

ORDER NO. MAC0112090C0

# Service Manual

AIR CONDITIONER  
HIDE AWAY TYPE  
HEAT PUMP MODEL  
**CS-A24BD1P (CU-A24BBP5)**  
**CS-A28BD1P (CU-A28BBP5, CU-A28BBP8)**  
**CS-A34BD1P (CU-A34BBP5, CU-A34BBP8)**  
**CS-A43BD1P (CU-A43BBP8)**  
**CS-A50BD1P (CU-A50BBP8)**



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**⚠ WARNING**

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**Panasonic**

**⚠ PRECAUTION OF LOW TEMPERATURE**

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigeration circuit.

# 1. SERVICE INFORMATION

## Notice of Address setting for NEW Cassette / NEW Outdoor Unit.

The new Ceiling / New Outdoor models are possible to have address setting for twin / triple control or group control by automatic when main power supply is switched on.  
(Manual address setting is also possible by using Dip switch on Indoor unit P.C. board.)  
However, this address setting is only possible when made proper wiring connection and also Indoor unit should be original virgin unit.

### 1.1. Example of trouble at test operation

If found out as following phenomenon at test operation on site, it may have possibility of wrong address setting. / Therefore, please ensure of the address setting.

1. LCD display of wired remote control had not illuminate although the main power supply switch is 'on'.
2. LCD display had indicated as normal illumination when power supply switch is 'on', however outdoor unit cannot be operated. / (But, it is necessary to take 3 to 5 minutes for outdoor unit to start from the timing of remote control ON/OFF switch is 'on'.)
3. P.C. board had memorized wrong setting information.
  - A. If main power supply is switched 'on' with the wrong connection.
  - B. When changing the connection or combination of units due to re-installation etc.
    - When changing the system from twin to triple (triple to twin).
    - When changing the system from group control to normal one to one system.
    - When making the replacement of units as master and slave etc.

### 1.2. Caution of test operation

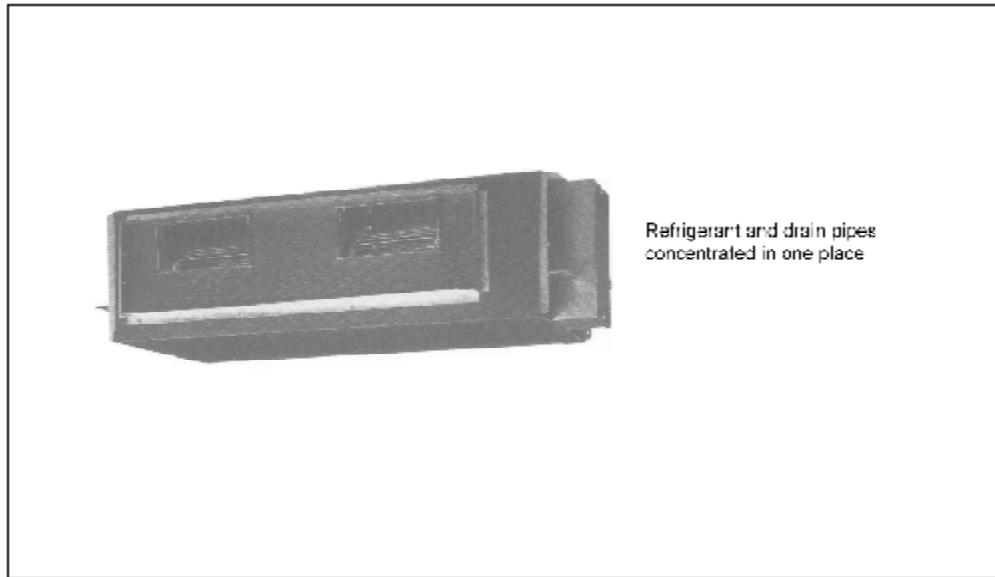
Do not touch the remote control switch and do not change any wirings for one minute when the main power supply switch is 'on'. / (Because the unit is having automatic address setting during the first one minute.)

### 1.3. Caution during automatic address setting

When main power supply switch is 'on', the P.C. board will automatically memorized the connecting system. / Consequently, when initial power supply is 'on', there will not be interchangeability of units even of the same type and same capacity unit. Therefore unable to connect the unit to another system.

## 2. FEATURES

### 2.1. Variety of excellent features /



#### 2.1.1. Compact design

- The height is only 29cm (2.5 HP model and 3 HP model) and can be installed even where the space is limited.

#### 2.1.2. Automatic restart function

- When the electric power comes back after a power failure, the unit itself automatically restarts the operation in the pre-failure mode.

#### 2.1.3. Auto fan mode (indoor unit)

- Auto fan mode is added besides Hi, Me and Lo. / It automatically adjusts the fan speed according to the indoor temperature.

#### 2.1.4. Dry mode function

- Dry mode can make a comfortable indoor environment during wet season.

#### 2.1.5. Quiet operation

- The sound level is as low as 42db (A) for 3 HP model and suitable for offices, shops, homes etc, where quiet operation is essential.

#### 2.1.6. Low ambient cooling operation

- Cooling is possible to temperature as low as -5°C

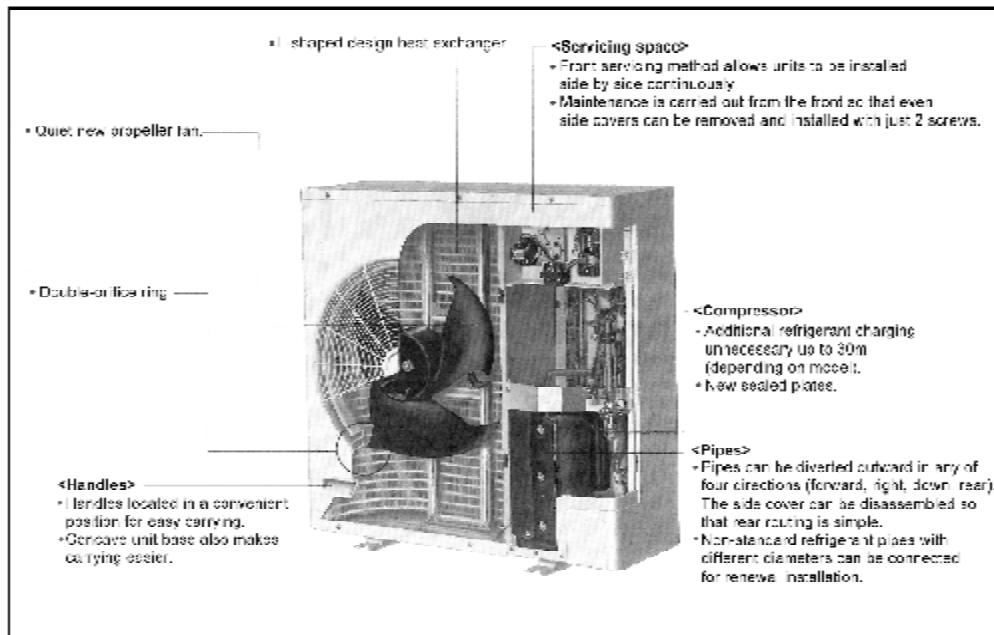
#### 2.1.7. Automatic changeover function (heat pump models)

- The unit automatically switches between cooling and heating in accordance with operating load in order to maintain a comfortable

indoor temperature.

#### 2.1.8. Hot start system / (heat pump model)

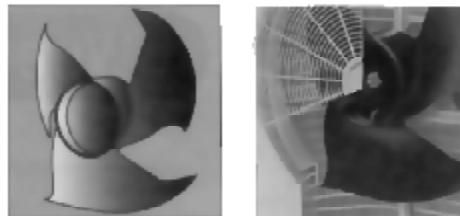
### 2.2. New low-noise outdoor units



#### [Product features]

##### 2.2.1. Low-noise design improves in surrounding areas

1. The noise-suppressing winglet fan is a result of new research into vane design theory. The unique curved shape suppresses the generation of vortexes, thus reduces air flow noise.



2. The adoption of double-orifice rings reduces air passage resistance.
3. Strengthening of the noise insulation materials in the compressor and the sealing-in of mechanical noise allows vibration noise to be greatly enclosed and suppressed.

4. The heat exchanger has an L-shaped design to allow air to flow more smoothly.
5. Noise is automatically reduced further during night time operation with lower outdoor air temperatures.

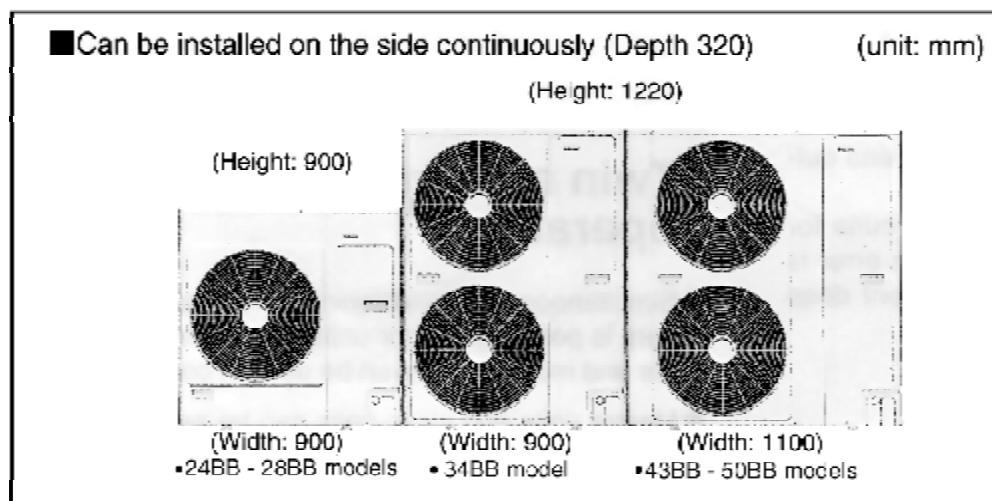
### **2.2.2. Automatic restart function**

When the electric power resumes after a power failure, the unit will automatically restarts the operation in the pre-failure mode.

### **2.2.3. Low ambient cooling operation**

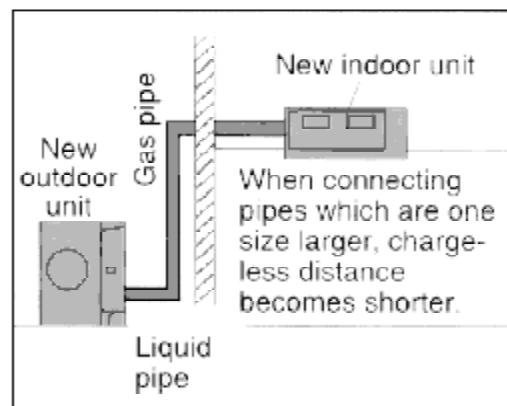
Cooling operation is possible at outdoor temperature of -5~C.

## **2.3. Greatly improved workability increases system renewal capability**



### **2.3.1. Pipes that are one size larger can also be connected for renewal**

- If renewing the system, existing refrigerant pipes can be utilized so that only the indoor units need to be replaced.



- For example, liquid and gas pipes from 10 years ago can be connected to current pipes with the same size for one size larger.

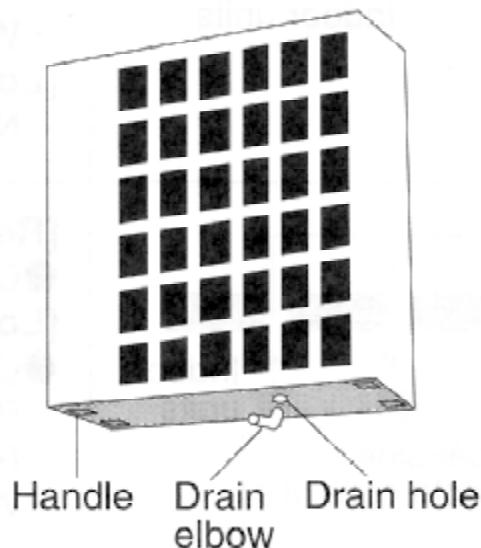
**Effective utilization of materials reduces working time and trouble.  
(Adaptor sockets are not supplied.)**

#### **2.3.2. Additional refrigerant charging unnecessary for 30 m**

- All models do not require any additional charging of refrigerant for 30 m of pipe length. This makes installation much easier.

#### **2.3.3. Drain water dripping-prevention structure**

- The base of the outdoor unit is provided with a single drain hole in order to prevent drain water from leaking out of the unit. Body connecting a drain elbow and a discharge pipe, water leakages can be prevented even when the unit is installed against a wall.



#### **2.3.4. Space saving design allows units to be installed side by side continuously**

- Servicing after installation can be carried-out by removing the front covers.

#### **2.3.5. Easy test operation**

- Test operation can be carried out for both indoor and outdoor units.

#### **2.3.6. Long pipe design**

Max piping length: 50 (m)	24BB~50BB
Height difference/ equivalent pipe length	30/50

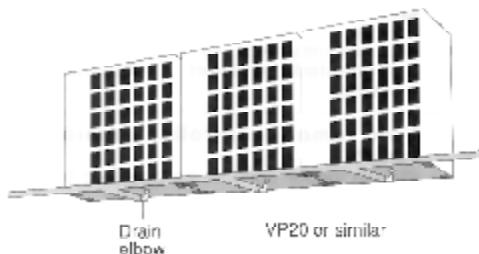
### 2.3.7. Internal pipe connection

- Pipes are connected inside the units (inside the side covers), making the final appearance more attractive.
- Pipes can be diverted outward in any of four directions (forward, right, down, rear).
- Small liquid pipe diameters of 9.52mm for 43BB and 50BB models, making installation work much easier.

■ Liquid-side pipe diameters (mm) : 9.52 (43BB~50BB / models)

### 2.3.8. Centralized draining method

- Even when multiple outdoor units are installed to a wall, the drain outlets can be concentrated into a single drain pipe. This makes installation easier and also improve appearance.

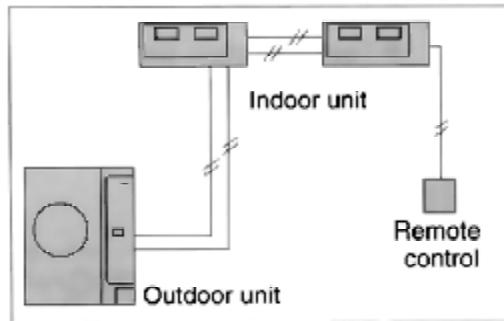


## 2.4. A brand-new control method using the latest in technology

### 2.4.1. Power supply wiring is also easier

Power supply wiring and other wiring tasks can be carried out more easily.

- Twin non-polar wires used to connect indoor and outdoor units.
- Adoption of connection error prevention circuits for drives wires and signal wires. If a connection error is made, the relay does not operate and current does not flow to the circuit boards.



#### 2.4.2. Separate indoor/outdoor unit power supplies

The power supply can be connected to (1) just the outdoor units, or (2) to both indoor and outdoor units.

#### 2.4.3. Automatic setting initialization function (Remote control and Indoor unit)

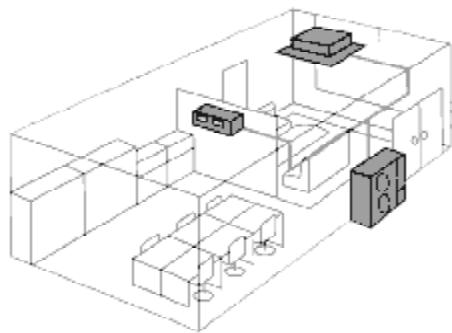
In accordance with the indoor and outdoor units connected and the connection methods, conditions such as the configuration (twin or triple format) and remote-control functions such as cooling only or heat pump model are automatically detected and set instantly.

#### 2.4.4. Group control equipment

Wired remote control	<b>Group control by one remote control</b>	<p>Indoor units</p> <p>[Remote side] - Optional wired remote control Parts No. - Remote control CZ-RD51P</p> <p>[Local side] Not needed</p>
	<b>Twin remote control separate control</b>	<p>Indoor units</p> <p>[Remote side] - Optional wired remote control [Local side] - Optional wired remote control Parts No. - Remote control CZ-RD51P</p>

#### 2.4.5. Twin and Triple operation

- Simultaneous air conditioning of wide spaces and corners is possible. Indoor units of different horsepowers and models can even be used in combination.
- Master unit and slave-units can be set automatically in twin and triple systems. No address setting is necessary.
- Multiple indoor units can be operated simultaneously with a single remote control. Note that individual operation is not possible.



■ Twin and Triple combination table

Outdoor unit	Simultaneous twin operation		Simultaneous triple operation	
	Standard	Horsepower difference	Standard	Horsepower difference
<b>3.0 HP</b>	[3.0] [1.5] [1.5]			
<b>4.0 HP</b>	[4.0] [2.0] [2.0]	[4.0] [1.5] [2.5]		
<b>5.0 HP</b>	[5.0] [2.5] [2.5]	[6.0] [2.0] [3.0]		
<b>6.0 HP</b>	[6.0] [3.0] [3.0]	[6.0] [2.0] [4.0]	[6.0] [2.0] [2.0]	[6.0] [1.5] [1.5] [3.0]

■ : Outdoor unit capacity  
■ : Indoor unit capacity

### 3. SPECIFICATION (HEAT PUMP TYPE)

#### 3.1 CS-A24BD1P / CU-A24BBP5

ITEM / MODEL			Indoor Unit	Outdoor unit
		Main Body	CS-A24BD1P	CU-A24BBP5
<b>Cooling Capacity</b>		kW (BTU/h)	6.50 (22,200)	
<b>Heating Capacity</b>		kW (BTU/h)	7.30 (24,900)	
<b>Refrigerant Charge-less</b>		m	30	
<b>Standard Air Volume for High Medium and Low Speed</b>		m <sup>3</sup> /min cfm	Hi 20 Hi 706	Hi 43 1518
<b>External Static Pressure</b>		mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
<b>Air Inlet</b>			Backward Suction	Rear sided Sucti
<b>Air Outlet</b>			Front blow-out	Front blow-out
<b>Outside Dimension (H x W x D)</b>		mm	290 x (1000 + 100) x 500	900 x 900 x 320
<b>Net Weight</b>		kg (lbs)	43 (95)	80 (176)
<b>Piping Connection</b>	Refrigerant Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type	
	Liquid	mm (inch)	O.D Ø 6.35 (1/4) Flared Type	
<b>Drain</b>		mm	Female screw RC1 (PT1)	I.DØ 20 x 1
<b>Compressor</b>	Type, Number of Set		-	Hermetic-1 (Rotary)
	Starting Method		-	Direct on-line star
	Motor	Type	-	2-pole single phase induction moto
	Input	kW	-	Cool/Heat 2.31/2.
	Rated Output	kW	-	1.9
<b>Fan</b>	Type, Number of Set		Sirocco fan-2	Prop. fan-1
	Air Volume Control		Three-Step and Auto mode (Remote Control)	-
	Motor	Type	4-pole single phase induction motor	6-pole single phase induction moto
	Input	kW	0.15	0.11
	Rated Output	kW	0.150	0.05
<b>Air-heat Exchanger</b>			Louvre-fin type	Louvre-fin type
<b>Refrigerant Control</b>			Capillary tube	Capillary tube
<b>Refrigerant Oil (Charged)</b>		L	-	MS32 (1.3)
<b>Refrigerant (Charged)</b>		kg (oz)	-	R-22 2.5 (88)
<b>Running Adjustment</b>	Control Switch		Wired Remote Control	-
	Room Temperature		Thermostat (Main Body)	-
<b>Safety Devices</b>			Internal protector for compressor, Internal thermostat, F.M, Drain over-flow switch, Crankcase heater, Hi pressure switch, Current Transformer	
<b>Noise Level (Sound Pressure)</b>		dB (A)	Hi 45 Lo 43	Cooling 50, Heating 43

**1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F)**

D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

**2. Heating capacities are based on indoor temp. 20° CD.B (68.0° FD.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

#### ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A24BD1P/CU-A24BBP5		
			Condition by JIS B 8616		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	2.70	2.70	2.70
		Heat	2.60	2.60	2.60
Running Current	A	Cool	12.5	12.0	11.8
		Heat	11.9	11.6	11.5
Starting Current	A		49	51	52
Power Factor	%	Cool	98	98	95
		Heat	99	97	94
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source	AC, 1~220V, 230V, 240V 50Hz			

#### 3.2 CS-A28BD1P / CU-A28BBP5

ITEM / MODEL	Main Body	Indoor Unit	Outdoor unit
		CS-A28BD1P	CU-A28BBP5
Cooling Capacity	kW (BTU/h)	7.30 (24,900)	
Heating Capacity	kW (BTU/h)	8.25 (28,100)	
Refrigerant Charge-less	m	30	
Standard Air Volume for High Medium and Low Speed	m <sup>3</sup> /min cfm	Hi 30 Hi 1059	Hi 43 1518
External Static Pressure	mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
Air Inlet		Backward Suction	Rear sided Sucti
Air Outlet		Front blow-out	Front blow-out
Outside Dimension (H x W x D)	mm	360 x (1000 + 10) x 650	900 x 900 x 320
Net Weight	kg (lbs)	53 (117)	82 (181)

Piping Connection	Refrigerant Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type	
	Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain	mm	Female screw (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set		-	Hermetic-1 (Rotar)
	Starting Method		-	Direct on-line star
	Motor	Type	-	2-pole single phase induction motor
	Input	kW	-	Cool/Heat 2.49/2.
	Rated Output	kW	-	2.0
Fan	Type, Number of Set		Sirocco fan-2	Prop. fan-1
	Air Volume Control		Three-Step and Auto mode (Remote Control)	-
	Motor	Type	4-pole single phase induction motor	6-pole single phase induction motor
	Input	kW	0.20	0.11
	Rated Output	kW	0.20	0.05
Air-heat Exchanger			Louvre-fin type	Louvre-fin type
Refrigerant Control			Capillary tube	Capillary tube
Refrigerant Oil (Charged)		L	-	MS32 (1.3)
Refrigerant (Charged)		kg (oz)	-	R-22 3.8 (134)
Running Adjustment	Control Switch Room Temperature		Wired Remote Control Thermostat (Main Body)	-
Safety Devices			Internal protector for compressor, Internal thermostat F.M, Drain over-flow switch, Crankcase heater, High pressure switch, Current Transformer	
Noise Level (Sound Pressure)		dB (A)	Hi 46 Lo 42	Cooling 50, Heating 42

- 1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
- 2. Heating capacities are based on indoor temp. 20°C D.B (68.0°F D.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A28BD1P/CU-A28BBP5		
			Condition by JIS B 8616		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	2.98	2.98	2.98
		Heat	2.78	2.78	2.78
Running Current	A	Cool	13.7	13.1	12.6
		Heat	12.7	12.2	11.7
Starting Current	A		50	52	54
Power Factor	%	Cool	99	99	99
		Heat	96	99	99
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 1~220V, 230V, 240V 50Hz		

### 3.3 CS-A28BD1P / CU-A28BBP8

ITEM / MODEL		Main Body	Indoor Unit	Outdoor unit
			CS-A28BD1P	CU-A28BBP8
Cooling Capacity		kW (BTU/h)	7.30 (24,900)	
Heating Capacity		kW (BTU/h)	7.75 (26,400)	
Refrigerant Charge-less		m	30	
Standard Air Volume for High Medium and Low Speed		m <sup>3</sup> /min cfm	Hi 30 Hi 1059	Hi 43 1518
External Static Pressure		mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
Air Inlet			Backward Suction	Rear sided Suction
Air Outlet			Front blow-out	Front blow-out
Outside Dimension (H x W x D)		mm	360 x (1000 + 10) x 650	900 x 900 x 320
Net Weight		kg (lbs)	53 (117)	82 (181)
Piping Connection	Refrigerant Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type	
	Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain	mm	Female screw (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set		-	Hermetic-1 (Rotary)
	Starting Method		-	Direct on-line start
	Motor	Type	-	2-pole single phase induction motor
	Input	kW	-	Cool/Heat 2.49/2.0
	Rated Output	kW	-	2.0

Fan	Type, Number of Set			Sirocco fan-2	Prop. fan-1	
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-	
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor	
		Input	kW	0.20	0.11	
		Rated Output	kW	0.20	0.05	
Air-heat Exchanger				Louvre-fin type	Louvre-fin type	
Refrigerant Control				Capillary tube	Capillary tube	
Refrigerant Oil (Charged)		L		-	MS32 (1.3)	
Refrigerant (Charged)		kg (oz)		-	R-22 3.8 (134)	
Running	Control Switch			Wired Remote Control	-	
Adjustment	Room Temperature			Thermostat (Main Body)	-	
Safety Devices				Head Thermostat for compressor, Internal thermostat F.M, Crankcase heater, High pressure switch, Current Transformer, Drain over-flow switch		
Noise Level (Sound Pressure)		dB (A)		Hi 46 Lo 42	Cooling 50, Heating 42	

- 1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.), and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
- 2. Heating capacities are based on indoor temp. 20°C D.B (68.0°F D.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

#### ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A28BD1P, CU-A28BBP8		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	2.98	2.98	2.98
		Heat	2.78	2.78	2.78
Running Current	A	Cool	5.6	5.3	5.1
		Heat	5.2	4.90	4.8
Starting Current	A		28	29	30
Power Factor	%	Cool	81	81	81
		Heat	81	82	81
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

#### 3.4 CS-A34BD1P / CU-A34BBP5

ITEM / MODEL		Main Body	Indoor Unit	Outdoor unit	
			CS-A34BD1P	CU-A34BBP5	
<b>Cooling Capacity</b>		kW (BTU/h)	10.45 (35,600)		
<b>Heating Capacity</b>		kW (BTU/h)	11.40 (38,900)		
<b>Refrigerant Charge-less</b>		m	30		
<b>Standard Air Volume for High Medium and Low Speed</b>		m <sup>3</sup> /min cfm	Hi 40 Hi 1413	Hi 70 2471	
<b>External Static Pressure</b>		mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-	
<b>Air Inlet</b>			Backward Suction	Rear sided Suction	
<b>Air Outlet</b>			Front blow-out	Front blow-out	
<b>Outside Dimension (H x W x D)</b>		mm	430 x (1000 + 10) x 650	1220 x 900 x 320	
<b>Net Weight</b>		kg (lbs)	56 (123)	97 (214)	
<b>Piping Connection</b>	Refrigerant Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type		
	Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type		
	Drain	mm	Female screw (PT1)	I.DØ 20 x 1	
<b>Compressor</b>	Type, Number of Set		-	Hermetic-1 (Scroll)	
	Starting Method		-	Direct on-line start	
	Motor	Type	-	2-pole single phase induction motor	
		Input	kW	-	
		Rated Output	kW	2.92	
<b>Fan</b>	Type, Number of Set		Sirocco fan-3	Prop. fan-2	
	Air Volume Control		Three-Step and Auto mode (Remote Control)	-	
	Motor	Type	4-pole single phase induction motor	6-pole single phase induction motor	
		Input	0.22	0.24	
		Rated Output	0.25	0.05 x 2	
<b>Air-heat Exchanger</b>			Louvre-fin type	Louvre-fin type	
<b>Refrigerant Control</b>			Capillary tube	Capillary tube	
<b>Refrigerant Oil (Charged)</b>		L	-	SONTEX 200LT (-)	
<b>Refrigerant (Charged)</b>		kg (oz)	-	R-22 4.2 (148)	
<b>Running Adjustment</b>	Control Switch		Wired Remote Control	-	
	Room Temperature		Thermostat (Main Body)	-	
<b>Safety Devices</b>			Internal protector for compressor, Internal thermostat, F.M, Drain over-flow switch, Crankcase heater, Hi pressure switch, Current Transformer		
<b>Noise Level (Sound Pressure)</b>		dB (A)	Hi 47 Lo 45	Cooling 55, Heating 55	

- Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
- Heating capacities are based on indoor temp. 20° CD.B (68.0° FD.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

**ELECTRICAL DATA (50Hz)**

MODEL / ITEM			CS-A34BD1P/CU-A34BBP5		
			Condition by JIS B 8616		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	3.8	3.8	3.8
		Heat	3.55	3.55	3.55
Running Current	A	Cool	19.0	19.1	19.2
		Heat	17.9	18.0	18.1
Starting Current	A		94	99	103
Power Factor	%	Cool	91	87	82
		Heat	90	86	82
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 1~220V, 230V, 240V 50Hz		

**3.5 CS-A34BD1P / CU-A34BBP8**

ITEM / MODEL			Indoor Unit	Outdoor unit
		Main Body	CS-A34BD1P	CU-A34BBP8
<b>Cooling Capacity</b>		kW (BTU/h)	10.45 (35,600)	
<b>Heating Capacity</b>		kW (BTU/h)	11.40 (38,900)	
<b>Refrigerant Charge-less</b>		m	30	
<b>Standard Air Volume for High Medium and Low Speed</b>		m <sup>3</sup> /min cfm	Hi 40 Hi 1413	Hi 70 2471
<b>External Static Pressure</b>		mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
<b>Air Inlet</b>			Backward Suction	Rear sided Sucti
<b>Air Outlet</b>			Front blow-out	Front blow-out
<b>Outside Dimension (H x W x D)</b>		mm	430 x (1000 + 10) x 650	1220 x 900 x 32
<b>Net Weight</b>		kg (lbs)	56 (123)	97 (214)
<b>Piping Connection</b>	Refrigerant Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type	
	Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
<b>Drain</b>		mm	Female screw (PT1)	I.DØ 20 x 1
<b>Compressor</b>	Type, Number of Set		-	Hermetic-1 (Scroll
	Starting Method		-	Direct on-line star
	Motor	Type	-	2-pole single pha induction moto
	Input	kW	-	Cool/Heat 2.93/3.
	Rated Output	kW	-	2.8
<b>Fan</b>	Type, Number of Set		Sirocco fan-3	Prop. fan-2
	Air Volume Control		Three-Step and Auto mode (Remote Control)	-
	Motor	Type	4-pole single phase induction motor	6-pole single pha induction moto
	Input	kW	0.40	0.24
	Rated Output	kW	0.25	0.05 x 2
<b>Air-heat Exchanger</b>			Louvre-fin type	Louvre-fin type
<b>Refrigerant Control</b>			Capillary tube	Capillary tube
<b>Refrigerant Oil (Charged)</b>		L	-	SONTEX 200LT (
<b>Refrigerant (Charged)</b>		kg (oz)	-	R-22 4.2 (148)
<b>Running Adjustment</b>	Control Switch		Wired Remote Control	-
	Room Temperature		Thermostat (Main Body)	-
<b>Safety Devices</b>			Internal protector for compressor, Internal thermostat F.M, Drain over-flow switch, Crankcase heater, Hi pressure switch, Current Transformer	
<b>Noise Level (Sound Pressure)</b>		dB (A)	Hi 47 Lo 45	Cooling 55, Heatin

**1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F**

D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

**2. Heating capacities are based on indoor temp. 20°C D.B. (68.0°F D.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

#### ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A34BD1P/CU-A34BBP8		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	3.65	3.65	3.65
		Heat	3.55	3.55	3.55
Running Current	A	Cool	6.5	6.5	6.5
		Heat	6.1	6.1	6.1
Starting Current	A		39	41	42
Power Factor	%	Cool	85	81	78
		Heat	88	84	81
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source	AC, 3N~380V, 400V, 415V 50Hz			

#### 3.6 CS-A43BD1P / CU-A43BBP8

ITEM / MODEL	Main Body	Indoor Unit		Outdoor unit
		CS-A43BD1P		CU-A43BBP8
Cooling Capacity	kW (BTU/h)		13.00 (44,300)	
Heating Capacity	kW (BTU/h)		14.50 (49,400)	
Refrigerant Charge-less	m		30	
Standard Air Volume for High Medium and Low Speed	m <sup>3</sup> /min cfm	Hi 50 Hi 1766		Hi 82 2895
External Static Pressure	mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29		-
Air Inlet		Backward Suction	Rear sided Sucti	
Air Outlet		Front blow-out	Front blow-out	
Outside Dimension (H x W x D)	mm	430 x (1000 + 10) x 650	1220 x 1100 x 32	
Net Weight	kg (lbs)	57 (126)	114 (251)	

Piping Connection	Refrigerant Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type	
	Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain	mm	Female screw (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set		-	Hermetic-1 (Scroll)
	Starting Method		-	Direct on-line star
	Motor	Type	-	2-pole 3 phase induction motor
	Input	kW	-	Cool/Heat 3.85/3.
	Rated Output	kW	-	3.54
Fan	Type, Number of Set		Sirocco fan-4	Prop. fan-2
	Air Volume Control		Three-Step and Auto mode (Remote Control)	-
	Motor	Type	4-pole single phase induction motor	6-pole single phase induction motor
	Input	kW	0.55	0.23
	Rated Output	kW	0.35	0.055 x 2
Air-heat Exchanger			Louvre-fin type	Louvre-fin type
Refrigerant Control			Capillary tube	Capillary tube
Refrigerant Oil (Charged)		L	-	SONTEX 200LT (1)
Refrigerant (Charged)		kg (oz)	-	R-22 5.2 (183)
Running Adjustment	Control Switch Room Temperature		Wired Remote Control Thermostat (Main Body)	-
Safety Devices			Internal protector for compressor, Internal thermostat, F.M, Drain over-flow switch, Crankcase heater, High pressure switch, Current Transformer	
Noise Level (Sound Pressure)		dB (A)	Hi 50 Lo 49	Cooling 55 Heating

- 1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
- 2. Heating capacities are based on indoor temp. 20°C D.B (68.0°F D.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A43BD1P/CU-A43BBP8		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	4.53	4.35	4.53
		Heat	3.90	3.90	3.90
Running Current	A	Cool	7.8	7.8	7.8
		Heat	6.1	6.1	6.1
Starting Current	A		58	58	58
Power Factor	%	Cool	88	84	81
		Heat	97	92	89
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

### 3.6 CS-A50BD1P / CU-A50BBP8

ITEM / MODEL		Main Body	Indoor Unit	Outdoor unit
			CS-A50BD1P	CU-A50BBP8
Cooling Capacity		kW (BTU/h)	14.50 (49,400)	
Heating Capacity		kW (BTU/h)	15.70 (53,500)	
Refrigerant Charge-less		m	30	
Standard Air Volume for High Medium and Low Speed		m <sup>3</sup> /min cfm	Hi 60 Hi 2119	Hi 86 3036
External Static Pressure		mmAq Pa	Hi 5 Me 4 Lo 3 Hi 49 Me 39 Lo 29	-
Air Inlet			Backward Suction	Rear sided Sucti
Air Outlet			Front blow-out	Front blow-out
Outside Dimension (H x W x D)		mm	430 x (1000 + 10) x 650	1220 x 1100 x 32
Net Weight		kg (lbs)	60 (132)	116 (256)
Piping Connection	Refrigerant Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type	
	Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type	
	Drain	mm	Female screw (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set		-	Hermetic-1 (Scroll
	Starting Method		-	Direct on-line star
	Motor	Type	-	2-pole 3-phase indu motor
	Input	kW	-	Cool/Heat 4.56/4.
	Rated Output	kW	-	4.1

Fan	Type, Number of Set			Sirocco fan-4	Prop. fan-2	
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-	
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor	
		Input	kW	0.71	0.25	
		Rated Output	kW	0.45	0.055X2	
Air-heat Exchanger				Louvre-fin type	Louvre-fin type	
Refrigerant Control				Capillary tube	Capillary tube	
Refrigerant Oil (Charged)		L			SONTEX 200LT (-)	
Refrigerant (Charged)		kg (oz)			R-22 5.0 (176)	
Running	Control Switch			Wired Remote Control	-	
Adjustment	Room Temperature			Thermostat (Main Body)	-	
Safety Devices				Internal protector for compressor, Internal thermostat, F.M, Drain over-flow switch, Crankcase heater, High pressure switch, Current Transformer		
Noise Level (Sound Pressure)		dB (A)		Hi 52 Lo 51	Cooling 56 Heating	

- 1. Cooling capacities are based on indoor temp. 27°C D.B (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temp. 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
- 2. Heating capacities are based on indoor temp. 20°C D.B (68.0°F D.B.) and outdoor air temp. 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F D.B.)**

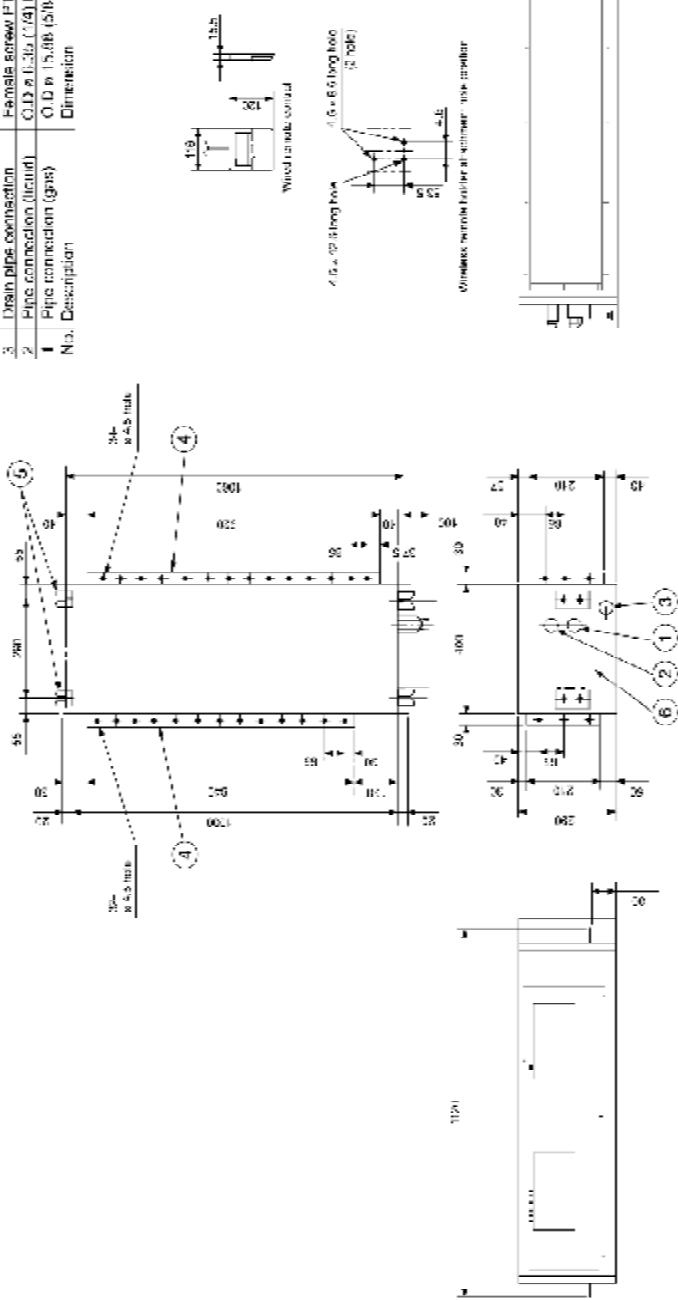
#### ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-A50BD1P/CU-A50BBP8		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	5.72	5.72	5.72
		Heat	5.03	5.03	5.03
Running Current	A	Cool	9.5	9.5	9.5
		Heat	8.4	8.4	8.4
Starting Current	A		69	69	69
Power Factor	%	Cool	91	87	84
		Heat	91	86	83
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

## 4. TECHNICAL DRAWING

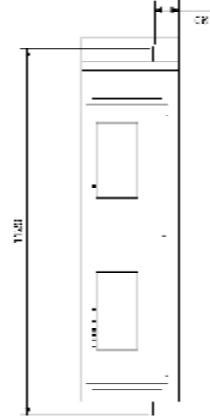
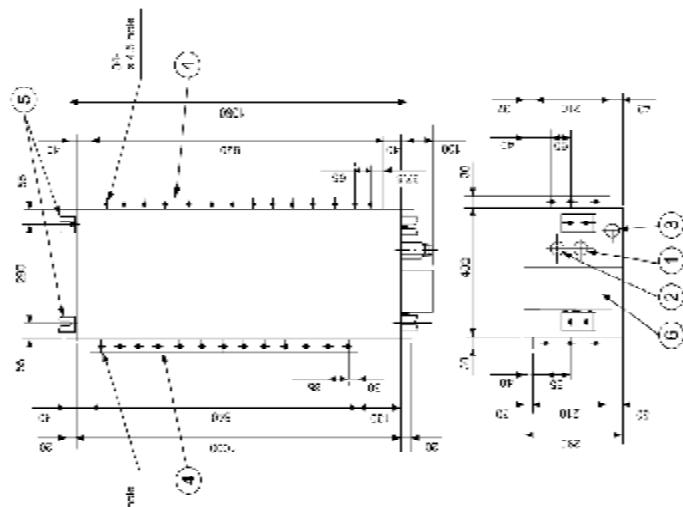
CS-A24BD1P  
OUTSIDE DIMENSIONS

7	Remote control unit	
6	Control box	
5	Hanging	
4	Duct connection	
3	Brain plus coating	
2	Wire connection (gray)	
1	Power connection (grey)	
	N.o.	Description



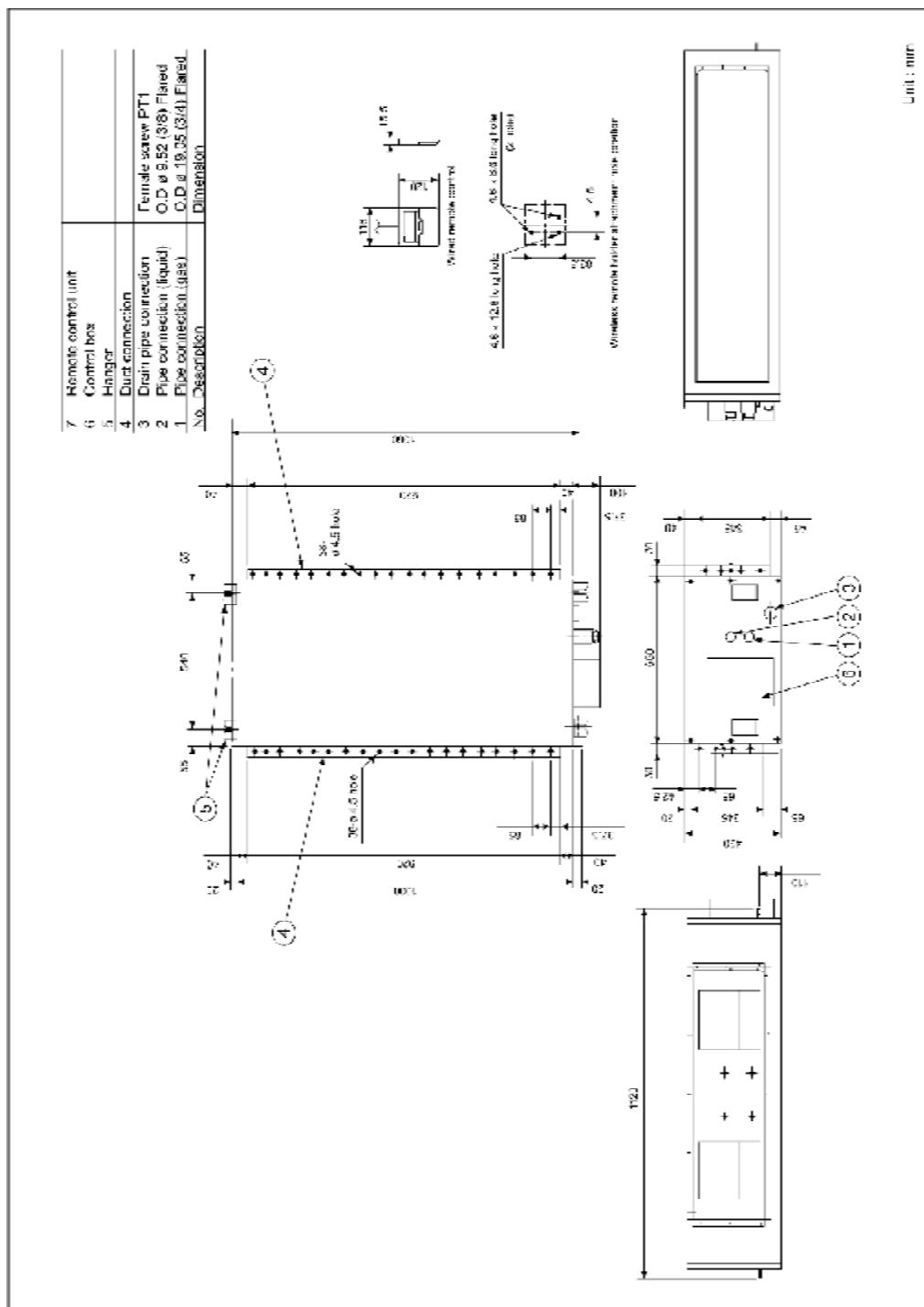
CS-A28BD1P  
OUTSIDE DIMENSIONS

No.	Description	Piping System P1	Piping System P2
7	Remote control unit		
6	Carry tank		
5	Hanger		
4	Duct connection		
3	Drain pipe connection		
2	Pipe connection (gas)	O.D. 15.0 mm (5/8") flared	O.D. 15.0 mm (5/8") flared
1	Pipe connection (gas)		



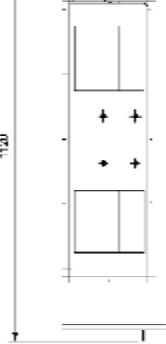
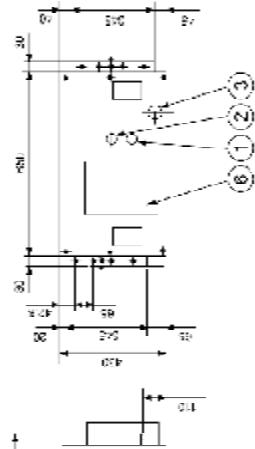
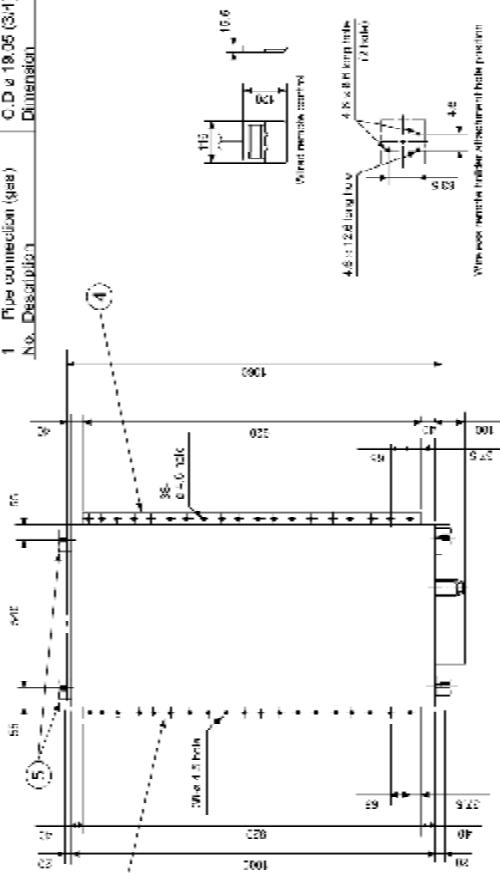
Unit : mtr

CS-A34BD1P  
OUTSIDE DIMENSIONS



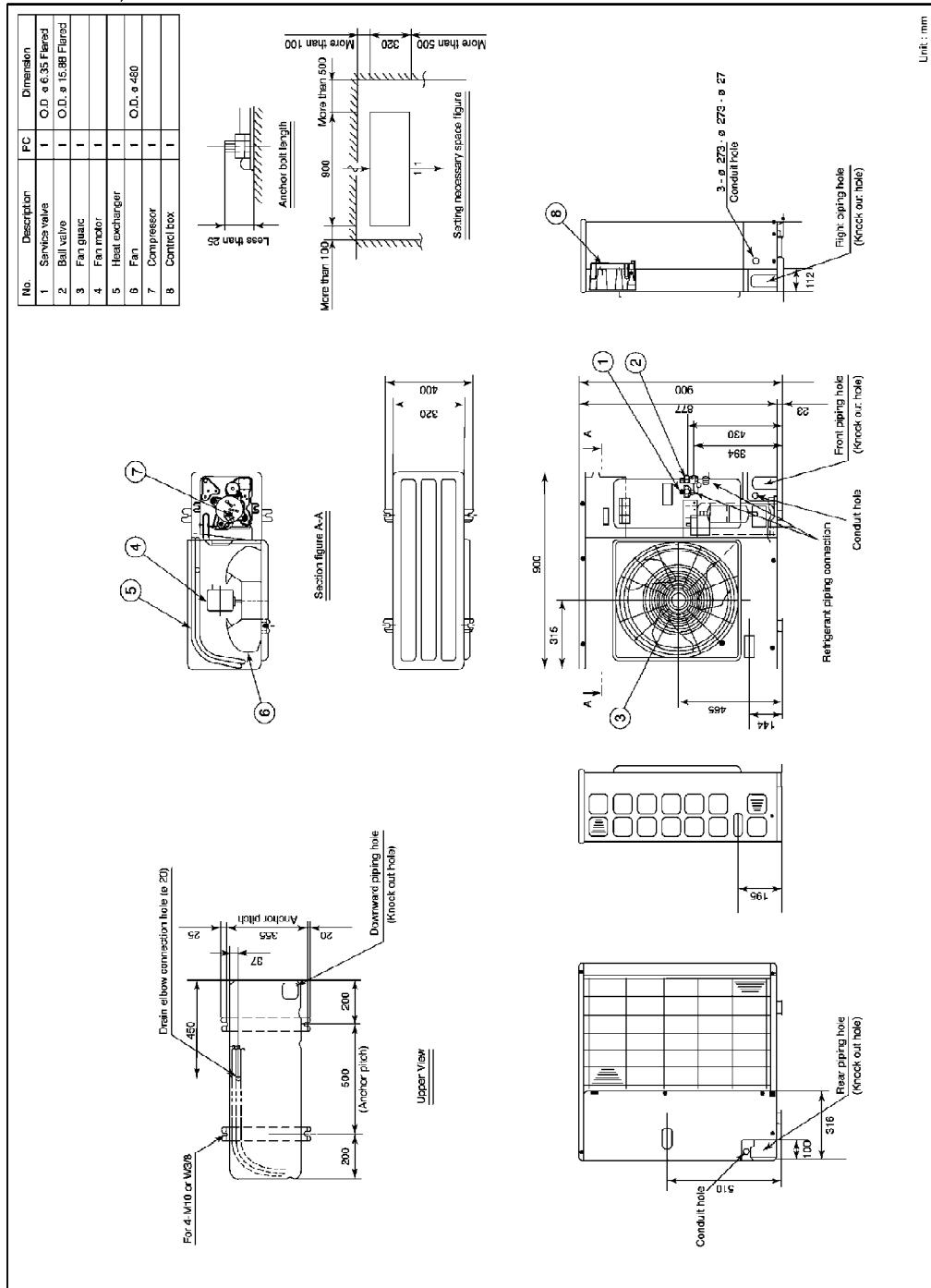
**CS-A43BD1P, CS-A50BD1P  
OUTSIDE DIMENSIONS**

No.	Description	Dimensions
7	Remote control unit	
6	Command box	
5	Hanger	
4	Build connection	
3	Drain pipe connection	Female screw PT1
2	Fuel connection (liquid)	O.D x 0.92 (3/8) Flared
1	Fuel connection (gas)	O.D x 0.95 (3/4) Flared

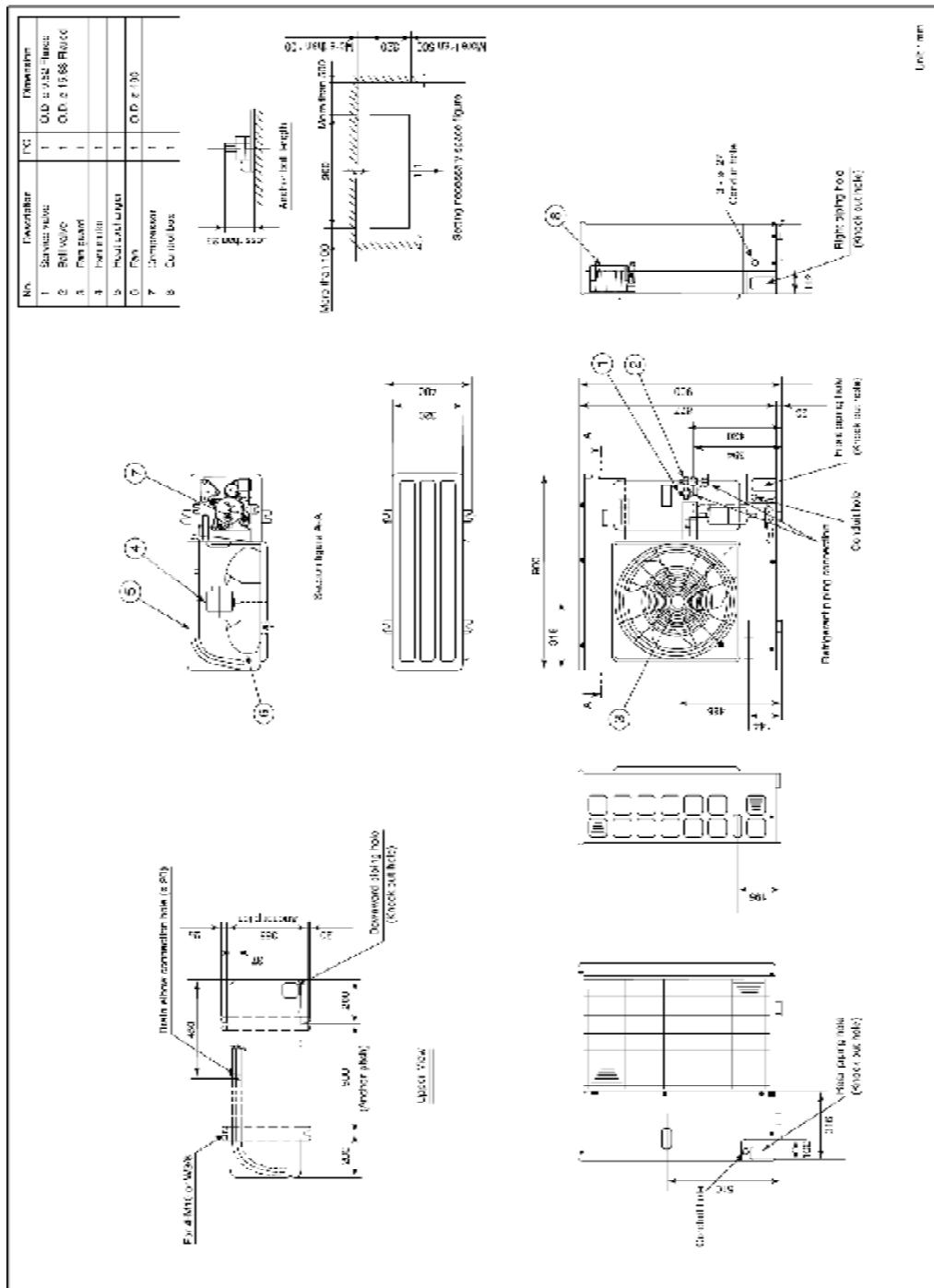


Unit : mtr

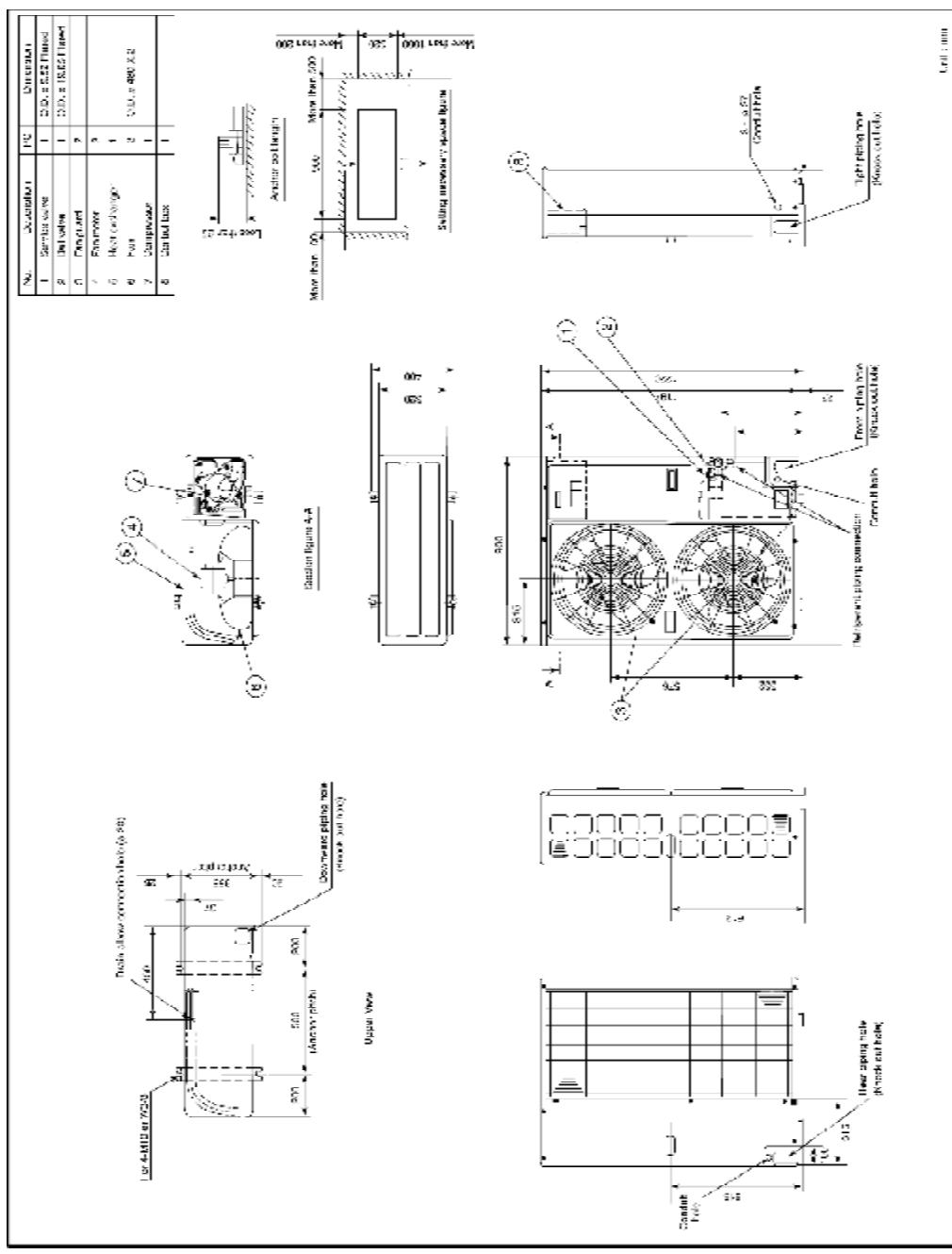
CU-C24BBP5, CU-C24BBP5



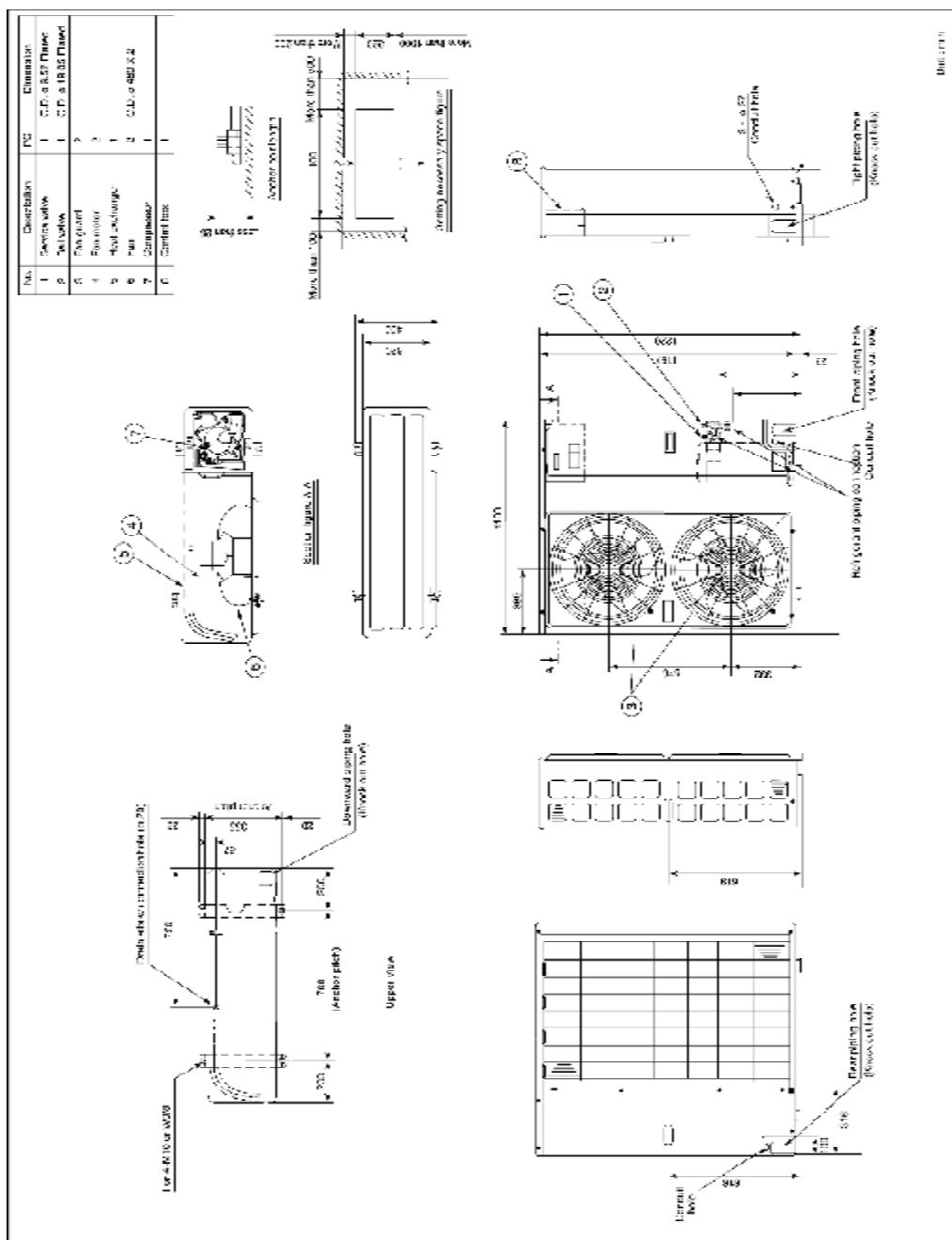
CU-A28BBP5, CU-A28BBP8,



**CU-A34BBP5, CU-C34BBP5, CU-A34BBP8, CU-C34BBP8**



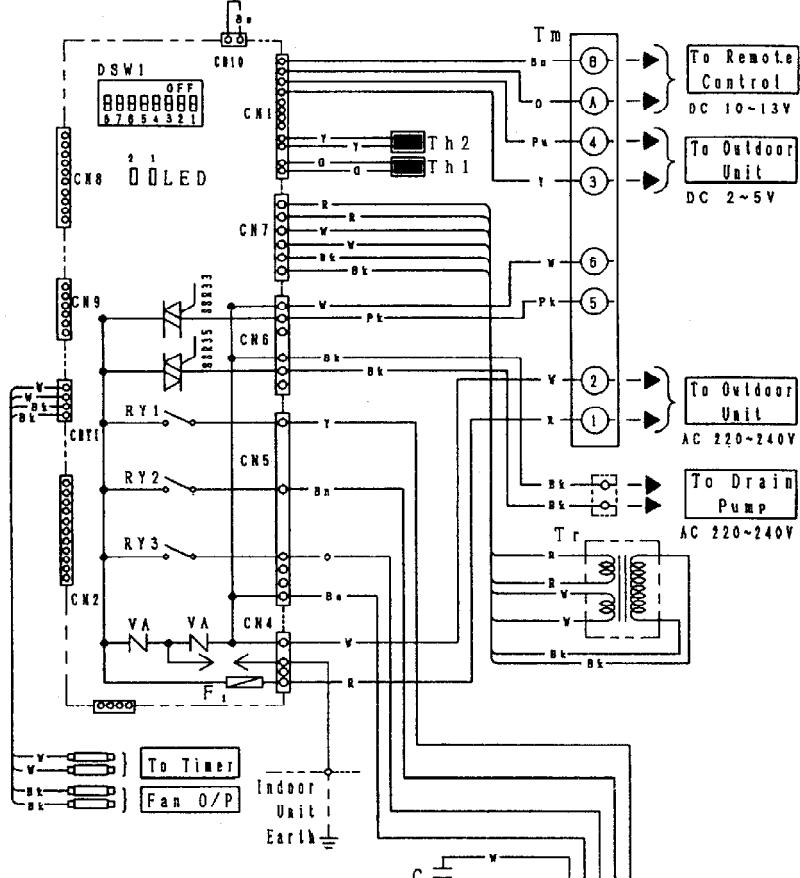
## **CU-A43BBP8, CU-A50BBP8, CU-C43BBP8, CU-C50BBP8**



## 5. CIRCUIT DIAGRAM

CS-A24BD1P, CS-A28BD1P, CS-A34BD1P

CONNECTION DIAGRAM (Indoor Unit)



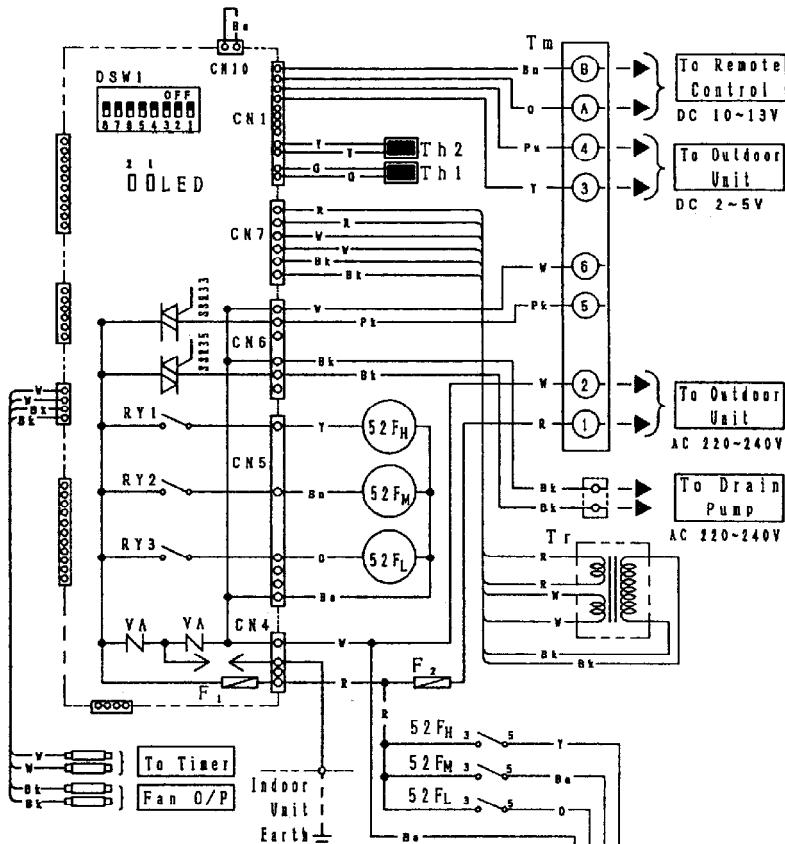
WIRE COLOR

R	Red	Bk	Black
W	White	Bn	Brown
G	Gray	Be	Blue
Y	Yellow	Pk	Pink
O	Orange	Pu	Purple



LEGEND

FM	Fan Motor	49F	Internal Thermostat for FM
VA	Varistor	C <sub>1</sub>	Capacitor for FM
Tr	Transformer	Tm	Terminal Board for Control Circuit
F	Fuse	Th1	Thermistor for Indoor Temperature
		Th2	Thermistor for Indoor Piping

CONNECTION DIAGRAM (Indoor Unit)WIRE COLOR

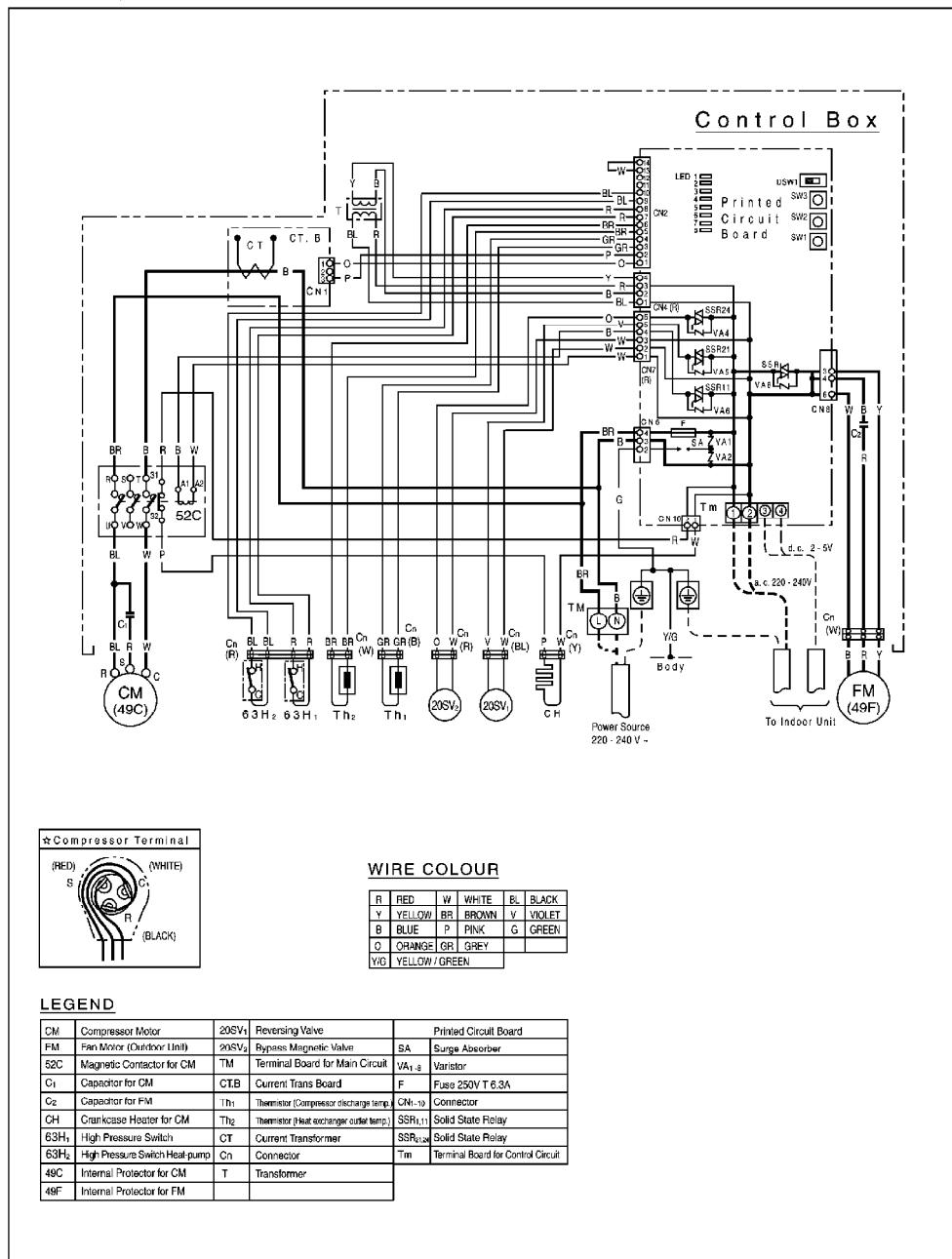
R	Red	Bk	Black
W	White	Bn	Brown
G	Gray	Be	Blue
Y	Yellow	Pk	Pink
O	Orange	Pu	Purple

FM  
(49F)

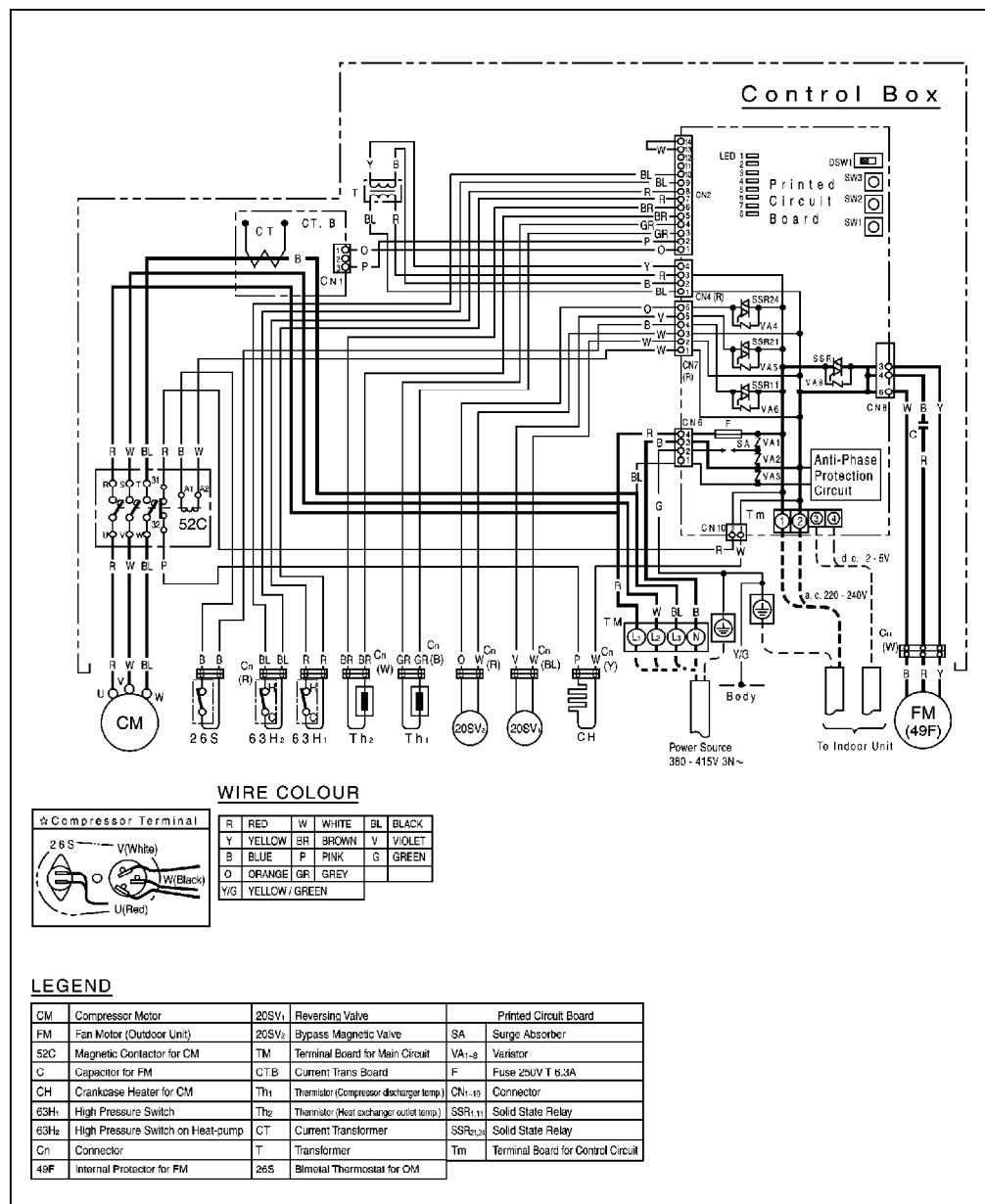
LEGEND

FM	Fan Motor	49F	Internal Thermostat for FM
VA	Varistor	C <sub>1</sub>	Capacitor for FM
Tr	Transformer	Tm	Terminal Board for Control Circuit
F	Fuse	Th1	Thermistor for Indoor Temperature
52F	FM Relay	Th2	Thermistor for Indoor Piping

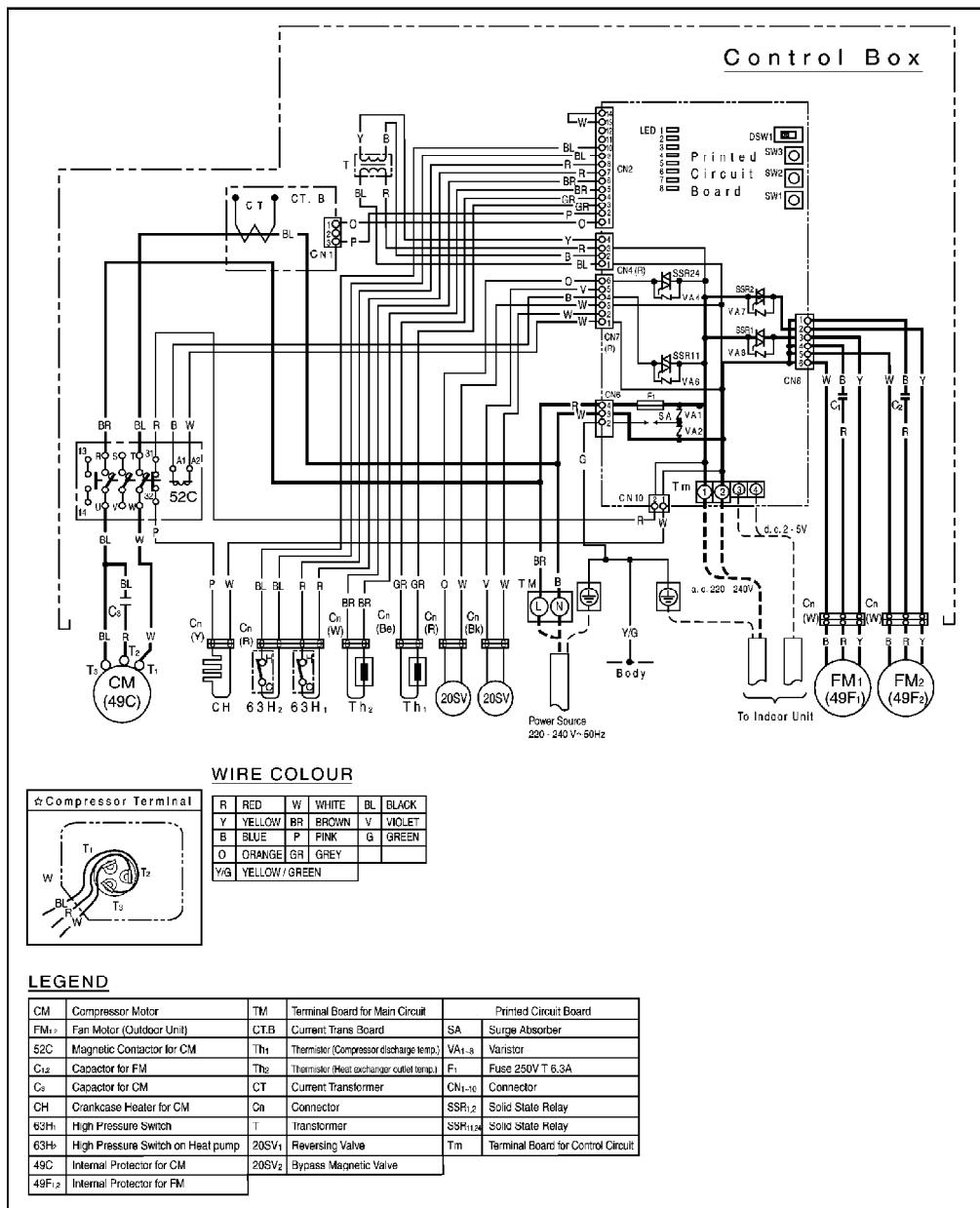
CU-A24BBP5, CU-A28BBP5



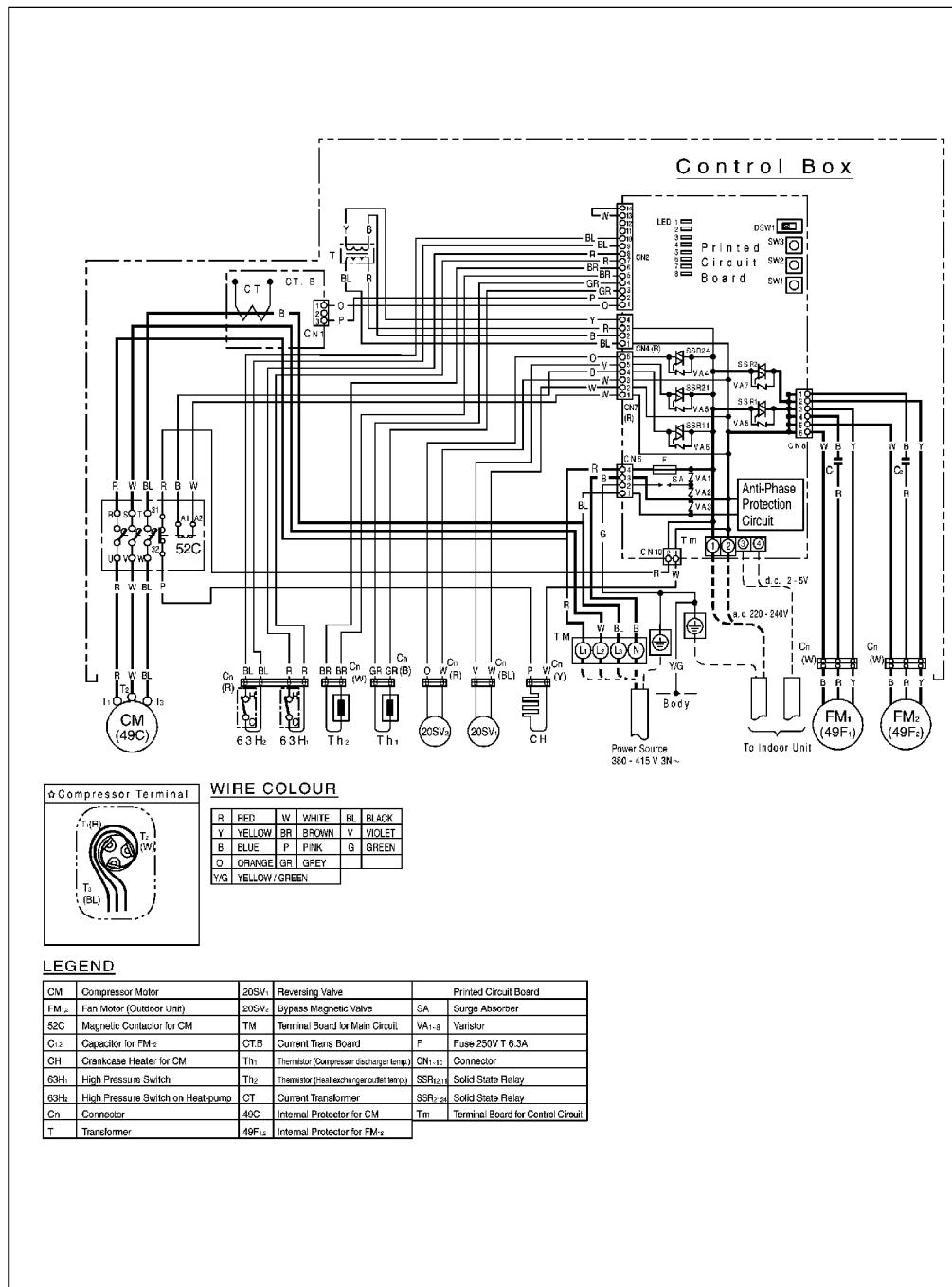
**CU-A28BBP8**



**CU-A34BBP5**



CU-A34BBP8, CU-A43BBP8, CU-A50BBP8



**APPLICABLE MODEL**  
ALL MODEL

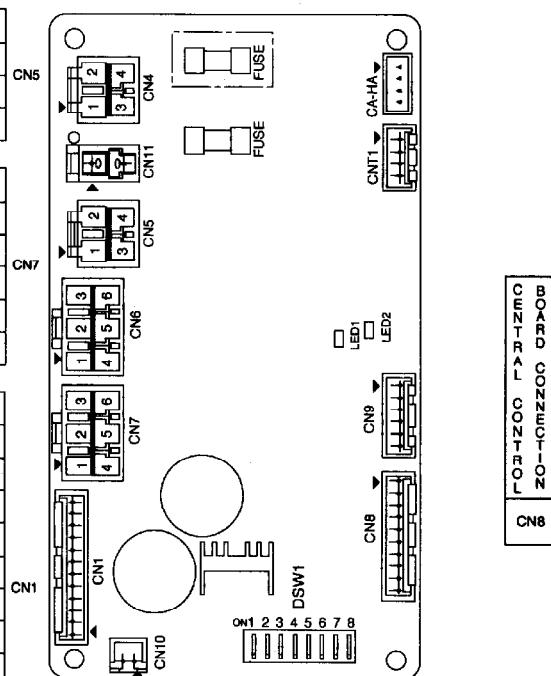
**INDOOR UNIT**  
**PRINTED CIRCUIT BOARD**

S PHASE	4
SURGE ABSORBER	3
	2
R PHASE	1

INDOOR FAN L	4
INDOOR FAN M	3
INDOOR FAN H	2
COM (S PH)	1

TRANSFORMER 1ST (R PH)	6
TRANSFORMER 2ND	5
TRANSFORMER 2ND	4
TRANSFORMER 1ST (S PH)	3
TRANSFORMER 2ND	2
TRANSFORMER 2ND	1

ROOM THERMISTOR	12
ROOM THERMISTOR	11
PIPE THERMISTOR	10
PIPE THERMISTOR	9
	8
	7
	6
	5
COMMUNICATION WITH OUTDOOR UNIT	4
COMMUNICATION WITH OUTDOOR UNIT	3
WIRED REMOTE CONTROLLER	2
WIRED REMOTE CONTROLLER	1



APPLICABLE FOR ALL MODELS

● OUTDOOR UNIT  
PRINTED CIRCUIT BOARD

	14
	13
GND	12
DEMAND INPUT	11
GND	10
HEATING PRESSURE SW	9
GND	8
HIGH PRESSURE SW	7
GND	6
PIPE TEMP SENSOR	5
GND	4
DISCHARGE TEMP SENSOR	3
GND	2
GT	1

TRANSFORMER 2ND(S)	4
TRANSFORMER 1ST(R)	3
TRANSFORMER 2ND(R)	2
TRANSFORMER 1ST(S)	1

LIQUID BYPASS valve(F)	6
REVERSING valve(F)	5
COMPRESSOR relay(R)	4
LIQUID BYPASS valve(S)	3
REVERSING valve(S)	2
COMPRESSOR relay(S)	1

CN4

CN4

CN7

1. HEAT PUMP MODEL ONLY  
2. CU-043B type }  
   CU-133B type } Model only  
   CU-033B type }

COMMUNICATION WITH INDOOR UNIT	4
COMMUNICATION WITH INDOOR UNIT	3
R Phase	2
B Phase	1

TMI



R Phase	1
Fan2(R)	2
Fan1(R)	3
S Phase	4
S Phase	5
S Phase	6

CN8

CRANKCASE HEATER(R)	1
CRANKCASE HEATER(B)	2

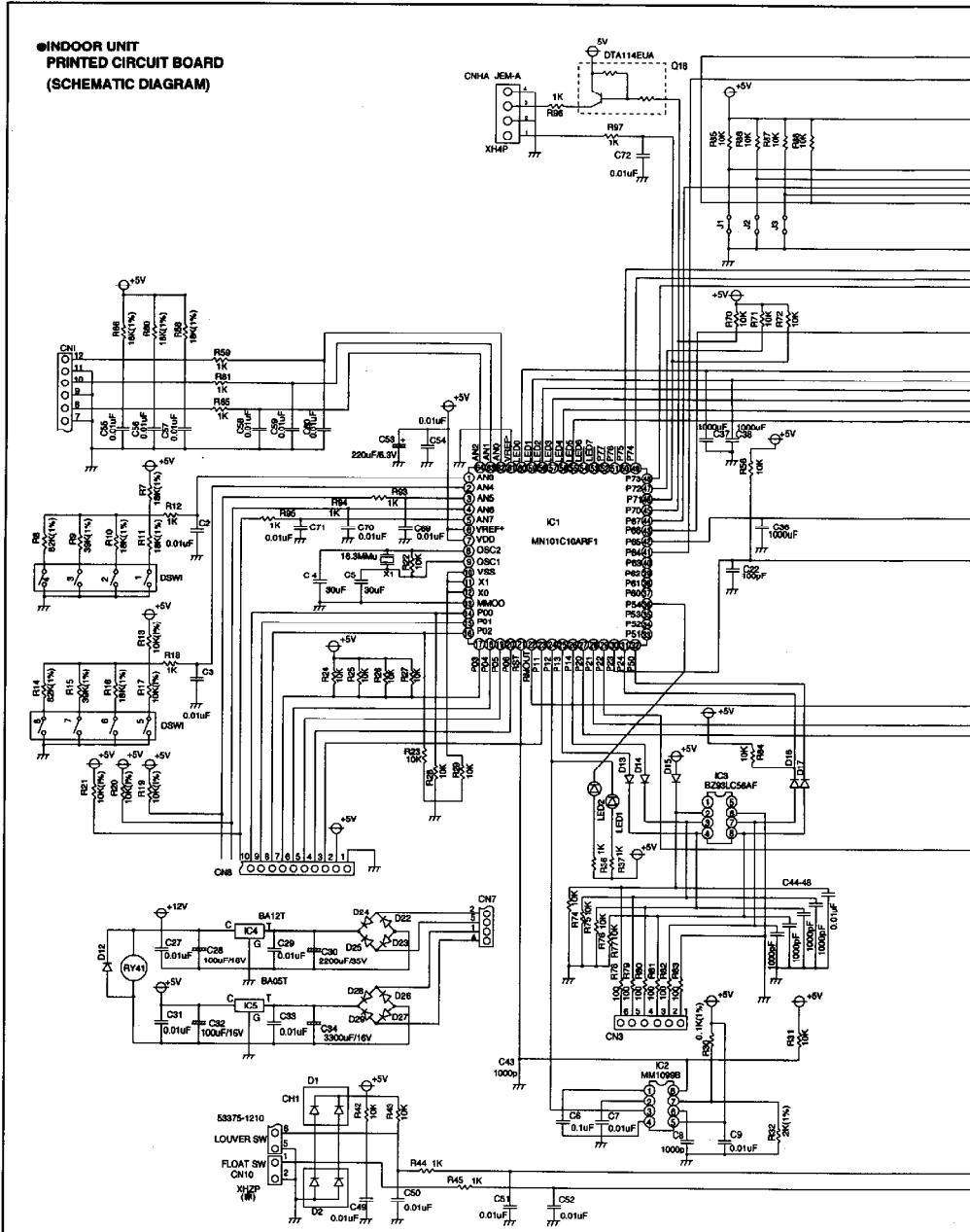
CN10

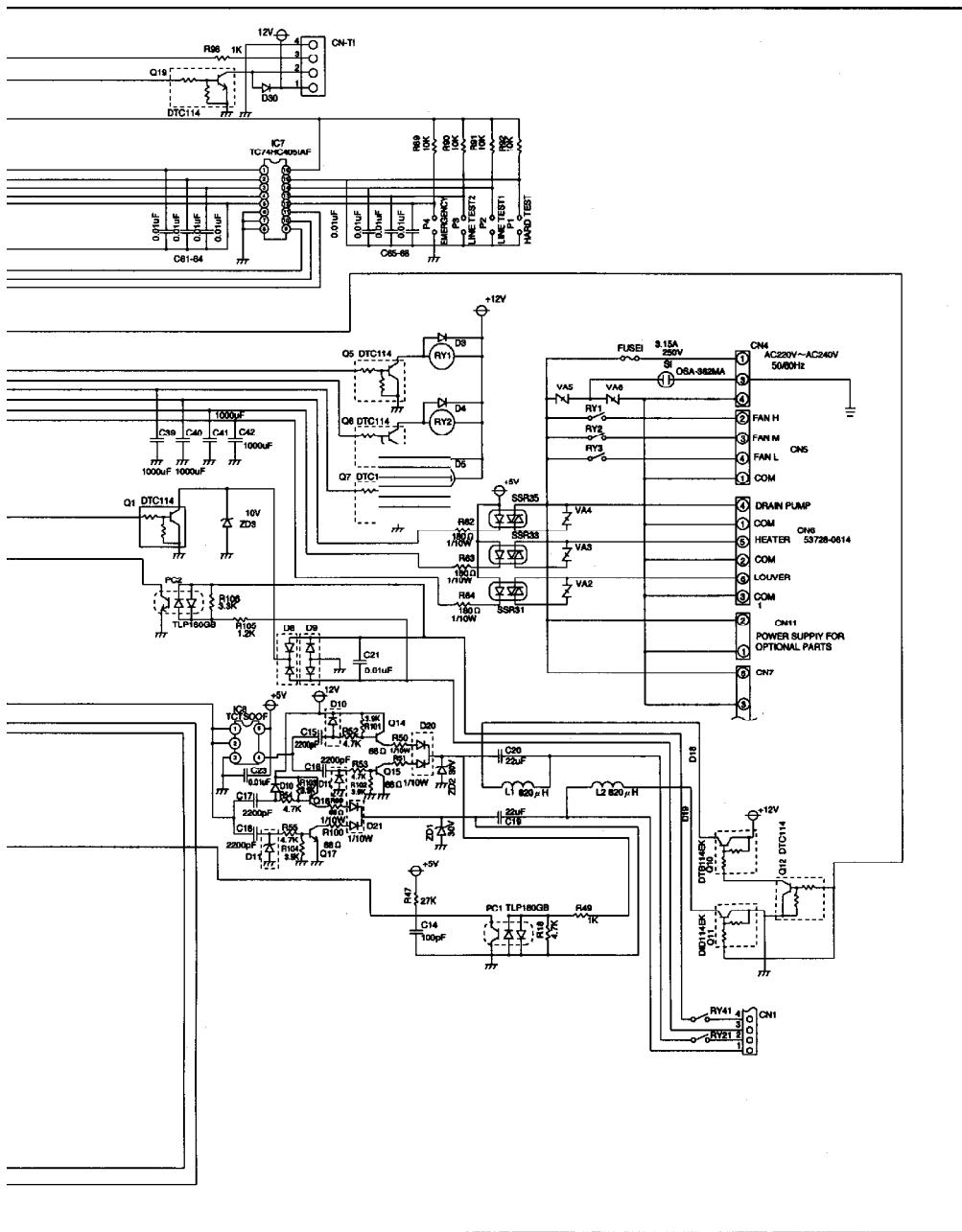
R Phase	4
S Phase	5
Earth	6
T Phase	1

CN6

**■APPLICABLE MODEL**  
ALL MODEL

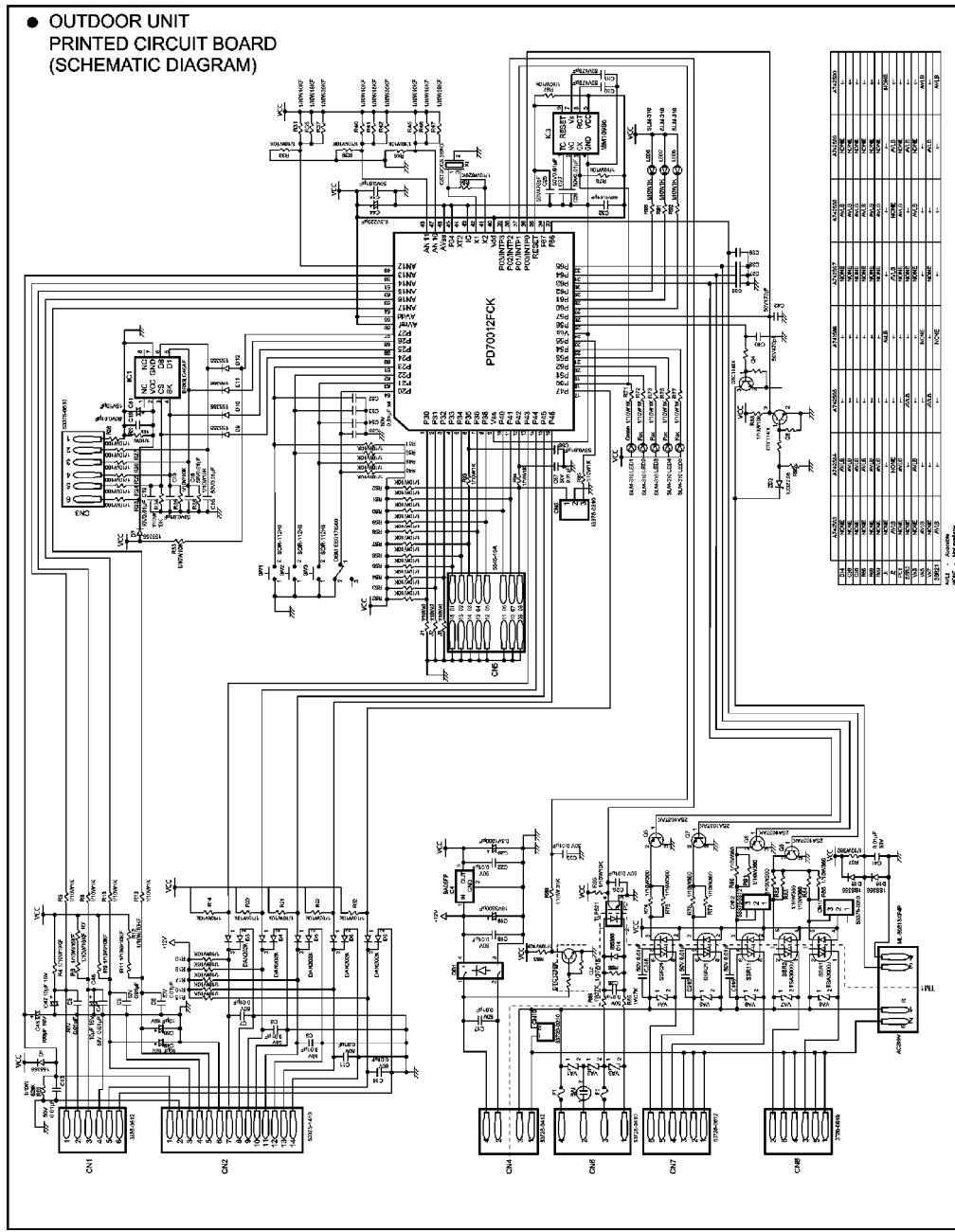
**●INDOOR UNIT  
PRINTED CIRCUIT BOARD  
(SCHEMATIC DIAGRAM)**





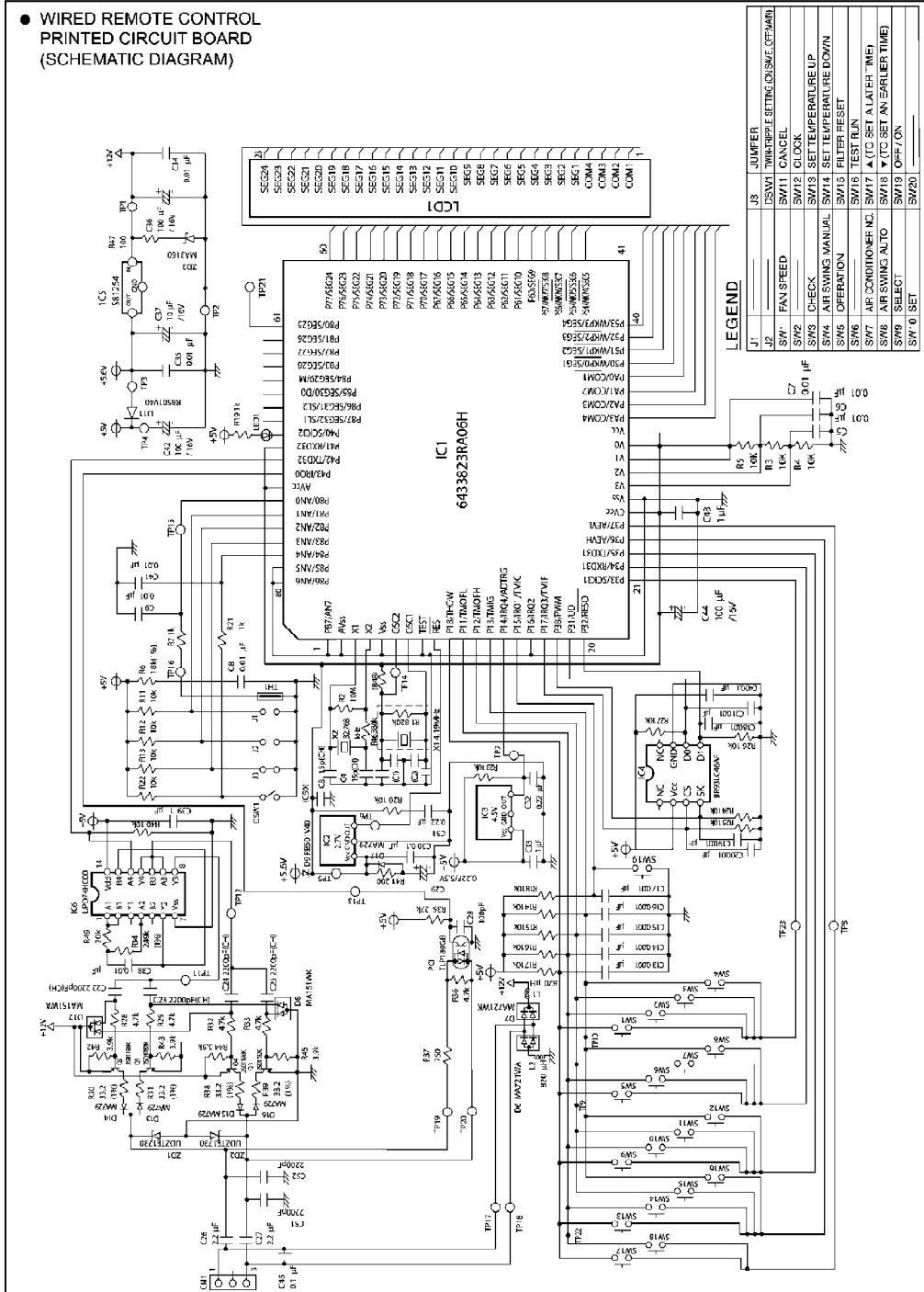
APPLICABLE FOR ALL MODELS

- OUTDOOR UNIT  
PRINTED CIRCUIT BOARD  
(SCHEMATIC DIAGRAM)



APPLICABLE FOR ALL MODELS

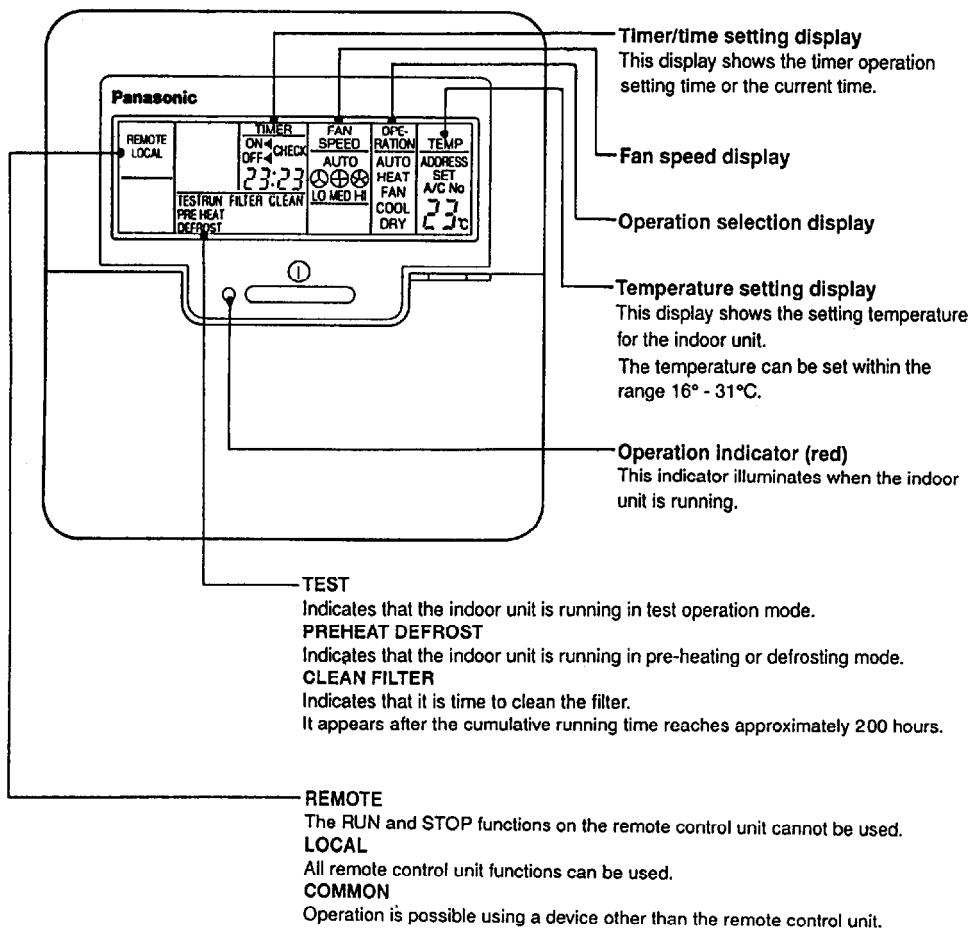
- WIRED REMOTE CONTROL  
PRINTED CIRCUIT BOARD  
(SCHEMATIC DIAGRAM)

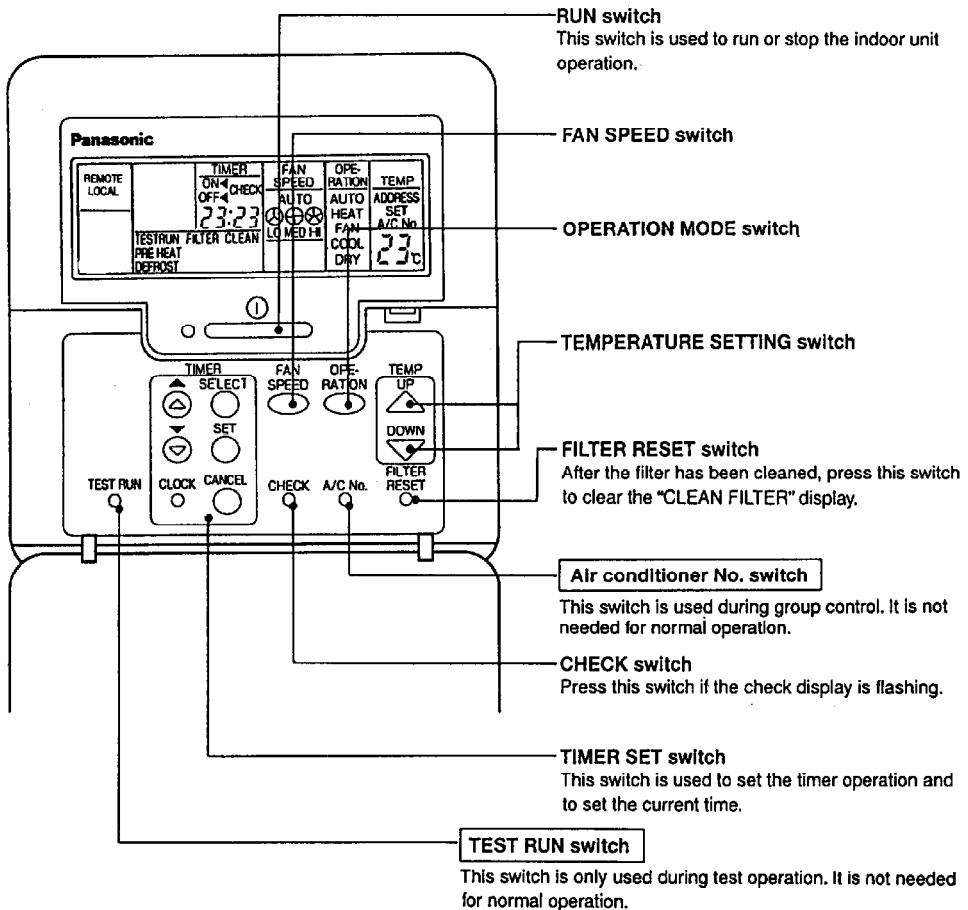


## **6. OPERATING INSTRUCTION**

## 6.1. Wired Remote Control

## **Name and function of each part**

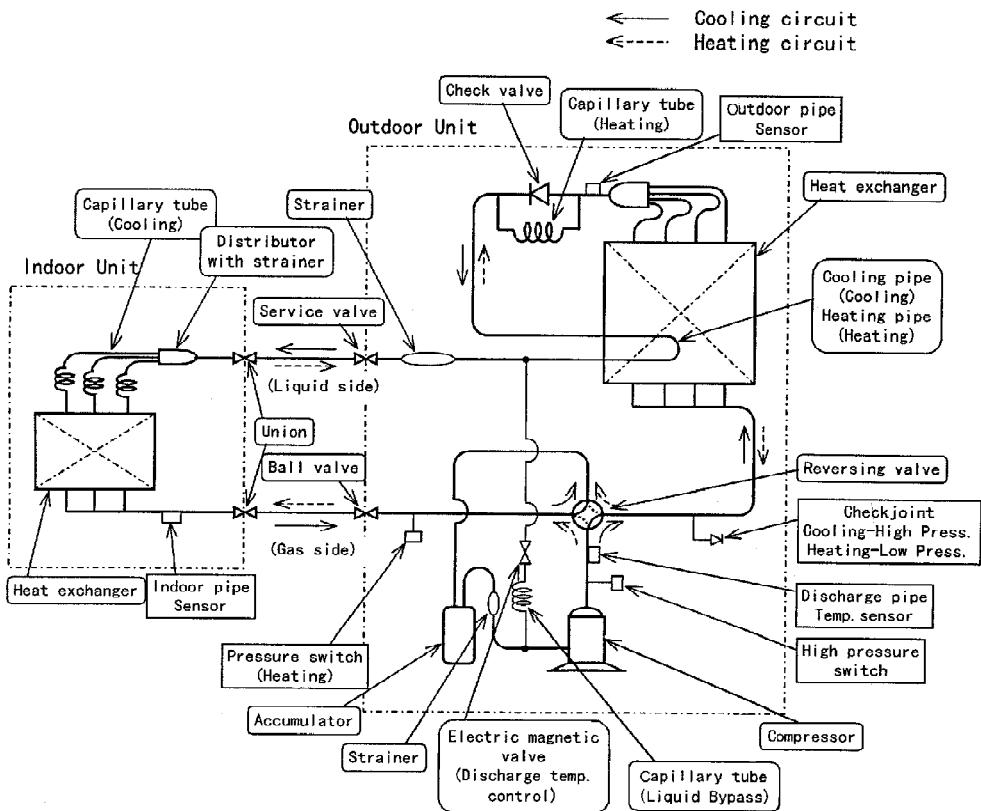




## 7. REFRIGERATION CYCLE

### 7.1. Heating Model

CS-A24BD1P / CU-A24BBP5 / CS-A28BD1P / CU-A28BBP5, 8 / CS-A34BD1P / CU-A34BBP5, 8 / CS-A43BD1P / CU-A43BBP8 / CS-A50BD1P / CU-A50BBP8



|||||||||

## 8. OPERATION RANGE

**Power Supply /** The applicable voltage range for each unit is given in “the following table”. The working voltage among the three phases must be balanced within 3% deviation from each voltage at the compressor terminals. The starting voltage must be higher than 85% of the rated voltage. / / Power Supply

Model-CU	Unit Main Power		Applicable Voltage		Model-CU	Unit Main Power		Applicable I
	Phase, Volts	Hz	Maximum	Minimum		Phase, Volts	Hz	
A24BBP5	1~220	50	242	198	A28BBP8	3N~380	50	418
	1~230	50	253	207		3N~400	50	440
	1~240	50	254	216		3N~415	50	457

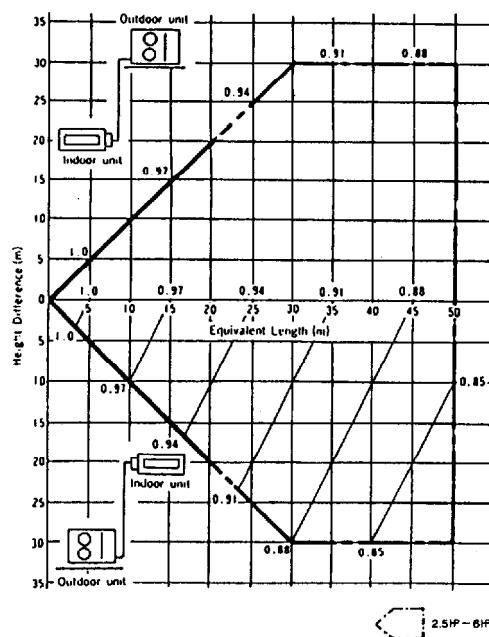
### Indoor and Outdoor Temperature All Models

Operating	Hz	Indoor Temp. (D.B./W.B.) (°C)		Outdoor Temp. (D.B./W	
		Maximum	Minimum	Maximum	Min
Cooling	50	32/23	21/15	43/-	-
Heating	50	27/-	16/-	24/18	-

## 9. PIPE LENGTH

### 9.1. CORRECTION OF COOLING AND HEATING CAPACITIES

Correction of cooling and heating capacities according to the connecting pipe length. / The data of cooling capacities (marked on the name plate) are based on 5 metres connecting pipe and horizontal installation. / (Cooling)



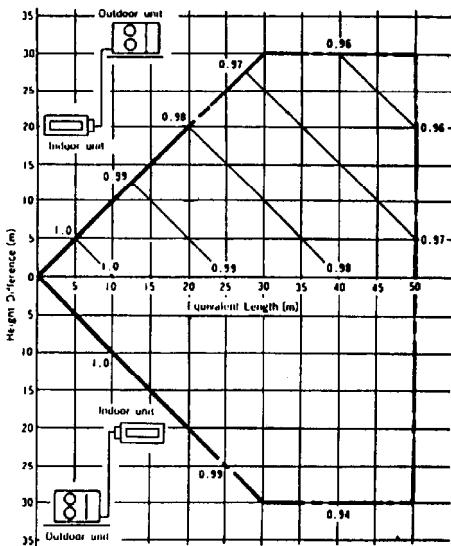
/// Equivalent Length = actual pipe length + / number of elbow x ELE + number of oil / trap x ELO / ELE : equivalent length of elbow. / ELO : equivalent length of oil trap.

### 9.2. REFRIGERANT ADDITIONAL CHARGE

- The piping length exceeds 30 metres. / APPLICABLE FOR ALL MODELS

Before shipment, this air conditioner is filled with the rated amount of refrigerant subject to 30m piping length. (The rated amount of refrigerant is indicated on the name plate.) But when the piping length exceeds 30m, additional charge is required according to the following table.

For other pipe length of other installation multiply / by the following correction factor to determine the revised cooling capacity. / / (Heating)



Outer diameter of gas side pipe mm (inch)	ELE
9.52	0.18
12.7 (1/2)	0.20
15.88 (5/8)	0.25
19.05 (3/4)	0.35

Model	Ref. Charge
2.5HP	20g per 1m
3~6HP	50g per 1m

**Example :** / CS-A24BD1P / In case of 30 m long pipe (one-way), the / amount of refrigerant to be replenished is: /  $(30 - 30) \times 20 = 0\text{g}$  / CS-A43BD1P / In case of 50m long pipe (one-way), the / amount of refrigerant to be replenished is: /  $(50 - 30) \times 50 = 1,000\text{g}$

### 9.3. Piping installation by existing piping

It is possible to use the existing piping by adjusting the refrigerant gas volume. / Please do correct piping installation referring to the table below.

Heat pump type	Standard piping specification					Existing piping specification (Larger pipe)			
	Liquid piping	Gas piping	Gas charge-less length	Additional gas volume		Liquid piping	Gas piping	Gas charge-less length	Additional gas volume
	(Ømm)	(Ømm)	(mm)	(g/m)		(Ømm)	(Ømm)	(m)	(g/m)
CU-A24BBP5	6.35	15.88	30	20		9.52	15.88	13	50
CU-A28BBP5,8	9.52	15.88	30	50		12.7	15.88	17	100
CU-A34BBP5,8	9.52	19.05	30	50		12.7	19.05	17	100
CU-A43BBP8	9.52	19.05	30	50		12.7	19.05	17	100
CU-A50BBP8	9.52	19.05	30	50		12.7	19.05	17	100

**Attention**

- Please never decrease the gas piping size. (It causes the breakdown of the compressor)
- The equivalent piping length and the cooling and heating capacity change rate are same as the standard piping / specification.

## 10. OPERATING CHARACTERISTIC

### 10.1. OPERATING CHARACTERISTIC

#### HEAT PUMP MODEL

Model	Main Power Source		Compressor Motor			Indoor Unit		Outdoor	
	Voltage	Frequency	S.C.	R.C.(A)	IPT(kW)	Fan Motor		Fan Motor	
						(A)	(kW)	(A)	
CS-A24BD1P CU-A24BBP5	220	50	49	10.6 / 10.5	2.31 / 2.30	0.92	0.20	0.50	
	230	50	51	10.2 / 10.1	2.31 / 2.30	0.92	0.20	0.50	
	240	50	52	9.8 / 9.8	2.31 / 2.30	0.92	0.20	0.50	
CS-A28BD3P CU-A28BBP5	220	50	50	11.35 / 11.05	2.49 / 2.41	0.92	0.20	0.50	
	230	50	52	11.05 / 10.75	2.49 / 2.41	0.92	0.20	0.50	
	240	50	54	10.75 / 10.45	2.49 / 2.41	0.92	0.20	0.50	
CS-A28BD1P CU-A28BBP8	380	50	28	4.18 / 3.98	2.49 / 2.41	0.92	0.20	0.50	
	400	50	29	4.13 / 3.93	2.49 / 2.41	0.92	0.20	0.50	
	415	50	30	4.08 / 3.88	2.49 / 2.41	0.92	0.20	0.50	
CS-A34BD1P CU-A34BBP5	220	50	94	15.3 / 15.1	3.23 / 3.18	1.79	0.40	1.00	
	230	50	99	15.4 / 15.2	3.23 / 3.18	1.79	0.40	1.00	
	240	50	103	15.5 / 15.3	3.23 / 3.18	1.79	0.40	1.00	
CS-A34BD1P CU-A34BBP8	380	50	39	5.13 / 5.23	2.93 / 3.03	1.79	0.40	1.00	
	400	50	41	5.13 / 5.23	2.93 / 3.03	1.79	0.40	1.00	
	415	50	42	5.13 / 5.23	2.93 / 3.03	1.79	0.40	1.00	
CS-A43BD1P CU-A43BBP8	380	50	58	6.63 / 6.33	3.82 / 3.67	2.47	0.55	1.10	
	400	50	58	6.63 / 6.33	3.82 / 3.67	2.47	0.55	1.10	
	415	50	58	6.63 / 6.33	3.82 / 3.67	2.47	0.55	1.10	
CS-A50BD1P CU-A50BBP8	380	50	69	7.90 / 7.80	4.54 / 4.52	3.23	0.71	1.20	
	400	50	69	7.90 / 7.80	4.56 / 4.54	3.23	0.71	1.20	
	415	50	69	7.90 / 7.80	4.54 / 4.52	3.23	0.71	1.20	

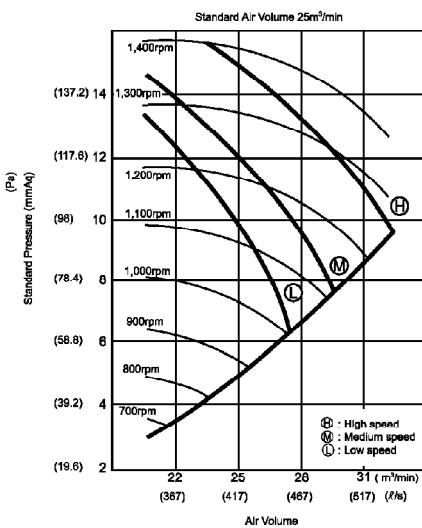
Legend : S.C. : Starting Current / R.C. : Running Current / IPT : Power Consumption

## 11. FAN PERFORMANCE

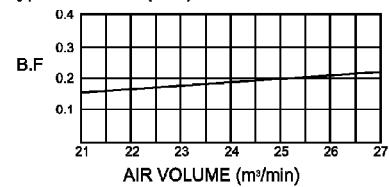
### Fan Performance

Model CS-	Power Frequency (Hz)	Air Volume			External Static Pressure in mmAq						
					0 (0)	2.5 (24.5)	5 (49)	7.5 (73.5)	10 (98)	12.5 (123)	15 (156)
		cfm	m <sup>3</sup> /min	I/S	rpm						
A24BD1P	50	77	22	367	735	885	1030	1180	1300	1420	1560
		883	25	417	875	1005	1135	1250	1375	1500	1625
		988	28	467	1035	1145	1255	1400	1520	1640	1760
		1094	31	517	1180	1280	1400	1520	1640	1760	1880
A28BD1P	50	953	27	450	750	920	1075	1210	1325	1440	1560
		1059	30	500	890	1030	1170	1290	1390	1500	1620
		1165	33	550	1040	1155	1275	1400	1520	1640	1760
		1271	36	600	1180	1290	1400	1520	1640	1760	1880
A34BD1P	50	1200	34	567	770	860	950	1040	1110	1190	1270
		1341	38	633	870	940	1000	1080	1150	1230	1310
		1487	42	700	950	1025	1090	1150	1225	1300	1380
		1624	46	767	1000	1060	1130	1200	1270	1340	1420
A43BD1P	50	1487	42	700	905	985	1060	1135	1205	1270	1345
		1624	46	767	990	1060	1130	1200	1265	1335	1410
		1765	50	833	1080	1145	1210	1270	1335	1400	1480
		1906	54	900	1165	1230	1290	1350	1420	1490	1560
A50BD1P	50	1942	55	917	1035	1095	1165	1230	1285	1345	1410
		2083	59	983	1125	1170	1230	1295	1355	1410	1475
		2224	63	1050	1205	1255	1310	1365	1420	1475	1530
		2365	67	1117	1290	1340	1395	1450	1500	1550	1600

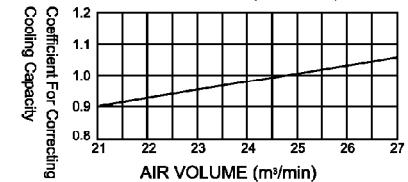
● CS-A24BD1P  
Fan Performance Curve



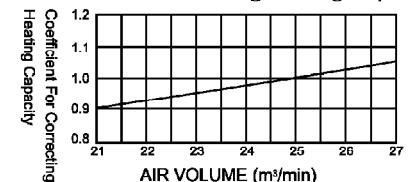
Bypass factor and Coefficient For Correcting Capacity according to Air volume change  
Bypass factor. (B.F)



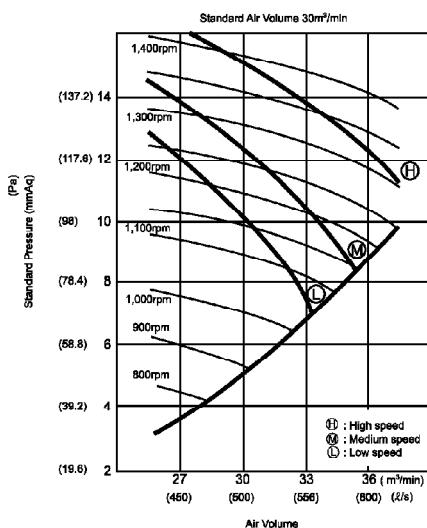
Coefficient For Correcting Cooling Capacity



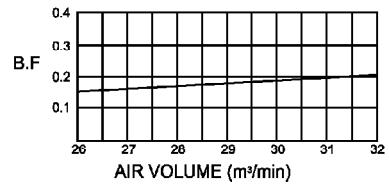
Coefficient For Correcting Heating Capacity



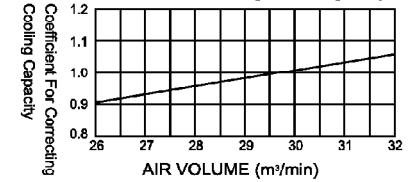
● CS-A28BD1P  
Fan Performance Curve



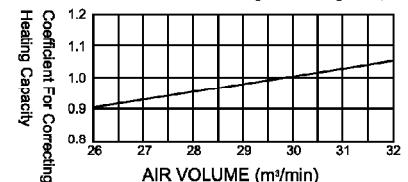
Bypass factor and Coefficient For Correcting Capacity according to Air volume change  
Bypass factor. (B.F)



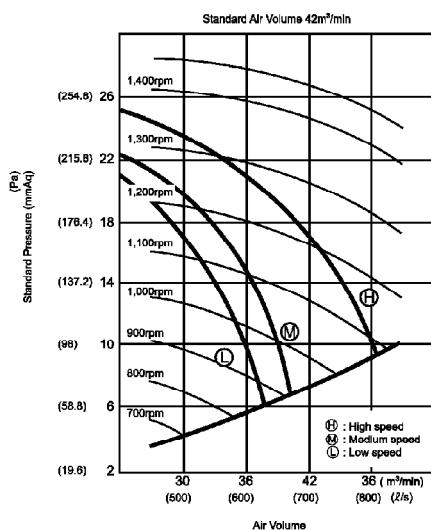
Coefficient For Correcting Cooling Capacity



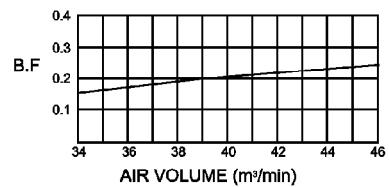
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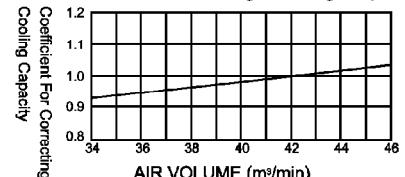
● CS-A34BD1P  
Fan Performance Curve



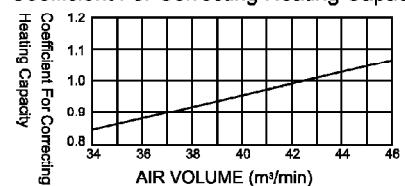
Bypass factor and Coefficient For Correcting Capacity according to Air volume change  
Bypass factor. (B.F)



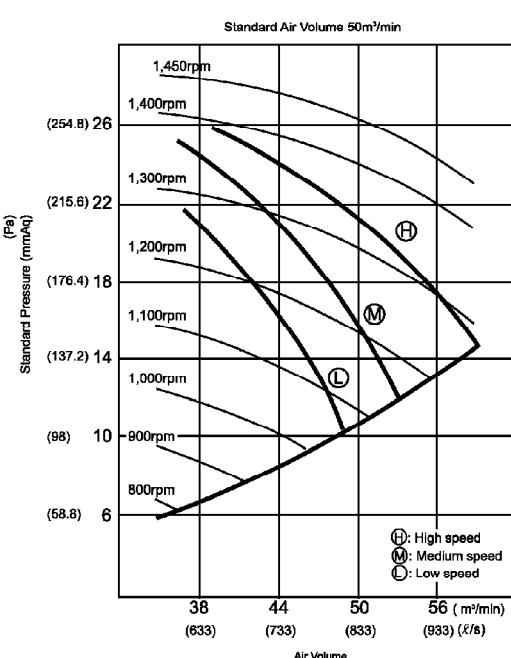
Coefficient For Correcting Cooling Capacity



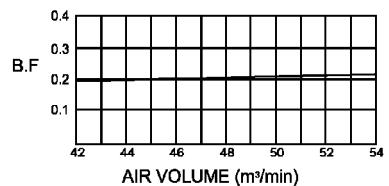
Coefficient For Correcting Heating Capacity



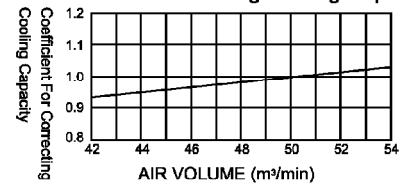
● CS-A43BD1P  
Fan Performance Curve



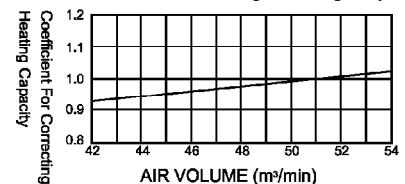
Bypass factor and Coefficient For Correcting Capacity according to Air volume change  
Bypass factor. (B.F)



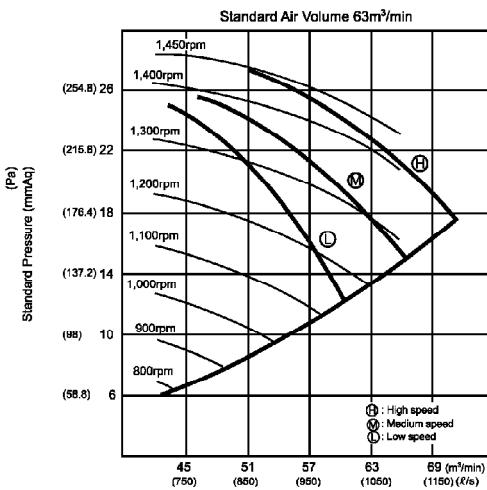
Coefficient For Correcting Cooling Capacity



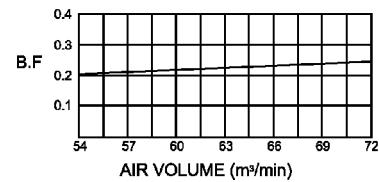
Coefficient For Correcting Heating Capacity



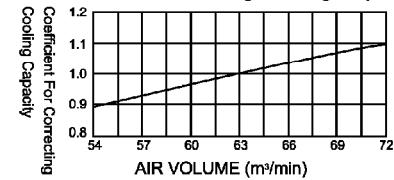
● CS-A50BD1P  
Fan Performance Curve



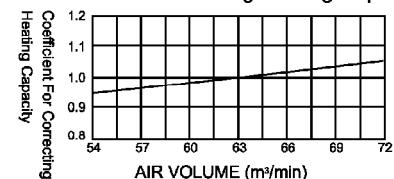
Bypass factor and Coefficient For Correcting Capacity according to Air volume change Bypass factor. (B.F)



Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity



## 12. SAFETY DEVICE

### ■ INDOOR UNIT

Indoor unit	Model	CS-A24BD1P	CS-A28BD1P	CS-A28BD1P	CS-A34BD1P	CS-A34BD1P	CS-A43BD1P	A
For fan motor protection								
Internal protector (49F)	OFF °C	135	135	135	135	135	135	135
	ON °C	87	87	87	87	87	87	87
For control protection								
Fuse	CUT A	3	3	3	3	3	3	3

### ■ OUTDOOR UNIT



Outdoor unit	Heat pump model	50Hz	CU-A24BBP5	CU-A28BBP5	CU-A28BBP8	CU-A34BBP5	CU-A34BBP8	CU-A43BBP8	A
(Fan speed)(63H2)	ON	MPa	2.25	2.25	2.25	2.25	2.25	2.25	
Cooling control									
Heat exchanger outlet temperature thermistor (Th2)	Control method		Th greater or equal to 30°C ----- High speed Th less than 30°C ----- 5 speed step control						
For control protection									
Fuse	CUT	A	6.3	6.3	6.3	6.3	6.3	6.3	

(\*) 1MPa = 10.2kgf/cm<sup>2</sup>

(\*) Head Thermostat

## 13. COMPONENT SPECIFICATION

### Compressor

Model	Heat pump model	50Hz	CU-A24BBP5	CU-A28BBP5	CU-A34BBP5	CU-A43BBP8	Cl A50B
Compressor Model			NE41VNDT	NE44VNDT	ZR45KC-TFD	ZR57KC-TFD	ZR-61 TF
Compressor Type No. of Cylinders				NE44VADT	ZR45KC-TF5	ZR57KC-TF5	ZR-61 TF
Revolution	r/min	2,900	ROTARY	1	1	1	1
Piston Displacement	m <sup>3</sup> /h	7.27		7.73	10.73	13.42	16.
Motor Type							
Starting Method		kW		Direct on-line Starting			
Rated Output			1.9	2.0	2.8	3.5	4.
Poles			2	2	2	2	2
Insulation Class			E	E	E	E	E
Oil Type			MS32	MS32	Sontex200LT	Sontex200LT	Sontex
Charge	L	1.3		1.3	1.2	2.1	1.

## Condenser

Models	Heat pump model	CU-A24BBP5	CU-A28BBP5 CU-A28BBP8	CU-A34BBP5 CU-A34BBP8	CU-A43BBP8	CU-A50BBP
Tube Material				Copper tube		
Outer Diameter	mm	9.52	9.52	9.52	9.52	9.52
Thickness	mm	0.3	0.3	0.3	0.3	0.3
Row		2	2	2	2	2
No. of Tubes/ Row		34	34	46	46	46
Fin Material				Aluminium		
Thickness	mm	0.105	0.105	0.105	0.105	0.105
Fin Pitch	No./ inch	14	14	14	14	14
Fin Surface		AX-Louvre fin	AX-Louvre fin	AX-Louvre fin	AX-Louvre fin	AX-Louvre fin
Total Face Area	m <sup>2</sup>	0.61	0.61	0.82	1.05	1.05
Fan				Propeller Fan		
Type						
No.of unit		1	1	2	2	2
Fan Motor				Direct on-line Starting		
Starting Method						
Rated Output	kW	0.05	0.05	0.05 X 2	0.05 X 2	0.055 X 2
Poles		6	6	6	6	6
Phase		Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phase
Insulation Class		E	E	E	E	E

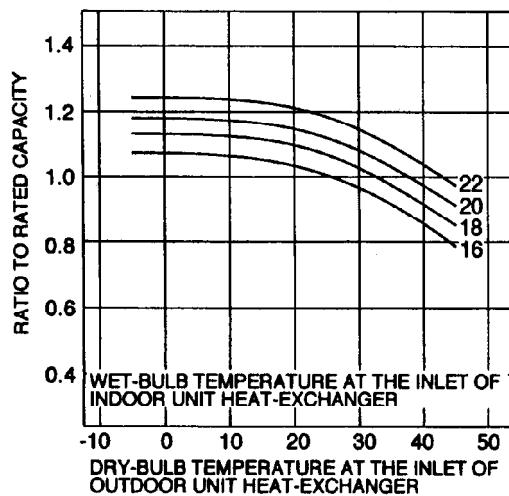
## Evaporator

Models		CS-A24BD1P	CS-A28BD1P	CS-A34BD1P	CS-A43BD1P	CS-A
Tube Material	mm mm	Copper Tube				
Outer Diameter		9.53	9.53	9.53	9.53	9
Thickness		0.28	0.28	0.3	0.28	0
Row		3	3	2	3	0
No. of Tubes/ Row		24	30	32	40	0
Fin Material	mm No./ inch	Aluminium				
Thickness		0.11	0.11	0.11	0.11	0
Fin Pitch		12	12	12	12	0
Fin Surface		Louvre-fin	Louvre-fin	Louvre-fin	Louvre-fin	Lou
Total Face Area		G	0.218	0.218	0.360	0.360
Evaporator Fan	Type No./Unit	Sirocco Fan				
		2	2	2	2	0
Evaporator Fan motor	kW	Direct On-Line Starting				
Starting		0.15	0.15	0.25	0.35	0
Rated Output		4	4	4	4	0
Poles		Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single
Phase		E	E	E	E	0
Insulation						

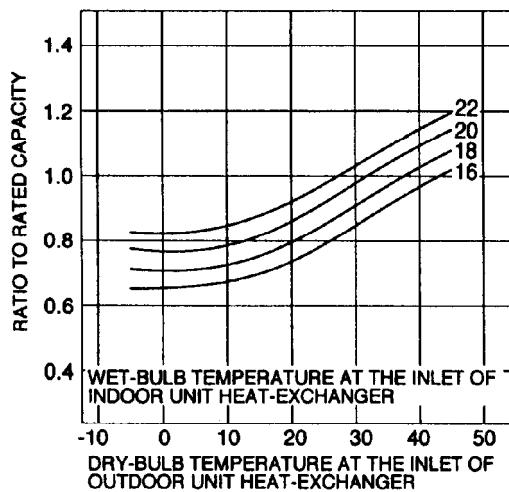
## 14. CAPACITY AND POWER CONSUMPTION

### 14.1. COOLING CAPACITY CURVE, COOLING POWER CONSUMPTION CURVE

#### ■ COOLING CAPACITY CURVE



#### ■ COOLING POWER CONSUMPTION CURVE



#### ■ RATED COOLING CAPACITY, RATED COOLING POWER / CONSUMPTION

MODEL NAME	RATED COOLING STANDARD	
	CAPACITY (kW)	POWER CONSUMPTION (kW)
CS-A24BD1P/CU-A24BBP5	6.50	2.59
CS-A28BD1P/CU-A28BBP5	7.30	2.69
CS-A28BD1P/CU-A28BBP8	7.30	2.69
CS-A34BD1P/CU-A34BBP5	10.45	3.95
CS-A34BD1P/CU-A34BBP8	10.45	3.65
CS-A43BD1P/CU-A43BBP8	13.00	4.53
CS-A50BD1P/CU-A50BBP8	14.50	5.10

- Calculation of actual cooling capacity and power consumption

Example / CS-A28BD1P / CU-A 28BBP8

- Calculation of the actual cooling capacity and power consumption for the following cooling conditions: Indoor temperature of 18°C (wet-bulb temperature) and outdoor temperature of 40°C (dry-bulb temperature).

Calculation method

- Find the cooling capacity ratio and power consumption ratio from the cooling capacity graph and power consumption graph for model CS-A28BD2P / CU-A28BBP8.

1. The cooling capacity ratio indicated at the intersection between an outdoor unit heat exchanger inlet air temperature of 40°C on the horizontal axis and an indoor unit heat exchanger inlet temperature on 18°C is 0.92.
  2. The cooling power consumption ratio from the same intersection on the power consumption graph is 1.02.
- Thus, / Actual cooling capacity = cooling capacity ratio x rated cooling =  $0.92 \times 7.80 = 7.18$  (kW)  
Actual cooling power consumption = cooling power consumption x rated power consumption =  $1.02 \times 2.70 = 2.75$  (kW)

## 14.2. PERFORMANCE DATA

Model

CS-A24BD1P/CU-A24BBP5

COOLING PERFORMANCE

Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IP
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kV
23	17	7.37	6.85	2.28	7.09	6.73	2.45	6.73	6.60	2.61	6.31	6.31	2.78	5.81	5.81	2.9
	19	7.72	5.95	2.45	7.44	5.88	2.61	7.09	5.74	2.78	6.73	5.59	2.95	6.31	5.36	3.0
	22	8.36	4.60	2.72	8.08	4.60	2.86	7.72	4.56	3.03	7.37	4.50	3.17	6.94	4.37	3.3
25	17	7.32	6.81	2.28	7.04	6.69	2.45	6.69	6.55	2.61	6.27	6.27	2.78	5.77	5.77	2.9
	19	7.67	5.91	2.45	7.39	5.84	2.61	7.04	5.70	2.78	6.69	5.55	2.95	6.27	5.33	3.0
	22	8.31	4.57	2.72	8.03	4.58	2.86	7.67	4.53	3.03	7.32	4.47	3.17	6.90	4.35	3.3
27	17	7.28	6.77	2.28	7.00	6.65	2.45	6.65	6.52	2.61	6.23	6.23	2.78	5.74	5.74	2.9
	19	7.63	5.88	2.45	7.35	5.81	2.61	7.00	5.67	2.78	6.65	5.52	2.95	6.23	5.30	3.0
	22	8.26	4.54	2.72	7.98	4.55	2.86	7.63	4.50	3.03	7.28	4.44	3.17	6.86	4.32	3.3
29	17	7.24	6.74	2.28	6.96	6.62	2.45	6.62	6.48	2.61	6.20	6.20	2.78	5.71	5.71	2.9
	19	7.59	5.84	2.45	7.31	5.78	2.61	6.96	5.64	2.78	6.62	5.49	2.95	6.20	5.27	3.0
	22	8.22	4.52	2.72	7.94	4.53	2.86	7.59	4.48	3.03	7.24	4.42	3.17	6.82	4.30	3.3
32	17	7.18	6.68	2.28	6.91	6.56	2.45	6.56	6.43	2.61	6.15	6.15	2.78	5.66	5.66	2.9
	19	7.53	5.80	2.45	7.25	5.73	2.61	6.91	5.60	2.78	6.56	5.45	2.95	6.15	5.23	3.0
	22	8.15	4.48	2.72	7.88	4.49	2.86	7.53	4.44	3.03	7.18	4.38	3.17	6.77	4.27	3.3

Legend: BF Bypass Factor 0.20 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m <sup>3</sup> /min (l/s)		22 (367)	25 (417)	28 (467)
SHC Sensible Heat Capacity		0.91	1.0	1.09
TC Total Cooling Capacity		0.93	1.0	1.07
				1.14

Model  
CS-A28BD1P/CU-A28BBP5, CU-A28BBP8

#### COOLING PERFORMANCE

Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IP
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kV
23	17	8.21	7.80	2.36	7.90	7.66	2.53	7.50	7.50	2.71	7.03	7.03	2.88	6.47	6.47	3.0
	19	8.61	6.80	2.53	8.29	6.72	2.71	7.90	6.55	2.88	7.50	6.38	3.05	7.03	6.11	3.2
	22	9.32	5.31	2.82	9.00	5.31	2.97	8.61	5.25	3.14	8.21	5.17	3.28	7.74	5.03	3.4
25	17	8.16	7.75	2.36	7.85	7.61	2.53	7.45	7.45	2.71	6.98	6.98	2.88	6.43	6.43	3.0
	19	8.55	6.76	2.53	8.24	6.67	2.71	7.85	6.51	2.88	7.45	6.34	3.05	6.98	6.07	3.2
	22	9.26	5.28	2.82	8.94	5.28	2.97	8.55	5.22	3.14	8.16	5.14	3.28	7.69	5.00	3.4
27	17	8.11	7.71	2.36	7.80	7.57	2.53	7.41	7.41	2.71	6.94	6.94	2.88	6.40	6.40	3.0
	19	8.50	6.72	2.53	8.19	6.63	2.71	7.80	6.47	2.88	7.41	6.30	3.05	6.94	6.04	3.2
	22	9.20	5.25	2.82	8.89	5.25	2.97	8.50	5.19	3.14	8.11	5.11	3.28	7.64	4.97	3.4
29	17	8.07	7.67	2.36	7.76	7.53	2.53	7.37	7.37	2.71	6.91	6.91	2.88	6.36	6.36	3.0
	19	8.46	6.68	2.53	8.15	6.60	2.71	7.76	6.44	2.88	7.37	6.27	3.05	6.91	6.01	3.2
	22	9.16	5.22	2.82	8.85	5.22	2.97	8.46	5.16	3.14	8.07	5.08	3.28	7.60	4.94	3.4
32	17	8.01	7.61	2.36	7.70	7.47	2.53	7.31	7.31	2.71	6.85	6.85	2.88	6.31	6.31	3.0
	19	8.39	6.63	2.53	8.08	6.55	2.71	7.70	6.39	2.88	7.31	6.22	3.05	6.85	5.96	3.2
	22	9.08	5.18	2.82	8.78	5.18	2.97	8.39	5.12	3.14	8.01	5.04	3.28	7.54	4.90	3.4

Legend: BF Bypass Factor 0.19 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m <sup>3</sup> /min (l/s)		27 (450)	30 (500)	33 (550)
SHC Sensible Heat Capacity		0.91	1.0	1.09
TC Total Cooling Capacity		0.93	1.0	1.07
				1.14

Model  
CS-A34BD1P/CU-A34BBP5, CU-A34BBP8

#### COOLING PERFORMANCE

Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IP
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kV
23	17	11.58	10.31	3.55	11.14	10.13	3.81	10.58	9.94	4.07	9.91	9.51	4.33	9.13	9.13	4.5
	19	12.14	8.86	3.81	11.69	8.77	4.07	11.14	8.57	4.33	10.58	8.36	4.59	9.91	8.03	4.8
	22	13.14	6.70	4.24	12.69	6.73	4.46	12.14	6.68	4.72	11.58	6.60	4.94	10.91	6.44	5.2
25	17	11.51	10.24	3.55	11.06	10.07	3.81	10.51	9.88	4.07	9.85	9.45	4.33	9.07	9.07	4.5
	19	12.06	8.80	3.81	11.62	8.71	4.07	11.06	8.52	4.33	10.51	8.30	4.59	9.85	7.98	4.8
	22	13.06	6.66	4.24	12.61	6.68	4.46	12.06	6.63	4.72	11.51	6.56	4.94	10.84	6.40	5.2
27	17	11.44	10.18	3.55	11.00	10.01	3.81	10.45	9.82	4.07	9.79	9.40	4.33	9.02	9.02	4.5
	19	11.99	8.75	3.81	11.55	8.66	4.07	11.00	8.47	4.33	10.45	8.26	4.59	9.79	7.93	4.8
	22	12.98	6.62	4.24	12.54	6.65	4.46	11.99	6.59	4.72	11.44	6.52	4.94	10.78	6.36	5.2
29	17	11.38	10.13	3.55	10.94	9.96	3.81	10.40	9.77	4.07	9.74	9.35	4.33	8.97	8.97	4.5
	19	11.93	8.71	3.81	11.49	8.62	4.07	10.94	8.43	4.33	10.40	8.21	4.59	9.74	7.89	4.8
	22	12.91	6.59	4.24	12.48	6.61	4.46	11.93	6.56	4.72	11.38	6.49	4.94	10.72	6.33	5.2
32	17	11.29	10.05	3.55	10.86	9.88	3.81	10.31	9.69	4.07	9.66	9.28	4.33	8.90	8.90	4.5
	19	11.83	8.64	3.81	11.40	8.55	4.07	10.86	8.36	4.33	10.31	8.15	4.59	9.66	7.83	4.8
	22	12.81	6.53	4.24	12.38	6.56	4.46	11.83	6.51	4.72	11.29	6.44	4.94	10.64	6.28	5.2

Legend: BF Bypass Factor 0.22 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m <sup>3</sup> /min (l/s)		34(567)	38 (633)	42 (700)
SHC Sensible Heat Capacity		0.91	0.95	1.0
TC Total Cooling Capacity		0.93	0.97	1.0
				1.03

Model  
CS-A43BD1P/CU-A43BBP8

#### COOLING PERFORMANCE

Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
23	17	14.32	12.74	4.52	13.77	12.53	4.85	13.08	12.29	5.18	12.25	11.76	5.51	11.29	11.29	5.7
	19	15.01	10.95	4.85	14.46	10.84	5.18	13.77	10.60	5.51	13.08	10.33	5.84	12.25	9.92	6.1
	22	16.25	8.29	5.40	15.69	8.32	5.68	15.01	8.25	6.01	14.32	8.16	6.28	13.49	7.96	6.6
25	17	14.23	12.66	4.52	13.68	12.45	4.85	13.00	12.22	5.18	12.17	11.69	5.51	11.22	11.22	5.7
	19	14.91	10.88	4.85	14.36	10.77	5.18	13.68	10.53	5.51	13.00	10.27	5.84	12.17	9.86	6.1
	22	16.14	8.23	5.40	15.59	8.26	5.68	14.91	8.20	6.01	14.23	8.11	6.28	13.41	7.91	6.6
27	17	14.14	12.73	4.52	13.60	12.51	4.85	12.92	12.27	5.18	12.10	11.74	5.51	11.15	11.15	5.7
	19	14.82	10.97	4.85	14.28	10.85	5.18	13.60	10.61	5.51	12.92	10.34	5.84	12.10	9.93	6.1
	22	16.05	8.34	5.40	15.50	8.37	5.68	14.82	8.30	6.01	14.14	8.20	6.28	13.33	8.00	6.6
29	17	14.07	12.52	4.52	13.53	12.31	4.85	12.85	12.08	5.18	12.04	11.56	5.51	11.09	11.09	5.7
	19	14.75	10.77	4.85	14.21	10.65	5.18	13.53	10.42	5.51	12.85	10.15	5.84	12.04	9.75	6.1
	22	15.96	8.14	5.40	15.42	8.17	5.68	14.75	8.11	6.01	14.07	8.02	6.28	13.26	7.82	6.6
32	17	13.96	12.42	4.52	13.42	12.21	4.85	12.75	11.99	5.18	11.95	11.47	5.51	11.01	11.01	5.7
	19	14.63	10.68	4.85	14.09	10.57	5.18	13.42	10.33	5.51	12.75	10.07	5.84	11.95	9.68	6.1
	22	15.84	8.08	5.40	15.30	8.11	5.68	14.63	8.05	6.01	13.96	7.96	6.28	13.15	7.76	6.6

Legend: BF Bypass Factor 0.21 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m <sup>3</sup> /min (l/s)		42(700)	46 (767)	50 (833)
SHC Sensible Heat Capacity		0.91	0.95	1
TC Total Cooling Capacity		0.93	0.97	1
				1.03

Model  
CS-A50BD1P/CU-A50BBP8

#### COOLING PERFORMANCE

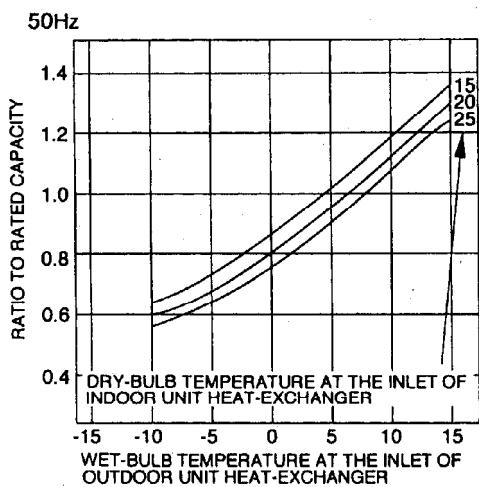
Ambient Return Air		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			45°C		
		TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT
D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
23	17	15.27	14.20	5.00	14.68	13.94	5.37	13.94	13.67	5.73	13.06	13.06	6.10	12.04	12.04	6.4
	19	16.00	12.32	5.37	15.41	12.18	5.73	14.68	11.89	6.10	13.94	11.57	6.47	13.06	11.10	6.7
	22	17.32	9.53	5.98	16.73	9.54	6.28	16.00	9.44	6.65	15.27	9.31	6.95	14.38	9.06	7.3
25	17	15.17	14.11	5.00	14.58	13.86	5.37	13.86	13.58	5.73	12.98	12.98	6.10	11.96	11.96	6.4
	19	15.90	12.24	5.37	15.31	12.10	5.73	14.58	11.81	6.10	13.86	11.50	6.47	12.98	11.03	6.7
	22	17.21	9.47	5.98	16.63	9.48	6.28	15.90	9.38	6.65	15.17	9.25	6.95	14.29	9.00	7.3
27	17	15.08	14.02	5.00	14.50	13.78	5.37	13.78	13.50	5.73	12.91	12.91	6.10	11.89	11.89	6.4
	19	15.81	12.17	5.37	15.23	12.03	5.73	14.50	11.75	6.10	13.78	11.43	6.47	12.91	10.97	6.7
	22	17.11	9.41	5.98	16.53	9.42	6.28	15.81	9.32	6.65	15.08	9.20	6.95	14.21	8.95	7.3
29	17	15.00	13.95	5.00	14.42	13.70	5.37	13.70	13.43	5.73	12.84	12.84	6.10	11.83	11.83	6.4
	19	15.72	12.11	5.37	15.15	11.97	5.73	14.42	11.68	6.10	13.70	11.37	6.47	12.84	10.91	6.7
	22	17.02	9.36	5.98	16.44	9.37	6.28	15.72	9.28	6.65	15.00	9.15	6.95	14.14	8.91	7.3
32	17	14.88	13.84	5.00	14.31	13.59	5.37	13.59	13.32	5.73	12.74	12.74	6.10	11.73	11.73	6.4
	19	15.60	12.01	5.37	15.03	11.87	5.73	14.31	11.59	6.10	13.59	11.28	6.47	12.74	10.83	6.7
	22	16.89	9.29	5.98	16.31	9.30	6.28	15.60	9.20	6.65	14.88	9.08	6.95	14.02	8.83	7.3

Legend: BF Bypass Factor 0.22 SHC Sensible Heat Capacity TC Total Cooling Capacity / CAPACITY SELECTION NOTES / (1) The table above is based on unit nominal evaporator airflow, / correction factor must therefore be applied for selections / away from this condition. /

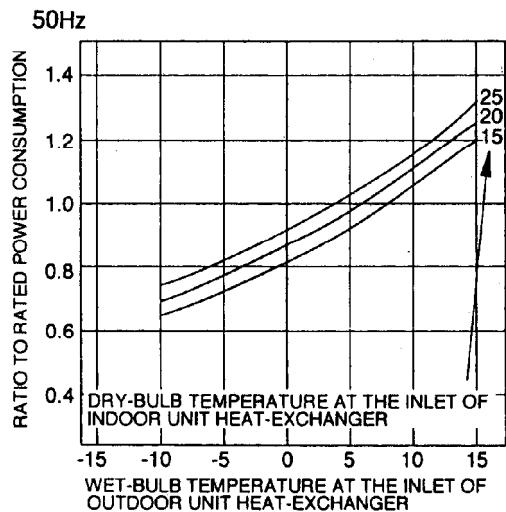
COOLING CORRECTION FACTORS				
EVAP. AIR FLOW m <sup>3</sup> /min (l/s)		55 (917)	59 (983)	63 (1050)
SHC Sensible Heat Capacity		0.89	0.93	1.0
TC Total Cooling Capacity		0.91	0.96	1.0
				1.04

#### 14.3. HEATING CAPACITY CURVE, HEATING POWER CONSUMPTION CURVE (HEAT PUMP MODEL ONLY)

##### ■ HEATING CAPACITY CURVE



#### ■ HEATING POWER CONSUMPTION CURVE



#### ■ RATED HEATING CAPACITY, RATED HEATING POWER / CONSUMPTION

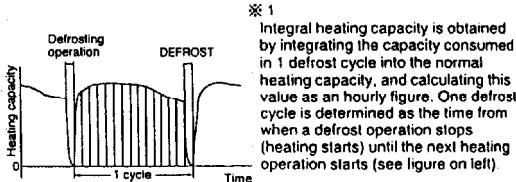
MODEL NAME	RATED HEATING STANDARD	
	CAPACITY(kW)	POWER CONSUMPTION(kW)
CS-A24BD1P/CU-A24BBP5	7.10	2.50
CS-A28BD1P/CU-A28BBP5	7.75	2.61
CS-A28BD1P/CU-A28BBP8	7.75	2.40
CS-A34BD1P/CU-A34BBP5	11.20	3.55
CS-A34BD1P/CU-A34BBP8	11.20	3.40
CS-A43BD1P/CU-A43BBP8	14.20	3.90
CS-A50BD1P/CU-A50BBP8	15.70	5.09

<Precautions on using capacity and electrical characteristics curves>

- Heating capacity when the unit is frosted over or while being defrosted will vary depending on outdoor temperature ('CW8) and the amount of frost. Heating capacity performance must be compensated because it does not take into account the capacity drop incurred when the unit is frosted over and while it is being defrosted. Therefore, to obtain the integral heating capacity in consideration of overfrosting and defrost operations. Heating capacity must be multiplied by the compensation coefficient below.
- Heating capacity compensation coefficient for heating in frosted situations.

Wet-bulb temperature at inlet of outdoor unit heat exchanger ('CW8)	-10	-8	-6	-4	-2	0	1	2	4	6
Heating capacity compensation coefficient	0.93	0.93	0.92	0.89	0.87	0.86	0.87	0.89	0.95	1.0

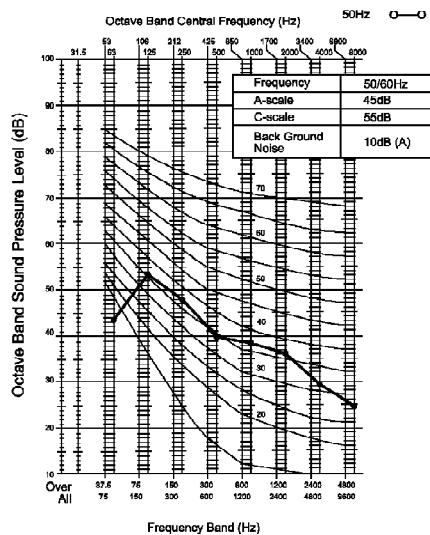
\* 1  
 Integral heating capacity = [Heating capacity by heating capacity performance] ×  
 [Heating capacity compensation coefficient] <kW>



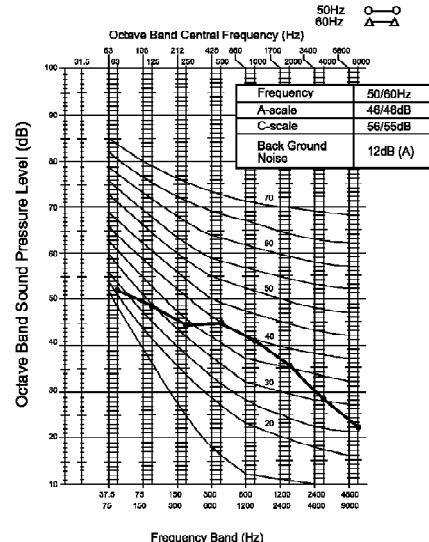
\* 1  
 Integral heating capacity is obtained by integrating the capacity consumed in 1 defrost cycle into the normal heating capacity, and calculating this value as an hourly figure. One defrost cycle is determined as the time from when a defrost operation stops (heating starts) until the next heating operation starts (see figure on left).

## 15. SOUND DATA

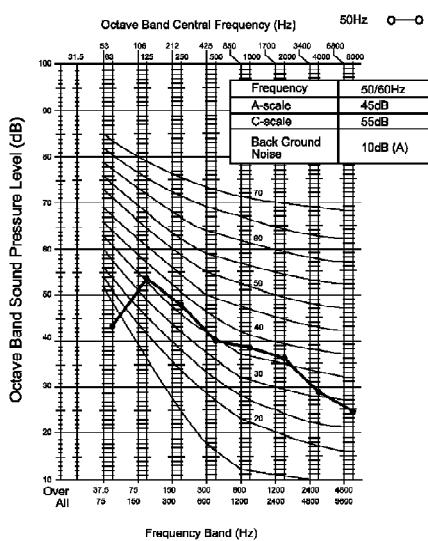
CS-A24BD1P



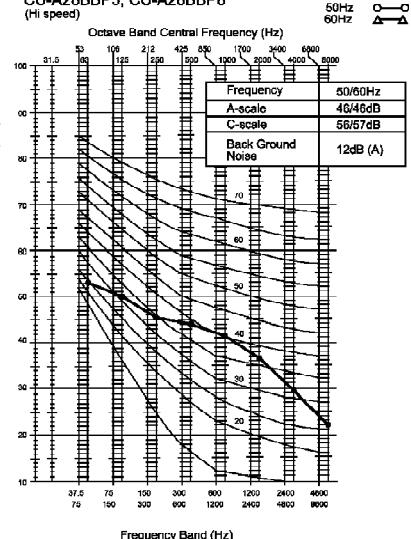
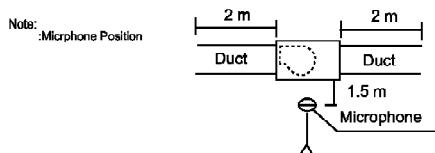
CU-A24BBP1



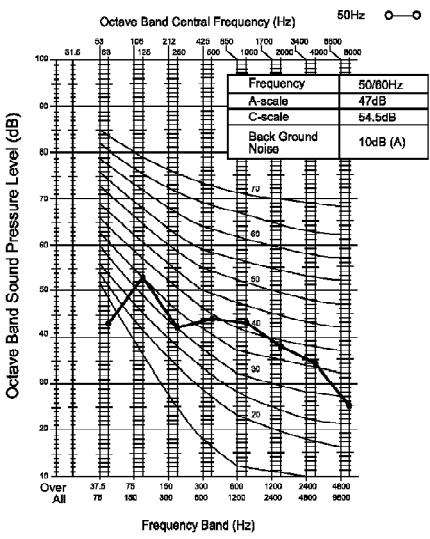
CS-A28BD1P



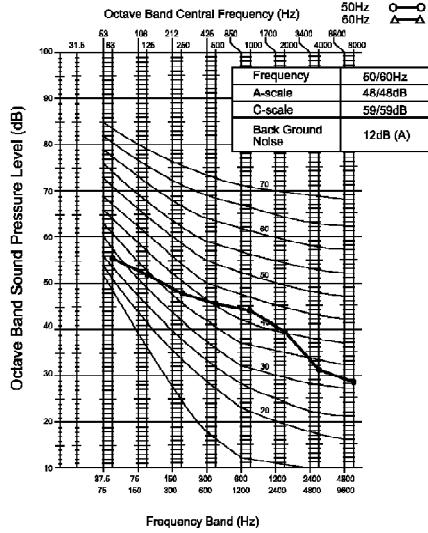
CU-A28BBP5, CU-A28BBP8

Note:  
Micphone Position

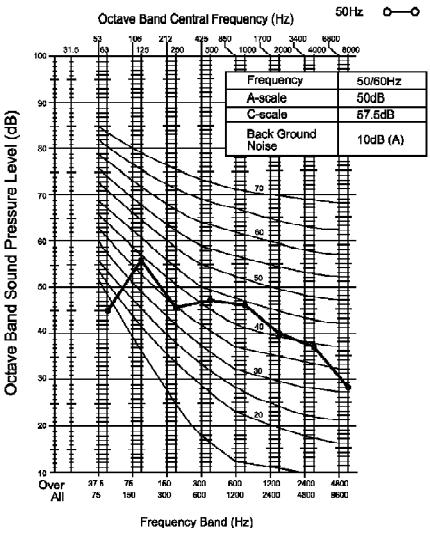
CS-A34BD1P



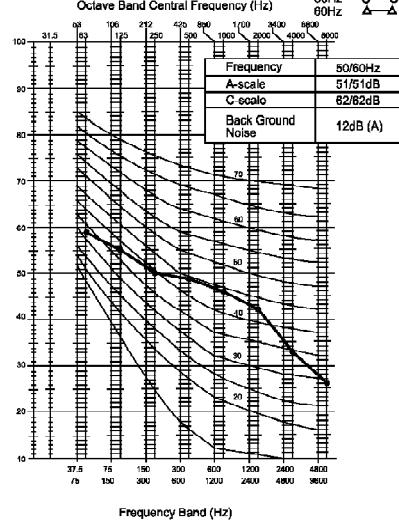
CS-A34BBP5, CS-A34BBP8  
(High speed)



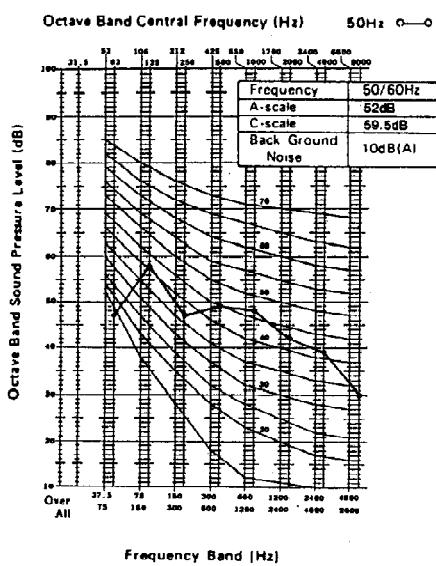
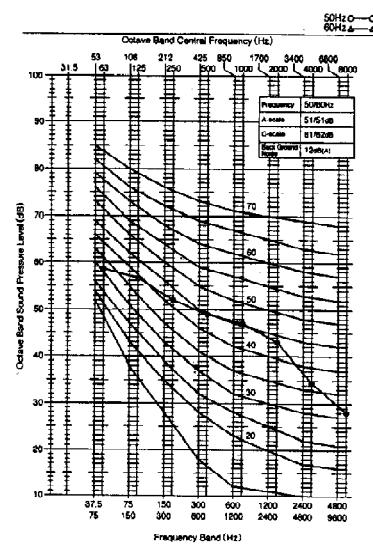
CS-A43BD1P



CU-A43BBP8  
(High speed)

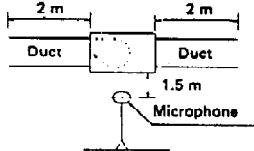


CS-A50BD1P

CU-A50BBP8  
(Hi speed)

NOTE:

: Microphone Position

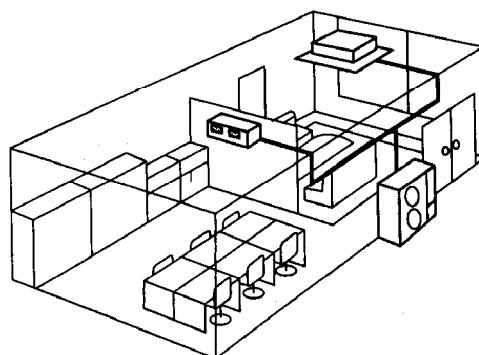


## 16. TWIN AND TRIPLE

### 16.1. TWIN

#### 16.1.1. Operation

- Simultaneous air conditioning of wide spaces and corners is possible.
- Master units and slave-units can be set automatically in twin and triple systems. No address setting is necessary.
- Multiple indoor units can be operated simultaneously with a single remote control unit. Note that individual operation is not possible.



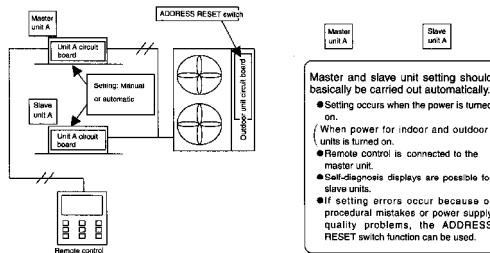
( ) : Outdoor unit capacity  
 ( ) : Indoor unit capacity  
 (Figures indicate capacity ratios in combination.)

OUTDOOR UNIT	SIMULTANEOUS TWIN OPERATION STANDARD	
	43BB	50BB
43BB	43BB 24BD3 24BD3	50BB 28BD3 28BD3
50BB		

#### (Twin operation setting)

- The master units and slave units are set automatically when the power is turned on. At this time, the indoor unit which is connected to the remote control unit becomes the master unit. / (If automatic setting is not possible, carry out the settings manually.)
- Install the remote control unit to the master unit. (It cannot be connected to slave units.)
- The remote control thermostat can also be set.
- Optional circuit boards can only be installed to the master unit.
- Setting the master unit and slave units can also be carried out manually by using DIP switches. However, manual settings will always take priority. If you have made manual settings but would like to return to using automatic settings, set all slave unit DIP switches (refer to the table below) to the OFF position, and then press the ADDRESS RESET switch on the outdoor unit (SW3 on the outdoor unit printed circuit board). / (Do not mix manual settings and automatic settings.)

Master unit	Slave unit
Manual setting *It is not necessary to operate any switches on the master unit. The unit connected to the remote control will become the master unit.	ON [ ] OFF [ ] 1 2 3 4 5 6 7 8 Set No. 8 to ON. All other switches can be ignored. (No. 7 is already set to ON at the time of shipment.)



/// Automatic address setting for twin system

/ **Procedure:** Turn on the power supply for the indoor and outdoor units. / **Operation:** Automatic address setting will start 10 to 30 seconds after the power supply is turned on, and will be completed / after about 1 minute. / /

If the power supplies for the indoor unit and outdoor unit cannot be turned on at the same time, turn on the power supply for the outdoor unit, the indoor unit which is connected to the remote control, and then the other indoor units in that order.

If the order of turning on the power supply is incorrect, the master unit setting may overlap. In such a case, turn on the power supplies for all units in the correct order as given above, or carry out a twin/triple automatic address reset (press dip switch 3 on the outdoor unit continuously for seconds or longer).

- The indoor unit which is connected to the remote control unit (receptor) will have priority for becoming the master unit.
- The master unit thermostat will be used as the indoor temperature thermostat. If the master unit thermostat is turned on, the slave unit thermostats cannot be adjusted even if they happen to be on.
- DIP switch settings take priority in the setting of twin and triple addresses.
- If address setting using the DIP switches is carried out after automatic address setting has been carried out, use DIP switch No.3 on the outdoor unit to carry out automatic address resetting.
- If you would like to designate a particular indoor unit as the master unit because no master unit has been set, use the DIP switches on the slave units to make the setting.

If automatic address setting is carried out once and then the slave unit addresses are set, the addresses will then be stored inside the EEPROM. Thus it is not necessary to repeat automatic address setting if the power is turned off and back on again.

DIP switch settings for twin slave unit addresses

**Procedure:** Turn off the power supply, and then set DIP switch 1-8 to ON. / The unit will become slave unit 1. / Turn on the power supply. /

**Operation:** The unit will operate as slave unit 1. Automatic address setting is not carried out at this time.

If the setting can be made while the power is still turned on, it is easier to mis-combine the setting with group settings. So, the setting be made better while the power is turned off.

- Only slave unit addresses can be set in this way. Master unit setting is not possible.
- If you make the DIP switch settings after the power has been turned back on, carry out twin/triple automatic address resetting.
- Be sure to set DIP switch 1-8 to ON when setting twin/triple addresses. If DIP switch 1-1 is set to ON without setting 1-8 to ON also, group addresses will be set instead, and the remote control open circuit error code (F26) will be displayed.

/ / Automatic address resetting for twin systems

Function

- This clears the current twin addresses which have been set automatically, and causes automatic twin address setting to be carried out once more.

Procedure: Press the ADDRESS RESET switch SW3 (push button switch) on the outdoor unit circuit board continuously / until LEDs 2 to 8 on the outdoor unit circuit board are all illuminated (takes approx. 3.5 seconds).

Operation: The outdoor unit will reset the addresses for the indoor units which it is connected to, and will send an instruction / to carry out automatic address setting again. If the indoor unit DIP switches have not been manually set for / twin address setting, the indoor units receive this command and they then clear their existing settings and carry / out automatic address setting.

If an indoor unit has had its address set by the DIP switch (DIP switch 1-8 is ON), or if the remote control unit is connected to one of the indoor units, then the addresses for those indoor units cannot be reset.

- The indoor units will not run for approximately 1 minute while automatic twin address resetting is being carried out.
- Do not turn off the power supply for at least 1 minute after automatic twin address resetting has been carried out.

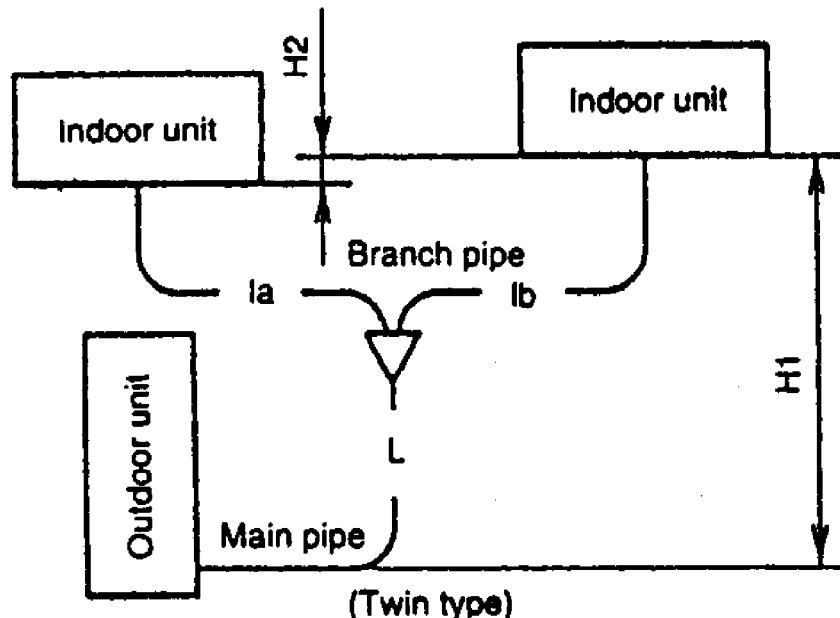
## 16.2. Piping connections

- The following table shows the pipe diameters for a twin-type system. /

Outdoor unit main pipe diameter (mm)		Indoor unit combinations	
Liquid side: $\phi 9.52$ Gas side: $\phi 19.05$	43BB	Indoor unit capacity	24BD1 24BD1
	Branch pipe diameter	Liquid side	$\phi 6.35$ $\phi 6.35$
		Gas side	$\phi 15.88$ $\phi 15.88$
Liquid side: $\phi 9.52$ Gas side: $\phi 19.05$	50BB	Indoor unit capacity	28BD1 28BD1
	Branch pipe diameter	Liquid side	$\phi 9.52$ $\phi 9.52$
		Gas side	$\phi 15.88$ $\phi 15.88$

- The following table shows the equivalent pipe lengths and height differences for twin-and triple-type systems

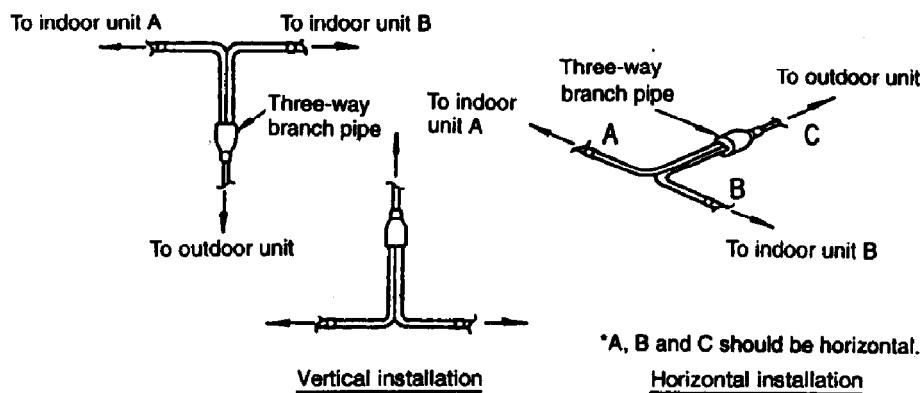
Equivalent length	$L + l_a + l_b$		Within 50 m
Branch pipe diameter	$l_a, l_b$		Within 15 m
Branch pipe difference	$l_a - l_b$		Within 10 m
Height difference	H1	Within 30 m	Height difference between indoor units H2 Within 1 m



※The branch pipe should be horizontal to or perpendicular to the indoor unit.

NOTE :

1. Use the main pipe to gain any rise or fall / required for the pipes.
  2. The number of bends should be 8 or less in a single system (L + Ia, L + Ib, L + Ic), and 15 or less overall.
  3. Branch pipes should be positioned horizontally.
- The branch pipe should be horizontal to or perpendicular to the / indoor unit.



#### ■ Installing branch pipes

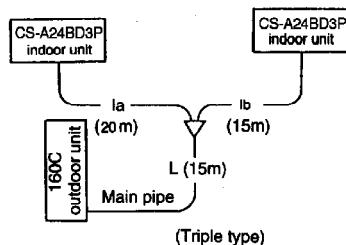
	Outdoor unit side (outer diameter)	Branch pipe (inner diameter)	Indoor unit side (outer diameter)
Gas side	φ 15.88	—	φ 12.7
	φ 19.05	Cut Adaptor socket (Check all of the soldering before use.)	φ 15.88 Cut φ 19.05 Adaptor socket
Liquid side	φ 9.52	—	φ 6.35
		φ 9.52 φ 6.35	φ 9.52 Cut

### 16.3. Refrigerant charging

- For twin- and triple-type systems / The pipe length is the total of the branch pipe (L) and the junction pipes (Ia → t Ib → t Ic in order from the thickest diameter)). At the / point where the pipe length exceeds 30 m, determine the amount of refrigerant for the remaining liquid-side pipe diameters and / pipe lengths from the following table in order to charge the system.

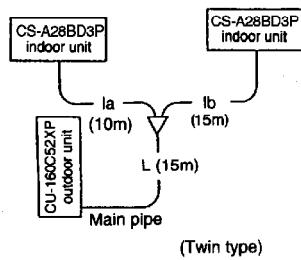
Liquid-side pipe diameter	$\phi 6.35$	$\phi 9.52$
Additional charging amount (kg/m)	0.02	0.05

Example 1: For 50BB outdoor unit with an equivalent pipe length of 50 m



	Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe(kg)
Main pipe (L)	9.52	15m	Not needed if within 30m
Main pipe (la)	6.35	20m	If exceeds 30 m, $5m \times 0.02 = 0.1$
Main pipe (lb)	6.35	15m	If exceeds 30 m, $15m \times 0.02 = 0.3$
	50m		Total 0.4 kg

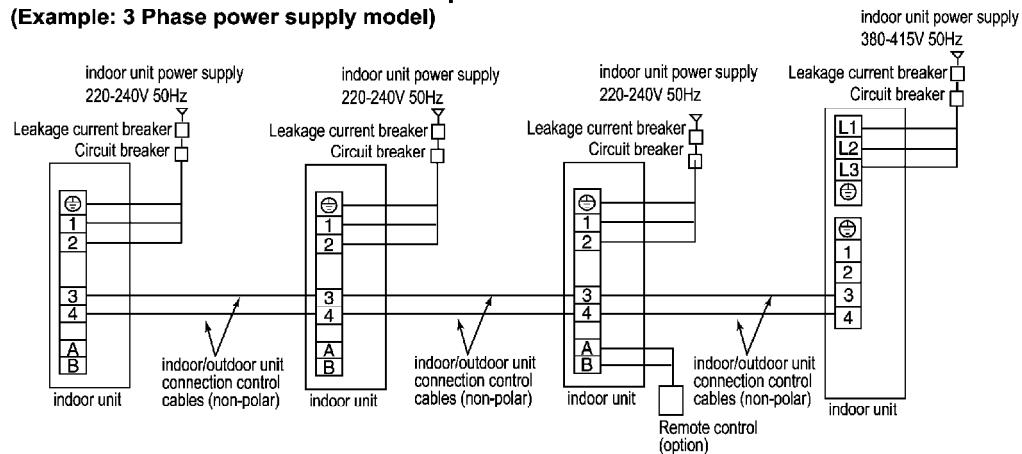
Example 2: For 50BB outdoor unit with an equivalent pipe length of 40 m



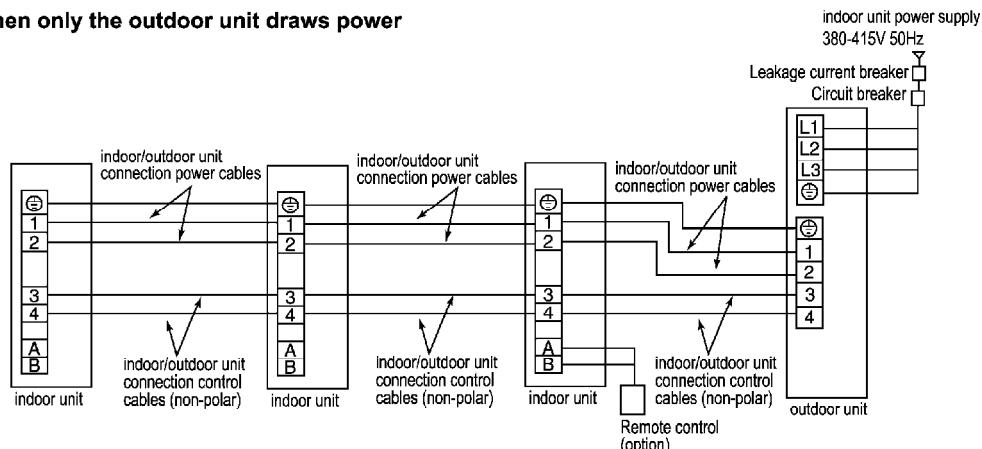
	Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe(kg)
Main pipe (L)	9.52	15m	Not needed if within 30m
Main pipe (la)	9.52	10m	Not needed if within 30m
Main pipe (lb)	9.52	15m	If exceeds 30 m, $10m \times 0.05 = 0.5$
	40m		Total 0.5 kg

## 16.4. Wiring

**When both indoor and outdoor unit draw power  
(Example: 3 Phase power supply model)**

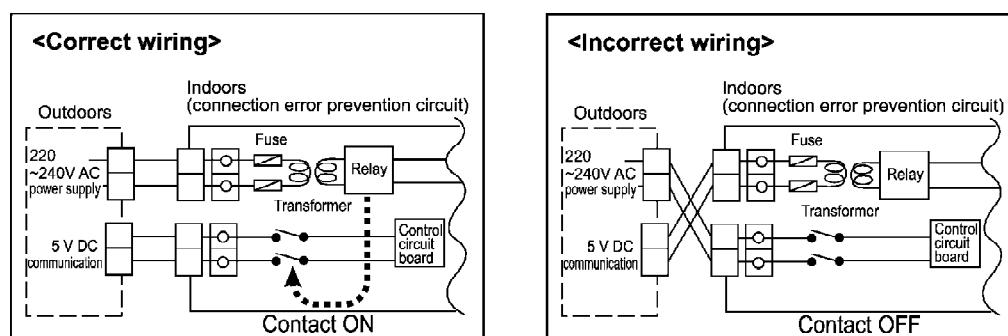


**When only the outdoor unit draws power**



## 17. WIRING MISTAKE PREVENTION

Improved quality of installation work through adoption of an “Connection error prevention” circuit which prevents wiring mistakes

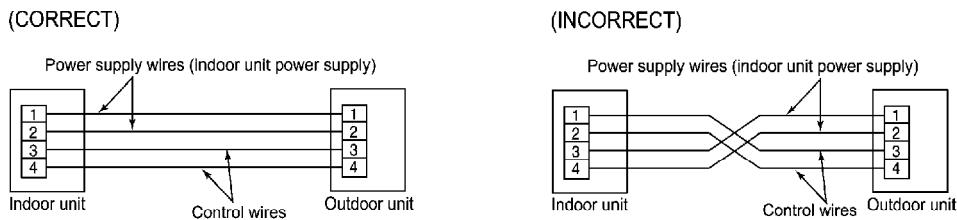


Connection errors with the control wires and the power supply wires will not only contribute to burning-out of the control circuit board, but can also cause large-scale working losses and affect reliability. If a circuit board with a “Connection error prevention” circuit is used, the relay will not operate if the wires have been connected incorrectly, so that current will not flow to the control circuit board. This is designed principally to eliminate human error at the installation site.

### Prevention of connection errors

These units are equipped with connection error prevention circuits. If the units do not operate,

it is possible that the connection error prevention circuits have operated. In such cases, check that the power supply wires (connected to terminals [1] and [2] and the control wires (connected to terminals [3] and [4]) are connected correctly. If they are connected incorrectly, connect them correctly. Normal operation should then commence.



- **Do not short the remote control wires to each other. (The protection circuit will be activated and the units will not operate.) Once the cause of the short is eliminated, normal operation will then be possible.**

NOTE:

- Wait one minute after turning on the indoor unit power supply before operating the remote control.
- If nothing at all appears in the remote control LCD, check the power supply for the indoor unit. / Refer to “TROUBLE SHOOTING”.

NOTE:

Never do any of the following, as doing so may damage the printed circuit board.

- Do not connect anything except a relay to the timer input or fan speed output (connector CNT1 on printed circuit board).
- Do not connect U-NET transmission wires to terminals 3 and 4 of the indoor and outdoor units. (\*1)
- Do not connect U-NET transmission wires to terminals A and B of the remote control. / (\*1) U-NET transmission wires are the communication wires used for the central controller.

## 18. TEST OPERATION AND SELF DIAGNOSIS

### 18.1. Test operation

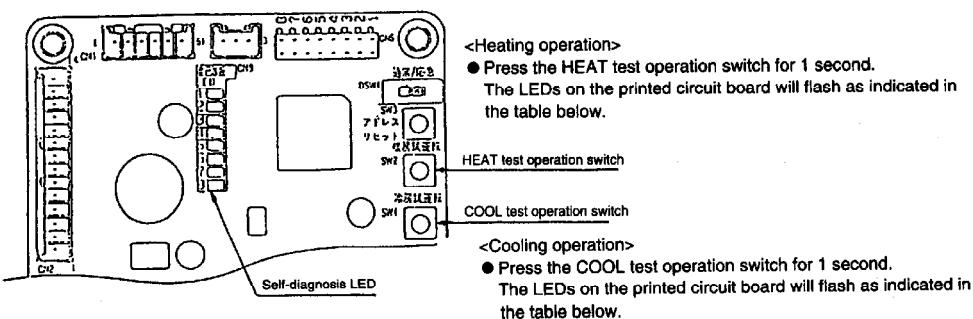
- Always be sure to use a properly-insulated tool to operate the switch on the circuit board. (Do not use your finger or a metallic object).
- Never turn on the power supply until all installation work has been completed.
- Turn on the circuit breaker before test operation extends past 6

hours. / (The crankcase heater will become energized, which will warm the compressor and prevent liquid compression.)

- For three-phase models, check that the phase is not reversed. / (If the phase is reversed, the LED on the printed circuit board will flash.)
- Check that the voltage is 198 V or higher when starting the unit. (The unit will not operate if the voltage is less than 198V.)
- Carry out test operation for 5 minutes or more using the remote control or the switch on the outdoor unit printed circuit board.
- Always carry out cooling first during test operation, even during the warm season. / (If heating is carried out first, problems with operation of the compressor will result.)

## 18.2. Test operation from the outdoor unit

(Outdoor unit printed circuit board)



During outdoor unit emergency operation or test operation, the LEDs on the printed circuit board will flash.

	LEDs on outdoor unit printed circuit board						
	LED2	LED3	LED4	LED5	LED6	LED7	LED8
Emergency operation display			-	-	-	-	
Cooling test operation from outdoor unit	-	-	-	-	-	-	
Heating test operation from outdoor unit				-	-	-	-

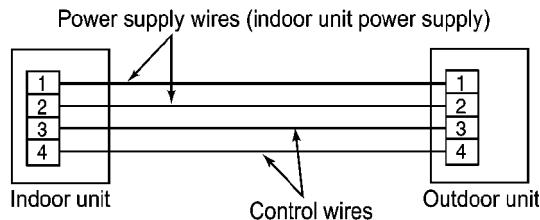
To cancel test operation, press the TEST or RUN button once more while test operation is being carried out. / (Test operation will stop automatically after 30 minutes have passed.)

NOTE:

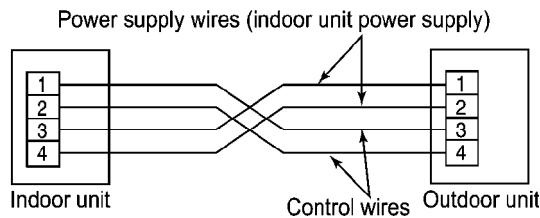
1. These units are equipped with connection error prevention circuits. If the units do not operate, it is possible that the connection error prevention circuits have operated. In such cases, check that the drive wires (connected to terminals [1] and [2]) and the control wires (connected to terminals [3] and [4]) are connected correctly. If they are connected incorrectly, connect

them correctly. Normal operation should then commence.

(CORRECT)

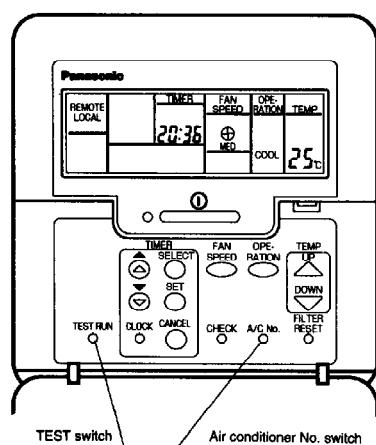


(INCORRECT)

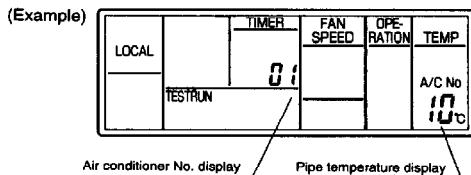


2. Do not short the remote control unit wires to each other. (The protection circuit will be activated and the units will not operate.) / Once the cause of the short is eliminated, normal operation will then be possible.

### 18.3. Test operation using the wired remote control

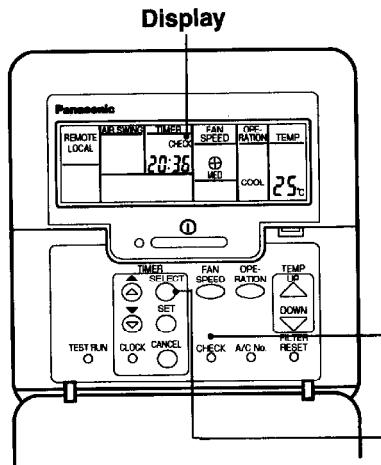


1. Check that "COOL" is displayed on the operation mode display, and then press the RUN switch to start test operation.
2. Within 1 minute of pressing the RUN switch, press the TEST RUN switch.
3. The pipe temperature (gas pipe) will then be displayed in the temperature setting display of the remote control



- During group control, the number appearing in the timer display will change each time the air conditioner No. switch is pressed, and the pipe temperature for the indoor unit corresponding to the number displayed will appear in the temperature setting display.
- 4. Check that the temperature in the pipe temperature display starts dropping after operation has been continuing for some time.  
(The temperature will increase during heating operation.)

- The wired remote control display and the self-diagnosis LEDs (red) on the outdoor unit printed circuit board indicate where the abnormality has occurred.
- Recalling the error display



(Example)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
	MANUAL	CHECK 20:36	MED	COOL	25°C

When an abnormality occurs at this unit, "CHECK" flashes in the display.

**Press the CHECK switch while the display is flashing.**

(Example)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
		CHECK F 15			A/C No 0 1°C

The timer display will change and an error code from F15 to F49 will appear in place of the time. (The temperature setting display will also change to show the air conditioner No.)

**Press the TIMER ON/OFF switch while the error is displayed.**

(Example)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
		CHECK - 0 1			A/C No 0 1°C

The F15 - F49 display will change to the detail display.

- <Air conditioner No. >
- The air conditioner No. "01" appears during normal installation and use. When using group control, a different number may appear. The air conditioner No. can be displayed by pressing the air conditioner No. switch.

- After checking the error display and the detail display, refer to the self-diagnosis error code table on the following page and check the location of the problem.
- If the problem is repaired and operation returns to normal, the CHECK display on the remote control will put out, but the self-diagnosis LED will remain illuminated until operation starts again.

**How to display the past error message**

If the "CHECK" display on the wired remote control is not flashing, press the CHECK button continuously for 5 seconds or more to display the problem details for the last problem or the problem before that. You can then switch between the displays for the previous problem and the problem before that by pressing the TIMER, FORWARD or BACK buttons.

(Last problem display: 1F15 - 1F49

Second-last problem display: 2F15 - 2F49)

Press the CHECK button once more to return to the normal display.

(Example of last problem display)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
		CHECK 1F 15			A/C No 0 1°C

An error code from 1F15 to 1F49 will be displayed.

(The temperature setting display will also change to show the air conditioner No.)

(Example)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
		CHECK 1- 0 1			A/C No 0 1°C

If the TIMER ON/OFF switch is pressed while the error code from 1F15 to 1F49 is being displayed, the display screen will change to show the details of the last problem display.

(If 2F15 to 2F49 is being displayed, the details of the second-last problem display will appear.)

## ■ Self-diagnosis error code table

Flashing Illuminated Off

Remote control display	Printed circuit board self-diagnosis LED (red)							Error display (Check location)
	Indoor unit		Outdoor unit					
Wired	LED2	LED3	LED4	LED5	LED6	LED7	LED8	
F17	-01							(*)2) (*)2)
F20	-01							(*)2) (*)2)
	-02							(*)2) (*)2)
F21	-01							(*)2) (*)2)
F25	-01							(*)2) (*)2)
F26	-01							(*)2) (*)2)
	-02							(*)2) (*)2)
F27	-01							
	-02							
F29	-01							(*)2) (*)2)
	-02							(*)2) (*)2)
	-12							(*)2) (*)2)
F30	-02							
	-06							
	-07							
F31	-02							
F33	-01							
	-02							
F40	-41							
	-61							
F41	-02							
	-03							
F42	-01							
F49	-01							
	-02							

If more than one error occurs between the indoor and outdoor units, the problem display on the remote control may not match the LED display on the outdoor unit printed circuit board. In such cases, check both locations and remove the causes of the problems.

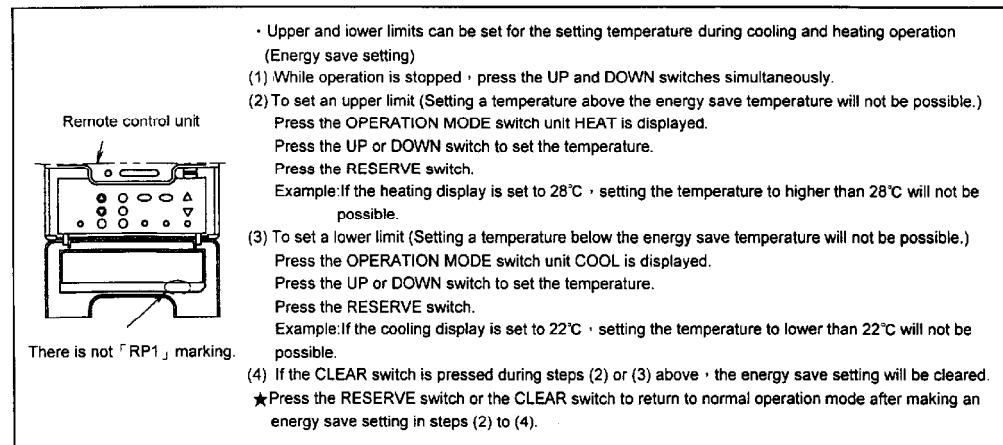
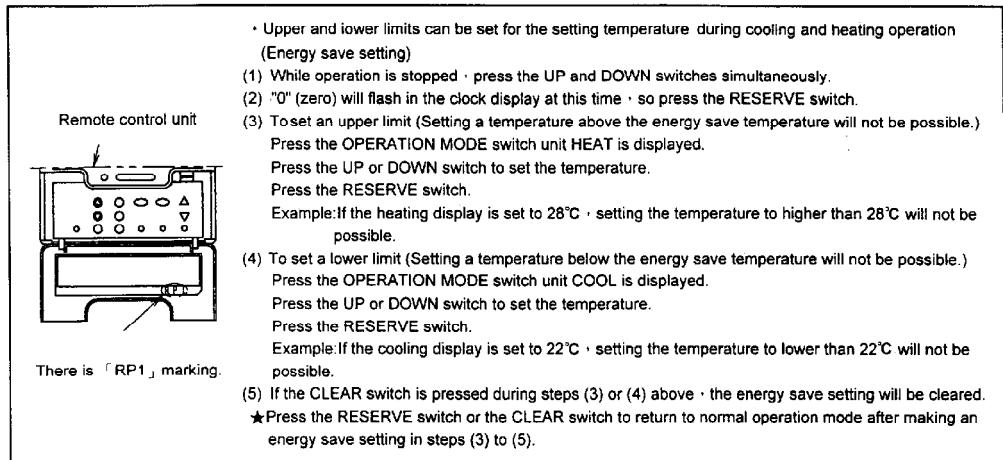
(*)2)	LED7	LED8	Unit display for twin/triple system
			Master unit error
			Slave unit 1 error

● The LED1 (green) illuminates to indicate that the microprocessor on the microprocessor circuit board is operating normally. If the LED is switched off or is flashing irregularly, check the power supply, and turn it off and then back on again.

## 19. SETTING OF SAVE ENERGY AND THERMISTOR SWITCH

### 19.1. Energy save setting

Open the cover remote control unit and confirm the presence of the [ RP1] marking. / Energy save setting method should be different for with [ RP1] marking and without [RP1] marking.



## 20. GROUP CONTROL

### 1 Setting group for 1 remote control unit

- When using a remote control thermostat, the thermostat setting is used for all indoor units in the group.
- During group control, up to a maximum of 16 indoor units can be connected. (Do not mix heat pump units and cooling-only units.)
- Do not mix manual settings and automatic settings. (manual settings take priority.)
- The master unit and slave units can all be centrally controlled during group control. /

### Automatic setting for group control

- If the power supplies for indoor units which are connected are turned on simultaneously, the indoor unit numbers will be determined automatically after approximately 1 minute. (DIP switch settings are not necessary.) /

**NOTE:**

- **Correct wiring connections are basic requirements for automatic setting.** If the wires are connected incorrectly when the power is turned on, the settings will not be made correctly and operation will not be possible.
- When address numbers are set automatically, you will not know which address number corresponds to which indoor unit.
- **Do not turn off the power supply for at least 1 minute during automatic address setting,** otherwise the settings will not be made correctly.

(Manual setting for group control)

Manual Setting	Indoor unit No.	1	2	3	4	5	6	7	8
	DIP switch (DSW1)	OFF ON 1 2 3 4 5 6 7 8							
	Setting on Indoor unit Printed circuit Board Air conditioner No.setting	No operation necessary	1 is ON	2 is ON	1 and 2 are ON	3 is ON	1 and 3 are ON	2 and 3 are ON	1, 2 and 3 are ON
	Indoor unit No.	9	10	11	12	13	14	15	16
	DIP switch (DSW1)	OFF ON 1 2 3 4 5 6 7 8							
	Setting on Indoor unit Printed circuit Board Air conditioner No.setting	4 is ON	1 and 4 are ON	2 and 4 are ON	1, 2 and 4 are ON	3 and 4 are ON	1, 3 and 4 are ON	2, 3 and 4 are ON	1, 2, 3, 4 are ON

**Automatic address resetting for group control**

After setting DIP switches 1 to 4 to OFF and stop operation. Then press the "AIR SWING AUTO" "OPERATION MODE" and "Air conditioner No." switches simultaneously. Then addresses will be momentarily reset, and then automatic address setting will be carried out once more. /

**Switching the thermistor.**

- The temperature detection thermistor used for detecting the air temperature and changing between COOL and HEAT operation can be switched between the thermistor at the indoor unit and the thermistor at the remote control unit box. However, do not switch to the remote control unit thermistor if using two remote control units.

1. While operation is stopped, press and hold the STOP/RUN switch, and then press the UP and DOWN / switches together.
2. "DO" or "01" will appear in the time display.
3. Press the FORWARD or BACK timer switches to switch the display between "00" and "01". "00" ... Indoor unit setting (factory default) "01" ... Remote control unit setting

**4. Press the RESERVE switch. (Be sure to press the RESERVE switch so that normal operation mode can be resumed.)**

- Repeat the procedure in steps (1) to (4) to change the setting again.

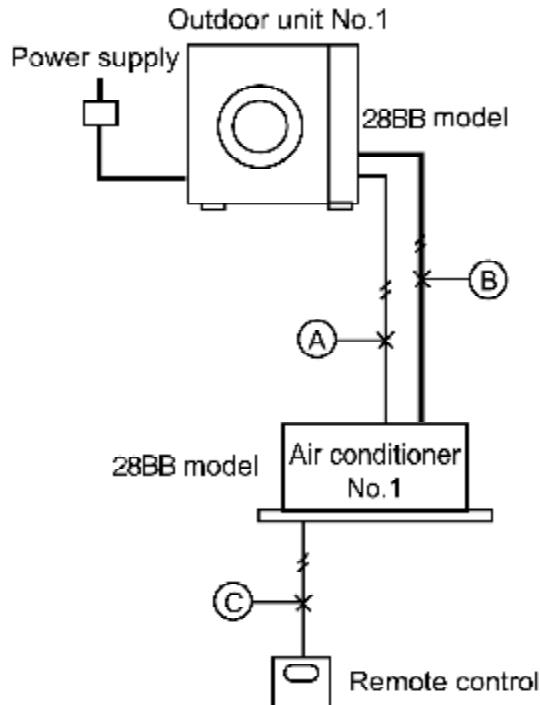
## 21. TROUBLE SHOOTING

If test operation does not proceed correctly

Carry out test operation after approximately 6 hours have passed since the power was turned on (crankcase heater is energized). If operation is started by using the remote control within 1 minute of turning on the power, the outdoor unit settings will not be made correctly and correct operation will not be possible.

If the following symptoms occur after turning on the power, check the wiring connections once more. /

- For standard installation / (System example)



1. The main power is turned on while the indoor-outdoor transmission wires are not connected (open circuit at section A) /  
Symptom: / Remote control unit . . . “CHECK” flashes / NOTE: / Indoor unit . . . LED2 on printed circuit board flashes / Outdoor

unit . . . LED3 and LED7 on printed circuit board flash /

2. The main power is turned on while the indoor-outdoor power supply wires are not connected (open circuit at section B) /

Symptom: / Remote control unit . . . Display of "No power supply"

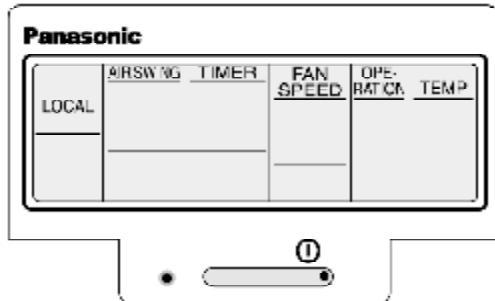
/ NOTE: / Indoor unit . . . No display / Outdoor unit . . . LED3 and LED7 on printed circuit board flash /

3. The main power is turned on while the remote control unit connection cord is not connected (open circuit at section C) /

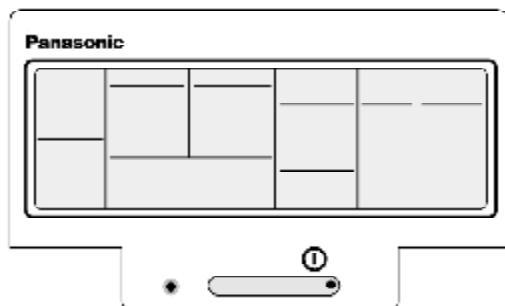
Symptom: / Remote control unit . . . Display of "No power supply"

/ NOTE: / Indoor unit . . . LED1 on printed circuit board stays illuminated / Outdoor unit . . . LED1 on printed circuit board stays illuminated

/ (When remote control display shows "Power supply")



(When remote control display shows "No power supply")

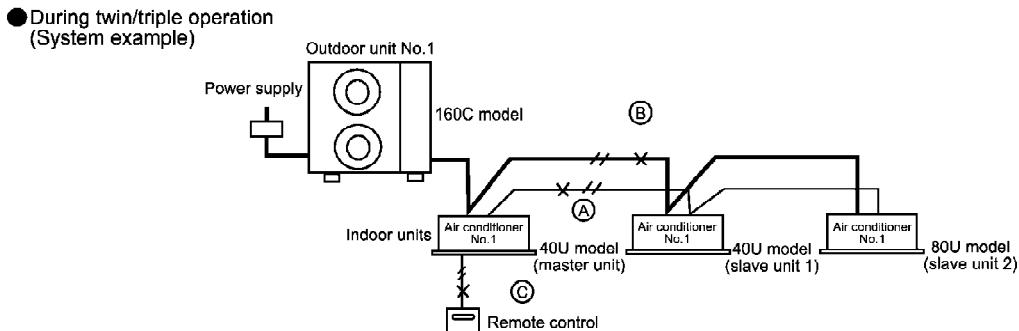


### Remedy

1. Turn off the main power. / ↓
2. Connect the disconnected wire correctly. / ↓
3. Turn the main power back on. / ↓
4. After 1 minute, start operation using the remote control. / (Indoor unit . . . Operation will start according to the remote control setting.) / (Outdoor unit . . . Operation will start after 3-5 minutes.)

NOTE: / / The "CHECK" display on the remote control and the

**flashing of LEDs on the printed circuit boards will not occur immediately. They will appear 3-6 minutes after the main power is turned on. /**



**1. The main power is turned on while the transmission wires between the indoor unit(s) are not connected (open circuit at section A) / Symptom: / Nothing abnormal appears on the remote control display. If operation is then started in this condition, the combination of the 160C outdoor unit and the 40U indoor unit (master unit) will cause abnormal operation to occur. / ↓ / If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop.**

- Remote control . . . “CHECK” flashes
- Indoor unit (master) . . . The LEDs on the printed circuit board flash and operation stops
- Indoor unit (slave) . . . LED1 on the printed circuit board illuminates and the unit does not operate at all
- Outdoor unit . . . The LEDs on the printed circuit board flash and operation stops /

**2. The main power is turned on while the power supply wires between the indoor unit(s) are not connected (open circuit at section B) / Symptom: / Same as above. If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop. / ↓**

- Remote control . . . “CHECK” flashes
- Indoor unit (master) . . . The LEDs on the printed circuit board flash
- Indoor unit (slave) . . . The LEDs on the printed circuit board

- do not illuminate and the unit does not operate at all
- Outdoor unit . . . The LEDs on the printed circuit board flash and operation stops /

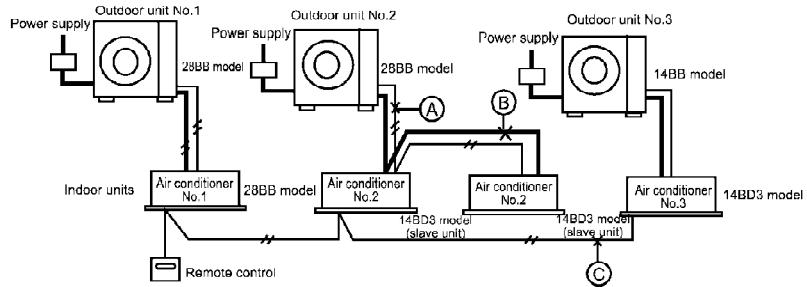
3. The main power is turned on while the remote control connection cord is not connected (open circuit at section C) / Symptom:

- Remote control unit . . . Display of “No power supply”
- Indoor unit (master) . . . LED1 on the printed circuit board stays illuminated and the unit does not operate
- Indoor unit (slave) . . . LED1 on the printed circuit board stays illuminated and the unit does not operate
- Outdoor unit . . . LED1 on the printed circuit board stays illuminated and the unit does not operate

/ Remedy

1. Turn off the main power. / ↓
2. Connect the disconnected wires correctly. / ↓
3. Turn the main power back on. / ↓
4. After 1 minute, start operation using the remote control. / (Indoor units . . . Operation will start according to the remote control setting.) / (Outdoor unit . . . Operation will start after 3-5 minutes.)  
/ If slave units do not operate even after the wiring has been corrected (automatic addressing is not possible)
1. Check that DIP switches 1 to 4 and DIP switch 8 are all set to OFF, and then stop operation. / ↓
2. Press the ADDRESS RESET button (SW3) at the outdoor unit for approximately 4 seconds / (The self-diagnosis LEDS 2 to 8 will illuminate in order, and the system is reset once they are all illuminated.)  
/ The above procedure cannot be used to carry out automatic address resetting during group control. /

● During group control operation  
(System example)



- 1. The main power is turned on while the transmission wires between the indoor unit and the outdoor unit are not connected (open circuit at section A) / Symptom: / Operation of indoor unit No. 1 and indoor unit No. 3 is possible. / However, “CHECK” flashes in the remote control unit display for 3-5 minutes after the main power is turned on.**
  - Remote control . . . “CHECK” flashes
  - Indoor unit No. 2 . . . LED2 on the printed circuit board flashes (both master and slave units)
  - Outdoor unit No. 2 . . . LED3 and LED7 on the printed circuit board flash /
- 2. The main power is turned on while the power supply wires between the indoor units are not connected (open circuit at section B) / Symptom: / Operation of indoor unit No. 1 and indoor unit No. 3 is possible / However, if operation is then started in this condition, the combination of the 28BB outdoor unit and the 14BB indoor unit (master unit) will cause abnormal operation of indoor unit No. 2 to occur / ↓ / If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop**
  - Remote control . . . “CHECK” flashes (indoor unit No. 2 abnormality)
  - Indoor unit No. 2 . . . LED2 on the printed circuit board flashes (both master and slave units)
  - Outdoor unit No. 2 . . . The LEDs on the printed circuit board flash /
- 3. The main power is turned on while the remote control connection cord is not connected (open circuit at section C) / Symptom: /**

**Nothing abnormal appears on the remote control display, and operation of indoor unit No. 1 and indoor unit No. 2 is possible. / However, indoor unit No. 3 cannot be operated. /**

**Remedy**

- 1. Turn off the main power. / ↓**
- 2. Connect the disconnected wires correctly. / ↓**
- 3. Turn the main power back on. / ↓**
- 4. After 1 minute, start operation using the remote control. / (Indoor units . . . Operation will start according to the remote control setting.) / (Outdoor units . . . Operation will start after 3-5 minutes.) /**

If slave units do not operate even after the wiring has been corrected (automatic addressing is not possible)

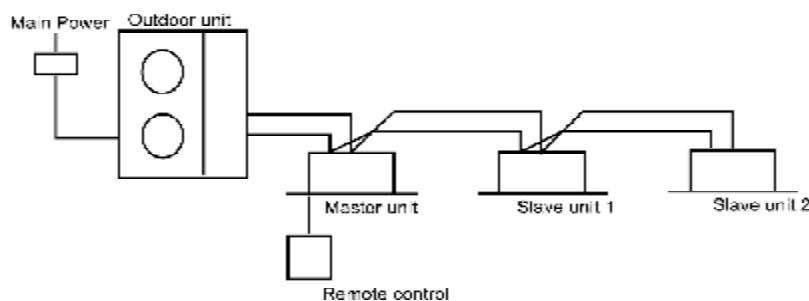
- 1. Check that DIP switches 1 to 4 and DIP switch 8 are all set to OFF, and then stop operation. / ↓**

- 2. Press the “AIRSWING AUTO”, “OPERATION” and “A/C No.” buttons simultaneously. / The addresses will be momentarily reset, and then automatic address setting will be carried out once more.**

/ The above procedure cannot be used to carry out automatic address resetting of twin/triple control. / / (Note on automatic address setting) / The printed circuit boards automatically store the connected system configuration when power is supplied. As a result, once the power has been turned on for these printed circuit boards, the units can not be changed about within the system, even if the units are of the same model and have same capacity. /

**ADDRESS SETTING FOR TWIN/TRIPLE SYSTEM**

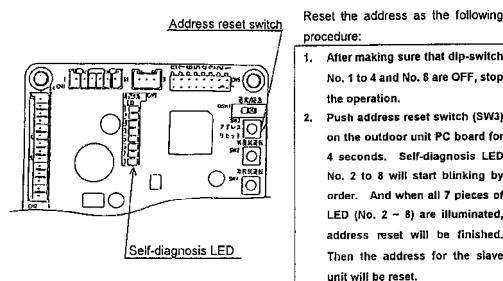
(Example)



- 1. Automatic address setting (no need to have dip-switch set) / If the wiring connected properly as above example, the address is set automatically by the main power supply. An indoor unit with**

**remote control will be set as the master. If the power source is installed to indoor units and outdoor separately, turn on the switch as the following procedure: outdoor unit, indoor unit with control, and other indoor units. /**

**When the slave units do not operate (when address cannot be set) /**



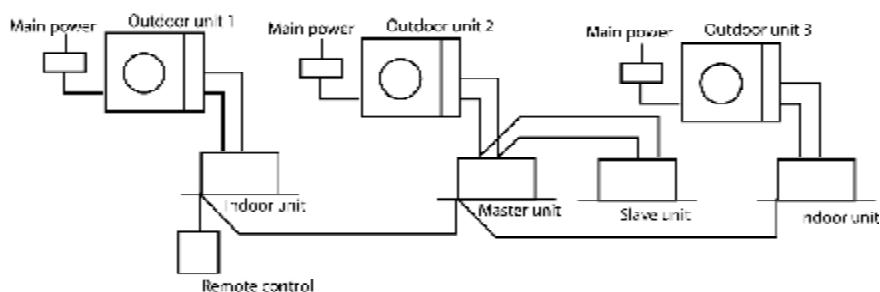
**Important: The address for the group control cannot be reset, using the above mentioned procedure. /**

**2. Manual address setting (by dip-switch DSW1) / When you set the address manually, set the dip-switch of the PC board in the indoor unit as follow:**

Master Unit	Slave unit (Slave No.1 of Triple)	Slave unit (Slave No.2 of Triple)
No need to set address for the RC of the master unit  The address for the master unit will be set in the unit with RC	DSW1 ON      OFF 1 2 3 4 5 6 7 8 No. 8 ON, the others no change	DSW1 ON      OFF 1 2 3 4 5 6 7 8 No. 1 and 8 ON, the others no change

#### ADDRESS SETTING FOR GROUP CONTROL SYSTEM

(Example)



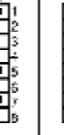
**1. Automatic address setting (no need to have dip-switch set) / If the wiring connected properly as above example, the AC numbers are set automatically by the main power supply. An indoor unit with remote control will be set as the master. / If the power source is installed to indoor units and outdoor separately, turn on the**

switch as the following procedure: outdoor unit, indoor unit with controller, and other indoor units. The AC number will be set at random. / /

**2. Manual address setting (by dip-switch DSW1) / When you set the address manually, set the dip-switch of the PC board in the indoor unit as follow:**

Master Unit	Slave Unit	
	Slave No.1 of Triple	Slave No.2 of Triple
No need to set address for the RC of the master unit.  The address for the master unit will be set in the unit with RC.	DSW1 ON OFF 1 2 3 4 5 6 7 8 No.8 ON, the others no change	DSW1 ON OFF 1 2 3 4 5 6 7 8 No.1 and 8 ON, the others no change

**3. Manual address setting (by dip-switch DSW1) / When you set the address manually, set the dip-switch of the PC board in the indoor unit as follow:**

Indoor unit No.	1	2	3	4	5	6	7	8
Dip-switch on the PCB of the Indoor unit (DSW1)								
	No Charge	No.1 ON	No.2 ON	No.1,2 ON	No.3 ON	No.1,3 ON	No.2,3 ON	No.1,2,3 ON
Indoor unit No.	9	10	11	12	13	14	15	16
Dip-switch on the PCB of the Indoor unit (DSW1)								
	No.4 ON	No.1,4 ON	No.2,4 ON	No.1,2,4 ON	No.3,4 ON	No.1,3,4 ON	No.2,3,4 ON	No.1,2,3,4 ON

**Procedures of deleting memory at twin/triple control system**

1. Set the “OFF” position for main power supply switch.
2. Set the “ON” position for No. 8 pin of dip switch (DSW1) on indoor unit P.C. board.
3. Take main power supply switch “ON” for one minute, and then main power supply switch off.
4. Set the “OFF” position for No. 8 pin of dip switch (DSW1).

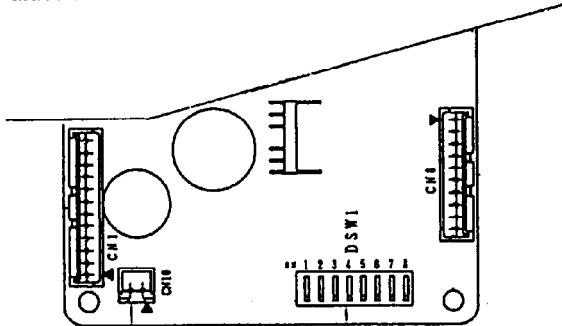
Procedure of deleting memory at group control system

1. Set the “OFF” position for main power supply switch.
2. Set the “ON” position for No. 1 pin to No. 4 pin of dip switch (DSW1) on indoor unit P.C. board. / (No. 8 pin of dip switch (DSW1) should be “OFF” position)
3. Take main power supply switch “ON” for one minute, and then main power supply switch off.
4. Set the “OFF” position for No. 1, No. 2, No. 3 and No. 4 pin of dip switch (DSW1).

(Important notice) / Above procedures are for deleting memory on indoor unit P.C. board. And it is not for Address reset.

### 21.1. Indoor unit P.C. board layout.

Below drawing has showing the location of dip switch 1(DSW1) on the indoor unit P.C. board.



Dip switch1(DSW1). [to use for manual setting ]

## 22. EMERGENCY OPERATION

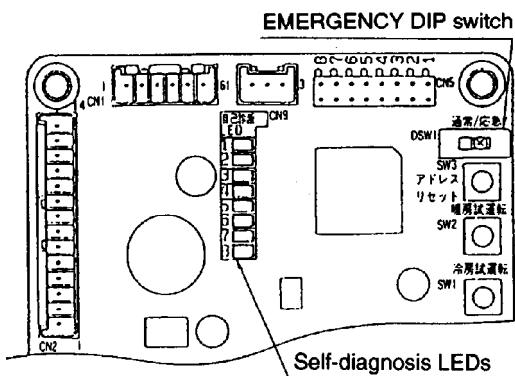
Emergency operation

- Emergency operation of outdoor unit / Emergency operation can be carried out by setting the DSW1 switch on the printed circuit board inside the outdoor unit to the EMERGENCY position. However, emergency operation is only carried out when an abnormality is detected by the indoor/outdoor temperature thermistors. / The resistance values of each thermistor are measured as shown in the table below to determine if there is an abnormality. / Thermistor resistance table

Temperature	Resistance value (kΩ) ± 5%	
	Room temperature thermistor	Pipe temperature thermistor
-20°C	205.8	197.8
-10°C	114.6	111.9
-5°C	87.3	85.4
0°C	67.0	65.8
5°C	51.8	51.0
10°C	40.4	39.9
15°C	31.7	30.7
20°C	25.1	25.0
25°C	20.0	20.0
30°C	16.1	16.0
40°C	10.4	10.6
50°C	6.9	7.1
60°C	4.7	4.9
70°C	—	3.5
80°C	—	2.5
90°C	—	1.8
100°C	—	1.4

The pipe temperature thermistor resistance value are the same for the indoor and outdoor units.

<When a thermistor abnormality is judged to have occurred>



- Set only the thermistor which shows an abnormality to the condition shown in the table below to carry out emergency operation

	Thermistor	Cooling mode	Heating mode
Indoor unit	Room temperature	Fixed at 25°C	
	Room temperature	Shorted	Open

	Thermistor	Cooling mode	Heating mode
Outdoor unit	Discharge temperature	Open	Shorted
	Heat exchanger outlet temperature	Shorted	Open

- Refer to the circuit diagram for the connection locations for each thermistor.
- If there is an abnormality in the room temperature thermistor, the temperature will be fixed at 25°C regardless of the remote control unit display.

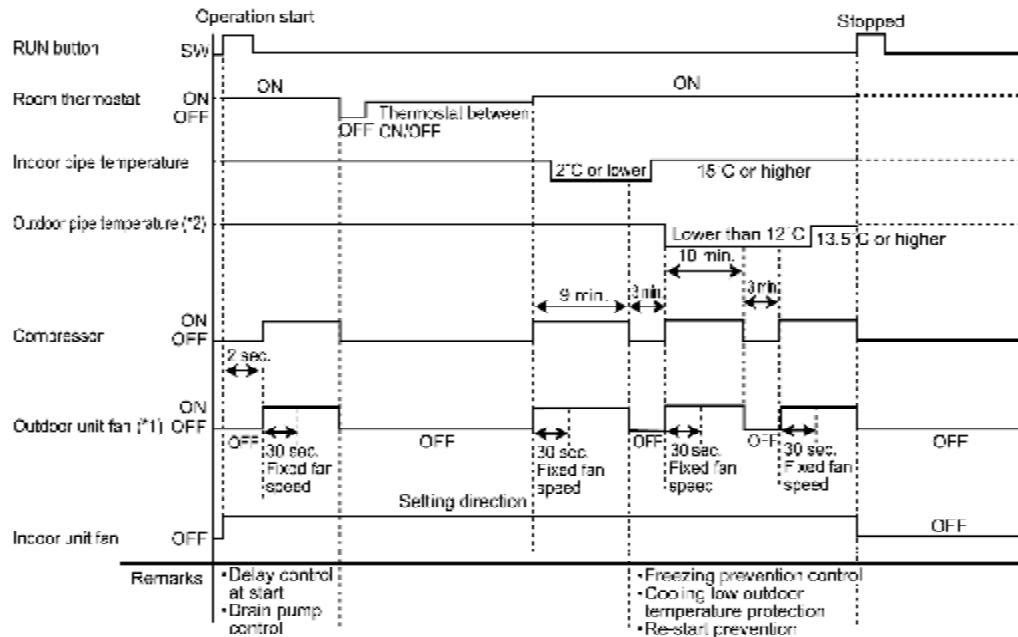
**NOTE:**

- Any abnormalities detected by the temperature thermistors are ignored during emergency operation, so that long-term operation in this mode should be avoided.
- After emergency mode operation has been completed and normal operation is to be resumed, turn the power supplies for the indoor and outdoor units off and return the DIP switch to the NORMAL position.
- Self-diagnosis LEDS 4 to 6 will flash during emergency operation.

## 23. CONTROL

### 23.1. Description of basic Functions

#### 23.1.1. Cooling mode operation time chart



(\*1) / Outdoor unit fan start control during cooling / At the start of cooling mode and drying mode operation, the outdoor unit heat exchanger outlet temperature is detected in order to set the fan speed. / Operation is carried out at the fan speed detected for 30 seconds.

Heat exchanger outlet temperature detected (T)	Outdoor unit fan start speed
$T < 0^{\circ}\text{C}$	SUPER LOW
$0^{\circ}\text{C} \leq T < 10^{\circ}\text{C}$	LOW
$10^{\circ}\text{C} \leq T < 20^{\circ}\text{C}$	MEDIUM
$20^{\circ}\text{C} \leq T < 25^{\circ}\text{C}$	HIGH
$25^{\circ}\text{C} \leq T$	SUPER HIGH

After 30 seconds, the heat exchanger outlet temperature is detected and the outdoor unit fan speed is changed automatically.

(\*2) / Cooling low outdoor temperature protection / When the heat exchanger outlet temperature drops to less than 12°C for a continuous period of 10 minutes, the outdoor unit stops running. / This is cancelled after 3 minutes (re-start prevention)

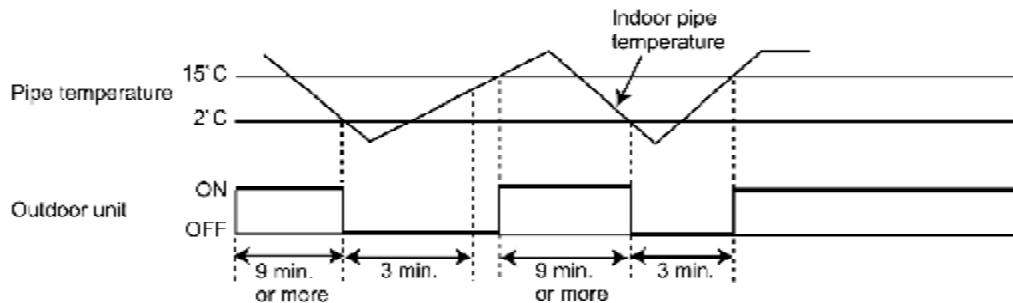
- Remote control displays and indoor unit operation continue during this time.
- The 10-minute countdown is cleared if the compressor stops or if the temperature at the outdoor unit outlet rises to 13.5°C or higher.

### 23.2. Freezing prevention control

1. Operation / During cooling mode operation, after 9 minutes have passed since the compressor turned on, the outdoor units stop operating when the temperature detected by the indoor unit pipe temperature sensor is 2°C or lower. / The indoor unit continues

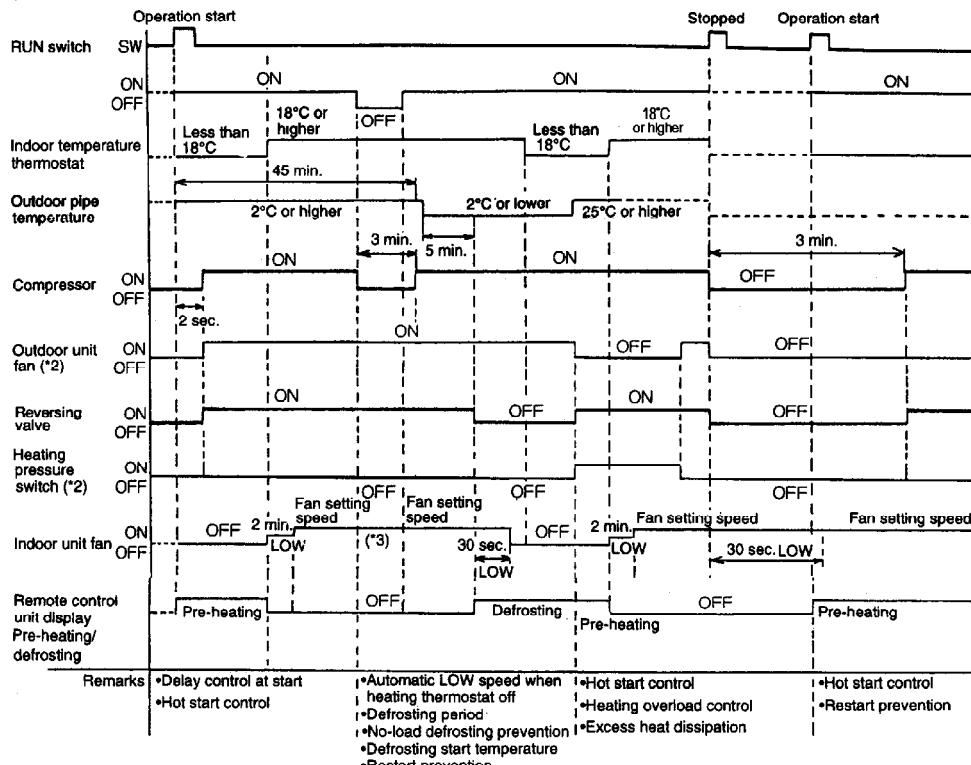
operating at the fan speed set by the remote control unit. (The remote control unit display does not change.)

2. Cancelling / This control is cancelled when the temperature detected by the indoor unit pipe temperature sensor is 15°C or higher. / (If the outdoor unit stops even though the temperature is 15°C or higher, restart prevention control will be activated and the outdoor unit will not start again for 3 minutes.) / (The 9-minute countdown is cleared while the compressor is stopped.)



(The above illustration shows the operation when there are no conditions for turning the outdoor unit off other than freezing prevention.)

### 23.3. Heating mode operation time chart (Heat pump type only)



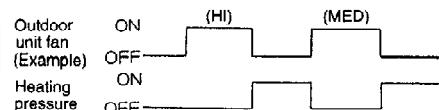
(\*)3 Refer to "⑥ Indoor unit fan control when thermostat is off during heating mode operation"

(\*)4 Refer to "⑨ Indoor thermostat characteristics"

#### (\*2) / Outdoor unit fan control during heating mode operation

Under conditions when the compressor is on during heating mode operation (except during defrosting and / when the liquid bypass valve is on), the outdoor unit fan is controlled by means of input (CN2) indicating / whether the contact of the heating pressure switch on the outdoor unit circuit board is open or closed / (At the start of heating mode operation, the fan operates at HI speed.)

Heating pressure switch contact	Outdoor unit fan operation
ON (open) - OFF (closed)	One step down from fan speed before stopping
ON (open)	Stopped



The heating pressure switch turns on at 2.35 MPa and off at 1.96 MPa.

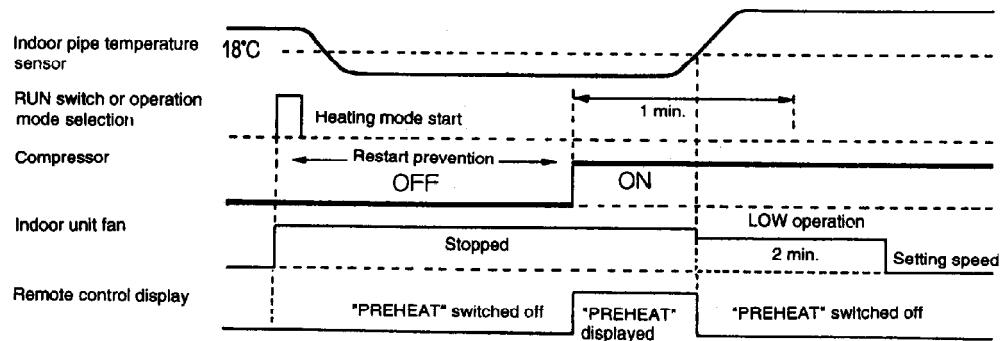
### 23.4. Hot starting

#### 1. When heating mode operation starts

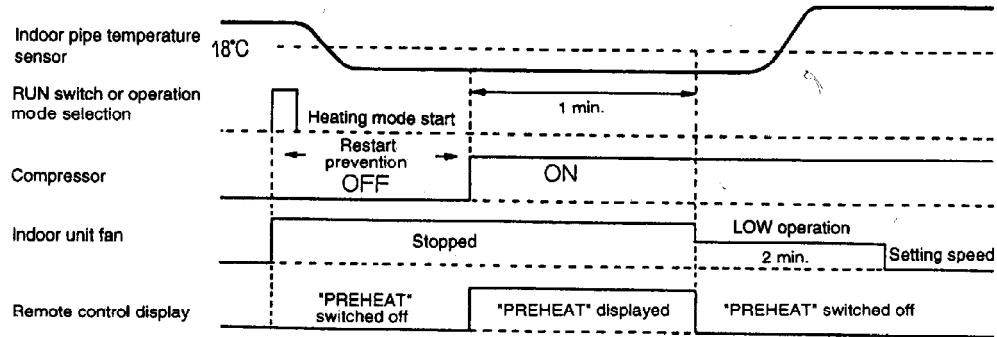
1. Start / Hot start control commences heating mode operation starts.

2. Operation / “PREHEAT” appears on the remote control display. (Other displays remain unchanged.) / At the indoor unit, the indoor unit fan stops. In addition, during hot starting, the louvre stays at the horizontal / position (angle 0~).

**3. Cancelling / After 1 minute has passed since heating mode operation started, or if the compressor has turned on, hot / starting is cancelled when the temperature detected by the indoor unit pipe temperature sensor is 18~C / or higher. / After cancellation, the "PREHEAT" display on the remote control disappears and the louvre operation / returns to the previous setting. / (However, for 2 minutes after cancellation, the indoor unit fan operates at LOW speed, and then returns to / the previous setting.) / / <When hot start operation is cancelled by temperature>**



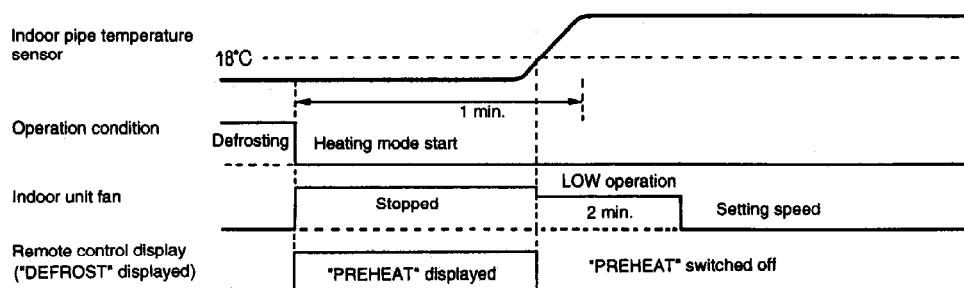
<When hot start operation is cancelled by time>



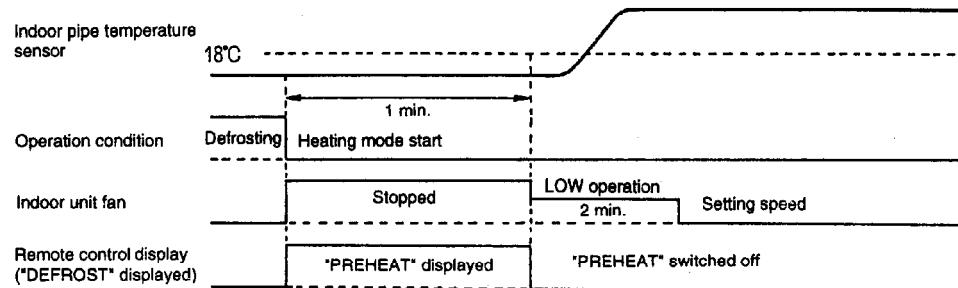
**2. When defrosting is complete**

- 1. Start / Hot start control commences when defrosting is complete.**
- 2. Operation / "PREHEAT" appears on the remote control display. (Other displays remain unchanged.) / At the indoor unit, the indoor unit fan stops. In addition, during hot starting, the louvre stays at the horizontal / position (angle 0~).**

**3. Cancelling / Hot starting is cancelled when the temperature detected by the indoor unit pipe temperature sensor is 18~C / or higher, or after a maximum 1 minute has passed since defrosting was completed. / After cancellation, the "PREHEAT" display on the remote control disappears and the louvre operation / returns to the previous setting. / (However, the indoor unit fan operates at LOW speed for 2 minutes after cancellation, and then returns to / the previous setting.) / < When hot start operation is cancelled by temperature >**

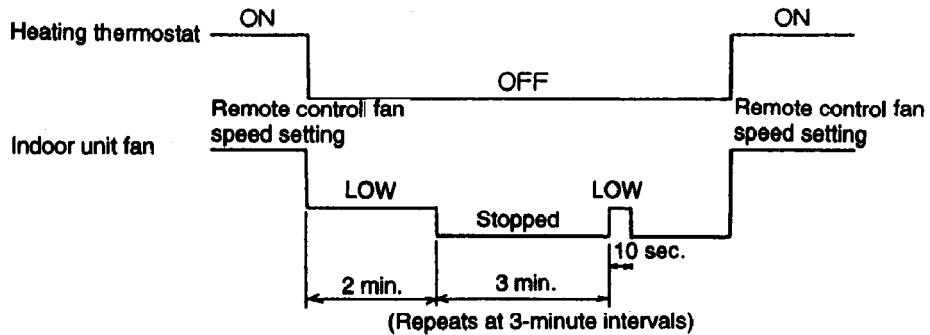


<When hot start operation is cancelled by time>



### 23.5. Indoor unit fan control when thermostat is off during heating mode operation

When the thermostat of the indoor unit turns off during heating mode operation, the indoor unit fan operates for 2 minutes at LOW and then stops. In addition, 5 minutes after the thermostat of the indoor unit turns off, the indoor unit fan again runs at LOW for 10 seconds, and at 3-minute intervals after that it switches back to LOW operation for 10 seconds.

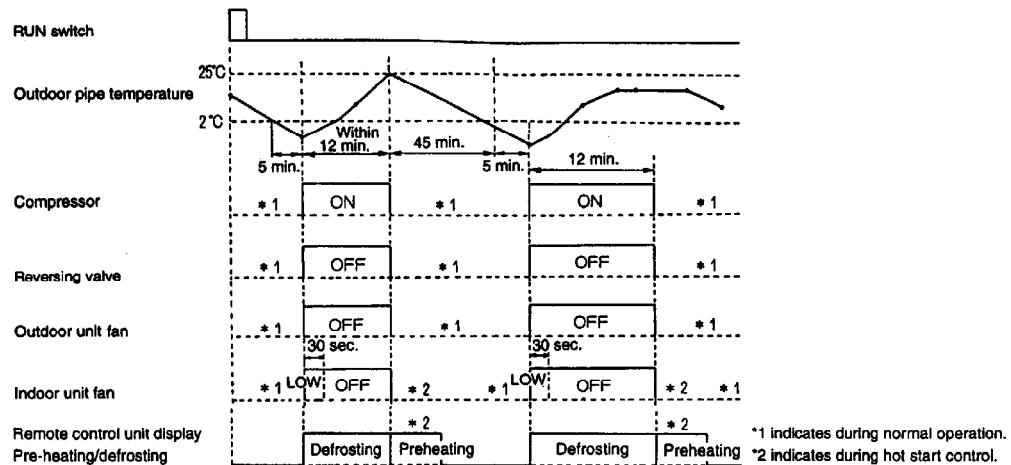


### 23.6. Excess heat dissipation for indoor unit

The indoor unit fan continues operating for 30 seconds after heating mode operation turns off in order to / dissipate excess heat.

1. When heating mode operation has stopped / (LOW operation for 30 seconds)
2. When operation is set to a mode other than heating by means of the OPERATION MODE switch
3. If operation starts again during the 30 seconds mentioned in (1) above / (The fan operates at LOW speed for the remainder of the 30 seconds in (1), and then hot start commences.)

### 23.7. Defrost mode operation time chart



#### 1. Start and completion of defrosting

- A. Start / During heating mode operation (including automatic heating), after the 45-minute defrosting cycle time has / passed, defrosting starts if the temperature detected by the outdoor unit heat exchanger outlet sensor is / 2~C or lower for a continuous

**5-minute period. / However, if the outdoor unit fan is stopped, the start of defrosting will be delayed by 5 minutes. / The defrosting cycle is 50 minutes from the start of heating mode operation.**

- B. Completion / Defrosting mode operation stops 12 minutes after it starts, or if the temperature detected by the outdoor / unit heat exchanger outlet sensor is 25~C or higher. / After defrosting is complete, hot starting commences.**
- C. Forced defrosting / If P8 on the outdoor unit circuit board is shorted while the compressor is 'ON' during heating mode operation / and the temperature detected by the outdoor unit heat exchanger outlet sensor is 25~C or lower, defrosting / is carried out regardless of the current starting conditions.**

## **2. Operation**

- A. During defrosting, the outdoor unit turns on the compressor and turns off the outdoor unit fan and the reversing valve.**
- B. The indoor unit fan operates at LOW for 30 seconds after defrosting starts. After this, the indoor unit fan turns off until defrosting is complete. / (During defrosting, the louvre of the indoor unit stays at the horizontal.)**

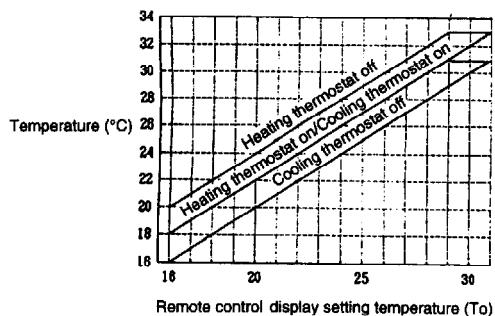
### **23.8. Indoor thermostat characteristic**

#### **1. Thermostat characteristic during cooling and heating modes**

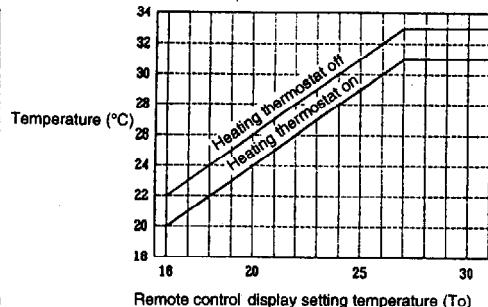
Operation mode	Setting temperature (To)	Room temperature (°C)			
		Operation	Differential		
			2.0K	4.0K	
Cooling	16	O N	18.0	—	
		O F F	16.0	—	
	31	O N	33.0	—	
		O F F	31.0	—	
Heating *1	16	O N	18.0	20.0	
		O F F	20.0	22.0	
	29-31 *1(27-31)	O N	31.0	31.0	
		O F F	33.0	33.0	

\*1 If jumper wire J3 on the indoor unit circuit board is disconnected, the thermostat characteristics during heating become 2 K or higher.

Thermostat characteristics during cooling and heating modes



Thermostat characteristics during heating mode (when jumper wire J3 is disconnected)



NOTE: If the remote control unit display setting temperature (To) is 29°C or higher, the heating thermostat turns on when the room temperature is 31°C.

## 2.Thermostat characteristics during dry mode

During dry mode operation, cooling mode operation is carried out in accordance with the indoor temperature as shown in the table below.

Mode	Indoor Temperature (°C) T	Operation details	
①	$T \geq 28$	Cooling thermostat on	LO, Louvre horizontal
*②	$28 > T \geq 25$	Cooling thermostat on 10 min./fan 5 min., alternate operation	LO, Louvre horizontal
*③	$25 > T \geq 21$	Cooling thermostat on 5 min./fan 10 min., alternate operation	LO, Louvre horizontal
④	$21 \geq T$	Cooling thermostat off	LO, Louvre horizontal

(Differential is 1.5 K)

\*When modes ② and ③ are active, dry mode operation starts when the cooling thermostat turns on.

When modes ② and ③ have been stopped, the 10 min./5 min. times have no relevance. However, if the indoor temperature is less than or equal to the remote control unit setting temperature, mode ④ is forcibly activated.

## 3.Thermostat characteristics during automatic changeover operation

### ①Settings at the start of automatic changeover operation

When operation starts, or when operation changes from some other mode to automatic changeover mode, it starts at the temperature characteristics given in the table below.

Indoor temperature (T) °C	Initial setting
$T < \text{remote control display temperature} - 2$ (°C)	Heating mode operation, thermostat on
$\text{Remote control display temperature} \geq T$	Heating mode operation, thermostat off (fan mode operation)
$\text{Remote control display temperature} \leq T$	Cooling mode operation, thermostat off (fan mode operation)
$\text{Remote control display temperature} + 2$ (°C) $< T$	Cooling mode operation, thermostat on

2 (°C): Thermostat differential

### ②Thermostat characteristics when switching between cooling and heating mode operation

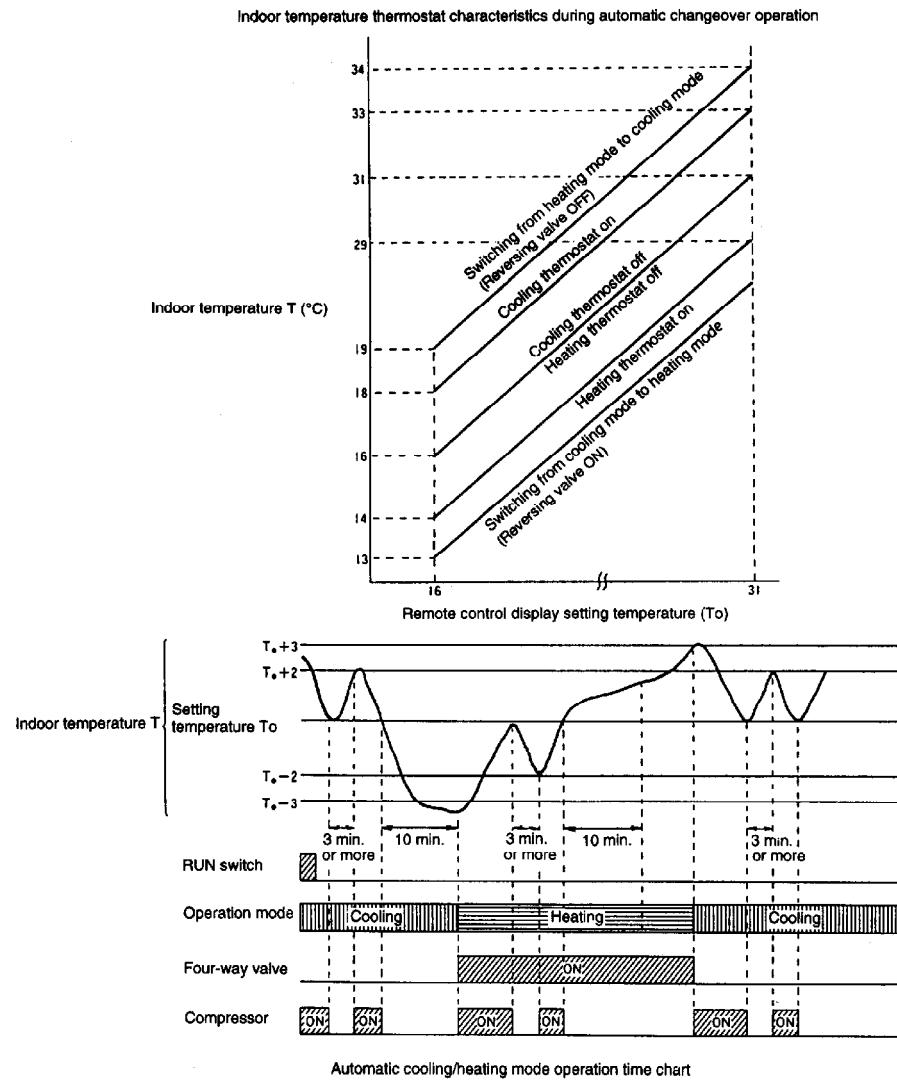
Switching between cooling mode and heating mode operation is carried out as shown in the table below. However, during automatic operation, the operation does not change again until 10 minutes after the thermostat has switched off in either cooling mode or heating mode.

(The 10-minute timer is cancelled when operation is changed to another mode or when operation stops and the thermostat turns on.)

Indoor temperature (T) °C	Operation switching
$T \geq \text{Remote control display temperature} + 3$ (°C)	Heating mode → Cooling mode
$T \leq \text{Remote control display temperature} - 3$ (°C)	Cooling mode → Heating mode

## 4.Thermostat characteristic during cooling mode and heating mode operation. / The thermostat on/off characteristic in both operation modes are given in the table below.

Operation mode	Indoor temperature (T) °C	Operation
Cooling mode	$T > \text{Remote control unit display temperature} + 2 (^{\circ}\text{C})$	Cooling thermostat on
	$T \leq \text{Remote control unit display temperature}$	Cooling thermostat off
Heating mode	$T < \text{Remote control unit display temperature} - 2 (^{\circ}\text{C})$	Heating thermostat on
	$T \geq \text{Remote control unit display temperature}$	Heating thermostat off



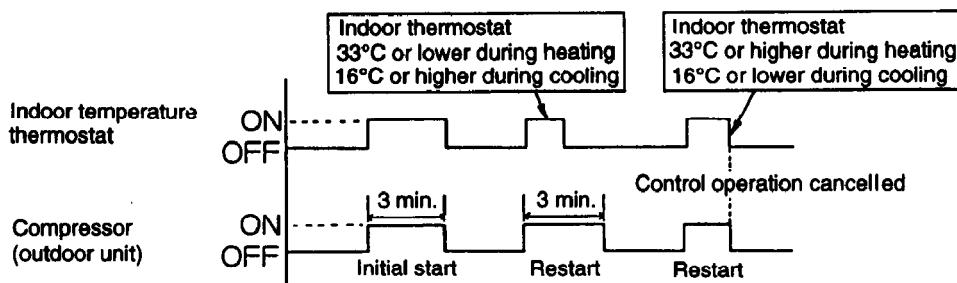
### 23.9. Indoor unit fan control

1. Fixing at LO, MED or HI / When LO,MED or HI is set, the relay switches and operation is carried out at that setting.
2. Automatic fan speed / When set to AUTO, the indoor unit fan operation changes as shown in the table below.

	(Indoor temperature) - (Setting temperature) (Units: K)		
	HI	MED	LO
Cooling mode	+ 3 or higher	+ 1.5 ~ 3	Less than + 1.5
Heating mode	- 3 or lower	- 1.6 ~ -3	More than -1.5
Fan mode	MED irrespective of temperature		

### 23.10. Forced operation during restart

The compressor will not stop operating for 3 minutes after cooling mode or heating mode operation starts, even if the indoor unit thermostat turns off. (However, the compressor will stop operating during this time if the indoor unit air intake temperature exceeds 33~C during heating mode operation or if the indoor unit air intake temperature drops below 16~C during cooling mode operation.)



### 23.11. Outdoor unit fan excess heat dissipation control

1. Start / Carried out when the compressor switches from on to off (when the remote control unit is used to stop operation)
2. Operation / The outdoor unit fan runs at SUPER HI speed for approximately 60 seconds and then stops.

### 23.12. Discharge temperature control

1. Operation / When the discharge temperature sensor detects a temperature of 100~C or higher during cooling mode operation, the liquid bypass valve is turned on.
2. Cancelling / When the discharge temperature sensor detects a temperature of 70~C or lower, the liquid bypass valve is turned off.

### 23.13. Emergency operation

When the emergency operation switch (DSW1) on the outdoor unit printed circuit board is set to the emergency setting, then emergency operation is enabled. This allows normal operation to continue, with all abnormalities other than a discharge temperature abnormality, high pressure abnormality or overcurrent abnormality being ignored.

### 23.14. DIP switch settings

## - Indoor unit printed circuit board (DSW1)

No.	Setting type	Factory shipment	Remarks
1	Group address setting (twin/triple address setting)	OFF	When group operation is being carried out using the remote control, this address is set in order to control the order of starting for the indoor units.  (If No. 8 is ON, twin/triple address setting is carried out.)
2		OFF	
3		OFF	
4		OFF	
5	Automatic restart	ON	When set to ON, operation after a power outage resumes at the settings which were in effect before the outage. (The backup time is semipermanent.)
6	Filter sign time	ON	When set to ON, the filter sign times can be set to 2,500 times.
7	Louvre control	*ON	When set to OFF, louvre control is disabled.
8	Twin/triple slave unit setting	OFF	When set to ON, the unit is designated as a slave unit.

## 24. INSTALLATION <INDOOR UNIT>

### 24.1. Precautions in terms of safety

Carry out the installation work with reliability after thorough reading of this "Precautions in terms of safety".

- Precautions shown here are differentiated between **⚠ Warning** and **⚠ Cautions**, those that have a high chance of leading to a significant result such as fatality or serious injury if the wrong installation is carried out are listed in the **⚠ Warnings**. / However, even in the case of items which are listed in the column **⚠ Cautions**, column such items also offer a chance of leading to a significant result depending on the situations. / In either case, important descriptions regarding the safety are listed, then observe them without fail.

#### - Description of illustration

	This mark means "Caution" or "Warning".
	This mark means "Prohibition".
	This mark means "Compulsion".

- After installation work has been completed, do not only make sure

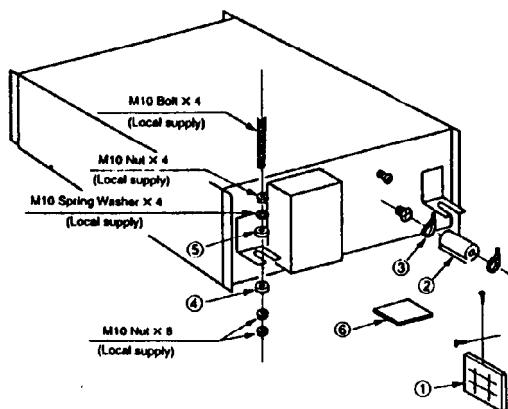
**that the unit is free from any abnormal condition through the execution of dry but also explain how to use and how to perform maintenance of this unit to the customer according to the instruction manual. / In addition, request the customer to keep this manual for installation work together with instruction manual.**

 <b>Warnings</b>	 <b>Cautions</b>
<ul style="list-style-type: none"> <li>▲ As to installation, request the distributor or vendor to perform it. Imperfection in installation caused by that having been carried out by the customer himself leads to water leakage, electric shock, fire, etc.</li> </ul>	<ul style="list-style-type: none"> <li>▲ Carry out ground work. Do not connect the ground return to the gas pipe, water line pipe, lightning rod, ground return of the telephone. Imperfection in ground return may lead to electric shock.</li> </ul> 
<ul style="list-style-type: none"> <li>▲ Carry out the installation work with reliability according to this manual for installation work. Imperfection in installation leads to water leakage, electric shock, fire, etc.</li> </ul>	<ul style="list-style-type: none"> <li>▲ Do not install the unit at the place where the possibility of inflammable gas leakage exists. If such gas leakage should arise and the gas builds up around the unit, such situation may lead to ignition.</li> </ul> 
<ul style="list-style-type: none"> <li>▲ Carry out the installation with reliability on the place that bears the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.</li> </ul>	<ul style="list-style-type: none"> <li>▲ Mounting of the earth leakage breaker is required. Omission in mounting of the earth leakage breaker may lead to electric shock.</li> </ul>
<ul style="list-style-type: none"> <li>▲ Carry out predetermined installation work in preparation for strong wind such as typhoon, earthquake. Imperfection in installation work may lead to accident arisen from overturn, etc.</li> </ul>	<ul style="list-style-type: none"> <li>▲ Drain piping should be made to ensure secure drainage according to the manual for installation work and carry out the thermal insulation to prevent the occurrence of condensation. Imperfection in piping work leads to water leakage and may cause the house and property, etc. to become wet.</li> </ul>
<ul style="list-style-type: none"> <li>▲ Electric work shall be carried out by the person qualification as an electric worker according to "Technical standards regarding electric installation", and manual for installation work, and use exclusive circuit without fail. Presence of insufficient capacity in power circuit or imperfection in execution leads to electric shock, fire, etc.</li> </ul>	

**⚠** Wiring shall be connected securely using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section. Imperfect connection and fixing leads to fire, etc.

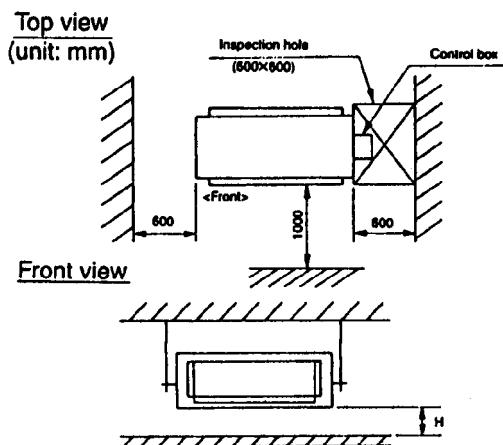
## 24.2. ACCESSORIES PACKED IN THE INDOOR UNIT CONTAINER

No.	Parts name	Q'ty
1	Remote control box	1
	Plastic cord retainer	4
	Ø 4 Tapping screw	2
	M4 Screw	2
	Ø 3 Tapping screw	4
2	Thermal insulator for refrigerant pipe	1
3	Hose clip for thermal insulator	2
4	M10 Flange washer	4
5	M10 Flat washer	4
6	Thermal insulator for drainage hole	1



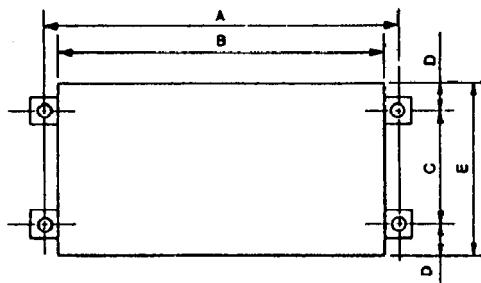
## 24.3. SELECTING THE LOCATION OF THE INDOOR UNIT

- The place shall easily bear a load exceeding four times the indoor units weight.
- The place shall be able to inspect the unit as the figure.
- The place where the unit shall be levelled.
- The place shall allow easy water drainage. / (Suitable dimension "H" is necessary to get slope to drain as figure.)
- The place shall easily connect with the outdoor unit.
- The place where the unit is not affected by an electrical noise.



## 24.4. INSTALLATION OF INDOOR UNIT

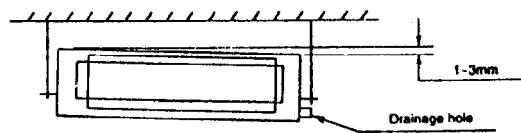
[ POSITION OF SUSPENSION BOLT ]



(unit: mm)

Model name	A	B	C	D	E
CS-A24BD1P	1,060	1,000	330	35	400
CS-A28BD1P					
CS-A34BD1P	1,060	1,000	540	55	560
CS-A43BD1P					
CS-A50BD1P					

- Apply a joint-canvas between the unit and duct to absorb unnecessary vibration.
- Apply a filter (local supply) at air return hole.  
⚠ Install the unit leaning to a drainage hole side as a figure for easy water drainage.

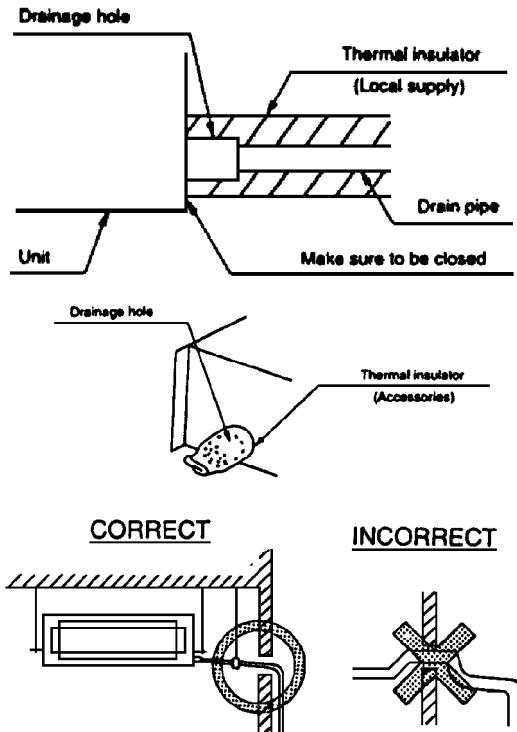


## 24.5. INDOOR UNIT DRAIN PIPING

- The unit has two drainage holes at both side.  
The drainage hole without connection needs seal and thermal insulation with accessories.

**!** Always lay the drain with downward inclination (1/50 to 1/100).  
Prevent any upward flow or reverse flow in any part.

- 5mm or thicker formed thermal insulator shall always be provided for the drain pipe.

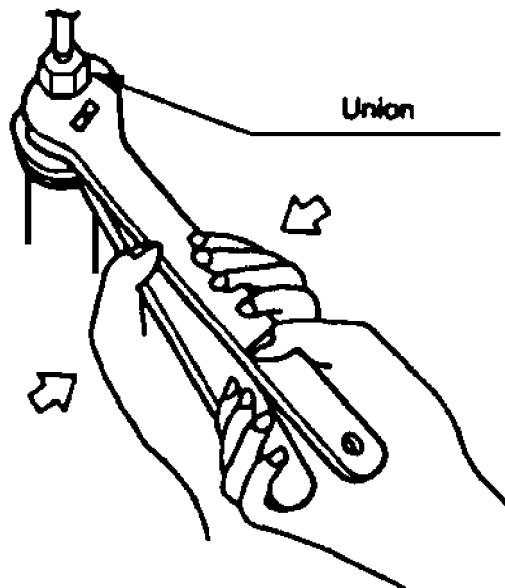


## 24.6. PIPING CONNECTION

1. Form the piping according to its routing. Avoid bending and bending back the same piping point more than three times. (This will result in hardening the pipe.)
2. After deforming the piping, align centres of the union fitting of the

indoor unit and the piping, and tighten them firmly with wrenches.

3. Connect pipe to the service valve or ball valve which is located below the outdoor unit.
4. After completing the piping connection, be sure to check if there is gas leakage in indoor and outdoor connection.



Model name	Liquid side piping	Gas side piping
CS-A24BD1P	Ø 9.52mm	Ø 15.88mm
CS-A28BD1P		
CS-A34-BD1P	Ø 9.52mm	Ø 19.05mm
CS-A43BD1P	Ø 12.7mm	Ø 19.05mm
CS-A50BD1P		



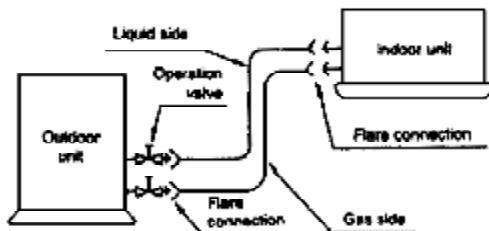
/ Vacuum drying

After completing the piping connection, execute vacuum drying for the connection piping and the indoor unit. The vacuum drying must be carried out using the service ports of both liquid and gas side valves.

#### CAUTION

Use two wrenches and tighten with regular torque.

Flare nut fastening torque N·m (kgf.cm)			
Ø 6.35	12.7 - 16.7 (130 - 170)	Ø 15.88	39.2 - 44.1 (400 - 450)
Ø 9.52	22.6 - 26.5 (230 - 270)	Ø 19.05	49.0 - 53.9 (500 - 550)
Ø 12.7	32.4 - 36.3 (330 - 370)		

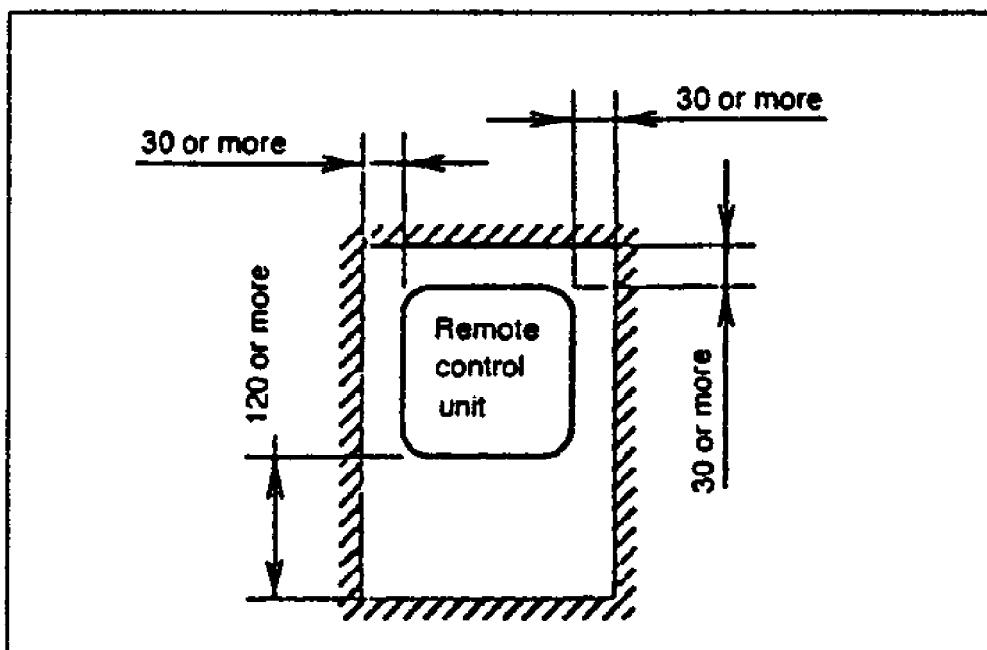


## 24.7. POINT OF REMOTE CONTROL INSTALLATION

### 24.7.1. Notes regarding wired remote control unit setting-up location

- Select a place where the remote control unit can be operated easily (after obtaining approval from the building's owner).
- Install in a place which is away from direct sunlight and as free from humidity as possible.
- Install in a place which is as flat as possible to avoid warping of the remote control unit. (If installed to a wall with an uneven surface, damage to the LCD case or operation problems may result.)
- Install in a place where the LCD can be seen easily. If the remote control unit is installed somewhere which is too low or too high, it may be difficult to read the LCD. (Standard height from the floor is 1.2 to 1.5 metres.)
- Avoid installing the remote control cord near refrigerant pipes or drain pipes.
- Install the remote control cord at least 5 cm away from other electric wires (including stereo and TV cables) to avoid mis-operation (electromagnetic noise).
- If passing the remote control cord through a wall, be sure to install a water trap above the cord.

- For twin and triple types, only the main unit can be connected to the remote control unit. (The indoor unit connected to the remote control unit becomes the main unit, and connection is not possible to the sub units.)
- Allow sufficient space around the remote control unit as shown in the illustration at right. Secure the remote control unit lower case to the wall or to an outlet.



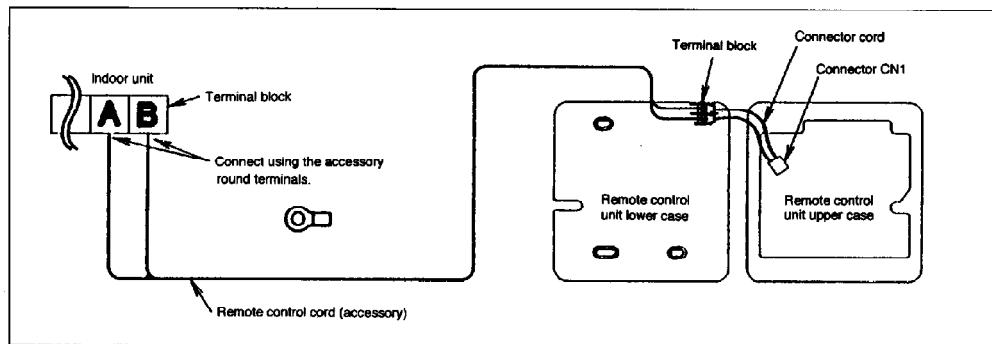
#### 24.7.2. Remote control unit installation

- Be sure to turn off the main power before installing and connecting the remote control unit. / (If the remote control unit is connected while the power is still turned on, the remote control unit displays may not appear.) / If no displays appear on the remote control unit, check while referring to "If no remote control unit displays appear" in "5. Test operation".
- The remote control cable is live during use, so take care not to short it. / /

#### Remote control unit wiring

- Connect the indoor unit and the remote control unit as shown in the illustration below.
- The remote control unit cord is non-polar.

- At the time of shipment from the factory, the connector cable used to connect the terminal block and / connector CN1 is disconnected. When connecting the remote control unit wiring and installing / the remote control unit, be sure to connect the cord to connector CN1. / /



Extending the remote control cord

- Solder a sheathed PVC cord or cable (0.5 - 2.0 mm<sup>2</sup>) with specifications among those given below to the remote control unit end of the accessory remote control cord (10m).
  - PVC round cabtire cord
  - PVC-insulated PVC sheathed cable for control use
  - PVC-insulated PVC sheathed cable for control use
  - 600 V PVC-insulated PVC sheathed round cable
  - 600 V PVC-insulated PVC sheathed flat cable
  - 600 V PVC-insulated PVC cabtire cable

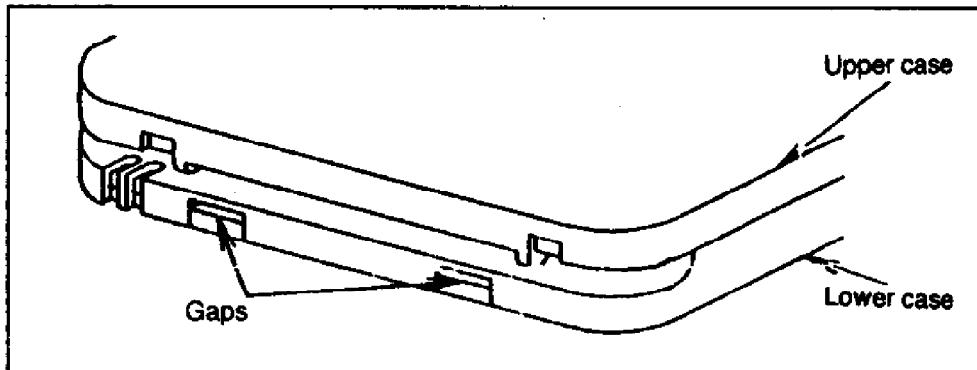
#### NOTE

The maximum possible length for the remote control cord is 200 metres.

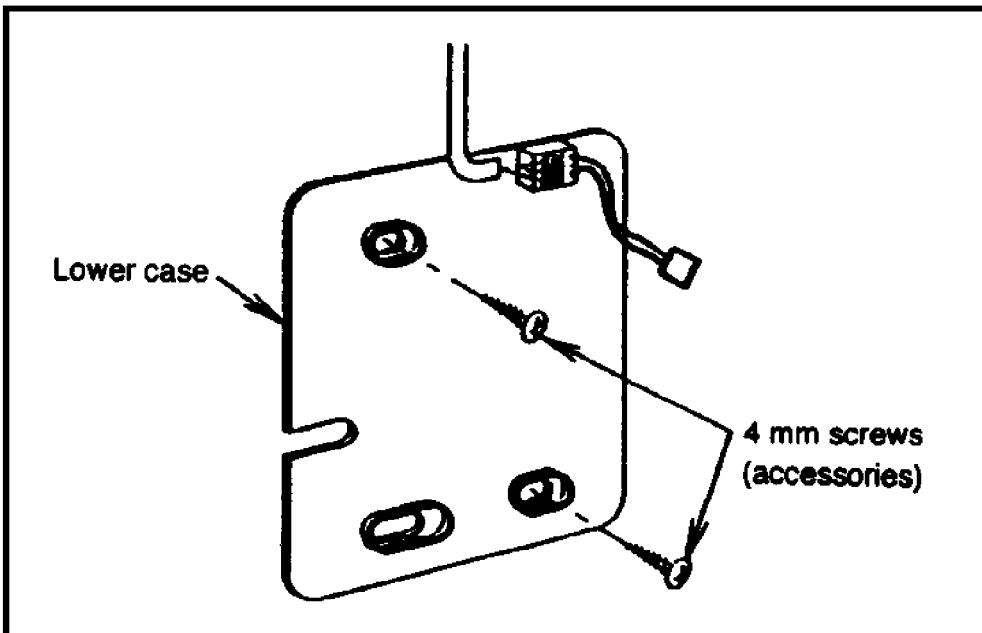
#### Remote control unit installation procedure

- Remove the remote control unit lower case. / (Insert a flat-tipped screwdriver or similar 2 to 3 mm into one of / the gaps at the bottom of the case, and then twist the screwdriver / to open. [Refer to the illustration at right.]) / Be careful not to damage the lower case.
- Secure the lower case to the wall or outlet box. / (Refer to the

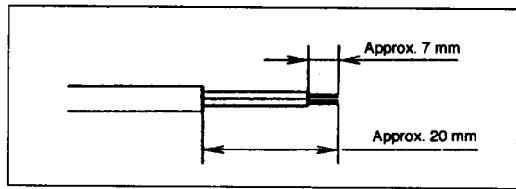
illustration at right for the embedded and exposed / positions for the remote control cord.)



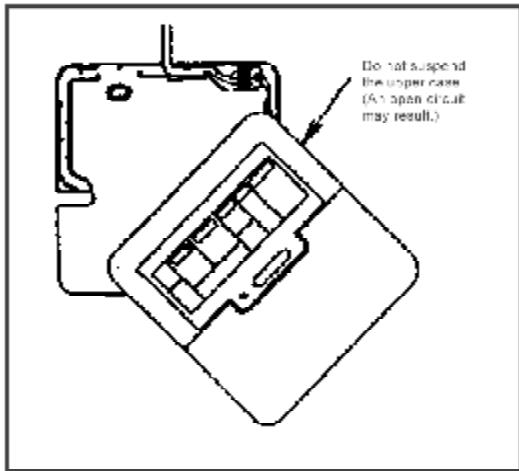
**NOTE /** Be sure to use only the accessory screws. / Do not bend the lower case when tightening the screws. (If the screws are overtightened, damage may result.) / Do not remove the protective tape which is affixed to the upper case circuit board.



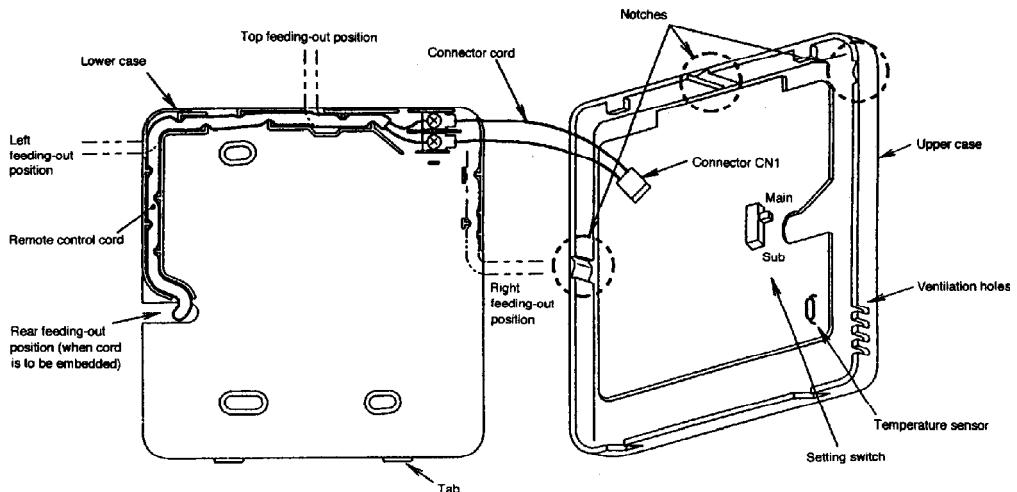
- If installing the remote control unit with the remote control unit cord exposed, use pliers to cut a notch into the upper case. (The feeding-out direction can be either up or to the left or right.)
- Strip the end of the remote control cord which is to be connected to the remote control unit. (Refer to the illustration at right.)



- Route the remote control cord inside the lower case in accordance with the intended feeding-out direction. (Refer to the illustration below) Securely connect connector CN1. (If it is not connected, the remote control unit will not operate.)

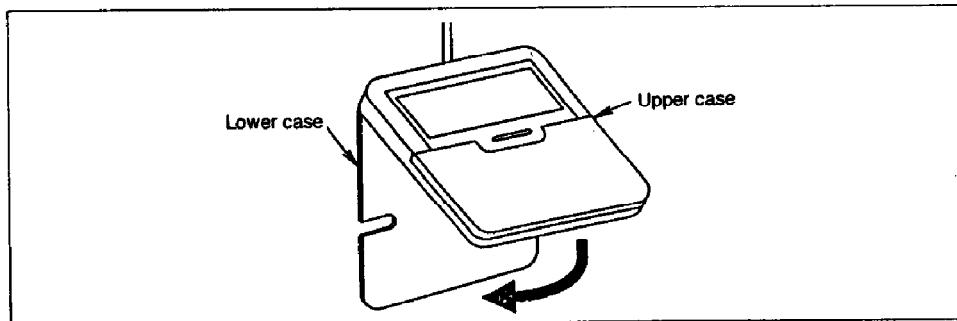


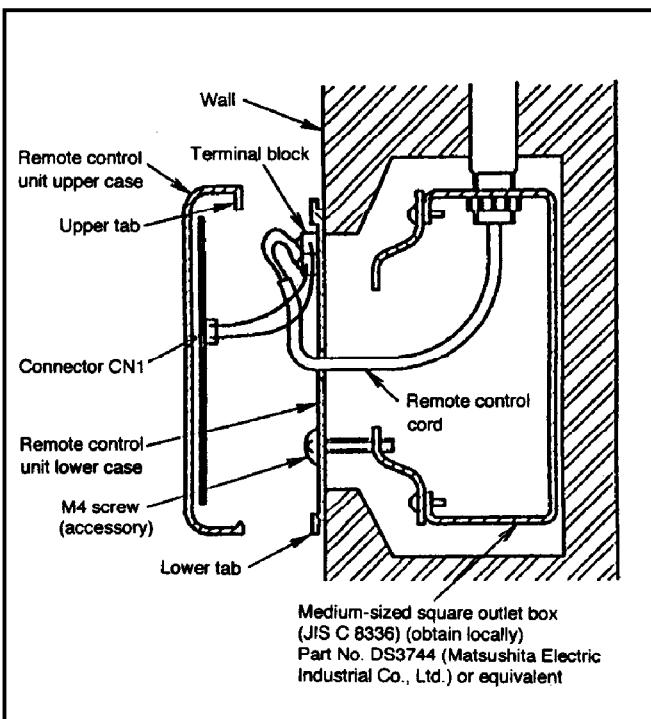
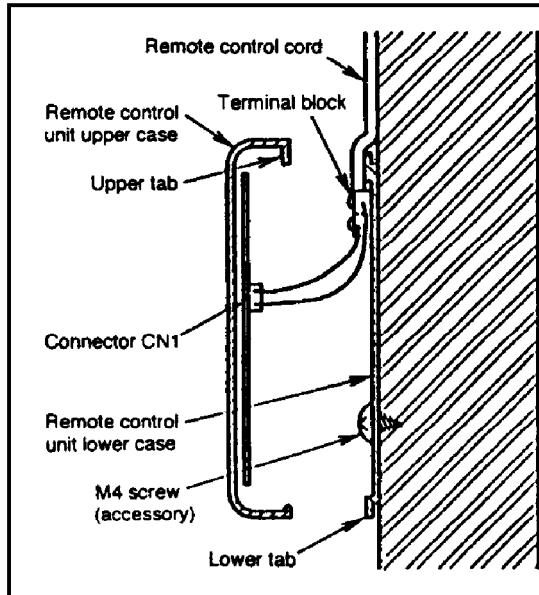
**NOTE /** After connecting the connector, do not suspend the upper case by its own weight, otherwise the connector cord may break.



- If controlling using two remote control units, refer to "Control using two remote control units" in "4.Settings".
- Secure the upper case to the lower case. / (Hook the upper tab of

**the upper case into the lower case, and then push the upper case until it snaps / shut onto the lower case tab, while being careful not to clamp the remote control cord and the / connector cord.)**



If remote control cord is embedded	If installing with the remote control cord
<p>1. Embed an outlet box (JIS C 8336) into the wall, and then secure the remote control unit base plate to the outlet box with the two accessory M4 screws. Make sure that the base plate is flat against the wall at this time, with no bending (looseness).</p> <p>2. Pass the remote control cord into the box and then install the remote control unit.</p> 	<p>1. Secure the remote control unit base plate to the wall with the two accessory 4 mm screws.</p> <p>2. The feeding-out direction for the remote control unit cord can be up or to the left or right. (Refer to the illustration above.) After the feeding-out direction, use pliers to make a notch in the cord.</p> <p>3. Route the remote control cord as shown in the illustration and bind the cord firmly around the outside of the base plate at this time.</p> 

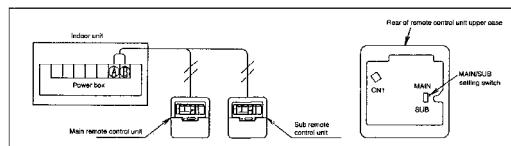
### 24.7.3. Setting

Control using two remote control unit

- Up to two remote control units can be installed for a single indoor unit, and either remote control unit can be used to operate the indoor unit.
  - The indoor unit can be operated with the last switch pressed having priority.
1. Decide which is to be the main and which is to be the sub remote control unit. The main or the sub status of the remote control unit is set automatically. The MAIN/SUB setting switch can also

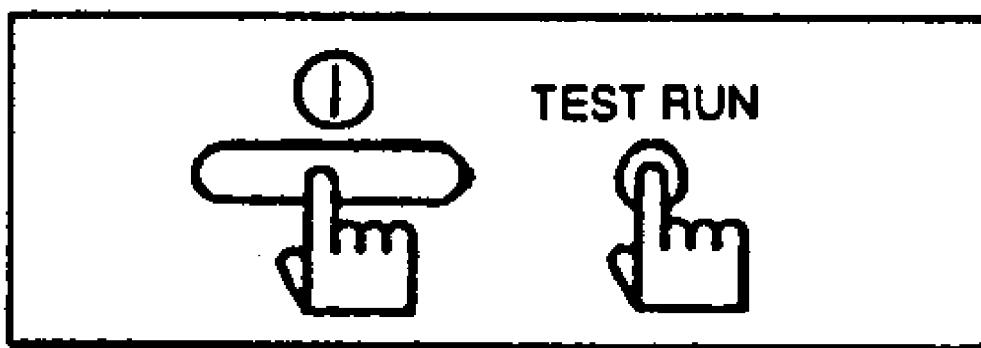
be used to make the setting manually, however if the manual setting is made, that manual setting has priority. Be sure to turn off the main power before making the manual setting.

2. Connect the remote control units. / Connect both remote control units to terminals (A) and (B) on the indoor unit terminal block (non-polar)



#### 24.7.4. Test operation

- Turn on the main power.
- After 3 minutes have passed since the power was turned on, press the STOP/RUN switch on the remote control unit. (No operation occurs within 3 minutes after the power was turned on.)
- Press the TEST RUN switch within 1 minute of pressing the STOP/RUN switch.
- Next, select the operation mode. (Be sure to select the cooling mode first, and run the unit in this mode for 5 minutes or more.)
- Press the STOP/RUN switch or the TEST RUN switch to cancel the test operation.
- Test operation will be cancelled automatically after 30 minutes.



If no remote control unit displays appear

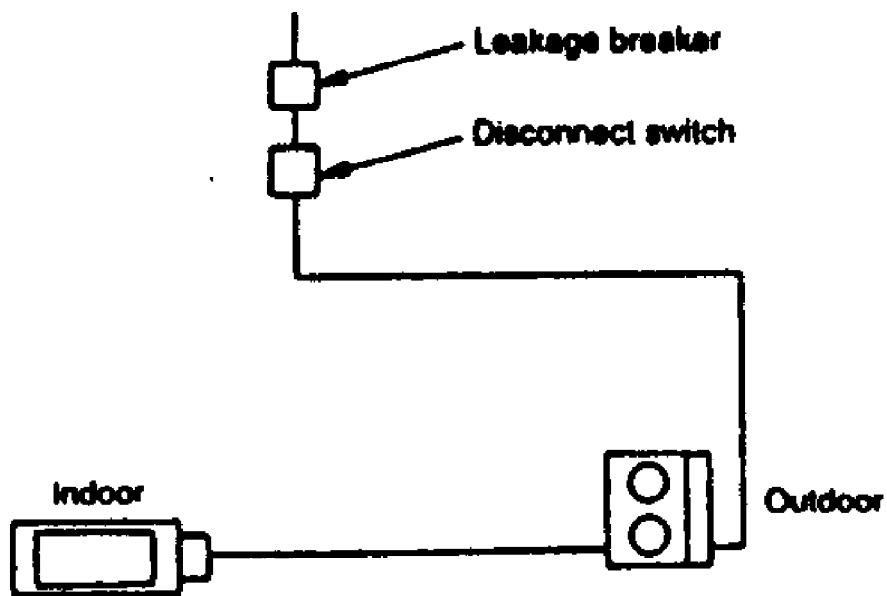
- Check whether LED1 (green) on the indoor unit printed circuit board is illuminated or switched off. If it is switched off, check the circuits on the indoor unit printed circuit board.
- Check once more that the remote control cord is securely

connected. (Check for loose terminals, poor contacts, connection positions on terminal block, etc.)

- If the above checks show that nothing is wrong but nothing appears on the remote control unit display, it is possible that the remote control unit was connected while the main power was still turned on. If such is the case, carry out the following.
- Set DIP switch (DSW1) Nos 1 to 4 to the ON position, and then turn the power back on. If the display appears after about 30 seconds, turn DIP switches 1 to 4 back to OFF.

#### **24.8. ELECTRICAL WIRING**

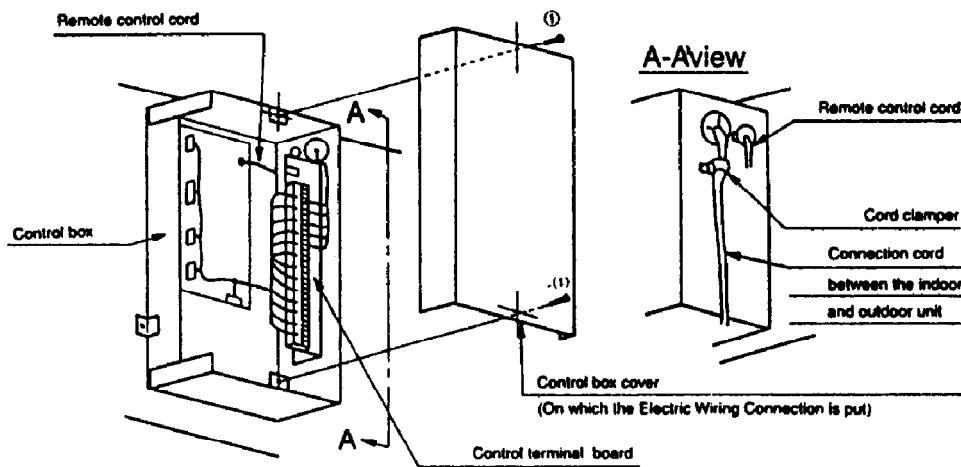
- All wiring must comply with local requirements.
- Select a power source that is capable of supplying the current required by the air conditioner.



#### **WIRING CONNECTION**

##### **<INDOOR UNIT>**

- Remove the control box cover for electrical connection between the indoor and outdoor unit. (Remove two screws no.(1).
- Use the cord clamper to fix the cord.



**Caution**

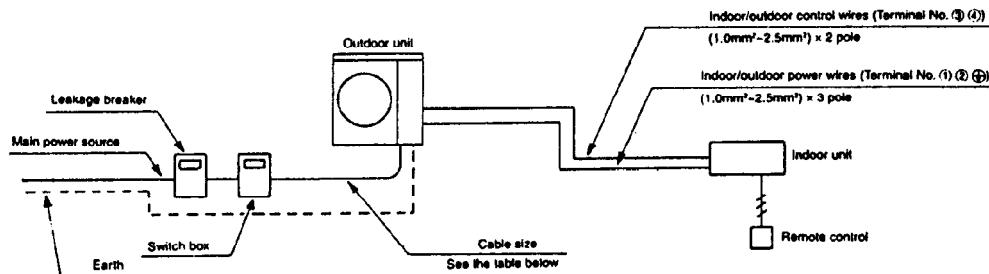
Make sure the screws of the terminals are correctly tightened. Fastening torque / M4 → 118N.cm {12kgf.cm} / M5 → 196N.cm (20kgf.cm)

## 24.9. ELECTRICAL WIRING

1. All wiring must comply with LOCAL REGULATIONS.
2. Select a power source that is capable of supplying the current required by the air conditioner.
3. Feed the power source to the unit via a distribution switchboard designed for this purpose.
4. Install a leakage breaker if the electrical wiring is subject to excessive moisture.
5. The terminal screws inside the control box may be loose due to vibration due to transport. Check the screws for loose connection. (Running the air conditioner with loose connection can overload and damage electrical components.)
6. Check that the cable size, overcurrent devices, and switch specifications comply with those given in the table.
  - The wire diameters in the table indicate values compatible with a metal or resin conduit that can pass up to three such wires.
  - The overall length in the table indicates a value when the main power cord is subject to a voltage drop of 1%.

**7. Always ground the air conditioner with a grounding wire and screw to meet the LOCAL REGULATIONS.**

**8. Be sure to connect the wires correctly to terminal block with connecting the crimp type ring terminal to the wires.**



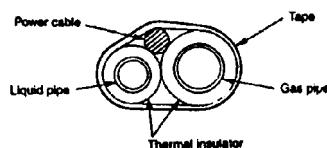
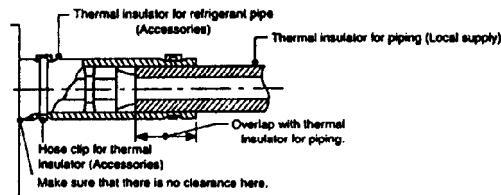
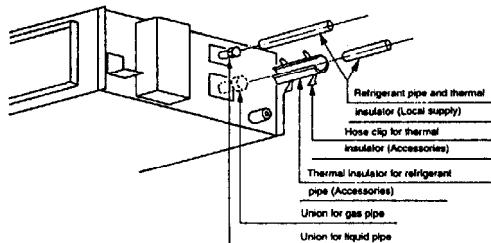
**Cautions**

- 🚫 ● Where ground work (earth) is carried out, do not connect the ground return to the gas pipe, water line pipe, grounded circuit of the telephone and lightning rod, or ground circuit of other product in which earth leakage breaker is incorporated. (Such action is prohibited by statute, etc.)
- ⚠ ● In order to prevent malfunction (noise generation) of the equipment, carry out the wiring of the control cable for indoor and outdoor units (signal cable) isolating it from other power cable with separate cable.
- Use a standard power cord for Europe (such as H05RN-F or H07RN-F which conforms to CENELEC (HAR) rating specifications.)

## 24.10. HEAT INSULATION

### THERMAL INSULATION

#### <INDOOR UNIT>



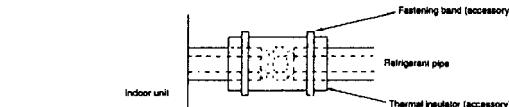
#### <REFRIGERANT PIPE>

**- Insulate and tape both the gas piping and liquid piping.**

**1. For refrigerant and drain pipings, execute referencing the piping procedure label packed with the unit body.**



**2. Use the heat insulation material for the refrigerant piping which has an excellent heat resistance (over 120°C)**



**3. Precautions in high humidity circumstance: / This air conditioner has been tested according to the "JIS Standard Conditions with Mist" and confirmed that there is not any fault. However if it is operated for a long time in high humid atmosphere (dew point temperature: more than 23°C), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:**

- Heat insulation material to be prepared. Adiabatic glass wool with thickness 10 to 20mm.**
- Stick all glass wool on all air conditioners that are located in ceiling atmosphere.**
- In addition to the normal heat insulation (thickness: more than 8mm) for refrigerant piping (gas piping: thick piping) and drain piping, add further 10mm to 30mm thickness material.**

## 24.11. SELF DIAGNOSIS FUNCTION

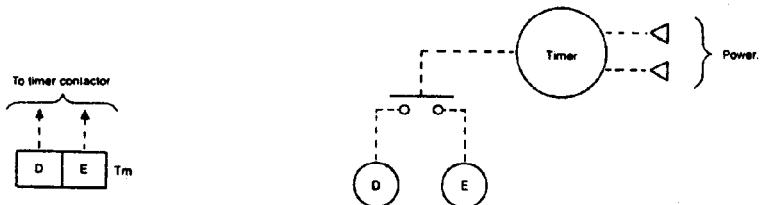
- If LED5 (yellow) is flashing, the microcomputer in the electronic controller is functioning normally. If LED5 is lighting steady, OFF, or flashing irregularly, try turning the power off and then on again.
- You can find the fault point by the remote control indicator or the self-diagnosis LEDs on the indoor and outdoor electronic controller.
- CHECK will flash in the remote control indicator when a problem occurs.
- When the CHECK switch is pushed , the problem will be displayed in the indoor temperature setting display
- Correct the accident point as shown in the table below before restarting operation.
- Accident points are stored in memory.
- During fault normal operations, pressing the CHECK switch for 5 sec or longer will display the contents of the previous accident points.
- Press the CHECK switch again to restore the normal display.

Remote control indicator	Indoor LED				Outlet LED				FAULT POINT	CHECK POINT
	LED1	LED2	LED3	LED4	LED1	LED2	LED3	LED4		
F2 Light on	■	■			■	■			Water level float switch	Drain pump and piping
F3		■			■				Indoor temperature thermistor	Indoor temperature thermistor cord
F4			■		■				Piping thermistor	Piping thermistor cord
F5	■	■	■	■	■				Remote control data transfer error	Data transmission waveform
	■	■			■				Remote control connection cord (disconnect)	Remote control connection terminal

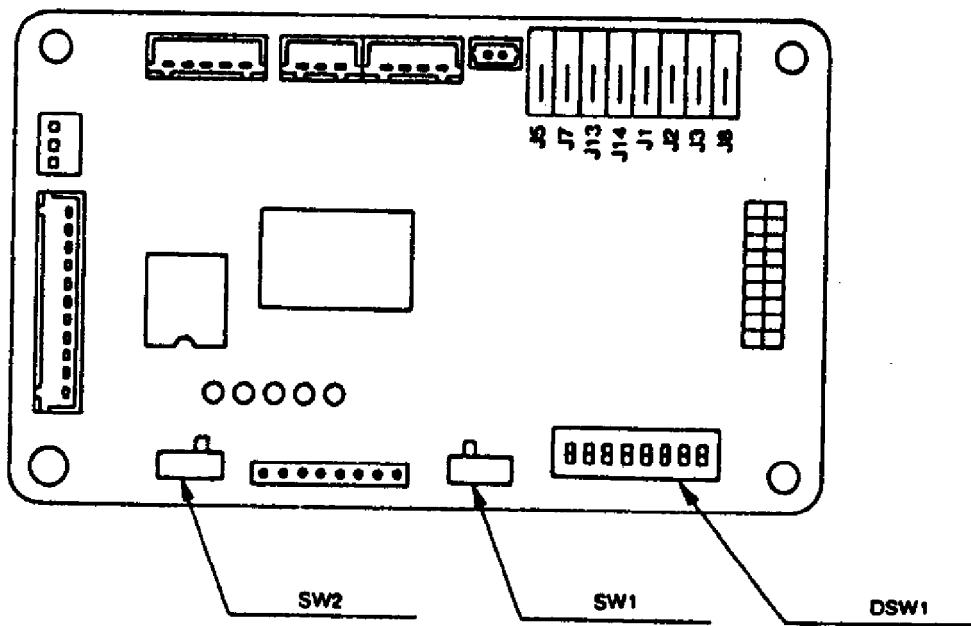
F6		■	■	■	■			Indoor/outdoor unit data transfer error	Indoor/outdoor transmission w...
			■	■	■			Indoor/outdoor unit connection cord (disconnect)	Indoor/outdoor and connection
								Compressor bimetal thermistor operating	Gas leaks, outd power supply, i unit connecting
			■	■				Outdoor unit over current protector	Compressor op phase, or lockir
								Phase protector operating	Outdoor unit pc supply negative
F15	■				■	■		High pressure switch operating	Outdoor unit
F18	■		■				■	Outdoor piping temperature thermistor	Piping temperat thermistor cord

## 24.12. USE OF TIMER (LOCAL ARRANGEMENTS)

Connect the contactor of the timer to "TM," (D) and (E).



## 24.13. INDOOR UNIT PRINTED CIRCUIT BOARD (MICROCOMPUTER BOARD)



#### Use of jumper wire

J1	J1	J2	DIFFERENTIAL
J2	EXIST	EXIST	2°C
	NOT	EXIST	1.5°C
	EXIST	NOT	2.5°C

#### Use of switch

Switch	Subject	ON/OFF
SW1	Twin.Triple	Master/Slave
SW2	Emergency operation	Emergency/Normal
DSW1 1 ~ 4	Indoor Unit adress	Please refer to the installation instruction sheet
DSW1 5 ~ 8	Do not change this switch	If change the switch, unit will not operate properly

#### CAUTION

- Use "SW2" with normal position.
- Emergency position of "SW2" take force operation of indoor fan &

**Drain up motor.**

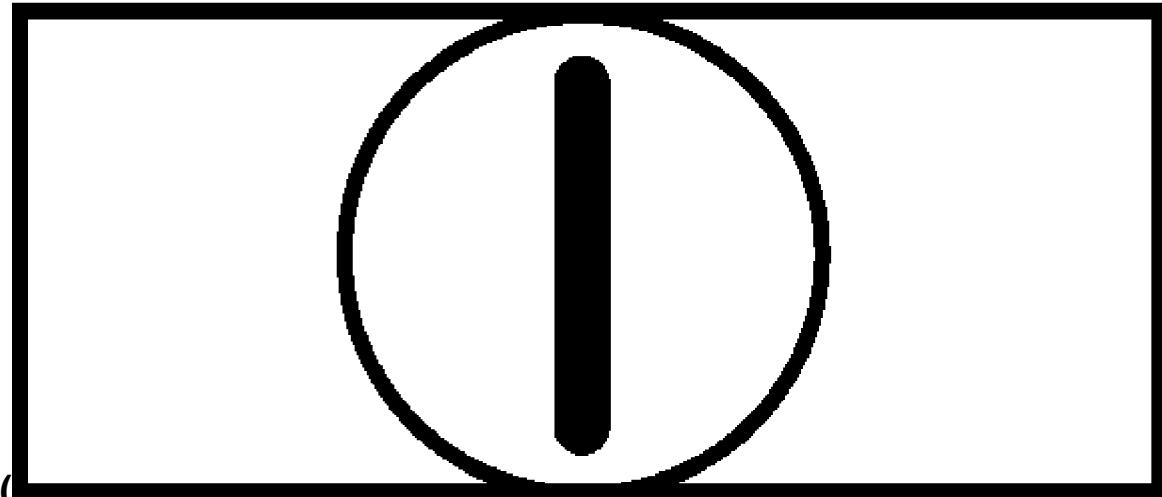
- Do not touch No. 5~8 of "DSW1".

#### **24.14. TEST OPERATION**

The initial power supply must provide at least 90% of the rated voltage.

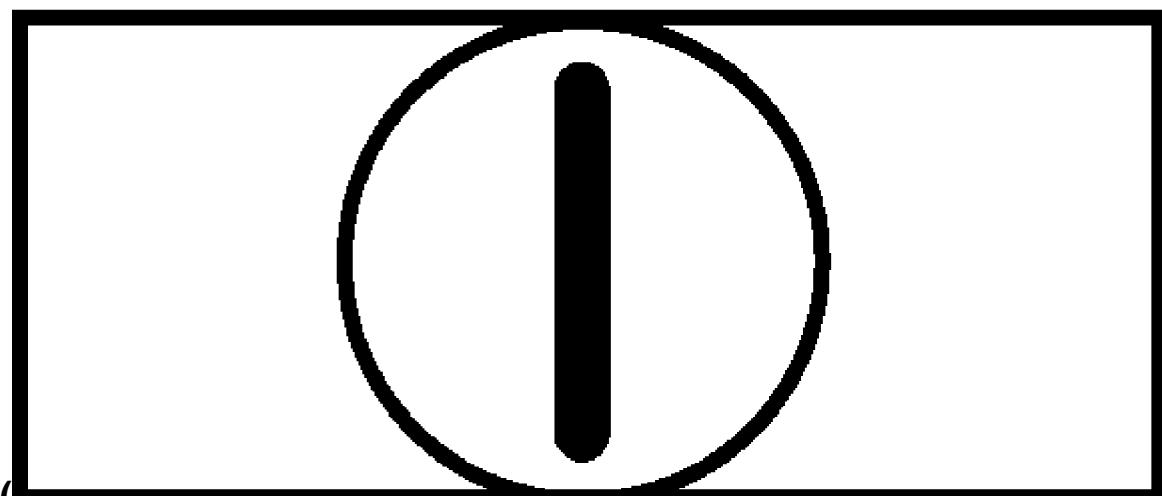
Otherwise, the air conditioner should not be operated.

- The remote control is used to execute a test run.
- Press the ON/OFF



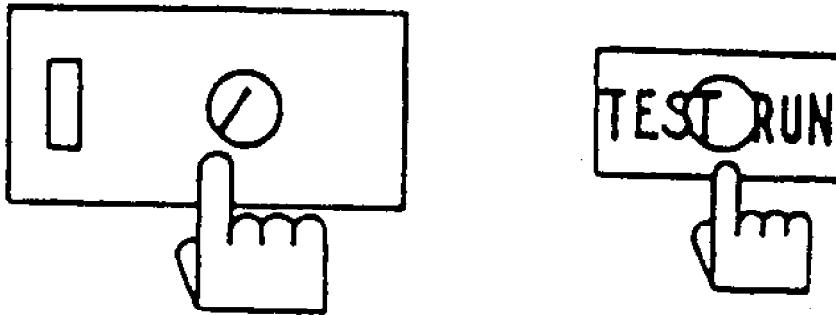
) switch first.

- Press the TEST RUN switch within one minute after the ON/OFF



) switch

- Select the operation mode.
- To cancel the test run, press the TEST RUN switch again.
- \* The test run terminates automatically after 30 minutes.



For the test operation, press the push buttons in the order shown

POWER-ON → COOLING → TEST RUN -ON (operated for five to eight minutes) → POWER OFF

#### **24.15. CHECK THE FOLLOWING ITEMS WHEN INSTALLATION IS COMPLETE**

- After completing work, be sure to measure and record trial run properties, and store measuring data. etc.
- Measured items are room temperature. outside temperature. suction temperature. blow out temperature. wind speed. wind amount. voltage. current. abnormal vibration. abnormal noise. running pressure. pipe temperature. withstand pressure and air tight pressure.
- As for structure and appearance, check on the below items.

Is circulation of air adequate?  
 Is draining smooth?  
 Is heat insulation complete?  
 (refrigerant and drain piping)  
 Is there any leakage of refrigerant?

Is remote control switch operated?  
 Are there any faulty wiring?  
 Are not terminal screws loosened?  
 Tightening torque (N · cm (kgf · cm))  
 M4...118 (12), M5...196 (20)  
 M6...245 (25), M8...588 (61)

#### **24.16. DELIVERY TO OUR CUSTOMERS**

- Teach the customers the operation and maintenance procedures, using the operation manual (air filter cleaning, temperature control, etc.)

As for work specifications of the outdoor unit, read the WORK INSTRUCTION attached to the outdoor unit.

### **25. INSTALLATION (OUTDOOR UNIT)**

# AIR CONDITIONERS OUTDOOR UNIT INSTALLATION INSTRUCTIONS

**REFRIGERANT  
R 22**

HP	Panasonic Model	National Model
2.5 HP	CU-A24BBP5 CU-C24BBP5	CU-C24BBN5 CU-C24BBN6
3 HP	CU-A28BBP5 CU-C28BBP5 CU-A28BBP8 CU-C28BBP6 CU-C28BBP8 CU-C28BBN8	CU-C28BBN5 CU-C28BBN6 CU-C28BBN8
4 HP	CU-A34BBP5 CU-C34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP8 CU-C34BBN8	CU-C34BBN7 CU-C34BBN8
5 HP	CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-C43BBN8	CU-C43BBN7 CU-C43BBN8
6 HP	CU-A50BBP8 CU-C50BBP7 CU-C50BBP8 CU-C50BBN8	CU-C50BBN7 CU-C50BBN8

## Precautions in terms of safety

Carry out installation work with reliability after thorough reading of this "Precaution in terms of safety".

- Precautions shown here are differentiated between **Warnings** and **Cautions**. Those that have much chances for leading to significant result such as fatality or serious injury if wrong installation would have been carried out are listed compiling them especially into the column of **Warnings**.

However, even in the case of items which are listed in the column of **Cautions**, such items also have a chance for leading to significant result depending on the situations.

In either case, important descriptions regarding the safety are listed, then observe them without fail.

- As to indications with illustration

This mark means "Caution" or "Warning".

This mark means "Earth".

- After installation work has been completed, do not only make sure that the unit is free from any abnormal condition through the execution of try run but also explain how to use and how to perform maintenance of this unit to the customer according to the instruction manual.

In addition, request the customer to keep this manual for installation work together with instruction manual.

### Warnings

- |   |   |
|---|---|
| ▲ The appliance must be installed by technician, who takes into account the requirements given by ISO5149 or <u>eventual equivalent requirements</u> .<br><br>▲ As to installation, request the distributor or vendor to perform it. Imperfection in installation caused by that having been carried out by the customer himself may lead to <u>water leakage, electric shock, fire, etc.</u><br><br>▲ Carry out the installation work with reliability according to this manual for installation work.<br>Imperfection in installation leads to water leakage, electric shock, fire, etc.<br><br>▲ Carry out the installation work with reliability on the place that can bear the weight of this unit sufficiently. Insufficient strength leads to <u>injury due to falling of the unit</u> .<br><br>▲ Carry out predetermined installation work in preparation for strong wind such as typhoon, earthquake. Imperfection in installation work may lead to accidents arisen from overturn, etc.<br><br>▲ The unit must be installed in accordance with applicable national and local regulations.<br>Any electrical work should only be carried out by qualified technician and use exclusive circuits without fail.<br>Presence of insufficient capacity in power circuit or imperfection in execution leads to electric shock, fire, etc.<br><br>▲ Wiring shall be connected securely using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section.<br>Imperfect connection and fixing leads to fire, etc. | ▲ If installing inside a small room, measures should be taken to prevent refrigerant levels from building up to critical concentrations in the event of a refrigerant leak occurring. Please discuss with the place of purchase for advice on what measures may be necessary to prevent critical concentrations being exceeded. If the refrigerant leaks and reaches critical concentration levels, there is the danger that death from suffocation may result.<br><br>▲ Securely attach the protective covers for the outdoor unit connection cables and power cord so that they do not lift up after installation. If the covers are not properly attached and installed, the terminal connections may overheat, and fire or electric shock may result.<br><br>▲ Switch off all supplies before accessing any electrical part.<br><br>▲ If refrigerant gas escapes during installation, ventilate the affected area. If the refrigerant gas comes into contact with sparks or naked flames, it will cause toxic gases to be generated.<br><br>▲ Once installation work is completed, check that there are no refrigerant gas in the room that can come into contact with sparks or flames from a fan heater, stove or kitchen range, which will cause toxic gases to be generated.<br><br>▲ When performing piping work do not mix air except for specified refrigerant (R22) in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle. |
|---|---|

<b>Cautions</b>	
<p>▲ Carry out Earthing work. Do not connect the Earth return to the gas pipe, water line pipe, lightning rod and telephone lines. Imperfection in Earth return may lead to electric shock.</p>	 <p>▲ Drain piping should be made to ensure secure drainage according to the manual for installation work and carry out the thermal insulation to prevent the occurrence of condensation. Imperfection in piping work leads to water leakage and may cause the house and property, etc. to become wet.</p>
<p>▲ Do not install the unit at the place where the possibility of inflammable gas leakage exists. If such gas leakages should arise and the gas builds up around the unit, such situation may lead to ignition.</p>	<p>▲ Position the indoor unit and outdoor unit, power cords and indoor/outdoor unit connection cables in a way so that they are at least 1 metre away from televisions and radios. This is to avoid problems such as interference with picture and/or sound. (However, note that depending on the electromagnetic wave conditions, interference may still occur even if the separation distance is more than 1 metre.)</p>
<p>▲ Mounting of the earth leakage circuit breaker is required. Omission in mounting of the earth leakage circuit breaker may lead to electric shock.</p>	

### 1. ACCESSORIES SUPPLIED WITH OUTDOOR UNIT

- The following parts are supplied as accessories with each outdoor unit.  
Check that all accessory parts are present before installing the outdoor unit.

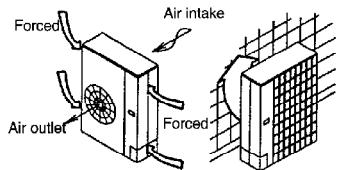
Part name	Q'ty	Diagram	Application
Protective bushing	2		For protecting electrical wires
Banding strap	3		For tying electrical wires together

#### Heat pump-types only

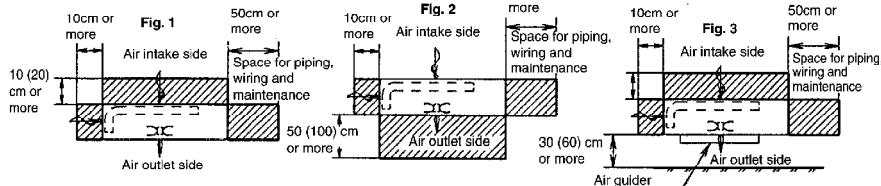
Part name	Q'ty	Diagram	Application
Drain elbow AS	1		For connecting the drain pipe (with ring seat)

### 2. SELECTING THE OUTDOOR UNIT INSTALLATION LOCATIONS

- Select location which satisfies the following condition, and then confirm with the customer that such a place is satisfactory before installing the outdoor unit.
  - There should be sufficient ventilation.
  - The outdoor unit should be sheltered as much as possible from rain and direct sunlight, and the air should be able to move around so that hot and cold air do not build up.
  - There should not be animals or plants near the air outlet which could be adversely affected by hot or cold air coming out from the unit.
  - The outlet air and operating noise should not be a nuisance to other occupants nearby.
  - The location should be able to withstand the full weight and vibration of the outdoor unit, and it should also be level and safe for the unit to be installed.
  - The intake and outlet should not be covered.
  - There should not be danger of flammable gas or corrosive gas leaks.
  - There should be as little back-ventilation (air blowing directly onto the fan) as possible.  
(If strong wind blows directly onto the fan, it may cause problems with normal operation.)
    - If you know which direction the prevailing wind comes from during the operating season, set the outdoor unit at a right-angle to this wind direction, or so that the air outlet faces toward a wall or fence.
    - If there are obstructions near the outdoor unit and the wind direction is not constant, install an optional air guider.
  - Do not allow any obstacles near the outdoor unit which will interfere with air flow around the air intake and air outlet.
  - If installing in a location which is prone to snowfall, place the installation base as high as possible, and be sure to install a roof or enclosure which does not allow snow to accumulate.
  - Avoid installing the unit in places where petroleum products (such as machine oil), salinity, sulphurous, gases or high-frequency noise are present.
  - Be sure to leave enough space around the outdoor unit to maintain proper performance and to allow access for routine maintenance.
    - Allow enough space from any obstacles as shown in Fig.1.2 below in order to prevent short-circuits from occurring.  
(If installing more than one outdoor unit, make the necessary space available as outlined in 14.)  
However, there should be at least 1 metre of free space above the unit.
    - The height of any obstacles at the air intake and outlet sides should not be greater than the height of the outdoor unit.



- When facing the air intake side toward a wall.
- When facing the air outlet side toward a wall.
- When using an optional air guider for outdoor units.



\* Maintain sufficient space above the unit.

13. If it is not possible to leave 50 (100)cm at the air outlet side as shown in Fig.2, the installation method shown in Fig.3 can be used if an optional air guider for outdoor units is installed. Install according to the instructions given in the separate instruction manual.

**(NOTE)** When installing the air guider

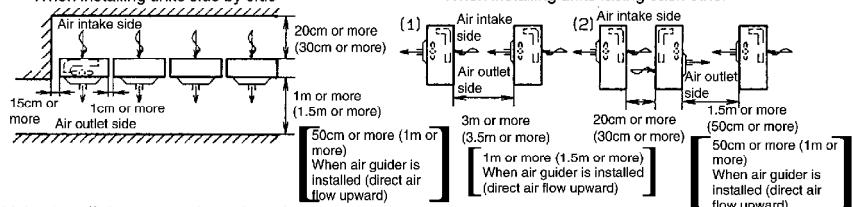
- 1) If directing the air upward, there should not be obstacles above the outdoor unit.
- 2) If directing the air to the left or right, there should not be obstacles at the left or right of the outdoor unit.
- 3) Never use the air guider in locations which are subject to snowfall.  
If snow gets inside the air guider, it could cause the fan to freeze up.
- 4) If connecting outdoor units in series, direct the flow upward.

**Air guider for outdoor units**

Model Name	Part No.	Model Name	Part No.
CU-A24BBP5 CU-A28BBP5 CU-A28BBP8 CU C28BBP5	CU-C24BBP5 CU-C28BBP6 CU-C28BBP8	CU-A34BBP5 CU-C34BBP7 CU-C34BBP5 CU-A43BBP8 CU-C43BBP8 CU-A50BBP8 CU-C50BBP8	CU-A34BBP8 CU-C34BBP8 CU-C43BBP7 CU-C50BBP7
CU-C24BBN5 CU-C28BBN5 CU-C28BBN8	CU-C24BBN6 CU-C28BBN6	CZ-UFS01P	CZ-UFD01P
		CZ-UFS01N	CZ-UFD01N
		CU-C34BBN7 CU-C43BBN7 CU-C50BBN7	CU-C34BBN8 CU-C43BBN8 CU-C50BBN8

14. If installing more than one outdoor unit, allow enough space around each unit as shown below.

- When installing units side by side



\* Maintain sufficient space above the unit.

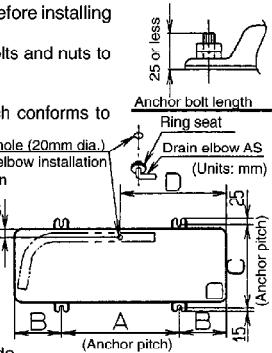
Values inside brackets indicate distances when installing the 4HP-6HP.

- The distance given above are the minimum distance required in order to maintain proper performance.  
Allow as much space as possible in order to get the best performance from the units.

**3. TRANSPORTING AND INSTALLING THE OUTDOOR UNIT**

- Transporting
  1. The outdoor unit should be transported in its original packaging as close to the installation location as possible.
  2. If suspending the outdoor unit, use a rope or belt, and use cloth or wood as padding in order to avoid damaging the unit.
  3. Use the handles at left and right to transport the unit, and be careful not to touch your hands or other objects against the fan.

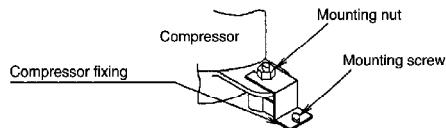
- Installation
  1. Read the "Selecting the outdoor unit installation location" section thoroughly before installing the outdoor unit.
  2. If installing the unit to a concrete base or other solid base, use M10 or W3/8 bolts and nuts to secure the unit, and ensure that the unit is fully upright and level.  
(The anchor bolt positions are shown in the diagram at the right side.)  
In particular, install the unit at a distance from the neighbouring building which conforms to regulations specified by local noise emission regulation standards.
  3. Do not install the outdoor unit to the building's roof.
  4. If there is a possibility that vibration may be transmitted to the rooms of the building, place rubber insulation between the unit and the installation surface.
  5. Drain water will be discharged from the outdoor unit when operating the system in heating or defrosting modes. Select an installation location which will allow the water to drain away properly, or provide a drainage channel so that the water can drain away.  
(If this is not done, the drain water may freeze during winter, or the water may spill down to areas underneath the installation location.)
  6. If a drain pipe needs to be installed, insert the accessory drain elbow into the mounting hole at the bottom of the outdoor unit, and connect a hose with an inside diameter of 15mm to this drain elbow.  
(The hose is not supplied.)
- \* If using the drain elbow, install the outdoor unit on a base which is at least 5cm high.



**NOTE** In cold regions (where the outdoor air temperature can drop to 0°C or below continuously for 2-3 days), the drain water may freeze, and this may prevent the fan from operating. Do not use the drain elbow in such cases.

**CAUTION**

- Be sure to remove the compressor fixing brackets.  
(Some models are not equipped with compressor fixing brackets.)
- To remove, first remove the mounting screws, loosen the compressor mounting nuts and then pull sideways.
- After removing, be sure to tighten the compressor mounting nuts again.



**4. CONNECTING THE PIPES**

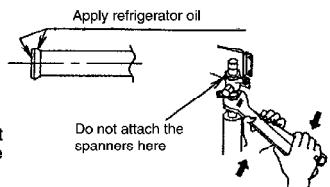
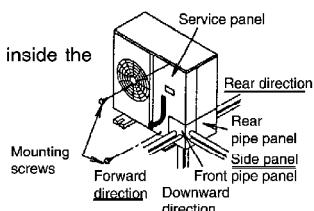
\* This product is used new refrigeration (R407C).

- Use a clean pipe which does not include water or dust for inside of piping.
- When cutting the refrigerant pipes, a piping cutter must be used. Before connecting the refrigerant pipes blow nitrogen and blow off dust in the pipes.  
(Never use tools which cause a lot of dust such as a saw and a magnet.)
- When waxing replace nitrogen inside the piping after removing dirt and dust. (In order to prevent oxidation scale from forming inside the piping).
- The refrigerant pipes are of particular importance.

The installation work for refrigerant cycles in separate-type air conditioners must be carried out perfectly.

Model Name	Pipe diameter (mm)		Equivalent length (m)	Difference of elevation (m)
	Liquid-side pipes	Gas-side pipes		
CU-A24BBP5 CU-C24BBP5 CU-C24BBN5 CU-C24BBN6	ø6.35	ø15.88	50	30
CU-A28BBP5 CU-A28BBP8 CU-C28BBP8 CU-C28BBP5 CU-C28BBP6 CU-C28BBN5 CU-C28BBN6 CU-C28BBN8	ø9.52	ø15.88	50	30
CU-A34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP5 CU-C34BBP8 CU-C34BBN7 CU-C34BBN8 CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-C43BBN7 CU-C43BBN8 CU-A50BBP8 CU-C50BBP7 CU-C50BBP8 CU-C50BBN7 CU-C50BBN8	ø9.52	ø19.05	50	30

1. Local pipes can project in any of four directions.
- Make holes in the pipe panels for the pipes to pass through.
  - Be sure to install the pipe panels to prevent rain from getting inside the outdoor unit.
- [Removing the service panel].
- (1) Remove the two mounting screws.
  - (2) Slide the service panel downward to release the pawls.
- After this, pull the service panel toward you to remove it.
2. Notes when connecting the refrigerant pipes.
- Use clean copper pipes with no water or dust on the insides.
  - Use phosphorus-free, unjointed copper pipes for the refrigerant pipes.
  - If it is necessary to cut the refrigerant pipes, be sure to use a pipe cutter, and use compressed nitrogen or an air blower to clean out any foreign particles from inside the pipe.
  - Be careful not to let any dust, foreign materials or water get inside the pipes during connection.
  - If bending the pipes, allow as large a bending radius as possible. Do not flex the pipes any more than necessary.
  - If joining pipe ends, do so before tightening the flare nut.
  - Always blow the pipe end with nitrogen while joining pipe ends.  
(This will prevent any oxide scaling from occurring inside the pipe.)
  - If using long pipe lengths with several joined pipe ends, insert strainers inside the pipes.(Strainers are not supplied.)
  - When tightening the flare nuts, coat the flares (both inside surfaces) with a small amount of refrigerator oil, and screw in about 3-4 turns at first by hand.
  - Refer to the following table for the tightening torques. Be sure to use two spanners to tighten.  
(If the nuts are overtightened, it may cause the flares to break or leak.)
- | Flare nut fastening torque N·m (kgf·cm) |          |          |            |
|---|----------|----------|------------|
| ø6.35mm                                 | 18 (180) | ø15.88mm | 65 (660)   |
| ø9.52mm                                 | 42 (430) | ø19.05mm | 100 (1020) |
| ø12.7mm                                 | 55 (560) |          |            |
3. After piping connection has been completed, make sure that the joint areas of the indoor and outdoor units are free from gas leakage by the use of nitrogen, etc.
4. Air purge within connection piping shall be carried out by evacuation.



## 5. HEAT INSULATION

**Caution**

Use a material with good heat-resistant properties as the heat insulation for the pipes. Be sure to insulate both the gas-side and liquid-side pipes. If the pipes are not adequately insulated, condensation or water leakages may occur.

Liquid-side pipes  
Gas-side pipes

Material that can withstand 120°C or higher

## 6. CHARGING WITH REFRIGERANT

- At the time of shipment from the factory, this unit is charged with enough refrigerant for an equivalent pipe length of 30m. If the equivalent pipe length used will be 30m or less, no additional charging will be necessary.
- If the equivalent pipe length will be between 30 and 50m (40m), charge with additional refrigerant according to the equivalent length given in the table below.

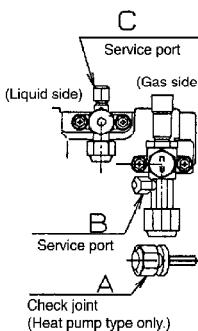
• For standard type

Model Name	Additional charging amount	Equivalent length
CU-A24BBP5 CU-C24BBP5 CU-C24BBN5 CU-C24BBN6	0.02kg/m	
CU-A28BBP5 CU-A28BBP8 CU-C28BBP8 CU-C28BBP5 CU-C28BBP6		
CU-C28BBN5 CU-C28BBN6 CU-C28BBN8		
CU-A34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP5 CU-C34BBP8	0.05kg/m	50m
CU-C34BBN7 CU-C34BBN8		
CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-C43BBN7 CU-C43BBN8		
CU-A50BBP8 CU-C50BBP7 CU-C50BBP8 CU-C50BBN7 CU-C50BBN8		

• Attention when pump down operation

- This outdoor unit is equipped with the low pressure switch for the protection of the compressor.

Therefore, operate the pump down according to the following procedures.



**CAUTION** Do not short-circuit the low pressure switch.

Procedure	Notes
1. Confirm the valve on the liquid side and the gas side is surely open.	
2. Press the COOL switch on outdoor printed board for 1 second or more.	Perform the cooling operation for five minutes or more.
3. Shut the valve on the liquid side surely.	
4. The low pressure switch operates, the unit stops, and then shut the valve on the gas side immediately.	When the valve is shut halfway the compressor is occasionally damaged.

The pump down is completed above.

**CHECKING THE PRESSURE**

Heat pump model

	A	B
During cooling operation	High pressure	Low pressure
During heating operation	Low pressure	High pressure

Check the pressure at the service port on the valve and the check joint where the pipe ends have been joined according to the table at below.

Cooling model only

	C	B
During cooling operation	High pressure	Low pressure

**7. ELECTRICAL WIRING**

<b>⚠ Warning</b>	The units must be connected to the supply cables for fixed wiring by qualified technician. Feed the power source to the unit via a distribution switch board designed for this purpose, the switch should disconnected all poles with a contact separation of at least 3mm. When the supply cable is damaged, it must be replaced by qualified technician.
<b>⚠ Caution</b>	Be sure to install a current leakage breaker, main switch and fuse to the main power supply, otherwise electric shocks may result.
<b>⚠ Caution</b>	Be sure to connect the unit to secure earth connection. If the earthing work is not carried out properly, electric shocks may result.
<b>⚠ Warning</b>	Wiring shall be connected securely by using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section. Imperfect connection and fixing leads to fire, etc.

- Connect the power supply wiring and indoor/outdoor unit connection wiring according to the electrical circuit diagram instructions.
- Clamp the wires securely to the terminal connections using cord clamps so that no undue force is placed on the wires.
- Once all wiring work has been completed, tie the wires and cords together with the binding strap so that they do not touch other parts such as the compressor and pipes.
- 1. Connect the power supply line to a 3-phase/380-415V (or single-phase 220-240V) power supply.  
If the phase is reversed, the self-diagnosis function will be activated and the unit will not operate. In such cases, switch over any two of the power supply wires (L1,L2,L3) (3-phase models only).  
(Never operate the unit by pressing the electromagnetic switch.)
- 2. The equipment shall be connected to a suitable mains network with a main impedance less than the value indicated in the table of power supply specifications.
- 3. Be sure to connect the wires correctly to terminal board with connecting the crimp type ring terminal to the wires.
- 4. The binding screws inside the power supply box may become loosened due to vibration during transportation, so check that they are tightened securely.
- 5. Tighten the binding screws to the specified torque while referring to the table below.
- 6. If connecting two separate wires to a single crimped terminal, place the two crimped terminal wires together as shown in Fig. A. (If the arrangement shown in Fig. B is used, poor contacts or contact damage may result.)
- 7. If momentarily turning on the power supply for both the indoor and outdoor units, do not turn the power off again until at least 1 minute has passed (except when a reversed phase has been detected).

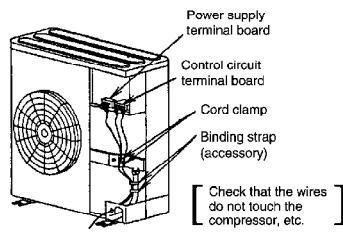


Fig A (OK)

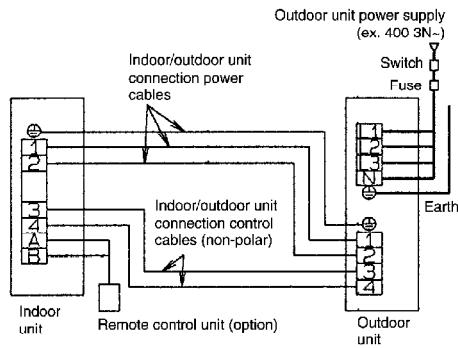
Fig B (not OK)

<b>⚠ Warning</b>	Use only the specified cables for wiring connections. Connect the cable securely, and secure them properly so that no undue force will be applied to the terminal connections. If the terminals are loose or if the wires are not connected securely, fire may result.
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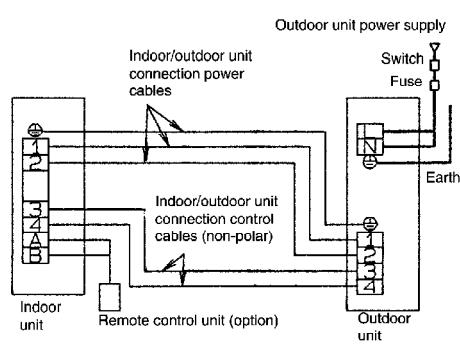
Terminal screw	Tightening torque N·cm {kgf·cm}
M3	69~98 {7~10}
M4	157~196 {16~20}
M5	196~245 {20~25}

Refer to the following diagrams for details on how to connect the power supply cables and indoor/outdoor unit connection cables.

#### OUTDOOR UNIT/3-PHASE MODEL



#### OUTDOOR UNIT/SINGLE-PHASE MODEL



#### ● Power supply specifications

Model name	Leakage current breaker (A)	Circuit breaker (Minimum Capacity)		Minimum power supply cables	4mm <sup>2</sup> cable based on length (m)	Indoor/outdoor unit connection power cables (terminals ① ② ④)	Indoor/outdoor unit connection power cables (terminals ① ② ③)	Maximum permissible impedance (Ω)
		Switch (A)	Fuse (A)					
CU-A24BBP5 CU-C24BBP5 CU-C28BBN5	220V-240V-	30	30	30	15			0.1
CU-C24BBN6	220V-	30	30	30	12			—
CU-A28BBP5 CU-C28BBP5 CU-C28BRN5	220V-240V-	30	30	30	14			0.1
CU-C28BBP6 CU-C28BBN6	220V 3-	30	30	30	11			—
CU-A28BBP8 CU-C28BBP8 CU-C28BBN8	380V-415V 3N~	15	15	15	46			0.05
CU-A34BBP5 CU-C34BBP5	220V-240V-	40	40	40	10	2.5mm <sup>2</sup> x 3	1.0mm <sup>2</sup> x 2	0.05
CU-C34BBP7 CU-C34BBN7	220V 3~	30	30	30	17			—
CU-A34BBP8 CU-C34BBP8 CU-C34BBN8	380V-415V 3N~	20	20	20	36			0.04
CU-C43BBP7 CU-C43BBN7	220V 3~	40	40	40	13			—
CU-A43BBP8 CU-C43BBP8 CU-C43BBN8	380V-415V 3N~	20	20	20	28			0.03
CU-C50BBP7 CU-C50BBN7	220V 3~	50	50	50	11			—
CU-A50BBP8 CU-C50BBP8 CU-C50BBN8	380V-415V 3N~	20	20	20	24			0.02

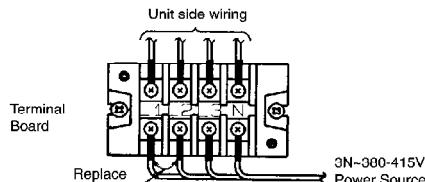
#### (NOTE)

- 1. Where ground work (earth) is carried out, do not connect the ground return to the gas pipe, water line pipe, grounded circuit of the telephone and lightning rod, or ground circuit of other product in which earth leakage breaker is incorporated. (Such action is prohibited by statute, etc.)
- △ 2. In order to prevent malfunction (noise generation) of the equipment, carry out the wiring of the control cable for indoor and outdoor units (signal cable) isolating it from other power cable with separate cable.

3. Use the standard power supply cables for Europe (such as H05RN-F or H07RN-F which conforms to CENELEC (HAR) rating specifications) or use the cables based on IEC standard. (245IEC57, 245IEC66)
4. Select the particular size of electrical wire for power supply cables in accordance with the standards of the given nation and region.

#### **CONNECTING POWER SUPPLY CABLES**

- If reversed phase is detected and the self-diagnosis function is activated after connecting the power supply cables, carry out the following operation.  
Switch over any two of the power supply wires which are connected to the power supply terminal board. Turn off the main power supply before correcting the phase.



#### **CAUTION**

- Never operate the unit by pressing the electromagnetic switch.
- Never correct the phase by switching over any of the wires inside the unit.

#### **(NOTE) When installing in Australia**

As next enumeration unit is a single phase connection with a starting current greater than 45amps, it will be necessary to fit a starting device that lowers the starting current to no more than 45amps if it causes interference to electricity supply.

**Single phase connection with greater than 45 amps unit**

CU-A24BBP5 CU-C24BBP5 CU-A28BBP5 CU-C28BBP5 CU-A34BBP5 CU-C34BBP5

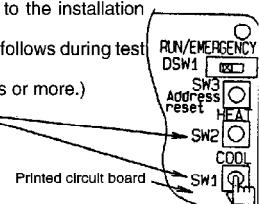
#### **9. PRECAUTIONS WITH REGARD TO TEST OPERATION**

#### **CAUTION**

- Always be sure to use a properly-insulated tool to operate the switch on the circuit board. (Do not use your finger or a metallic object.)
- Never turn on the power supply until all installation work has been completed.
- Turn on the circuitbreaker 12 hours or more before a test run. (By supplying power to crankcase heater, compressor is warmed and liquid compressing is prevented.)
- For three-phase models, check that the phase is not reversed. (If the phase is reversed, the LED on the printed circuit board will flash.)
- Check that the voltage is 90% of rated voltage or higher when starting the unit. (The unit will not operate if the voltage is less than 90% of rated voltage.)
- Test operation can be carried out using the remote control unit or by using the switch on the printed circuit board inside the outdoor unit.  
If carrying out test operation at the printed circuit board of the outdoor unit, follow the procedure given below. (If using the remote control unit to carry out test operation, refer to the installation manual which is supplied with the indoor unit.)
- Press the COOL or HEAT switch for 1 second or more. The LEDs will operate as follows during test operation.  
(Be sure to select cooling mode first, and run the units in this mode for 5 minutes or more.)

\* The compressor will stop momentarily when the operation mode is changed.

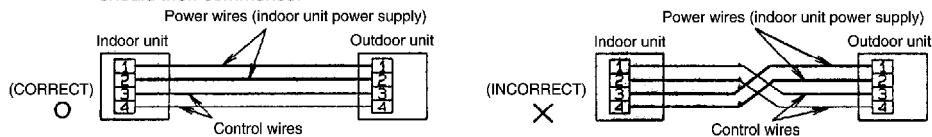
Test operation mode	LEDs on printed circuit board
Cooling test mode	LEDs 2-4 flash, LEDs 5-8 switch off
Heating test mode	LEDs 2-5 switch off, LEDs 6-8 flash



- Press the TEST button once more to cancel test operation mode.
- When performing heating test operation when the outside temperature is high, or cooling test operation when the outside temperature is low, the protection circuits may sometimes operate within a few minutes.

**NOTE 1**

These units are equipped with connection error prevention circuits. If the units do not operate, it is possible that the connection error prevention circuits have been operated. In such cases, check that the drive wires (connected to terminals ① and ②) and the control wires (connected to terminals ③ and ④) are connected correctly. If they are connected incorrectly, connect them correctly. Normal operation should then commence.

**NOTE 2**

Do not short the remote control unit wires to each other. (The protection circuit will be activated and the units will not operate.) Once the cause of the short is eliminated, normal operation will then be possible.

**NOTE 3**

When running the units in heating mode during test operation, be sure to run the units in cooling mode first before selecting this mode. If heating mode is selected first, it may cause problems with operation of the compressor.

**NOTE 4**

Test operation should be carried out for a minimum of 5 minutes. (Test operation will be cancelled automatically after 30 minutes.)

**NOTE 5**

Test operation mode should always be cancelled once test operation itself has been completed.

**NOTE 6**

Emergency operation can be carried out by setting the DSW1 switch on the printed circuit board inside the outdoor unit to the EMERGENCY position. During emergency operation, any abnormalities detected by the temperature thermistors are ignored while the outdoor unit is operating, so that long-term operation in this mode should be avoided. After emergency mode operation has been completed and normal operation is to be resumed, turn the power supplies for the indoor and outdoor units off and then back on again.

- Set the abnormal temperature thermistor only to the setting in the table below when carrying out emergency operation.

	Thermistor	Cooling operation	Heating operation
Indoor unit side	Room temperature detection	Fixed at 25°C	
	Pipe temperature detection	Shorted	Open
Outdoor unit side	Discharge thermistor detection	Open	Open
	Heat exchanger outlet temperature detection	Shorted	Open

\* Refer to the electrical circuit diagrams for details on wiring for each thermistor.

**NOTE 7**

If the self-diagnosis function reports a problem but more than one problem has developed at the indoor and/or outdoor units, the problem display on the remote control unit may not match the LED display on the outdoor unit printed circuit board. In such cases, check both locations and remove the causes of the problems.

**10. AS TO MAKING THE INSPECTION AFTER COMPLETION OF WORK FULLY UNDERSTOOD**

- At the time when the work has been completed, measure and record the characteristics of test run without fail and keep the measuring date, etc.
- Carry out the measurement regarding room temperature outside air temperature, suction and air discharge temperatures, wind velocity, wind volume, voltage current, presence of abnormal vibration, operating pressure, piping temperature, compressive pressure, airtight pressure as items to be measured.
- As to the structure and appearance, check following items.
  - Short circuit of the blowout air.
  - Smooth flow of the drain
  - Reliable thermal insulation
  - Leakage of refrigerant
  - Mistake in wiring
  - Reliable connection of the ground wire
  - looseness in terminal screw, fastening torque  
M3... 69-98cm<sup>2</sup>(7-10kgf<sup>2</sup>cm) M4... 157-196N<sup>2</sup>cm<sup>2</sup>(16-20kgf<sup>2</sup>cm)  
M5... 196-245N<sup>2</sup>cm<sup>2</sup>(20-25kgf<sup>2</sup>cm)

**11. AS TO DELIVERY TO THE CUSTOMER**

- Request the customer to operate this air conditioner viewing instruction manual come with indoor unit in practice and explain how to operate.
- Deliver the instruction manual to the customer without fail.

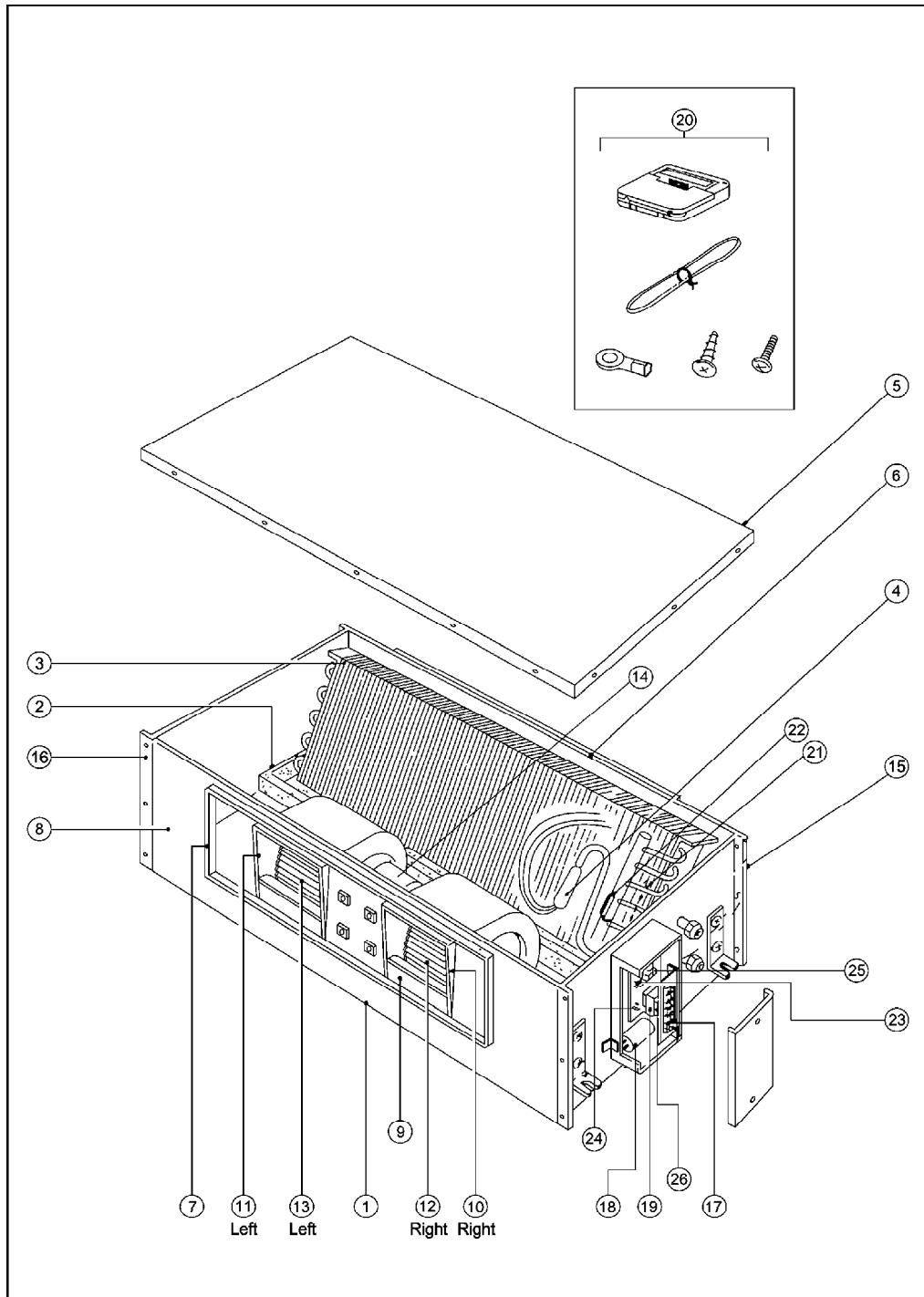
**12. AS TO PARTS TO BE SOLD SEPARATELY**

We are preparing air guider for outdoor unit and parts to be sold separately for indoor unit, etc., however, as to details of mounting method, etc., observe respective instruction manual.

## 26. REPLACEMENT PARTS

### 26.1. INDOOR UNIT

CS-A24BD1P, CS-A28BD1P, CS-A34BD1P, CS-A43BD1P, CS-A50BD1P

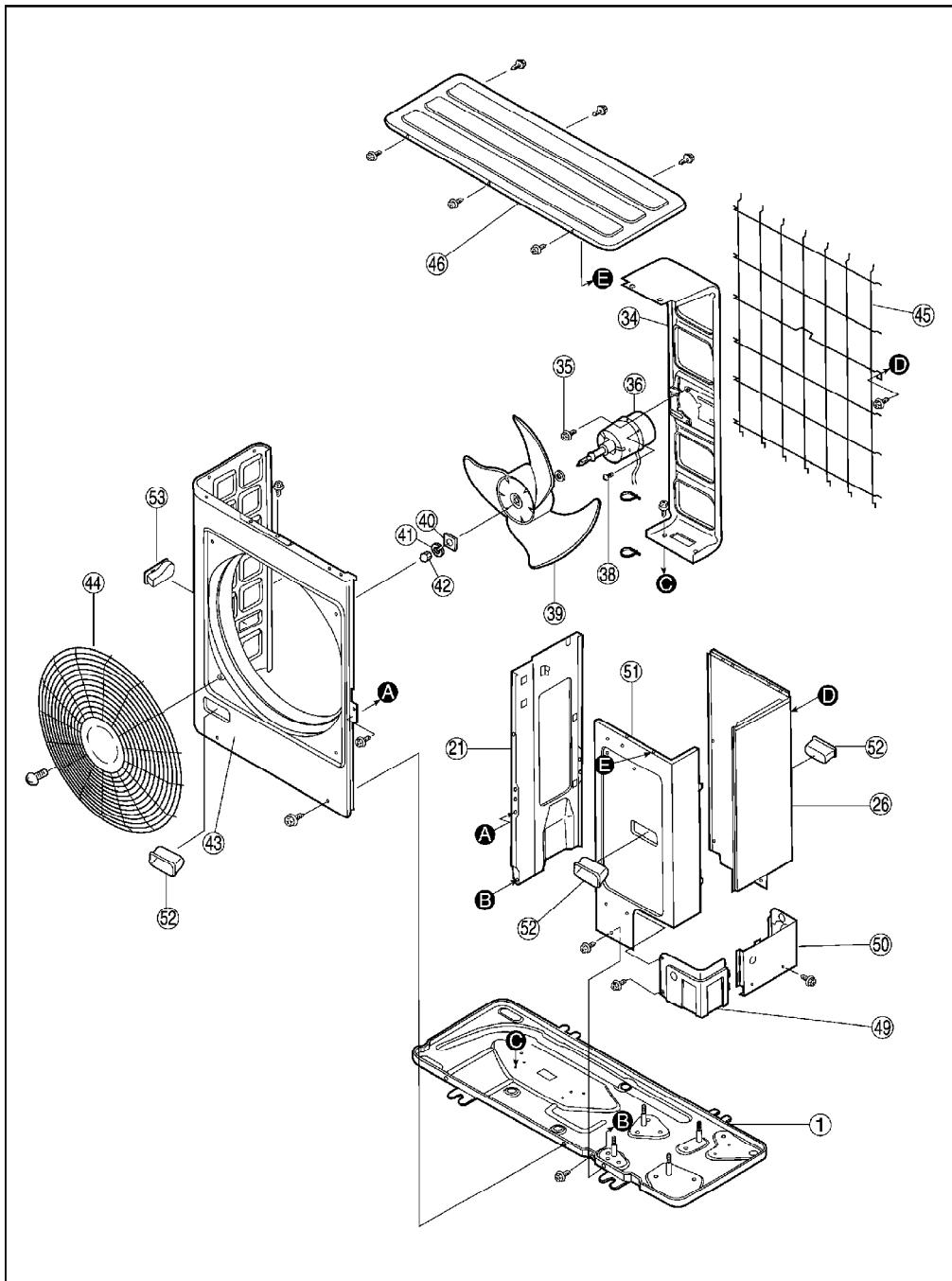


**CS-A24BD1P, CS-A28BD1P, CS-A34BD1P, CS-A43BD1P, CS-A50BD1P**

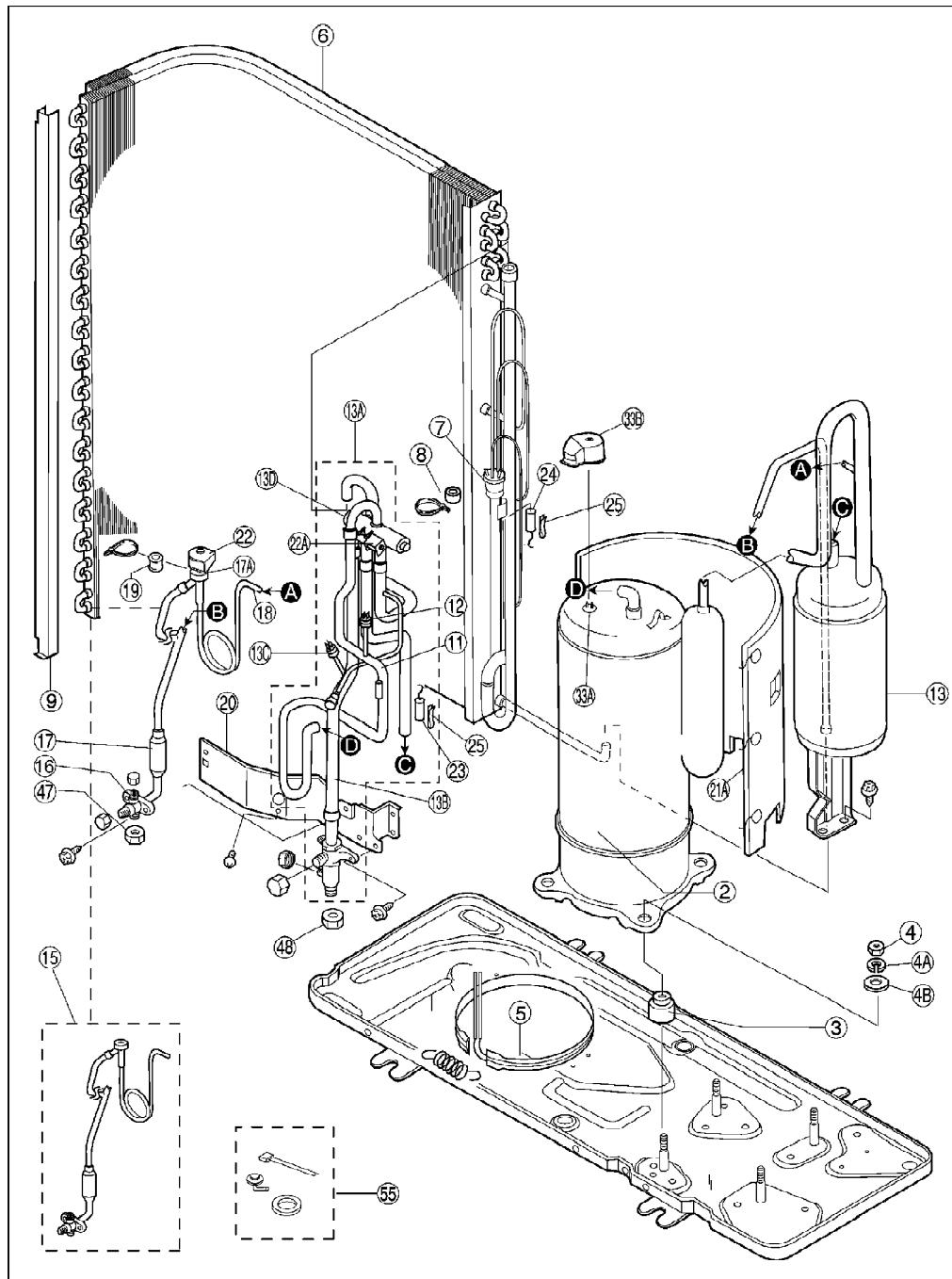
NO.	PART DESCRIPTION	QTY.	CS-A24BD1P	CS-A28BD1P	CS-A34BD1P	CS-A43BD1P	CS-A50BD1P
<u>1</u>	CABINET (BOTTOM)	1	P42-T03010	P42-T02170	P42-T01910	---	---
<u>2</u>	DRAIN PAN	1	P42-T02370	P42-T02700	P42-T02010	---	---
<u>3</u>	EVAPORATOR	1	P45-T05110	P45-T05840	P45-T05140	P45-T05150	---
<u>4</u>	DISTRIBUTOR ASS'Y	1	P45-T04670	P45-T04510	P45-T04940	P45-T04770	P45-T04690
<u>5</u>	CABINET (TOP)	1	P02-T07570	P02-T07490	---	---	---
<u>6</u>	CABINET (BACK)	1	P42-T03380	P42-T03400	P42-T03390	---	---
<u>7</u>	DUCT FLANGE ASS'Y (OUTLET)	1	P42-T02390	P42-T02150	P42-T01860	---	---
<u>8</u>	FAN BASE ASS'Y	1	P45-T07020	P45-T06980	P45-T07000	---	P45-T07010
<u>9</u>	CASING ASS'Y	1	-	-	P45-T04260	---	P45-T04050
<u>10</u>	CASING R ASS'Y	1	P45-T06760	---	-	-	-
<u>11</u>	CASING L ASS'Y	1	P45-T06770	---	-	-	-
<u>12</u>	IMPELLER R	1	-	-	-	-	P05-T08780
<u>13</u>	IMPELLER L	1	-	-	-	-	P05-T08760
<u>14</u>	FAN MOTOR	1	P06-T04311	P06-T04510	P06-T04321	P06-T04331	P06-T04540
<u>15</u>	PANEL SIDE R ASS'Y	1	P42-T03300	P42-T02980	P42-T03460	---	---
<u>16</u>	PANEL SIDE L ASS'Y	1	P42-T03000	P42-T02200	P42-T01890	---	---
<u>17</u>	TERMINAL BOARD	1	P06-T04680	---	---	---	---
<u>18</u>	CAPACITOR	1	P06-T04630	P06-T04640	---	P06-T04660	P06-T04670
<u>19</u>	TRANSFORMER	1	P06-T04300	---	---	---	---
<u>20</u>	REMOTE CONTROL (P)	1	A75C2240	---	---	---	---
<u>21</u>	THERMISTOR ASS'Y	1	06-854510	---	---	---	---
<u>22</u>	COIL SENSOR	1	06-853760	---	---	---	---
<u>23</u>	PCB ASS'Y	1	A53D0003A	---	---	---	---
<u>24</u>	NOISE FILTER	1	A491018 (P46-T06120)	---	---	---	---
<u>25</u>	PCB FUSE (250V T 3.15A)	1	-	-	-	-	-
<u>26</u>	FUSE (250V T5A)	1	P06-T04740	---	---	---	---

## 26.2. OUTDOOR UNIT

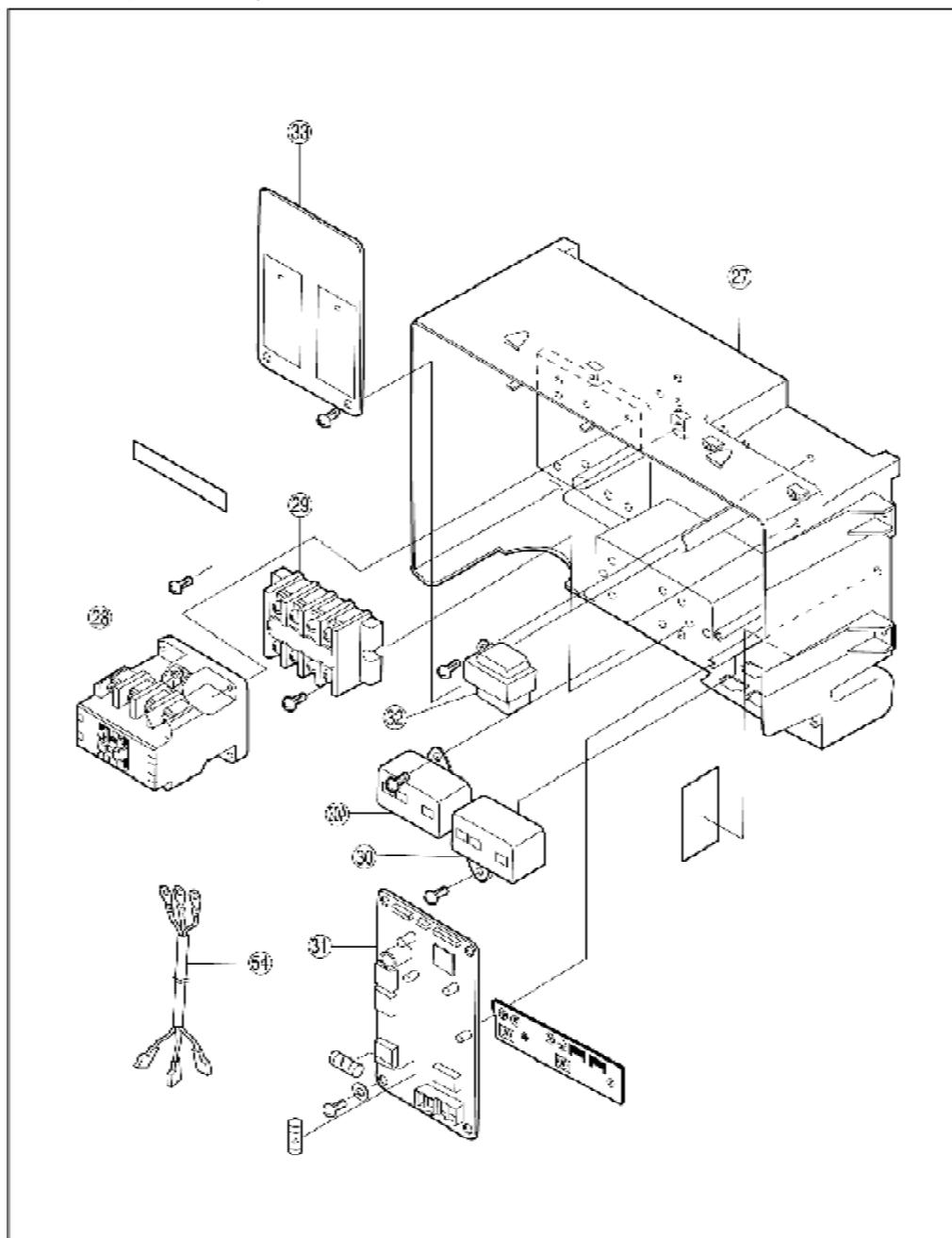
CU-A24BBP5, CU-A28BBP5, CU-A28BBP8



CU-A24BBP5, CU-A28BBP5, CU-A28BBP8



CU-A24BBP5, CU-A28BBP5, CU-A28BBP8

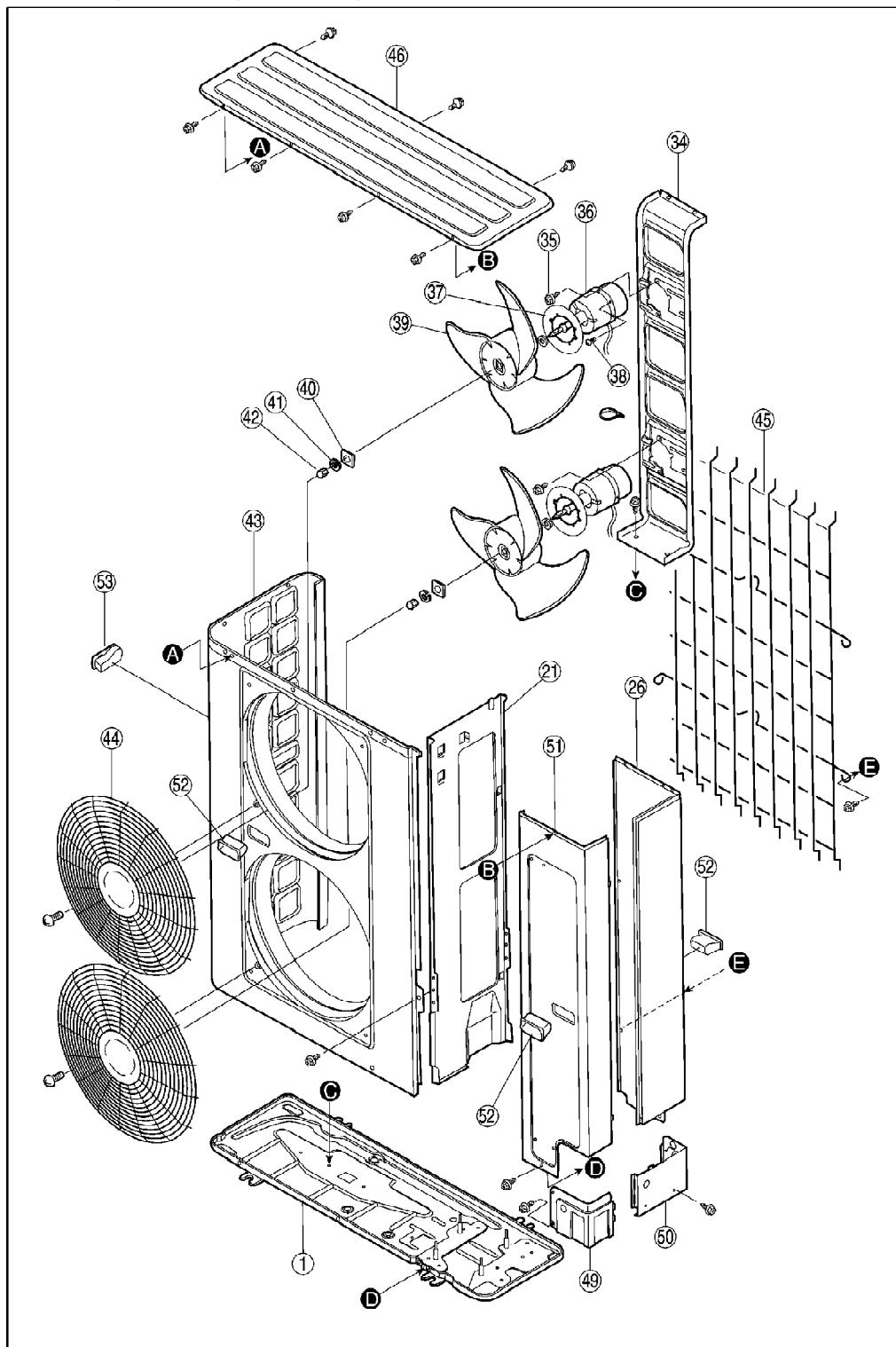


NO.	PART DESCRIPTION	QTY.	CU-A24BBP5	CU-A28BBP5	CU-A28BBP8
<u>1</u>	BASE PAN ASS'Y	1	CWD52K1038A		
<u>2</u>	COMPRESSOR	1	NH41VNDT	NH44VNDT	NH44YDET
<u>3</u>	ANTI-VIBRATION BUSHING	4	CWH501018		
<u>4</u>	NUT FOR COMP. MOUNT.	3	XNG8		
<u>4a</u>	WASHER for COMPRESSOR	3	XWA8		
<u>4b</u>	SP WASHER	3	CWH571018		
<u>5</u>	CRANKCASE HEATER	1	CWA341005		
<u>6</u>	CONDENSER COMPLETE	1	CWB32C1088	CWB32C1089	
<u>7</u>	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1045	CWT07K1046	
<u>8</u>	PIPE HOLDER RUBBER	1	CWG251016		
<u>9</u>	CONDENSER SIDE PLATE	1	CWD911122		
<u>11</u>	TUBE ASS'Y(PRESSURE SWITCH)	1	CWT022355		
<u>12</u>	HIGH PRESSURE SWITCH	1	CWA101002		
<u>13</u>	ACCUMULATOR	1	CWB131007A	CWB131008A	
<u>13a</u>	4-WAYS VALVE COMPLETE	1	CWB00C1002	CWB00C1003	
<u>13b</u>	TUBE ASS'Y(PRESS.SW + VALVE)	1	CWT01C2285		
<u>13c</u>	HEATING PRESSURE SWITCH	1	CWA101001		
<u>13d</u>	4-WAYS VALVE	1	CWB00003		
<u>15</u>	TUBE ASS'Y(VALVE+STRAINER)	1	CWT01C2282	CWT01C2283	
<u>16</u>	3-WAYS VALVE	1	CWB011054	CWB011053	
<u>17</u>	STRAINER	1	CWB111006	CWB111005	
<u>17a</u>	2-WAYS VALVE	1	CWB02299		
<u>18</u>	CAPILLARY TUBE for VALVE	1	CWB15K1038	CWB15K1037	
<u>19</u>	PIPE HOLDER RUBBER	1	CWG251014	CWG251015	
<u>20</u>	HOLDER-SERVICE VALVE	1	CWD911124		
<u>21</u>	SOUND-PROOF BOARD ASS'Y	1	CWH151016		
<u>21a</u>	SOUND PROOF MATERIAL-COMP	1	CWG302098		
<u>22</u>	V-COIL COMPLETE	1	CWA43C2068		

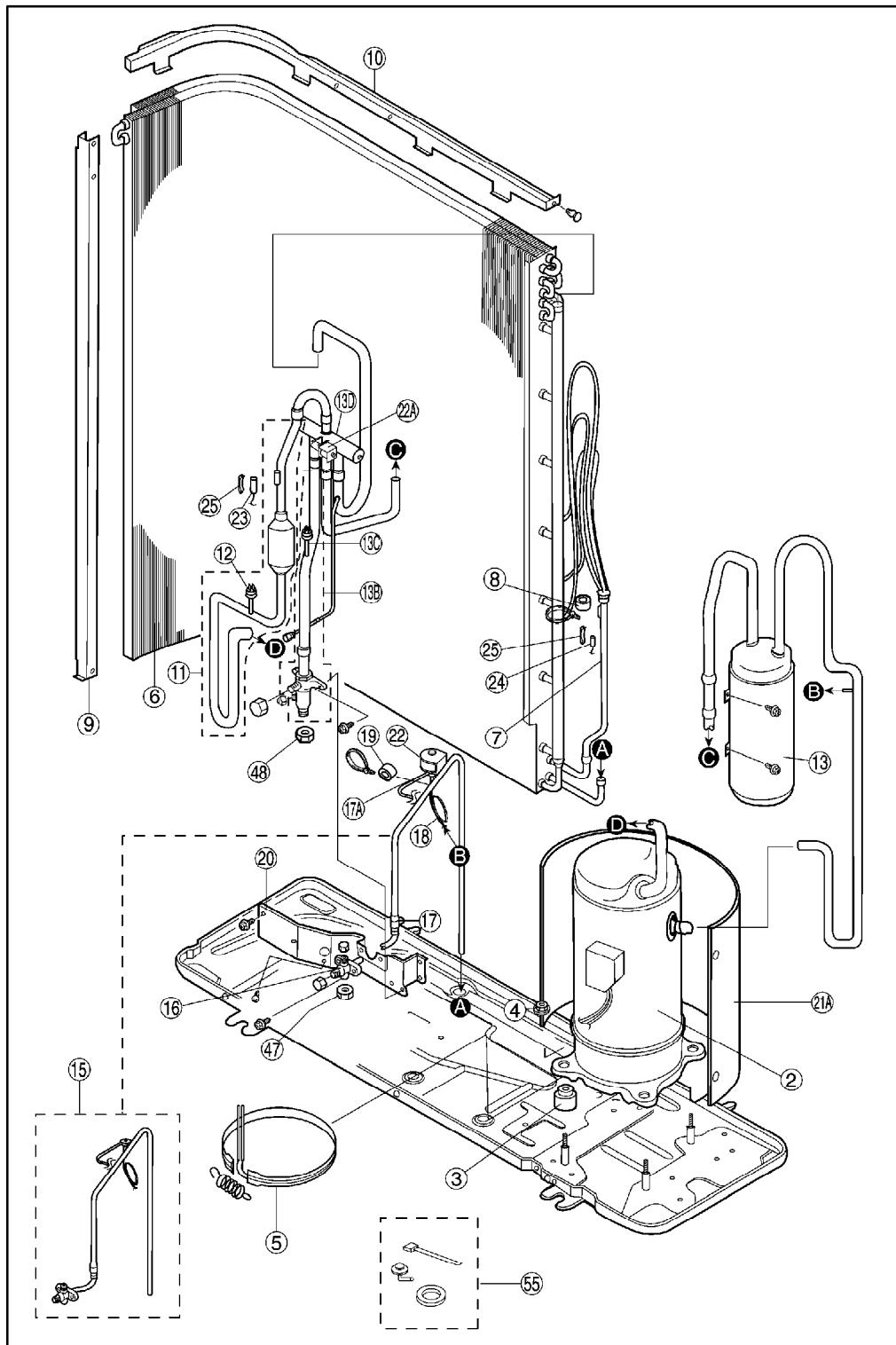
<u>22a</u>	V-COIL COMPLETE (4 WAY VALVE)	1	CWA43C2060			
<u>23</u>	PIPING SENSOR (DISCHARGE)	1	CWA501042			
<u>24</u>	PIPING SENSOR (COIL)	1	CWA501043			
<u>25</u>	SPRING FOR SENSOR	2	CWH711010			
<u>26</u>	CABINET REAR PLATE	1	CWE02C1005			
<u>27</u>	CONTROL BOARD	1	CWH141004			
<u>28</u>	COMPRESSOR RELAY	1	CWA001005			CWA001007
<u>29</u>	TERMINAL BOARD ASS'Y	1	CWA28K1027			CWA28K1029
<u>30</u>	CAPACITOR-FAN MOTOR (3 / 460)	1	DS461305QP-A			
<u>30a</u>	CAPACITOR-COMP (MF/V)	1	DS441456CPNB / (45 / 440)	DS441506CPNB / (50 / 440)		-
<u>31</u>	ELECTRONIC CONTROLLER	1	CWA742583			CWA742584
<u>32</u>	TRANSFORMER	1	CWA401029			
<u>33</u>	CURRENT TRANSFORMER BOARD	1	CWA742591			CWA742592
<u>33a</u>	OVERLOAD PROTECTOR	1	-			CWA121075
<u>33b</u>	TERMINAL COVER	1	CWH171019			CWH171022
<u>34</u>	BRACKET FAN MOTOR	1	CWD541027			
<u>35</u>	SCREW-BRACKET FAN MOTOR	4	CWH551040			
<u>36</u>	FAN MOTOR	1	CWA951077			
<u>38</u>	SCREW-FAN MOTOR	4	CWH55442			
<u>39</u>	PROPELLER FAN	1	CWH001007			
<u>40</u>	WASHER for P.FAN	1	CWH571013			
<u>41</u>	SPRING WASHER for P.FAN	1	XWB10B			
<u>42</u>	NUT for PROPELLER FAN	1	CWH56033			
<u>43</u>	P.FAN AIR GUIDER PLATE	1	CWE061036A			
<u>44</u>	FAN GUARD	1	CWD041014A			
<u>45</u>	CONDENSER GUARD	1	CWD041015A			
<u>46</u>	CABINET TOP PLATE COMPLETE	1	CWE03C1004			
<u>47</u>	FLARE NUT (1/4") / (3/8")	1	6002140 (1/4")	CWT25005 (3/8")		
<u>48</u>	FLARE NUT (5/8")	1	CWT25004			

<b>49</b>	PIPE COVER (FRONT)	1	CWD601017A	—	—
<b>50</b>	PIPE COVER (BACK)	1	CWD601018A	—	—
<b>51</b>	CABINET FRONT PLATE	1	CWE06C1033	—	—
<b>52</b>	HANDLE	3	CWE161008	—	—
<b>53</b>	HANDLE	1	CWE161009	—	—
<b>54</b>	LEADWIRE-COMPRESSOR	1	CWA67C3657	—	CWA67C3665
<b>55</b>	ACCESSORY COMPLETE	1	CWH82C1105	—	—
	INSTALLATION INSTRUCTION	1	CWF612231	—	—

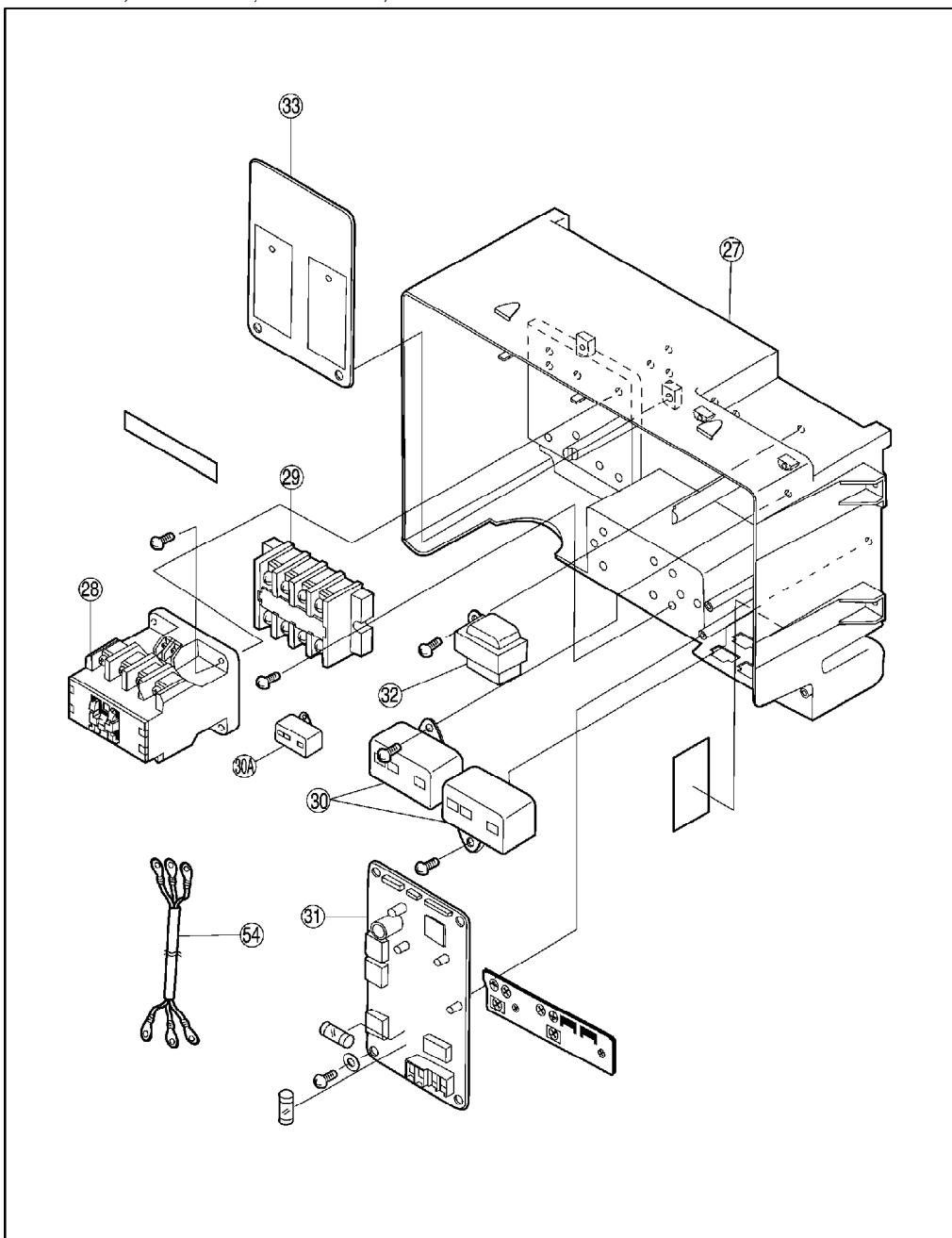
CU-A34BBP5, CU-A34BBP8, CU-A43BBP8, CU-A50BBP8



CU-A34BBP5, CU-A34BBP8, CU-A43BBP8, CU-A50BBP8



CU-A34BBP5, CU-A34BBP8, CU-A43BBP8, CU-A50BBP8



NO.	PART DESCRIPTION	QTY.	CU-A34BBP5	CU-A34BBP8	CU-A43BBP8	CU-A50BBP8
<u>1</u>	BASE PAN ASS'Y	1	CWD52K1039A	—	CWD52K1040A	—
<u>2</u>	COMPRESSOR	1	ZR47K3PFJ522	ZR45KCTFD522	ZR57KCTFD599	ZR68KCTFD599
<u>3</u>	ANTI-VIBRATION BUSHING	4	CWH501020	—	—	—
<u>4</u>	NUT FOR COMP. MOUNT.	3	4582065	—	—	—
<u>5</u>	CRANKCASE HEATER	1	CWA341004	—	CWA341002	—
<u>6</u>	CONDENSER COMPLETE	1	CWB32C1094	—	CWB32C1095	CWB32C1096
<u>7</u>	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1023	—	CWT07K1048	CWT07K1049
<u>8</u>	PIPE HOLDER RUBBER	1	CWG251016	—	CWG251021	—
<u>9</u>	CONDENSER SIDE PLATE	1	CWD911123	—	—	—
<u>10</u>	CONDENSER TOP PLATE	1	CWD911132	—	CWD911133	—
<u>11</u>	TUBE ASS'Y(PRESSURE SWITCH)	1	CWT022371	—	CWT022374	—
<u>12</u>	HIGH PRESSURE SWITCH	1	CWA101002	—	—	—
<u>13</u>	ACCUMULATOR	1	CWB131009A	—	CWB131011A	CWB131012A
<u>13b</u>	TUBE ASS'Y(PRESS.SW + VALVE)	1	CWT022370	—	CWT022373	—
<u>13c</u>	HEATING PRESSURE SWITCH		CWA101001	—	—	—
<u>13d</u>	4-WAYS VALVE	1	CWB001014	—	CWB001015	—
<u>15</u>	TUBE ASS'Y(VALVE+STRAINER)	1	CWT022359	—	CWT022360	CWT022361
<u>16</u>	3-WAYS VALVE		CWB011058	—	—	—
<u>17</u>	STRAINER		CWB111005	—	—	—
<u>17a</u>	2-WAYS VALVE		CWB02299	—	—	—
<u>18</u>	CAPILLARY TUBE for VALVE	1	CWB15K1037	—	CWB15K1039	CWB15K1040
<u>19</u>	PIPE HOLDER RUBBER	1	CWG251015	—	—	—
<u>20</u>	HOLDER-SERVICE VALVE	1	CWD911131	—	—	—
<u>21</u>	SOUND-PROOF BOARD ASS'Y	1	CWH15K1001	—	—	—
<u>21a</u>	SOUND PROOF MATERIAL-COMP.	1	CWG302101	—	CWG302103	—

<u>22</u>	V-COIL COMPLETE	1	CWA43C2067	---	---	---
<u>22a</u>	V-COIL COMPLETE-4 WAY VALVE	1	CWA43C2063	---	---	---
<u>23</u>	PIPING SENSOR (DISCHARGE)	1	CWA501044	---	---	---
<u>24</u>	PIPING SENSOR (COIL)	1	CWA501045	---	---	---
<u>25</u>	SPRING FOR SENSOR	2	CWH711010	---	---	---
<u>26</u>	CABINET REAR PLATE	1	CWE021012A	---	CWE02C1006	---
<u>27</u>	CONTROL BOARD	1	CWH141004	---	---	---
<u>28</u>	COMPRESSOR RELAY	1	CWA001006	CWA001005	---	---
<u>29</u>	TERMINAL BOARD ASS'Y	1	CWA28K1027	CWA28K1029	---	---
<u>30</u>	CAPACITOR-FAN MOTOR (3 / 460)	2	DS461305QP-A	---	---	---
<u>30a</u>	CAPACITOR-COMP (MF/V)	1	DS371606CPNA (60 / 370)	-	-	-
<u>31</u>	ELECTRONIC CONTROLLER	1	CWA742590	CWA742585	---	---
<u>32</u>	TRANSFORMER	1	CWA401029	---	---	---
<u>33</u>	CURRENT TRANSFORMER BOARD	1	CWA742591	CWA742592	---	---
<u>34</u>	BRACKET-FAN MOTOR	1	CWD541028	---	---	---
<u>35</u>	SCREW-BRACKET FAN MOTOR	4	CWH551040	---	---	---
<u>36</u>	FAN MOTOR	2	CWA951077	---	---	CWA951078
<u>37</u>	FAN MOTOR SUPPORTER	2	-	---	---	CWD932142
<u>38</u>	SCREW-FAN MOTOR	8	CWH55442	---	---	---
<u>39</u>	PROPELLER FAN	2	CWH001007	---	---	---
<u>40</u>	WASHER for P.FAN	2	CWH571013	---	---	---
<u>41</u>	SPRING WASHER for P.FAN	2	XWB10B	---	---	---
<u>42</u>	NUT for PROPELLER FAN	2	CWH56033	---	---	---
<u>43</u>	P.FAN AIR GUIDER PLATE	1	CWE061042A	---	CWE061044A	---
<u>44</u>	FAN GUARD	2	CWD041014A	---	---	---
<u>45</u>	CONDENSER GUARD	1	CWD041016A	---	CWD041017A	---
<u>46</u>	CABINET TOP PLATE COMPLETE	1	CWE03C1004	---	CWE03C1005	---
<u>47</u>	FLARE NUT (3/8")	1	CWT25005	---	---	---

<b>48</b>	FLARE NUT (6/8")	1	CWT251012	---	---	---
<b>49</b>	PIPE COVER (FRONT)	1	CWD601017A	---	---	---
<b>50</b>	PIPE COVER (BACK)	1	CWD601018A	---	---	---
<b>51</b>	CABINET FRONT PLATE	1	CWE061046A	---	---	---
<b>52</b>	HANDLE	3	CWE161008	---	---	---
<b>53</b>	HANDLE	1	CWE161009	---	---	---
<b>54</b>	LEADWIRE-COMPRESSOR	1	CWA67C3876	CWA67C3656	---	---
<b>55</b>	ACCESSORY COMPLETE	1	CWH82C1105	---	---	---
	INSTALLATION INSTRUCTION	1	CWF612231	---	---	---

All parts are supplied from MACC, Malaysia (Vendor Code: 086)