16. HIGH STATIC PRESSURE, DUCT TYPE PACKAGED AIR-CONDITIONER

(Split system, Air cooled cooling only type)

FDU308CEN-A
308CES-A
408CES-A
508CES-A
508CEM-A

CONTENTS

16.1 GENERAL INFORMATION

16.1.1 Specific features

(1) 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%.

(2) The indoor outdoor interconnection signal wiring has been done away with. The microcomputer chip is installed in the indoor 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.

(3) There are only four power lines between the outdoor and indoor unit. As no signal wire is used there is no need to separate the power line from the signal line. One cab tyre cable with 4 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.

(4) The controls are wired residential split air conditioner type remote controller with 4 malfunction modes.

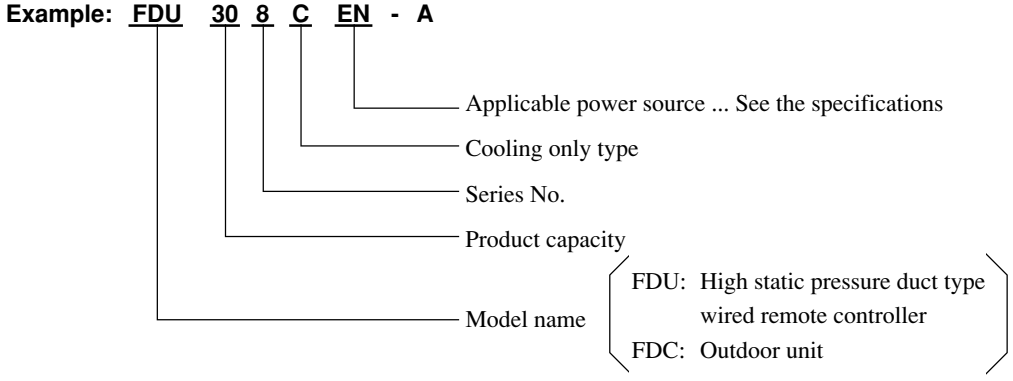
(5) All models have service valves protruding from the outdoor unit for faster flare connection work in the field.

(6) Operation noise has been drastically reduced by increasing the number of high performance fans and by thorough sound insulation.

(7) When installing, the optimum outside static pressure can be set using the fan controller.

(8) With the height of all equipment made uniform at 360 mm and neatly installed into the ceiling, the installation of equipment with different capacities into the same ceiling space is made easy.

16.1.2 How to read the model name



16.2 SELECTION DATA

16.2.1 Specifications

Model FDU308CEN-A

Item				Model	FDU308CEN-A	
					FDU308-A	FDC306CEN3
Nominal cooling capacity(1)			ISO-T1	W	**7100**	
			ISO-T3		**5700**	
Power source					**1 Phase, 220/240V 50Hz**	
Operation data(3)	ISO-T1	Cooling input		kW	3.29/3.33	
		Running current (Cooling)		A	16.5/17.3	
		Power factor (Cooling)		%	91/80	
	ISO-T3	Cooling input		kW	3.48/3.52	
		Running current (Cooling)		A	17.5/18.3	
		Power factor (Cooling)		%	90/80	
	Inrush current (L.R.A)			A	89	
	Noise level			dB(A)	**41**	**56**
Exterior dimensions Height × Width × Depth				mm	**360 × 820 × 830**	**844 × 950 × 340**
Net weight				kg	**48**	**67**
Refrigerant equipment Compressor type & Q'ty					–	**RC5532ENE1 × 1**
Motor				kW	–	**2.24**
Starting method					–	Line starting
Heat exchanger					Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control					–	Capillary tube
Refrigerant					**R22**	
Quantity				kg	**Holding charged**	**1.3 [Pre-charged up to the piping length of 5m]**
Refrigerant oil				ℓ	–	**1.63 (SUNISO 3GS)**
High pressure control					High pressure regulator valve	
Air handling equipment Fan type & Q'ty					Multiblade centrifugal fan × 2	Propeller fan × 1
Motor				W	**130 × 1**	**60 × 1**
Starting method					Line starting	Line starting
Air flow (Standard)				CMM	**20**	**54**
Available static pressure				Pa (mmAq)	**Standard: 100 (10), Max 200 (20)**	–
Fresh air intake					Available	–
Air filter, Q'ty					Field purchased	–
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater				W	–	–
Operation control Operation switch					Remote control switch (Optional: RCD-C-E)	– (Indoor unit side)
Room temperature control					Thermostat by electronics	–
Safety equipment					Internal thermostat for fan motor. Frost protection thermostat.	Internal protector for compressor. Internal thermostat for fan motor. Internal pressure relief valve for compressor.
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.	
Optional parts					–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Cooling	29°C	19°C	46°C	24°C	ISO-T3, SASO

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

(3) The operation data indicate when the air-conditioner is operated at 220 / 240V 50Hz.

Model FDU308CES-A

Item				Model	FDU308CES-A	
					FDU308-A	FDC306CES3
Nominal cooling capacity(1)			ISO-T1	W	**7100/7700**	
			ISO-T3		**5700/6000**	
Power source					**3 Phase, 380-415V 50Hz, 380V 60Hz**	
Operation data(3)	ISO-T1	Cooling input		kW	3.05/3.06/3.64	
		Running current (Cooling)		A	5.9/6.0/7.1	
		Power factor (Cooling)		%	79/71/78	
	ISO-T3	Cooling input		kW	3.24/3.25/3.87	
		Running current (Cooling)		A	6.3/6.4/7.6	
		Power factor (Cooling)		%	78/71/77	
	Inrush current (L.R.A)			A	43	
	Noise level			dB(A)	41/43	56
Exterior dimensions Height × Width × Depth				mm	**360 × 820 × 830**	**844 × 950 × 340**
Net weight				kg	**48**	**67**
Refrigerant equipment Compressor type & Q'ty					–	**RC5538ESE1 × 1**
Motor				kW	–	**2.24**
Starting method					–	Line starting
Heat exchanger					Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control					–	Capillary tube
Refrigerant					**R22**	
Quantity				kg	**Holding charged**	**1.3 [Pre-charged up to the piping length of 5m]**
Refrigerant oil				ℓ	–	**1.63 (SUNISO 3GS)**
High pressure control					High pressure regulator valve	
Air handling equipment Fan type & Q'ty					Multiblade centrifugal fan × 2	Propeller fan × 1
Motor				W	**130 × 1**	**60 × 1**
Starting method					Line starting	Line starting
Air flow (Standard)				CMM	**20/24**	**54/56**
Available static pressure				Pa (mmAq)	**Standard: 100 (10), Max 200 (20)**	–
Fresh air intake					Available	–
Air filter, Q'ty					Field purchased	–
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater				W	–	–
Operation control Operation switch					Remote control switch (Optional: RCD-C-E)	– (Indoor unit side)
Room temperature control					Thermostat by electronics	–
Safety equipment					Internal thermostat for fan motor. Frost protection thermostat.	Internal protector for compressor. Internal thermostat for fan motor. Internal pressure relief valve for compressor.
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.	
Optional parts					–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Cooling	29°C	19°C	46°C	24°C	ISO-T3, SASO

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

(3) The operation data indicate when the air-conditioner is operated at 380V 50Hz/415V 50Hz/380V 60Hz.

Model FDU408CES-A

Item				Model	FDU408CES-A	
					FDU408-A	FDC406CES3
Nominal cooling capacity(1)			ISO-T1	W	**10200/11300**	
			ISO-T3		**8900/9900**	
Power source					**3 Phase, 380-415V 50Hz, 380V 60Hz**	
Operation data(3)	**ISO-T1**	Cooling input		kW	3.96/3.96/4.88	
		Running current (Cooling)		A	7.8/7.8/9.4	
		Power factor (Cooling)		%	77/71/79	
	ISO-T3	Cooling input		kW	4.30/4.30/5.38	
		Running current (Cooling)		A	8.4/8.4/10.1	
		Power factor (Cooling)		%	78/71/81	
	Inrush current (L.R.A)			A	45	
	Noise level			dB(A)	44/46	57
Exterior dimensions Height × Width × Depth				mm	**360 × 820 × 830**	**1250 × 950 × 340**
Net weight				kg	**49**	**80**
Refrigerant equipment Compressor type & Q'ty					–	**RC5547ESE1 × 1**
Motor				kW	–	**2.61**
Starting method					–	Line starting
Heat exchanger					Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control					–	Capillary tube
Refrigerant					**R22**	
Quantity				kg	**Holding charged**	**1.55 (Pre-charged up to the piping length of 0m)**
Refrigerant oil				ℓ	–	**1.63 (SUNISO 3GS)**
High pressure control					High pressure regulator valve	
Air handling equipment Fan type & Q'ty					Multiblade centrifugal fan × 2	Propeller fan × 2
Motor				W	**200 × 1**	**60 × 2**
Starting method					Line starting	Line starting
Air flow (Standard)				CMM	**27/32**	**100/110**
Available static pressure				Pa (mmAq)	**Standard: 100 (10), Max 200 (20)**	–
Fresh air intake					Available	–
Air filter, Q'ty					Field purchased	–
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater				W	–	–
Operation control Operation switch					Remote control switch (Optional: RCD-C-E)	– (Indoor unit side)
Room temperature control					Thermostat by electronics	–
Safety equipment					Internal thermostat for fan motor. Frost protection thermostat.	Internal protector for compressor. Internal thermostat for fan motor. Internal pressure relief valve for compressor.
Installation data Refrigerant piping size				mm (in)	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ19.05 (3/4″)**	
Connecting method					**Flare piping**	
Drain hose					(Connectable with VP25)	–
Insulation for piping					Necessary (both Liquid & Gas lines)	
Accessories					Mounting kit.	
Optional parts					–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Cooling	29°C	19°C	46°C	24°C	ISO-T3, SASO

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

(3) The operation data indicate when the air-conditioner is operated at 380V 50Hz/415V 50Hz/380V 60Hz.

Model FDU508CES-A

Item				Model	FDU508CES-A	
					FDU508-A	FDC506CES3
Nominal cooling capacity(1)			ISO-T1	W	**12500/14000**	
			ISO-T3		**10600/11900**	
Power source					**3 Phase, 380-415V 50Hz, 380V 60Hz**	
Operation data(3)	ISO-T1	Cooling input		kW	5.01/5.03/6.03	
		Running current (Cooling)		A	10.3/10.3/11.5	
		Power factor (Cooling)		%	74/68/80	
	ISO-T3	Cooling input		kW	5.56/5.58/6.63	
		Running current (Cooling)		A	11.6/11.6/12.5	
		Power factor (Cooling)		%	73/67/81	
	Inrush current (L.R.A)			A	68	
	Noise level			dB(A)	45/47	59
Exterior dimensions Height × Width × Depth				mm	**360 × 1200 × 830**	**1250 × 950 × 340**
Net weight				kg	**62**	**85**
Refrigerant equipment Compressor type & Q'ty					–	**RC5563ESE2 × 1**
Motor				kW	–	**3.73**
Starting method					–	Line starting
Heat exchanger					Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control					–	Capillary tube
Refrigerant					**R22**	
Quantity				kg	**Holding charged**	**1.85 [Pre-charged up to the piping length of 5m]**
Refrigerant oil				ℓ	–	**2.07 (SUNISO 3GS)**
High pressure control					High pressure regulator valve	
Air handling equipment Fan type & Q'ty					Multiblade centrifugal fan × 2	Propeller fan × 2
Motor				W	**230 × 1**	**60 × 2**
Starting method					Line starting	Line starting
Air flow (Standard)				CMM	**34/40**	**100/110**
Available static pressure				Pa (mmAq)	**Standard: 100 (10), Max 200 (20)**	–
Fresh air intake					Available	–
Air filter, Q'ty					Field purchased	–
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater				W	–	40 (Crank case heater)
Operation control Operation switch					Remote control switch (Optional: RCD-C-E)	– (Indoor unit side)
Room temperature control					Thermostat by electronics	–
Safety equipment					Internal thermostat for fan motor. Frost protection thermostat.	Internal protector for compressor. Internal thermostat for fan motor. Internal pressure relief valve for compressor.
Installation data Refrigerant piping size				mm (in)	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ19.05 (3/4″)**	
Connecting method					**Flare piping**	
Drain hose					(Connectable with VP25)	–
Insulation for piping					Necessary (both Liquid & Gas lines)	
Accessories					Mounting kit.	
Optional parts					–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Cooling	29°C	19°C	46°C	24°C	ISO-T3, SASO

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

(3) The operation data indicate when the air-conditioner is operated at 380V 50Hz/415V 50Hz/380V 60Hz.

Model FDU508CEM-A

Item				Model	FDU508CEM-A	
					FDU508-A	FDC506CEM3
Nominal cooling capacity(1)			ISO-T1	W	**12500/14000**	
			ISO-T3		**11900**	
Power source					**3 Phase, 230V 50Hz/220V 60Hz**	
Operation data(3)	**ISO-T1**	Cooling input		kW	4.76/5.76	
		Running current (Cooling)		A	15.2/16.9	
		Power factor (Cooling)		%	79/89	
	ISO-T3	Cooling input		kW	6.28	
		Running current (Cooling)		A	18.2	
		Power factor (Cooling)		%	91	
	Inrush current (L.R.A)			A	108	
	Noise level			dB(A)	45/47	59
Exterior dimensions Height × Width × Depth				mm	**360 × 1200 × 830**	**1250 × 950 × 340**
Net weight				kg	**62**	**85**
Refrigerant equipment Compressor type & Q'ty					–	**RC5563EME2 × 1**
Motor				kW	–	**3.73**
Starting method					–	Line starting
Heat exchanger					Louver fins & inner grooved tubing	Slitted fins & bare tubing
Refrigerant control					–	Capillary tube
Refrigerant					**R22**	
Quantity				kg	**Holding charged**	**1.8 [Pre-charged up to the piping length of 5m]**
Refrigerant oil				ℓ	–	**2.07 (SUNISO 3GS)**
High pressure control					High pressure regulator valve	
Air handling equipment Fan type & Q'ty					Multiblade centrifugal fan × 2	Propeller fan × 2
Motor				W	**230 × 1**	**60 × 2**
Starting method					Line starting	Line starting
Air flow (Standard)				CMM	**34/40**	**100/110**
Available static pressure				Pa (mmAq)	**Standard: 100 (10), Max 200 (20)**	–
Fresh air intake					Available	–
Air filter, Q'ty					Field purchased	–
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber mount (for compressor)
Electric heater				W	–	40 (Crank case heater)
Operation control Operation switch					Remote control switch (Optional: RCD-C-E)	– (Indoor unit side)
Room temperature control					Thermostat by electronics	–
Safety equipment					Internal thermostat for fan motor. Frost protection thermostat.	Internal protector for compressor. Internal thermostat for fan motor. Internal pressure relief valve for compressor.
Installation data Refrigerant piping size				mm (in)	**Liquid line: ϕ9.52 (3/8″) Gas line: ϕ19.05 (3/4″)**	
Connecting method					**Flare piping**	
Drain hose					(Connectable with VP25)	–
Insulation for piping					Necessary (both Liquid & Gas lines)	
Accessories					Mounting kit.	
Optional parts					–	

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

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Cooling	29°C	19°C	46°C	24°C	ISO-T3, SASO

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

(3) The operation data indicate when the air-conditioner is operated at 230V 50Hz/220V 60Hz.

16.2.2 Range of usage & limitations

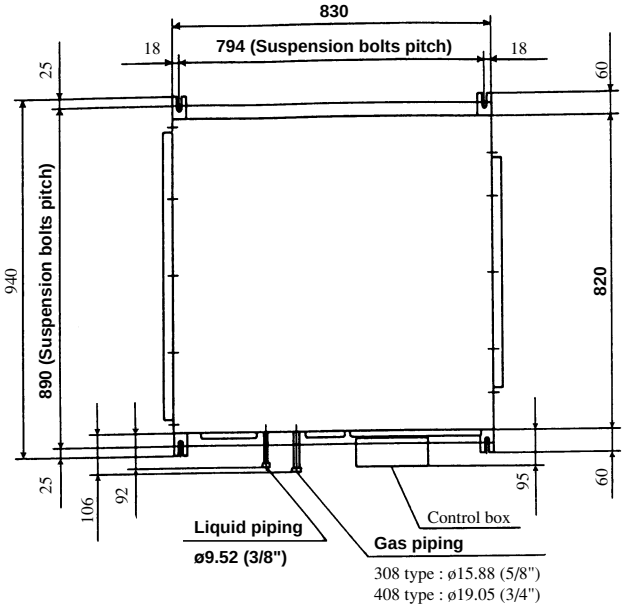
Item \ Models	All models
Indoor return air temperature (Upper, lower limits)	Refer to the selection chart
Outdoor air temperature (Upper, lower limits)	
Indoor unit atmosphere (behind ceiling) temperature and humidity	Dew point temperature 28˚C or less, relative humidity 80% or less
Refrigerant line (one way) length	**Max. 30m**
Vertical height difference between outdoor unit and indoor unit	**Max. 15m**
Power source voltage	Rating ± 10%
Voltage at starting	Min. 85% of rating
Frequency of ON-OFF cycle	**Max. 10 times/h**
ON and OFF interval	**Min. 3 minutes**

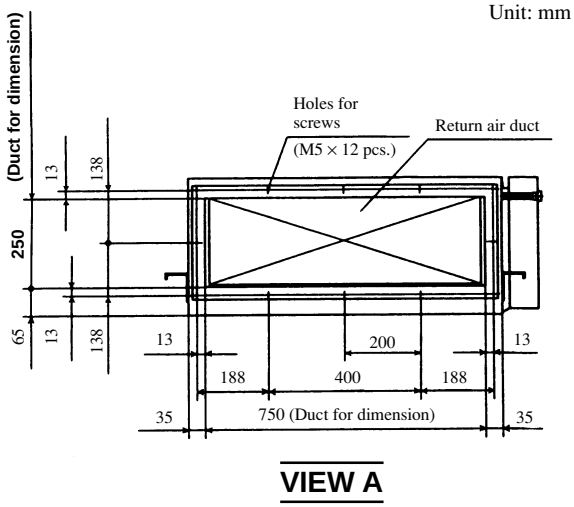
16.2.3 Exterior dimensions

(1) Indoor unit

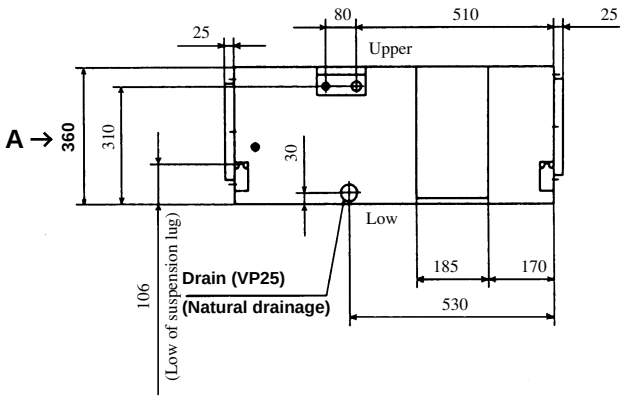
Models FDU308-A, 408-A

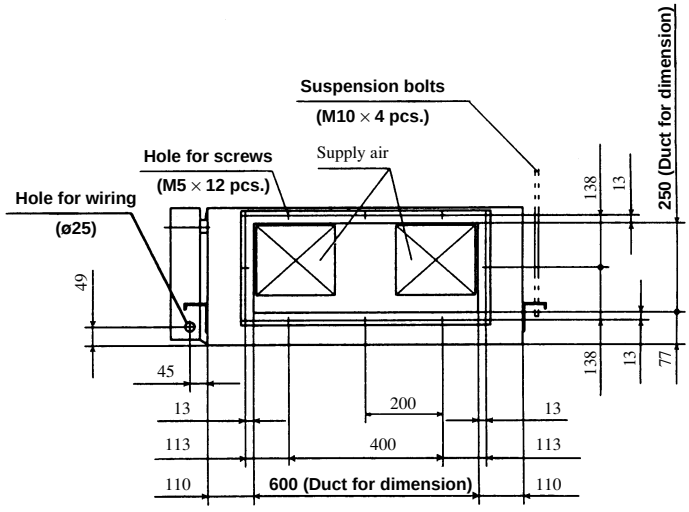
Unit: mm



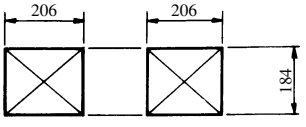


VIEW A

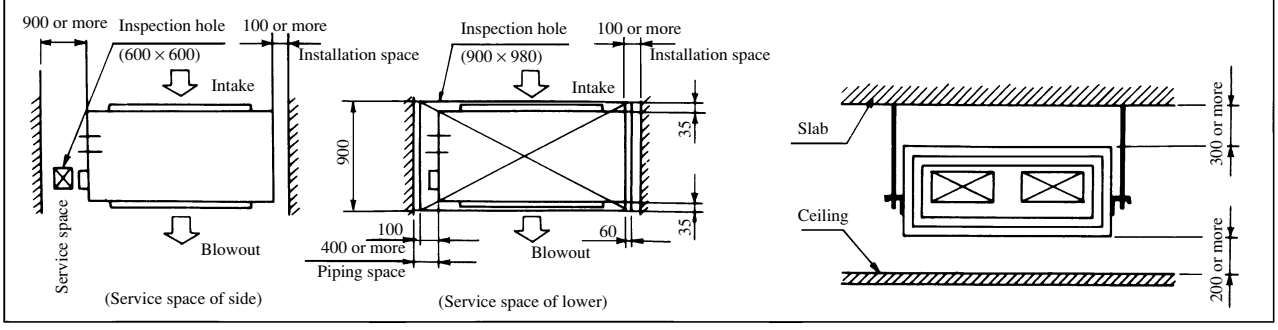




Dimention for supply air

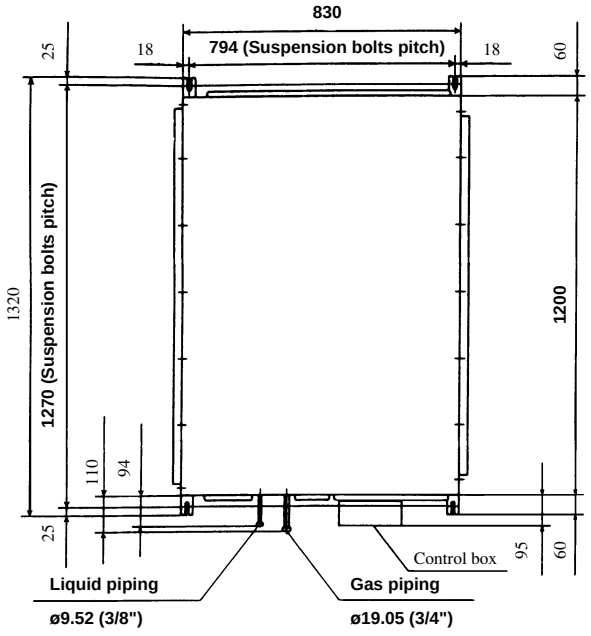


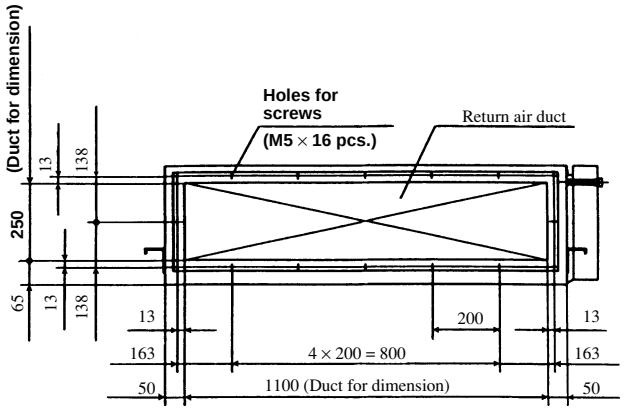
Space for installation and service



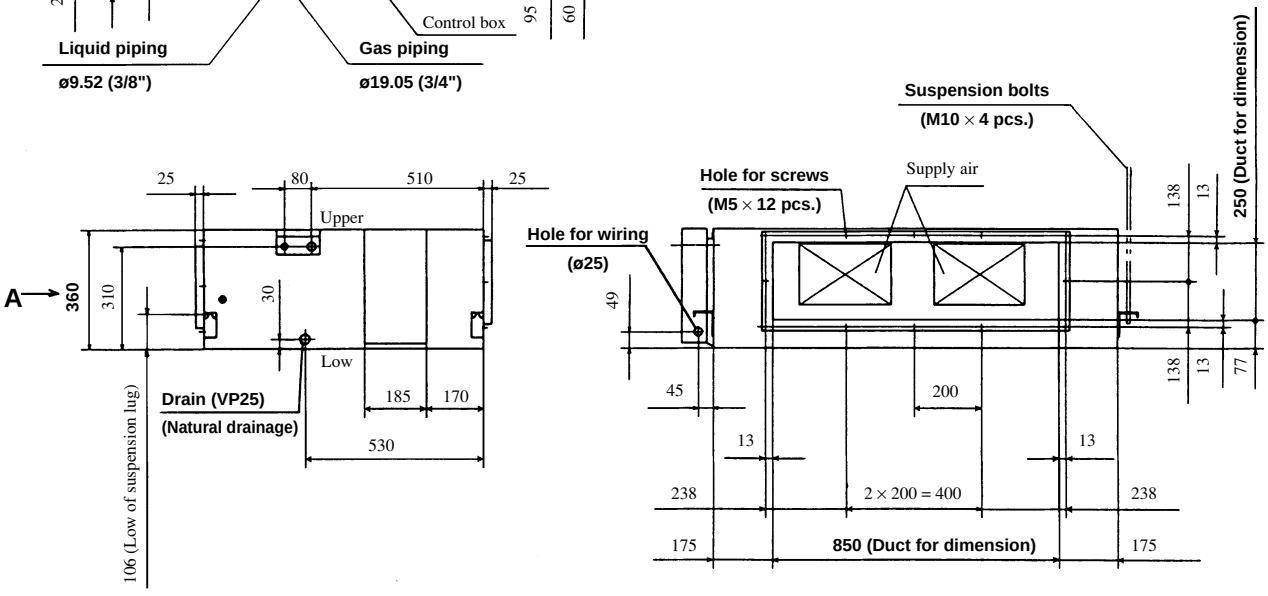
Model FDU508-A

Unit: mm

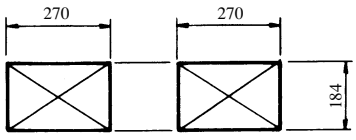




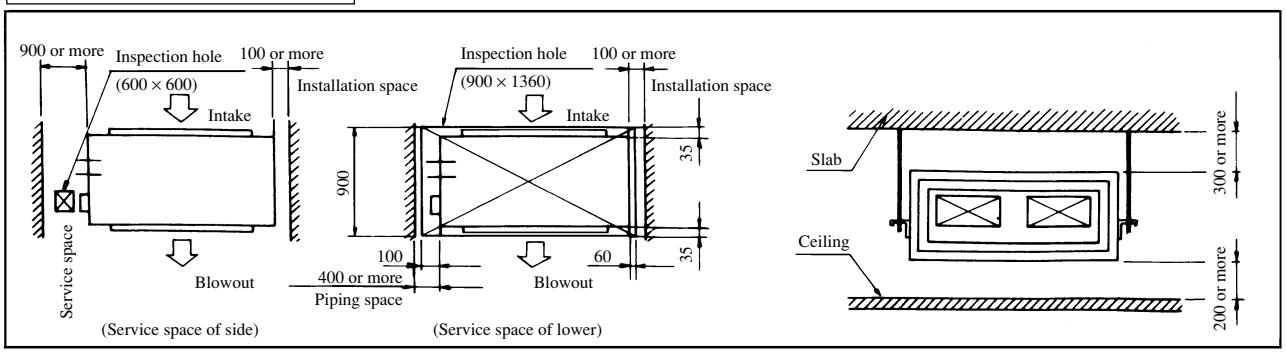
VIEW A



Dimention for supply air

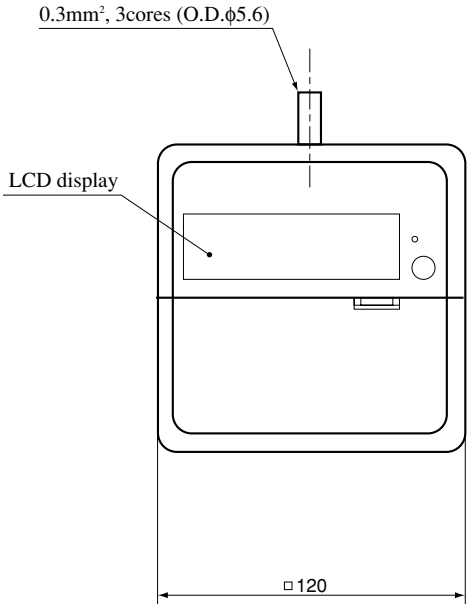


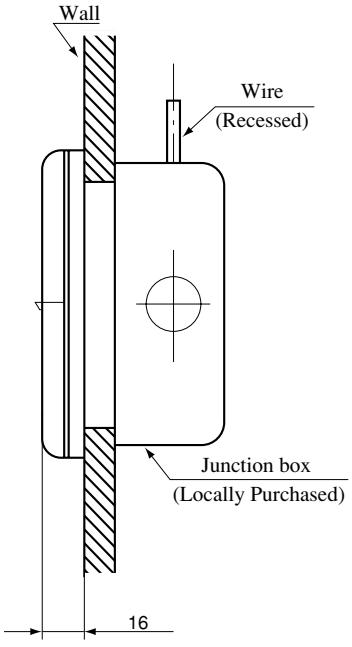
Space for installation and service



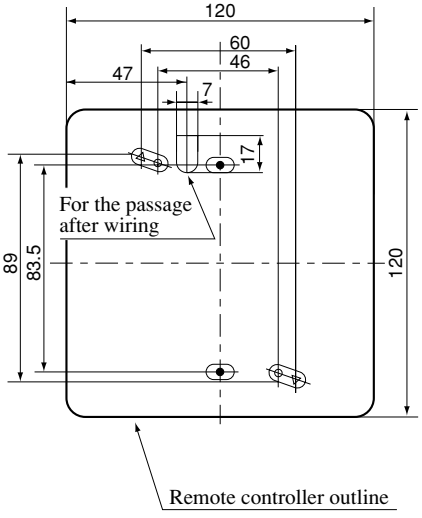
(2) Remote controller (Optional parts)

Unit: mm





Remote controller mounting dimensions



♦ Usable JIS box, JIS C 8336
- Switch box for 1 piece (without cover)
  (use of the ● mark hole as illustrated on the left)
- Switch box for 2 pieces
  (use of the ○ mark hole as illustrated on the left)
  (without cover)
  (use of the △ mark hole as illustrated on the left)
  (when installing the cover)

Note (1) Allowable length of remote controller cable: 600 m

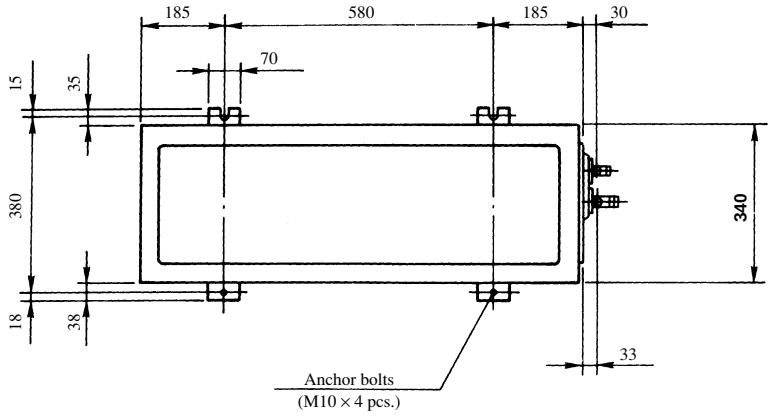
Allowable rang of wire thickness and length

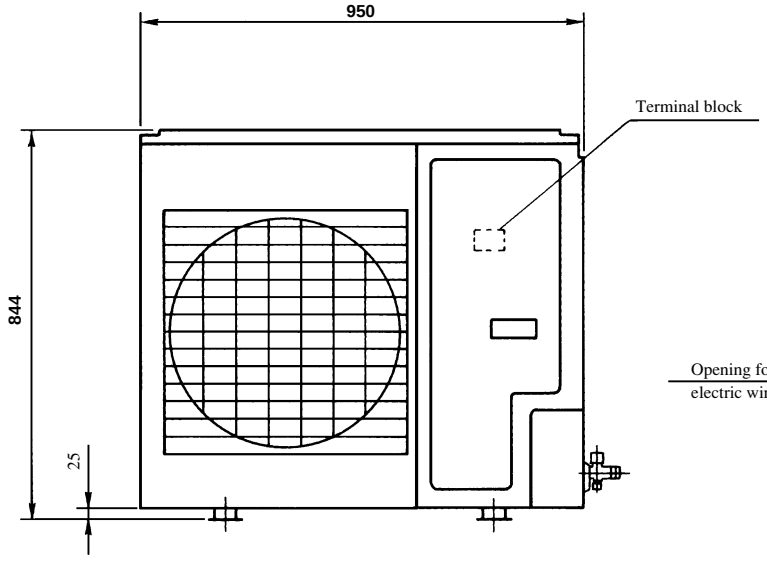
Standard Within	0.3 mm²	× Within 100 m
	0.5 mm²	× Within 200 m
	0.75 mm²	× Within 300 m
	1.25 mm²	× Within 400 m
	2 mm²	× Within 600 m

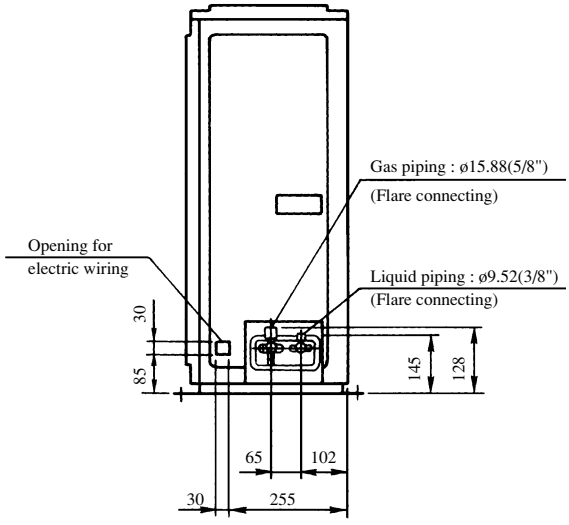
(3) Outdoor unit

Models FDC306CEN3, 306CES3

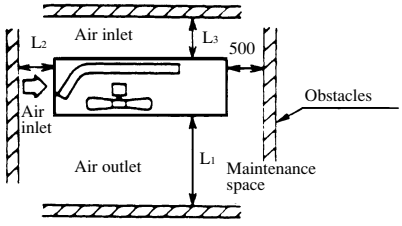
Unit: mm







Required space for maintenance and air flow



Minimum allowable space to the obstacles

Unit:mm

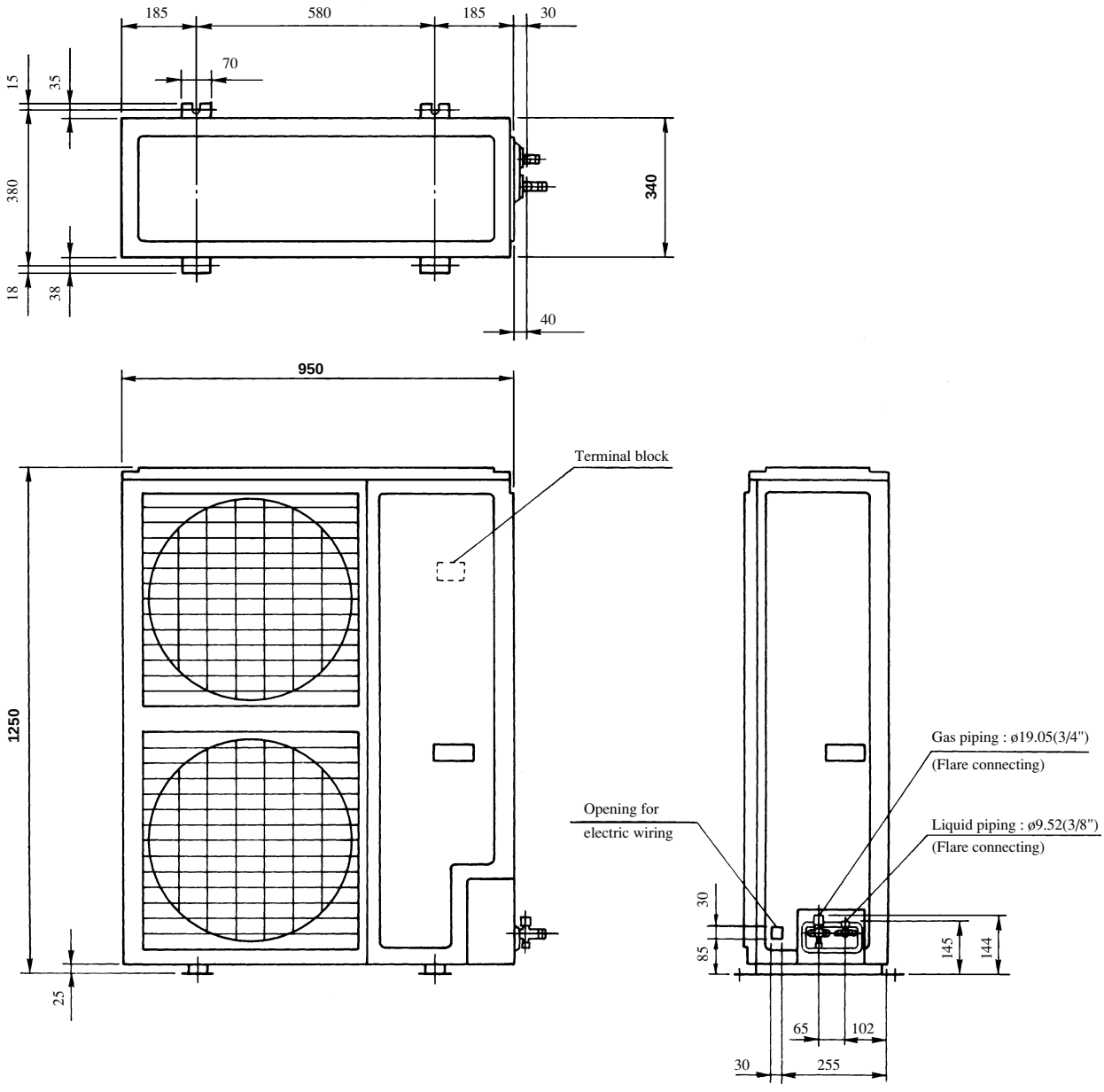
Mark \ Installation type	Ⅰ	Ⅱ	Ⅲ
L_1	Open	Open	500
L_2	300	0	Open
L_3	100	150	100

Notes

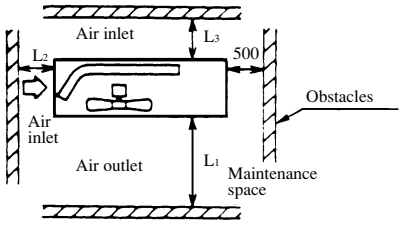
(1) Fix the unit with anchor bolts.
(2) Strong wind must not be directed to the air outlet.
(3) Free space over the unit must be larger than 1 m.
(4) The unit should not be surrounded by obstructions in all direction.
At least one direction around the unit must be free.

Models FDC406CES3, 506CES3, 506CEM3

Unit: mm



Required space for maintenance and air flow



Minimum allowable space to the obstacles

Unit:mm

Mark \ Installation type	Ⅰ	Ⅱ	Ⅲ
L_1	Open	Open	500
L_2	300	0	Open
L_3	150	300	150

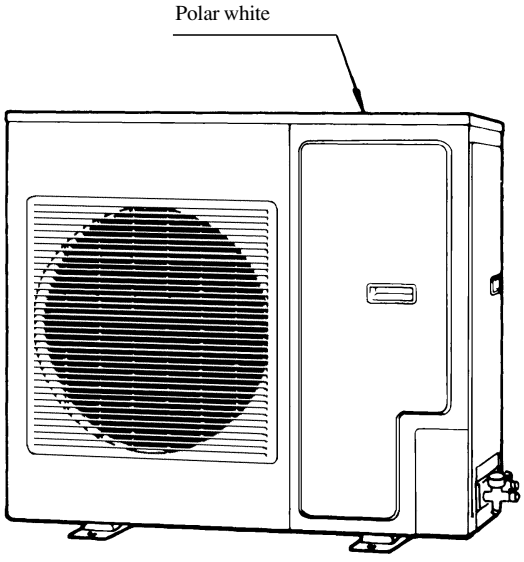
Notes
(1) Fix the unit with anchor bolts.
(2) Strong wind must not be directed to the air outlet.
(3) Free space over the unit must be larger than 1 m.
(4) The unit should not be surrounded by obstructions in all direction.
At least one direction around the unit must be free.

16.2.4 Exterior appearance

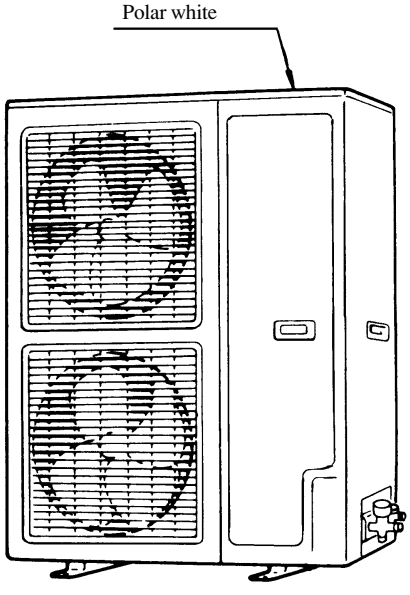
(1) Indoor unit ..... Zinc steel plate

(2) Outdoor unit

Models FDC306CEN3, 306CES3

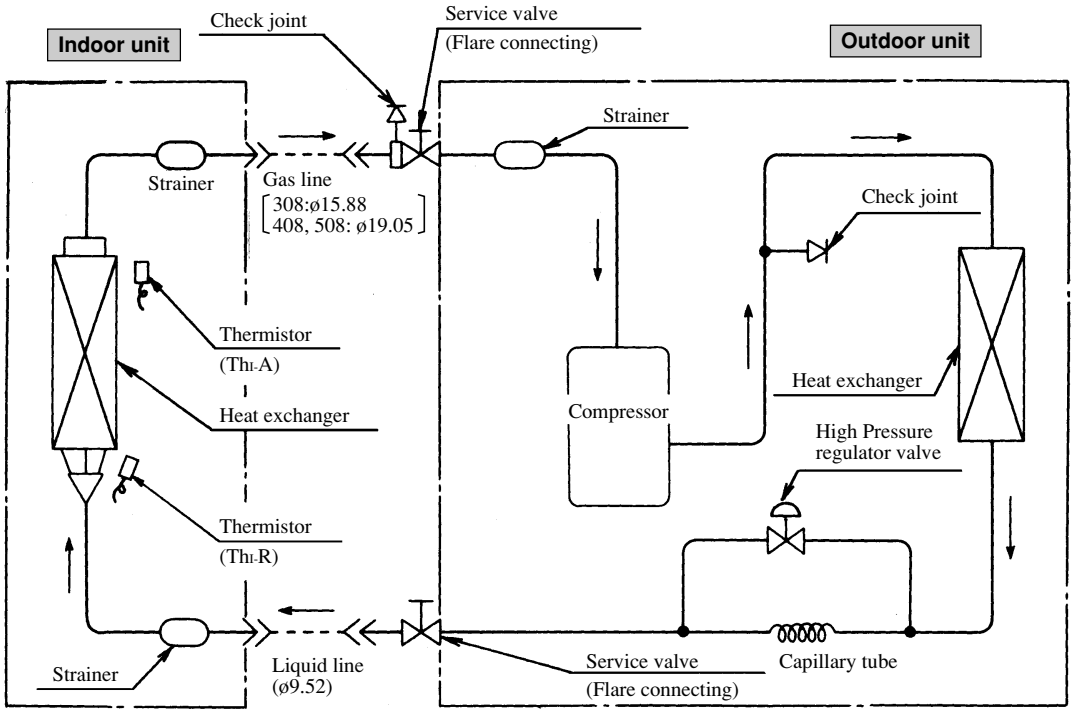


Models FDC406CES3, 506CES3, 506CEM3



16.2.5 Piping system

Models FDU308CEN-A, 308CES-A, 408CES-A, 508CES-A, 508CEM-A



Preset point of protective devices

Part name	Mark	Equipped unit	All models
Thermistor (for frost prevention)	**ThI-R**	Indoor unit	OFF 2.5°C ON 10°C

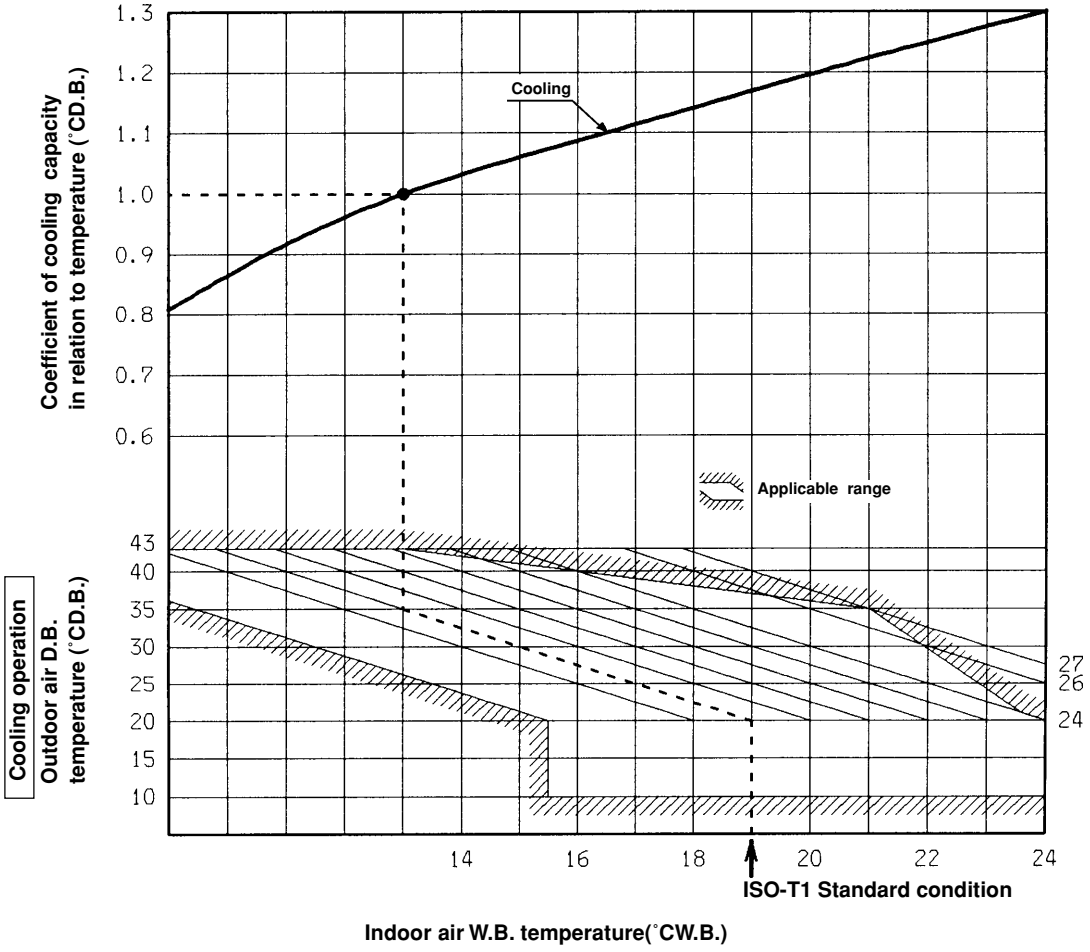
16.2.6 Selection chart

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

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

(1) Coefficient of cooling capacity in relation to temperatures

(a) Only case of ISO-T1 models.



(b) Only case of ISO-T3 and SASO models.

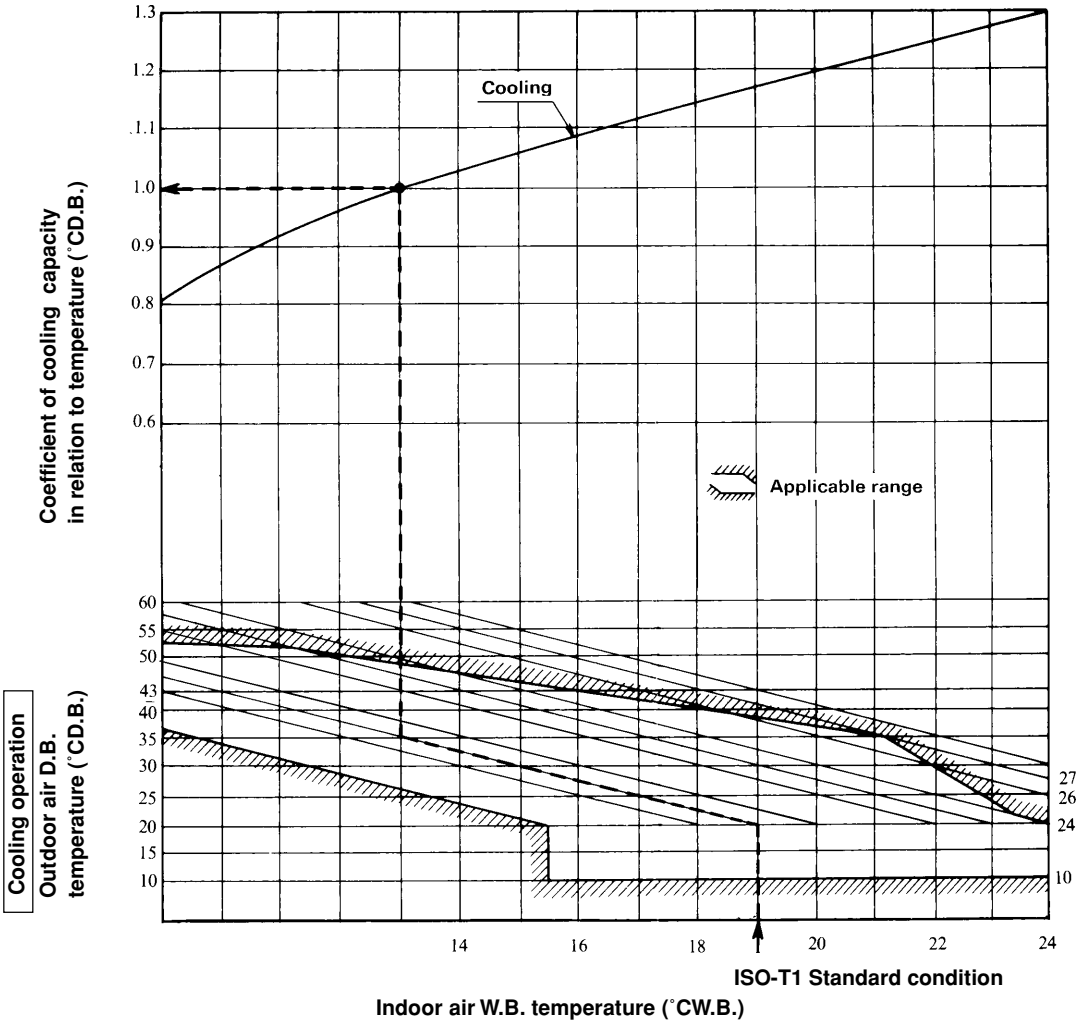


Table of bypass factor

(50/60 Hz)

Item \ Model		FDU308 type	FDU408 type	FDU508 type
Air flow	Upper limit	0.019/0.096	0.048/0.05	0.103/0.106
	Standard	0.067/0.086	0.032/0.043	0.076/0.094
	Lower limit	0.043/0.057	0.017/0.025	0.051/0.064

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

Coefficient: 1.00 at High, 0.95 at Low

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

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

(50/60Hz)

Equivalent piping length(1) m		5	10	15	20	25	30	35
Cooling	FDU308 type	1.0	0.99	0.98/0.975	0.97/0.965	0.96/0.95	0.95/0.94	0.94/0.925
	FDU408 type	1.0	0.995/0.99	0.985/0.98	0.98/0.97	0.97/0.96	0.965/0.95	0.955/0.94
	FDU508 type	1.0	0.99/0.985	0.975/0.97	0.965/0.955	0.95/0.94	0.94/0.925	0.925/0.91

Note (1) Equivalent piping length can be obtained by calculating as follows.
308 series [ø15.88 (5/8")]: Equivalent piping length = Real piping length + (0.10 × Number of bends in piping)
408, 508 series [ø19.05 (3/4")]: Equivalent piping length = Real piping length + (0.15 × Number of bends in piping)
[Equivalent piping length < Limitation length of piping + 5 m]

(4) When the outdoor unit is located at a lower height than the indoor unit in cooling 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 differenc	5 m	10 m	15 m
Adjustment coefficient	0.01	0.02	0.03

Piping length limitations

Item \ Model	All models
Max. one way piping length	30 m
Max. vertical height difference	15 m

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

How to obtain the cooling capacity

Example: The net cooling capacity of the model FDU308CEN-A with the air flow "High", the piping length of 15 m, the outdoor unit located 5 m lower than the indoor unit, indoor wet-bulb temperature at 19.0°C and outdoor dry-bulb temperature 35°C is

Net cooling capacity = $\underset{\text{FDU308CEN-A}}{7100} \times \underset{\text{Air flow "High"}}{1.00} \times \underset{\substack{\text{Length 15 m.}\\\text{Height difference 5 m}}}{(0.98 - 0.01)} \times \underset{\text{Factor by air temperatures}}{1.0}$ = **6887 W**

16.2.7 Characteristics of fan

How to interpret the blower characteristics table

Example ● What is the Fan Controller's Volume Number setting if, at the high operation speed of FDU308CES (60Hz), it is required to have 140Pa (14mmAq) outside static pressure at 24m³/min airflow volume as the operating point?

Move the 140Pa (14mmAq) outside static pressure point to the right as shown in the diagram below. The "ⓐ - point", i.e. where this intersects with the solid curve tracing the 24m³/min airflow volume upwards, is the appropriate Volume Number. In this example the appropriate Volume Number is "No. 6".

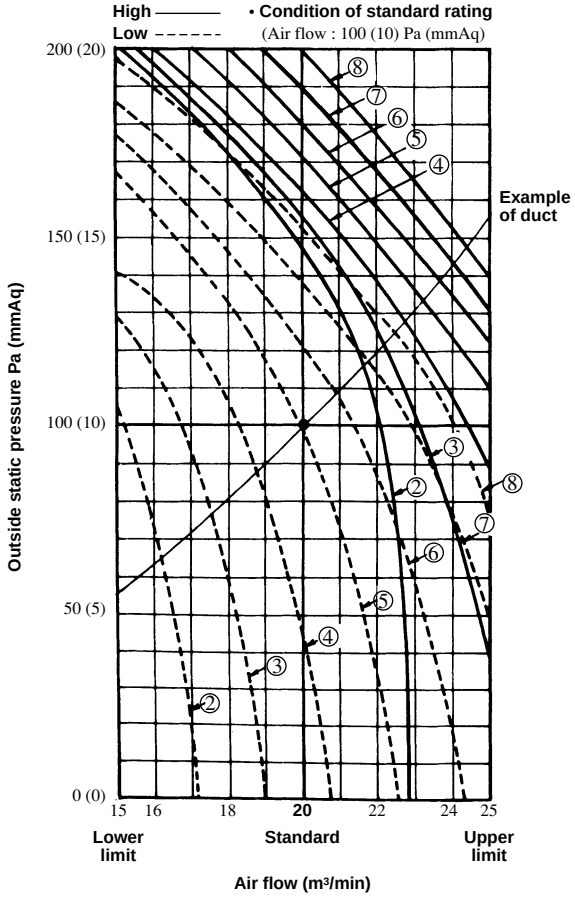
● In this situation, a condition of 19.7m³/min airflow volume at 93Pa (9.3mmAq) outside static pressure can be predicted at Low Tap and it can be concluded that operation is possible.

Always follow the procedure in "ⓑ - Point" to verify that the condition at Low Tap is not outside the Feasible Operation Airflow Volume Range.

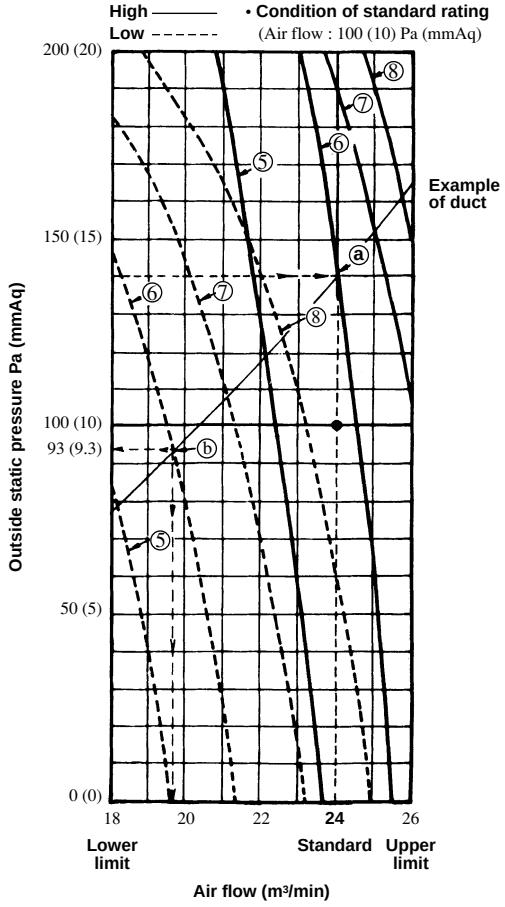
Notes (1) Circled values in the Special Feature Table indicate Fan Controller Volume Numbers. Volume Numbers with no entry are outside the Feasible Operation Airflow Volume Range and therefore operation is not possible.

(2) The Fan Controller Volume Number is set at "No. 5" when shipped from the assembly plant.

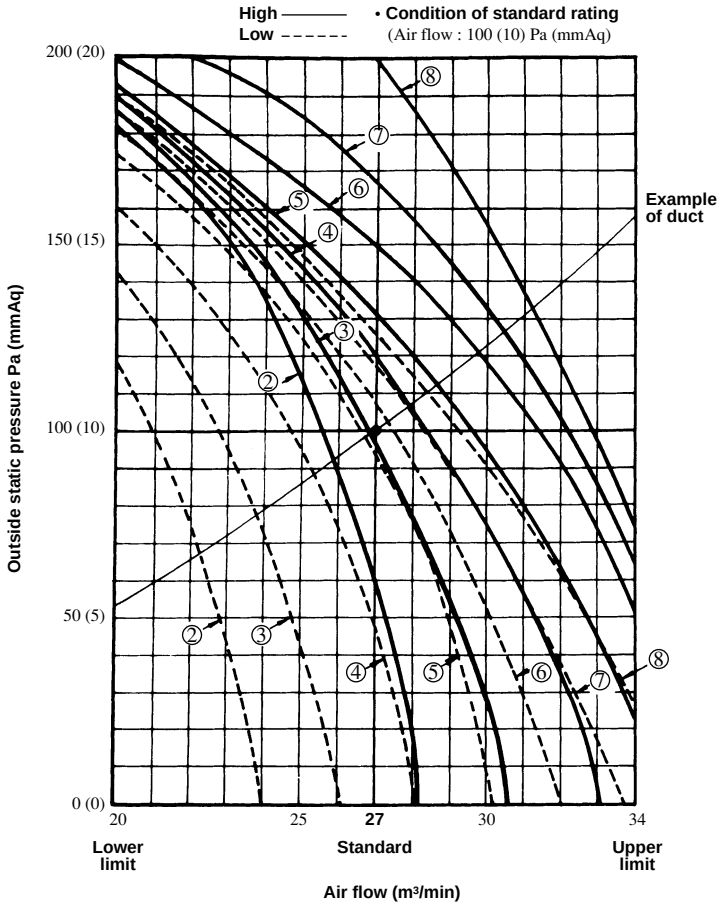
Model FDU308-A (50Hz)



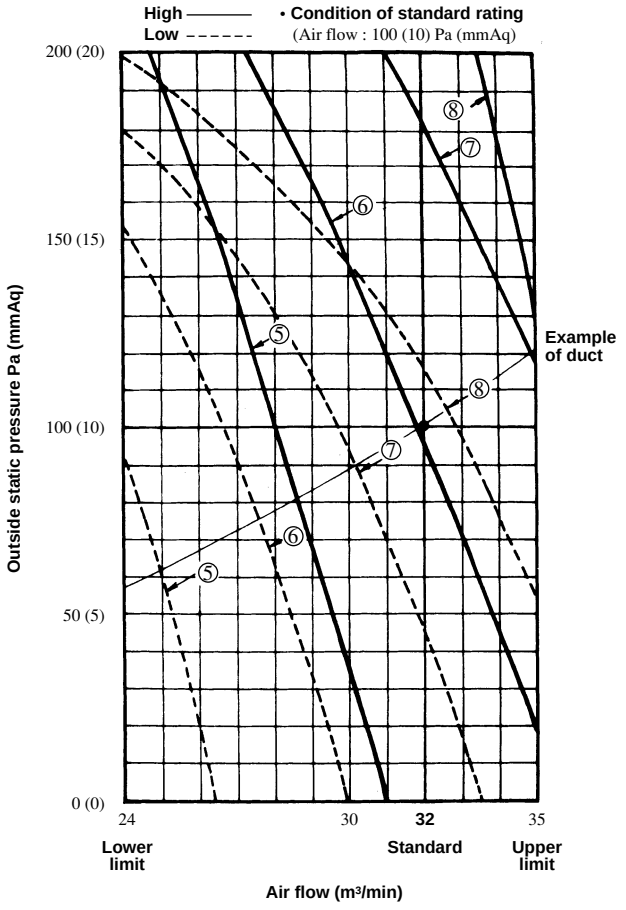
Model FDU308-A (60Hz)



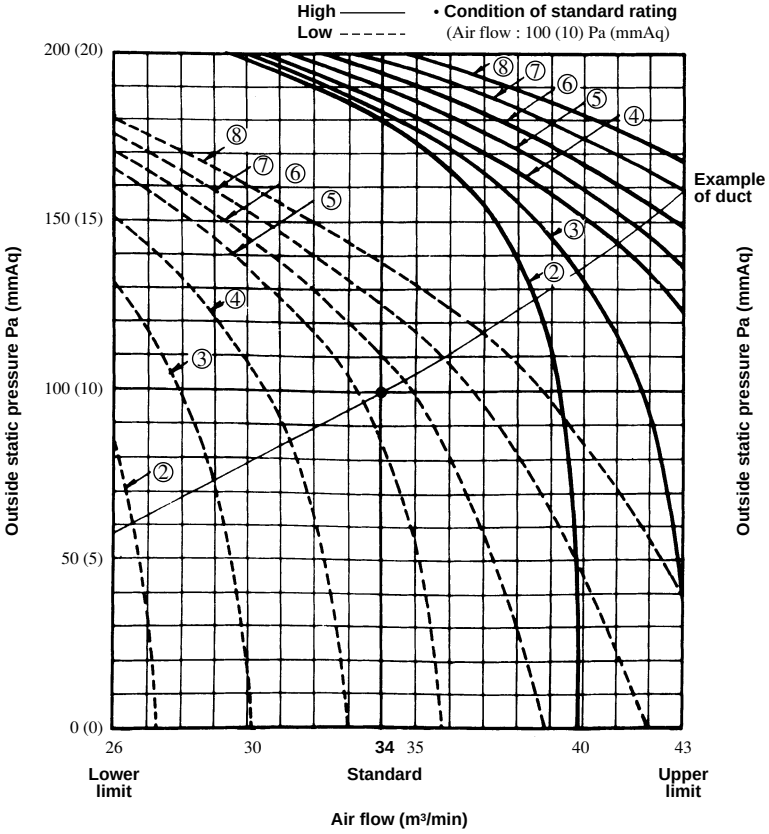
Model FDU408-A (50Hz)



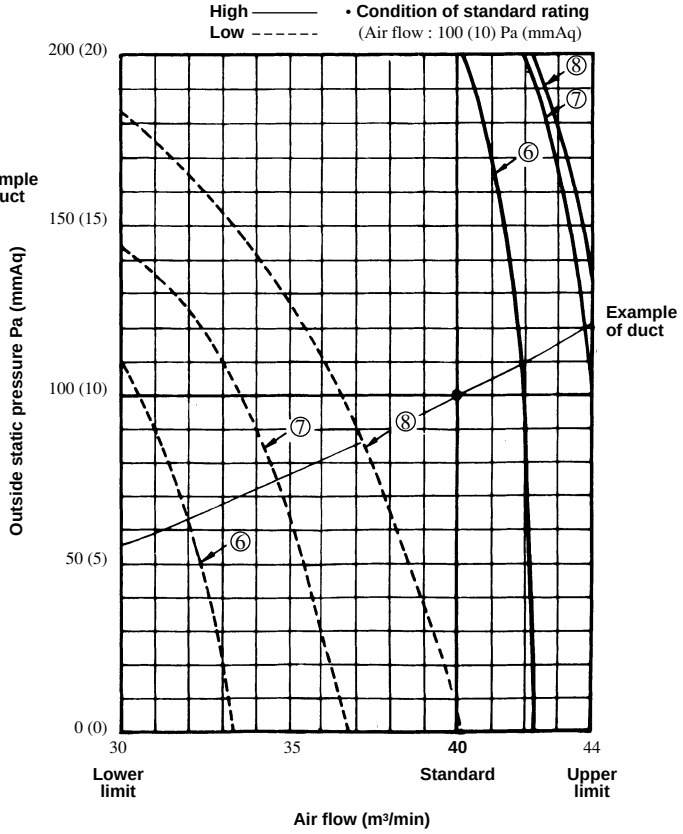
Model FDU408-A (60Hz)



Model FDU508-A (50Hz)

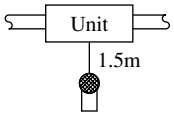


Model FDU508-A (60Hz)



16.2.8 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,
Indoor unit
Measured based on JIS B 8616
Mike position as below



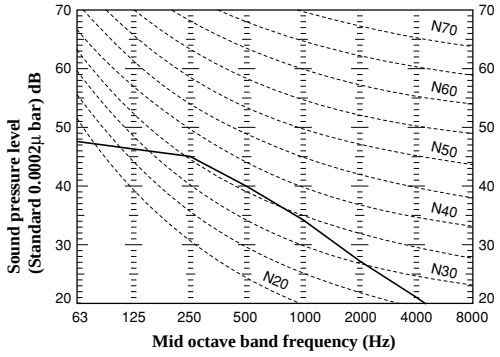
Outdoor unit
Measured based on JIS B 8616
Mike position: at highest noise level
in position as below
Distance from front side 1 m
Height 1 m

(2) The data in the chart are measured in an unechonic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

(1) Indoor unit

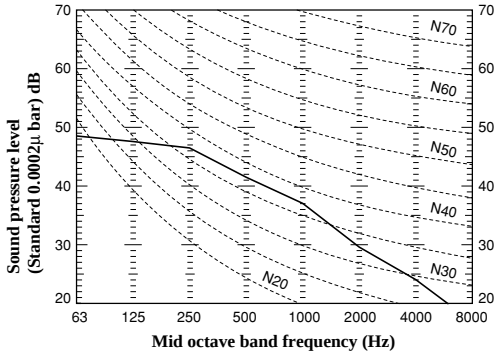
Model FDU308-A (50Hz)

Noise level 41dB (A)



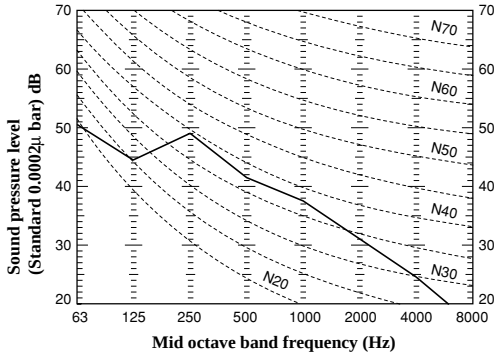
Model FDU308-A (60Hz)

Noise level 43dB (A)



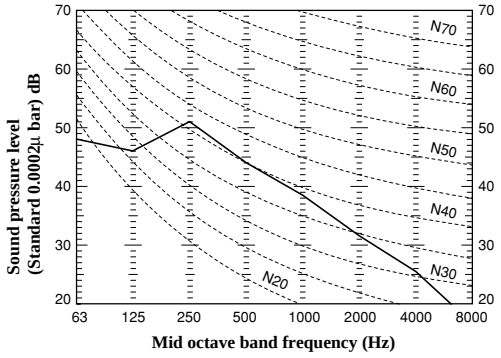
Model FDU408-A (50Hz)

Noise level 44dB (A)



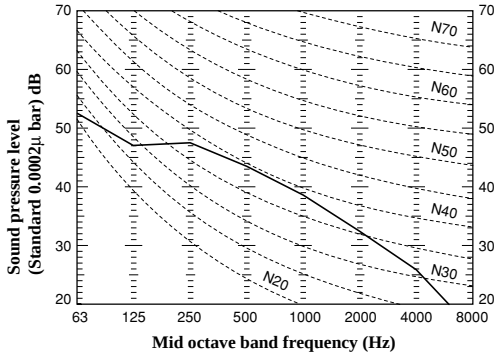
Model FDU408-A (60Hz)

Noise level 46dB (A)



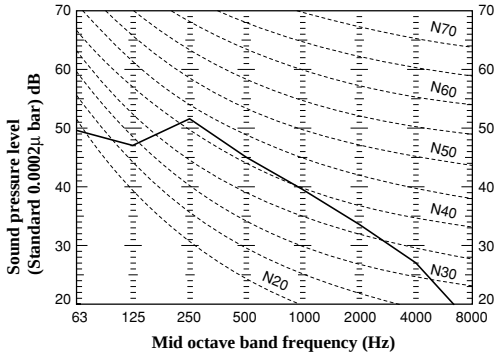
Model FDU508-A (50Hz)

Noise level 45dB (A)



Model FDU508-A (60Hz)

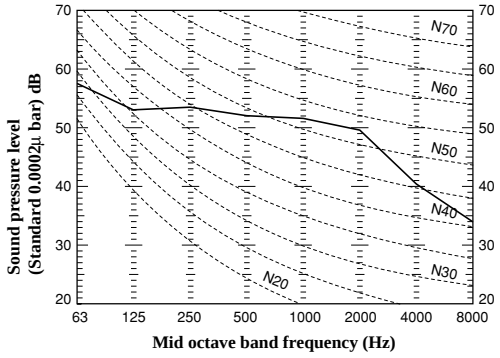
Noise level 47dB (A)



(2) Outdoor unit

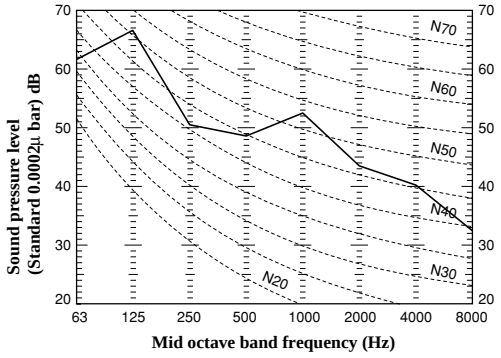
Model FDC306CEN3

Noise level 56dB (A)



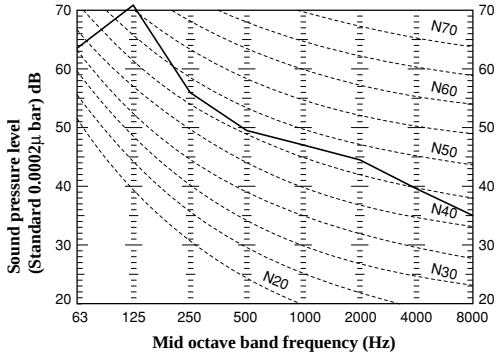
Model FDC306CES3

Noise level 56dB (A)



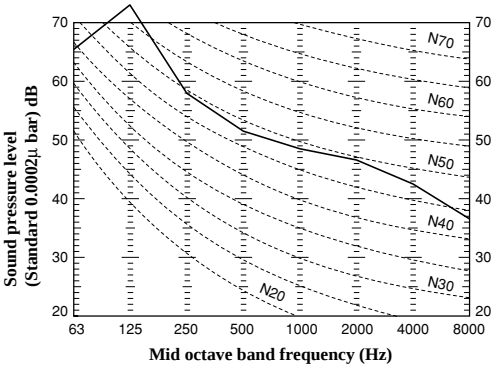
Model FDC406CES3

Noise level 57dB (A)



Models FDC506CES3, 506CEM3

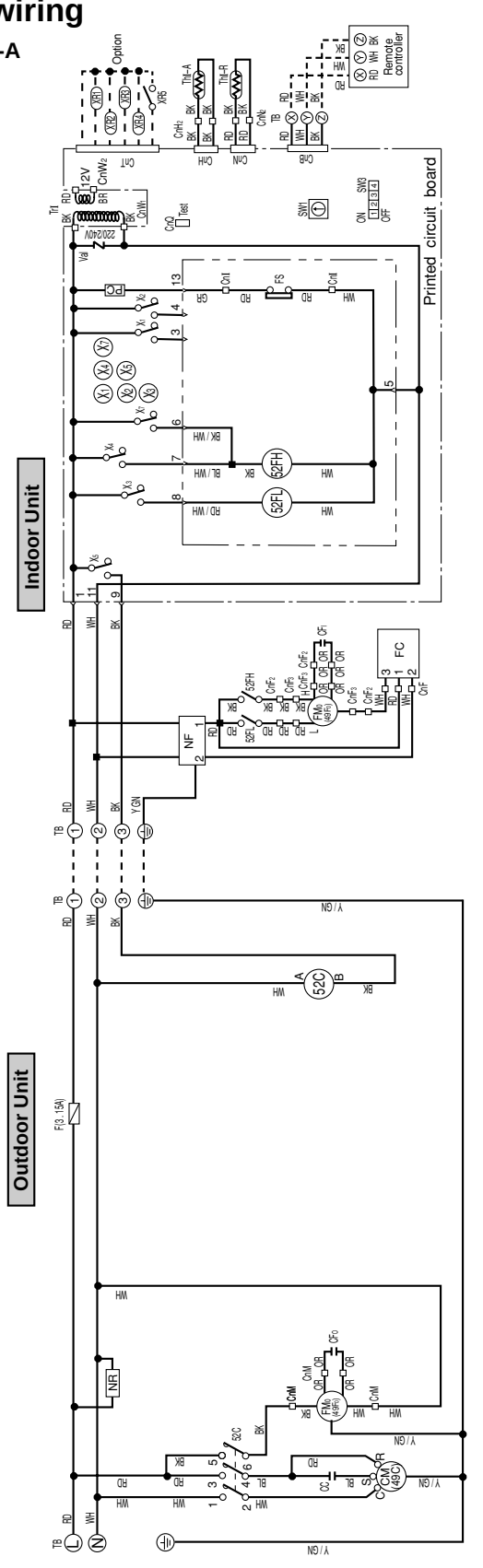
Noise level 59dB (A)



16.3 ELECTRICAL DATA

16.3.1 Electrical wiring

Model FDU308CEN-A



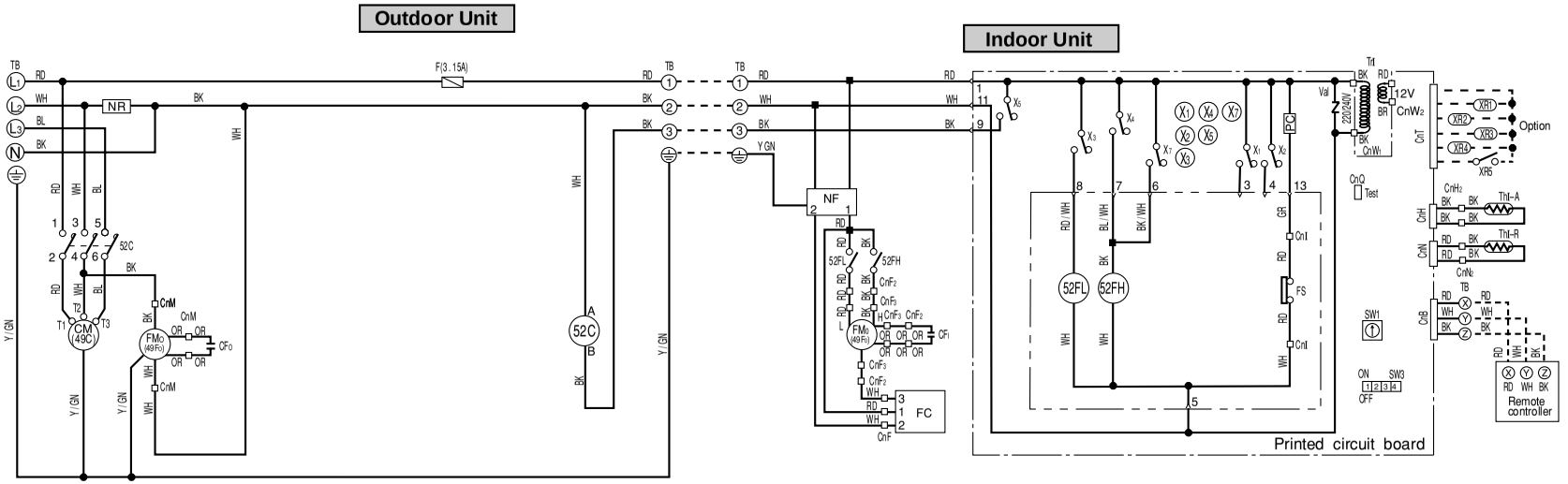
Color mark

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

Meaning of marks

Mark	Parts name	Mark	Parts name
CC	Capacitor for CM	**Th-A**	Thermistor
CFI	Capacitor for FMI	**Th-R**	Thermistor
CFo	Capacitor for FMo	**TrI**	Transformer
CM	Compressor motor	**Val**	Varistor
CnA ~ W	Connector (□ mark)	**49C**	Internal thermostat for CM
F	Fuse	**49FI**	Internal thermostat for FMI
Fc	Fan controller	**49Fo**	Internal thermostat for FMo
FMI	Fan motor (Indoor unit)	**52C**	Magnetic contactor for CM
FMo	Fan motor (Outdoor unit)	**52FH**	Auxiliary relay (for FMI)
FS	Float switch	**52FL**	Auxiliary relay (for FMI)
NF	Noise filter	**X1~5, 7**	Auxiliary relay
SW1	Switch (Address set)	▽	Terminal (F)
SW3	Changeover switch	■	Connector
TB	Terminal block (○ mark)		

Power Source
3 Phase 380-415V 50Hz / 380V 60Hz



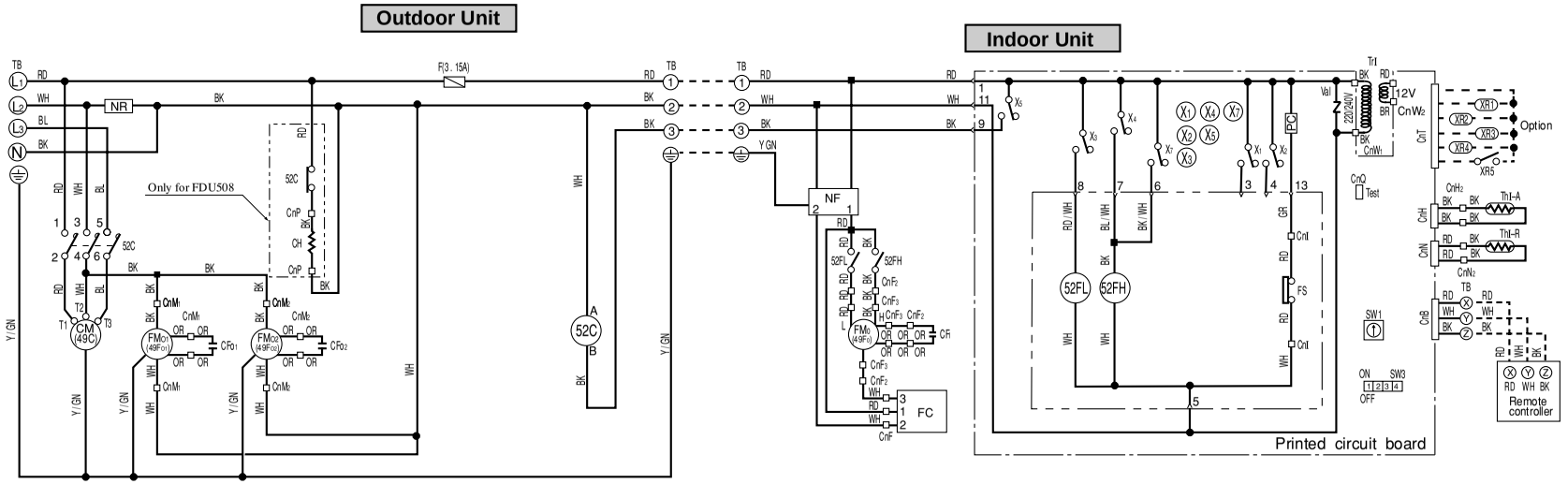
Meaning of marks

Mark	Parts name	Mark	Parts name
CFI	Capacitor for FMI	**THI-A**	Thermistor
CFO	Capacitor for FMO	**THI-R**	Thermistor
CM	Compressor motor	**TrI**	Transformer
CnA ~ W	Connector (□ mark)	**VaI**	Varistor
F	Fuse	**49C**	Internal thermostat for CM
Fc	Fan controller	**49FI**	Internal thermostat for FMI
FMI	Fan motor (Indoor unit)	**49Fo**	Internal thermostat for FMo
FMO	Fan motor (Outdoor unit)	**52C**	Magnetic contactor for CM
FS	Float switch	**52FH**	Auxiliary relay (for FMI)
NF	Noise filter	**52FL**	Auxiliary relay (for FMI)
SW1	Switch (Address set)	**X1~5, 7**	Auxiliary relay
SW3	Changeover switch	◁	Terminal (F)
TB	Terminal block (○ mark)	■	Connector

Color mark

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

Power Source
3 Phase 380-415V 50Hz / 380V 60Hz



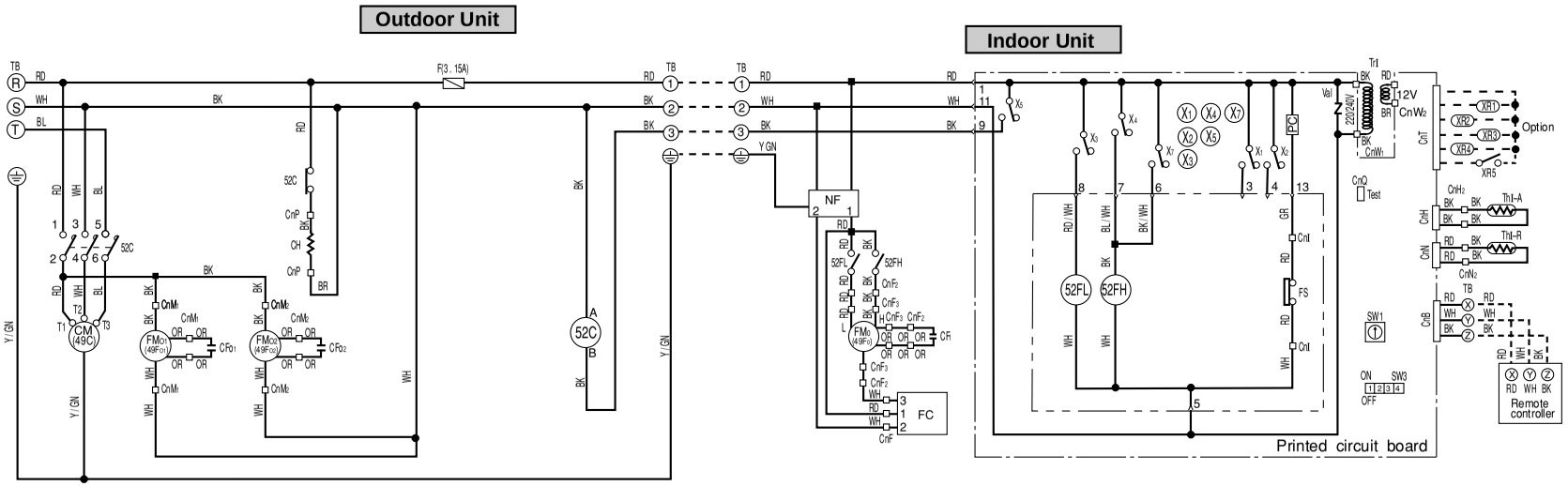
Meaning of marks

Mark	Parts name	Mark	Parts name
CFI	Capacitor for FMI	**THI-A**	Thermistor
CFO1, 2	Capacitor for FMO	**THI-R**	Thermistor
CH	Crankcase heater	**TrI**	Transformer
CM	Compressor motor	**VaI**	Varistor
CnA ~ W	Connector (□ mark)	**49C**	Internal thermostat for CM
F	Fuse	**49FI**	Internal thermostat for FMI
Fc	Fan controller	**49FO1, 2**	Internal thermostat for FMo
FMI	Fan motor (Indoor unit)	**52C**	Magnetic contactor for CM
FMO1, 2	Fan motor (Outdoor unit)	**52FH**	Auxiliary relay (for FMI)
FS	Float switch	**52FL**	Auxiliary relay (for FMI)
NF	Noise filter	**X1~5, 7**	Auxiliary relay
SW1	Switch (Address set)	◁	Terminal (F)
SW3	Changeover switch	■	Connector
TB	Terminal block (O mark)		

Color mark

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

Power Source
3 Phase 230V 50Hz/220V 60Hz



Meaning of marks

Mark	Parts name	Mark	Parts name
CFı	Capacitor for FMı	**Thı-A**	Thermistor
CFo1, 2	Capacitor for FMo	**Thı-R**	Thermistor
CH	Crankcase heater	**Trl**	Transformer
CM	Compressor motor	**Val**	Varistor
CnA ~ W	Connector (□ mark)	**49C**	Internal thermostat for CM
F	Fuse	**49Fı**	Internal thermostat for FMı
Fc	Fan controller	**49Fo1, 2**	Internal thermostat for FMo
FMı	Fan motor (Indoor unit)	**52C**	Magnetic contactor for CM
FMo1, 2	Fan motor (Outdoor unit)	**52FH**	Auxiliary relay (for FMı)
FS	Float switch	**52FL**	Auxiliary relay (for FMı)
NF	Noise filter	**X1~5, 7**	Auxiliary relay
SW1	Switch (Address set)	◁	Terminal (F)
SW3	Changeover switch	■	Connector
TB	Terminal block (O mark)		

Color mark

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

16.4 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

Except for function relating to heating, same as the unit for FDT(N) heat pump type. See page 317.

16.5 APPLICATION DATA

The application data for the cooling only models are similar to those for the heat pump models. (See page 623.)

16.6 MAINTENANCE DATA

Same as the cooling /heating equipment for FDT(N) heat pump type. Refer to page 348.