	Louver motor	SW9-3	Emergency operation	XR3	Thermo ON output(DC12V output)
ThI-A	Thermistor	LED3	Indication lamp(Yellow-Timer/Inspection alert)	XR4	Inspection output(DC12V output)
ThI-R1	Thermistor	LED5	Indication lamp(Green-Run)	XR5	Remote operation input(volt-free contact)
ThI-R2	Thermistor	F	Fuse	TB	Terminal block(○ mark)
ThC	Thermistor	LED • R	Indication lamp(Red)	CnA~Z	Connector
SW1	Backup switch(ON/OFF)	LED • G	Indication lamp(Green)	AMP	Wireless receiver
SW2	Remote controller communication address	XR1	Operation output(DC12V output)	■ mark	Closed-end connector

Color marks

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



**Blower fan tap switch**

Use one of the two methods to set the fan tap.

- 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 Select the “Hi CEILING 1 (high-speed tap)” setting for “©” in #01 of “I/U FUNCTION ▲” (indoor unit function) by using remote controller function setting.

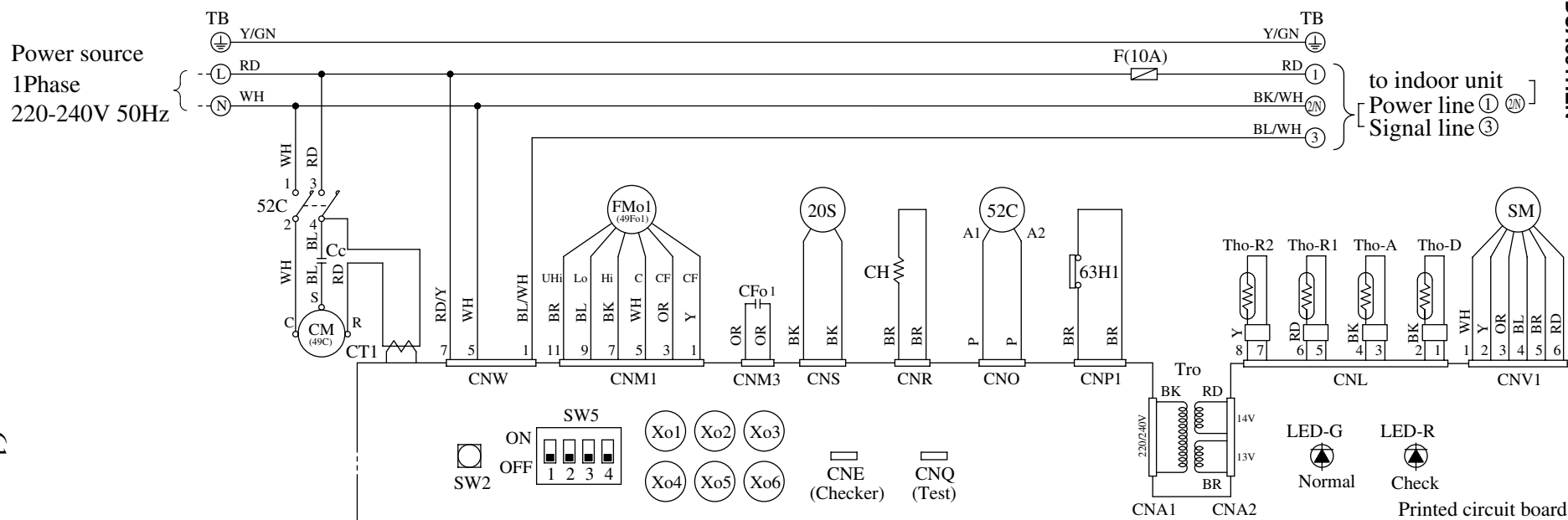
Function number (A)	Function description (B)	Setting (C)
01	Hi CEILING SET	Hi CEILING1

**Meaning of marks**

Mark	Parts name	Mark	Parts name	Mark	Parts name
<b>FMI</b>	Fan motor	<b>SW5-3,4</b>	Filter sign	<b>XR4</b>	Inspection output(DC12V output)
<b>CFI</b>	Capacitor for FMI	<b>SW9-3</b>	Emergency operation	<b>XR5</b>	Remote operation input(volt-free contact)
<b>DM</b>	Drain motor	<b>TrI</b>	Transformer	<b>X1,2,3,6</b>	Auxiliary relay(For FM)
<b>FS</b>	Float switch	<b>F</b>	Fuse	<b>X4</b>	Auxiliary relay(For DM)
<b>ThI-A</b>	Thermistor	<b>LED1</b>	Indication lamp(Red)	<b>TB</b>	Terminal block(○ mark)
<b>ThI-R1</b>	Thermistor	<b>LED2</b>	Indication lamp(Green)	<b>CnA-Z</b>	Connector
<b>ThI-R2</b>	Thermistor	<b>XR1</b>	Operation output(DC12V output)	<b>■mark</b>	Closed-end connector
<b>ThC</b>	Thermistor	<b>XR2</b>	Heating output(DC12V output)		
<b>SW2</b>	Remote controller communication address	<b>XR3</b>	Thermo ON output(DC12V output)		

**Color marks**

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

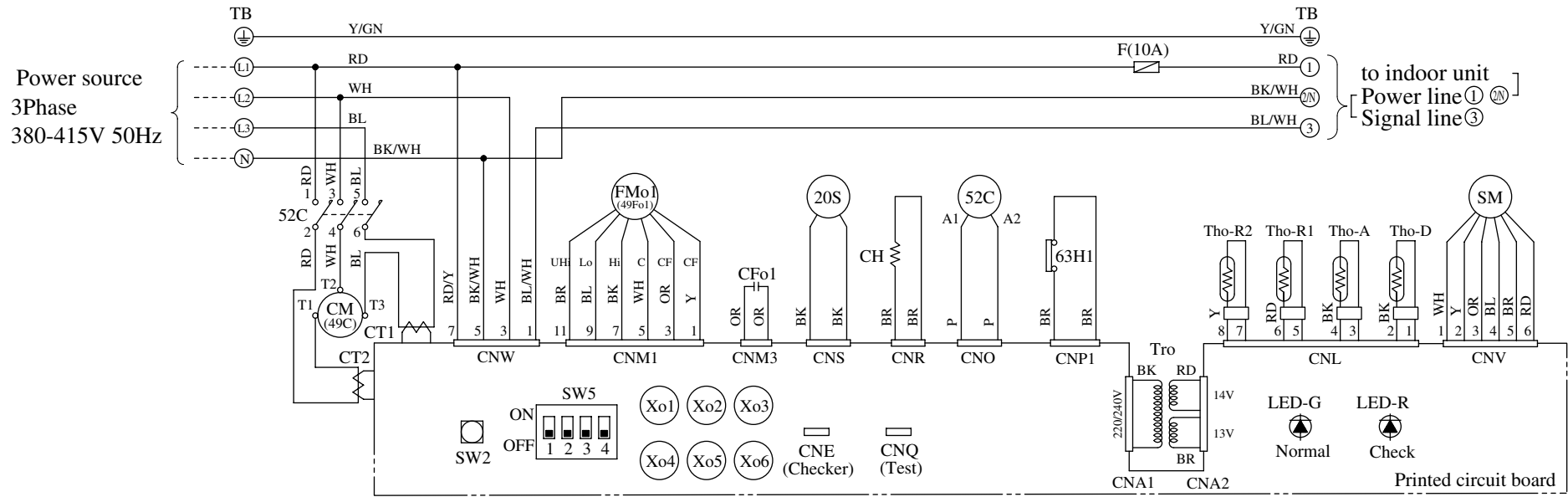


**Meaning of marks**

Mark	Parts name	Mark	Parts name	Mark	Parts name
<b>Cc</b>	Capacitor for CM	<b>SM</b>	Stepping motor(for EEV)	<b>Xo1</b>	Auxiliary relay(for 52C)
<b>CFo1</b>	Capacitor for FMo1	<b>SW2</b>	Test run switch	<b>Xo2,3,4</b>	Auxiliary relay(for FMo)
<b>CH</b>	Crankcase heater	<b>SW5-1</b>	Defrost control switch	<b>Xo5</b>	Auxiliary relay(for 20S)
<b>CM</b>	Compressor motor	<b>SW5-2</b>	Snow prevented fan control switch	<b>Xo6</b>	Auxiliary relay(for CH)
<b>CNA~Z</b>	Connector(□ mark)	<b>SW5-4</b>	Operate test run switch	<b>20S</b>	4 way valve(coil)
<b>CT1</b>	Current sensor	<b>TB</b>	Terminal block(○mark)	<b>49C</b>	Internal thermostat for CM
<b>F</b>	Fuse	<b>Tho-A</b>	Thermistor(outdoor air temp.)	<b>49Fo1</b>	Internal thermostat for FMo1
<b>FMo1</b>	Fan motor	<b>Tho-D</b>	Thermistor(discharge temp.)	<b>52C</b>	Magnetic contactor for CM
<b>LED-G</b>	Indication lamp(Green)	<b>Tho-R1,2</b>	Thermistor(outdoor H.EX. temp.)	<b>63H1</b>	High pressure switch
<b>LED-R</b>	Indication lamp(Red)	<b>Tro</b>	Transformer		

**Color marks**

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



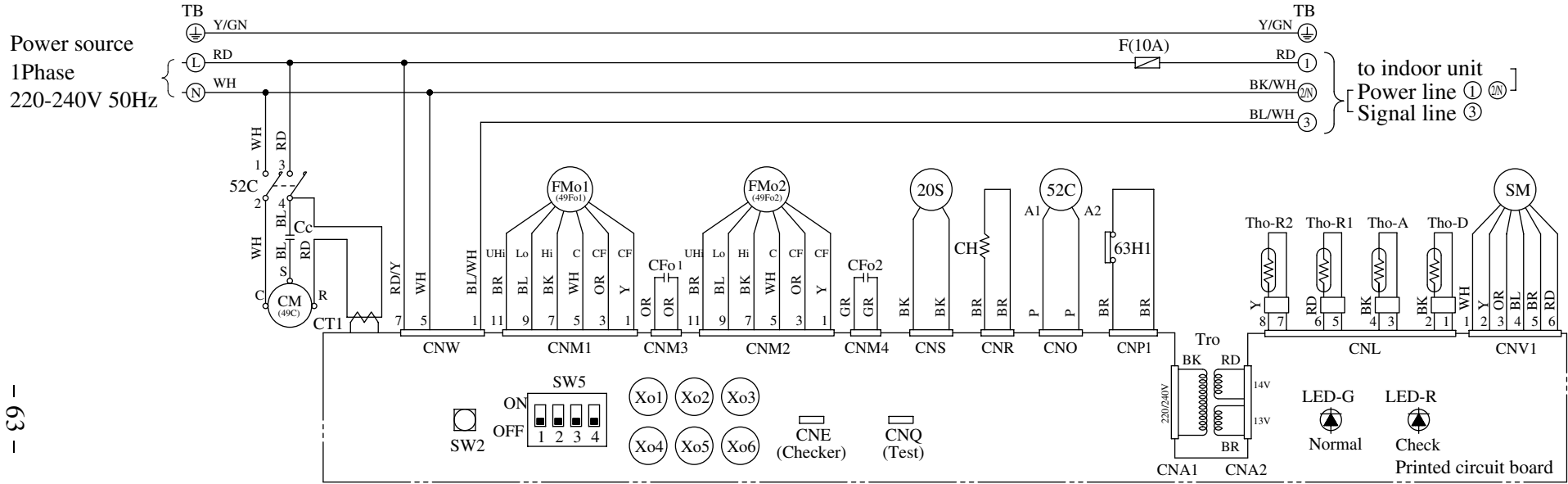
**Meaning of marks**

Mark	Parts name	Mark	Parts name	Mark	Parts name
<b>CFo1</b>	Capacitor for FMo1	<b>SW2</b>	Test run switch	<b>Xo2,3,4</b>	Auxiliary relay(for FMo)
<b>CH</b>	Crankcase heater	<b>SW5-1</b>	Defrost control switch	<b>Xo5</b>	Auxiliary relay(for 20S)
<b>CM</b>	Compressor motor	<b>SW5-2</b>	Snow prevented fan control switch	<b>Xo6</b>	Auxiliary relay(for CH)
<b>CNA-Z</b>	Connector(□mark)	<b>SW5-4</b>	Operate test run switch	<b>20S</b>	4 way valve(coil)
<b>CT1,2</b>	Current sensor	<b>TB</b>	Terminal block(○mark)	<b>49C</b>	Internal thermostat for CM
<b>F</b>	Fuse	<b>Tho-A</b>	Thermistor(outdoor air temp)	<b>49Fo1</b>	Internal thermostat for FMo1
<b>FMo1</b>	Fan motor	<b>Tho-D</b>	Thermistor(discharge temp)	<b>52C</b>	Magnetic contactor for CM
<b>LED-G</b>	Indication lamp(Green)	<b>Tho-R1,2</b>	Thermistor(outdoor H.Ex.temp)	<b>63H1</b>	High pressure switch
<b>LED-R</b>	Indication lamp(Red)	<b>Tro</b>	Transformer		
<b>SM</b>	Stepping motor(for EEV)	<b>Xo1</b>	Auxiliary relay(for 52C)		

**Color marks**

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



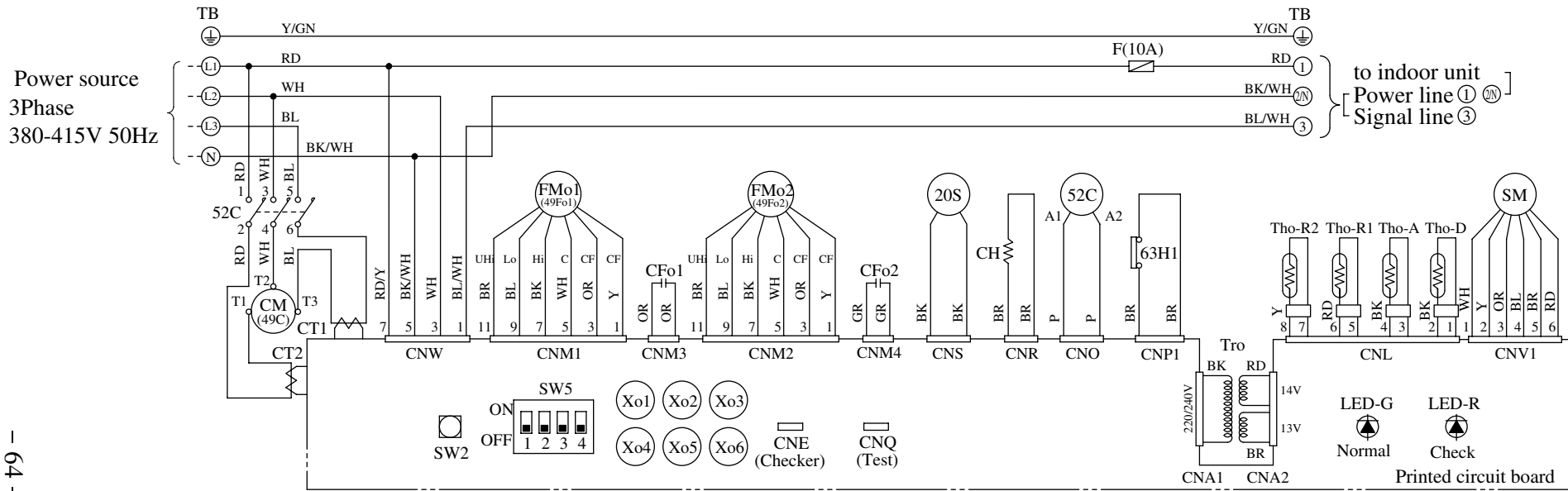


**Meaning of marks**

Mark	Parts name	Mark	Parts name	Mark	Parts name
<b>Cc</b>	Capacitor for CM	<b>SM</b>	Stepping motor(for EEV)	<b>Xo1</b>	Auxiliary relay(for 52C)
<b>CFo1,2</b>	Capacitor for FMo1,2	<b>SW2</b>	Test run switch	<b>Xo2,3,4</b>	Auxiliary relay(for FMo)
<b>CH</b>	Crankcase heater	<b>SW5-1</b>	Defrost control switch	<b>Xo5</b>	Auxiliary relay(for 20S)
<b>CM</b>	Compressor motor	<b>SW5-2</b>	Snow prevented fan control switch	<b>Xo6</b>	Auxiliary relay(for CH)
<b>CNA-Z</b>	Connector(□ mark)	<b>SW5-4</b>	Operate test run switch	<b>20S</b>	4 way valve(coil)
<b>CT1</b>	Current sensor	<b>TB</b>	Terminal block(○ mark)	<b>49C</b>	Internal thermostat for CM
<b>F</b>	Fuse	<b>Tho-A</b>	Thermistor(outdoor air temp.)	<b>49Fo1,2</b>	Internal thermostat for FMo1,2
<b>FMo1,2</b>	Fan motor	<b>Tho-D</b>	Thermistor(discharge temp.)	<b>52C</b>	Magnetic contactor for CM
<b>LED-G</b>	Indication lamp(Green)	<b>Tho-R1,2</b>	Ther mistor(outdoor H.EX. temp.)	<b>63H1</b>	High pressure switch
<b>LED-R</b>	Indication lamp(Red)	<b>Tro</b>	Transformer		

**Color marks**

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

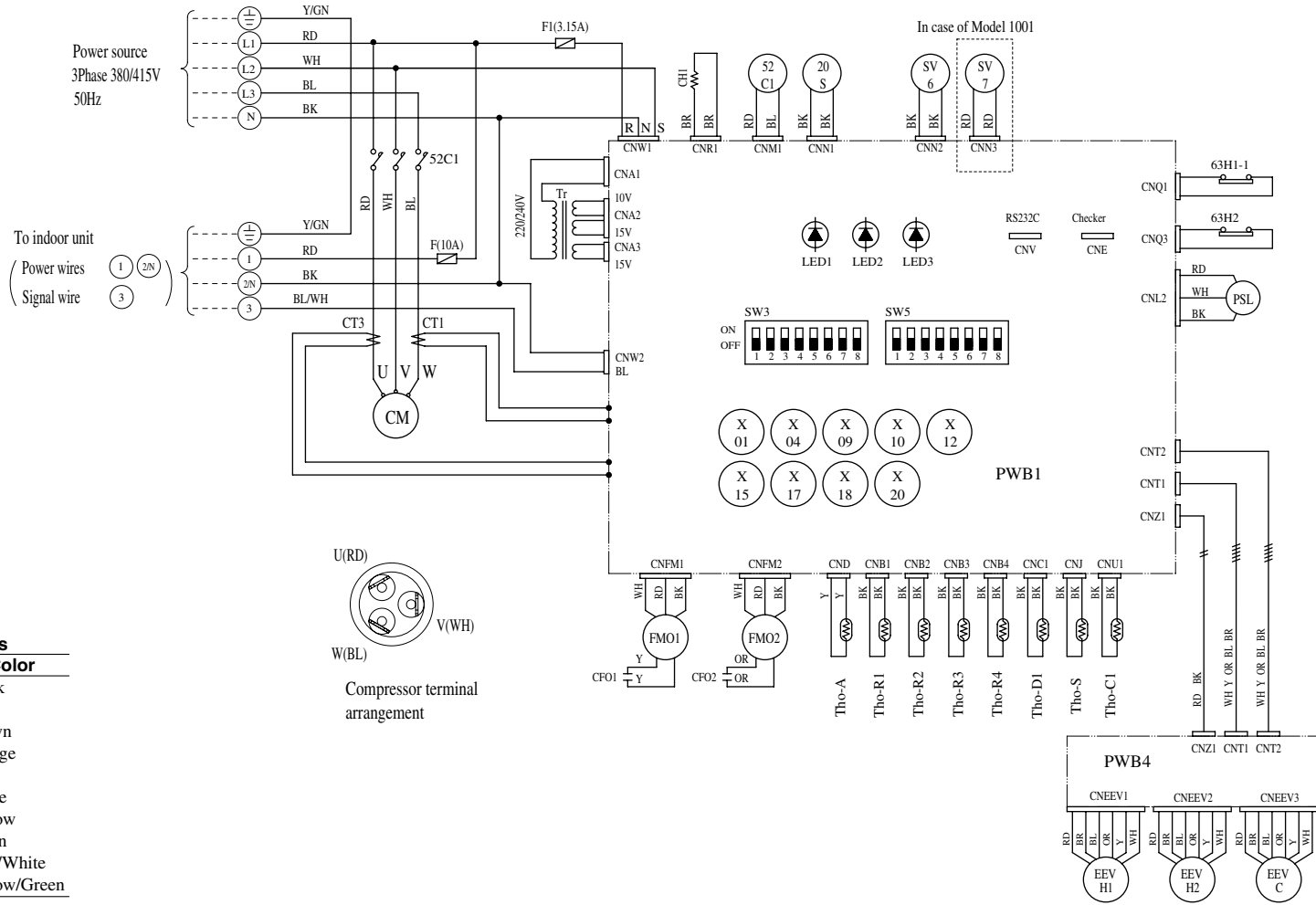


**Meaning of marks**

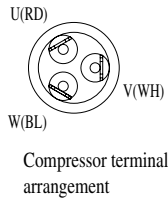
Mark	Parts name	Mark	Parts name	Mark	Parts name
<b>CFo1,2</b>	Capacitor for FMo1,2	<b>SW2</b>	Test run switch	<b>Xo2,3,4</b>	Auxiliary relay(for FMo)
<b>CH</b>	Crankcase heater	<b>SW5-1</b>	Defrost control switch	<b>Xo5</b>	Auxiliary relay(for 20S)
<b>CM</b>	Compressor motor	<b>SW5-2</b>	Snow prevented fan control switch	<b>Xo6</b>	Auxiliary relay(for CH)
<b>CNA~Z</b>	Connector(□ mark)	<b>SW5-4</b>	Operate test run switch	<b>20S</b>	4 way valve(coil)
<b>CT1,2</b>	Current sensor	<b>TB</b>	Terminal block(○ mark)	<b>49C</b>	Internal thermostat for CM
<b>F</b>	Fuse	<b>Tho-A</b>	Thermistor(outdoor air temp)	<b>49Fo1,2</b>	Internal thermostat for FMo1,2
<b>FMo1,2</b>	Fan motor	<b>Tho-D</b>	Thermistor(discharge temp)	<b>52C</b>	Magnetic contactor for CM
<b>LED-G</b>	Indication lamp(Green)	<b>Tho-R1,2</b>	Thermistor(outdoor H.Ex.temp)	<b>63H1</b>	High pressure switch
<b>LED-R</b>	Indication lamp(Red)	<b>Tro</b>	Transformer		
<b>SM</b>	Stepping motor(for EEV)	<b>Xo1</b>	Auxiliary relay(for 52C)		

**Color marks**

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



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



**Meaning of marks**

Mark	Parts name	Mark	Parts name	Mark	Parts name
CM	Compressor motor	20S	4way valve	Tho-S	thermistor (suction temp.)
FMO1,2	Fan motor	SV6	Solenoid valve (oil separator)	PSL	Low pressure sensor
52C1	Magnetic contactor for CM	SV7	Solenoid valve (for assistance of EEVC)	CT1,CT3	Current sensor
CH1	Crankcase heater	EEVH1,2	Expansion valve for heating	Tr	Transformer
CFO1,2	Fan motor condenser	EEVC	Expansion valve for cooling	TB1	Terminal block (○ mark)
X01	Auxiliary relay (for 52C1)	63H1-1	High pressure switch (for protection)	F,F1	Fuse
X04	Auxiliary relay (for 20S)	63H2	High pressure switch (for control)	CnA~Z	Connector (□ mark)
X09	Auxiliary relay (for SV6)	Tho-A	thermistor (outdoor air temp.)	PWB1,4	Printed wiring board
X10	Auxiliary relay (for SV7)	Tho-C1	thermistor (dome temp.)	LED1	Indication lamp (red)
X12	Auxiliary relay (for CH1)	Tho-D1	thermistor (discharge temp.)	LED2	Indication lamp (green)
X15,17	Auxiliary relay (for FMO1)	Tho-R1,2	thermistor (outdoor H.X. temp. exhaust)	LED3	Indication lamp (green for service)
X18,20	Auxiliary relay (for FMO2)	Tho-R3,4	thermistor (outdoor H.X. temp. inlet)		

**Function of switches**

Mark	Function	Mark	Function
SW3-1	ON Defrosting-Cold weather region	SW5-1	ON Renewal switch
	OFF Defrosting-Normal		OFF Normal
SW3-2	ON Snow protection control-With	SW5-2	ON Reserve
	OFF Snow protection control-None		OFF Normal
SW3-3	ON Test run operation switch: Test run	SW5-3	ON LED reset
	OFF Normal		OFF Normal
SW3-4	ON Test run operation: Heating	SW5-4	ON Test mode
	OFF Test run operation: Cooling		OFF Normal
SW3-5	ON Pump down		
	OFF Normal		
SW3-6	ON Defrosting end operation change		
	OFF Normal		

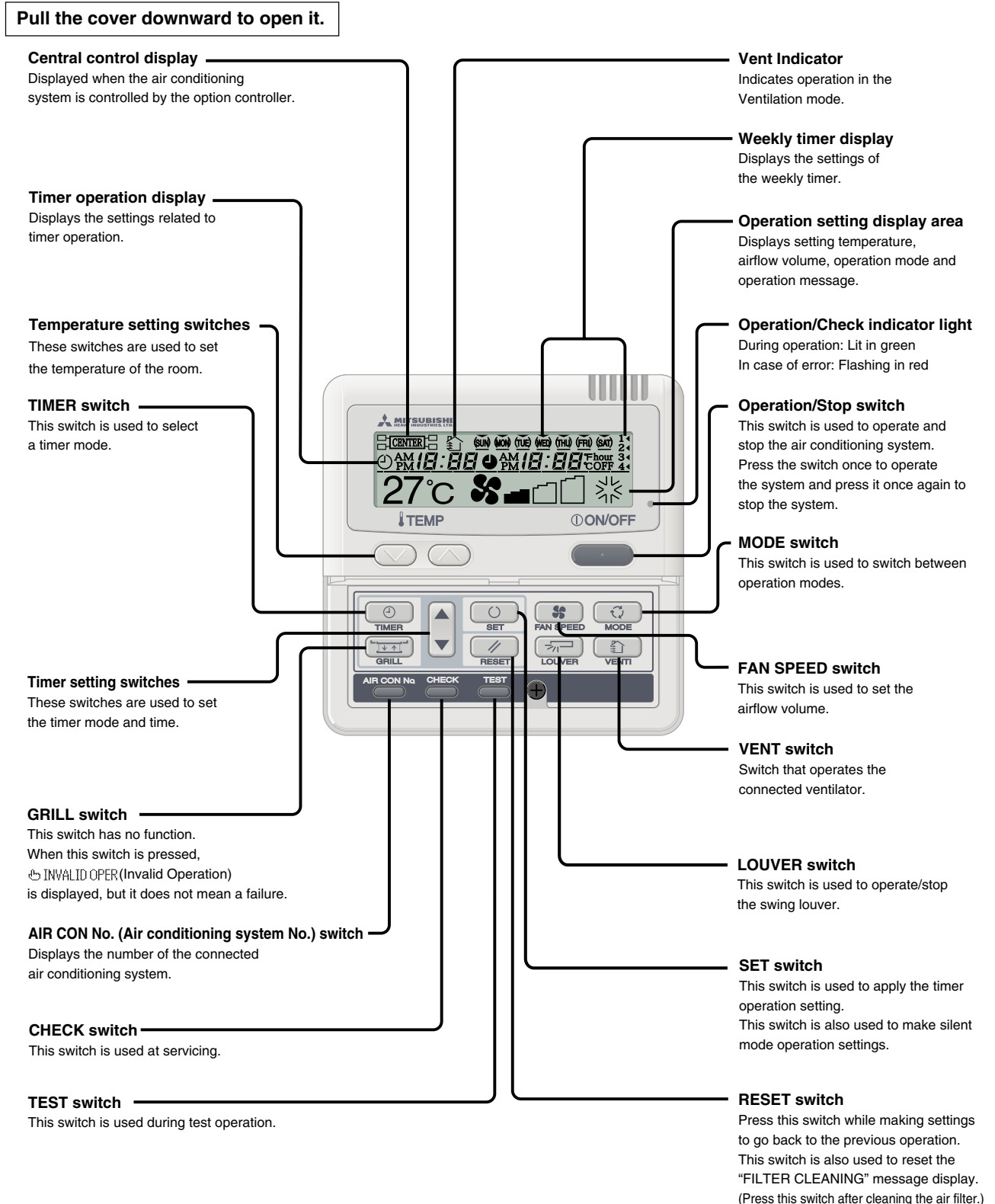
# 4 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

## (1) Remote controller

### (a) Wired remote controller

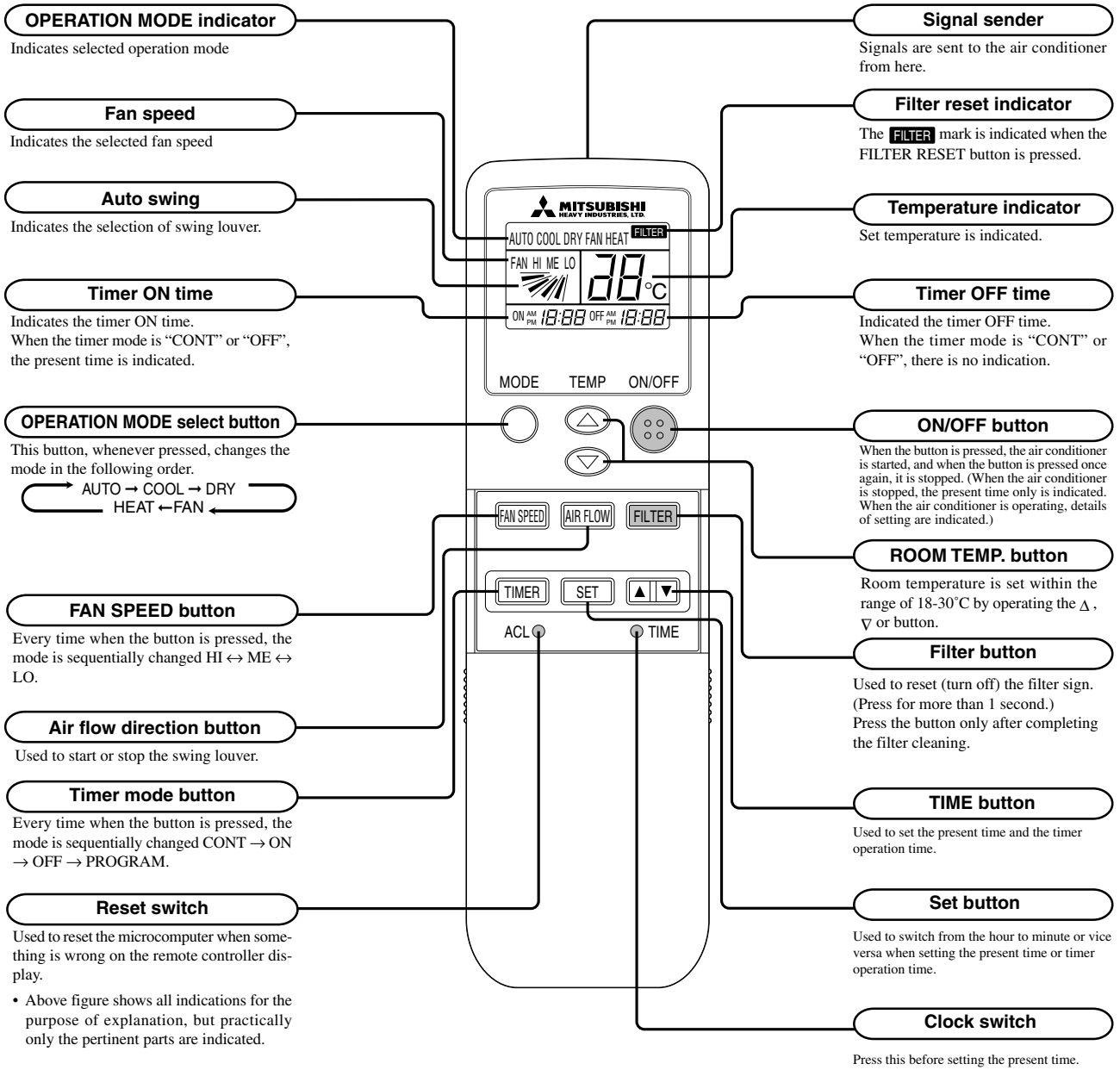
The figure below shows the remote controller with the cover opened. Note that all the items that may be displayed in the liquid crystal display area are shown in the figure for the sake of explanation.

Characters displayed with dots in the liquid crystal display area are abbreviated.



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

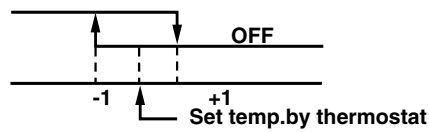
**(b) Wireless remote controller**



(2) Operation control function by the indoor controller

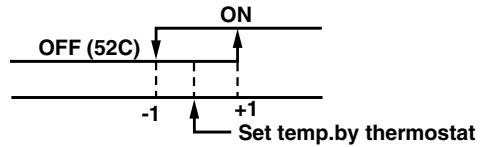
(a) Room temperature control (Differential of thermostat)

Heating operation



Temperature difference between thermostat set temp. and return air temp. (Detected by Th<sub>1</sub>-A)

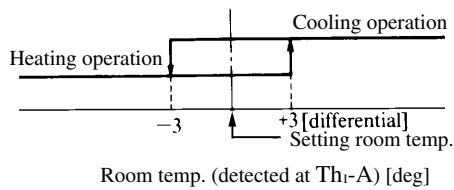
Cooling operation



Temperature difference between thermostat set temp. and return air temp. (Detected by Th<sub>1</sub>-A)

(b) Automatic operation

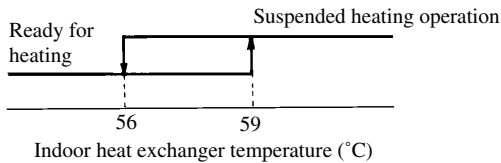
If the Auto mode is selected on the remote control device, the selection of cooling or heating can be made automatically depending on the room temperature (and the temperature of indoor heat exchanger). (When the switching between the cooling and the heating is made within 3 minutes, the compressor will not operate for 3 minutes.) This will make much easier the switching of cooling/heating at the change of season and can be adapted to the unmanned operation at bank cash dispenser.



Room temp. (detected at Th<sub>1</sub>-A) [deg]

Notes (1) During the automatic switching of cooling/heating the room temperature is controlled based on the setting of room temperature.

(2) If the temperature of indoor heat exchanger rises beyond 59°C during the heating operation, it is switched automatically to the cooling operation. For an hour after this switching, the heating operation is suspended regardless of the temperature as shown at left.



Indoor heat exchanger temperature (°C)

(c) Control parts operation during cooling and heating

Function	Cooling		Fan	Heating				Dry
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Defrost	HOT START	
Control part			-					-
Compressor	○	×	×	○	×	○	○	○
4-way valve	×	×	×	○	○	×	○	×
Outdoor fan	○	×	×	○	×	×	○	○
Indoor fan	○		○	○	○/×			○/×
Louver motor	○/×							
Condensate motor	○	×(5min. ON)	×(5min. ON)	○(5min. ON)				○

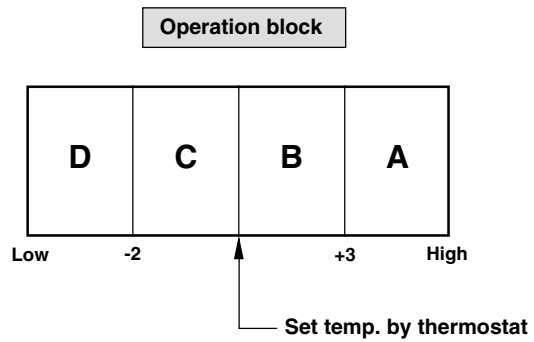
Note (1) ○:ON

×:OFF

○/×:According to control other than temperature control.

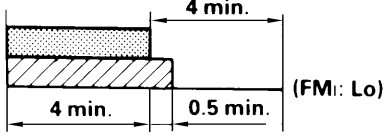
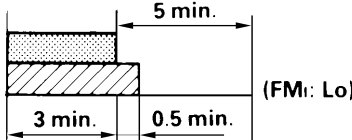
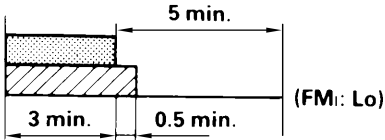
**(d) Dehumidifying operation (“THERMAL DRY”)**

The compressor, the indoor fan motor and the outdoor fan motor are operated intermittently under thermistor (Thi-A) control according to the appropriate operation block, to provide cooling operation for the dehumidifying.



**Pattern of operation**

 CM, FM<sub>o</sub>: ON     FM<sub>i</sub>: ON

Operation block	Thermal drying starting (for 8 or 16 minutes after operation started)	Normal thermal dry operation (after completion of thermal drying)
<b>A</b>	(16 minutes) Normal cooling operation • The air flow is set at 1 speed lower than the set air flow.	(8 minutes) Continuous cooling operation (FM <sub>i</sub> :Lo)
<b>B</b>		(8 minutes) 
<b>C</b>	(8 minutes) 	(8 minutes) 
<b>D</b>		(8 minutes) All stoppage

- Notes (1) Blocks **A** and **B**: Normal cooling operation for 16 minutes after operation starts, then when the set temperature is reached, the thermostat stops. 16 minutes later, it switches to normal operation.  
 Blocks **C** and **D**: The operation mode shown in the table above is performed for 8 minutes. After 8 minutes, it switches to normal operation.
- (2) Under normal operation, the temperature is checked every 8 minutes after normal operation starts to determine which block is operating, then the operation mode is decided.

**(e) Timer Operation**

1) Simple Timer

This sets the amount of time from the current time that the air conditioner goes OFF.

The off time can be selected in 10 steps, from “Off 1 hour from now” to “Off 10 hours from now.” After the simple timer is set, the number of hours until the air conditioning goes off is displayed in one hour units from the current time.

2) Time Off Timer

The time the air conditioner goes OFF can be set in 10-minute increments.

3) Time On Timer

The time the air conditioner goes ON can be set in 10-minute increments. The set temperature can also be set at the same time.

4) Weekly Timer

Each day, it is possible to set this timer's operation up to 4 times (On time, or Off timer).

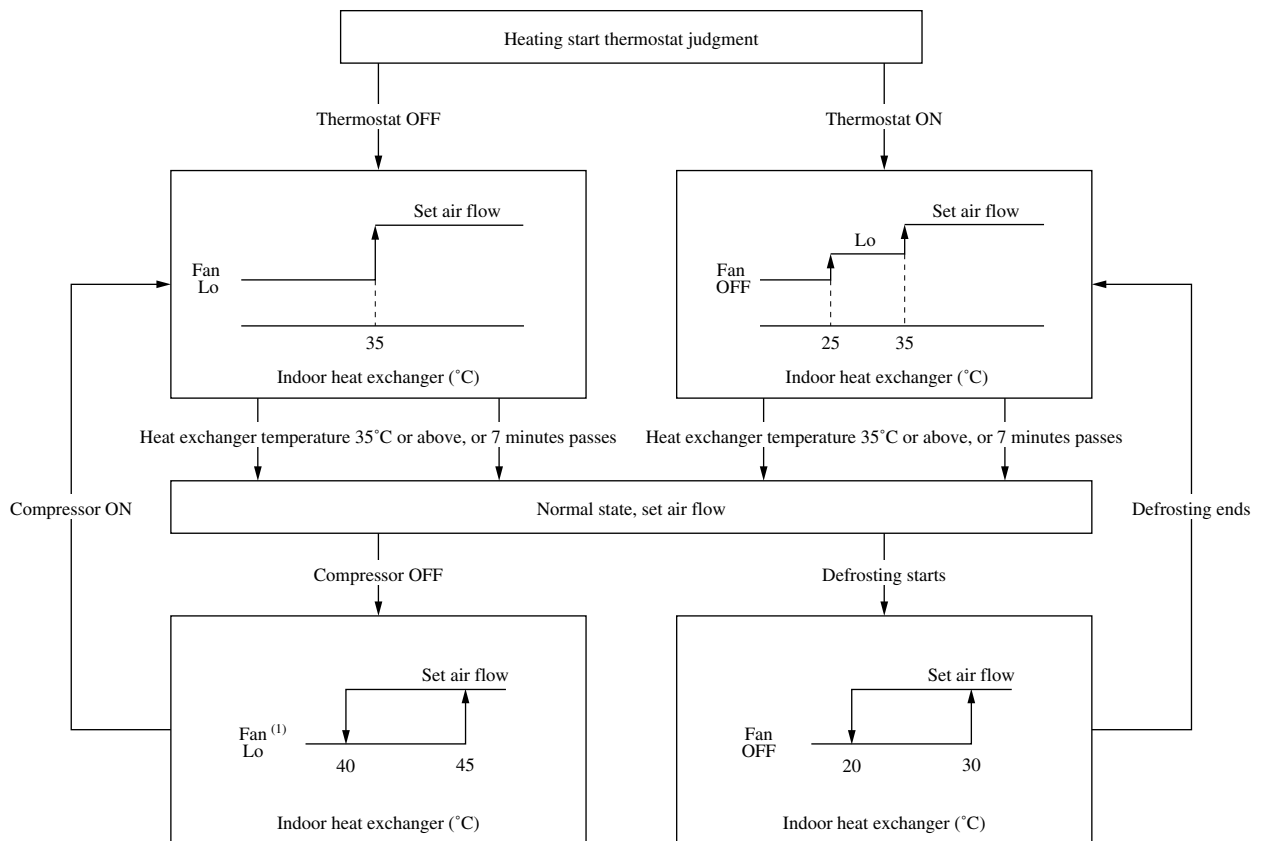
5) Possible joint use timer operation setting combinations

	Simple Timer	Time Off Timer	Time On Timer	Weekly Timer
Simple Timer	/	×	○	×
Time Off Timer	×	/	○	×
Time On Timer	○	○	/	×
Weekly Timer	×	×	×	/

Note (1) ○: Possible, ×: Impossible

**(f) Hot start (Cold draft prevention during heating)**

When heating operation starts, when the thermostat is reset, during a defrosting operation or when resetting a heating operation, in order to prevent a cold draft, the indoor heat exchanger (sensed by Thi-R1 and R2) control the indoor fan.

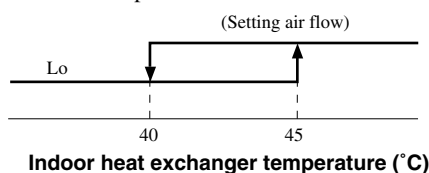


Notes (1) If J2 starts, it changes from OFF to Lo for 5 minutes.

(2) During Hot Start (the compressor is operating and the indoor fan is not operating at the set air flow), Heating preparation is displayed.

**(g) FM control with the heating thermostat turned off (For cold draft prevention)**

In order to prevent a cold draft while the heating thermostat is turned off, the indoor blower is controlled in response to the temperature of the indoor heat exchanger as illustrated below. It should be noted that if jumper wire J2 (SW7-2) on the indoor PCB is turned off, the indoor blower will stop so far as the temperature of the indoor heat exchanger is lower than 40°C. It will be turned to the Lo operation 5 minutes later.

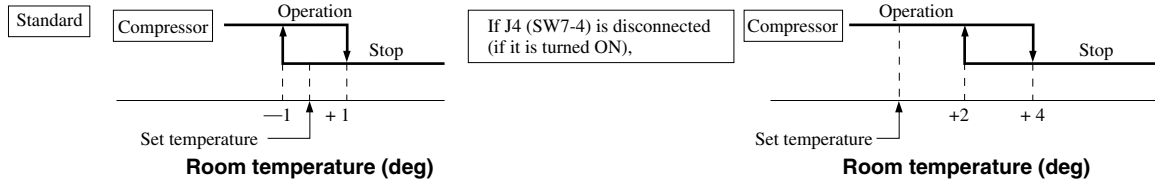


Note (1) After the thermostat is reset, it returns to the hot start control.



**(h) Room temperature sensing temperature compensation during heating**

In the standard specifications, the temperature set on the thermostat is used to turn the compressor on and off, but in cases where the warm air easily escapes to the ceiling and the thermostat ends up turning off too soon, Jumper wire J4 (SW7-4) on the indoor PCB can be disconnected. When this is done, the compressor can be turned ON and OFF at the set temperature +3 degrees, and the feeling that the room is heated can be improved. However, the upper limit for the set temperature is 30°C.



**(i) Filter sign**

If operating time (the length of time the ON/OFF switch is ON) totals 180 hours<sup>(1)</sup>, “FILTER CLEANING” is displayed on the remote control unit. (This is displayed whether the system is running or not, when the unit is broken down, and when there is central control.)

Notes (1) The following controls are enabled by the combination of the ON/OFF settings of 2 switches on the indoor unit PCB, SW5-3 and SW5-4. (They are switched OFF when the unit is shipped from the factory. The setting time is 180 hours.)

Switch	Function
SW5-3 OFF	Setting time: 180 hrs. (when shipped from factory)
SW5-4 OFF	
SW5-3 OFF	Setting time: 600 hrs. (Display)
SW5-4 ON	
SW5-3 ON	Setting time: 1000 hrs. (Display)
SW5-4 OFF	
SW5-3 ON	Setting time: 1000 hrs. (Unit stop) <sup>(2)</sup>
SW5-4 ON	

(2) The message “FILTER CLEANING” is displayed after the setting time has passed, then the unit stops after another 24 hours have passed (including stop time).

**(j) Auto swing control (Except the FDUR model)**

1) Louver Control

- a) While the air conditioner is operating, press the “LOUVER” switch. “AUTO ” is displayed for 3 seconds and the swing louvers move up and down continuously.
- b) When fixing the position of the swing louvers, press the “LOUVER” switch once while the swing louvers are moving. 4 stop positions are displayed in sequence at 1-second intervals. When the display comes to the position where you would like to stop the louvers, press the “LOUVER” switch once more. The display will stop the message (ex. “STOP ”) will be displayed for 3 seconds, then the swing louvers will stop.
- c) Louver operation when the louver 4-position controller’s power goes On. When the power is turned ON, the louvers automatically swing 1 time automatically (without remote control operation). This is done so that the microcomputer can confirm the louver’s position and input the louver motor’s (LM) position to the microcomputer.

Note (1) When the “LOUVER” switch is turned ON, the louver position LCD display displays the swing operation for 10 seconds. Then “AUTO ” is displayed for 3 seconds.

**2) Auto louver horizontal set during heating**

During display of “ ” (Heating Preparation) (during hot start and heating thermostat OFF), the louvers are in the horizontal position regardless of the operation of the auto swing switch (auto swing and louver stop). (In order to prevent cold drafts.) Also, the louver position display LCD continues the previous display from before this control started.

If the “ ” (Heating Preparation) display goes off, the LCD display also returns to the original display.

**3) Louver free stop control**

Setting an open circuit with jumper wire J5 (SW8-1), used for setting louver free stop, causes the louver motor to stop if there is a stop signal from the remote control unit and saves the position of the louver in memory. Then if there is an auto swing signal from the remote control unit, auto swing control starts from the previous stop position.

**(k) Condensate pump motor (DM) Control [FDT and FDUR models only]**

- (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 performed by the float switch at all times regardless of the operating mode. If the float switch circuit is detected to be open continuously for 3 seconds (or when the float switch is disconnected or a wire is broken), an abnormal stop (E9) is performed and the condensate pump motor runs until the float switch recovers.

**(l) Air flow mode control**

Air flow mode control can be changed using DIP switch SW9-4 on the indoor PCB.

**FDT, FDEN, FDKN models**

DIP SW Item	SW9-4 OFF (Mild Mode Control)	SW9-4 ON (Powerful mode Control)
Air flow mode	Hi, Me, Lo	UHi, Hi, Me

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

**FDUR model**

DIP SW Item	SW9-4 OFF (Standard)	SW9-4 ON (High speed)
Air flow mode	Hi, Lo	UHi, Hi

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

**(m) Compressor inching prevention control**

**1) 3-minute timer**

If the compressor stops due to operation of the thermostat, the Run switch on the remote controller or some trouble, it is not restarted after 3 minutes. However, when the power is turned ON, the 3-minute timer becomes inactive.

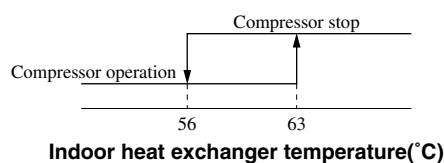
**2) 3-minute forced operation timer**

- a) For 3 minutes after the compressor goes ON, it does not stop. However, it will stop if the Run/Stop button is pressed and through a change in the operation mode, it will stop immediately when the thermostat goes OFF.
- b) During 3-minute forced operation timer control in heating operation, if the thermostat goes OFF, the louver position is set in the horizontal position.

Note (1) The compressor stops when protection control starts.

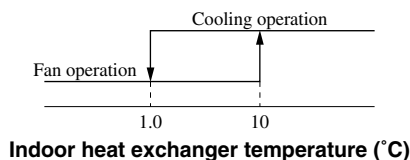
**(n) Heating overload protection**

If a temperature of 63°C or higher is detected in the indoor heat exchanger continuously for 2 seconds (sensed by Thi-R1 of R2), the compressor stops. After a 3-minute delay, the compressor is restarted. If a temperature of 63°C or higher is detected continuously for 2 seconds 5 times within 60 minutes of the first detection, an abnormal stop is performed (E8). Detection of a temperature of 63°C or higher in the indoor heat exchanger continuously for 6 minutes also results in an abnormal stop.



**(o) Frost prevention during cooling, dehumidification**

If an indoor heat exchanger temperature is 1°C or lower is detected (by Thi-R1 or R2) when 9 minutes have passed since the compressor went ON, the compressor stops. The compressor runs when the indoor heat exchanger temperature becomes 10°C or higher.



**(p) Thermistor (Return air, heat exchanger) disconnected wire detection.**

If the temperature sensed by the thermistor is -50°C or lower continuously for 5 seconds, the compressor stops. After a 3-minute delay, the compressor is restarted, but if a recurrence is detected within 60 minutes of the 1st time, or if it is sensed continuously for 6 minutes, it results in an abnormal stop (E6, E7).

**(q) Using 1 remote controller to control multiple units (indoor units - up to 16 units)**

**1) Function**

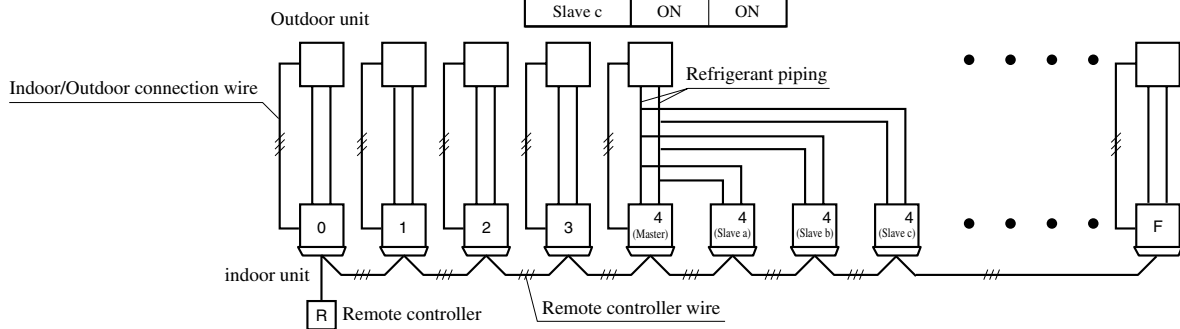
A single remote control switch can be used for group control of multiple units (indoor units - up to 16 units). All units in the group that have had the remote control switch set at [Operating Mode] can be turned on and off in order of the unit number.

This functions independently of the thermostat and protection functions of each unit.

Notes (1) Set the Unit No. using SW2 on the indoor unit's control PCB. It is necessary to set the unit No. using SW2 in the indoor unit only. Setting of master and slave units is necessary for twin, triple or double twin specifications. SW5 can be switched. (All units are set as master units when shipped from the factory.)

SW2: Set on 0-9, A~F.  
SW5: Set the master and slave unit.  
(See the table at right.)

Unit	Set SW5	
	SW5-1	SW5-2
Master	OFF	OFF
Slave a	OFF	ON
Slave b	ON	OFF
Slave c	ON	ON



(2) If unit number is not important, random can be used. However, setting in order from 0, 1, 2, to F will ensure setting without error.

**2) Display to remote controller**

**a) Remote or center and heating preparation:** Displays for the youngest unit for the remote mode (center mode if there is no remote mode) of the units in operation.

**b) Inspection and filter sign:** Displays either to the first corresponding unit.

**3) Confirmation of connected units**

Pressing the "AIR CON No." switch on the remote control unit displays the indoor unit address. Pressing the ▲ or ▼ button displays the indoor units in the order of lowest to highest assigned No.

**4) Error**

**a)** If an error occurs (protection device activation) with some of the units in the group, those units will have an error stop, but the properly operating units will continue operation.

**b) Wiring outline**

Route the wire connecting each of the indoor and outdoor units as it would be for each unit. Use the terminal block (X, Y, Z) for the remote control for the group controller and use a jumper wire among each of the rooms.

**(r) External control (remote display)/control of input signal**

**1) External control (remote display) output**

Following output connectors (CnT) are provided on the control circuit board of indoor unit.

- Operation output: Power to engage DC 12V relay (provided by the customer) is outputted during operation.
- Heating output: Power to engage DC 12V relay (provided by the customer) is outputted during the heating operation.
- Compressor ON output: Power to engage DC 12V relay (provided by the customer) is outputted while the compressor is operating.
- Error output: When any error occurs, the power to engage DC 12V relay (provided by the customer) is outputted.

## 2) Control of input signal

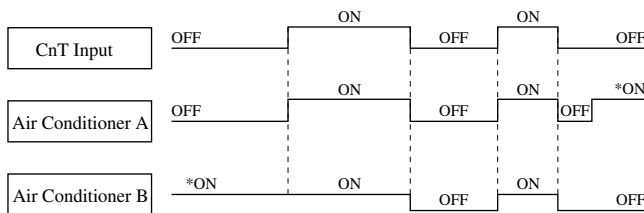
(Make sure to connect the standard remote control unit. Control of input signal is not available without the standard remote controller.)

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.

a) At shipping from factory J1 on PCB OFF

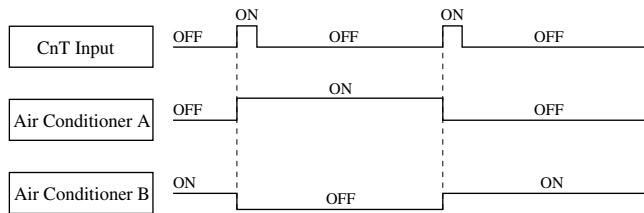
- Input signal to CnT OFF → ON [Edge input] ... Air conditioner ON
- Input signal to CnT ON → OFF [Edge input] ... Air conditioner OFF



Note (1) The ON at the \* mark indicates ON using the remote control switch, etc.

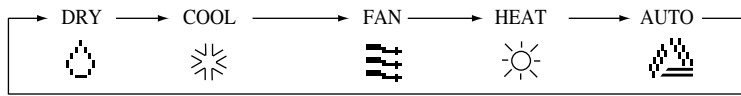
b) When J1 on the PCB of indoor unit is turned on at the field.

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



**(3) Operation control function by the wired remote controller**

**(a) Remote controller operation mode switch switching sequence**



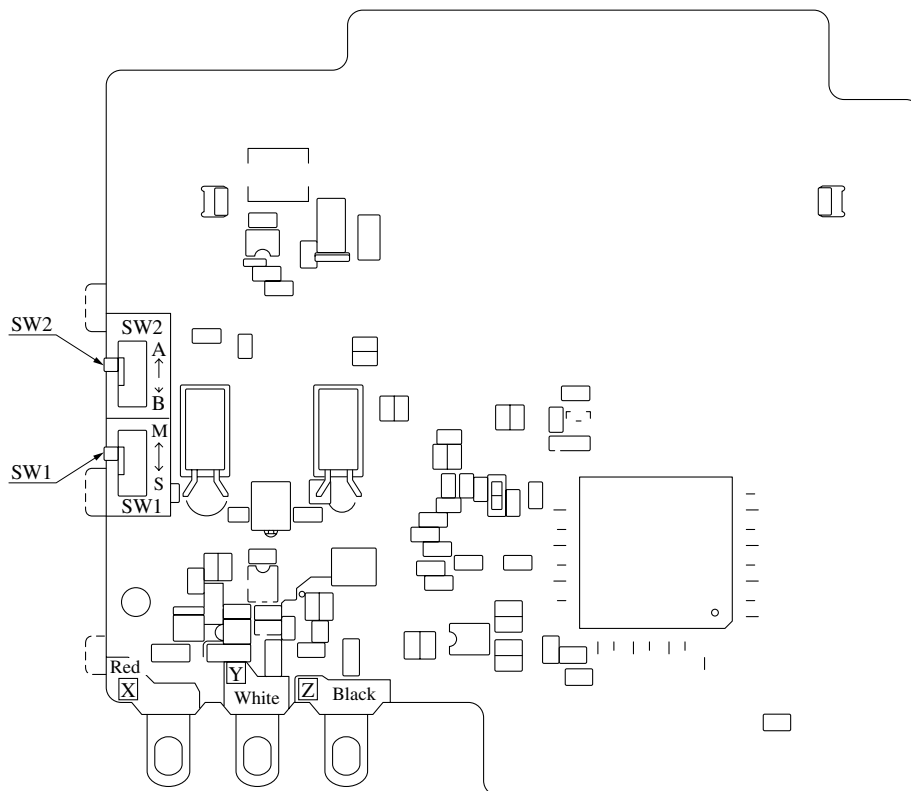
**(b) CPU reset**

If the “GRILL” switch and “CHECK” switch on the remote controller are pressed at the same time, this function is activated. Power supply reset and run are the same.

**(c) Power failure compensation function**

This function is activated by setting “Activate Power Failure Compensation” using the remote control function settings. Normally, the remote control’s state is recorded in memory and after recovery following a power failure, operation is re-started in accordance with the contents in memory. However, the auto swing stop position, and the timer mode are cancelled, However the weekly timer setting is reset with the “Holiday setting” set for all day.

**Remote controller board parts arrangement**



**Control select switch (SW1)**

Switch	Function	
SW1	M	Master remote controller
	S	Slave remote controller

Note (1) SW2 is not normally used, so do not change the selection.

**(4) Operation control function by the outdoor controller**

**(a) Compressor Starting Control (FDCA801, 1001 models only)**

The controls in 1) and 2) are performed at the moment when compressor operating conditions are met.

- 1) If the operating mode is the same as the mode the first time the compressor started after the power was turned ON or the same as the operating mode the previous time.

The oil return solenoid valve (SV6) and expansion valve auxiliary solenoid valve (SV7 (in the 1001 model only)) go ON, then the compressor starts 5 seconds later.

- 2) If the operating mode changes from the previous operating mode.

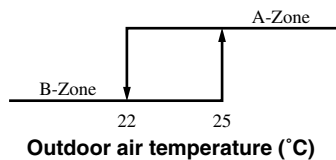
The 4-way valve switches after 10 seconds, each solenoid valve in item 1) goes ON, then 20 seconds later, the compressor starts.

**(b) Outdoor fan control**

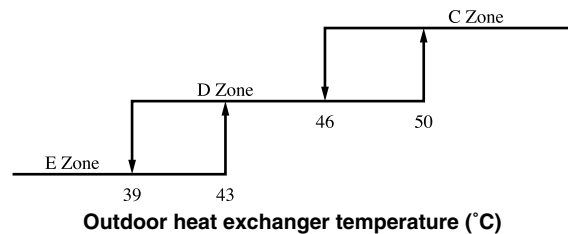
**◆ FDCA301~ 601 models only**

**1) Outdoor fan tap control during cooling**

The outdoor fan is controlled according to the outdoor heat exchanger temperature (sensed by Tho-R) and outdoor air temperature (sensed by Tho-A).

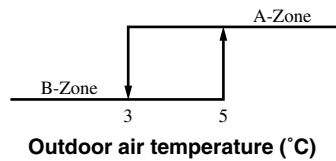


Zone	A	B
C	UHi	
D	Hi	
E	Hi	Lo

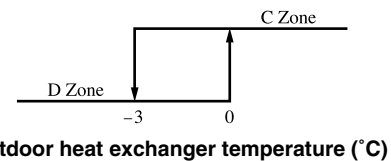


**2) Outdoor fan tap control during heating**

The outdoor fan tap is controlled in accordance with the outdoor heat exchanger temperature (sensed by Tho-R) and the outdoor air temperature (sensed by Tho-A).



Zone	A	B
C	Hi	
D	Hi	UHi



**3) Outdoor fan tap control during heating high pressure control**

- a) If the compressor is started with an outdoor air temperature (sensed by Tho-A) of 12°C or higher, the outdoor unit's fan motor is turned OFF for 4 minutes, then after 4 minutes of operation, control switches to outdoor fan tap control in item 2).
- b) If the outdoor air temperature (sensed by Tho-A) becomes 12 °C or lower with the outdoor fan motor OFF, operation continues for 4 minutes with the outdoor fan motor OFF.

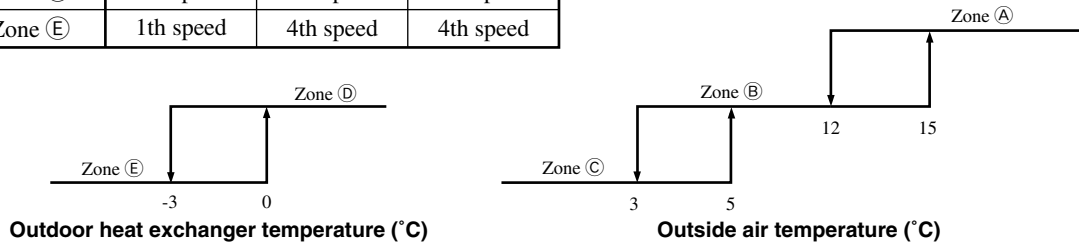
**◆ FDCA801, 1001 models only**

**1) Fan speed and fan motor control contents during control**

Fan speed	FM01	FM02
4 th speed	Hi	Hi
3 th speed	Hi	Lo
2 th speed	Lo	Lo
1 th speed	Lo	OFF
0 th speed	OFF	OFF

2) During heating operation, the fan speed is controlled in accordance with the outdoor heat exchanger temperature (detected by Tho-R) and the outside air temperature (detected by Tho-A).

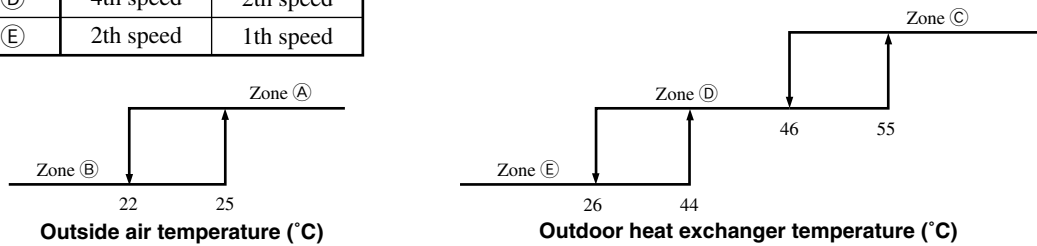
	Tho-A	Zone (A)	Zone (B)	Zone (C)
Tho-R	Zone (D)	1th speed	4th speed	4th speed
	Zone (E)	1th speed	4th speed	4th speed



Notes (1) The temperature at whichever outdoor heat exchanger temperature thermistor (Tho-R1 or R2) has the lowest reading is detected.

3) The fan speed is controlled in accordance with the outdoor heat exchanger temperature (detected by Tho-R) and the outside air temperature (detected by Tho-A) during cooling or dehumidifying.

	Tho-A	Zone (A)	Zone (B)
Tho-R	Zone (C)	4th speed	4th speed
	Zone (D)	4th speed	2th speed
	Zone (E)	2th speed	1th speed



Notes (1) The temperature at whichever outdoor heat exchanger temperature thermistor (Tho-R1 or R2) has the highest reading is detected.

4) Outdoor fan speed control during heating

a) If the fan starts when the outside air temperature (detected by Tho-A) is 12°C or higher, the outdoor fan motor runs at speed A for 4 minutes, then after 4 minutes control switches to the outdoor fan speed control in item 2).

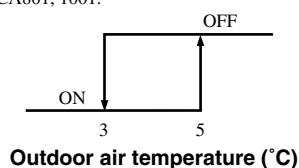
	Control speed	Speed A
Model	801H	1th speed
	1001H	0th speed

b) Even if the outside air temperature (detected by Tho-A) drops below 12°C during operation with the outdoor fan motor OFF, the outdoor fan motor continues to run at 2th speed for 4 minutes.

(c) Snow protection fan control

If SW5-2 (SW3-2) on the outdoor unit PCB is turned ON, a full stop results. Then in the abnormal stop mode and with the thermostat OFF unit's outdoor fan outdoor temperature at 3°C or lower, the fan is run for 10 seconds at 6th speed once every 10 minutes [Hi tap (4th speed)].

Note (1) Items is ( ) show in the case of models FDCA801, 1001.



**(d) Defrosting**

1) Defrosting start conditions

Defrosting operation starts when all the following conditions are satisfied.

- a) If 45<sup>(1)</sup> minutes of cumulative compressor operating time have passed since defrosting ended and cumulative compressor operating time of 30 minutes have passed since heating operation started (Remote controller: ON)

Note (1) In the case of FDCA301~601, the cumulative time can be changed to 37 minutes by opening jumper J7 (SW6-3) on the outdoor unit's PCB.

- b) If 5 minutes have passed since the compressor went ON.
- c) 5 minutes of outdoor fan operation have passed.
- d) After all the above conditions have been met, when the temperature sensed by the outdoor heat exchanger temperature thermistor (Tho-R) and outdoor temperature thermistor (Tho-A) continues for 30 (15) seconds and drops below the dehumidifying operation start temperature shown in the figure at right.

Note (1) Values in ( ) show in the case of the FDCA801, 1001 models.

2) Defrosting start temperature change procedure

Turn SW5-1 (SW3-1) on the outdoor unit PCB ON.

- a) A cumulative total of 30 minutes of compressor operating time has passed since defrosting ended.
- b) When the temperature at the outdoor heat exchanger thermistor (Tho-R) and the temperature at the outdoor air temperature thermistor (Tho-A) is below the defrost operation start temperature continuously for 30 (15) seconds.
- c) Other than items a) and b), the same as standard conditions.

Note (1) Values in ( ) show in the case of the FDCA801, 1001 models.

3) Defrosting end conditions

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

◆ Models FDCA301~601 only

- a) If 10 minutes<sup>(1)</sup> have passed since defrosting started.
- b) If the temperature at the outdoor heat exchanger thermistor (Tho-R) is 14°C or higher continuously for 2 seconds.

Notes (1) This setting can be changed to 12 minutes by turning SW5-1 on the outdoor unit PCB ON.

(2) When jumper wire J6 (when SW6-2 OFF) is open, raise the defrosting end temperature and carry out forced defrosting.

◆ Models FDCA801, 1001 only

- a) When 10 minutes 20 seconds have passed since dehumidifying started.
- b) When the outdoor heat exchanger thermistor (Tho-R) senses a temperature of 12°C or higher continuously for 10 seconds.

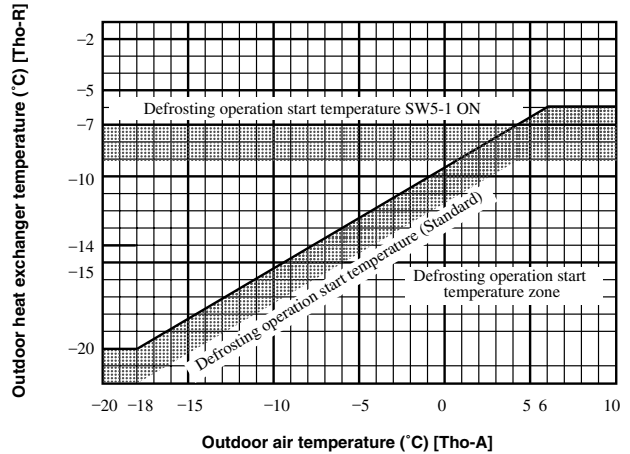
**(e) Compressor protection control**

**(i) Compressor overcurrent protection**

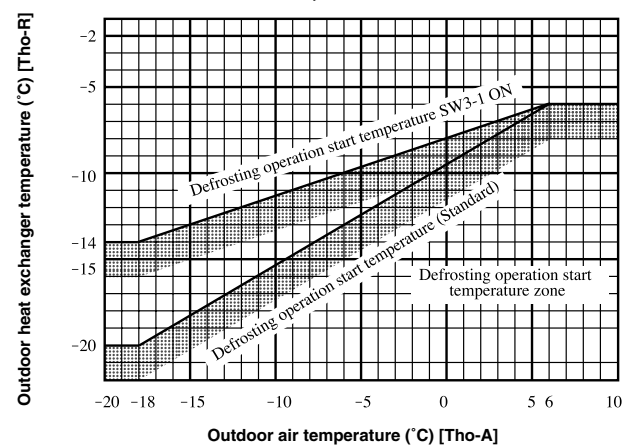
◆ Models FDCA301~601 only

- 1) If a value at or higher than the set value is detected continuously for approximately 0.5 second in the L1 and L2 phases (1 phase model: L phase) on the secondary side of the 52C (sensed by the current sensor (CT)), the compressor stops. After a 3-minute delay, the compressor restarts if the detected current is 1.5 ~ 2 A or lower, but if this condition is repeated 5 times within 60 minutes of the first detection, the unit is subjected to an abnormal stop (E33).

◆ Models FDCA301~601



◆ Models FDCA801, 1001





- 2) After the compressor stops the first time, if 60 seconds pass with the detected current not dropping to 1.5~2 A or lower for 60 minutes, An abnormal stop is performed after the first time.

◆ **Models FDCA801, 1001 only**

- 1) If an overcurrent of 20A or greater is detected 5 times in 60 minutes after the compressor goes ON, or if an overcurrent of 20A or greater is detected continuously for 60 minutes while the compressor is stopped, an abnormal stop (E33) occurs.  
 2) If the overcurrent is detected to be 1.5 ~ 2A, operation recovers automatically.

(ii) **Reverse phase and out of phase detection**

1) **Reverse phase protection**

The phase sequence in the 52C secondary side is detected, and in cases other than those shown below, reverse phase is judged and the unit is subjected to an abnormal stop (E32).

<b>Terminal block display</b>	L1 · L2 · L3 · N
<b>Wire connections</b>	L1 · L2 · L3 · N
	L3 · L1 · L2 · N
	L2 · L3 · L1 · N

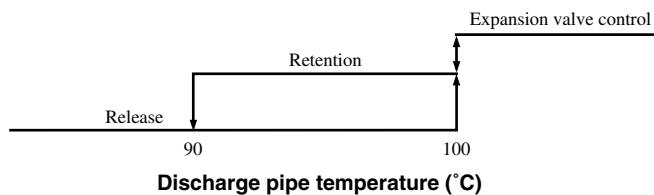
2) **Out of phase detection (Detected by the T-phase)**

If a current of 1.5 ~ 2A or lower is detected continuously for 4 seconds during compressor operation, the compressor is stopped. If it is detected again within 60 minutes after it is detected the first time, and if it is detected while the compressor is ON within 10 minutes after the power is turned ON (FDCA801, 1001 only), an abnormal stop (E34) occurs.

(iii) **Discharge pipe temperature control (Models FDCA301~601 only)**

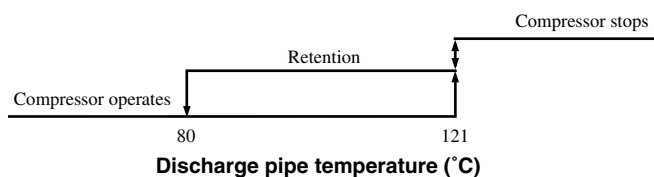
If the discharge pipe temperature (sensed by Tho-D) exceeds the set value, the expansion valve opening angle is controlled to prevent the discharge pipe temperature from rising. If it continues to rise anyway, the compressor is stopped.

1) **Compressor speed (Expansion valve) control**



2) **Abnormal discharge pipe temperature**

- a) If the discharge pipe temperature rises to 121°C or higher, the compressor is stopped [the outdoor unit's fan motor stops 30 seconds later. If the temperature drops to 80°C or lower, the compressor recovers automatically.

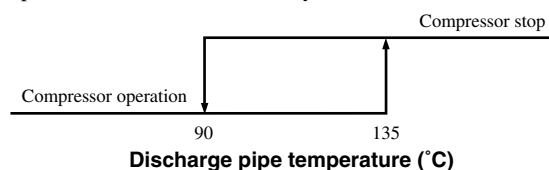


- b) If the abnormal discharge pipe temperature occurs 5 times in 60 minutes, or continues at 121°C or higher for 60 minutes, including when the compressor is stopped, the unit performs an abnormal stop (E36).

Note (1) If the abnormal discharge pipe temperature continues for 45 minutes from the time it first occurs and does not drop below 80°C, the compressor cannot be operated again.. (It can be reset using the remote control unit.)

(iv) **Abnormal discharge pipe temperature (Models FDCA801, 1001)**

- 1) If the discharge pipe temperature rises to 135°C or higher, the compressor stops. If the temperature drops to 90°C or lower, the compressor recovers automatically.



- 2) If the discharge pipe temperature is abnormal 5 times within 60 minutes, including when the compressor is stopped, or is 135°C or higher continuously for 60 minutes, then unit undergoes an abnormal stop (E36).

**(v) High pressure control**

**◆ Models FDCA301~601 only**

**1) Heating**

- a) After the compressor starts, the temperature at the indoor heat exchanger temperature (ThI-R) is checked, and when all the following conditions are met, the electronic expansion valve (EEV) is controlled to control the high pressure rise.
- ① The indoor heat exchanger temperature (ThI-R) is 60 (56)°C or higher while the compressor is running.
  - ② The electronic expansion valve's (EEV) opening angle is 470 pulses or lower.
- b) This control ends when the indoor heat exchanger temperature (ThI-R) becomes 57 (54) °C or lower.

Note (1) Values in ( ) show the setting when DIP switch SW 5-3 is ON. (It is normally OFF.)

**2) Cooling**

- a) After the compressor starts, when all the following conditions are met, the electronic expansion valve (EEV) is controlled to control the high pressure rise.
- ① The outdoor heat exchanger temperature (Tho-R) is 58°C or higher while the compressor is running.
  - ② The outdoor air temperature (Tho-A) is 41°C or higher.
  - ③ The outdoor fan motor runs continuously for 30 seconds or longer at the UHi tap.
  - ④ The electronic expansion valve's (EEV) opening angle is 470 pulses or lower.
- b) This control ends when the temperature at the outdoor heat exchanger (Tho-R) becomes 53°C or lower.

**3) High pressure abnormal**

**a) Heating, cooling**

- ① If the high pressure switch (63H1) opens (4.15 MPa), the compressor stops (the outdoor unit's fan motor stops after running for 30 seconds longer). After a 3-minute delay, when the high pressure switch (63H1) is restored to the closed state (3.15 MPa), the compressor restarts. If the same condition occurs 5 times within 60 minutes after the first detection, an abnormal stop is performed and an error message (E40) is displayed.

**b) Cooling**

- ① If the outdoor heat exchanger temperature (sensed by Tho-R) is 65°C or higher 5 times within 60 minutes while the compressor is operating, or if that temperature is detected continuously for 60 minutes, an abnormal stop is performed.
- ② If the outdoor heat exchanger temperature becomes 48°C or lower, it becomes possible to reset the unit using the remote control unit.

**◆ Models FDCA801, 1001 only**

**1) High pressure control during heating**

- a) When the pressure at the high pressure switch (63H2) during operation in the heating mode is 3.24 MPa or higher, the outdoor fan and electronic expansion valve (EEVH1, 2)for heating are controlled and increases in the high pressure are prevented.
- b) When either of the following conditions exists
- ① This control ends when pressure at the high pressure switch (63H2) drops to 2.65 MPa or lower.
  - ② If this control continues intermittently for 30 minutes, this control ends and the compressor is stopped.

**2) Abnormality detection control using the high pressure switch (63H1)**

If the high pressure switch (63H1) is open (4.15 MPa), the compressor stops. After a 3-minute delay, when the high pressure switch (63H1) recovers (3.15 MPa), the compressor is restarted. If this condition is detected 5 times within 60 minutes after it is detected the first time, an abnormal stop occurs and an error message (E40) is displayed.

**3) Abnormal high pressure control using the outdoor heat exchanger temperature (Tho-R1, R2)**

- a) If the outdoor heat exchanger temperature sensors Tho-R1 or Tho-R2 detect a temperature of 65°C or higher in the cooling mode during compressor operation, stop control is carried out. This control ends when the outdoor heat exchanger temperature drops to 48°C or lower.
- b) When an outdoor heat exchanger temperature of 65°C or higher (Tho-R1, R2) is detected 5 times in 60 minutes, or if it is detected continuously for 60 minutes, including when the compressor is stopped, an abnormal stop (E35) occurs.

**(vi) Abnormal low pressure detection control (FDCA801, 1001 only)**

- 1) The compressor is stopped when the following conditions are satisfied.
- ① When the low pressure sensor detects a pressure of 0.079 MPa or lower continuously for 15 seconds after the compressor starts operating.
  - ② Superheat (SH) rises to 30°C or higher continuously for 60 seconds when the pressure detected by the low pressure sensor is 0.120 MPa or lower 10 minutes or longer after the compressor starts.
- 2) The compressor recovers when the pressure detected by the low pressure sensor rises to 0.128 MPa or higher.
- 3) If the condition in ① or ② of item 1) above is detected 3 times within 60 minutes, or if a pressure of 0.079 MPa or lower is detected continuously for 5 minutes or longer by the low pressure sensor, an abnormal stop (E49) occurs.

**(f) Detection of disconnected wires in temperature thermistors (outdoor heat exchanger, outside air temperature, discharge pipe, suction pipe, under-dome) and low pressure sensor.**

**1) Outdoor heat exchanger temperature thermistor, outside air temperature thermistor and low pressure sensor**

If the following conditions are detected 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 is restarted, but if the same condition is detected 3 times within 60 minutes (within 40 min.), an abnormal stop occurs.

Note (1) For 3 minutes after dehumidifying and defrosting are finished (2 min ~ 2 min. 20 seconds), there is no detection.

- Outdoor heat exchanger temperature thermistor: -30 (-50) °C or lower.
- Outside air temperature thermistor: -30°C or lower
- Low pressure sensor thermistor: 0V or lower, or 3.49 V or higher (FDCA801, 1001 only)

Note (1) Values in ( ) show in the case of the FDCA801, 1001 models.

**2) Discharge pipe temperature thermistor, suction pipe temperature thermistor, under-dome temperature thermistor**

If the following conditions are detected 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 is restarted, but if the same condition is detected 3 times within 60 minutes (within 40 min.), an abnormal stop occurs.

Note (1) For 3 minutes after dehumidifying and defrosting are finished, there is no detection.

- Discharge pipe temperature thermistor: -10°C or lower
- Suction pipe temperature thermistor: -50°C or lower (FDCA801, 1001 only)
- Under-dome temperature thermistor: -50°C or lower (FDCA801, 1001 only)

Note (1) Values in ( ) show in the case of the FDCA801, 1001 models.

**(g) Insufficient refrigerant protection control**

1) 3 minutes after the compressor starts in the case of cooling and dehumidification, and 4 minutes after in the case of heating, the indoor heat exchanger temperature (sensed by Thi-R) and indoor return air temperature (sensed by Thi-A) are detected and at the point when all the following conditions are satisfied, stop control is performed.

- a) When the following conditions are detected continuously for 5 minutes or longer.
- During cooling and dehumidification: The indoor heat exchanger temperature (Thi-R) is 4 degrees higher than the indoor return air temperature (Thi-A).
  - During heating: The indoor heat exchanger temperature (Thi-R) is 6 degrees lower than the indoor return air temperature (Thi-A).

b) If the controls in item a) are implemented 3 times within 30 minutes, an abnormal stop is performed and an error message is displayed (E57).

2) If the compressor is starting for the first time after the power is turned ON, and abnormal stop is performed the first time and an error message (E57) is displayed.

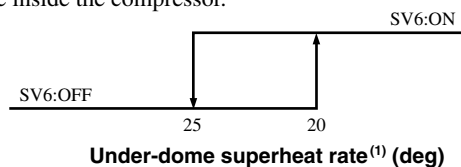
Note (1) A defrost operation or pump down control are excluded.

**(h) Low voltage protection control**

If a power supply voltage of 176 V or lower is detected while the compressor is stopped, or if a power supply voltage of 176 V or lower is detected for 3 minutes during compressor operation, the compressor is stopped.

**(i) Oil return solenoid valve (SV6) control (Models FDCA801, 1001 only)**

During compressor operation, signals from the under-dome temperature sensor are sent to the oil return solenoid valve (SV6) to control the dilution rate inside the compressor.



Note (1) The under-dome superheat rate is the under-dome sensor value. It is a value determined by the intake pressure saturation temperature.

**(o) Test operation**

1) It is possible to operate the outdoor unit using SW2 (SW3) and SW5-4 (SW3-4) on the outdoor unit PCB.

<b>SW2 (SW3)</b>	After pressing continuously for 1 second	<b>SW5-4 (SW3-4)</b>	OFF	Cooling test operation
		<b>SW5-4 (SW3-4)</b>	ON	Heating test operation
Test operation is ended by pressing SW2 (SW3) during test operation.				

Note (1) Items in ( ) show in the case of FDCA801, 1001 models.

- 2) Test operation control
  - a) Each protective control and abnormal sensing control is activated.
  - b) If SW5-4 (SW3-4) is switched back during test operation, stop control is implemented and the cooling and heating operations are toggled.
  - c) Remote control unit settings and displays during test operation

Mode \ Capacity	Remote control unit settings, display contents
Cooling operation	Cooling. The initial setting temperature is 5°C. The temperature at the indoor unit's heat exchanger is displayed in the return air temperature display.
Heating operation	The initial set temperature for heating (preparation) is 30°C and the return air temperature is displayed in the return air temperature display.

Note (1) Items in ( ) show in the case of FDCA801, 1001 models.

**(j) Pump down control (Models FDCA801, 1001 only)**

If the pump down switch (SW3-5) is turned ON during an operation stop or during an abnormal stop (except when the thermostat is OFF), pump down operation starts. (This control is invalid during indoor unit operation. It is valid during indoor unit abnormal stop or when the indoor units are OFF.)

**1) Control contents**

- a) The compressor starts in the cooling mode.
- b) The red and green (LED's) on the outdoor unit control board blink continuously.
- c) Each protective and abnormal detection control is valid except low pressure control.
- d) The outdoor fan is controlled as normal.
- e) The electronic expansion valve (cooling, heating) is fully open.

**2) Control end conditions**

Stop control is executed when any of the following conditions exists.

- a) A low pressure of 0.87 MPa or lower is detected (PSL).
  - Ⓐ Red LED: On continuously, Green LED: Blinking; shows a remote control stop.
  - Ⓑ When the low pressure (PSL) rises above 0.87 MPa, it is possible to restart.
  - Ⓒ The electronic expansion valve (cooling, heating) is fully open.
- b) Stopped by Error Detection Control
  - Ⓐ Red LED: Blinks continuously, Green LED: Blinks.
  - Ⓑ Restarting is impossible. Reset the power supply to resume normal operation.
  - Ⓒ The electronic expansion valve (cooling, heating) is fully open.
- c) The compressor's cumulative operating time under pump down control becomes 5 minutes.
  - Ⓐ Red LED: Off, Green LED: Blinks, Remote control stop.
  - Ⓑ Resumption of pump down control is possible.
  - Ⓒ The electronic expansion valve (cooling, heating) is fully open.

Caution: Communications with the indoor units is cancelled when the pump down switch is pressed, so E5, "Transmission Error" is displayed by the indoor units and the remote controller. However, there is no error.

## 5 APPLICATION DATA


# SAFETY PRECAUTIONS

- Please read these “Safety Precautions” 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 specializing in this type of installation. 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 properly rated for the weight in lifting it for portage. An improper manner of portage can result in a fail of the unit resulting in an accident involving personal death or injury.
- When installing a unit in a small room, take measure so that if the refrigerant leaks, it does not exceed the concentration limit. For information regarding measures to prevent the concentration limit from being exceeded, please contact the dealer.
- If 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 circuit for the equipment. If the power supply circuit capacity is insufficient or the work is not done correctly, 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 cables from being pulled 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 personal 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 electricity 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. If grounding is not performed correctly electric shock could occur.
- Depending on the installation location, a circuit breaker may need to be installed. If 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. If 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 fan 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 over-tighten 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-tightness 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 right side and perfect draining can be assured.
- 2) With the customer's consent, select a location with following suitable conditions.
  - a) Where cool air or hot air can easily pass through.
  - 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 erroneously, 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%.

Model	Space above ceiling (h)
FDT151, 201, 251, 301	Over 290mm
FDT401	Over 315mm
FDT501	Over 385mm

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.

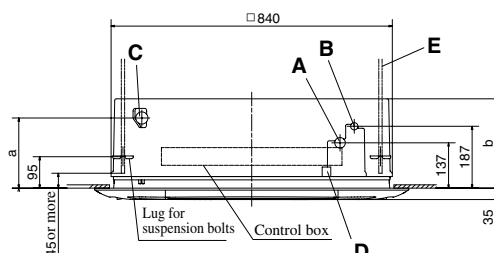
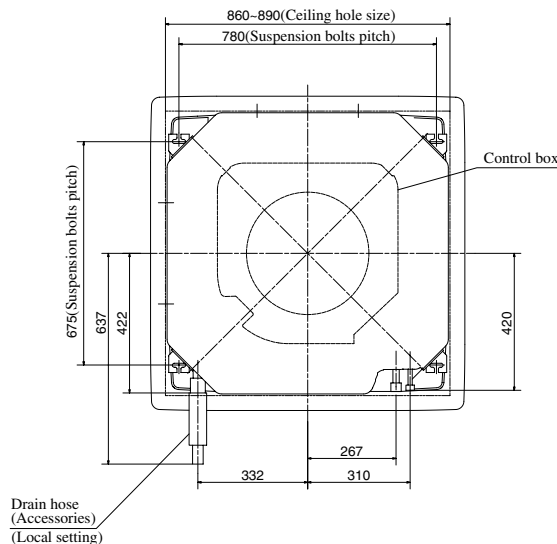
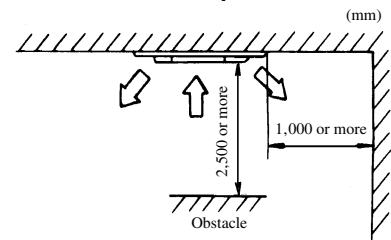
- 3) Consider the supporting strength of the location. If the strength is not sufficient to sustain the unit weight, use reinforcing materials.

( 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. )

#### (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.

#### • Installation space



A	Gas tube connecting port
B	Liquid tube connecting port
C	Drain line connecting port
D	Power intake
E	Hanging bolt

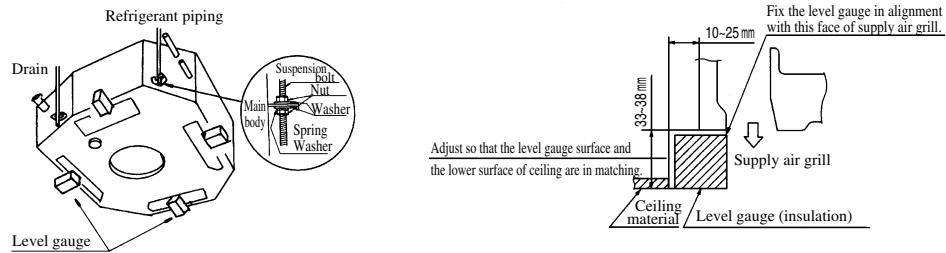
Model	a	b
FDT151, 201, 251, 301	212	270
FDT401	212	295
FDT501	269	365

### (c) Suspension

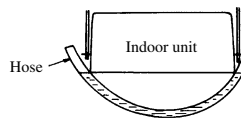
- Please arrange four sets of a suspension bolt (M10 or M8), a nut matching the bolt, a flat washers and a spring washer on the installation site.

#### When suspension from the ceiling

- 1) In the case of the standard series: Cut and opening of □860~□890.  
In cutting an opening 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)



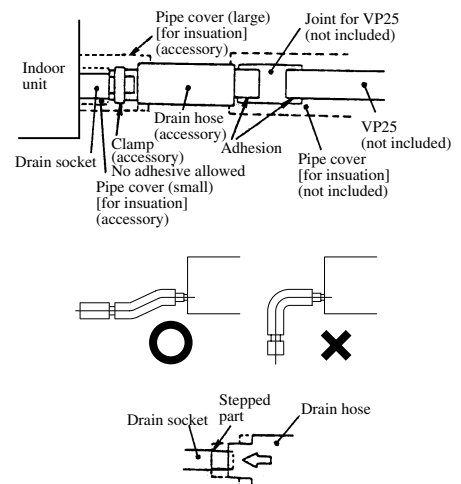
#### When embedded into ceiling

- 1) Determine the positions of suspension bolts (675×780).
  - The pitch center of a suspension 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 cardboard 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.

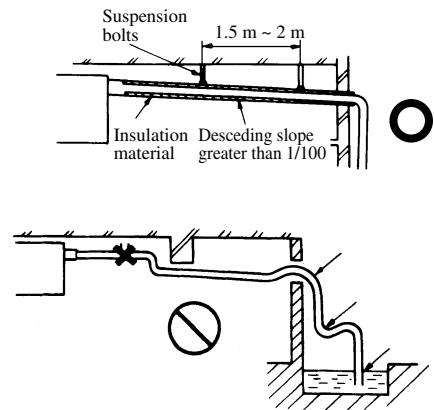
Note (1): When a hanging bolt exceeds 1.3 m in length, use an M10 bolt and give it reinforcements such as braces.

### (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.



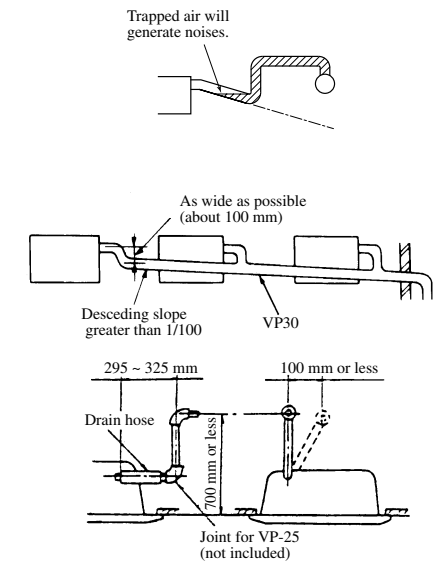
#### 7) Drain socket

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)

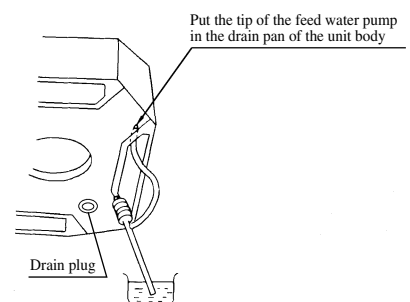
#### 8) Hard PVC pipes laid indoor

- a) Since a drain pipe outlet can be raised up to 700 mm from the ceiling, use elbows, etc. to install drain pipes, if 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 heating.
- 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 plug back where it was.
    - \* Be careful not to get splashed when pulling the drain plug.



### Forced drain pump operation

- ◆ Set up from a unit side.
  - ① Turn power on after selecting the emergency operation mode with a setting on the indoor unit board (SW9-3 ON) and disconnecting the CnB connector on the board. Then, the drain pump will start a continuous operation 15 seconds later. (Note: The blower will also start operation in tandem)
  - ② When a drain test is completed, reinstate the setting to cancel the emergency operation mode (SW9-3 OFF) and plug in the CnB connector on the board. (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 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” → “○ SET → STOP”

2. To cancel a drain pump operation.

- ④ If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.

The air conditioning system will become OFF.

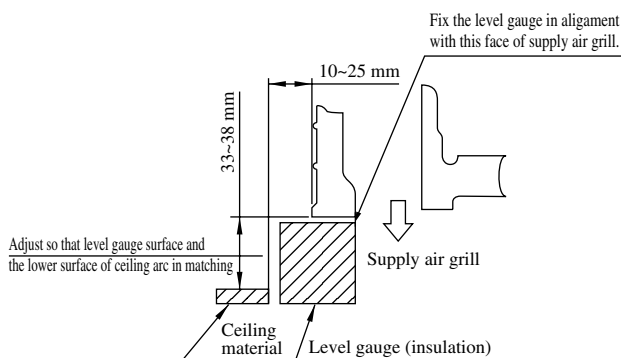
(e) Panel installation

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 broken 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.

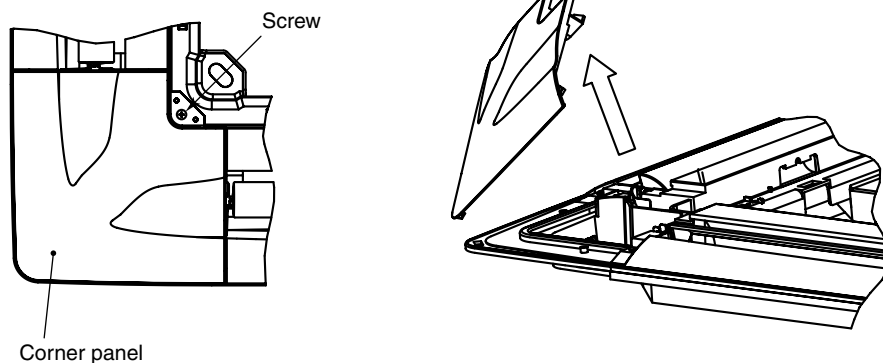
If you are changing the direction of the air inlet grille, change the panel's striker installation position to the “Pull” character position direction on the surface of the grille.

#### 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.

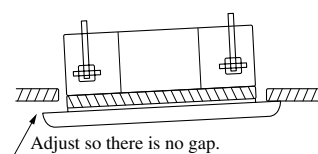
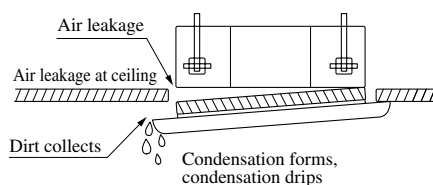


#### 6) Panel installation

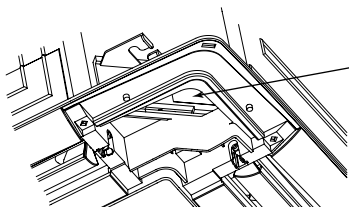
- ① Screw in lightly 2 of the 4 air conditioner unit suspension bolts in opposite corners from each other by about 5 mm.  
(Fasten the drain piping side and the opposite corner temporarily.)
- ② Hang the panel on the two suspension bolts to install it temporarily.
- ③ Install the two remaining suspension 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.

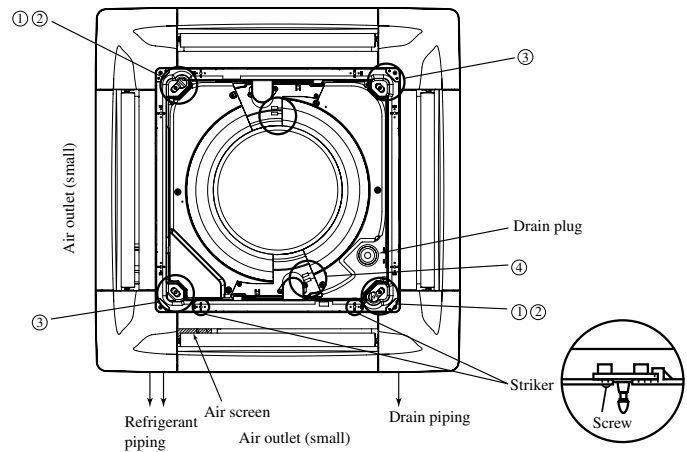


(3) : The unit's installation height can be minutely adjusted with the decorator panel as long as the indoor unit is level and drain piping are not affected.



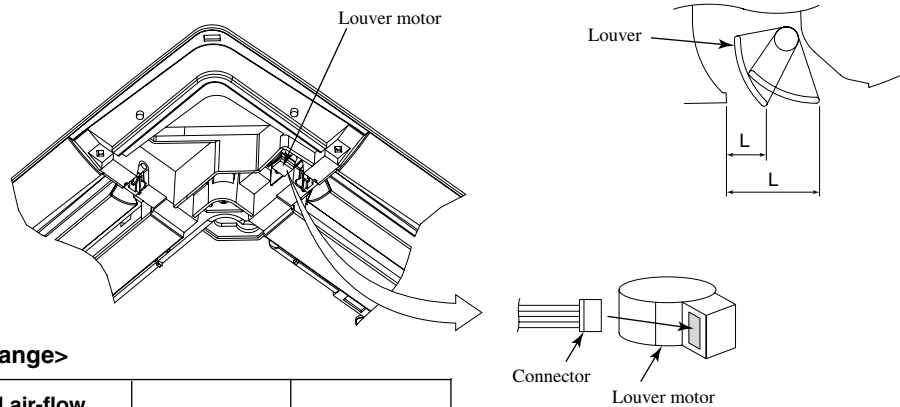
- ④ Connect the (white, 5p) louver motor connector.
- ⑤ Place each of the connectors inside the control box.

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 30°	Downward 70°
L Dimension (mm)	36.5	22.5

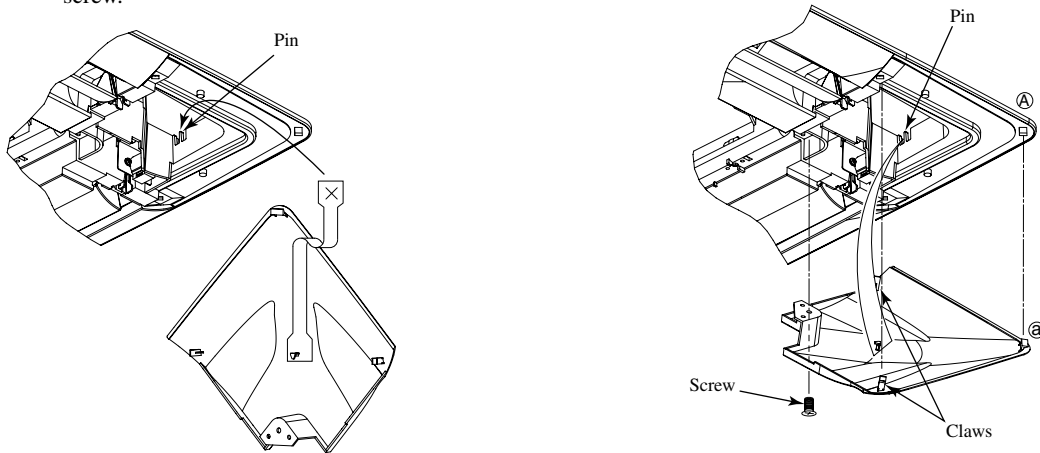
\* It can be set anywhere desires as long as it is within a range of 22.5 and 36.5 mm.

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 ② on the corner panel in part ① 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) Ceiling suspension type (FDEN)

### (a) Selection of installation location

- 1) A place where good air circulation and delivery can be obtained.

#### Cold air throw

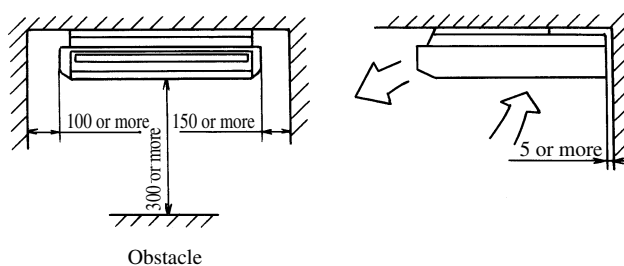
Unit : m

Models	FDEN151, 201	FDEN251, 301	FDEN401, 501
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

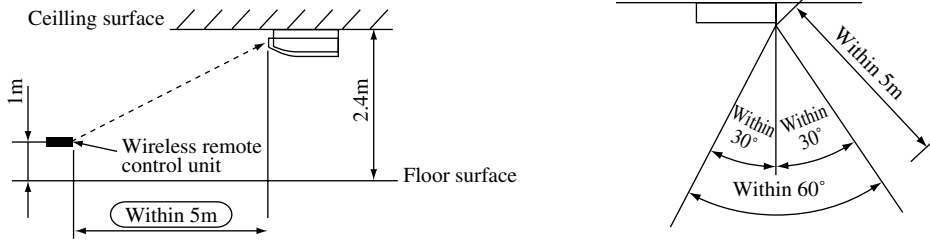


Unit : mm

**(b) Wireless remote control unit operation distance**

**1) Standard signal receiving range**

[Condition] Illuminance at the receiver area: 360 lux. (When no lighting fixture is located within 1m of indoor unit in an ordinary office.)



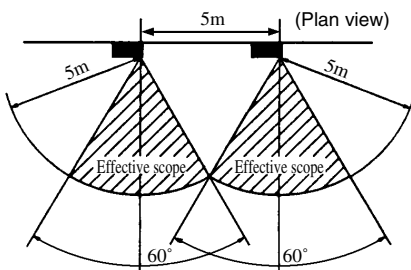
**2) Points for attention in connecting a plural number of indoor units**

[Condition] Illuminance at the receiver area: 360 lux.

(When no lighting fixture is located within 1m of indoor unit in an ordinary office.)

When the remote control unit is used with the aforementioned interference-prevention setting, a minimum distance guaranteeing the prevention of unintended unit responses is 5m.

(Top view)



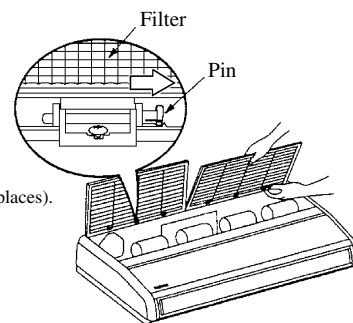
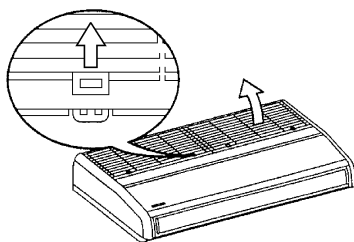
- Please operate remote control unit switches with the unit faced correctly toward the indoor unit's receiver section.
- Effective operation distance can vary with the luminance around the receiver and the reflection from walls of the room.
- When the receiver is exposed to intensive light such as from the direct sun or a strong light, it may become operable only from a short distance or unable to receive signals at all.

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.

**(c) Installation preparation**

**1) Remove the air inlet grille.**

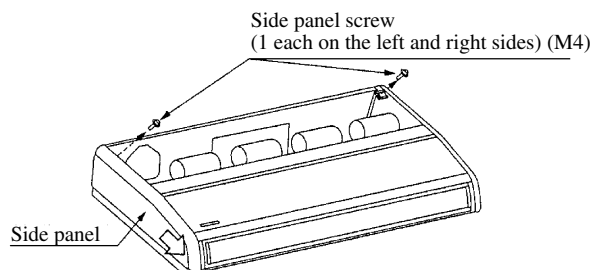
Slide the stoppers (4 places).



Take out the pins (4 or 6 places).

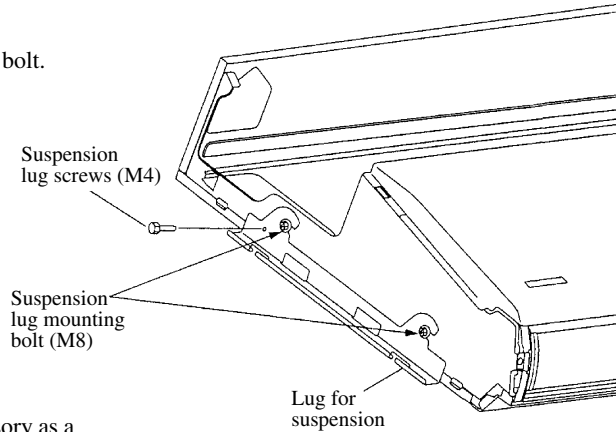
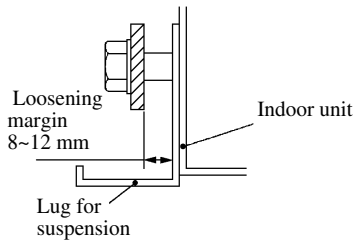
**2) Remove the side panels.**

Take out the screws, then slide the side panels in the arrow direction to remove them.



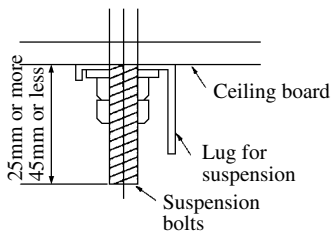
### 3) Remove the suspension lug.

Take out the screws, then loosen the installation bolt.



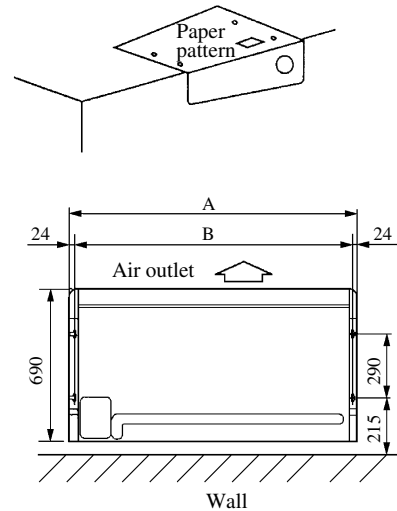
### 4) Suspension Bolt Position

- 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.
- Keep strictly to the suspension bolt lengths specified below.



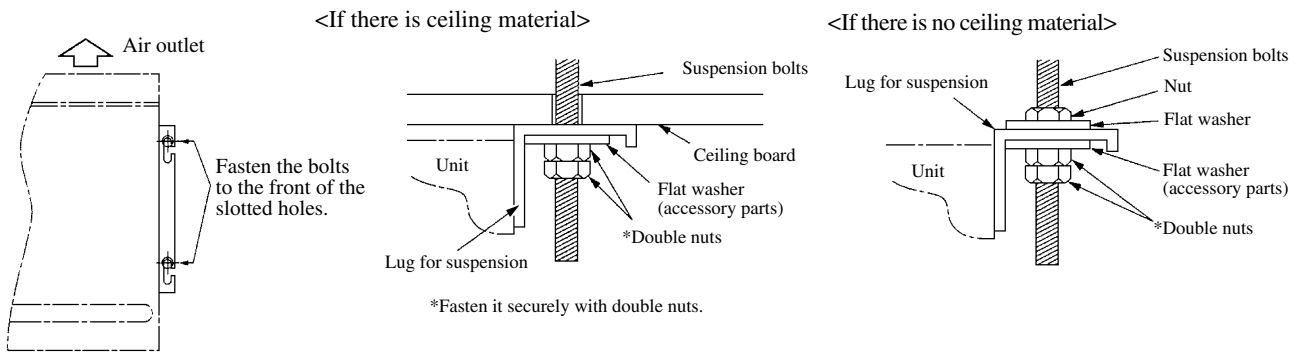
Unit : mm

Model	A	B
FDEN151, 201	1070	1022
FDEN251, 301	1320	1272
FDEN401, 501	1620	1572



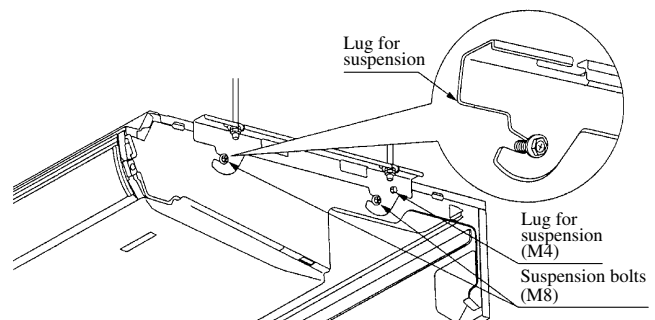
### (d) Installation

#### 1) Fasten the suspension lugs to the suspension bolts.



#### 2) Attach the unit to the suspension lugs.

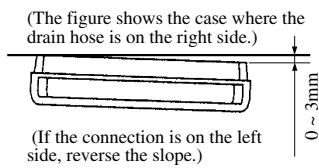
- Slide the unit onto the suspension lugs from the front, hanging it on the bolts.
- Fasten the unit securely on the left and right sides with 4 suspension bolts (M8).
- Tighten the 2 screws (M4) on the left and right sides.



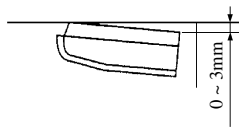
**!** After sliding the side panels on from the front to rear, fasten them securely with the screws.

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



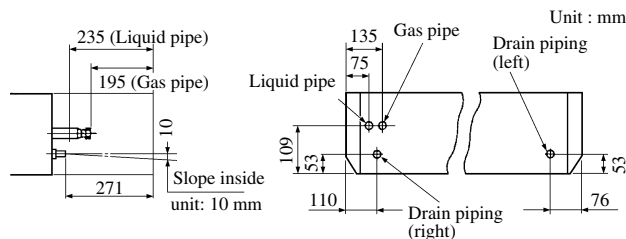
● Front-rear direction



⚠ If the slope is reversed, there is danger of water leaking out.

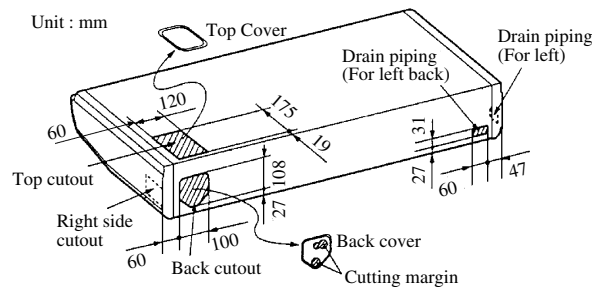
(e) Refrigerant Piping

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 cover.)



(f) 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.

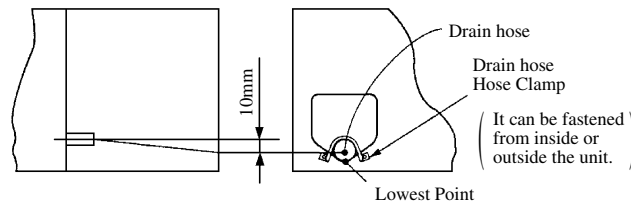
- a) Connect the drain hose fully all the way to the base of the fitting.
- b) Fasten the hose securely with the drain hose clamp.
- c) Keep strictly within the lengths specified below for the suspension bolts.

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.

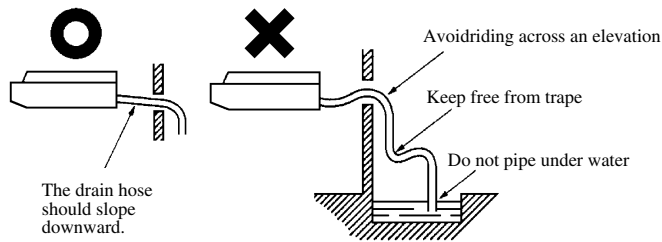
⚠ Be careful that water doesn't pour out when the drain plug is removed.

**⚠ 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.

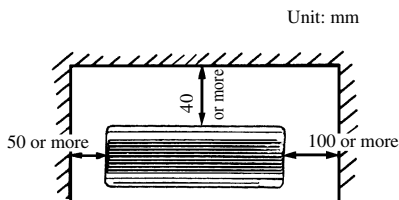


After piping has been installed, check to make sure water drains well and that there is no overflow.

**(3) Wall mounted type (FDKN)**

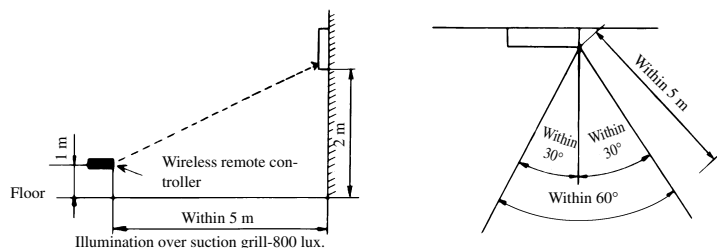
**(a) Selection of installation location**

- 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.



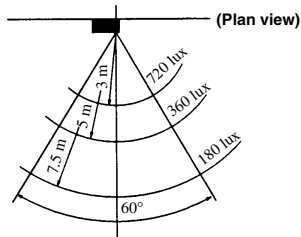
**(b) Cautions for use of wireless remote controller**

- 1) Operating distance of wireless remote controller

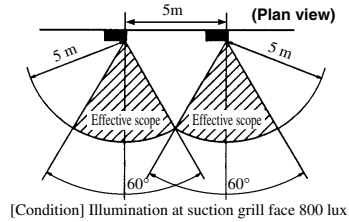




**Relation between illumination at receiver unit and operating distance**



**Caution item for close installation of multiple units**



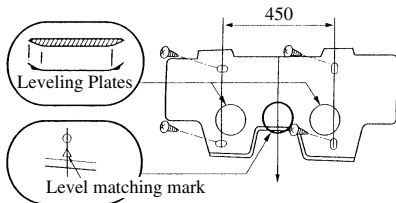
2) Cautions for operation

- a) Orient the remote control switch properly toward the receiver of the unit.
- b) Operating distance is as shown above but it may vary largely depending on the conditions.
- c) Effective distance may be shortened and the receiving may be disturbed when the receiver is under the condition of direct exposure to sunlight or other strong light like electric bulb, dust is accumulated on it and it is shielded with a curtain, etc.

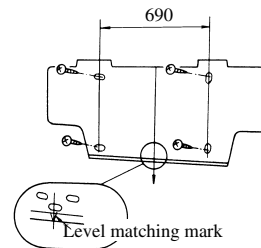
**(c) Attaching of mounting plate**

- 1) The indoor unit weighs approx, FDKN151~251 models : 12kg, FDKN301 model: 13.5kg. 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.

**Models FDKN151~251**

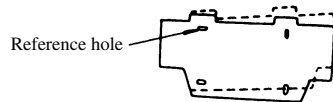


**Model FDKN301**



Unit: mm

- 3) Adjust the level of mounting plate under the condition that four screws are tightened temporarily.



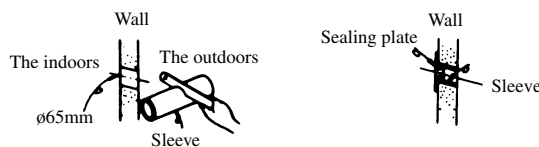
- 4) Turn the mounting plate around the reference hole to adjust the levelness.

**⚠ 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.

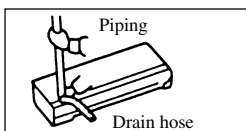
**(d) Procedure for making hole on the wall**

- Make a downgrade (5°) from the indoors toward the outdoors.



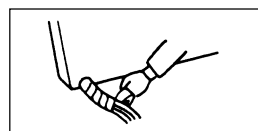
**(e) Forming of piping and drain hose**

- 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

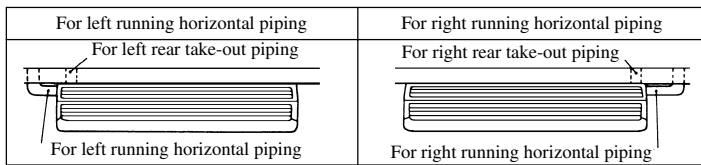


- Wind the tape on the portion which passes through the hole on the wall.
- Always make taping on the wiring which crosses with the piping, if any.

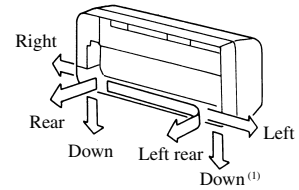
Note (1) After forming of piping and before tape winding, confirm that the connecting wire is securely fixed to the terminal block.

2) Cautions for left take-out and rear take-out case

a) Looking down

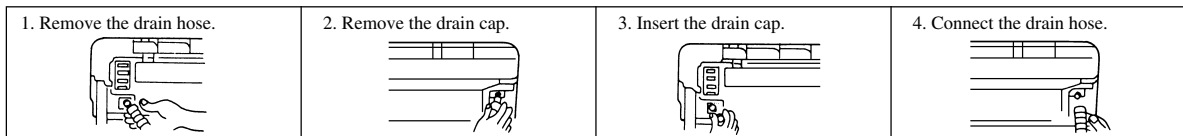


b) The piping can be taken out from the rear, left, left rear, right and down.



Note (1) Running of piping from the lower left can only be done with the FDKN151~251 models.

b) Procedure for changing drain hose



- Pull the drain hose off while turning the end around.  
(In the case of the FDKN301 model, loosen the spring clamp.)

- 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.

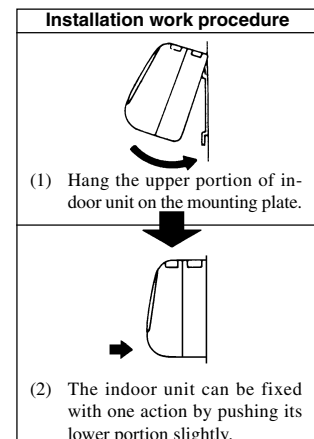
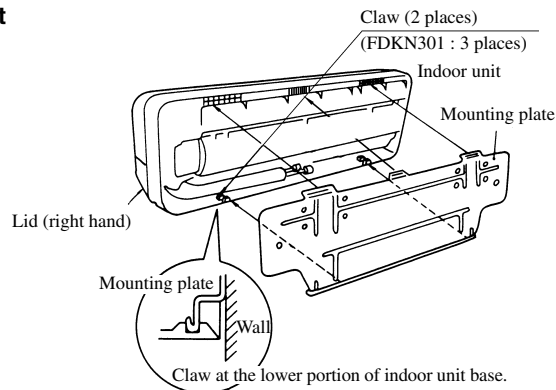
- Push the end of the drain hose onto the fitting while turning it around.

(In the case of the FDKN301 model, loosen the spring clamp, then attach the drain hose securely on the fitting.)

Note(1) When it is not inserted securely, water leakage may occur.

(f) 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.



(g) 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 check that water is drained outdoors.

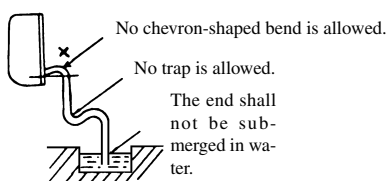
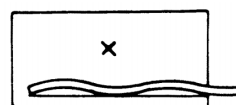


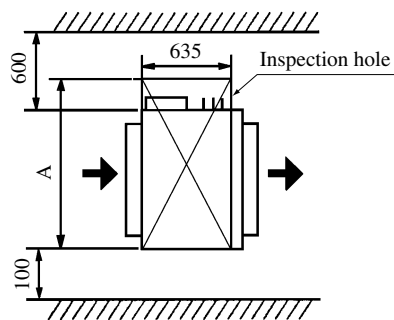
Illustration showing the end of drain hose



**(4) 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 generated 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 the unit.  
Otherwise, apply reinforcement using boards and beams before starting the installation work.

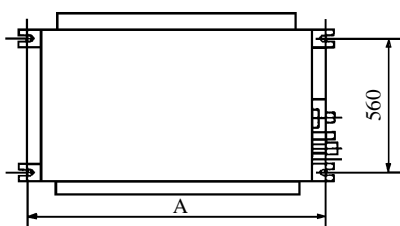


Unit : mm

Models	Mark	A
FDUR201, 251, 301		1200
FDUR401, 501		1720

**(b) Suspension**

Be sure to observe the finished length of the suspension bolts given below.

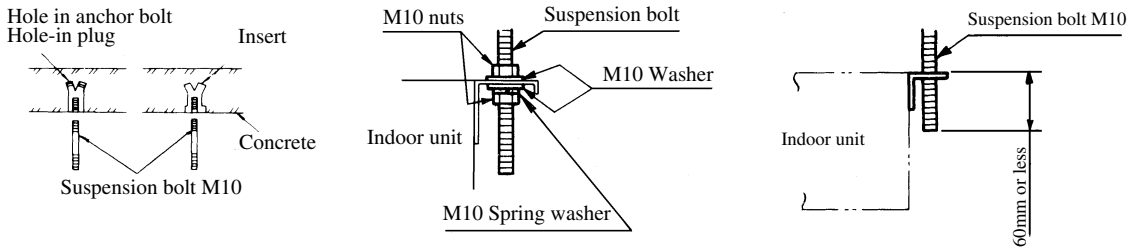


Unit : mm

Models	Mark	A
FDUR201, 251, 301		886
FDUR401, 501		1406

**1) Fixing the suspension bolt (customer ordered parts M10)**

Securely fix the suspension bolt as illustrated below or in another way.

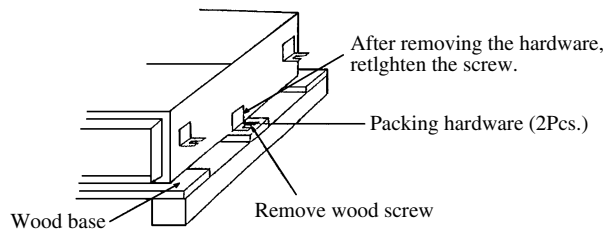


**(c) Installation of indoor unit**

**Packing hardware**

Two pieces of packing hardware are used. 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.



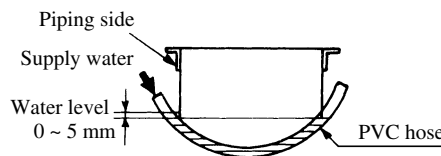
- When installing the unit, heed must be taken that the side touching the wood frame is the top surface of the unit.

**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**

- 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

- Unless the levelness is adjusted properly, the malfunction of the float switch will occur.

**2) Blower fan switching. (When the high performance filter is used.)**

The fan tap's factory setting is "Standard." If you want to change it to the high static-pressure setting, you can avail yourself of the following two methods. Use one of the two methods to set the fan tap.

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

- Set SW9-4 provided on the indoor unit PCB to ON.
- Select the "HI CEILING 1 (high-speed tap)" setting for "©" in #01 of "I/U FUNCTION ▲" (indoor unit function) by using remote controller function setting. For the setting method, please refer to the installation manual supplied with the remote controller.

Function number ①	Function description ②	Setting ③
01	Hi CEILING SET	Hi CEILING 1

Unit : Pa

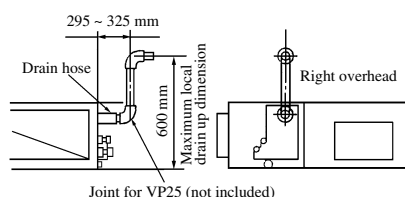
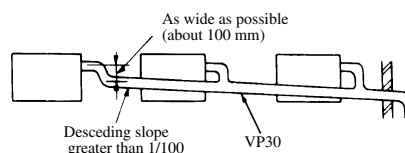
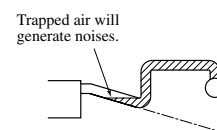
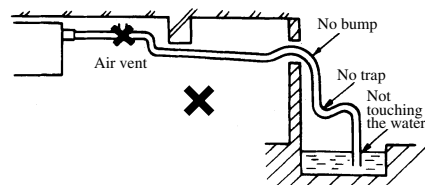
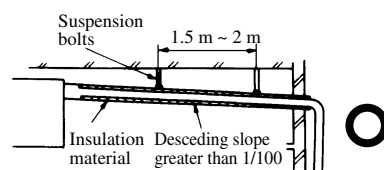
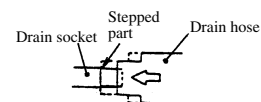
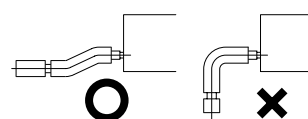
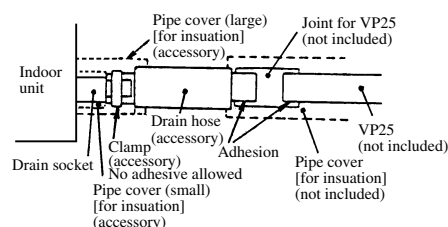
Models	Static Pressure	
	Standard tap	High tap
FDUR201,251	50	85
FDUR301,401,501	50	130

**⚠ 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 700 mm from the ceiling, use elbows, etc. to install drain pipes, if 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.

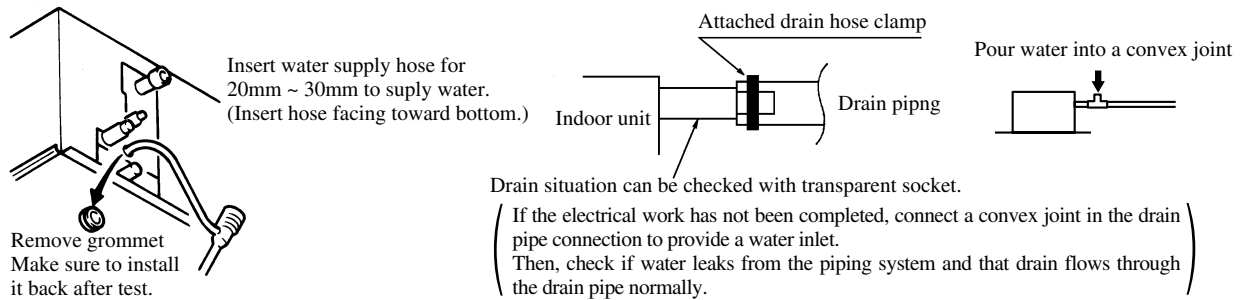


9) Drainage test

- a) Conduct a drainage test after completion of the electrical work.
- b) During the trial, make sure that drain flows properly through the piping and that no water leaks from connections.
- c) In case of a new building, conduct the test before it is furnished with the ceiling.
- d) Be sure to conduct this test even when the unit is installed in the heating season.

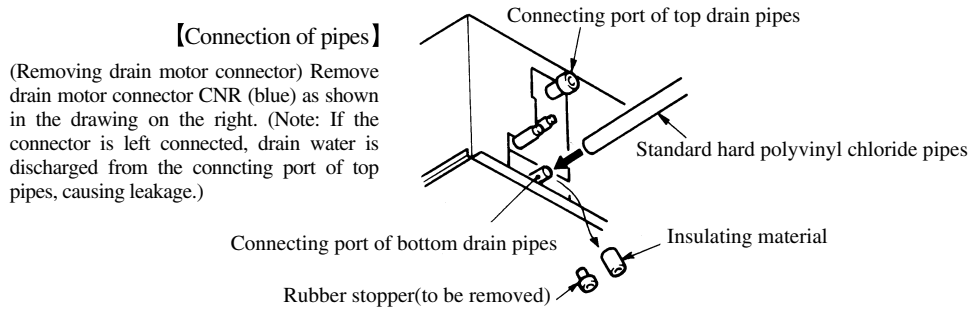
**Procedures**

- ① Supply about 1000 cc of water to the unit through the air outlet by using a feed water pump.
- ② Check the drain while cooling operation.

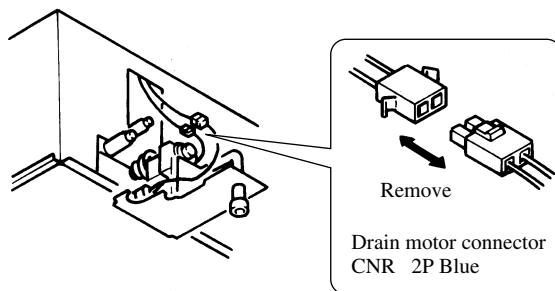


10) Outline of bottom drain piping work

- 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.



- b) Do not use acetone-based adhesives to connect to the drain socket.



**Forced drain pump operation**

- ◆ Set up from a unit side.
- ① Turn power on after selecting the emergency operation mode with a setting on the indoor unit board (SW9-3 ON) and disconnecting the CnB connector on the board. Then, the drain pump will start a continuous operation 15 seconds later. (Note: The blower will also start operation in tandem)
  - ② When a drain test is completed, reinstate the setting to cancel the emergency operation mode (SW9-3 OFF) and plug in the CnB connector on the board. (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 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 DOWN 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.

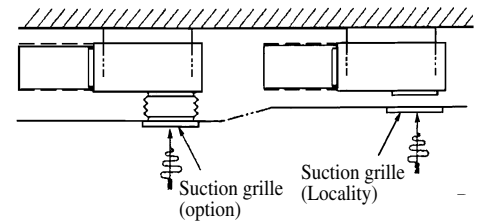
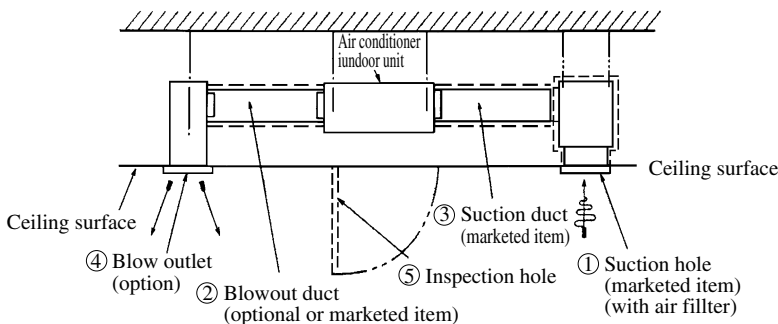
Display: “DRAIN PUMP RUN” → “STOP”

2. To cancel a drain pump operation.

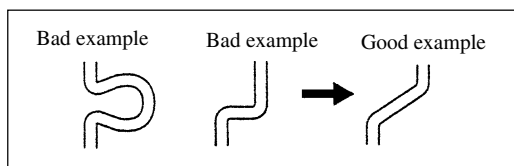
- ④ If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.

The air conditioning system will become OFF.

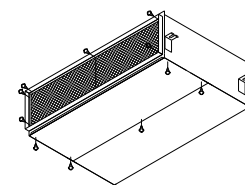
(e) Duct work



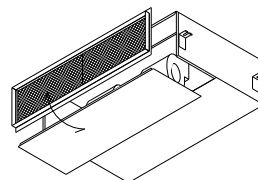
- 1) A corrugated board (for preventing sputtering) is attached to the main body of the air conditioner (on the outlet port). Do not remove it until connecting the duct.
  - a) An air filter is provided on the main body of the air conditioner (on the inlet port). Remove it when connecting the duct on 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.)



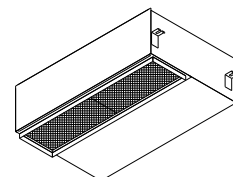
- d) Conduct the duct installation work before finishing the ceiling.
- 3) Inlet port
  - a) When shipped, the inlet port lies on the back.
  - b) When connecting the duct to the inlet port, remove the air filter fitted to the inlet port.
  - c) When placing the inlet port to carry out suction from the 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.



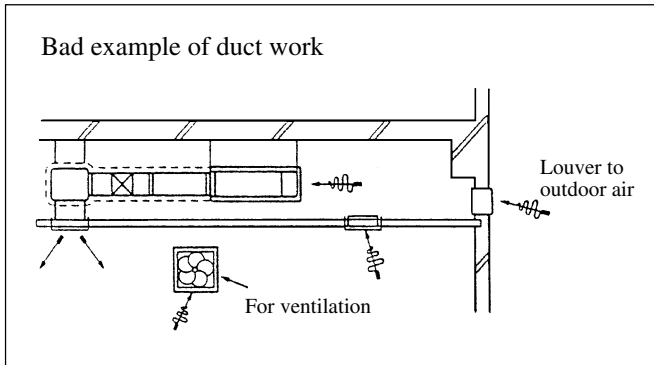
- Remove the screws which fasten the bottom plate and the duct joint on the inlet side of the unit.



- Replace the removed bottom plate and duct joint



- Fit the duct joint with a screw, fit the bottom plate.

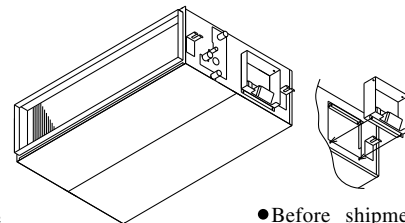


- 7) If a duct is not provided at the suction side but it is substituted with the space over the ceiling, humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing against the outdoor air louver, weather (rainy day) and others.
- a) Moisture in air 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 possibility 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 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 FDURA401, 501)**

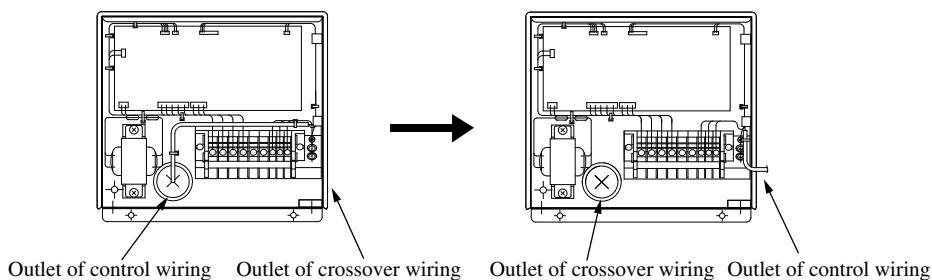
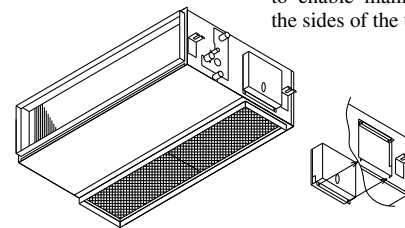
- During bottom side suction, the orientation of the control box can be changed to allow the control box to be maintained from the inlet port.

- 1) Remove the bottom plate (on the inlet port side), and all wiring connectors from the control box.



- 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.

● Before shipment from the plant, arrangements are made to enable maintenance from the sides of the unit.





## 5.2 Installation of remote controller

### (a) Selection of installation location

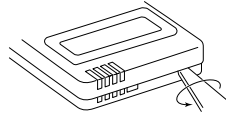
Avoid the following locations

- 1) Direct sunlight.
- 2) Close to heating device.
- 3) Highly humid or water splashing area.
- 4) Uneven surface.

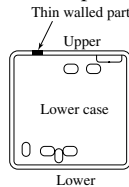
### (b) Installation procedure

#### a) Exposed fitting

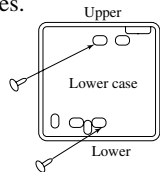
- 1) Open the remote controller cover and unscrew the screw located beneath the switch.
- 2) Open the remote controller case.



- Put a screw driver (flat-head) into the concavity made on the upper part of a remote controller and twist it lightly to open the casing.
- 3) The cord of a remote controller can only be pulled out in the upward direction.

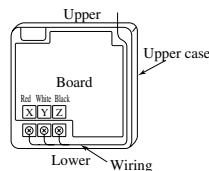


- Cut off with nippers or a knife a thin walled part made on the upper end of the remote controller bottom casing, and then remove burrs with a file or the like.
- 4) Fix the remote controller bottom casing onto a wall with two wood screws supplied as accessories.



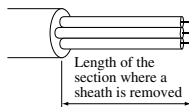
- 5) Connect the remote controller to the terminal block. Connect the terminals of the remote controller to the indoor unit with the same numbers. Because the terminal block has polarity, the device becomes inoperative if there are wrong connections.

Terminals: ⊗ Red wire, ⊙ White wire, ⊚ Black wire



- Use a cord of 0.3mm<sup>2</sup> (recommended) - 0.5mm<sup>2</sup> (maximum) for a remote controller cord. Remove a sheath of the remote controller cord for the section laid within the remote controller casing.

The length of each wire that should be left after a sheath is removed is as follows:



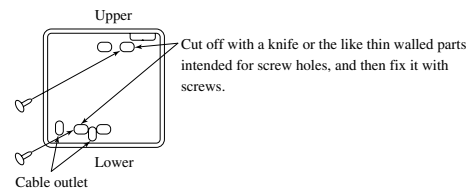
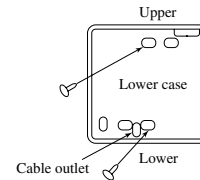
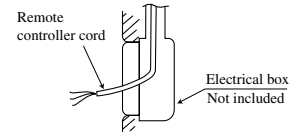
Black: 195mm, White: 205mm, Red: 125mm

- 6) Replace the top casing as before.

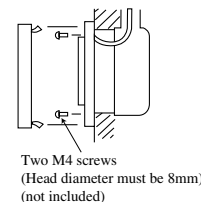
- 7) Use a cord clamp to attach the remote controller cord to the wall.
- 8) Set the functions according to the types of indoor unit. See Section "Function Setting".

### (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 Electrical 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 controller 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 function switch according to the type of the indoor unit. (Refer to 118 page)



### Precaution in Extending the Remote controller cord

- ▶ Maximum total extension 600m.

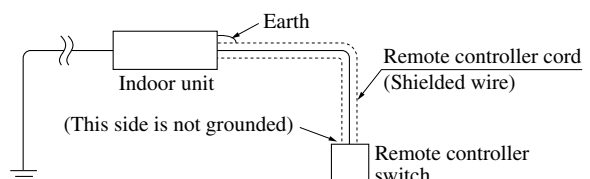
The cord should be a shielded wire.

- For all types : 0.3mm<sup>2</sup> × 3 cores

Note (1) Use cables up to 0.5mm<sup>2</sup> (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.....	0.55 mm <sup>2</sup> × 3 cores
Within 300m.....	0.75 mm <sup>2</sup> × 3 cores
Within 400m.....	1.25 mm <sup>2</sup> × 3 cores
Within 600m.....	2.05 mm <sup>2</sup> × 3 cores

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



## 5.3 Installation of outdoor unit

### Special instructions for R410A air conditioning systems

- Use only R410A refrigerant. R410A refrigerant is operated at about 1.6 times as high pressure as the conventional refrigerant is.
- Air conditioning systems using R410A are equipped with different-diameter outdoor unit service valve charge ports and check joints provided in the units so as to prevent wrong refrigerant from being charged by mistake. To achieve higher strength resistible to refrigerant pressure, the dimensions of flaring and the across-the-flats measurement of a flare nut have been changed for refrigerant piping. Therefore, please arrange dedicated R410A tools as listed in the table shown on the below before you set to installation or service work.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, resulting in performance degradation falling short of the rated capacity.
- In charging refrigerant, always take out refrigerant from a cylinder in the liquid phase.

Dedicated R410 tools	
Ⓐ	Gauge manifold
Ⓑ	Charge hose
Ⓒ	Electronic scale for refrigerant charging
Ⓓ	Torque wrench
Ⓔ	Flare tool
Ⓕ	Protrusion control copper pipe gauge
Ⓖ	Vacuum pump adapter
Ⓗ	Gas leak sensor

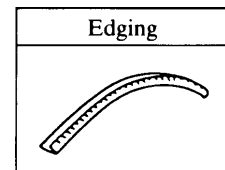
#### (1) Installation

##### ◆ Models FDCA301~601 only

##### (a) Accessories

Confirm accessories shown below are attached in the bag with this installation manual.

- 1) “Edging” for protection of electric wires from opening edge.



##### (b) Selection of installation location

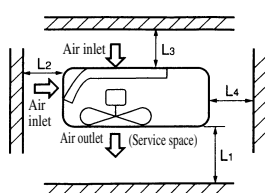
Select the installation location after obtaining the approval of customer.

- 1) The place where the foundation can bear the weight of Outdoor unit.
- 2) The place where there is no concern about leakage of combustible gas.
- 3) The place where it is not stuffy.
- 4) The place where free from thermal radiation of other thermal source.
- 5) The place where flow of drain is allowed.
- 6) The place where noise and hot air blast do not trouble neighboring houses.
- 7) When the unit is installed at the particular location as shown below, corrosion or failure may be caused. Please consult the dealer from which you purchased the air-conditioner.
  - a) The place where corrosive gas is generated (hot spring, etc.).
  - b) The place where wind containing salt blows (seaside area).
  - c) The place where enveloped by oil mist.
  - d) The place where there is a machine that radiates electromagnetic wave.
  - Restrict the height of obstruction wall in front of the discharge air port to the height of unit or less.
  - Do not enclose around the unit by the obstruction. Secure the top space for 1 m or more.
  - When installing the units side by side in series, secure a space of 10 mm between units.
  - When installing the unit where there is a concern about the short circuit, attach the guide louver in front of discharge air port to prevent the short circuit.
  - When installing plural units in a group, secure sufficient intake space to prevent the short circuit.
  - When installing the unit where it is covered by snow, provide appropriate snow break means.

##### (c) The minimum space for installation

Select the space considering the direction of refrigerant piping.

Unit : mm

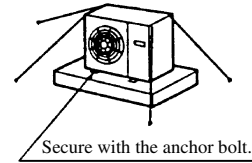
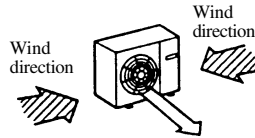
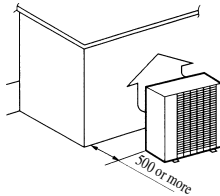


Installation example	FDCA301			FDCA401, 501, 601		
	I	II	III	I	II	III
Distance L <sub>1</sub>	Open space	Open space	500	Open space	Open space	500
L <sub>2</sub>	300	5	Open space	300	5	Open space
L <sub>3</sub>	100	150	100	150	300	150
L <sub>4</sub>	5	5	5	5	5	5

**(d) Location where strong wind blows against the unit**

- Where the unit is likely to be subjected to strong winds, guard it from winds with the following measures.  
A failure to give protection against winds may cause performance degradation, a rise of high pressure resulting in an operation interruption, a broken fan, etc.

- 1) Install the unit directing the discharge air port to the wall.
- 2) Install the unit directing the discharge air port at a right angle to the wind direction.
- 3) Where the foundation is not stable, secure the unit with wire, etc.

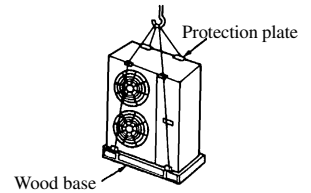


**(e) Carry-in and installation of unit**

Pay sufficient attention to the carry-in and moving work of the unit, and always execute work by two persons or more.

**1) Carry-in**

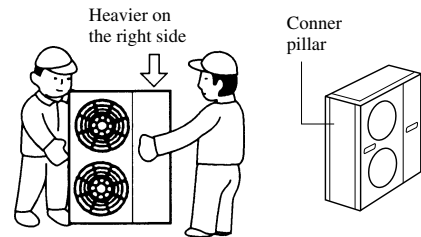
- a) When carrying-in the unit, carry it in as packed condition to the installation site as near as possible.
- b) If you are compelled to carry-in the unit unpacked condition, lift the unit by the rope using a nylon sling or applying protection plates so that the unit is not marred.



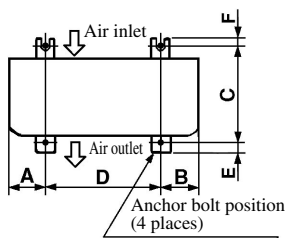
**CAUTION** • Rope the unit taking the discrepancy of center of gravity into consideration.

**2) Moving**

- a) The unit is heavier on the right side looking from the front of unit (air outlet port side). Therefore, sufficient caution is required for the person who carries the right side of unit. The person who carries the left side must hold the handle of front panel and the corner pillar with both hands.



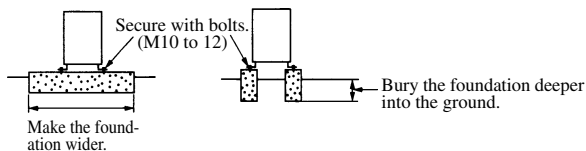
**3) Bolt securing position**



Unit : mm

Model \ Item	A	B	C	D	E	F
FDCA301	150	150	380	580	20	20
FDCA401	165	175	380	580	20	20
FDCA501, 601	190	200	410	580	20	20

- a) To install the unit, secure the legs of unit by below mentioned bolts without fail.



- b) Limit the protrusion height of front side anchor bolts to 15 mm at the maximum.
- c) Install the unit firmly so that it does not fall by earthquake and strong wind.
- d) Make the concrete foundation by referring the above illustration.
- e) Install the unit in level. (The height difference between right and left is within 5 mm.)

◆ Models FDCA801, 1001 only

(a) Selecting the installation location

- 1) Where air is not trapped.
- 2) Where the installation fittings can be firmly installed.
- 3) Where wind does not hinder the intake and outlet pipes.
- 4) Out the heat range of other heat sources.
- 5) Where it is safe for the drain water to be discharged.
- 6) Where noise and hot air will not bother neighboring residents.
- 7) Where snow will not accumulate.
- 8) 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.

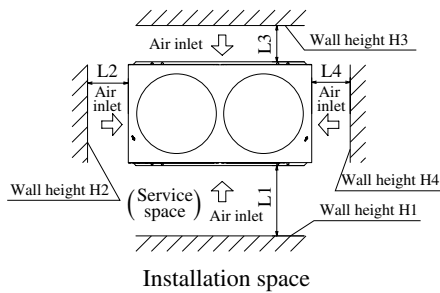
- (2) If there is a danger of a short-circuit, then install a wind direction variable adapter.
- (3) When installing multiple units, provide sufficient intake space so that a short-circuit does not occur.
- (4) In areas where there is snowfall, install the unit in a frame or under a snow hood to prevent 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.

(b) 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)

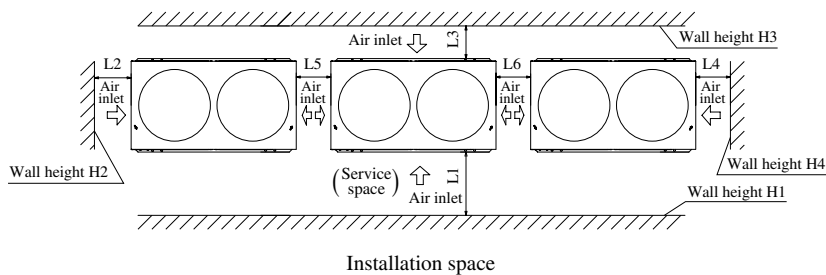
1) When one unit is installed



Unit: mm

Example installation	I	II
Dimensions		
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	-

2) When more than one unit are installed.



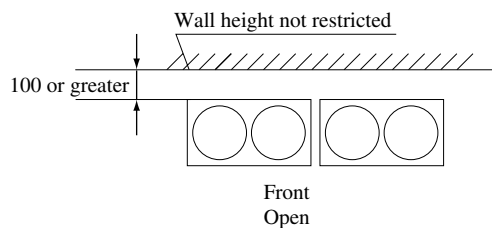
Unit: mm

Example installation	I	II
Dimensions		
L1	500	Open
L2	10	200
L3	100	300
L4	10	Open
L5	0	400
L6	0	400
H1	1500	No limit
H2	No limit	No limit
H3	1000	No limit
H4	No limit	No limit

3) Multiple unit installation (Multiple longitudinal and vertical and horizontal rows installed)

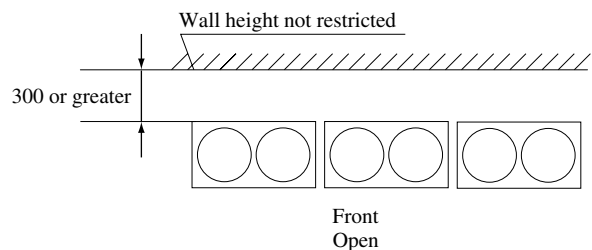
• Pattern 1

3-side Intake Example 1 (2 units)



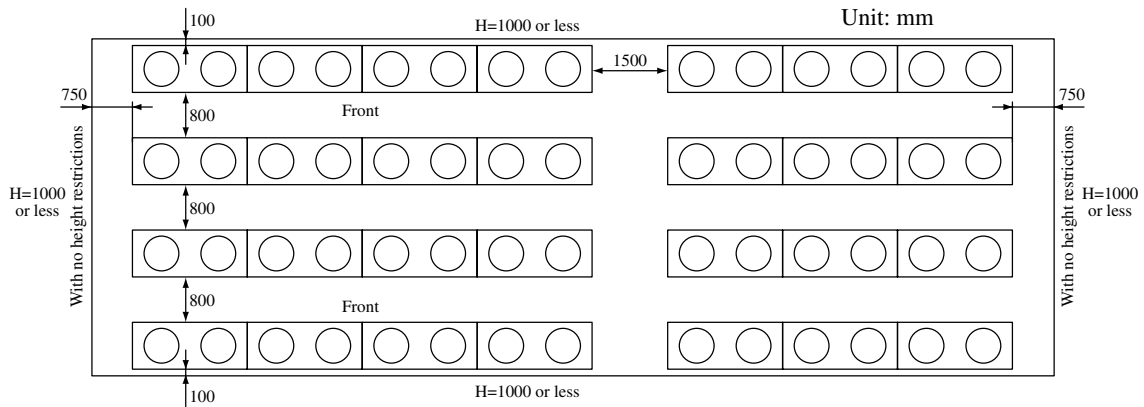
• Pattern 2

3-side Intake Example 2 (3 units)



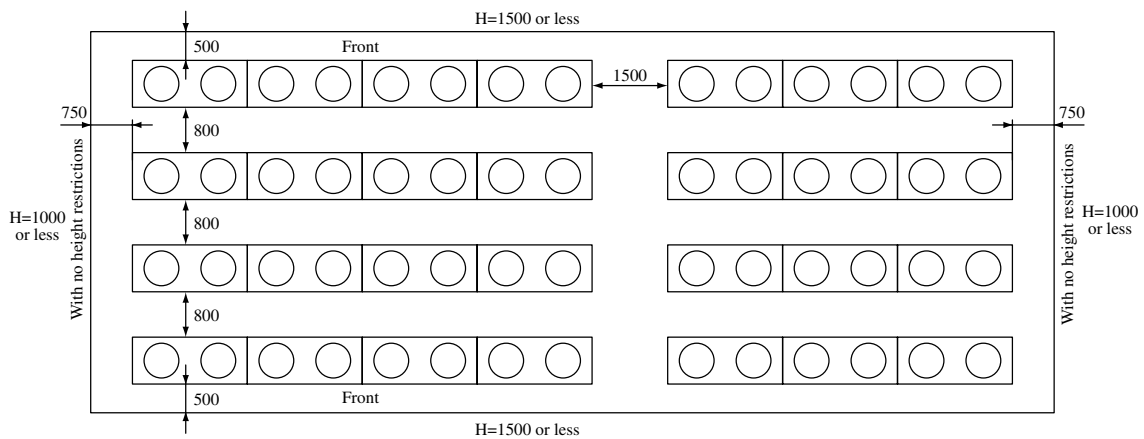
• **Pattern 3**

**Multiple longitudinal and vertical and horizontal rows installed**



• **Pattern 4**

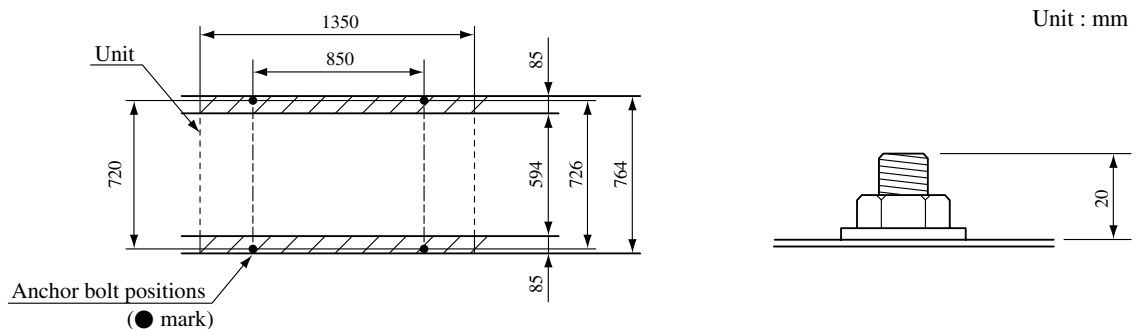
**Multiple longitudinal and vertical and horizontal rows installed**



(c) **Notabilia for installation**

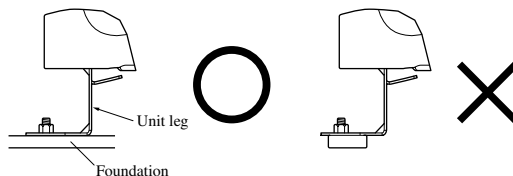
1) **Anchor bolt positions**

a) Use four anchor bolts (M12) to fix an outdoor unit's anchoring legs at all times. Ideally, an anchor bolt should protrude 20mm.



b) **Base**

- Install the unit so that it does not vibrate and doesn't make noise. Make sure the base is strong and that it is installed level.
- Provide a foundation that is at least as wide as the area shown by the shaded portion in the diagram above (wider than the width between the front surface of the anchoring legs of the outdoor unit).



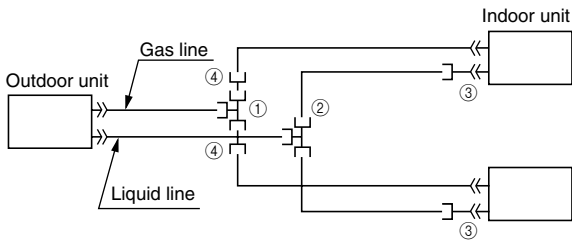
## (2) Refrigerant piping work

Select the piping specification to fit the specification of Indoor unit and installation location.

### (a) Decision of piping specification

#### (i) Twin type

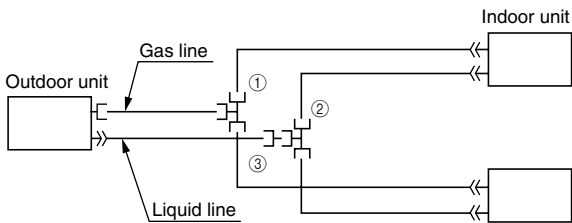
Models FDCA301~601 [Branch pipe set : DIS-WA1]



Item Model	Indoor unit combinations	Liquid pipe		Gas pipe	
		Main pipe	Branch pipe	Main pipe	Branch pipe
FDCA301	151 + 151	φ 9.52 × t 0.8	φ 9.52 × t 0.8	φ 15.88 × t 1.0	φ 12.7 × t 0.8
FDCA401	201 + 201				φ 15.88 × t 1.0
FDCA501	251 + 251				
FDCA601	301 + 301				

Notes (1) If you are using this model in combination with the 151 ~ 251 Series indoor units, use the irregular fittings ③ supplied with the branch piping set and make the branch piping (branch ~ indoor unit) liquid piping size φ9.52.  
(2) Mark is ④ to FDC301, 401 only.

Models FDCA801, 1001 [Branch pipe set : DIS-WB1]



Item Model	Indoor unit combinations	Liquid pipe		Gas pipe	
		Main pipe	Branch pipe	Main pipe	Branch pipe
FDCA801	401 + 401	φ 9.52 × t 0.8	φ 9.52 × t 0.8	φ 25.4 × t 1.0	φ 15.88 × t 1.0
FDCA1001	501 + 501	φ 12.7 × t 0.8			

Notes (1) In the case of the FDCA801, if the length of the main pipe exceeds 40 m, make the liquid piping size φ12.7.

Chart of shapes of branch piping parts (DIS-WA1)

Gas pipe	Mark	Liquid pipe	Mark	Reducer	Mark
	①		②		③
					④

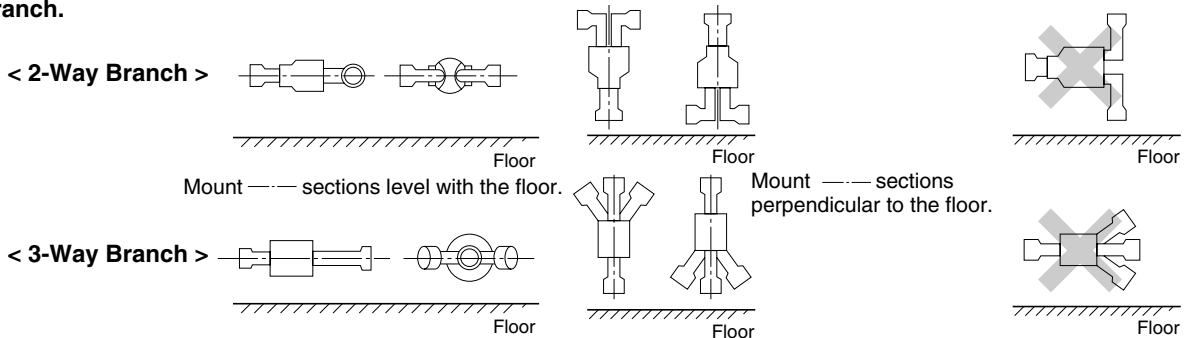
Notes (1) ① to ④ in the drawing include parts provided in the branch piping set. It shows the codes for the shapes of different-diameter connections.  
(2) Branch piping should always be arranged to have level or perpendicular branch. (Refer to the drawing below for details.)

Chart of shapes of branch piping parts (DIS-WB1)

Gas pipe	Mark	Liquid pipe	Mark	Reducer	Mark
	①		②		③

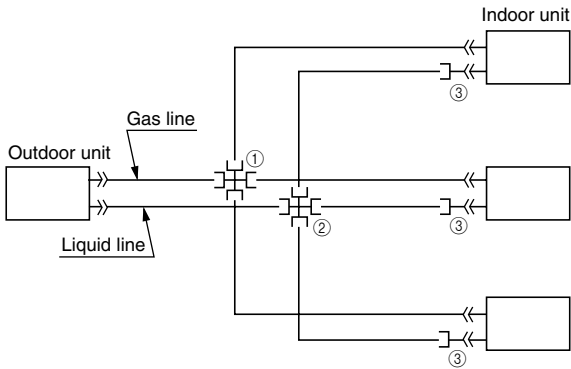
Notes (1) ① to ③ in the drawing include parts provided in the branch piping set. It shows the codes for the shapes of different-diameter connections.  
(2) Branch piping should always be arranged to have level or perpendicular branch. (Refer to the drawing below for details.)

The branch piping (both gas and liquid lines) should always be arranged to have a level or perpendicular branch.



(ii) Triple type

Model FDCA601 [Branch pipe set : DIS-TA1]



Item Model	Indoor unit combinations	Liquid pipe		Gas pipe	
		Main pipe	Branch pipe	Main pipe	Branch pipe
FDCA601	201+201+201	φ 9.52×t 0.8	φ 9.52×t 0.8	φ 15.88×t 1.0	φ 12.7×t 0.8

Notes (1) Use the irregular fittings ③ supplied with the branch piping set on the indoor unit side, and make the branch piping (branch ~ indoor unit) liquid piping size φ9.52.

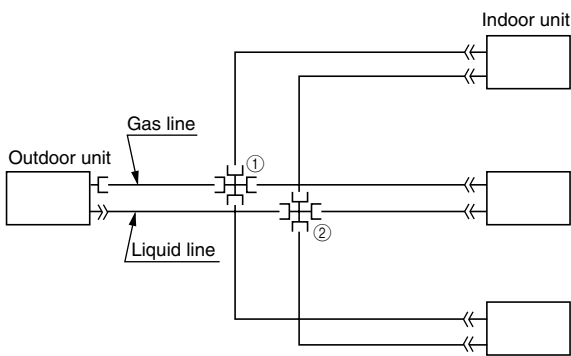
Chart of shapes of branch piping parts (DIS-TA1)

Gas pipe	Mark	Liquid pipe	Mark	Reducer	Mark
	①		②		③

Notes (1) ① to ③ in the drawing include parts provided in the branch piping set. It shows the codes for the shapes of different-diameter connections.

(2) Branch piping should always be arranged to have level or perpendicular branch. (Refer to the preceding page for details.)

Model FDCA801 [Branch pipe set : DIS-TB1]



Item Model	Indoor unit combinations	Liquid pipe		Gas pipe	
		Main pipe	Branch pipe	Main pipe	Branch pipe
FDCA801	301+301+301	φ 9.52×t 0.8	φ 9.52×t 0.8	φ 25.4×t 1.0	φ 15.88×t 0.8

Notes (1) If the length of the main pipe exceeds 40 m, make the liquid piping size φ12.7.  
 (2) If units with different capacities are such as the 201 and 251 models are used in combination, different diameter joints for the liquid side (indoor unit side) should be procured locally.

Chart of shapes of branch piping parts (DIS-TB1)

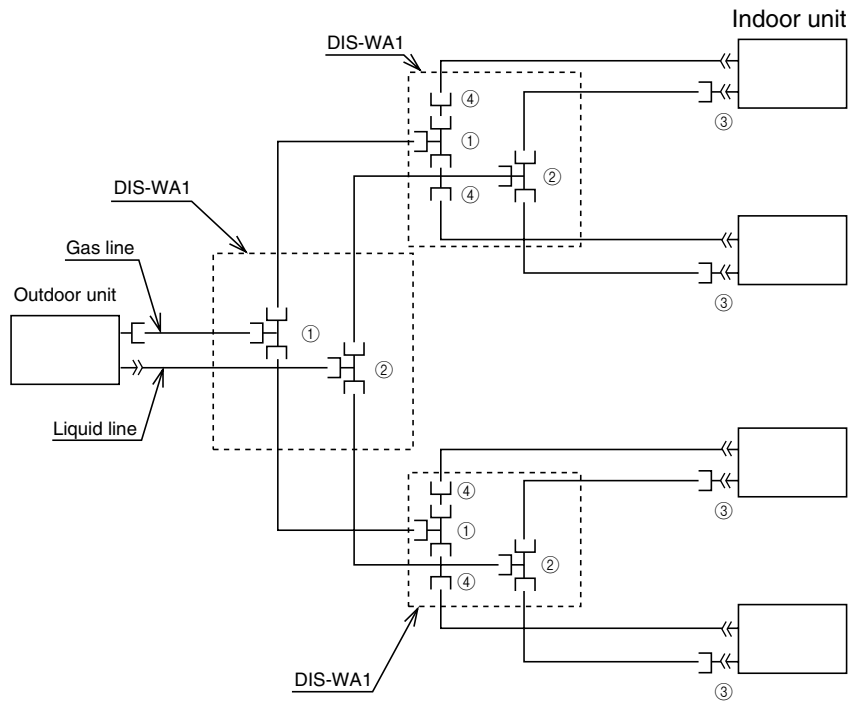
Gas pipe	Mark	Liquid pipe	Mark
	①		②

Notes (1) ① to ② in the drawing include parts provided in the branch piping set. It shows the codes for the shapes of different-diameter connections.

(2) Branch piping should always be arranged to have level or perpendicular branch. (Refer to the preceding page for details.)

(iii) Double twin type

Models FDCA601 [Branch pipe set : DIS-WA1 × 3set]



Item Model	Indoor unit combinations	Liquid pipe			Gas pipe		
		Main pipe	1st branch pipe	2st branch pipe	Main pipe	1st branch pipe	2st branch pipe
FDCA601	151+151+151+151	φ 9.52 × t 0.8	φ 9.52 × t 0.8	φ 9.52 × t 0.8	φ 15.88 × t 1.0	φ 15.88 × t 1.0	φ 12.7 × t 0.8

Notes (1) Use the irregular fittings ③ supplied with the branch piping set on the indoor unit side, and make the branch piping (branch ~ indoor unit) liquid piping size φ9.52.

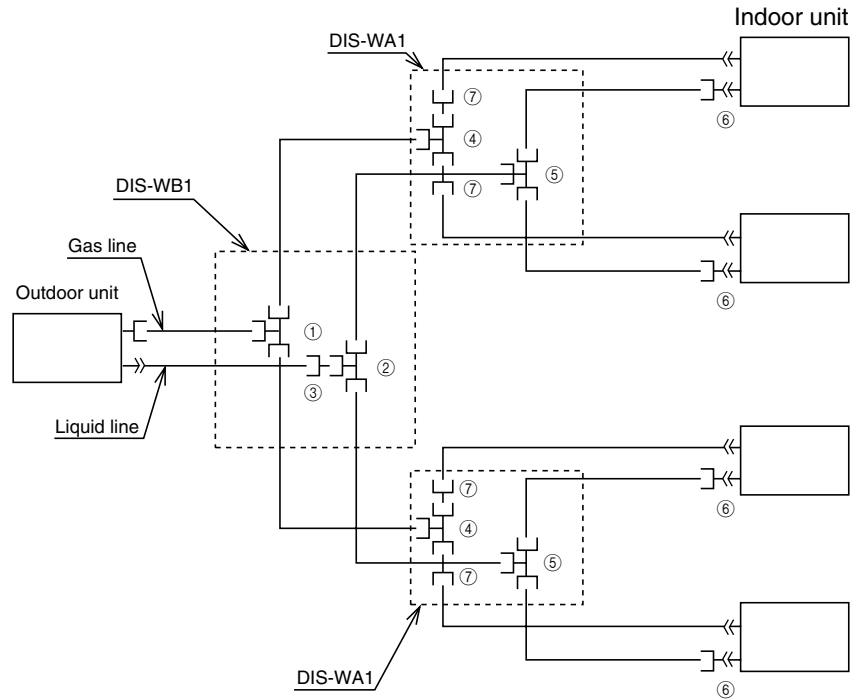
Chart of shapes of branch piping parts (DIS-WA1)

Gas pipe	Mark	Liquid pipe	Mark	Reducer	Mark
	①		②		③
					④

Notes (1) ① to ④ in the drawing include parts provided in the branch piping set. It shows the codes for the shapes of different-diameter connections.  
 (2) Branch piping should always be arranged to have level or perpendicular branch. (Refer to the 108 page for details.)



**Models FDCA801, 1001 [Branch pipe set : DIS-WA1 × 2set, DIS-WB1 × 1set]**



Item Model	Indoor unit combinations	Liquid pipe			Gas pipe		
		Main pipe	1st branch pipe	2st branch pipe	Main pipe	1st branch pipe	2st branch pipe
FDCA801	201+201+201+201	φ 9.52 × t 0.8	φ 9.52 × t 0.8	φ 9.52 × t 0.8	φ 25.4 × t 1.0	φ 15.88 × t 1.0	φ 12.7 × t 0.8
FDCA1001	251+251+251+251	φ 12.7 × t 0.8					φ 15.88 × t 1.0

Notes (1) In the case of the FDCA801, if the length of the main pipe exceeds 40 m, make the liquid piping size φ12.7.

(2) Use the irregular fittings ⑥ supplied with the branch piping set on the indoor unit side, and make the branch piping (branch ~ indoor unit) liquid piping size φ9.52.

(3) Mark is ⑦ to FDCA801 only.

**Chart of shapes of branch piping parts (DIS-WB1)**

Gas pipe	Mark	Liquid pipe	Mark	Reducer	Mark
	①		②		③

**Chart of shapes of branch piping parts (DIS-WA1)**

Gas pipe	Mark	Liquid pipe	Mark	Reducer	Mark
	④		⑤		⑥
					⑦

Notes (1) ① to ⑦ in the drawing include parts provided in the branch piping set. It shows the codes for the shapes of different-diameter connections.

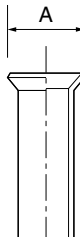
(2) Branch piping should always be arranged to have level or perpendicular branch. (Refer to the 108 page for details.)

(3) Mark ③ shows for the FDCA801 model only.

**(b) Flare processing**

- 1) The unit and the refrigerant pipe are to be flare connected. Flare a pipe after a flare nut is attached onto it.
- 2) Because the parallel side measurement of a φ12.7 or φ15.88 flare nut will be changed depending on the measurement after flaring, do not fail to change the size of a flare to one specified for R410A.

- 3) A flare size for R410A is different from that for R407C. Although we recommend the use of flare tools developed specifically for R410A, conventional flare tools can also be used by adjusting the measurement of protrusion B with a protrusion control copper pipe gauge.

Flare nut parallel side measurement: H (mm)		A	Flared pipe end: A (mm)	
Copper pipe outer diameter	H		Copper pipe outer diameter	A
ø6.35	17		0 -0.4	
ø9.52	22		9.1	
ø12.7	26		13.2	
ø15.88	29		16.6	

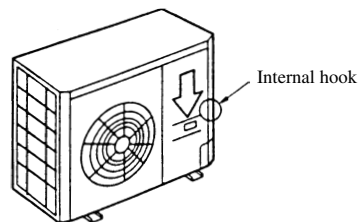
Copper pipe outer diameter	Copper pipe protrusion for flaring: B (mm)	
	In the case of a rigid (clutch) type	
	With an R410A tool	With a conventional tool
ø6.35	0~0.5	0.7~1.3
ø9.52		
ø12.7		
ø15.88		

- 4) Tighten a flare joint securely with a double spanner. Use the following tightening torque values for flare nuts.

ø 6.35 Flare nut	14~18 N·m (1.4~1.8kg·m)
ø 9.52 Flare nut	34~42 N·m (3.4~4.2kg·m)
ø 12.7 Flare nut	49~61 N·m (4.9~6.1kg·m)
ø 15.88 Flare nut	68~82 N·m (6.8~8.2kg·m)

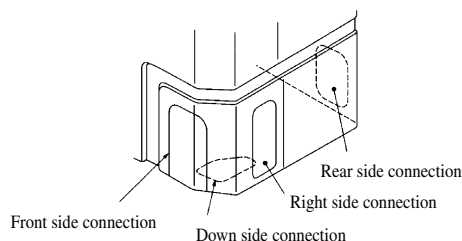
**(c) How to remove the service panel (Models FDCA 301~601 only)**

First unscrew four screws holding the service panel in place, pull down the panel toward the direction indicated by the arrow, and then pull it toward you to remove it from the casing.



**(d) Refrigerant pipe connection (Models FDCA 301~601 only)**

- 1) The pipe can be laid in any of the following directions: side right, front, rear and downward.
- 2) Remove a knock-out plate provided on the pipe penetration to open a minimum necessary area and attach an edging material supplied as an accessory by cutting it to an appropriate length before laying a pipe.



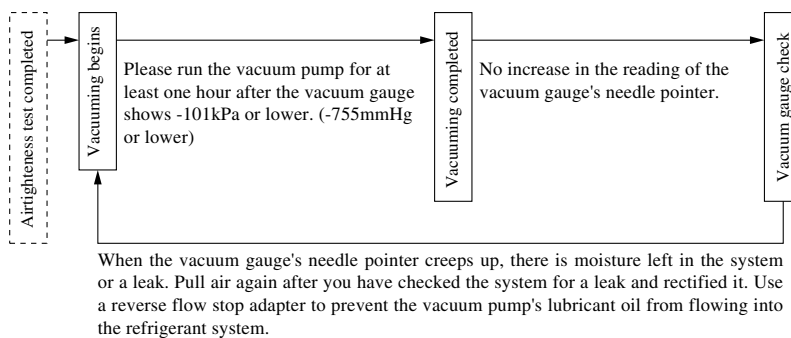
### (3) Air tightness test and air purge

- Always use a vacuum pump to purge air trapped within an indoor and the refrigerant piping.

#### (a) Air tightness test

- When all the flare nuts on both indoor and outdoor unit sides are fastened. Conduct an air-tightness test from the service valves (on both liquid and gas sides) closed tightly to check whether the system has no leaks.
- Use nitrogen gas in the air-tightness test. Do not use gas other than nitrogen gas under any circumstances. Conduct the air-tightness test by applying 4.15MPa of pressure.
- Do not apply the specified pressure at once, but increase pressure gradually.
  - Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
  - Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
  - Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
  - If the pressure does not drop after the units is left for approximately one day, the airtightness 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.

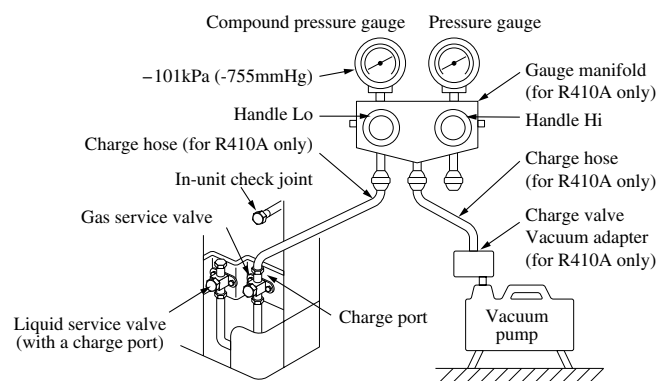
#### (b) Air purge



When a vacuum air purge is completed, remove the valve rod cap nuts and open the service valves (both liquid and gas sides) as illustrated below. After you have made sure that the valves are in the full-open position, lighten the cap nuts (for the valve rods and charge ports).

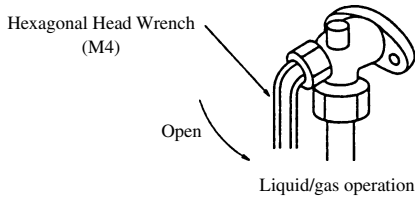
Pay attention to the following points in addition to the above for the R410A and compatible machines.

- 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.



- You can purge air with either liquid operation valve or gas operation valve.

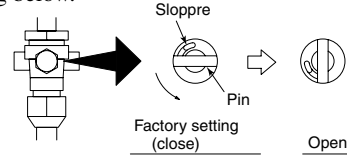
◆ **Models FDCA301~601**  
 ▶ **Hexagonal wrench type**



- Open the valve rod until it touches the stopper. You need not apply force to push it further.
- When an operation is completed, replace the cap nut and tighten it as before.

▶ **Pin type**

Remove the hexagon cap nut, set it as illustrated in the drawing below.



- When a pin setting operation is completed, replace the cap nut and tighten it as before.

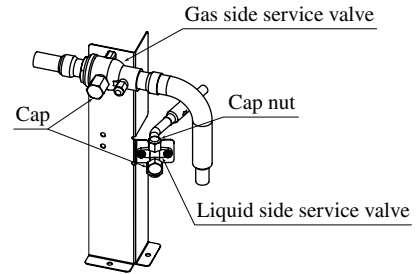
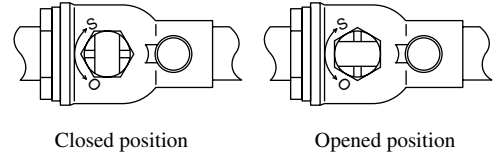
◆ **Models FDCA801, 1001**

Method of opening/closing a valve

- Remove the cap, turn the gas pipe side until comes to the “Closed” position as indicated in the drawing on the right.
- 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.
- Tighten the cap securely.

For tightening torque, refer to the table below.

	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)



(4) **Refrigerant charge**

◆ **Models FDCA301~601**

- The outdoor unit is charged with enough refrigerant for a piping length of 30 m when it is shipped from the factory, and additional charging is not necessary in the case of a system with 30 m or piping or less.
- If the system’s piping exceeds 30 m, charge with an amount of additional refrigerant corresponding to the additional length of piping in the system.

Item	Model	FDCA301	FDCA401	FDCA501	FDCA601
	Factory Charge Amount (for 30 m of pipe) (kg)		3.15	3.9	3.2
Additional Charge Amount (for each 1 m of piping) (kg/m)		0.040			

(Example) If the FDCA301 model is newly installed and the piping length is 45 m.  
 Additional Charge Amount: 0.60 kg = (45 – 30) m × 0.040 kg/m

◆ **Models FDCA801, 1001**

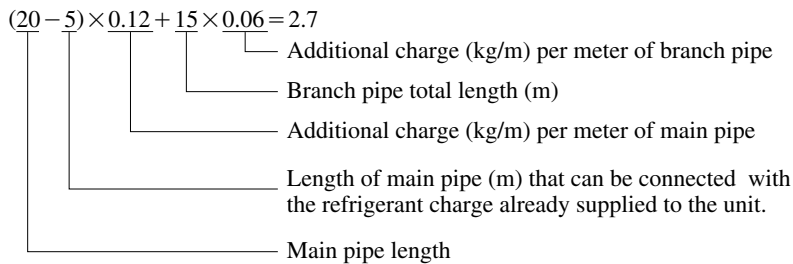
(a) **Additional charge amount**

Model	Item	Standard refrigerant charge volume (kg) <sup>(1)</sup>	Additional charge volume per meter of refrigerant piping (kg) <sup>(2)</sup>	Charge volume when shipped from factory (kg)	Local piping length for which additional charge is not required. (m)	Limit length of refrigerant piping (m)
				Outdoor unit		
FDCA801		6.3	Main pipe Liquid piping φ 9.52 : 0.06 Liquid piping φ 12.7 : 0.12 Branch pipe 0.06	6.6	5	70
FDCA1001		7.3	Main pipe 0.12 Branch pipe 0.06	7.9		

- Notes (1) The standard refrigerant charge volume shows the charge volume with the length of refrigerant piping is 0 m.  
 (2) Concerning the additional charge per meter of piping and the refrigerant charge volume when the unit is shipped from the factory, as shown in the above the unit is charged with a portion of the refrigerant needed for the local piping, so be sure to calculate the amount of additional charge that is needed and charge the system locally.

**(b) Example of calculation of additional charge volume**

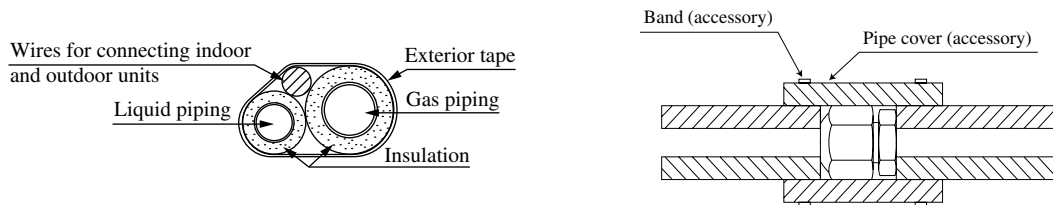
**FDCA801 (Twin type) Main pipe: 20 m, Branch pipe: 15m** What is the amount of additional charge?



Amount of additional charge = 2.7 kg (be sure to weigh the refrigerant before charging).

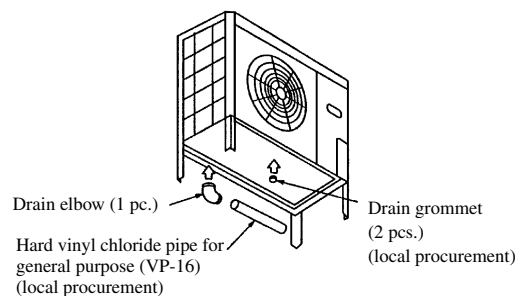
**(5) Heating and condensation prevention**

- 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 burns, when touched accidentally. So, do not fail to dress it with a heat insulation material.
  - b) Wrap 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.



**(6) Drain piping work (Models FDCA301~601 only)**

- Execute drain piping by using a drain elbow and drain grommets supplied separately as optional parts, where water drained from the outdoor units is a problem.
- There are 3 drain holes provided on the bottom plate of an outdoor unit to discharge condensed water.
- When condensed water needs to be led to a drain, etc., install the unit on a flat base (supplied separately as an optional part) or concrete blocks.
- Connect a drain elbow as shown in the illustration and close the other two drain holes with grommets.



**(7) Electrical wiring**

- This air conditioning system should be notified to supply authority before connection to power supply system.
- (a) Selection of size of power supply and interconnecting wires.

**⚠ IMPORTANT**

- Electric wiring work should be conducted only by authorized personnel.
- Use copper conductor only.
- Power source wires and Interconnecting wires shall not be lighter than polychloroprene sheathed flexible cord (design HO5RN-F IEC 57).
- Do not connect more than three wires to the terminal block.
- Use round type crimped terminal lugs with insulated grip on the end of the wires.

- Select wire sizes and circuit protection from Table 1.

Table 1

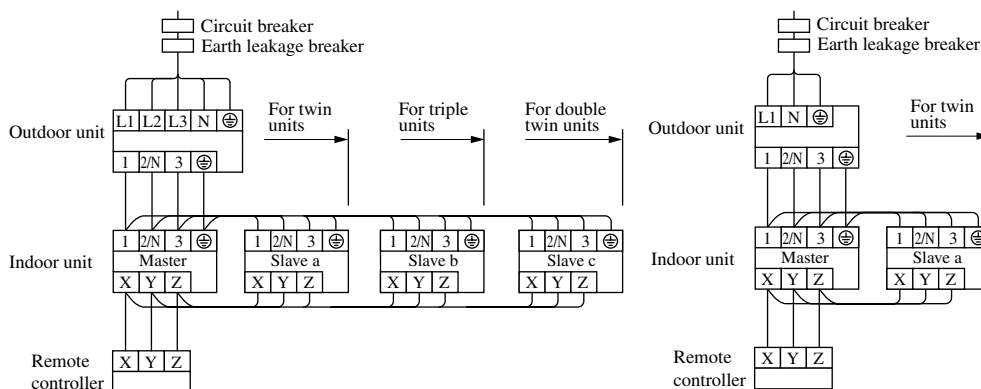
Item Model	Phase	Earth leakage breaker	Circuit breaker		Power source wires (minimum)	Interconnecting and grounding wires (minimum)
			Switch breaker (A)	Over-current protector rated capacity (A)		
FDCA301HEN	1	20A, 30mA, 0.1 sec or less	30	20	3.5mm <sup>2</sup>	ø 1.6
FDCA301HES	3	15A, 30mA, 0.1 sec or less		15	2.0mm <sup>2</sup>	
FDCA401HEN	1	40A, 30mA, 0.1 sec or less	40	40	5.5mm <sup>2</sup>	
FDCA401HES	3	15A, 30mA, 0.1 sec or less	30	15	3.5mm <sup>2</sup>	
FDCA501HES		20A, 30mA, 0.1 sec or less		20		
FDCA601HES		40A, 6mA, 0.4 sec or less	60	40	5.5mm <sup>2</sup>	
FDCA801HES						
FDCA1001HES					Interconnecting wire: ø1.6 Grounding wire: 3.5mm <sup>2</sup>	

(b) Wiring connection.

- 1) Connect the same terminal number between the Indoor unit and Outdoor unit as shown in the following diagram.
- 2) Secure the wiring with wiring clamp so that no external force is transmitted to the connecting portion of terminal.
- 3) There is a ground (Earth) terminal in the control box.

• 3 phase model

• 1 phase model



- 4) Between master and slave indoor units, connect between the same numbers ①, ②N, ③ and ④, ⑤, ⑥ on the respective terminal blocks.
- 5) Set the same address for the master and slave indoor units as the communications address for the remote controller using rotary switch SW2 on the indoor units' control PCB.
- 6) Set Slave a, Slave b and Slave c using DIP switch SW5-1 and SW5-2 on the control PCB of the respective indoor slave units.
- 7) Be sure to press the AIR CON No. button on the remote controller after turning on the power, then check if the indoor master and slave unit No. is displayed in the remote controller.  
The indoor unit address is displayed when the AIR CON No. button is pressed. After that, pressing the ▲ or ▼ key displays the unit No. beginning from the lowest No.

(c) Plural Master / Slave setting

Set the plural address switches SW5-1 and SW5-2 on the indoor circuit board as shown in the table below.

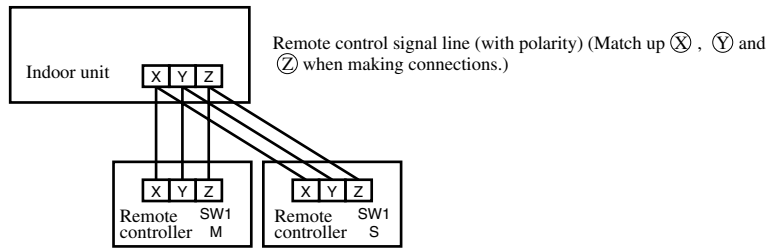
Master setting at time of factory shipment		Indoor unit			
		Master	Slave a	Slave b	Slave c
Plural address switch	SW5-1	OFF	OFF	ON	ON
	SW5-2	OFF	ON	OFF	ON

(d) Remote controller wiring and connection procedure

1) Master-slave settings when using multiple remote controllers

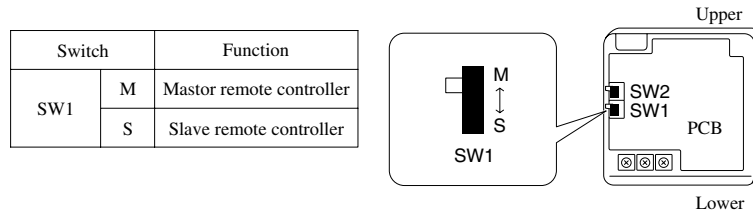
- Up to 2 remote controllers can be connected for each indoor unit (or group).

- There are two methods, one where the remote controller signal line (3-wire) for the slave remote controller is taken from the indoor unit and the other where the signal lines are taken from the master remote controller.



- Set the SW1 select switch on the slave remote controller on the Slave setting. (It is set on the Master setting at the factory.)

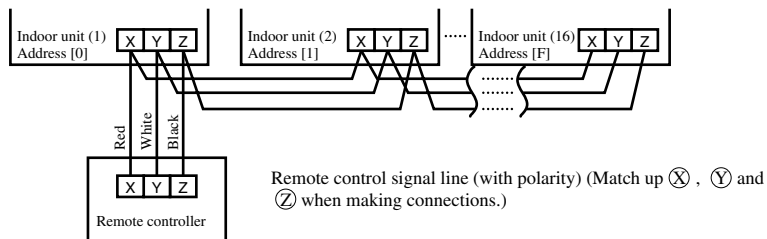
Note (1) Remote controller sensor activation settings are possible only with the master remote controller. Install the master remote controller in a location where it can sense the room temperature.



2) Controlling multiple indoor units using a single remote controller.

- Up to 16 indoor units can be controlled with a single remote controller.

- Run 3-wire remote control lines between each of the indoor units. See “Cautions when extending remote control lines” on page concerning extended remote control lines.
- Set the remote controller communications address on “0” ~ “F” using rotary switch SW2 on the indoor unit’s control board, taking care not to overlap the addresses of any of the units.



- After turning the power on, press the AIR CON No. button to display the indoor unit’s address. Be sure to confirm that the settings are displayed correctly in the remote controller by using the ▲ and ▼ buttons to display the address of each connected indoor unit.

**(8) Setting functions using the remote controller**

**(a) The default settings of this unit's functions are as follows: If you want to change 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 unit.**

① Remote controller unit functions (FUNCTION ▼)

Function number(A)	Function description(B)	Setting(C)	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	INVALID INVALID	○
05	ON/OFF 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 S/W (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	○

② Indoor unit functions (I/U FUNCTION ▲)

Function number(A)	Function description(B)	Setting(C)	Default setting
01	Hi CEILING SET	STANDARD (Mild mode) Hi CEILING 1 (Powerful mode)	*
03	FILTER SIGN SET	NO DISPLAY AFTER 180H AFTER 600H AFTER 1000H 1000H→STOP	*
04	POSITION (Louver control setting)	FIX (1 OF 4) (4 position 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	○

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.

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".



**(b) 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 change 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: ①, Function description: ②)

The screen display will be switched like this.

- ② Press either ▲ or ▼ button.

“Function number: ①, Function description: ②” 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: ③” (ex. “AUTO RUN ON”)

- ④ Press either ▲ or ▼ button.

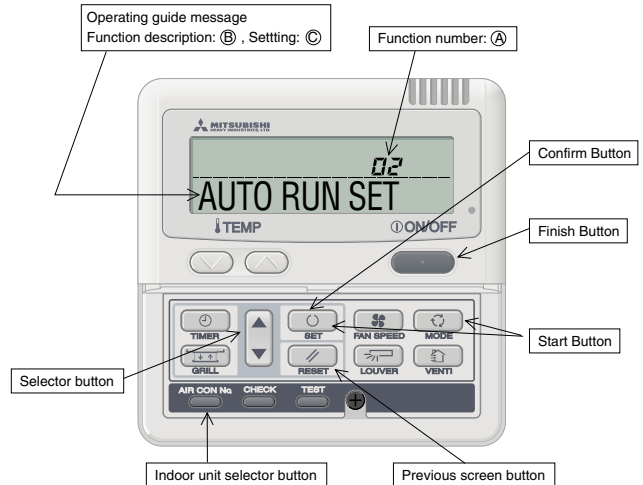
A list of “Settings: ③” will be displayed one by one. Select your desired setting.

- ⑤ Press the SET button.

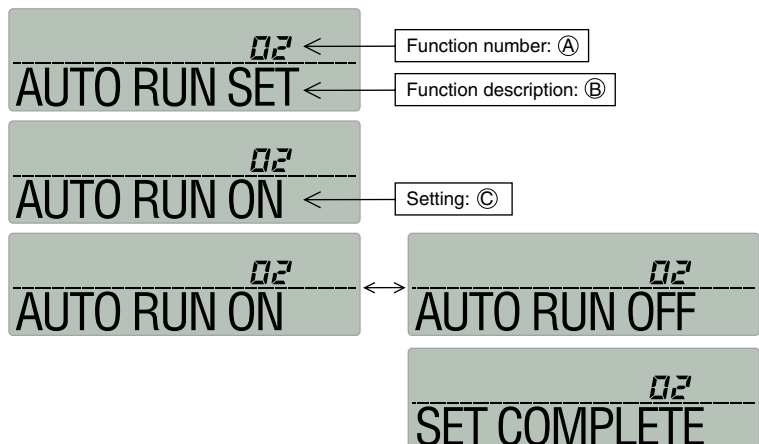
The selected setting is displayed for 2 seconds, then followed by “SET COMPLETE” and the function setting process is completed.

Then the screen display will be switched to “Function number: ①, Function description: ②,” 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 change, 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.

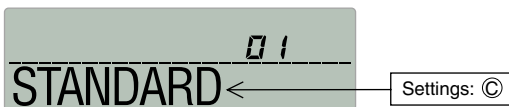


- ④ Press either ▲ or ▼ button.

"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 steps 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.

**(c) 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 "Setting: Ⓒ". (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.**

**(d) 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: 22~30°C (valid during heating) Lower Limit Value: 18 ~ 26°C (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 ▲ .”, then press the SET button.
  - e) If “Hi LIMIT SET” is selected,
    - ① The display changes from “ SET UP” → “Hi LIMIT 22°C ” (flashing).
    - ② Using the “ ” button, select the upper limit value. Display example: “Hi LIMIT 22°C ” (flashing)
    - ③ Press the SET button to fix the setting. Display example: “Hi LIMIT 22°C” (lighted up)
  - f) If “Lo LIMIT SET” is selected,
    - ① The display changes from “ SET UP” → “Lo LIMIT 26°C ” (flashing).
    - ② Using the “ ” button, select the upper limit value. Display example: “Lo LIMIT 26°C ” (flashing)
    - ③ Press the SET button to fix the setting. Display example: “Lo LIMIT 26°C” (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 28°C.
		NO DISP CHANGE	The remote controller's display upper limit remains at 30°C and only the upper limit of the sent data is changed to 28°C.

## (9) Test run

### (a) Carry out test operation from outdoor units.

#### Models FDCA301~601

##### 1) Test run method

- a) A test run can be initiated from an outdoor unit by using SW2 and SW5-4 for on-site setting.
- b) Press SW2 (push-button switch) for one second. The compressor will start when the button is released. The compressor will stop when 30 minutes elaps.
- c) The unit will start a cooling operation, when SW5-4 is OFF, or a heating operation, when SW5-4 is ON.
- d) When a test run is completed, press SW2 (push-button switch) again for one second and then release it.

##### 2) Checking the state of the unit in operation

Check discharge pressure and suction pressure, using the check joint provided inside the outdoor unit and the gas charge valve charge port. The check joint in the unit is provided on the pipe connecting the four-way valva and the heat exchanger, and these points offer different pressure measurements depending on a cooling or heating operation as summarized in the table below.

	Check joint in the unit	Gas operation valve charge port
Cooling	Discharge pressure (high pressure)	Suction pressure (low pressure)
Heating	Suction pressure (low pressure)	Discharge pressure (high pressure)

##### 3) Setting SW5-1, SW5-2 on-site

- a) Defrost conteol switching (SW5-1)
  - ① When this switch is turned on, the unit will run in the defrost mode more frequently.
  - ② Please set this switch to ON, when installed in a region where outdoor tempaure falls below zero during the season the unit is run for a heating operation.
- b) Snow guard fan control (SW5-2)
  - ① When this switch is turned on, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running.
  - ② When the unit is used in a very snowy country, please set this switch to ON.

#### Models FDCA801, 1001

- a) Trial operation can be performed using the local setting switches SW3-3 and SW3-4.
    - ① Turning SW3-3 ON operates the compressor.
    - ② Turning SW3-4 OFF starts cooling. Turning SW3-4 ON starts heating.
- Note (1) Be sure to turn SW3-3 OFF when trial operation is finished.

### (b) Trial operation from a remote controller

#### 1) Cooling Test Operation Procedure

Carry out the following test operation procedure using the remote controller.

##### a) 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.”



##### b) 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.



## (10) Checking Operation Data

Operation data can be checked with remote controller unit 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 connected, the indoor unit number displayed on the screen will not change.)



- ④ Determine the indoor unit number will 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 unit 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 air 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)

## 6 MAINTENANCE DATA

### 6.1 Servicing

#### (1) Evacuation

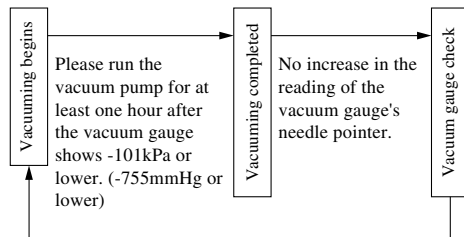
The evacuation is a procedure to purge impurities, such as noncondensable gas, air, moisture from the refrigerant equipment by using a vacuum pump. Since the refrigerant R410A is very insoluble in water, even a small amount of moisture left in the refrigerant equipment will freeze, causing what is called ice clogging.

#### Evacuation procedure

Make sure that the both service valves of gas and liquid line are fully opened.

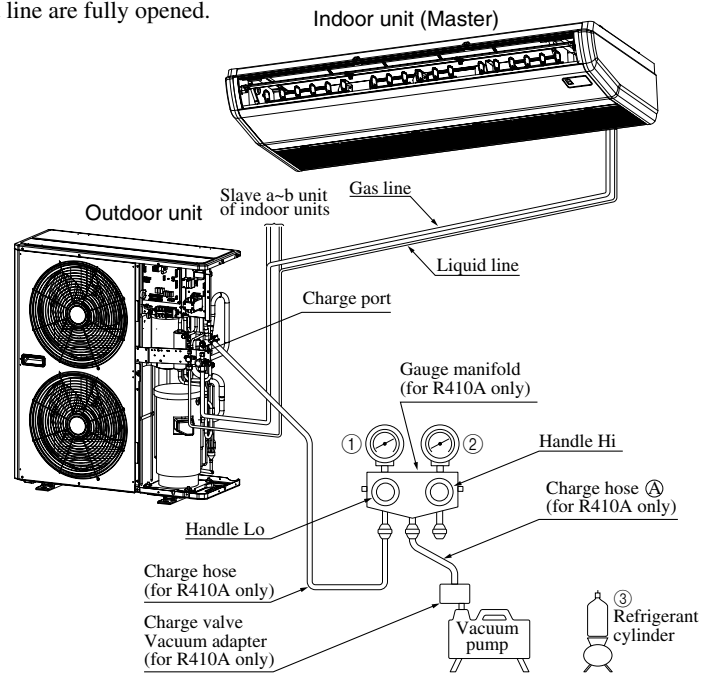
- Check to ensure that there is no internal pressure in the unit. If there is an internal pressure, it should be relieved through the service port.
- Connect the charging hose of the gauge manifold to the service port of the gas piping. Close high pressure valve ② of gauge manifold.
- Connect the charging hose ④ to a vacuum pump.

Repeat evacuation in the following sequence.



When the vacuum gauge's needle pointer creeps up, there is moisture left in the system or a leak. Pull air again after you have checked the system for a leak and rectified it. Use a reverse flow stop adapter to prevent the vacuum pump's lubricant oil from flowing into the refrigerant system.

- Notes (1) Do not use the refrigerant pressure to expel air.  
 (2) Do not use the compressor for evacuation.  
 (3) Do not operate the compressor in a vacuum condition.



- Notes (1) Refer to the exterior-view drawing for the position of the service valve.  
 (2) When connecting of their service valve, flare connection for both the indoor and outdoor unit.

## (2) Refrigerant charging

- (a) After the evacuation shown in the above, change the connection of the charge hose ④ to the refrigerant cylinder.  
 (b) Purge air from the charge hose ④.

First loosen the connecting portion of the charge hose at the gauge manifold side and open valve ③ for a few seconds, and then immediately retighten it after observing that gas has blown out from loosened connecting portion.

- (c) Open valves ① and ③ then gas refrigerant begins flowing from the cylinder into the unit.

When refrigerant has been charged into the unit to some extent, refrigerant flow becomes stagnant. When that happens, start the compressor in cooling cycle until the system is filled with the specified amount of gas, then close valves ① and ③ and remove the gauge manifold. Cover the service port with caps and tighten them securely.

- (d) Check for gas leakage by applying a gas leak detector around the piping connection.  
 (e) Start the air conditioner and make sure of its operating condition.

## 6.2 Trouble shooting for refrigerant circuit

### (1) Judgement of operating condition by operation pressure and temperature difference

Making an accurate judgement requires a skill that is acquired only after years of experience, one trouble may lead to another trouble from a single trouble source and several other troubles may exist at the same time which comes from a undetected different trouble source.

Filtering out the trouble sources can be done easier by comparing with daily operating conditions. Some good guides are to judge the operating pressure and the temperature difference between suction air and delivery air.

Following are some pointers,

Circuit	Pressure					Trouble cause
	Indi- cation Too low	A little low	Normal	A little high	Too high	
High side Low side					●	1) Excessive overcharging of refrigerant 2) Mixture of non condensable gas (air etc.)
High side Low side	●				●	Ineffective compression (defective compressor)
High side Low side	●	●				1) Insufficient refrigerant in circuit 2) Clogging of strainer 3) Gas leakage 4) Clogging of air filter (in cooling) 5) Decrease in heat load (in cooling) 6) Locking of indoor fan (in cooling)
High side Low side				●	●	1) Locking of outdoor unit fan (in cooling) 2) Dirty outdoor heat exchanger (in cooling) 3) Mixture of non condensable gas (air etc.)
High side Low side				●	●	1) Too high temperature of room

**(1) Selfdiagnosis function**

**(a) Check Indicator Table**

Whether a failure exists or not on the indoor unit and outdoor unit can be know by the contents of remote controller error code, indoor/outdoor unit green LED (power pilot lamp and microcomputer normality pilot lamp) or red LED (check pilot lamp).

**1) Indoor unit side**

Remote controller error code	Indoor unit LED		Outdoor unit LED		Cause
	Green	Red	Green	Red	
<b>No-indication</b>	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Normal
	Stays OFF	Stays OFF	Stays OFF	Stays OFF	Power OFF, L 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.
<b>LCD flashes continuously or is off.</b>	Keeps flashing	Stays OFF	Keeps flashing	2 time flash	Poor connection or disconnection in wires connecting the indoor and outdoor units.
<b>E1</b>	Stay OFF or Lights continuously	Stay OFF	Keeps flashing	Stays OFF	Indoor unit PCB fault
	Keeps flashing	Stay OFF	Keeps flashing	Stays OFF	The remote controller wire Y is open. The remote controller wires X and Y are reversely connected. Noise is penetrating the remote control lines. The remote controller or indoor control PCB is faulty. (The communications circuit is faulty.)
<b>E5</b>	Keeps flashing	2 time flash	Keeps flashing	2 time flash	Indoor / outdoor transmission error.
	Keeps flashing	2 time flash	Keeps flashing	Stays OFF	Outdoor unit microcomputer failure
<b>E6</b>	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Indoor unit heat exchanger thermistor failure
<b>E7</b>	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Indoor unit return air thermistor failure
<b>E8</b>	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Heating overload (indoor heat exchanger temperature is abnormally high) and indoor heat exchanger thermistor is faulty.
<b>E9</b>	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	The float SW operates (with FS only). Drain up kit wiring fault.
<b>E10</b>	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 performed.
<b>E16</b>	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Fan motor is faulty (FDTA 501 type, FDKN type).
<b>E28</b>	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Remote controller thermistor failure



## 2) Outdoor unit side

Remote controller error code	Indoor unit LED		Outdoor unit LED		Cause
	Green	Red	Green	Red	
<b>E32</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Wiring is open or reversal phase
<b>E33</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Abnormal current cut of compressor
<b>E34</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	52C secondary side L3-phase wiring is open.
<b>E35</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Outdoor heat exchanger temperature is high or outdoor heat exchanger thermistor is faulty.
<b>E36</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Discharge temperature abnormality.
<b>E37</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Outdoor unit heat exchanger thermistor failure
<b>E38</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Outdoor air temperature thermistor failure
<b>E39</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Discharge pipe thermistor failure
<b>E40</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	63H1 operation
<b>E49</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Low pressure error or gas low error. Service valve closes operation. (FDCA801, 1001 type)
<b>E52</b>	Keeps flashing	Stays OFF	Keeps flashing	Lights contiously	52C abnormal.
<b>E53</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Suction pipe temperature thermistor failure (FDCA801, 1001 type)
<b>E54</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Low pressure sensor disconnection/output error (FDCA801, 1001 type)
<b>E55</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Under-doom thermistor failure (FDCA801, 1001 type)
<b>E57</b>	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	Insufficient refrigerant.

**(b) Display sequence of error, inspection display lamp**

- 1) One kind error  
Display corresponding to the error is shown.
- 2) More than one errors.

Section	Display section
Error code of remote controller	• Displays the error of higher priority (When plural errors are persisting)
Inspection LED (red) of indoor unit PCB	<i>E1 &gt; E5 &gt; ..... E10 &gt; E32 ..... E57</i>
Inspection LED (red) of outdoor unit PCB	• Displays the present errors. (When a new error has occurred after the former error was reset.)

3) Timing of error detection

● **Indoor unit side.**

Error detail	Error code	Timing of error detection
Drain error (float switch motion)	<i>E9</i>	Normally, 30 seconds after the power is turned ON.
Wrong connection between the indoor and outdoor units.	“(Wait)”	No communications even once with the outdoor unit.
Transmission error of remote controller indoor unit	<i>E1</i>	After 1 or more communications of the indoor unit with the remote controller following power on, transmission errors cause an interruption for 2 minutes.
Transmission error between indoor/outdoor units	<i>E5</i>	After communications with the outdoor unit 1 or more times, communications are abnormal continuously for 2 minutes.
The number of connected indoor units exceeds the connection limit (when multiple units are control by a single remote controller).	<i>E10</i>	Normally after the power is turned ON (during communications).
Broken wire of indoor unit return air thermistor	<i>E7</i>	When an input temperature of $-50^{\circ}\text{C}$ or lower is measured by the return air thermistor is measured for 5 seconds or longer within 60 minutes after the first detection.
Broken wire of heat exchanger thermistor	<i>E6</i>	When an input temperature of $-50^{\circ}\text{C}$ or lower is measured by the heat exchanger thermistor is measured for 5 seconds or longer within 60 minutes after the first detection.

● **Outdoor unit side.**

Error detail	Error code	Timing of error detection
Broken wire of outdoor air temperature thermistor	<i>E38</i>	When a thermistor input temperature of $-30^{\circ}\text{C}$ or lower is measured for 5 seconds or longer within 60 minutes (3 times within 60 minutes) after the 1st detection between 2 minutes and 2 minutes 20 seconds after compressor operation starts.
Broken wire of heat exchanger thermistor	<i>E37</i>	When a thermistor input temperature of $-30^{\circ}\text{C}$ or lower is measured for 5 seconds or longer within 60 minutes (3 times within 60 minutes) after the 1st detection between 2 minutes and 2 minutes 20 seconds after compressor operation starts.
Broken wire of discharge pipe thermistor	<i>E39</i>	When a thermistor input temperature of $-10^{\circ}\text{C}$ or lower is measured for 5 seconds or longer within 60 minutes (3 times within 60 minutes) after the 1st detection between 10 minutes and 10 minutes 20 seconds (between 2 minutes and 2 minutes 20 seconds) after compressor operation starts.
Broken wire of under-doom thermistor	<i>E55</i>	When the under-dome thermistor input temperature of $-10^{\circ}\text{C}$ is measured for 5 seconds or longer 3 times within 60 minutes after the 1st detection between 10 minutes and 10 minutes 20 seconds after compressor operation starts.

Notes (1) Values in ( ) show for the FDCA801, 1001 models.

(2) The under-doom thermistor is used in the FDCA801, 1001 models only.

#### 4) Recording and reset of error

Error display	Memory	Reset
Error code of remote controller	• Saves in memory the mode <sup>(1)</sup> of higher priority	<ul style="list-style-type: none"> <li>• Stop the unit operation by pressing the ON/OFF switch of remote controller.</li> <li>• Operation can be started again if the error has been reset.</li> </ul>
Indoor unit inspection lamp (red)	• Cannot save in memory	
Outdoor unit inspection lamp (red)	• Saves in memory the mode <sup>(1)</sup> of higher priority	

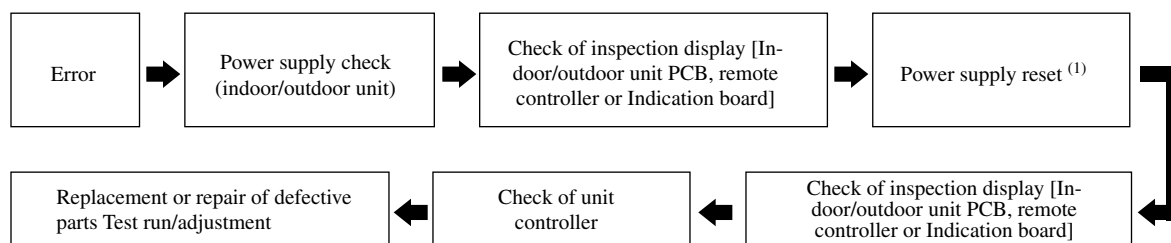
Notes (1) Priority is in the order of E1 > ... > E10 > ... > E57.

**Indoor unit** : Press the ON/OFF button on the remote controller. Or disconnect and reconnect the power supply connector (CNW1 or CNW0) on the indoor unit control PCB or turn the main power supply OFF.

**Outdoor unit** : Turn the main power supply OFF.

#### (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.

#### (3) Error diagnosis procedures at the indoor unit side

To diagnose the error, measure the voltage (AC, DC), resistance, etc. at each connector around the circuit board of indoor unit based on the inspection display or the operation state of unit (no operation of compressor or blower, no switching of 4-way valve, etc.) If any defective parts are discovered, replace with the assembly of parts as shown below.

##### (a) Single-unit replacement parts for circuit board of indoor unit. (Peripheral electric parts for circuit board.)

Indoor unit printed circuit board, thermistor (return, heat exchanger), operating switches, limit switches, transformers, fuses.

Note (1) Use normal inspection methods to determine the condition of strong electrical circuits and frozen cycle parts.

##### (b) Replacement procedure of indoor unit microcomputer printed circuit board

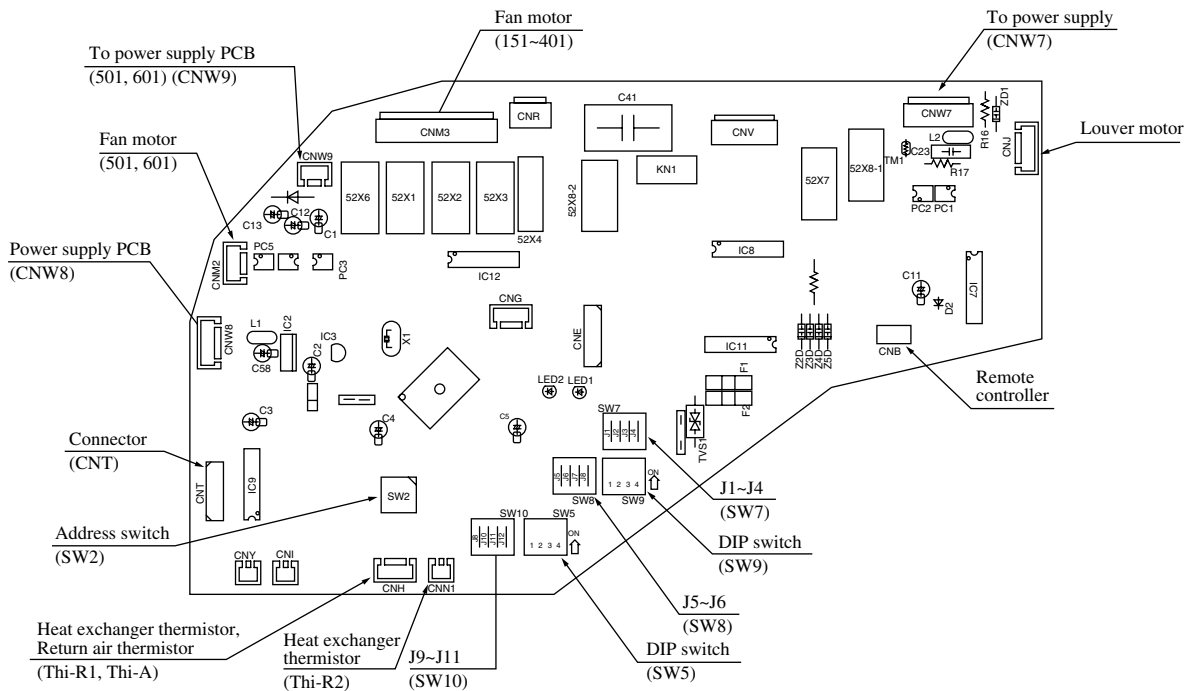
Microcomputer printed circuit board can be replaced with following procedure.

(i) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

Model	Parts number	Model	Parts number
FDT 151~401	PJA505A122ZD	FDKN 151~251	PHA505A018ZF
FDT 501	PJA505A122ZC	FDKN 301	PHA505A018ZG
FDEN	PJA505A128ZF	FDUR	PJA505A131ZC

## Parts layout on the indoor unit PCB

Model: FDT series



### ● Change by the jumper wire

Name		Function
J1 (SW7-1)	With	Input signal - Reverse invalid
	None <sup>(1)</sup>	Input signal - Run stop
J2 (SW7-2)	With	Heating thermostat OFF-Lo
	None <sup>(1)</sup>	Heating thermostat OFF-Stop, Lo
J3 (SW7-3)	With	Normal operation operable
	None <sup>(1)</sup>	Operation permission prohibited
J4 (SW7-4)	With	Normal
	None <sup>(1)</sup>	Heating temp. +3
J5 (SW8-1)	With	Louver free stop control - Invalid
	None <sup>(1)</sup>	Louver free stop control - Effective
J6 (SW8-2)	With	Freeze prevention fan control activated.
	None <sup>(1)</sup>	Freeze prevention fan control deactivated.

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumpers J1 ~ J6. Instead, SW7 and 8, with the same functions as jumpers J1~J6, are used in the position where the jumpers were previously. Set SW7 and 8 locally in accordance with the above table.

### ● Control change switch (SW5, SW9, SW10)

Function of DIP switch SW5 (Usually all turned OFF)

Switch	Function	
SW5-3	ON	Setting time : 1000hrs. (Unit stop)
	OFF	Setting time : 1000hrs. (Display)
	ON	Setting time : 600hrs. (Display)
	OFF	Setting time : 180hrs. (when shipped from factory)

Function of DIP switch SW9 (Usually all turned OFF)

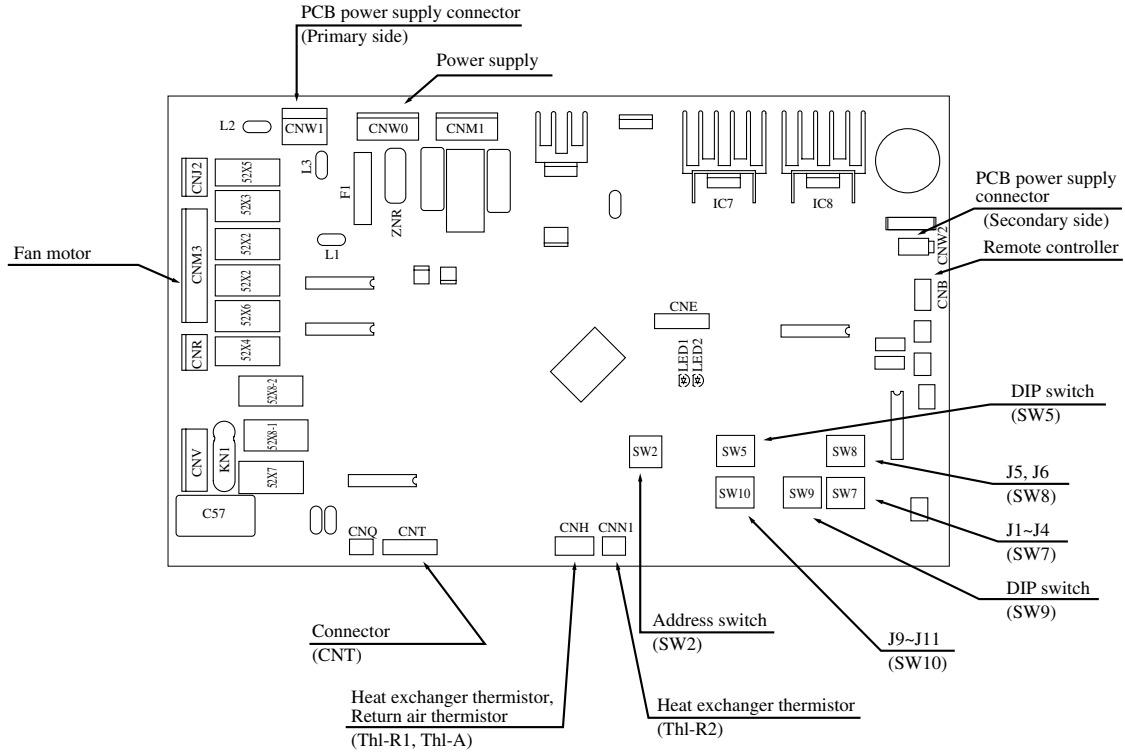
Switch	Function	
SW9-3	ON	Emergency operation
	OFF	Normal
SW9-4	ON	Fan control : Powerful mode
	OFF	Fan control : Mild mode

Note (1) It is normally ON only in the case of SW9-4.

Function of DIP switch SW10 (Usually all turned OFF)

Switch	Function	
SW10-1 (J9)	OFF	Auto swing function - None
	ON	Auto swing function - With
SW10-2 (J10)	OFF	Remote controller air flow -
	ON	Remote controller air flow 1 speed
	ON	Remote controller air flow 2 speed
SW10-3 (J11)	OFF	Remote controller air flow 3 speed
	ON	Remote controller air flow 3 speed

**Model: FDEN series**



● **Change by the jumper wire**

Name	With	Function
J1 (SW7-1)	With	Input signal - Reverse invalid
	None (1)	Input signal - Run stop
J2 (SW7-2)	With	Heating thermostat OFF-Lo
	None (1)	Heating thermostat OFF-Stop, Lo
J3 (SW7-3)	With	Normal operation operable
	None (1)	Operation permission prohibited
J4 (SW7-4)	With	Normal
	None (1)	Heating temp. +3
J5 (SW8-1)	With	Louver free stop control - Invalid
	None (1)	Louver free stop control - Effective
J6 (SW8-2)	With	Freeze prevention fan control activated.
	None (1)	Freeze prevention fan control deactivated.

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumpers J1 ~ J6. Instead, SW7 and 8, with the same functions as jumpers J1~J6, are used in the position where the jumpers were previously. Set SW7 and 8 locally in accordance with the above table.

● **Control change switch (SW5, SW9, SW10)**

Function of DIP switch SW5 (Usually all turned OFF)

Switch	Function	
SW5-3	ON	Setting time : 1000hrs. (Unit stop)
	OFF	Setting time : 1000hrs. (Display)
	ON	Setting time : 600hrs. (Display)
	OFF	Setting time : 180hrs. (when shipped from factory)

Function of DIP switch SW9 (Usually all turned OFF)

Switch	Function	
SW9-3	ON	Emergency operation
	OFF	Normal
SW9-4	ON	Fan control : Powerful mode
	OFF	Fan control : Mild mode

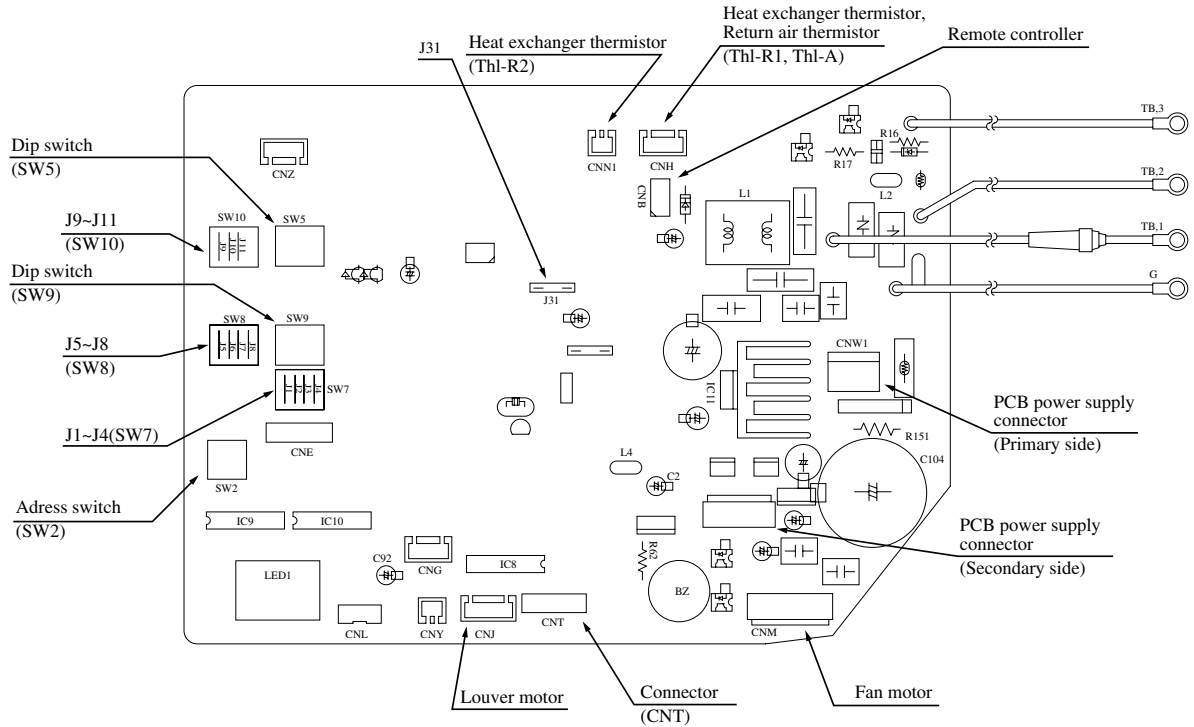
Note (1) It is normally ON only in the case of SW9-4.

Function of DIP switch SW10 (Usually all turned OFF)

Switch	Function	
SW10-1 (J9)	OFF	Auto swing function - None
	ON	Auto swing function - With
SW10-2 (J10)	OFF	Remote controller air flow -
	ON	Remote controller air flow 1 speed
	OFF	Remote controller air flow 2 speed
	ON	Remote controller air flow 3 speed

**Model: FDKN series**

This diagram shows the PCB for the 151~251. The component layout on the 301 PCB is different, but the functions are the same.



● **Change by the jumper wire**

Name	With	Function
J1 (SW7-1)	With	Input signal - Reverse invalid
	None (1)	Input signal - Run stop
J2 (SW7-2)	With	Heating thermostat OFF-Lo
	None (1)	Heating thermostat OFF-Stop, Lo
J3 (SW7-3)	With	Normal operation operable
	None (1)	Operation permission prohibited
J4 (SW7-4)	With	Normal
	None (1)	Heating temp. +3
J5 (SW8-1)	With	Louver free stop control - Invalid
	None (1)	Louver free stop control - Effective
J6 (SW8-2)	With	Freeze prevention fan control activated.
	None (1)	Freeze prevention fan control deactivated.
J8 (SW8-4)	With	Model 151~251
	None (1)	Model 301
J31	With	Wireless remote controller
	None (1)	Wired remote controller

Notes (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumpers J1 ~ J8. Instead, SW7 and 8, with the same functions as jumpers J1~J8, are used in the position where the jumpers were previously. Set SW7 and 8 locally in accordance with the above table.

● **Control change switch (SW5, SW9, SW10)**

Function of DIP switch SW5 (Usually all turned OFF)

Switch	Function	
SW5-3	ON	Setting time : 1000hrs. (Unit stop)
	OFF	Setting time : 1000hrs. (Display)
	ON	Setting time : 600hrs. (Display)
	OFF	Setting time : 180hrs. (when shipped from factory)

Function of DIP switch SW9 (Usually all turned OFF)

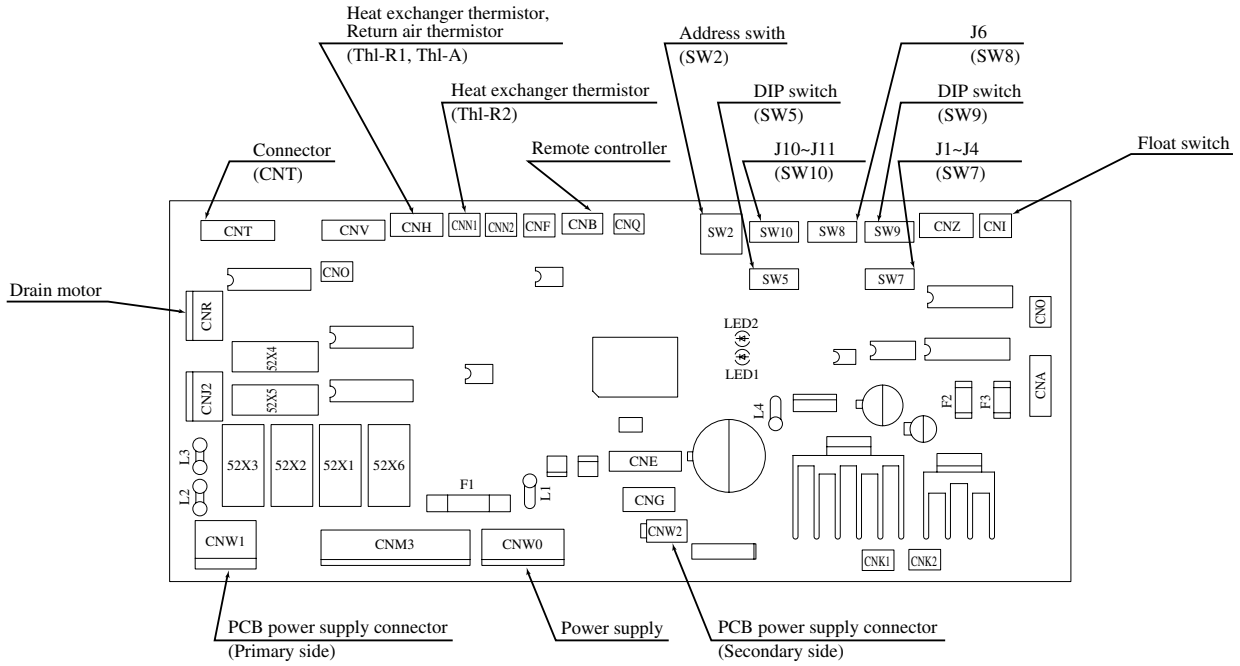
Switch	Function
SW9-1	OFF Custom code - Change
	ON Custom code - Normal
SW9-2	OFF Power failure security - Effective
	ON Power failure security - Invalid
SW9-3	ON Emergency operation
	OFF Normal
SW9-4	ON Fan control : Powerful mode
	OFF Fan control : Mild mode

Note (1) It is normally ON only in the case of SW9-4.

Function of DIP switch SW10 (Usually all turned OFF)

Switch	Function	
SW10-1 (J9)	OFF	Dryness operation: 120 minutes (Louver level)
	ON	Dryness operation: 60 minutes (Louver close)
	OFF	Dryness operation: 120 minutes (Louver close)
	ON	Dryness operation: Invalid

**Model: FDUR series**



● **Change by the jumper wire**

Name	With	Function
J1 (SW7-1)	With	Input signal - Reverse invalid
	None <sup>(1)</sup>	Input signal - Run stop
J2 (SW7-2)	With	Heating thermostat OFF-Lo
	None <sup>(1)</sup>	Heating thermostat OFF-Stop, Lo
J3 (SW7-3)	With	Normal operation operable
	None <sup>(1)</sup>	Operation permission prohibited
J4 (SW7-4)	With	Normal
	None <sup>(1)</sup>	Heating temp. +3
J6 (SW8-2)	With	Freeze prevention fan control activated
	None <sup>(1)</sup>	Freeze prevention fan control deactivated

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumpers J1 ~ J4, J6. Instead, SW7 and 8, with the same functions as jumpers J1~J4, J6, are used in the position where the jumpers were previously. Set SW7 and 8 locally in accordance with the above table.

● **Control change switch (SW5, SW9, SW10)**

Function of DIP switch SW5 (Usually all turned OFF)

Switch	Function		
SW5-3	ON	Setting time : 1000hrs. (Unit stop)	
	OFF	Setting time : 1000hrs. (Display)	
	SW5-4	ON	Setting time : 600hrs. (Display)
		OFF	Setting time : 180hrs. (when shipped from factory)

Function of DIP switch SW9 (Usually all turned OFF)

Switch	Function	
SW9-3	ON	Emergency operation
	OFF	Normal
SW9-4	ON	Fan control : High speed (High Ceiling)
	OFF	Fan control : Standard

Function of DIP switch SW10 (Usually all turned OFF)

Switch	Function			
SW10-2 (J10)	OFF	SW10-3 (J11)	OFF	Remote controller air flow -
	ON		ON	Remote controller air flow 1 speed
	ON	OFF	Remote controller air flow 2 speed	
		ON	Remote controller air flow 3 speed	

**(c) Check method when the error code is display**

Remote controller or Indication board: Inspection LED, error code

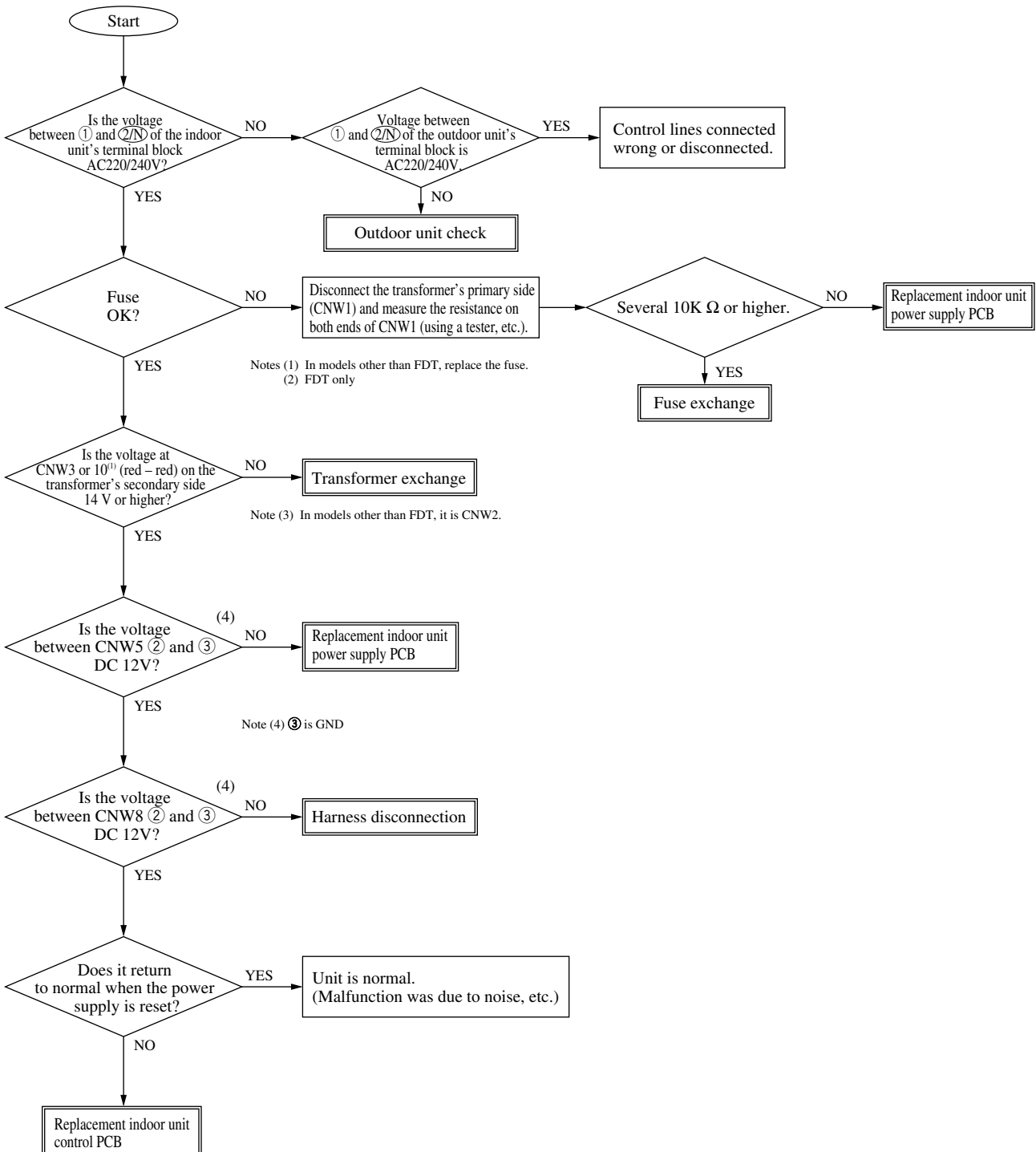
Indoor unit PCB: Red LED (inspection display), Green LED (CPU. normal display)

Outdoor unit PCB: ARed LED (inspection display), Green LED (CPU. normal display)

**1** Error display : No display  
LCD display : No display

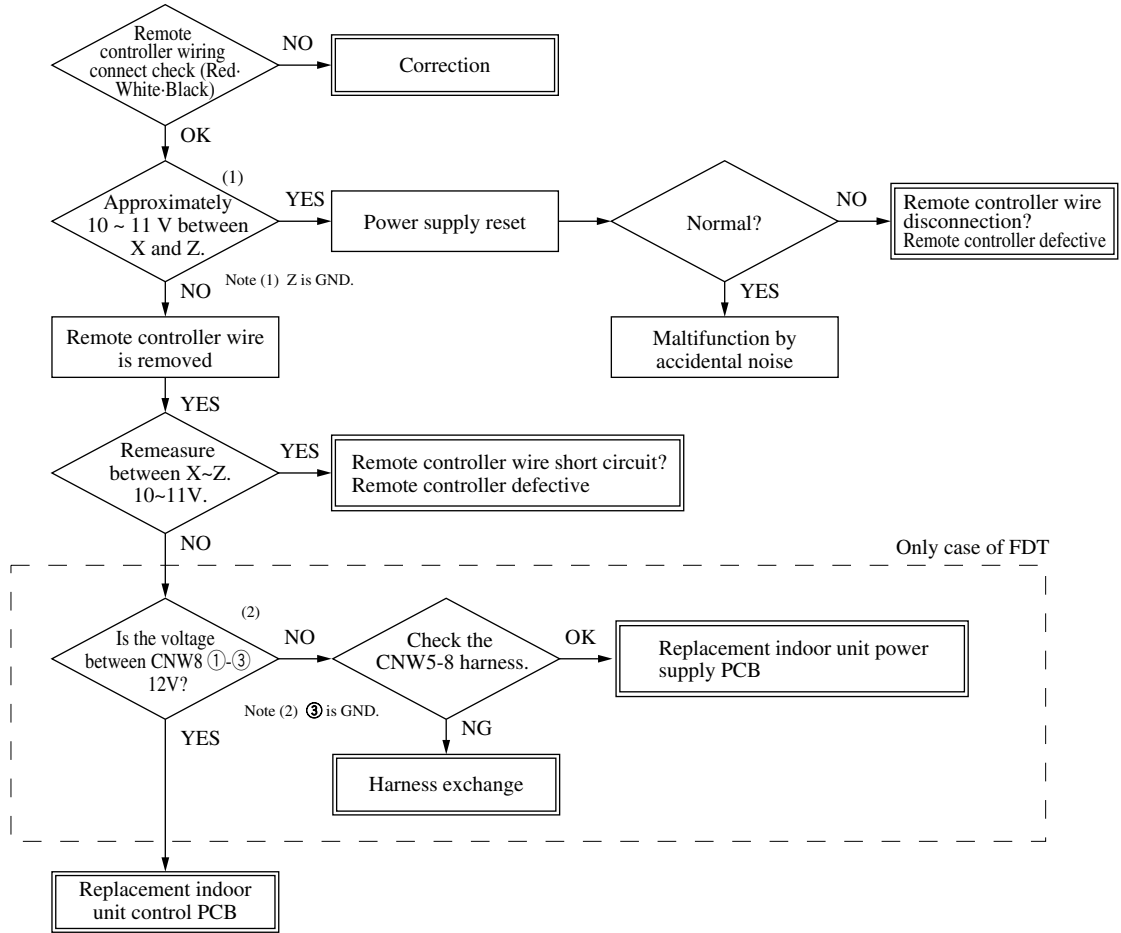
**[Power supply line error]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green 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



2

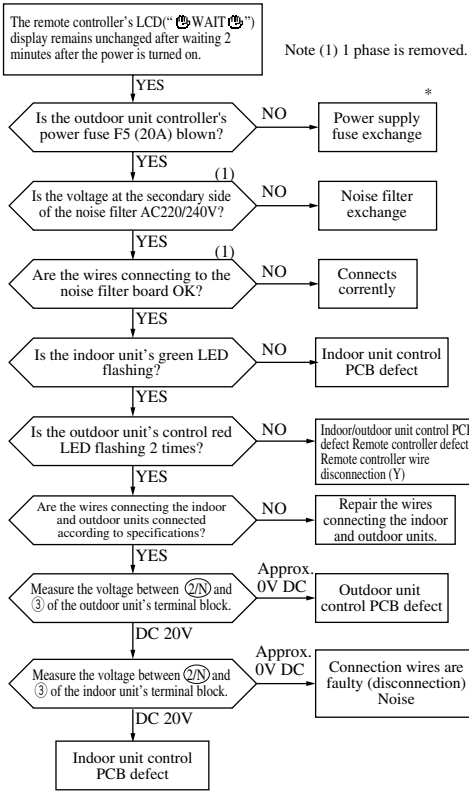
Error display “WAIT”

Indoor – outdoor communications trouble  
(Initial (when the power is turned on))

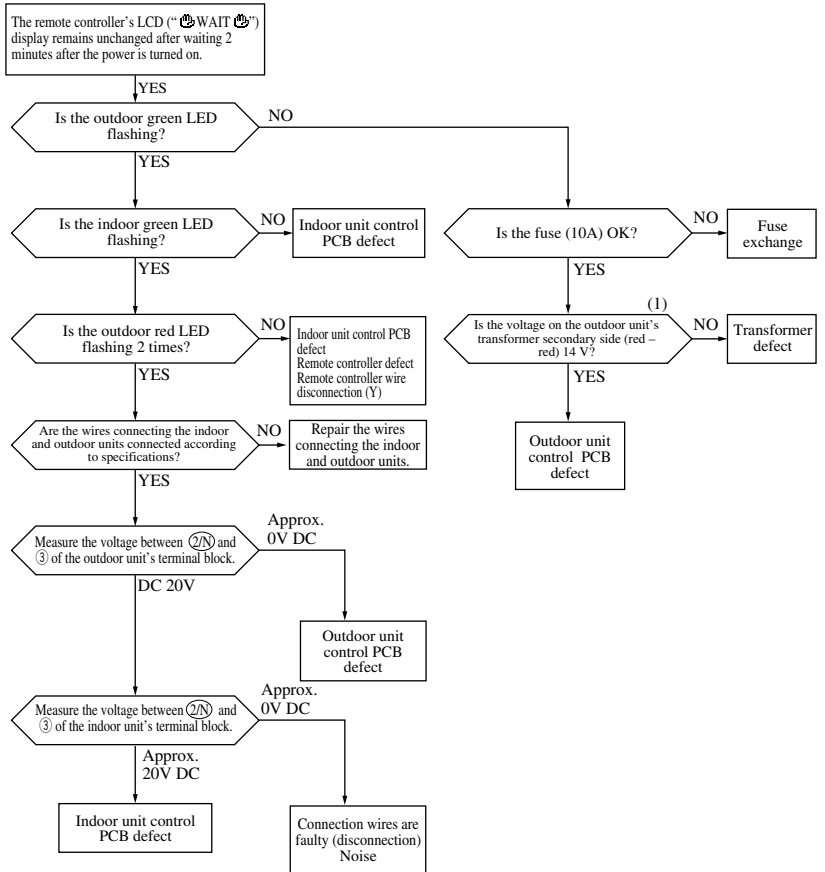
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	2 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

Notes (1) If trouble occurs during communications, the error code E5 is displayed (Outdoor, Red LED flashes 2 times). The check procedure is as shown below. (However, excluding connection related problems) Also, if the power supply is reset after E5 occurs, if the trouble is intermittent, it will be displayed in the LCD (“WAIT”).

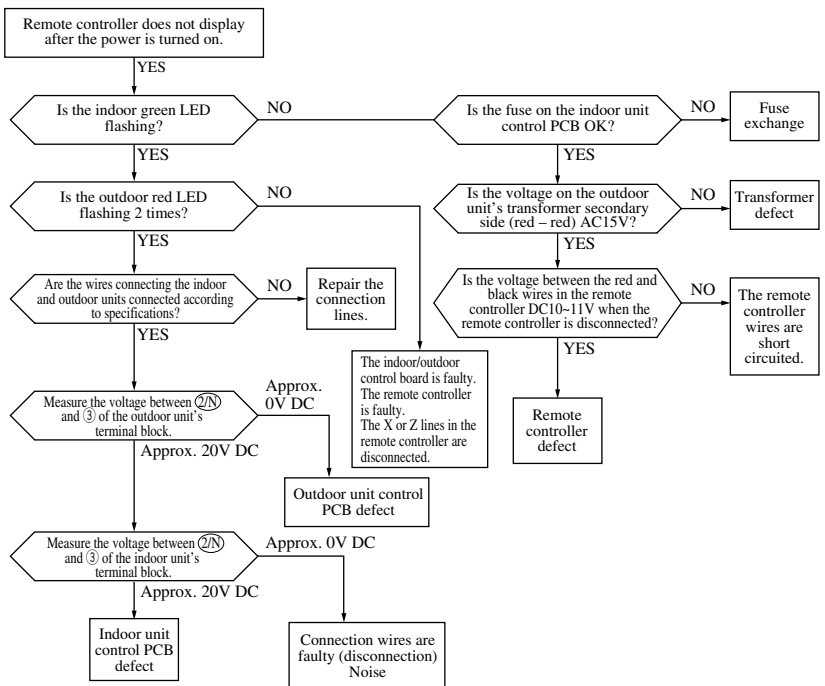
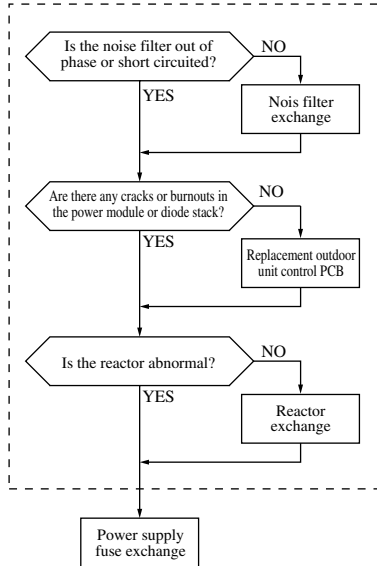
● 151~251



● 301~501



Inverter check before replacing the power supply fuse.

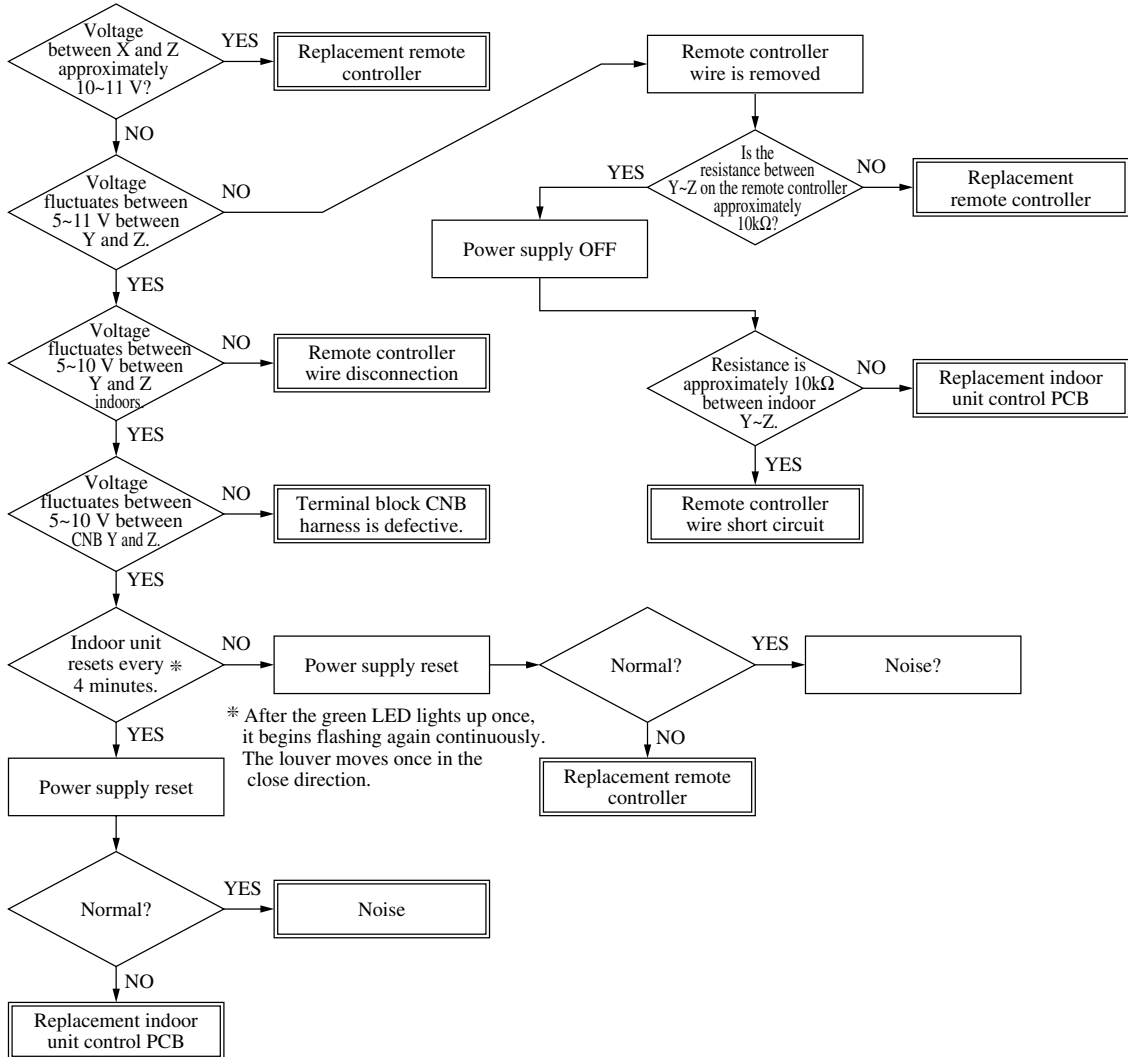


3

Error display : E1

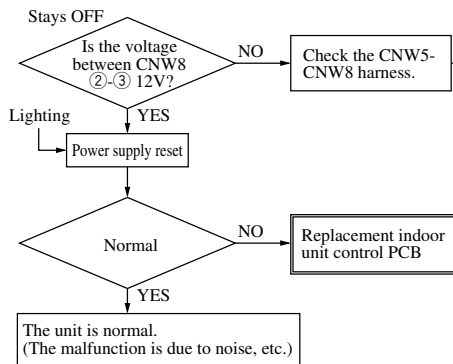
[Communication error between remote controller-Indoor unit]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

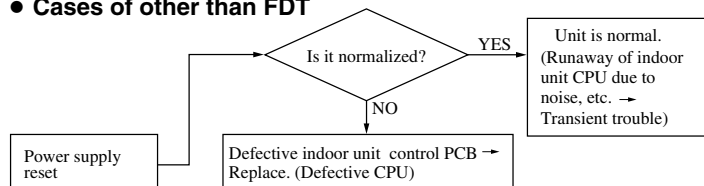


Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Stays OFF or Lights continuously	Green LED	Keeps flashing

● Only case of FDT

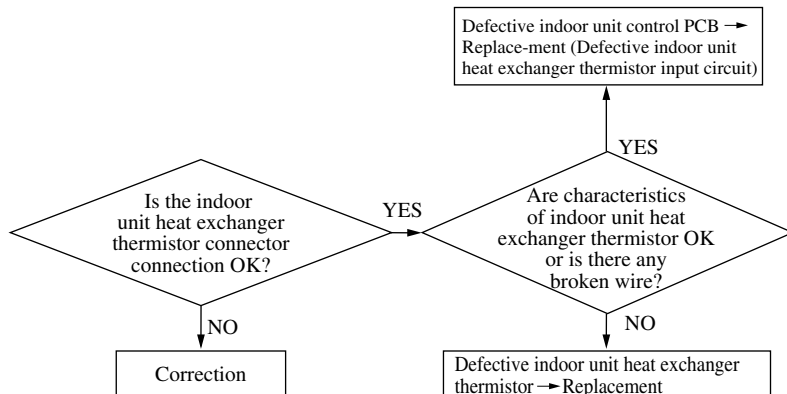


● Cases of other than FDT

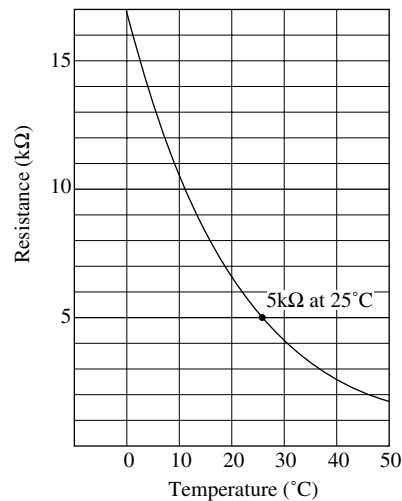


**4** Error display : **E6** [Defective indoor unit heat exchanger thermistor]

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-A)  
Indoor unit heat exchanger thermistor (Th-R1, R2)  
Resistance temperature characteristics

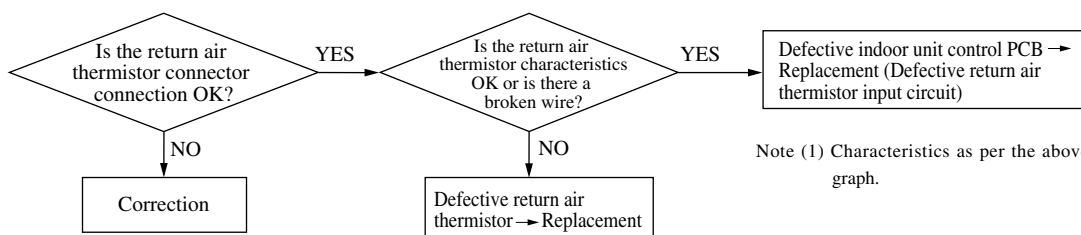


● Display condition

If a temperature of  $-50^{\circ}\text{C}$  or lower is detected continuously for 5 seconds or longer by the thermistor, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected again within 60 minutes after the first detection.

**5** 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

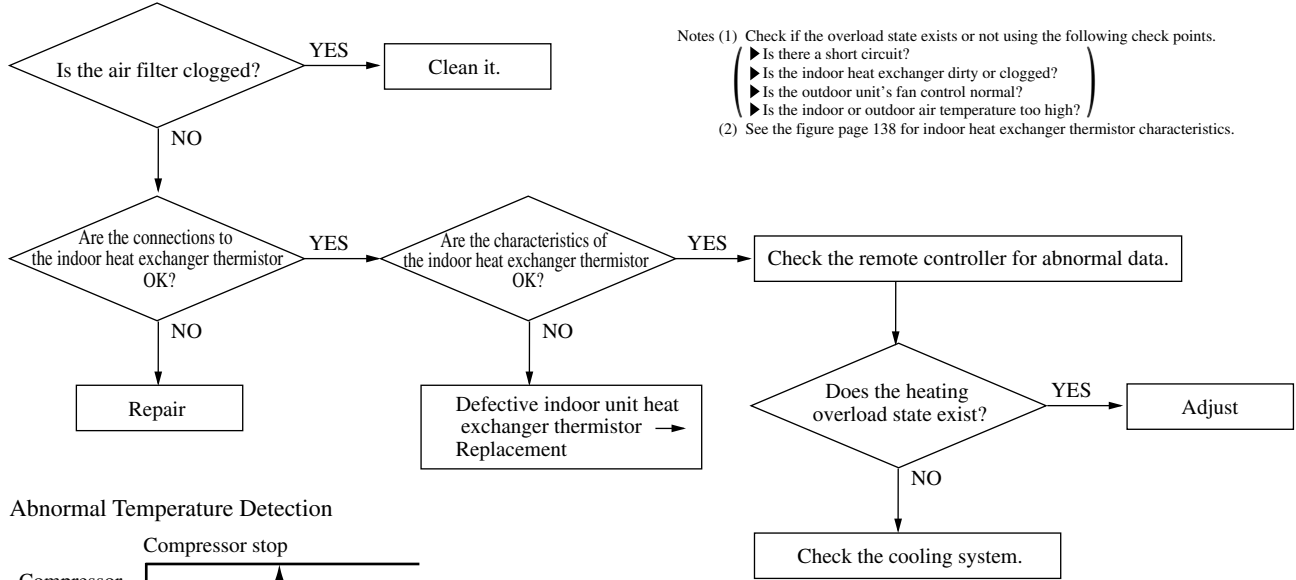
If a temperature of  $-50^{\circ}\text{C}$  or lower is detected continuously for 5 seconds or longer by the thermistor, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected again within 60 minutes after the first detection.

6

Error display : **EB**

[Heating overload]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

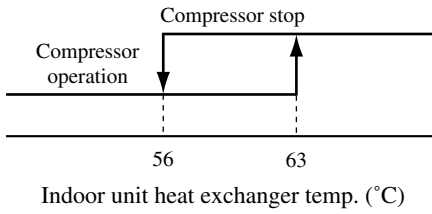


Notes (1) Check if the overload state exists or not using the following check points.

- ▶ Is there a short circuit?
- ▶ Is the indoor heat exchanger dirty or clogged?
- ▶ Is the outdoor unit's fan control normal?
- ▶ Is the indoor or outdoor air temperature too high?

(2) See the figure page 138 for indoor heat exchanger thermistor characteristics.

• Abnormal Temperature Detection



• Display condition

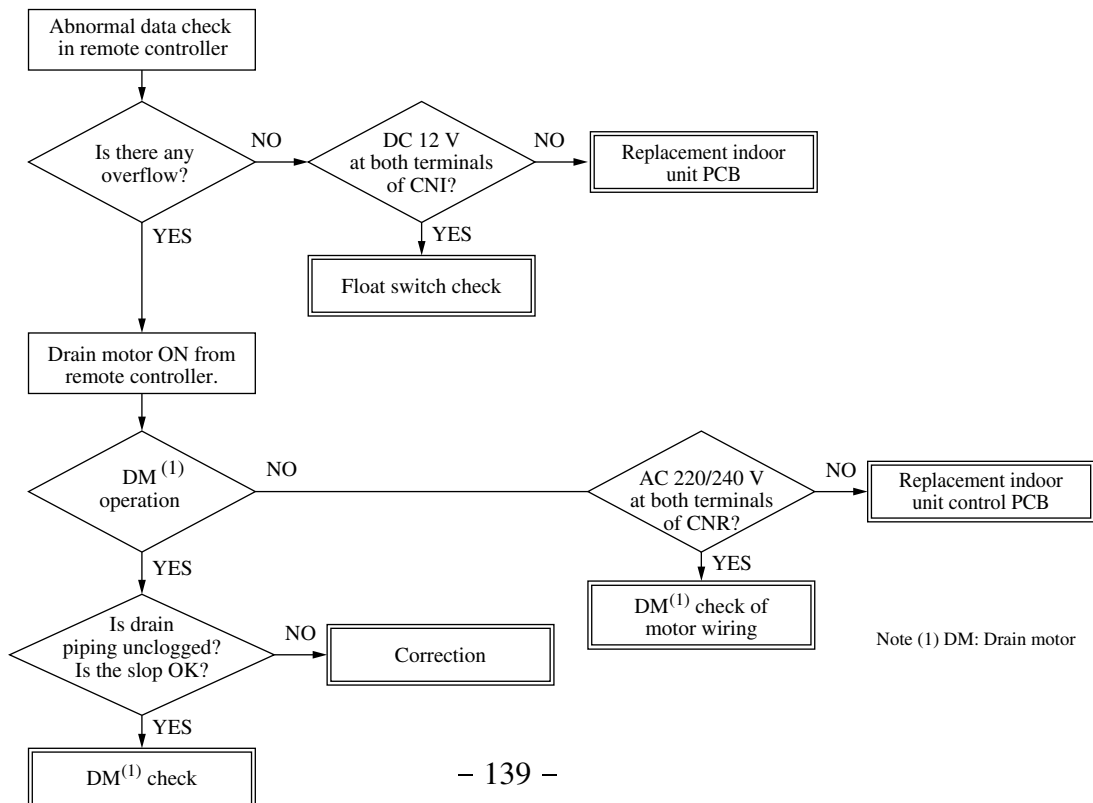
An abnormal stop occurs if this state is detected 5 times within 60 minutes of the first detection, and if a temperature of 63°C or higher is detected in the indoor heat exchanger continuously for 6 minutes.

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



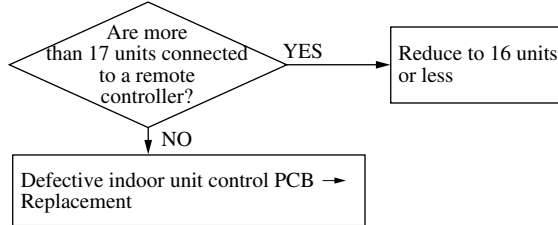
Note (1) DM: Drain motor

8

Error display : *E1D*

[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



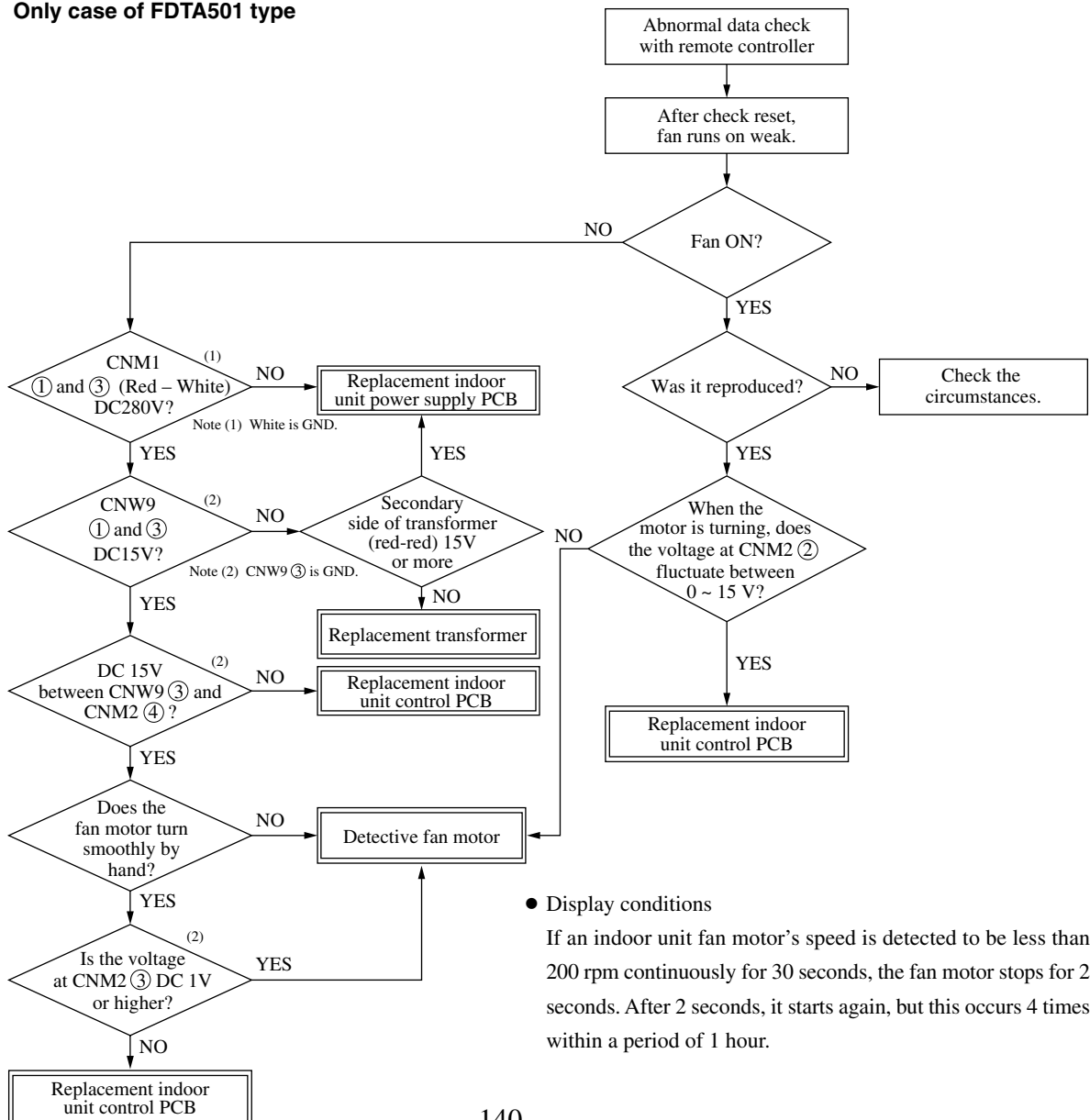
9

Error display : *E1E*

[Fan motor abnormalities]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

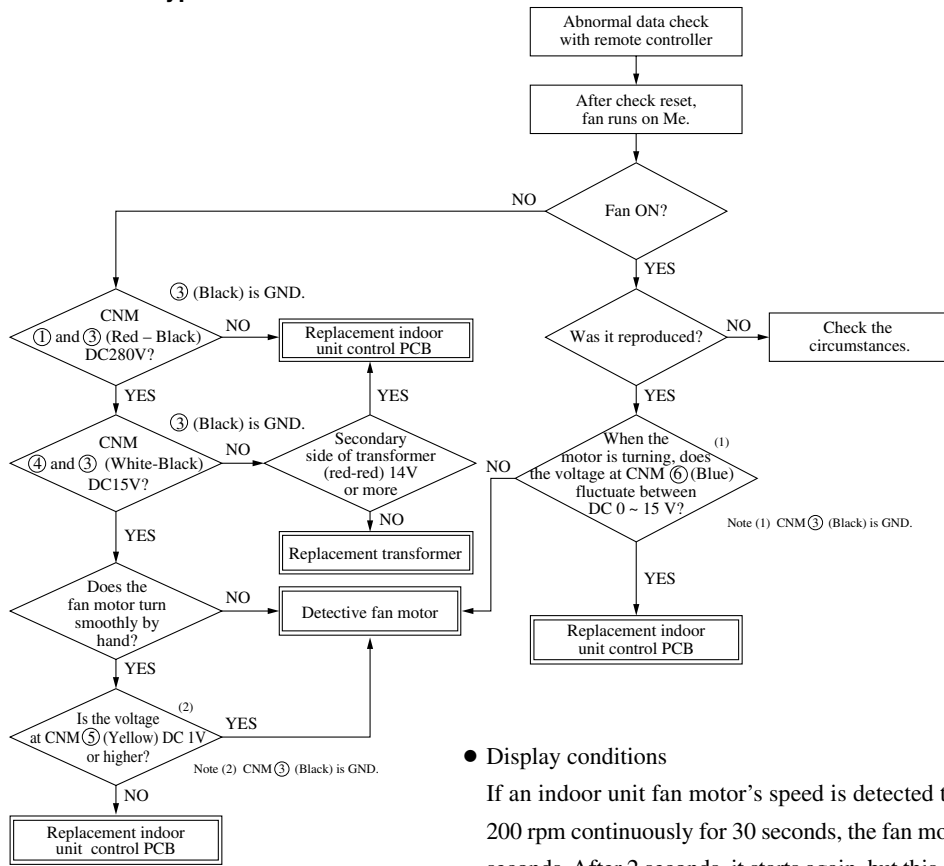
◆ Only case of FDTA501 type



● 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.

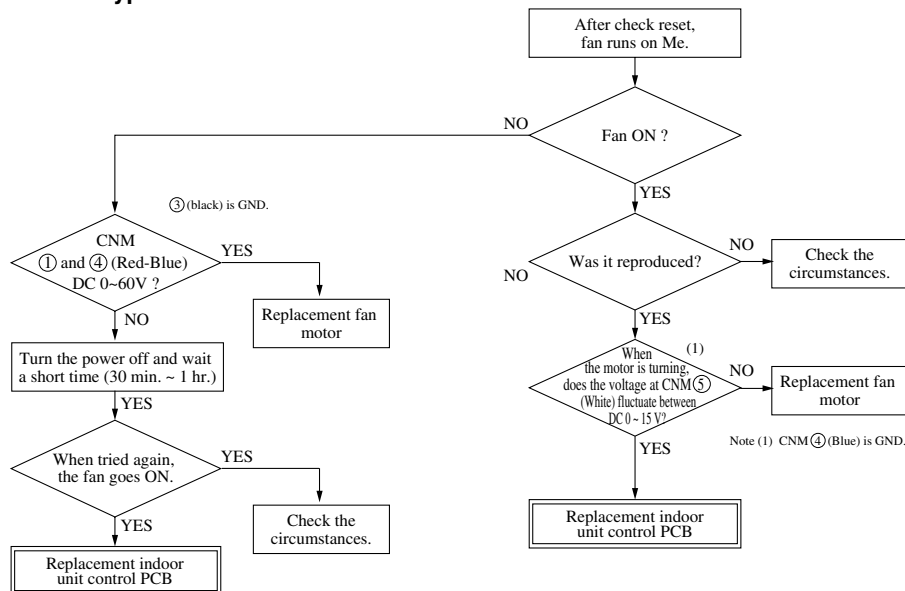
◆ Only case of FDKN  
Only case of 151~251 types



● 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 301 type



● Display conditions

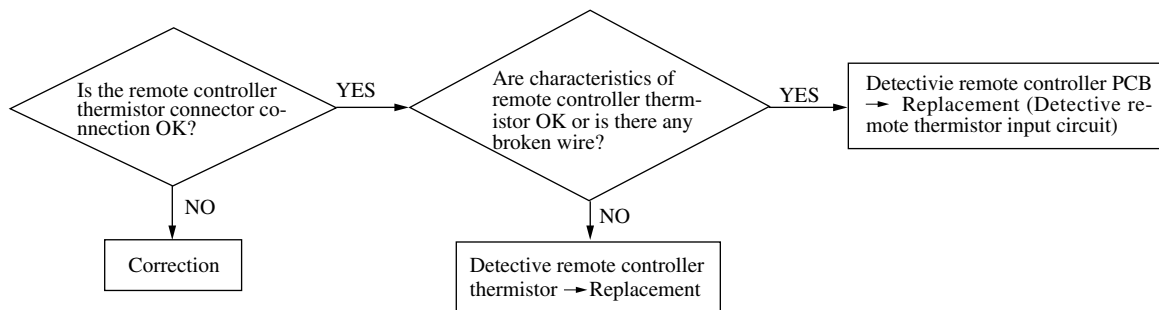
If an indoor unit fan motor's speed is detected to be less than 200 rpm continuously for 30 seconds, the fan motor stops for 2 seconds. After 2 seconds, it starts again, but this occurs 4 times within a period of 1 hour.

**10**

**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**

Temperature(°C)	Resistance value (kΩ)	Temperature(°C)	Resistance value (kΩ)	Temperature(°C)	Resistance value (kΩ)	Temperature(°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



**(4) Error diagnosis procedures at the outdoor units side**

At the error diagnosis related to the outdoor unit, check at first the error code of remote controller and the illumination patterns of normal 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 inspection and repair.

Since the self diagnosis function by means of the microcomputers of indoor/outdoor units provide the judgement of error of microcomputers themselves 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 interrupted) after the irregularity is automatically recovered to give irregularity information to the service personnel. 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.

**(a) Replacement parts assembly related to the outdoor unit controller**

Outdoor unit PCB, capacitor, thermistor, (heat exchanger, discharge pipe, outdoor temperature, under-doom), fuse, transformer, etc.

**(b) Replacement procedure of outdoor unit microcomputer printed circuit board.**

Microcomputer printed circuit board can be replaced with following procedure.

- 1) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

Parts No.	Applicable Model
<b>PCA505A065ZP</b>	FDCA301HEN, 401HEN
<b>PCA505A065ZT</b>	FDCA301HES, 401HES, 501HES, 601HES
<b>PCB505A042PB</b>	FDCA801HES, 1001HES

- 2) Set the overcurrent value using the overcurrent setting switch for CM (SW3). (In the case of the FDCA301~601 only)

Switch Setting Table (All switches are set in the OFF position when shipped from the factory.)

Model	FDCA 301HEN	FDCA 301HES	FDCA 401HEN	FDCA 401HES	FDCA 501HES	FDCA 601HES
<b>Setting Value (A)</b>	<b>17</b>	<b>10</b>	<b>27</b>	<b>11</b>	<b>12</b>	<b>14</b>
Switch Setting Table Set the switches ON or OFF for each switch No. (■ ON, □ OFF)	<input type="checkbox"/> S <input type="checkbox"/> S <input type="checkbox"/> T <input type="checkbox"/> S <input type="checkbox"/> S <input checked="" type="checkbox"/> S <input type="checkbox"/> S	<input type="checkbox"/> S <input type="checkbox"/> S <input type="checkbox"/> T <input type="checkbox"/> S <input type="checkbox"/> S <input checked="" type="checkbox"/> S <input type="checkbox"/> S	<input type="checkbox"/> S <input type="checkbox"/> S <input type="checkbox"/> T <input type="checkbox"/> S <input type="checkbox"/> S <input checked="" type="checkbox"/> S <input type="checkbox"/> S	<input type="checkbox"/> S <input type="checkbox"/> S <input type="checkbox"/> T <input type="checkbox"/> S <input checked="" type="checkbox"/> S <input type="checkbox"/> S <input type="checkbox"/> S	<input type="checkbox"/> S <input type="checkbox"/> S <input type="checkbox"/> T <input type="checkbox"/> S <input type="checkbox"/> S <input checked="" type="checkbox"/> S <input type="checkbox"/> S	<input type="checkbox"/> S <input type="checkbox"/> S <input type="checkbox"/> T <input type="checkbox"/> S <input type="checkbox"/> S <input checked="" type="checkbox"/> S <input type="checkbox"/> S

- 3) Set the control select switch to match the previously set settings on the previous board.

If the previously set settings were set with jumper wires, the control select switch should be set in the ON position if there was a jumper wire and in the OFF position if there wasn't a jumper wire.

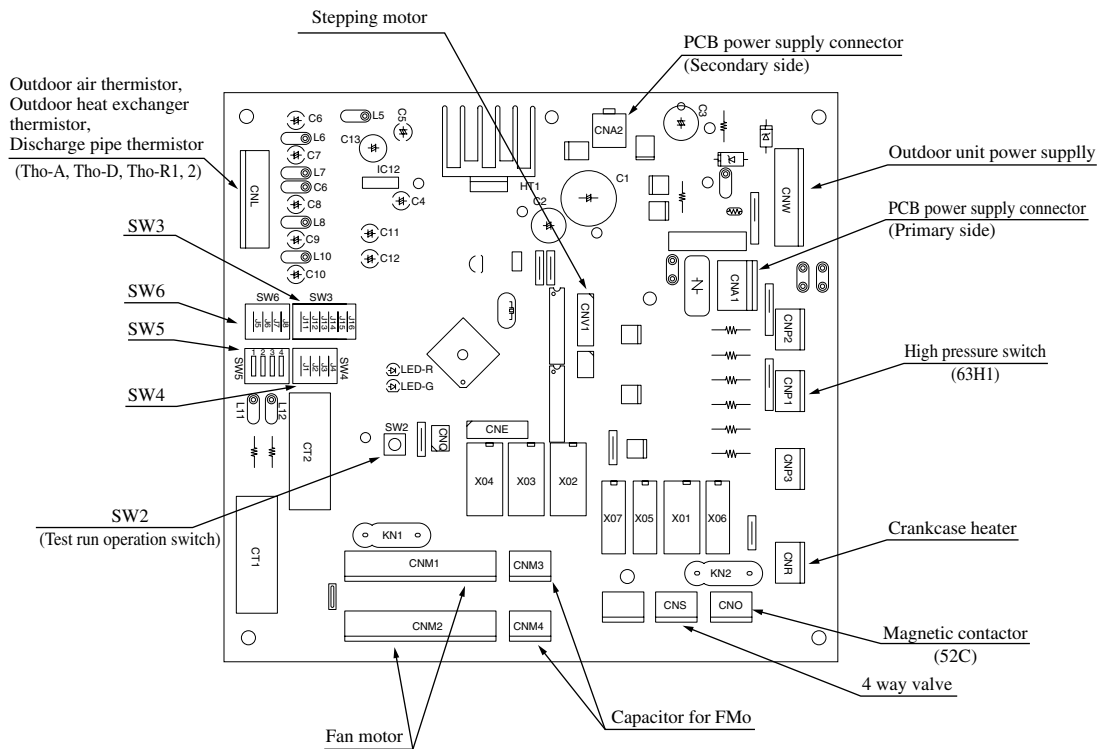
- 4) Connect the faston terminals and connectors to the control board.

When connecting the wires to the faston terminals, connect each wire to the terminal printed with the same color on the board.

Note (1) When connecting the faston terminals to the control PCB, connect them so that there is no deformation of the far end of the control PCB.

## Parts layout on the outdoor unit PCB

### ◆ Models FDCA301~601 type



#### ● Change by the jumper wire

Switch	Function
J1 (SW4-1)	with 1 Phase None <sup>(1)</sup> 3 Phase
J2 (SW4-2)	with Cooling None <sup>(1)</sup> Heating
J6 (SW6-2)	with Defrost recovery temperature 14°C None <sup>(1)</sup> Defrost recovery temperature (See page 78)
J7 (SW6-3)	with Defrost prohibited temperature 45 min. None <sup>(1)</sup> Defrost prohibited temperature 37 min.
J8 (SW6-4)	None <sup>(1)</sup> —

Notes (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumper wires JA1~JA8. Instead, SW4 and 6 are mounted in the same position and have the same functions as jumper wires JA1~JA8. Carry out the local settings in accordance with the above table using SW4 and 6.

#### ● Function of DIP switches (SW5) (Usually all turned OFF)

Switch	Function
SW5-1	ON Defrost Setting Select For cold regions. OFF Normal
SW5-2	ON Snow-guard fan control-Effective OFF Snow-guard fan control-Invalid
SW5-3	ON Low refrigerant protection control-Effective OFF Low refrigerant protection control-Invalid
SW5-4	ON Test run operation-Heating OFF Test run operation-Cooling

#### ● Overcurrent Setting

Model	301HEN	301HES	401HEN	401HES	501HES	601HES
Setting Value (A)	17	10	27	11	12	14
J11 (SW3-1)	With	With	With	With	With	With
J12 (SW3-2)	None <sup>(1)</sup>	None <sup>(1)</sup>	None <sup>(1)</sup>	None <sup>(1)</sup>	With	With
J13 (SW3-3)	None <sup>(1)</sup>	None <sup>(1)</sup>	With	With	None <sup>(1)</sup>	With

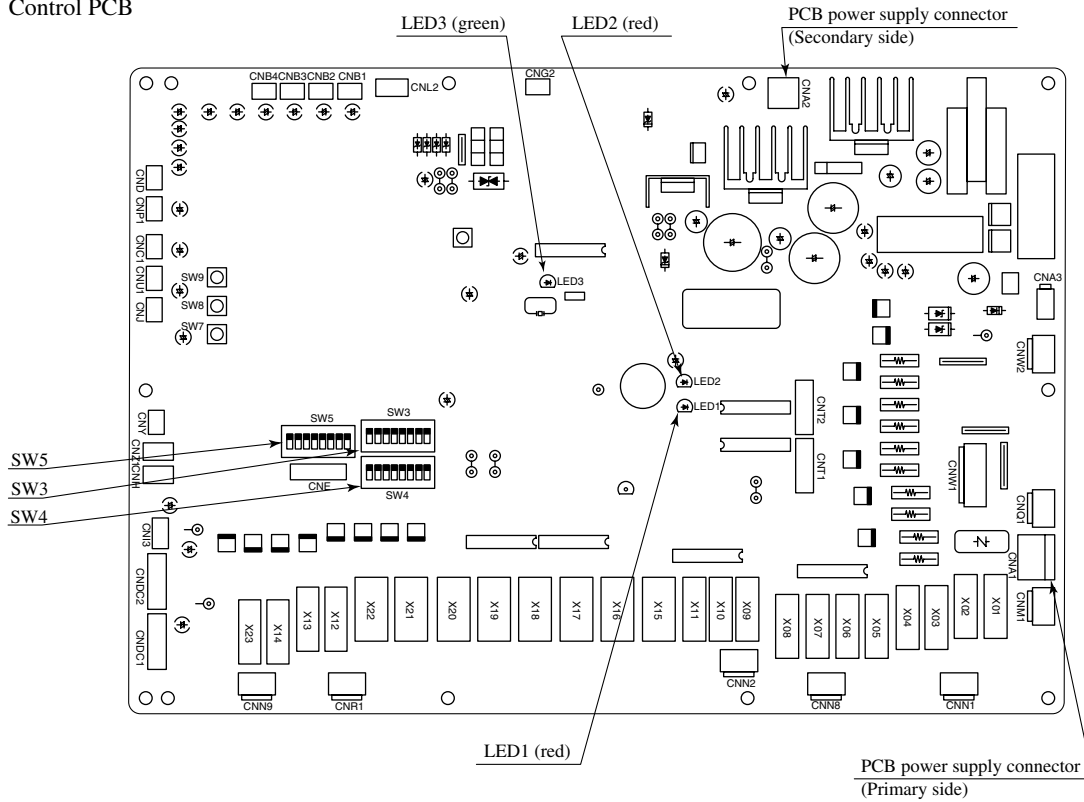
Notes (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

(2) The replacement board is not equipped with jumper wires J11~J13. Instead, SW3 is mounted in the same position and has the same functions as jumper wires J11~J13. Carry out the local settings in accordance with the above table using SW3.

(3) The overcurrent setting value becomes the above setting value (A) automatically in accordance with the settings on J11(SW3-1) ~ J13(SW3-3) and J1(SW4-1).

◆ **Models FDCA801, 1001 type**

● **Control PCB**



■ **Control change switch (SW3, SW4, SW5)**

● **Function of switch SW3 (Usually all turned OFF)**

Name	Function
SW3-1	ON Defrosting-Cold weather region OFF Defrosting-Normal
SW3-2	ON Snow protection control-With OFF Snow protection control-None
SW3-3	ON Test run operation switch: Test run OFF Normal
SW3-4	ON Test run operation: Heating OFF Test run operation: Cooling
SW3-5	ON Pump down OFF Normal
SW3-6	ON Defrosting end operation change OFF Normal

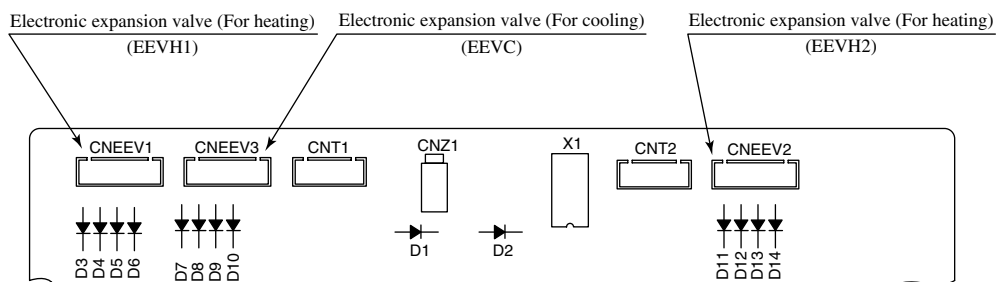
● **Function of switch (SW5) (Usually all turned OFF)**

Name	Function
SW5-1	ON Renewal switch OFF Normal
SW5-2	ON Reserve OFF Reserve
SW5-3	ON LED reset OFF Normal
SW5-4	ON Test mode OFF Normal

● **Function of switch SW4**

	FDCA801	FDCA1001
SW4-1	OFF	ON
SW4-2	OFF	OFF
SW4-3	ON	ON
SW4-4	ON	ON

● **Electronic expansion valve PCB**



Electronic expansion valve PCB parts number

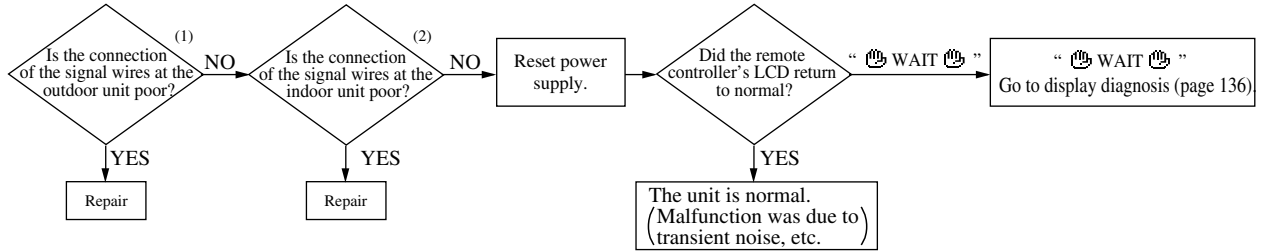
Parts No.	Applicable Model
PCB505A041ZA	FDCA801, 1001

1

Error display : E5

[Communications error during operation]

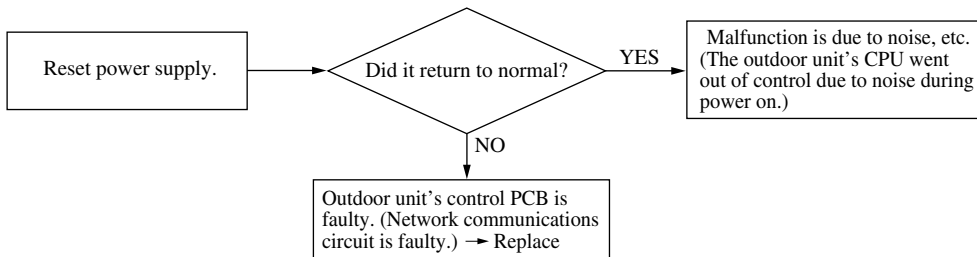
Indoor unit		Outdoor unit	
Red LED	2 time flash	Red LED	2 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



Notes (1) Check for poor connections (disconnection, looseness) on the outdoor unit's terminal block.

(2) Check for poor connections or disconnection of the signal lines between the indoor and outdoor units.

Indoor unit		Outdoor unit	
Red LED	2 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

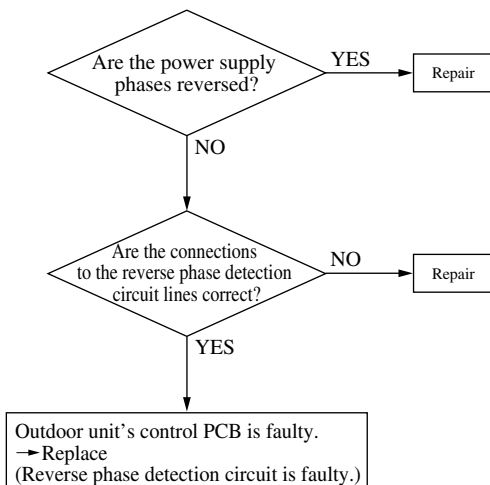


2

Error display : E32

[Power supply phases reversed]

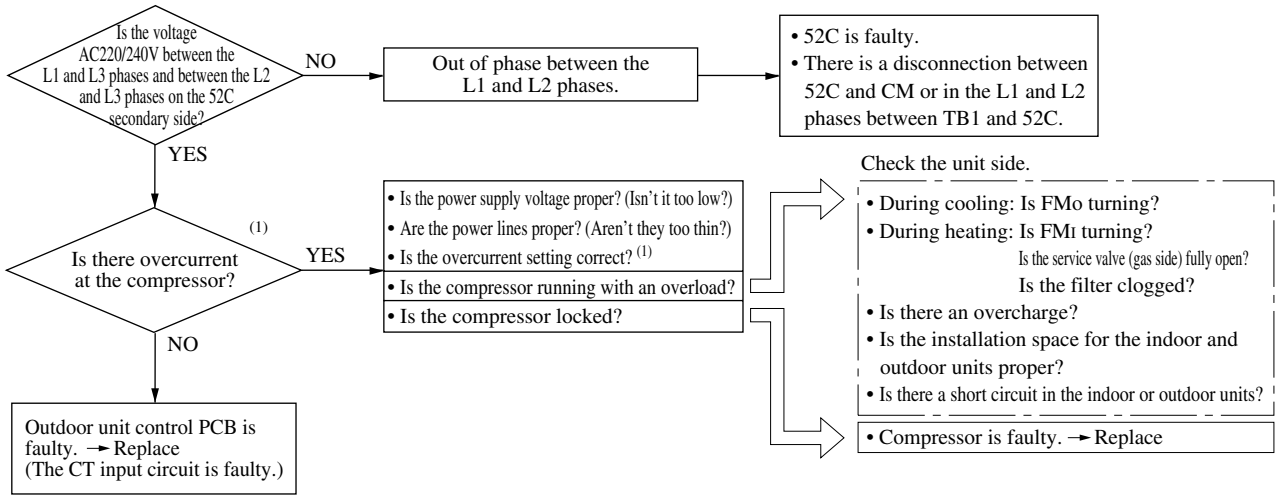
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



**3**

**Error display : E33 [Compressor overcurrent trouble]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

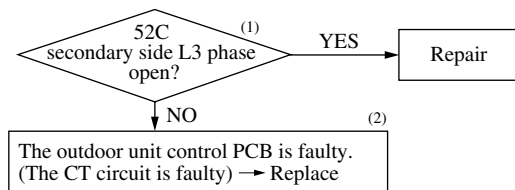


Notes (1) Measure the overcurrent value to make sure. (Models FDCA301~601 only)  
Also make sure the overcurrent setting set with SW3 and SW4-1 on the outdoor unit control PCB is not incorrect.

**4**

**Error display : E34 [Open phase at L3 phase of 52C secondary side]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

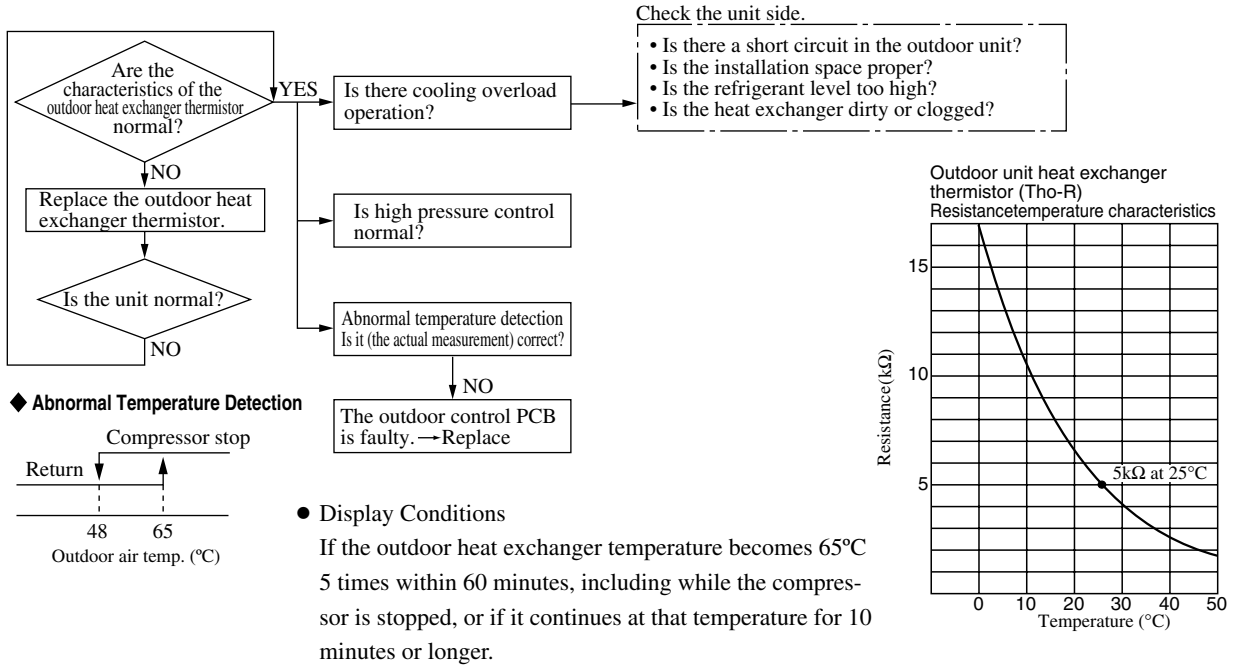


Notes (1) Also check if there is voltage at the L3 phase on the 52C primary side, but no voltage on the secondary side (coil wire disconnection or faulty contacts).  
(2) If there is voltage at the L3 phase on the 52C primary side and it is not abnormal, the outdoor unit control PCB is faulty.

Only case of FDCA301~601  
If the unit is operated with the service valve closed, 49C (internal thermostat) operates. E34 may also be displayed. Check the service valve.

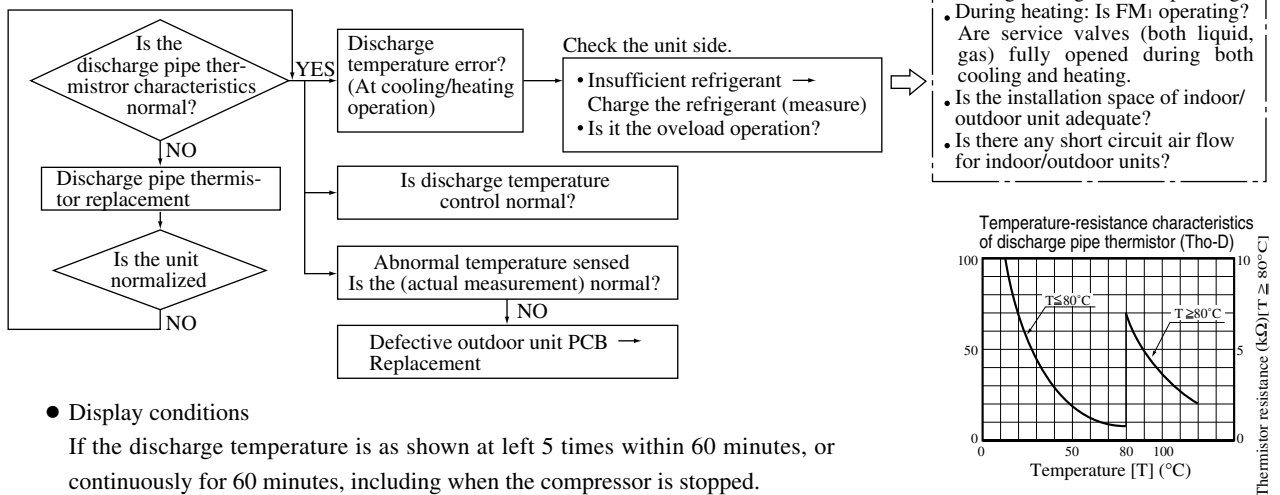
## 5 Error display : E35 [Cooling overload operation]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

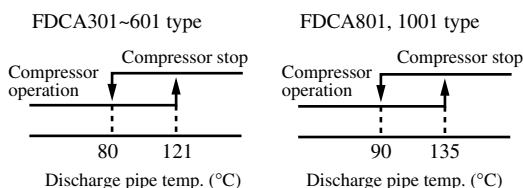


## 6 Error display : E36 [Discharge temperature error]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



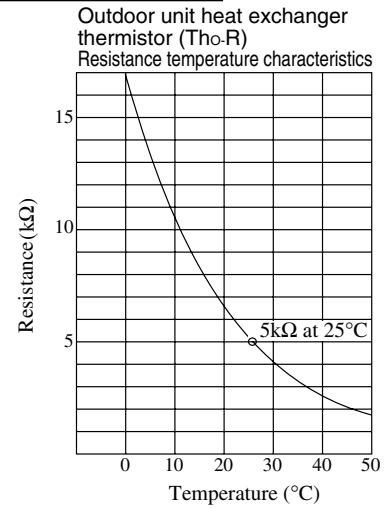
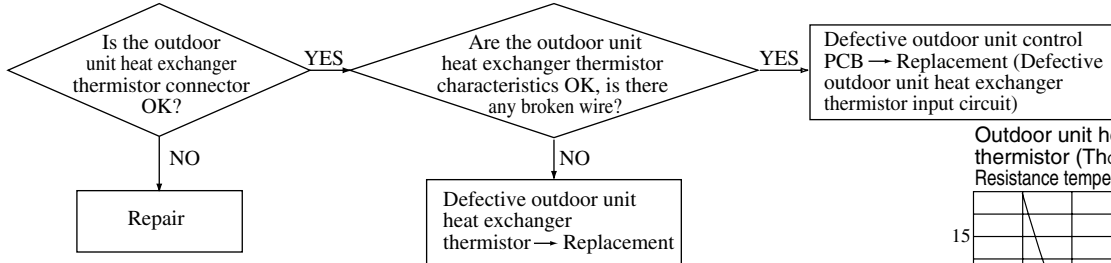
◆ **Abnormal Temperature Detection**



7

**Error display : E37 [Defective outdoor unit heat exchanger thermistor]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



● Display conditions

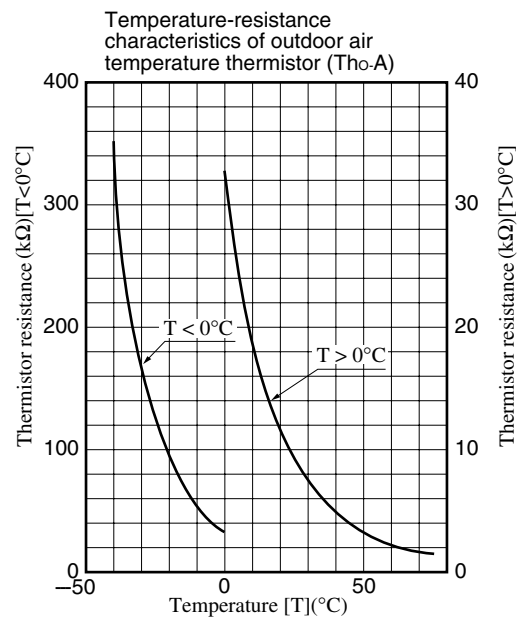
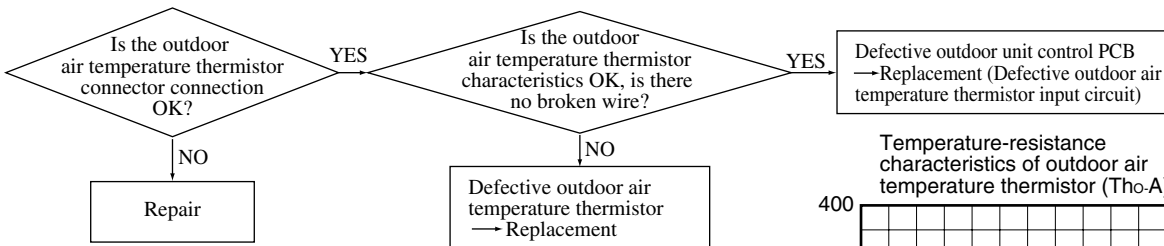
If the temperature sensed by the thermistor is  $-30$  ( $-50$ )  $^{\circ}\text{C}$  or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 60 (40) minutes.

Note (1) Values in ( ) show for the case of the FDCA801, 1001 models.

8

**Error display : E38 [Defective outdoor air 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

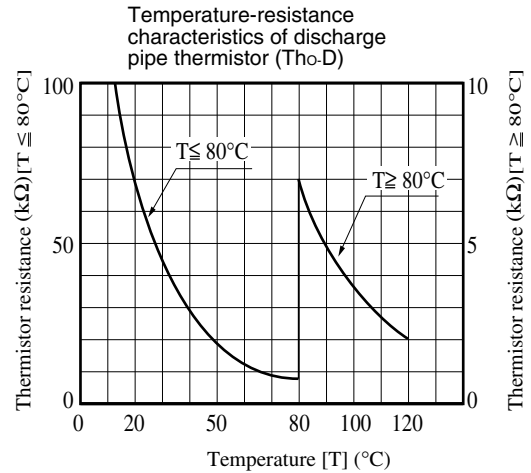
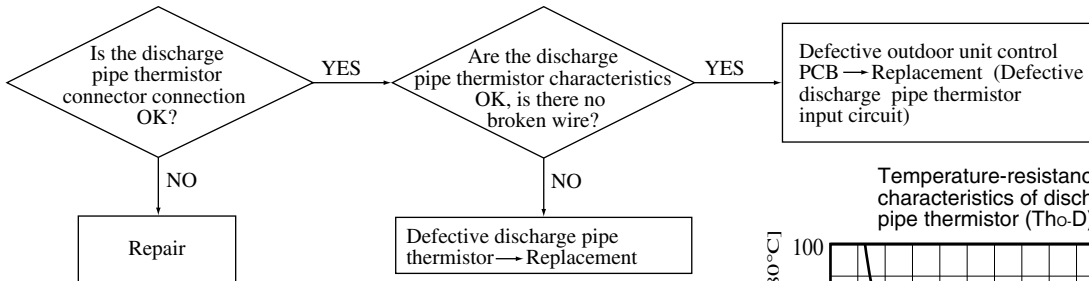
If the temperature sensed by the thermistor is  $-30^{\circ}\text{C}$  or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 60 (40) minutes.

Note (1) Values in ( ) show for the case of the FDCA801, 1001 models.

9

**Error display : E39 [Defective discharge pipe thermistor]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



• Display conditions

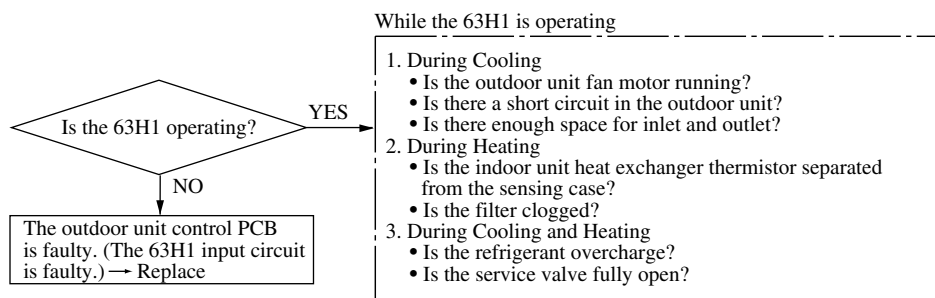
If the temperature sensed by the thermistor is  $-10^{\circ}\text{C}$  or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds (10 minutes and 10 minutes 20 seconds) after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 60 (40) minutes.

Note (1) Values in ( ) show for the case of the FDCA801, 1001 models.

10

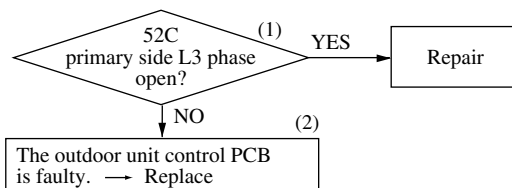
**Error display : E40 [63H1 operation]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



**[Open phase at L3-phase of 52C primary side]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



Notes (1) Also check if there is voltage at the L3 phase on the 52C primary side, but no voltage on the secondary side (coil wire disconnection or faulty contacts).

(2) If there is voltage at the L3 phase on the 52C primary side and it is not abnormal, the outdoor unit control PCB is faulty.

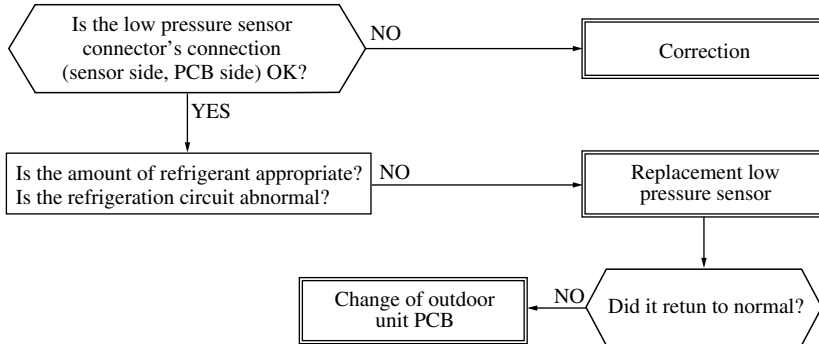


11

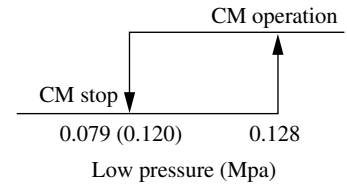
Error display : E49

[Abnormal low pressure or low pressure sensor wire disconnected]  
(Only case of FDCA801, 1001 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



◆ Abnormal pressure detection



● Display Conditions

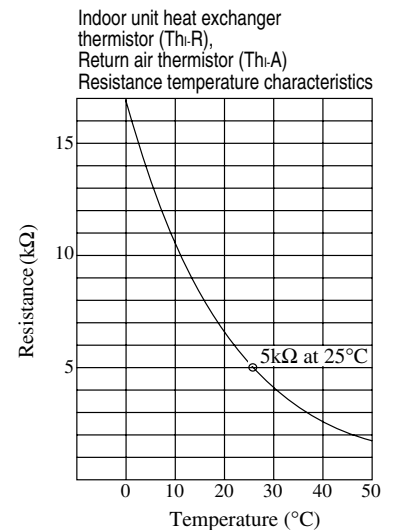
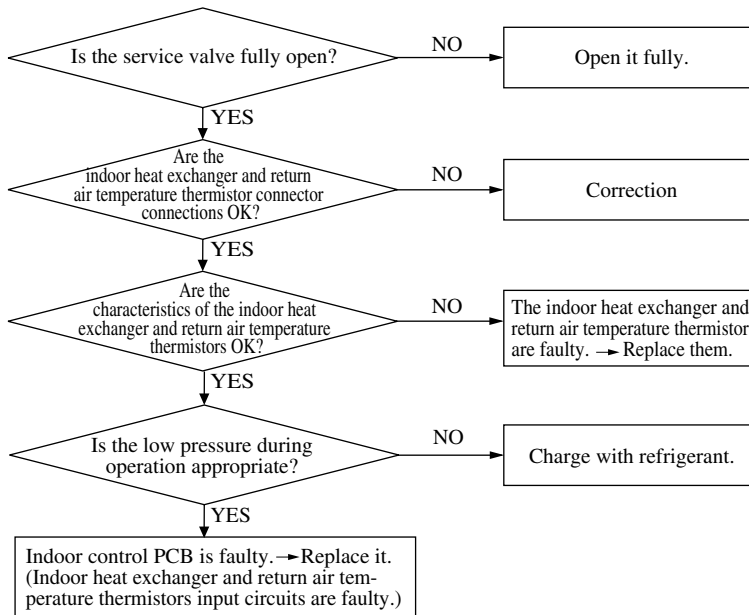
The compressor stops if the low pressure sensor detects a pressure of 0.079 (0.120) MPa or lower continuously for 15 seconds.

After a 3-minute delay, the compressor restarts, but if this occurs 3 times within 60 minutes.

Note (1) Values in ( ) show in the case where 10 minutes or longer have passed since the compressor started.

[Gas low error] (Only case of FDCA801, 1001 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

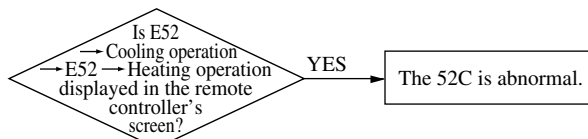


12

Error display : E52

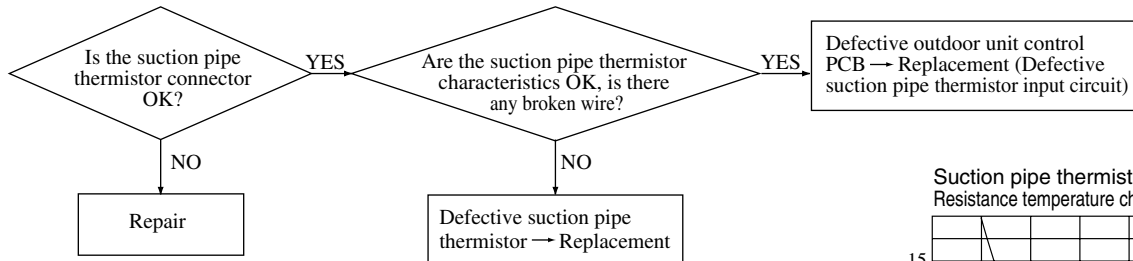
[52C Abnormal]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Lights contiously
Green LED	Keeps flashing	Green LED	Keeps flashing



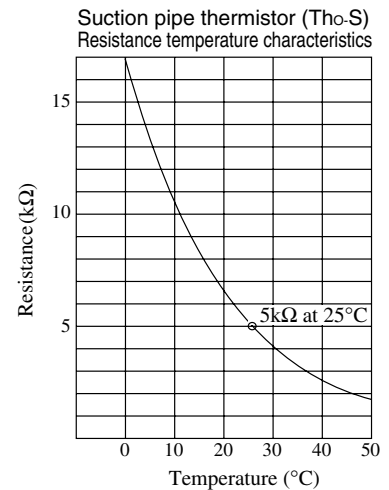
**13** Error display : **E53** [Defective suction pipe thermistor] (Only case of FDCA801, 1001 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



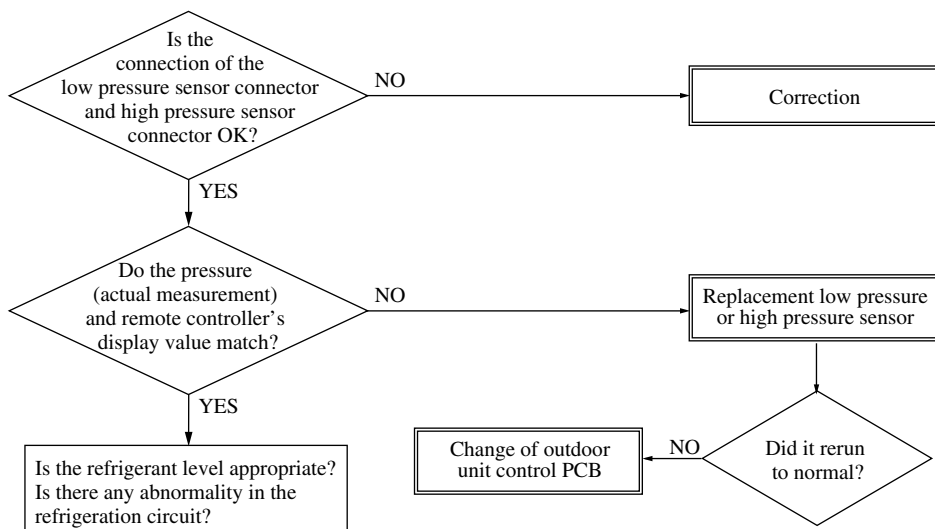
● Display conditions

If the temperature sensed by the thermistor is  $-50^{\circ}\text{C}$  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.



**14** Error display : **E54** [Defective low pressure and high pressure sensor] (Only case of FDCA801, 1001 type)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



Note (1) See page 155 concerning the methods of displaying operating data with the remote controller.

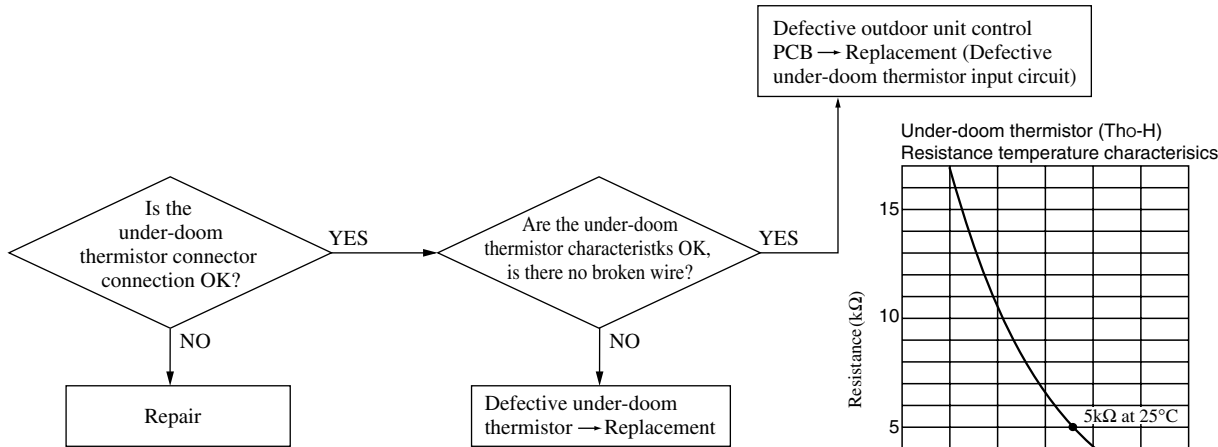
● Display conditions

If the voltage detected by the sensor is  $0\text{V}$  or lower or  $3.49\text{V}$  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.

15

**Error display : E55 [Defective under-doom thermistor] (Only case of FDCA801, 1001 type)**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



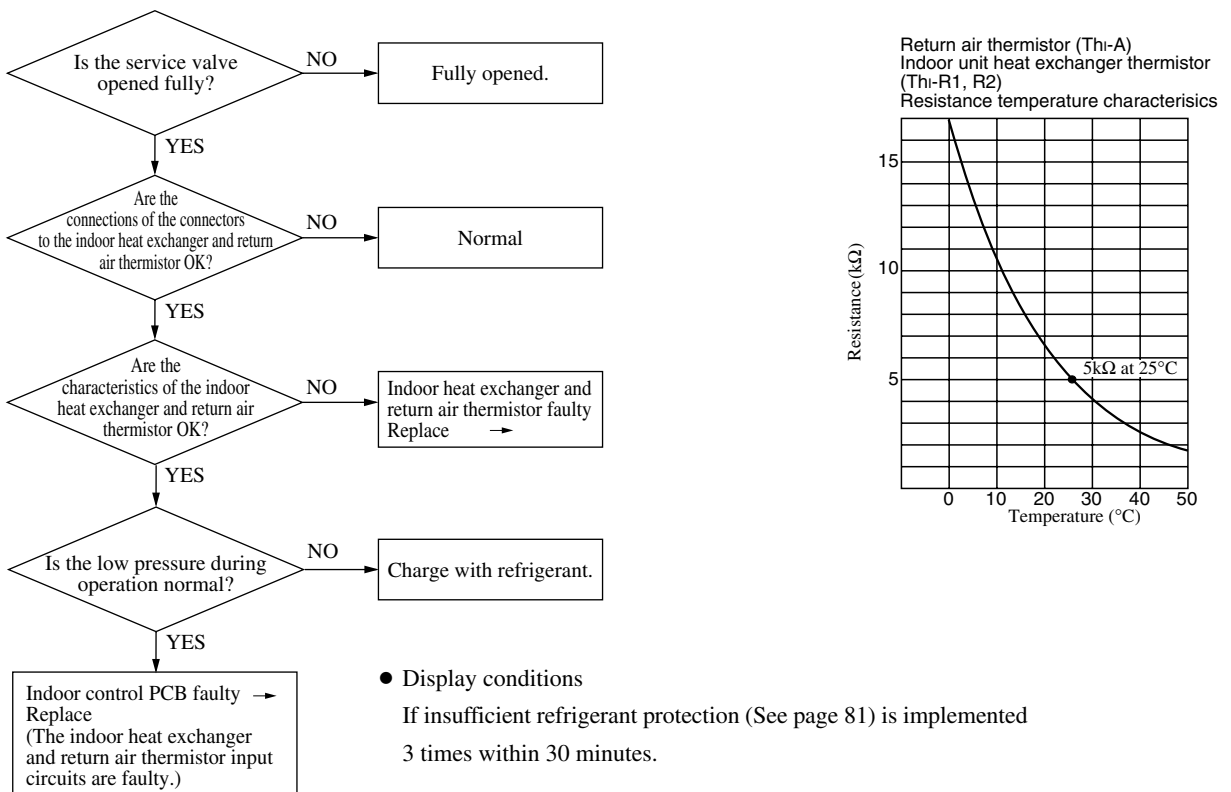
• Display conditions

If the temperature sensed by the thermistor is  $-50^{\circ}\text{C}$  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.

16

**Error display : E57 [Insufficient refrigerant volume.]**

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



• Display conditions

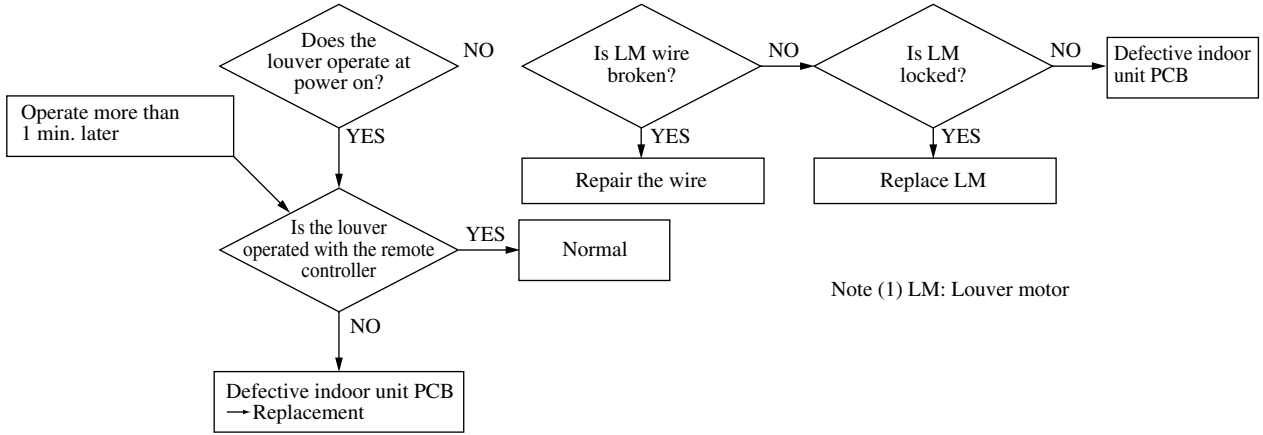
If insufficient refrigerant protection (See page 81) is implemented 3 times within 30 minutes.

(d) How to advance checks for each faulty symptom

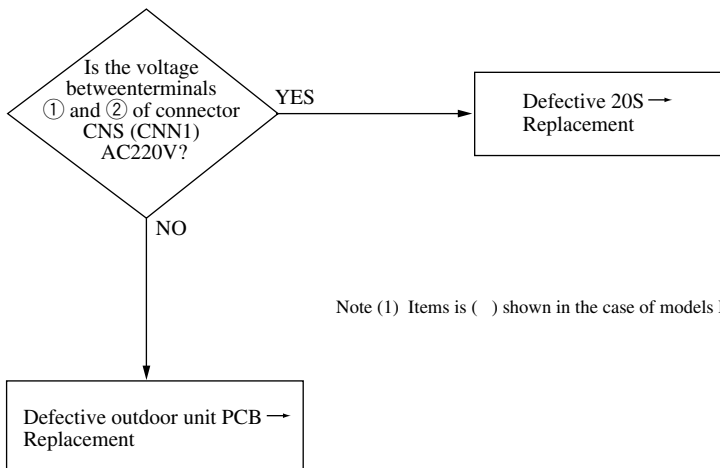
(i) Inspection method when there is no error display

1) Louver motor does not operate

► Inspect at the indoor unit side.



3) Four way valve does not switch during heating operation



**(5) 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.

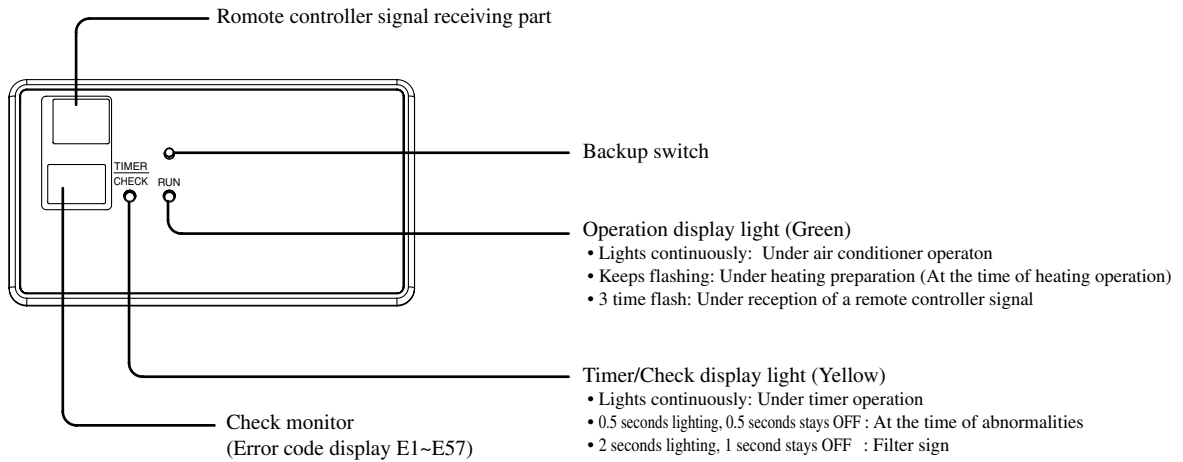
**If you press the RESET button during the settings, the display returns to the previous setting screen.**

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
07	I/U FAN Hi
11	TOTAL I/U RUN 10500H
21	OUTDOOR 35°C
22	O/U HEAT EXCH1 55°C
23	O/U HEAT EXCH2 55°C
24	COMP HERTZ 85.0Hz
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/OFF
34	63H1 ON/OFF
35	DEFROST ON/ OFF
36	TOTAL COMP RUN 8500H
37	EEV1 480PULS

## 6.4 Check display on wireless specification models (FDEN · FDKN)

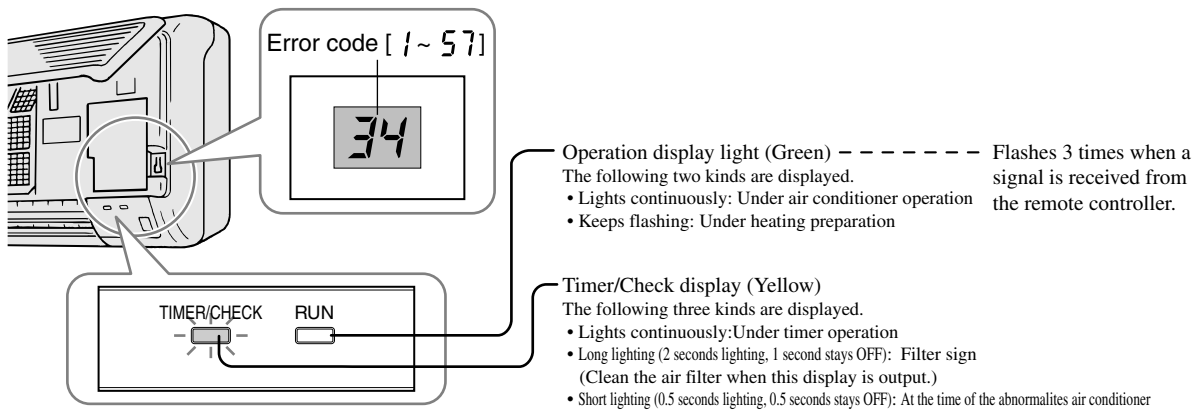
### (1) Indication board

#### (a) FDEN Series



#### (b) FDKN Series

This figure shows the display on the 301 model. The shape of the display differs slightly on other models, but the functions are the same.



## 7 WIRELESS KIT (OPTION FOR FDT MODEL ONLY)

The FDT series is an exclusive series with all wired models. However, these models can also be used as wireless units by using the optional wireless kit.

### Model

Model
FDT series all model

### (1) Wireless kit model

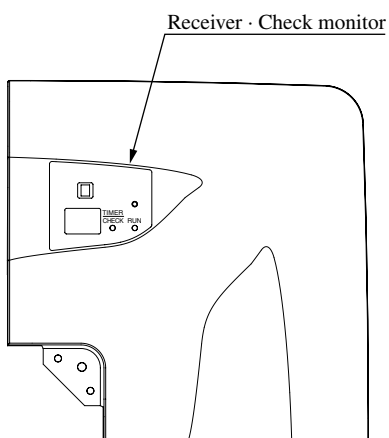
Model	Paint color
RCN-T-W-E	Pearl white

### (2) Accessories

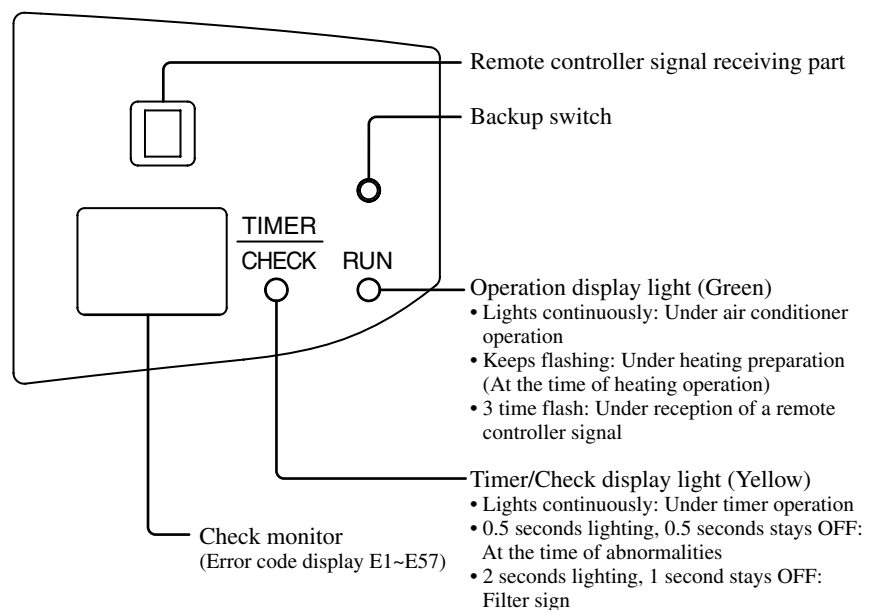
Name	Quantity	Name	Quantity
Receiver	1	AAA dry cell battery	2
Wireless remote controller	1	Wood screw for holder	2
Remote controller holder	1	Installation manual	1

### (3) Receiving outside view and function

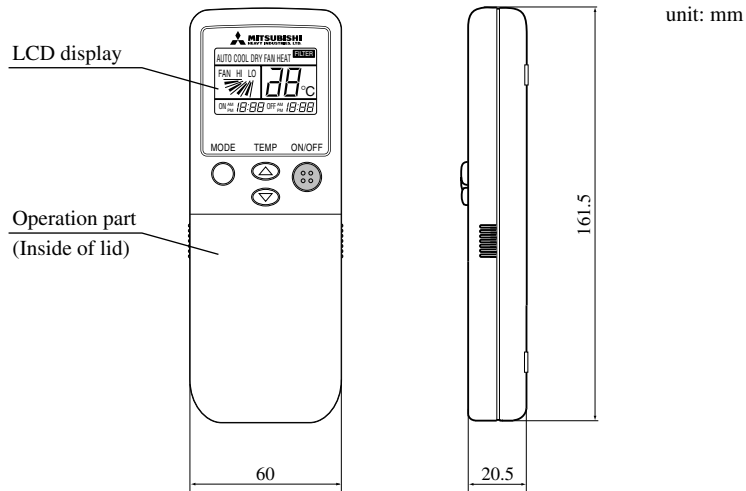
#### • Corner panel



#### • Receiver part details



**(4) Wireless remote controller**

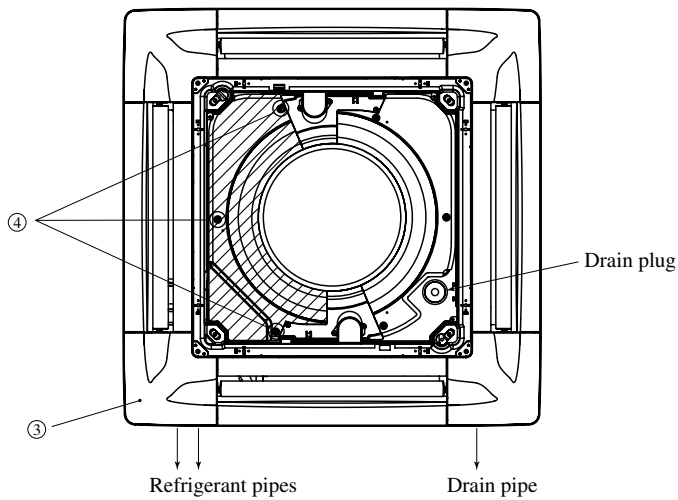


**(5) Attachment of wireless kit**

(a) Installation of the receiver

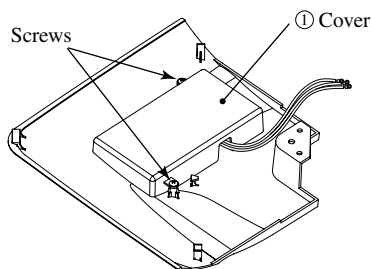
1) Preparation before installation

- ① Attach the cover panel supplied as an accessory onto the indoor unit according to the panel installation manual. (Refer to 87 pages)
- ② Remove the air inlet grille. (Refer to 88 pages)
- ③ Remove a corner panel located on the refrigerant pipe side. (Refer to 88 pages)
- ④ Remove three screws and detach the cover (indicated as a shadowed area) from the indoor unit control box.



2) Local setup

- ① Remove the cover by unscrewing two screws from the back of the receiver.



Wireless kit backside

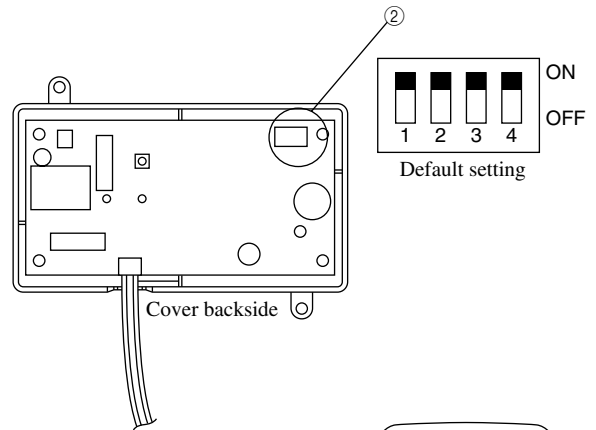


- ② Turn switches provided on the back of the PCB.

Switches (SW1-4) provided on the receiver PCB are for setting the following.

All switches are set to the ON position for shipment.

SW1	Prevention of unintended movement caused by interference.	ON: Normal OFF: Remote
SW2	Receiver master/slave setting	ON: Master OFF: Slave
SW3	Buzzer valid/invalid	ON: Valid OFF: Invalid
SW4	Cooling only/heat pump switching	ON: Heat pump OFF: Cooling only

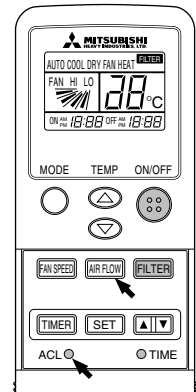


- ③ When SW1 is turned to the OFF position, change the corresponding remote controller setting as follows.

Wireless remote controller setting change

Change the interference prevention setting to “Enabled” by pressing the ACL button or inserting batteries, while the AIR FLOW button is depressed.

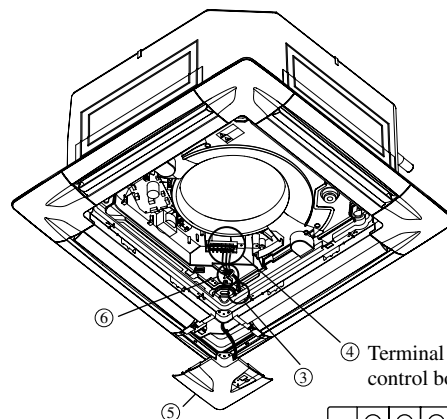
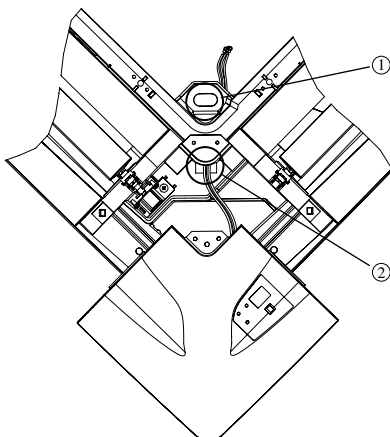
( \* When batteries are removed, the setting will be reset to the default setting. )  
When batteries are removed, please follow the above procedure again.



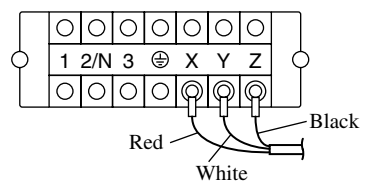
### 3) Attachment of wireless kit

- ① By loosening the panel hanger bolt, create a gap between the panel and the indoor unit.
- ② Lay the wireless kit wiring through the opening.
- ③ Place the wiring together with other wiring laid on site into the indoor unit.
- ④ Connect the wiring to the terminal block provided in the control box as follows.  
X-Red, Y-White, Z-Black.
- ⑤ Attach the wireless kit to the panel according to the panel installation manual. (Refer to 90 pages)
- ⑥ Bundle redundant wiring together with other wiring laid on site.

Note (1) Ensure that wirings are not caught between the receiver and the panel in attaching the receiver.



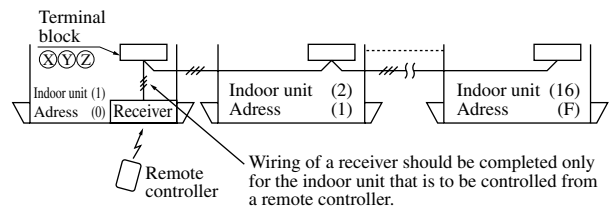
④ Terminal block provided in the control box of the indoor unit



**(6) Control of a plural number of indoor units with one remote controller**

(a) Up to 16 indoor units can be connected.

- ① Connect indoor unit's (X), (Y) and (Z) terminals with 3-core connecting wires (remote controller signal wires). For a connecting wire, please refer to the "Restrictions on the thickness and length of a connecting wire".



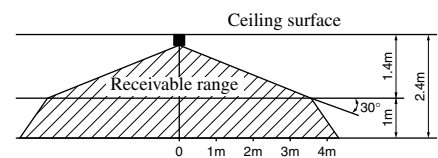
- ② The receiver wiring must be connected only for the indoor unit that will be operated by the remote controller directly.
- ③ Set the address of remote controller communication to [0] through [F] avoiding overlap with the rotary switch SW2 provided on the indoor unit's PCB.

(b) Wireless remote controller operation distance

- ① Standard signal receiving range

[Condition] Illuminance at the receiver area: 300 lux.

(When no lighting fixture is located within 1m of PAC in an ordinary office)

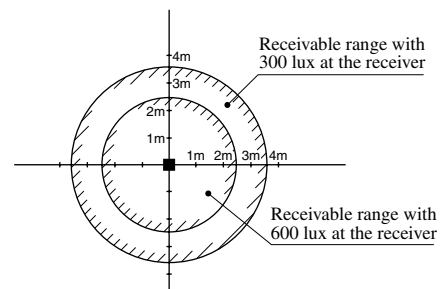


- ② Relation between illuminance at the receiver and the receivable range viewed from above

[Condition] Relation between illuminance at the receiver and the

receivable range when a remote controller is operated 1m above the floor under the ceiling that is 2.4m above the floor.

When illuminance doubles, the receivable range drops to two thirds.



- ③ Points for attention in connecting a plural number of indoor units

[Condition] Illuminance at the receiver area: 300 lux.

(When no lighting fixture is located within 1m of PAC in an ordinary office)

[When more than one unit are installed close each other]

Distance between units that can prevent them from making the same movement is 5m.

**(7) Check display list**

Display	LED		Display method
	RUN	TIMER/CHECK	
Reception	Green	—	3 time flash (ON-0.25 seconds, OFF-0.25 seconds)
Hot keep	Green	—	Keeps flashing (ON-0.5 seconds, OFF-0.5 seconds)
Operation	Green	—	Lights continuously
Stop	Green	—	Stays OFF
Center mode	—	Yellow	3 time flash (ON-0.25 seconds, OFF-0.25 seconds)
Check	—	Yellow	Keeps flashing (ON-0.5 seconds, OFF-0.5 seconds)
Filter sign	—	Yellow	Keeps flashing (ON-2 seconds, OFF-1 seconds)
Timer	—	Yellow	Lights continuously

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# **PACKAGED AIR-CONDITIONER**

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