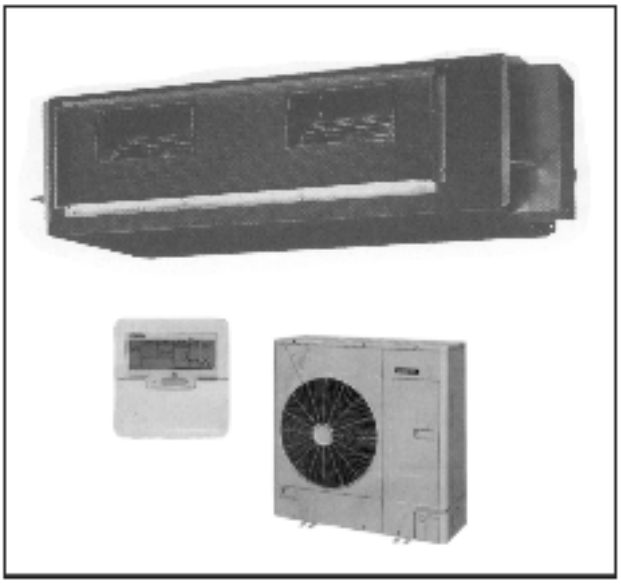
ORDER NO. MAC0201010C2

Service Manual

AIR CONDITIONER



CS-W24BD2P CU-W24BBP5
CS-W28BD2P CU-W28BBP5
CS-W28BD2P CU-W28BBP8
CS-W34BD2P CU-W34BBP8
CS-W43BD2P CU-W43BBP8
CS-W24BD2P CU-V24BBP5
CS-W24BD2P CU-V24BBP8
CS-W28BD2P CU-V28BBP5
CS-W28BD2P CU-V28BBP8
CS-W34BD2P CU-V34BBP8
CS-W43BD2P CU-V43BBP8

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

⚠ PRECAUTION OF LOW TEMPERATURE

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

CONTENTS

Panasonic

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

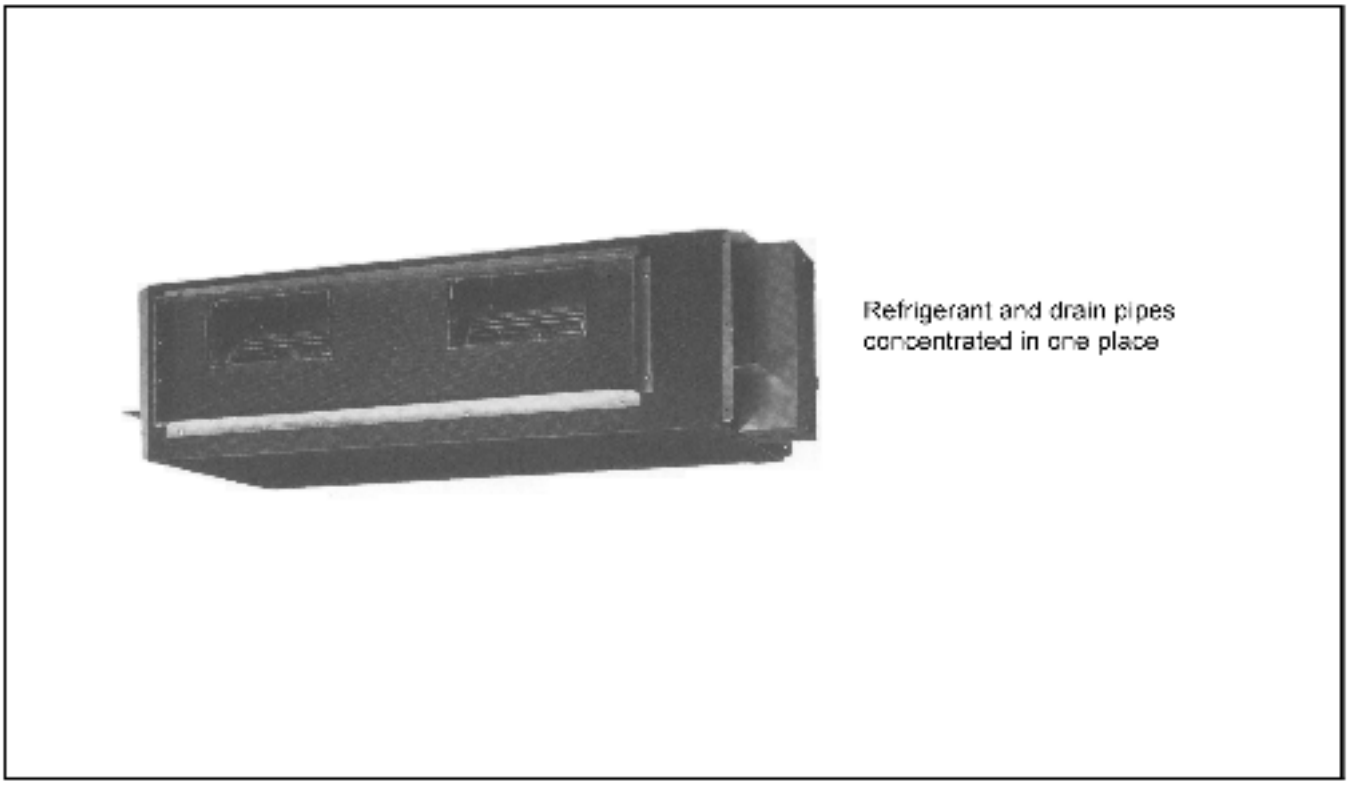
Do not touch the remote control switch and do not change any wirings for one minute when the main power supply switch is 'on'. (Because the unit is having automatic address setting during the first one minute.)

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

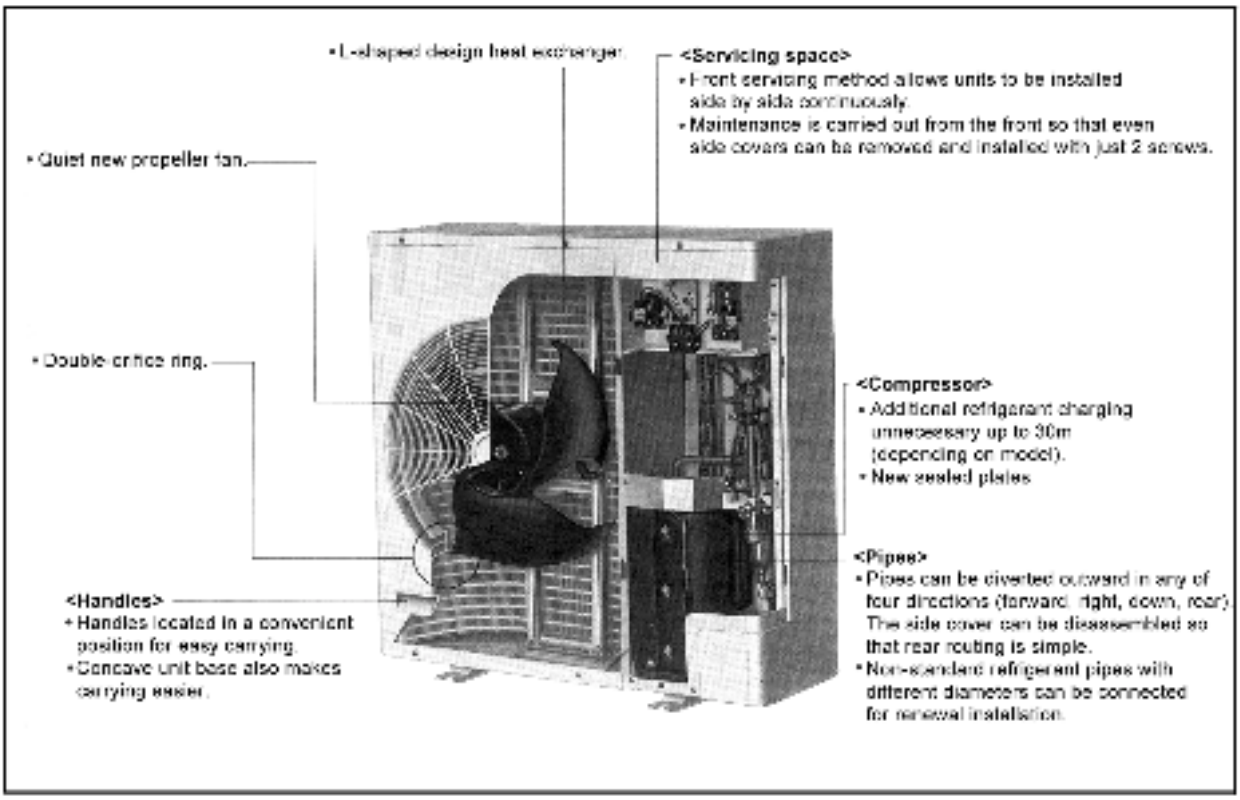
- Cooling is possible to temperature as low as -5°C

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.

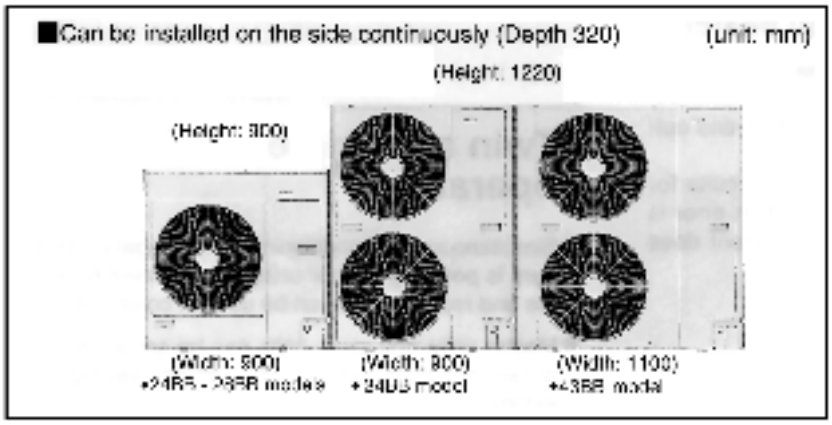
2.2.2. Automatic restart function

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

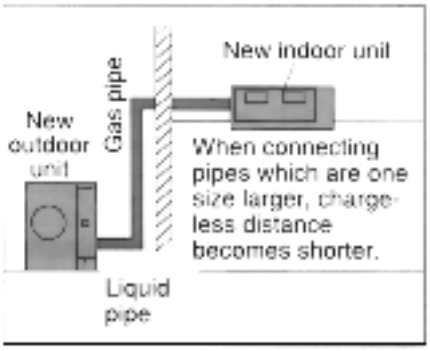
Cooling operation is possible at outdoor temperature of -5°C.

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.



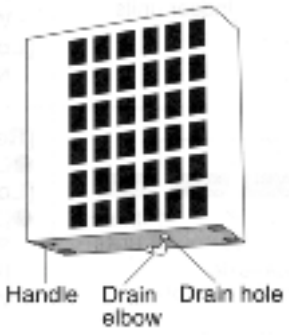
- For example, liquid and gas pipes from 10 years ago can be connected to current pipes with the same size for one size larger. Effective utilization of materials reduces working time and trouble. (Adaptor sockets are not supplied.)

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~43BB
Height difference/equivalent pipe length	30/50

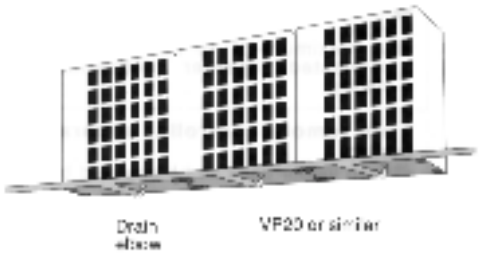
2.3.7. Internal pipe connection

- 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 model, 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.

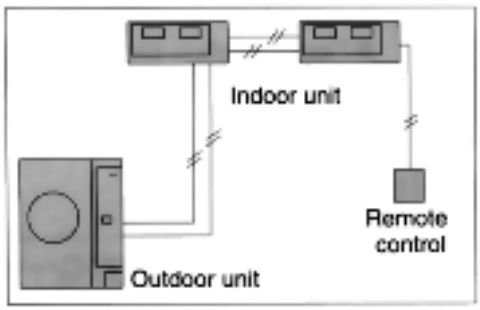


2.4. A brand-new control method using the latest in technology

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.



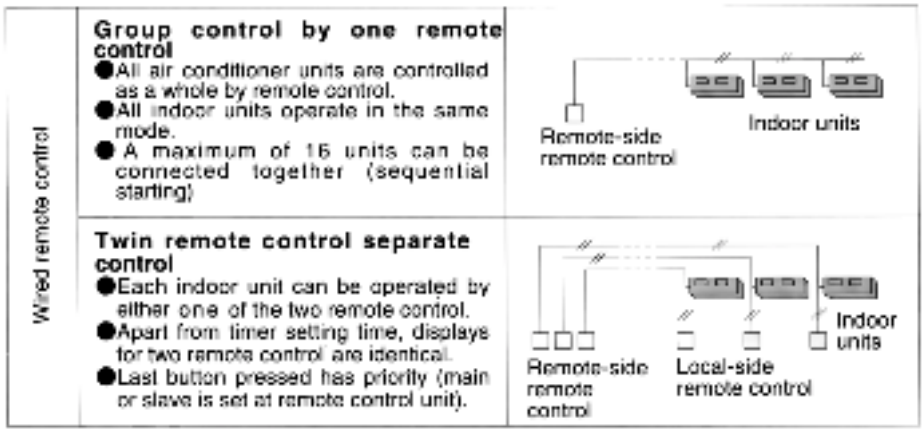
2.4.2. Separate indoor/outdoor unit power supplies

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)

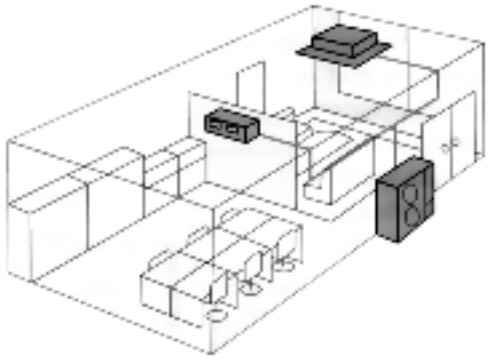
In accordance with the indoor and outdoor units connected and the connection methods, conditions such as the configuration (twin or triple format) and remote-control functions such as cooling only or heat pump model are automatically detected and set instantly.

2.4.4. Group control equipment



2.4.5. Twin 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 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 Combination Table**

Outdoor unit	Simultaneous twin operation
	Standard
5.0 HP	2.5 / 3.0 / 2.5

: Outdoor unit capacity
: Indoor unit capacity

2.5. New refrigerant Series [R407C] pipe installation

2.5.1. Procedure

- The new refrigerant (R407C) has a different composition to the previously-used refrigerant (R22), so some contents and method of pipe installation and charging work are different from before. Care should be taken when carrying out this work.

2.5.2. Installation and precautions

2.5.2.1. Before installation

1. Determine the installation division.
2. Check the refrigerant to be used.
   - Check that the refrigerant is R407C.
   - Check that the gauge pressure is at a maximum of 3.3 MPa.
3. Make a drawing of the Installation.

2.5.2.2. Installation

1. Install the sleeve and the insert.
2. Install the indoor unit.
3. Install the refrigerant piping.
   - Pipe materials
   - Refrigerant pipes which were previously used to carry R22 must not be re-used. If replacing the indoor and outdoor units, be sure to replace all refrigerant pipes also.
   - Check the pipe thickness.
   - Clean the inside of the pipes.

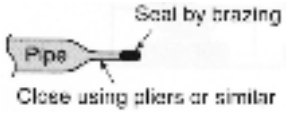
- When storing pipes, seal both ends of the pipes and store them indoors to prevent water, dust and other foreign particles from getting inside.
- Take care not to let any foreign particles (oxide scales, water or dirt) get inside the refrigerant lines (same as for R22).

■ Refrigerant pipe storing

Location	Installation period	Storing method
Outdoors	1 month or more	Pinching
	Less than 1 month	Pinching or taping
Indoors	Any	

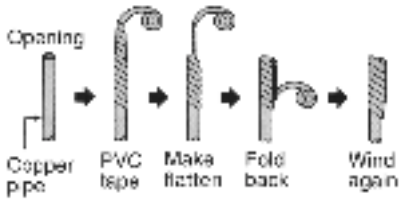
- Pinching method

  Close off the ends of the pipes with pliers or similar tool and seal the opening by brazing.



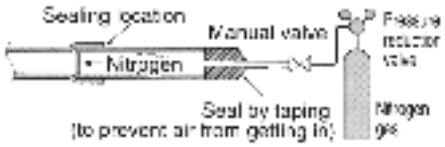
- Taping method

  Wind PVC tape around the ends of the pipes to seal the openings.



- Do not work for refrigerant piping on outdoor on rainy days.
- Seal by brazing.
- Be sure to use only a non-oxidizing brazing material.

  (Use nitrogen. Anti-oxidants cannot be used.)



- When brazing pipes together, or when brazing copper pipes and copper joints, use a brazing material (Bcup-3) which does not require flux.
- Flare processing and ester oil.
- Sealing can be improved by applying ester oil or mineral oil (the minimum amount necessary) to flares and flange connections.
- Due to the high hygroscopic tendency for ester oil, do not mix or use any other impurities. (This can cause deterioration of the compressor oil and problems with the compressor.)
- After preparing the refrigerant pipes, close both ends of the pipes by brazing if not immediately connecting them.
- A torque wrench must be used.

4. Install the drain pipe.
5. Install the ducts.
6. Insulate against heat.
7. Carry out the electrical work.
   - Connecting cables and power cables.
8. Make all necessary settings.
9. Prepare the outdoor unit foundation.
10. Install the outdoor unit.
11. Air-tightness test.

    For the final check, there should be no pressure drop when 3.3 MPa is applied for 24 hours.
12. Vacuum drying.

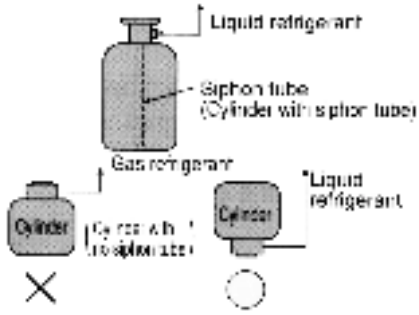
Vacuum draw time	60 min. or more

* Vacuum pump capacity 60 l/min. or higher

- Drawing the vacuum will remove any moisture.
- The pressure after vacuum drawing should be 755 mmHg or less.
- Use a special vacuum pump (with backflow-prevention mechanism).
- Gas must never be used for air purging.

13. Additional refrigerant charging.
    - Check that refrigerant volume is correct.
    - Be sure to charge refrigerant in liquid state.
    - Always charge in liquid state.

      When the refrigerant is charged from the cylinder, the composition may change greatly (compounds which do not easily evaporate may remain inside the cylinder), so the refrigerant must always be charged in a liquid state.



(It is recommended that a manifold with sight glass be used.)

■ Boiling point at normal atmospheric pressure (reference)

Refrigerant	HFC32	HFC125	HFC134a
Boiling point	-52°C	-49°C	-26°C

- Use a special gauge manifold and charging hose.
- If refrigerant leaks occur, replace all of the refrigerant (same as for R22).
- Note that a R22 leak detector cannot be use to detect leaks.
- Refer to the Installation Instructions included for the correct charging amount.
- Make a note of additional refrigerant charging amounts in the record table.

14. Test operation and adjustment.
15. Organize documentation before handover.
16. Handover and explanation of operation.

- Ventilation of closed rooms

  R407C is a non-flammable refrigerant with low toxicity, but in the gas state its specific gravity is heavier than that of air, and so if leaks occur in a closed room, suffocation may occur. Toxic gases may also be generated if it comes into direct contact with flames, so adequate ventilation must be provided.

Name	Application	Class	Remarks
Pipe cutter	Cutting refrigerant pipes	○	
Flare tool	Flaring of refrigerant pipes	○	• Clean off any refrigeration oil if the tool has been used with the previous refrigerant
Refrigerant pipe expander (tube expander)	Enlarging pipes during connection	○	
Torque wrench	Tightening flare nuts	○	
Pipe bender	Bending refrigerant pipes	○	
Compressor oil	Applying to flares	◎	• Use care when storing and handling due to high hygroscopicity
Nitrogen gas	Preventing oxidation inside refrigerant pipes when welding pipes	○	
Welder	Brazing refrigerant pipe opening	○	
Gauge manifold	Checking vacuum drawing, refrigerant charging and operating pressure	◎	• Check pressure-resistance specifications. • If used previously with R22 air conditioners, compressor oil from that air conditioner may still be present. • Use a tool with a sight glass to make liquid refrigerant checking easier.
Charging hose			
Vacuum pump	Drawing vacuum and drying	○	• Backflow-prevention mechanism necessary. Changed to screw-on specifications (adaptor required)
Charging cylinder	Charging refrigerant	×	• Cannot be used for normal usage method due to change in refrigerant composition.
Electronic scale for refrigerant charging		○	• Pressure-resistance and connection opening specifications must be checked.
Electronic gas leak detector	Checking refrigerant leaks	◎	• Previous electronic-type gas leak detectors can not detect.
Refrigerant collector	Collection refrigerant	◎	• Special equipment required

◎: Special tool for R407C use required ○: Same tool can be used for R407C and R22 ×: Cannot be used

* It is recommended that materials and tools to be used only for the R407C substitute refrigerant be specially coloured for discrimination. (Example: Paint a marking by turning the brown colour of R407C cylinder, or attach discrimination tape.)

3 SPECIFICATION (HEAT PUMP TYPE)

3.1. CS-W24BD2P / CU-W24BBP5

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W24BD2P	CU-W24BBP5
Cooling Capacity			kW (BTU/h)	6.30 (21,500)	
Heating Capacity			kW (BTU/h)	7.10 (24,200)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 18 Hi 636	
External Static Pressure			mmAq Pa	Hi 10 Hi 98	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	290 x (1000 + 100) x 500	900 x 900 x 320
Net Weight			kg (lbs)	43 (95)	81 (179)
Piping Connection	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	
	Drain		mm	Female screw RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Rotary), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole single phase induction motor
		Rated Output	kW	-	1.9
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.15	0.05
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MEL56 (1.3)
Refrigerant (Charged)			kg (oz)	-	R407C 2.8 (99)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 40 Lo 36	Cooling 52, Heating 53
			Power level dB	Hi 55 Lo 51	Cooling 65, Heating 66

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-W24BD2P/CU-W24BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	2.56	2.56	2.56
		Heat	2.60	2.60	2.60
Running Current	A	Cool	11.7	11.2	10.8
		Heat	11.9	11.4	10.9
Starting Current	A		64	66	68
Power Factor	%	Cool	99	99	99
		Heat	99	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		

3.2. CS-W28BD2P / CU-W28BBP5

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W28BD2P	CU-W28BBP5
Cooling Capacity			kW (BTU/h)	7.10 (24,200)	
Heating Capacity			kW (BTU/h)	8.00 (27,300)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 20 Hi 706	
External Static Pressure			mmAq Pa	Hi 10 Hi 98	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	290 x (1000 + 100) x 500	900 x 900 x 320
Net Weight			kg (lbs)	43 (95)	81 (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 RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Rotary), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole single phase induction motor
		Rated Output	kW	-	2.0
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.15	0.05
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MEL56 (1.3)
Refrigerant (Charged)			kg (oz)	-	R407C 3.3 (116)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 41 Lo 37	Cooling 53, Heating 54
			Power level dB	Hi 56 Lo 52	Cooling 66, Heating 67

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-W24BD2P/CU-W28BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	2.86	2.86	2.86
		Heat	3.02	3.02	3.02
Running Current	A	Cool	13.1	12.5	12.5
		Heat	13.8	13.2	12.7
Starting Current	A		68	70	72
Power Factor	%	Cool	99	99	95
		Heat	99	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-W28BD2P / CU-W28BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W28BD2P	CU-W28BBP8
Cooling Capacity			kW (BTU/h)	7.10 (24,200)	
Heating Capacity			kW (BTU/h)	8.00 (27,300)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 20 Hi 706	
External Static Pressure			mmAq Pa	Hi 10 Hi 98	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	290 x (1000 + 100) x 500	900 x 900 x 320
Net Weight			kg (lbs)	43 (95)	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 RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Rotary), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole 3-phase induction motor
		Rated Output	kW	-	2.0
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.15	0.05
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MEL56 (1.3)
Refrigerant (Charged)			kg (oz)	-	R407C 3.3 (116)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Head thermostat for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 41 Lo 37	Cooling 53, Heating 54
			Power level dB	Hi 56 Lo 52	Cooling 66, Heating 67

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-W28BD2P/CU-W28BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	2.72	2.72	2.72
		Heat	2.86	2.86	2.86
Running Current	A	Cool	4.6	4.6	4.6
		Heat	4.5	4.5	4.5
Starting Current	A		28	29	30
Power Factor	%	Cool	90	85	82
		Heat	97	92	88
*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-W34BD2P / CU-W34BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W34BD2P	CU-W34BBP8
Cooling Capacity			kW (BTU/h)	10.00 (34,100)	
Heating Capacity			kW (BTU/h)	11.20 (38,200)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 33 Hi 1165	
External Static Pressure			mmAq Pa	Hi 15 Hi 147	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	360 x (1000 + 100) x 650	1220 x 900 x 320
Net Weight			kg (lbs)	56 (123)	97 (214)
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 RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Scroll), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole 3-phase induction motor
		Rated Output	kW	-	3.0
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.25	0.05 x 2
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MMMAPOE (1.3)
Refrigerant (Charged)			kg (oz)	-	R407C 3.2 (113)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 47 Lo 43	Cooling 56, Heating 58
			Power level dB	Hi 62 Lo 58	Cooling 69, Heating 71

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-W34BD2P/CU-W34BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	3.88	3.88	3.88
		Heat	4.07	4.07	4.07
Running Current	A	Cool	6.2	6.2	6.2
		Heat	6.5	6.5	6.5
Starting Current	A		39	41	42
Power Factor	%	Cool	95	90	87
		Heat	95	90	87
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

3.5. CS-W43BD2P / CU-W43BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W43BD2P	CU-W43BBP8
Cooling Capacity			kW (BTU/h)	12.50 (42,600)	
Heating Capacity			kW (BTU/h)	14.0 (47,700)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 36 Hi 1271	
External Static Pressure			mmAq Pa	Hi 15 Hi 147	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	360 x (1000 + 100) x 650	1220 x 1100 x 320
Net Weight			kg (lbs)	58 (128)	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 RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Scroll), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole 3 phase induction motor
		Rated Output	kW	-	3.75
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.35	0.055 x 2
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MMMAPOE (2.0)
Refrigerant (Charged)			kg (oz)	-	R407C 3.6 (127)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 48 Lo 44	Cooling 56, Heating 58
			Power level dB	Hi 63 Lo 59	Cooling 69, Heating 71

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-W43BD2P/CU-W43BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	4.49	4.49	4.49
		Heat	4.66	4.66	4.66
Running Current	A	Cool	7.8	7.8	7.8
		Heat	8.0	8.0	8.0
Starting Current	A		58	58	58
Power Factor	%	Cool	87	83	80
		Heat	89	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		

4 SPECIFICATION (COOLING ONLY TYPE)

4.1. CS-W24BD2P / CU-V24BBP5

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W24BD2P	CU-V24BBP5
Cooling Capacity			kW (BTU/h)	6.30 (21,500)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 18 Hi 636	-
External Static Pressure			mmAq Pa	Hi 10 Hi 98	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	290 x (1000 + 100) x 500	900 x 900 x 320
Net Weight			kg (lbs)	43 (95)	80 (176)
Piping Connection	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	
	Drain		mm	Female screw RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Rotary), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole single phase induction motor
		Rated Output	kW	-	1.9
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.15	0.05
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MEL56 (1.3)
Refrigerant (Charged)			kg (oz)	-	R407C 2.8 (99)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 40 Lo 36	52
			Power level dB	Hi 55 Lo 51	65

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.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-W24BD2P/CU-V24BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	2.56	2.56	2.56
Running Current	A	Cool	11.70	11.20	10.80
Starting Current	A		64	66	68
Power Factor	%	Cool	99	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		

4.2. CS-W24BD2P / CU-V24BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W24BD2P	CU-V24BBP8
Cooling Capacity			kW (BTU/h)	6.30 (21,500)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 18 Hi 636	-
External Static Pressure			mmAq Pa	Hi 10 Hi 98	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	290 x (1000 + 100) x 500	900 x 900 x 320
Net Weight			kg (lbs)	43 (108)	90 (198)
Piping Connection	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	
	Drain		mm	Female screw RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Rotary), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole 3-phase induction motor
		Rated Output	kW	-	1.9
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.15	0.05
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MEL56 (1.3)
Refrigerant (Charged)			kg (oz)	-	R407C 2.8 (99)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 40 Lo 36	52
			Power level dB	Hi 55 Lo 51	65

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.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-W24BD2P/CU-V24BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	4N
Input Power	kW	Cool	2.42	2.42	2.42
Running Current	A	Cool	4.10	4.10	4.10
Starting Current	A		27	28	29
Power Factor	%	Cool	90	85	82
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

4.3. CS-W28BD2P / CU-V28BBP5

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W28BD2P	CU-V28BBP5
Cooling Capacity			kW (BTU/h)	7.10 (24,200)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 20 Hi 706	-
External Static Pressure			mmAq Pa	Hi 10 Hi 98	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	290 x (1000 + 100) x 500	900 x 900 x 320
Net Weight			kg (lbs)	43 (95)	81 (179)
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 RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Rotary), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole single phase induction motor
		Rated Output	kW	-	2.0
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.15	0.05
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MEL56 (1.3)
Refrigerant (Charged)			kg (oz)	-	R407C 3.3 (116)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 41 Lo 37	56
			Power level dB	Hi 56 Lo 52	66

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.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-W28BD2P/CU-V28BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	240
Phase			Single	Single	Single
Input Power	kW	Cool	2.86	2.86	2.86
Running Current	A	Cool	13.1	12.5	12.5
Starting Current	A		68	70	72
Power Factor	%	Cool	99	99	95
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 1~220V, 230V, 240V 50Hz		

4.4. CS-W28BD2P / CU-V28BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W28BD2P	CU-V28BBP8
Cooling Capacity			kW (BTU/h)	7.10 (24,200)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 20 Hi 706	-
External Static Pressure			mmAq Pa	Hi 10 Hi 98	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	290 x (1000 + 100) x 500	900 x 900 x 320
Net Weight			kg (lbs)	43 (95)	81 (179)
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 RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Scroll), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole 3 phase induction motor
		Rated Output	kW	-	2.0
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.15	0.05
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MEL56 (1.3)
Refrigerant (Charged)			kg (oz)	-	R407C 3.3 (116)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 41 Lo 37	53
			Power level dB	Hi 56 Lo 52	66

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.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-W28BD2P/CU-V28BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	4N
Input Power	kW	Cool	2.72	2.72	2.72
Running Current	A	Cool	4.60	4.60	4.60
Starting Current	A		28	29	30
Power Factor	%	Cool	90	85	82
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

4.5. CS-W34BD2P / CU-V34BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W34BD2P	CU-V34BBP8
Cooling Capacity			kW (BTU/h)	10.00 (34,100)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 33 Hi 1162	-
External Static Pressure			mmAq Pa	Hi 15 Hi 147	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	360 x (1000 + 100) x 650	1220 x 900 x 320
Net Weight			kg (lbs)	56 (123)	95 (209)
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 RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Scroll), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole 3 phase induction motor
		Rated Output	kW	-	3.0
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.25	0.05 x 2
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MMMAPOE (1.3)
Refrigerant (Charged)			kg (oz)	-	R407C 3.2 (113)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 47 Lo 43	56
			Power level dB	Hi 62 Lo 58	69

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.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-W34BD2P/CU-V34BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	3.88	3.88	3.88
Running Current	A	Cool	6.2	6.2	6.2
Starting Current	A		39	41	42
Power Factor	%	Cool	95	90	87
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

4.6. CS-W43BD2P / CU-V43BBP8

ITEM / MODEL				Indoor Unit	Outdoor unit
			Main Body	CS-W43BD2P	CU-V43BBP8
Cooling Capacity			kW (BTU/h)	12.50 (42,600)	
Refrigerant Charge-less			m	30	
Standard Air Volume for High Speed			m^3/min cfm	Hi 36 Hi 1271	-
External Static Pressure			mmAq Pa	Hi 15 Hi 147	-
Air Inlet				Backward Suction	Back sided Suction
Air Outlet				Front blow-out	Front blow-out
Outside Dimension (H x W x D)			mm	360 x (1000 + 100) x 650	1220 x 1100 x 320
Net Weight			kg (lbs)	58 (128)	111 (245)
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 RC1 (PT1)	I.DØ 20 x 1
Compressor	Type, Number of Set			-	Hermetic-1 (Scroll), 1
	Starting Method			-	Direct on-line starting
	Motor	Type		-	2-pole 3-phase induction motor
		Rated Output	kW	-	3.75
Fan	Type, Number of Set			Sirocco fan	Prop. fan
	Air Volume Control			Three-Step and Auto mode (Remote Control)	-
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Rated Output	kW	0.35	0.055 x 2
Air-heat Exchanger				Louvre-fin type	X-Louvre-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigerant Oil (Charged)			L	-	MMMAPOE (2.0)
Refrigerant (Charged)			kg (oz)	-	R407C 3.60 (127)
Running Adjustment	Control Switch			Wired Remote Control	-
	Room Temperature			Thermostat (Main Body)	-
Safety Devices				Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Transformer	
Noise Level			dB (A)	Hi 48 Lo 44	56
			Power level dB	Hi 63 Lo 59	69

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.)

ELECTRICAL DATA (50Hz)

MODEL / ITEM			CS-W43BD2P/CU-V43BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Input Power	kW	Cool	4.49	4.49	4.49
Running Current	A	Cool	78	7.8	7.8
Starting Current	A		58	58	58
Power Factor	%	Cool	87	83	80
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50Hz		

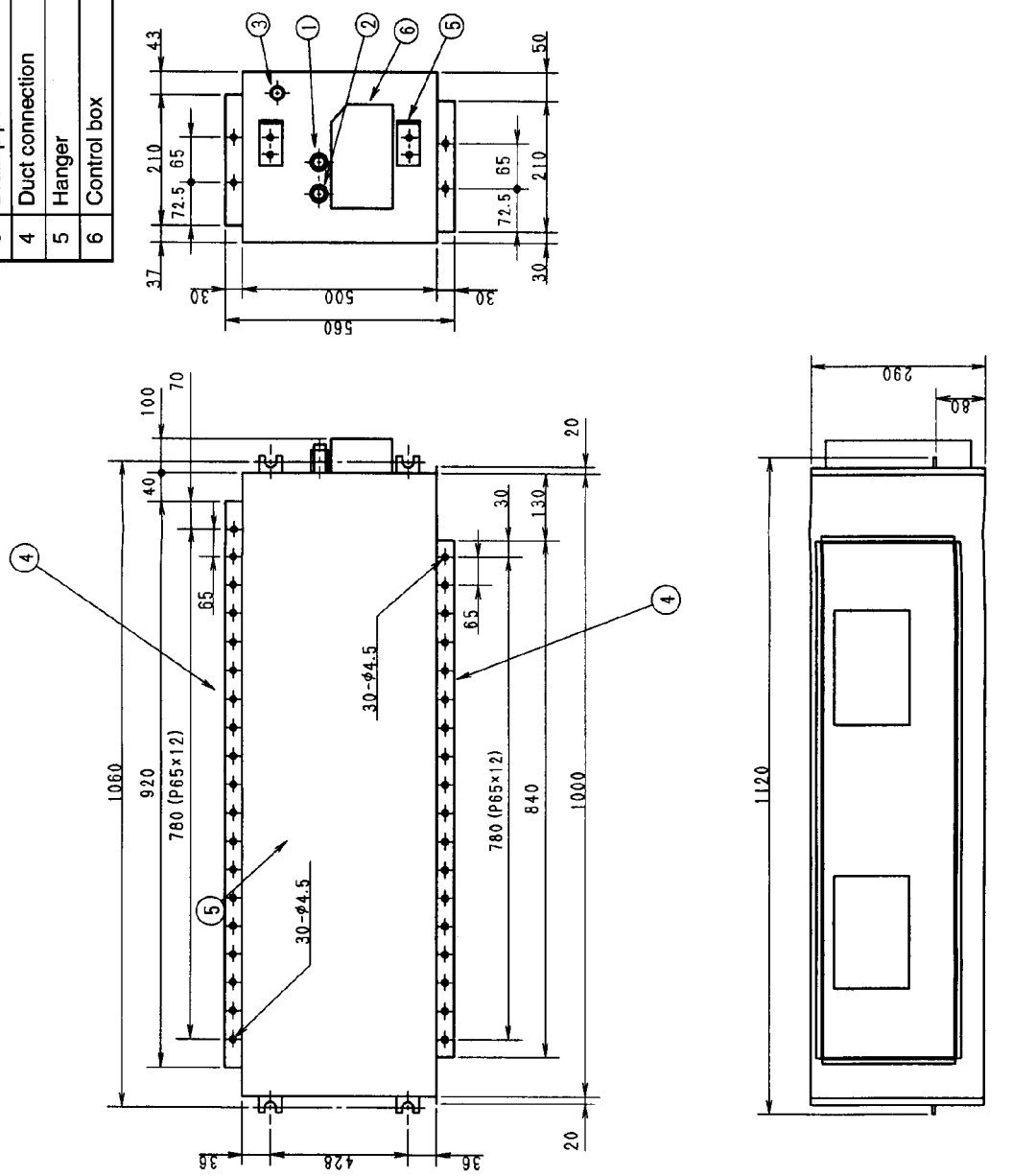
5 TECHNICAL DRAWING

CS-W24BD2P, CS-W28BD2P

OUTSIDE DIMENSIONS

NO.	NAME	QTY	NOTE	
			CS-W24BD2P	CS-W28BD2P
1	Pipe Connection (gas)	1	0. D. ϕ 15.88 Flared	0. D. ϕ 15.88 Flared
2	Pipe Connection (liquid)	1	0. D. ϕ6.35 Flared	0. D. ϕ 9.52 Flared
3	Drain pipe connection	2	Female screw PT1"	Female screw PT1"
4	Duct connection	2		
5	Hanger	4		
6	Control box	1		

Unit : mm

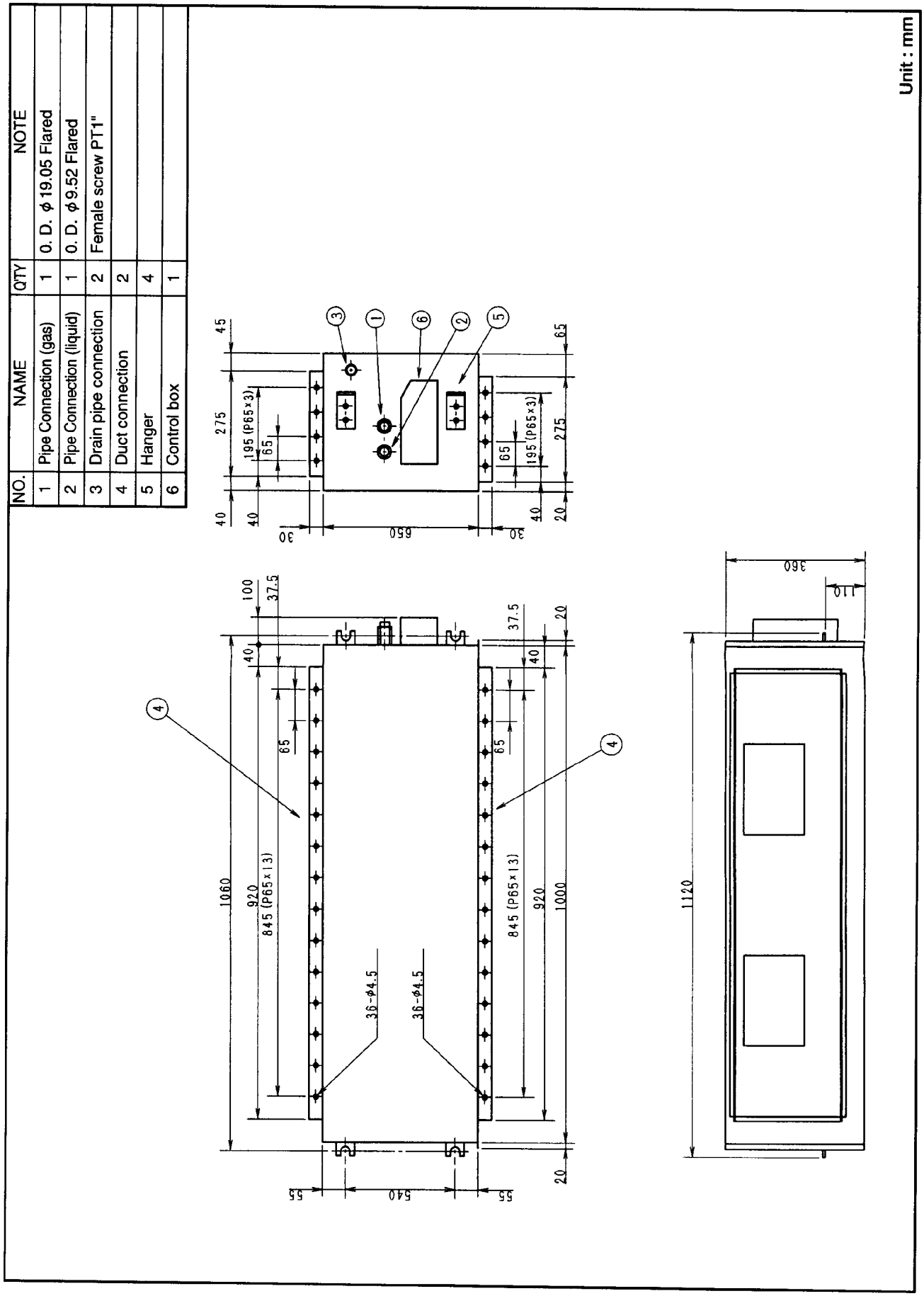


CS-W34BD2P, CS-W43BD2P

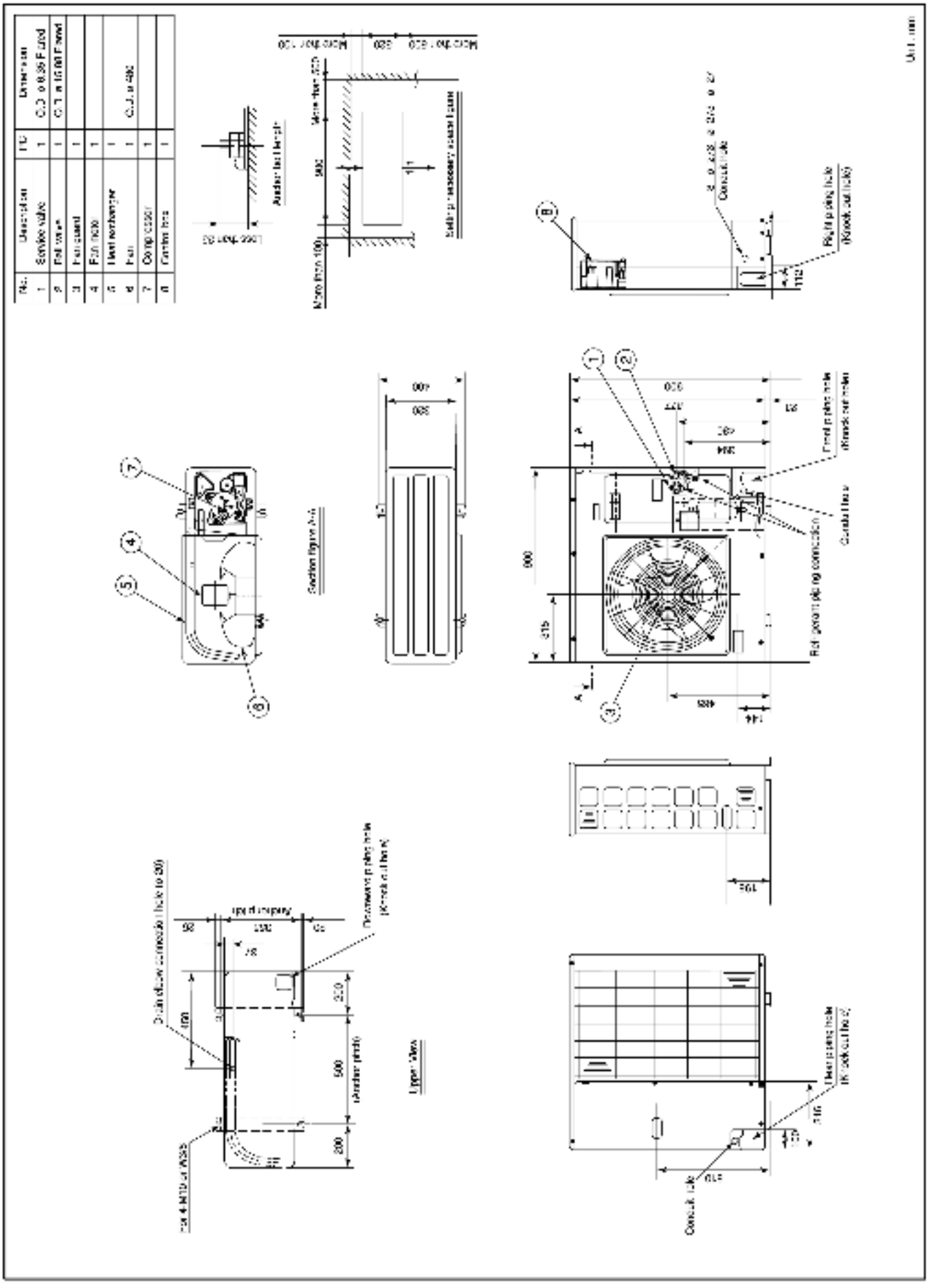
OUTSIDE DIMENSIONS

NO.	NAME	QTY	NOTE
1	Pipe Connection (gas)	1	0. D. ϕ19.05 Flared
2	Pipe Connection (liquid)	1	0. D. ϕ9.52 Flared
3	Drain pipe connection	2	Female screw PT1"
4	Duct connection	2	
5	Hanger	4	
6	Control box	1	

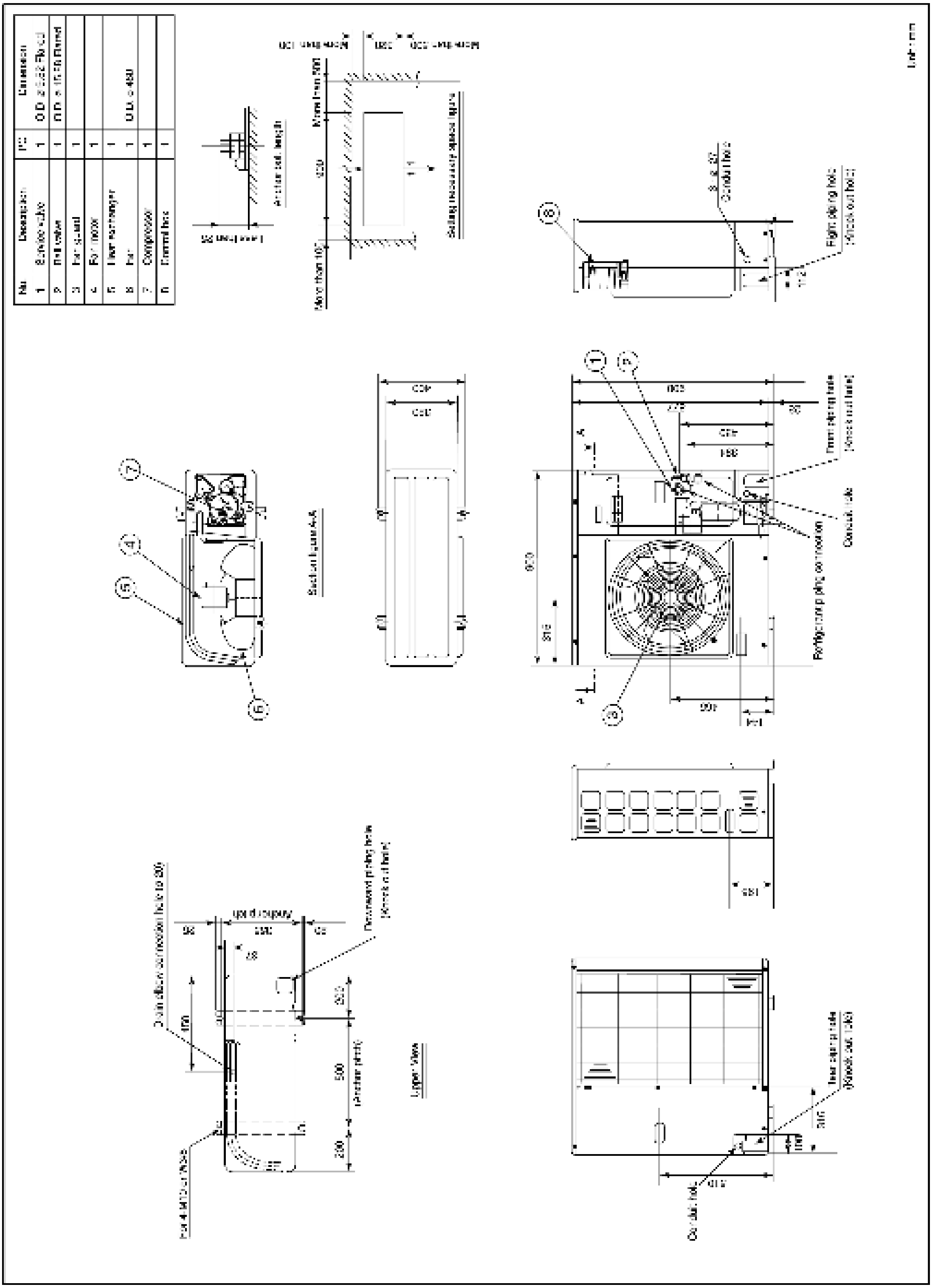
Unit : mm



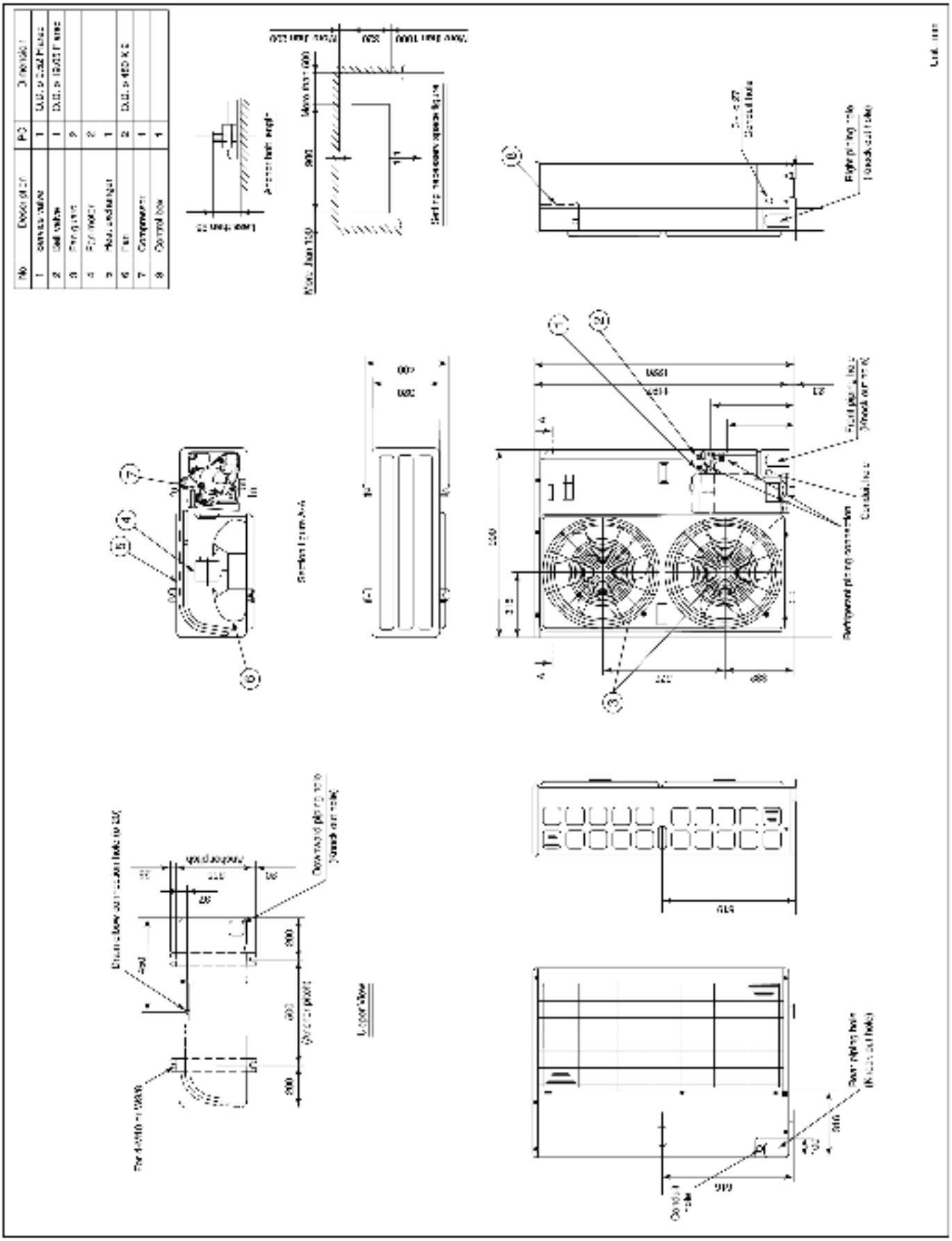
CU-W24BBP5, CU- V24BBP5, CU-V24BBP8



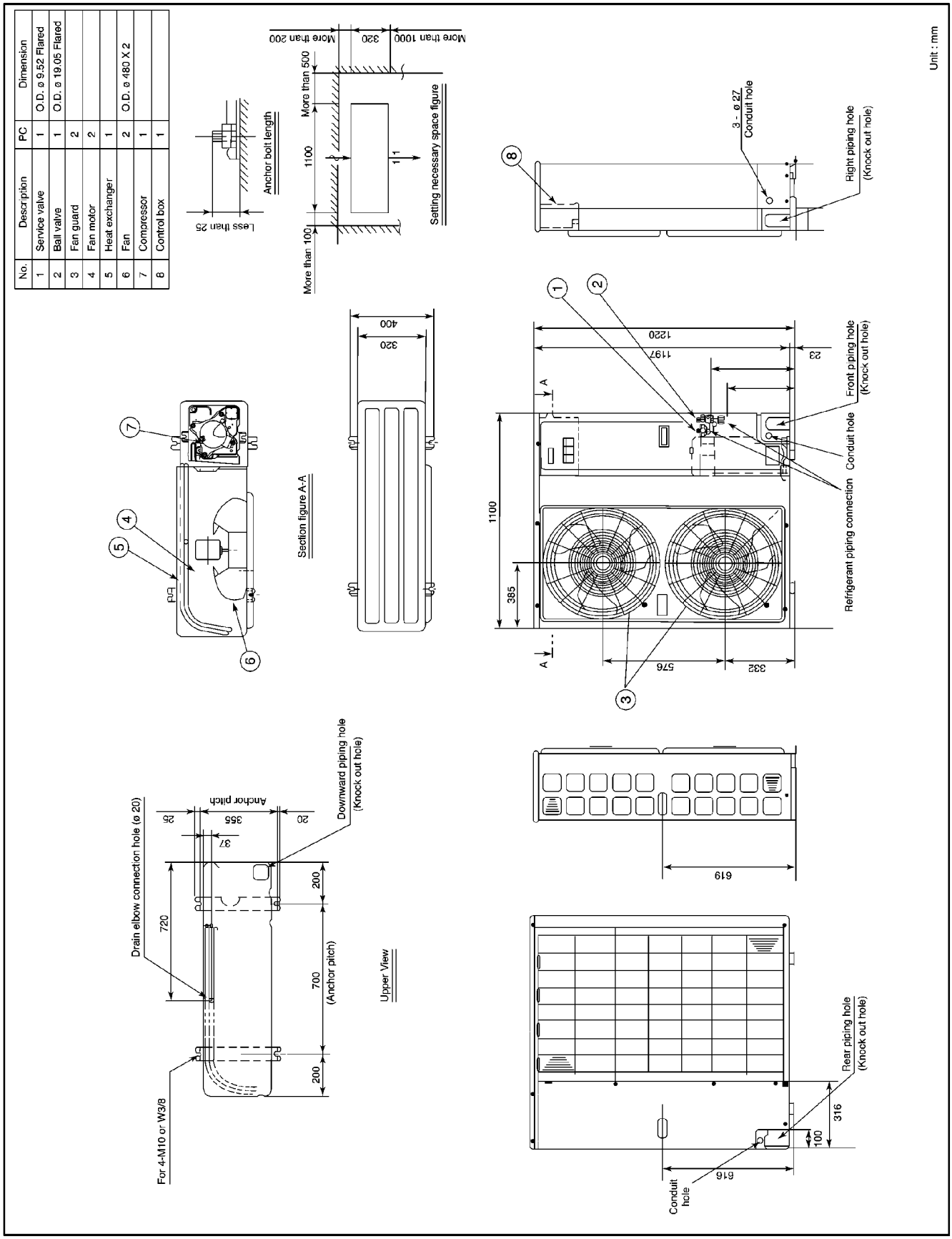
CU-W28BBP5, CU-W28BBP8, CU-V28BBP5, CU-V28BBP8



CU-W34BBP8, CU-V34BBP8



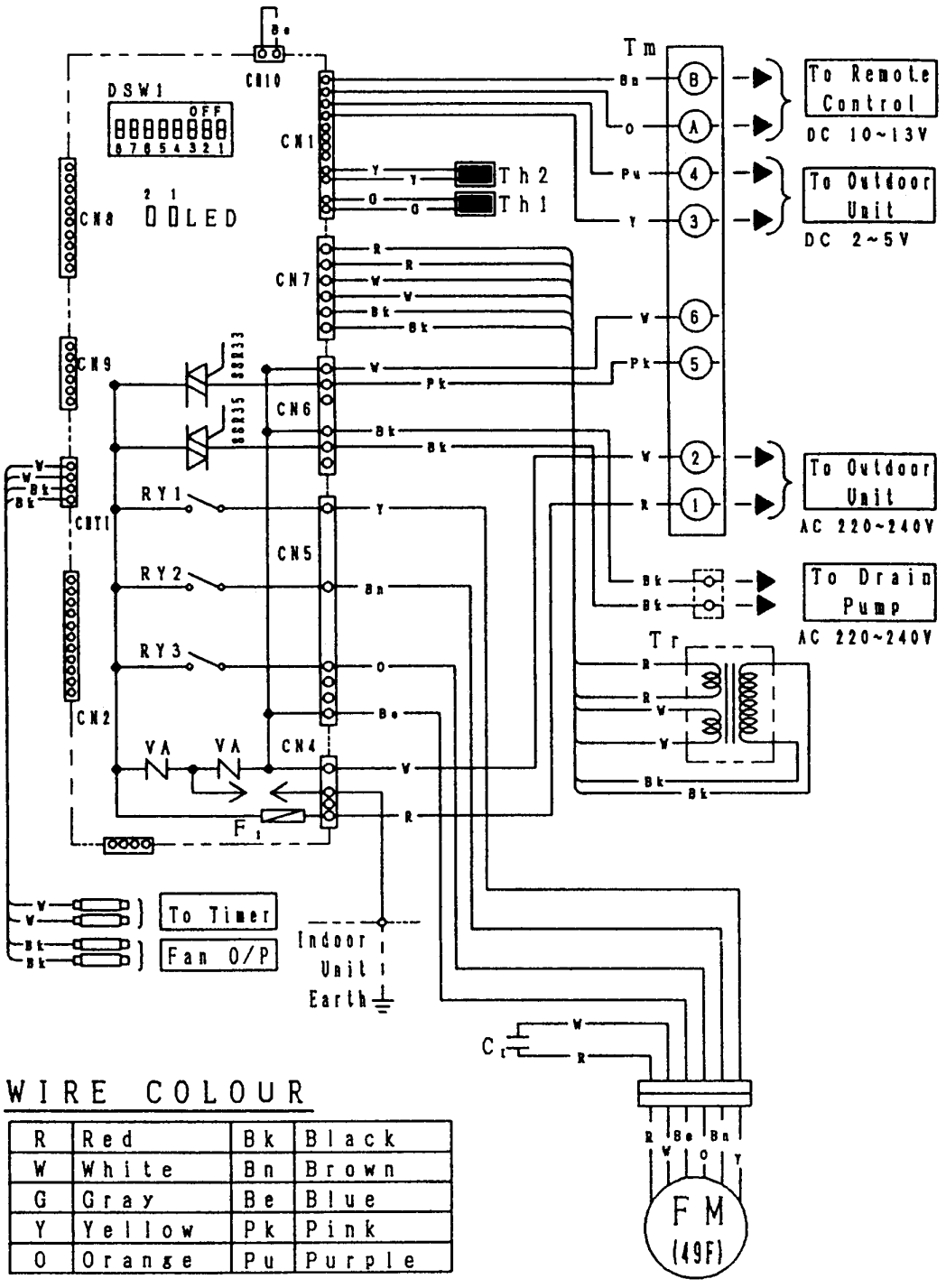
CU-W43BBP8, CU-V43BBP8



6 CIRCUIT DIAGRAM

CS-W24BD2P, CS-W28BD2P

CONNECTION DIAGRAM (Indoor Unit)



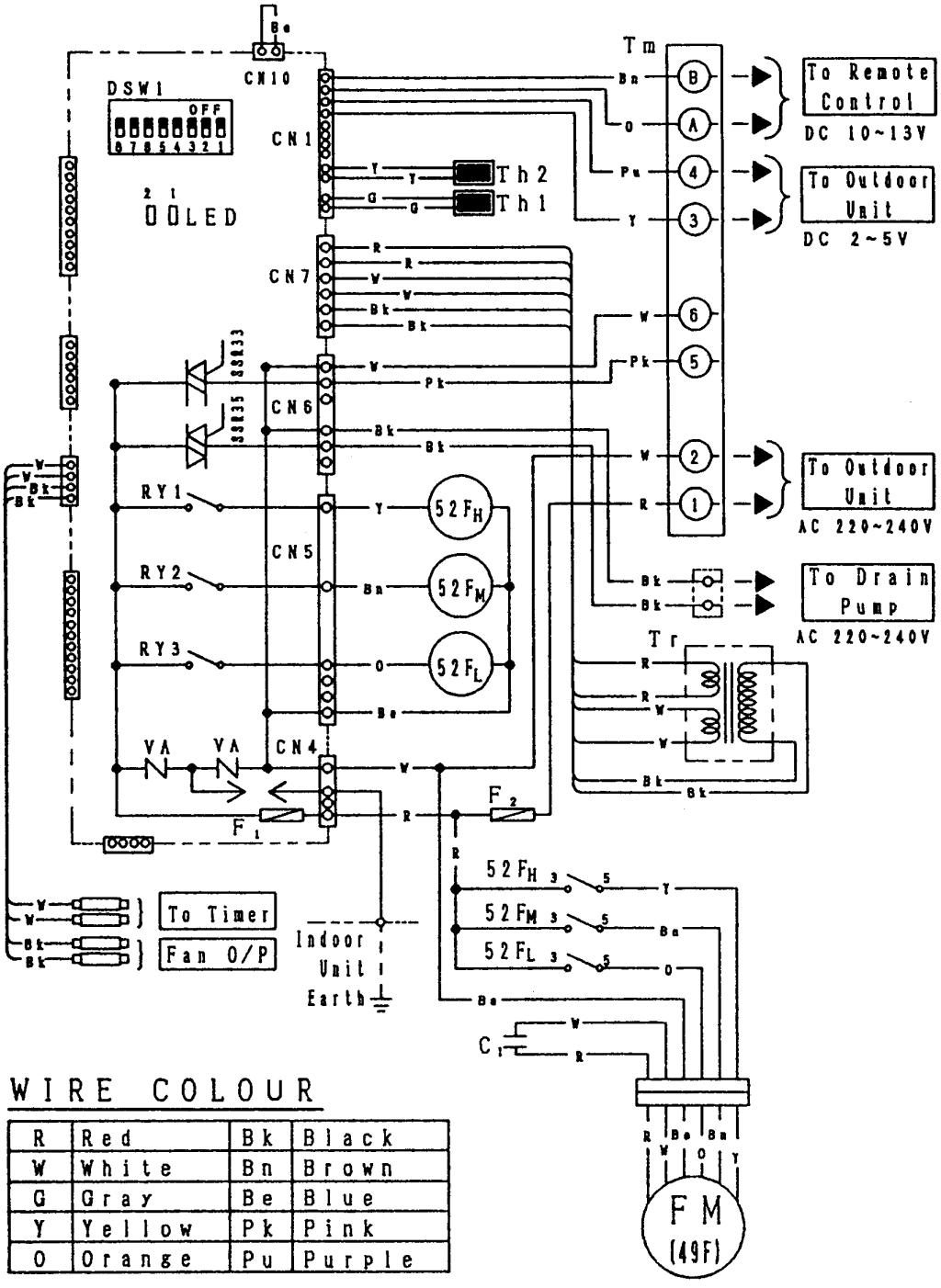
WIRE COLOUR

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_1	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)



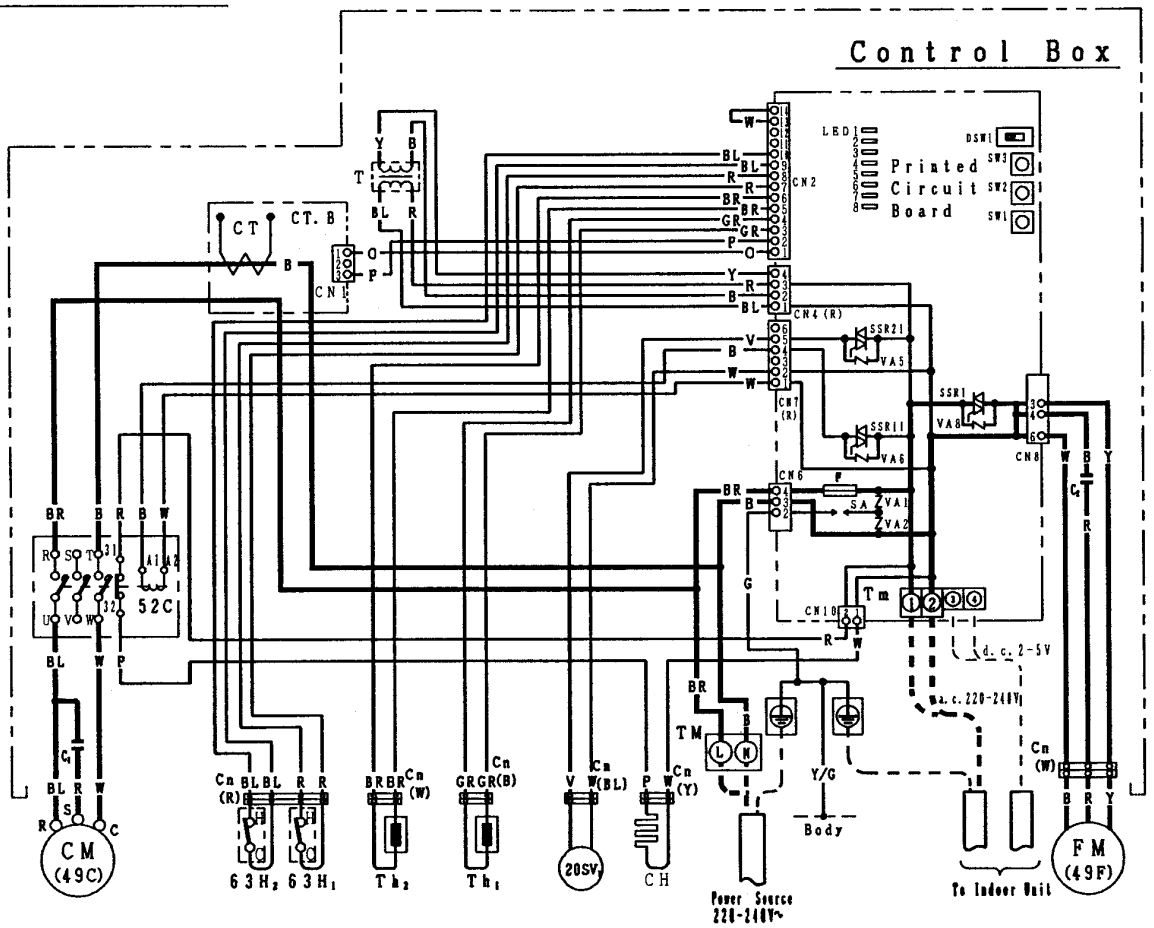
WIRE COLOUR

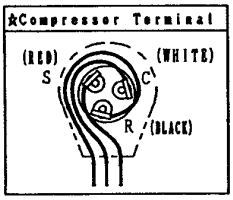
R	Red	Bk	Black
W	White	Bn	Brown
G	Gray	Be	Blue
Y	Yellow	Pk	Pink
O	Orange	Pu	Purple

LEGEND

FM	Fan Motor	49F	Internal Thermostat for FM
VA	Varistor	C_1	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

ELECTRIC CIRCUIT DIAGRAM



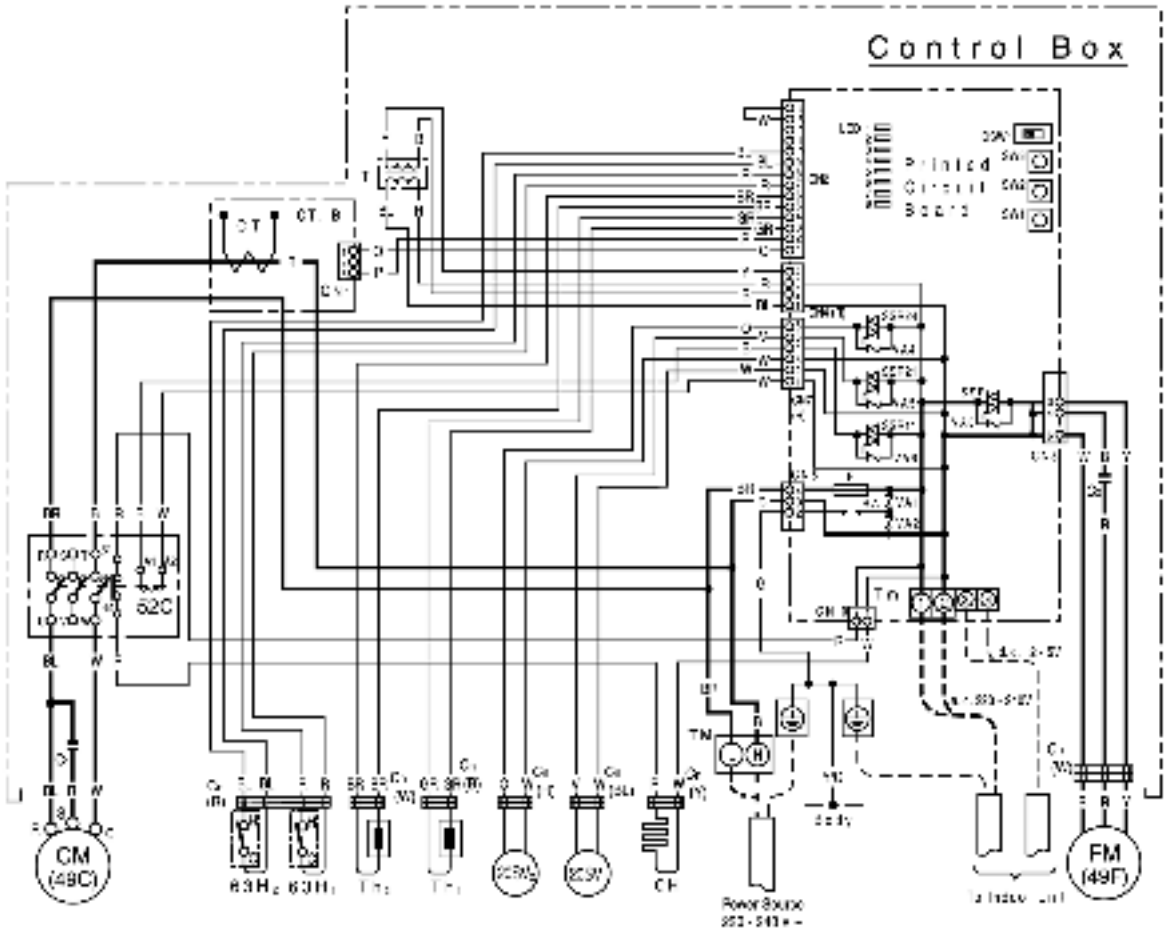


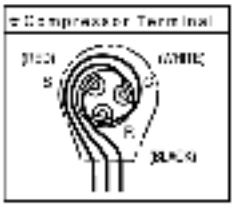
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GRAY		
Y/G	YELLOW / GREEN				

LEGEND

CM	Compressor Motor	20SV$_1$	Reversing Valve		Printed Circuit Board
FM	Fan Motor (Outdoor Unit)	TM	Terminal Board for Main Circuit	SA	Surge Absorber
52C	Magnetic Contactor for CM	CT. B	Current Trans Board	VA$_{1\sim6}$	Varistor
C$_1$	Capacitor for CM	Th$_1$	Thermistor(Compressor discharge temp.)	F	Fuse 250V T 6.3A
C$_2$	Capacitor for FM	Th$_2$	Thermistor(Heat exchanger outlet temp.)	CN$_{1\sim10}$	Connector
CH	Crankcase Heater for CM	CT	Current Trans	SSR$_{11}$	Solid State Relay
63H$_1$	High Pressure Switch	Cn	Connector	SSR$_{21}$	Solid State Relay
63H$_2$	High Pressure Switch on Heat-pump	T	Transformer	Tm	Terminal Board for Control Circuit
49C	Internal Protector for CM				
49F	Internal Protector for FM				



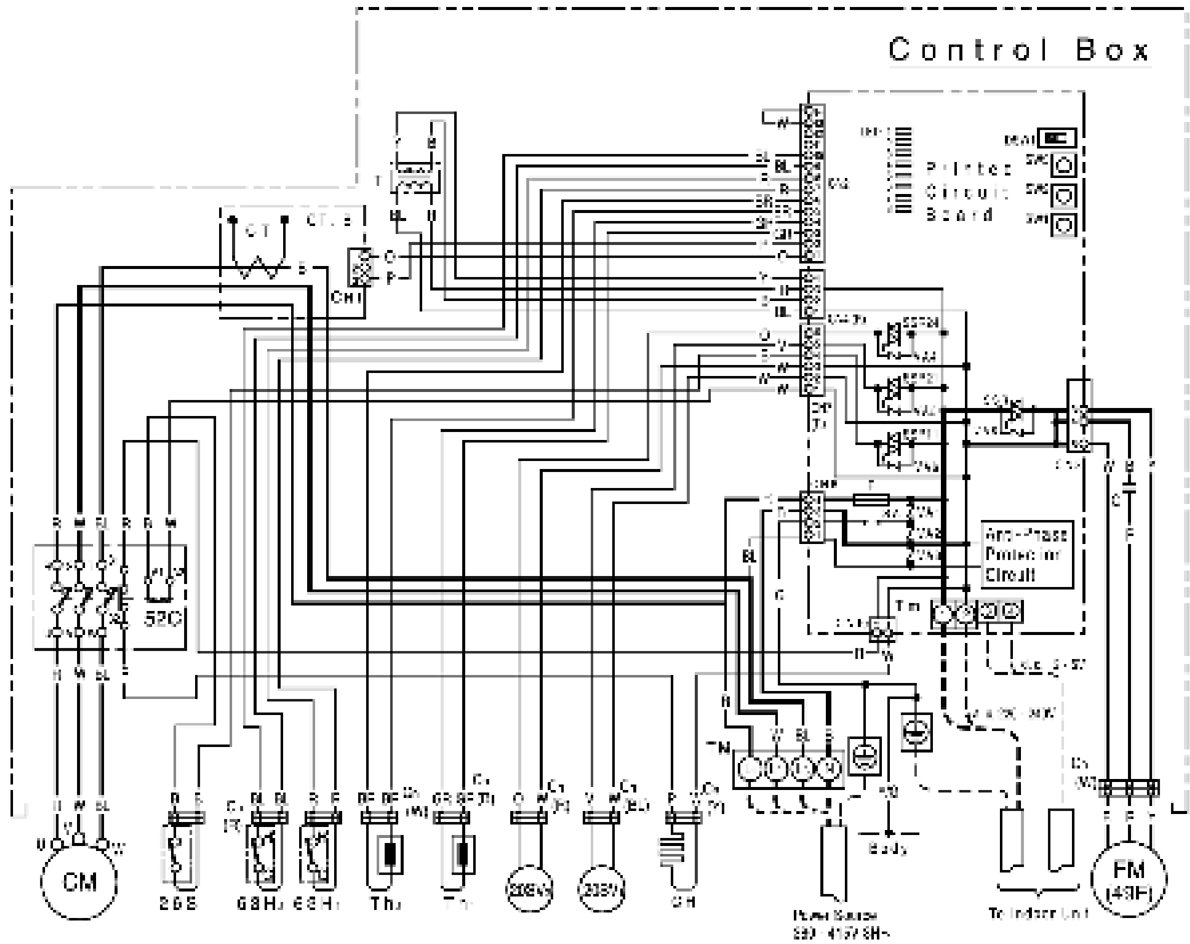


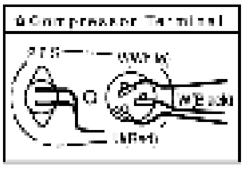
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
YG	YELLOW/GREEN				

LEGEND

CM	Compressor Motor	20SV	Reversing Valve		Printed Circuit Board
FM	Fan Motor (Outdoor Unit)	63SV	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	VA	Varistor
C	Capacitor for CM	CTB	Current Trans Board	F	Fuse 250V T 6.3A
Cp	Capacitor for FM	Tm	Thermistor (Compressor Temperature)	CN--	Connector
CH	Crankcase Heater for CM	Th	Thermistor (Heat Exchanger Temperature)	SSR1	Solid State Relay
63H	High Pressure Switch	CT	Current Trans Sensor	SSR2	Solid State Relay
63HS	High Pressure Switch (Sensor)	Cn	Connector	Tm	Terminal Board for Control Circuit
49C	Internal Protector for CM	T	Transformer		
49F	Internal Protector for FM				



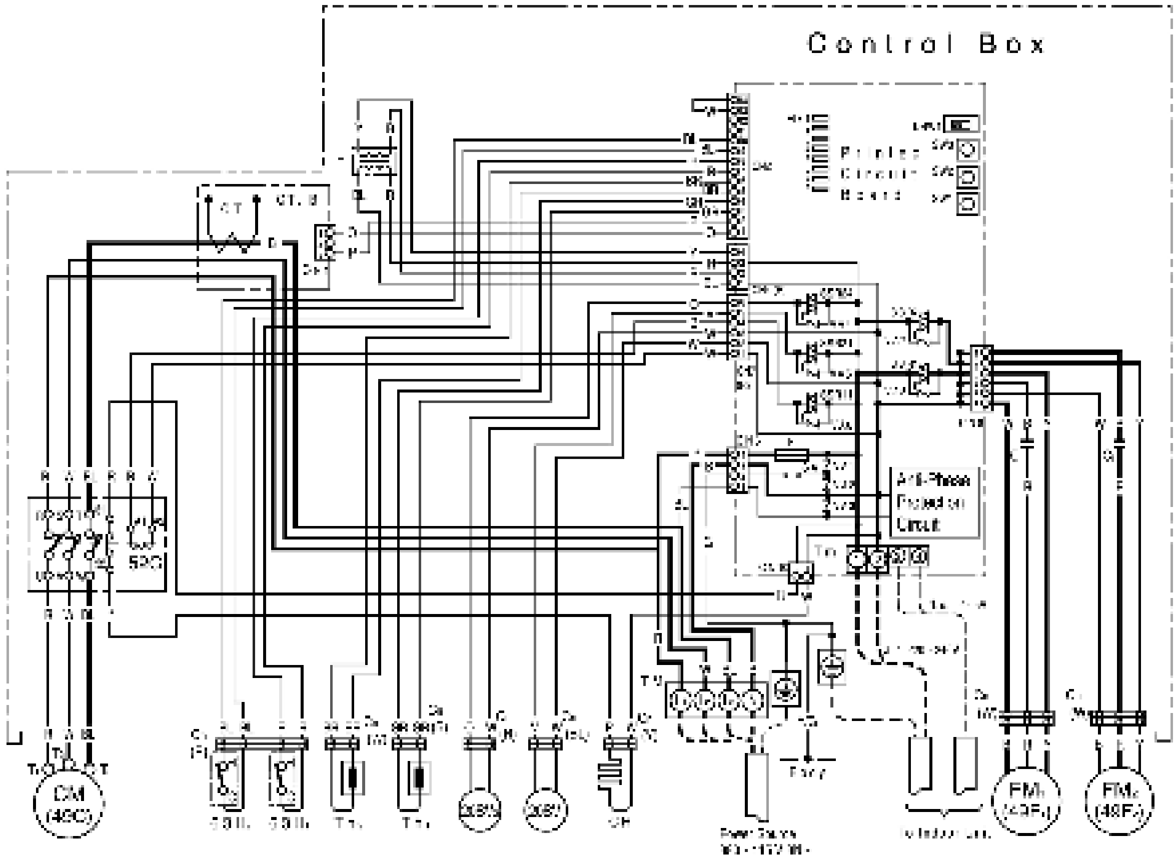


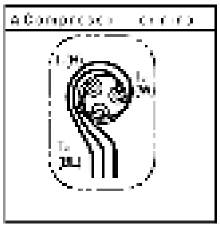
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

LEGEND

CM	Compressor Motor	20SV	Reversing Valve	Printed Circuit Board	
FM	Fan Motor (Outdoor Unit)	20SV2	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TV	Terminal Board for Main Circuit	Var	Varistor
C	Capacitor for FM	CTB	Current Trans Board	F	Fuse 250V T6.3A
CH	Crankcase Heater for CM	Tm	Thermistor (Compressor discharge temp)	CN	Connector
63H	High Pressure Switch	Th1	[illegible]	SSR	Solid State Relay
63H2	High Pressure Switch on Heat-pump	CT	Current Transformer	SSR	Solid State Relay
Cn	Connector	T	Transformer	Tm	Terminal Board for Control Circuit
49F	Internal Protector for FM	26S	Bimetal Thermostat for CM		





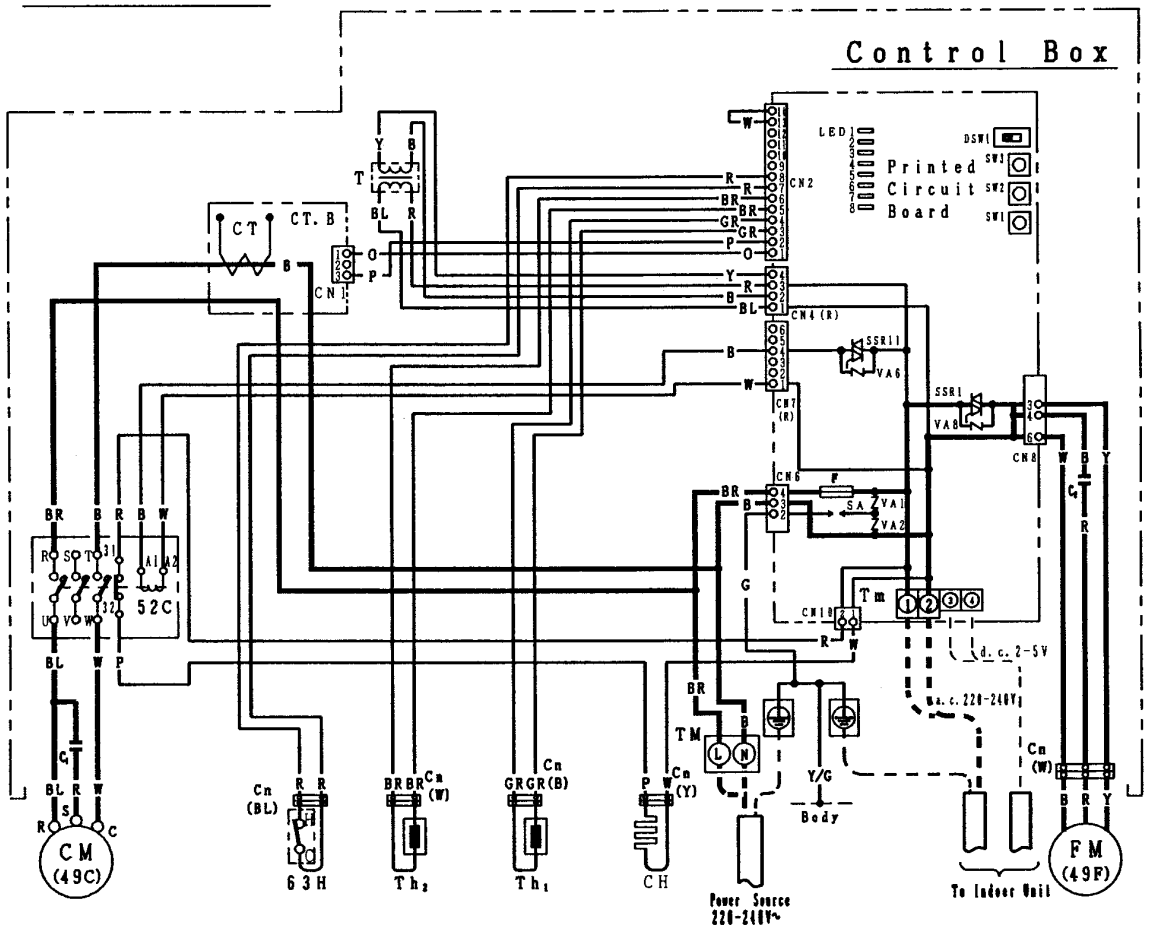
WIRE COLOUR

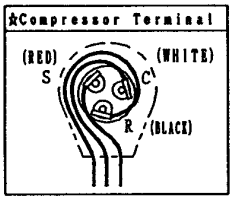
R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GY	GREY		
Y/G	YELLOW/GREEN				

LEGEND

CM	Compressor Motor	20S?	Reversing Valve		Printed Circuit Board
FM1,2	Fan Motor (Outdoor Unit)	20SA	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TB	Terminal Board for Main Circuit	[illegible]	Varistor
C[illegible]	Capacitor for FM	CTB	Current Trans Board	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th	[illegible]	[illegible]	Connector
63H	High Pressure Switch	Th[illegible]	[illegible]	SSR[illegible]	Solid State Relay
63HH	High Pressure Switch for Heat pump	CT	Current Transformer	SSR[illegible]	Solid State Relay
Cn	Connector	49C	Internal Protector for CM	Tb	Terminal Board for Control Circuit
	[illegible]	49F[illegible]	Internal Protector for FM[illegible]		

ELECTRIC CIRCUIT DIAGRAM





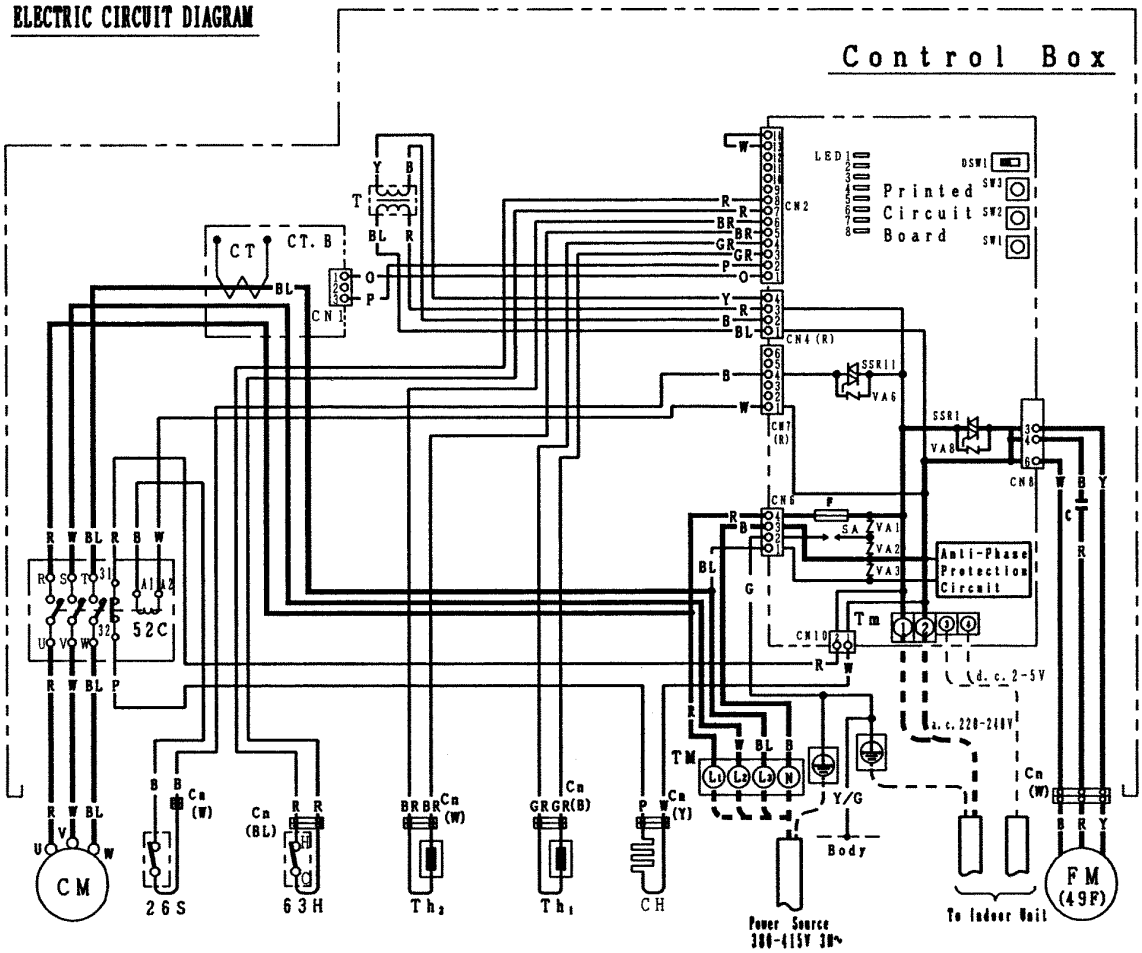
WIRE COLOUR

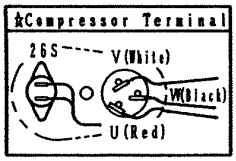
R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GRAY		
Y/G	YELLOW / GREEN				

LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit		Printed Circuit Board
FM	Fan Motor (Outdoor Unit)	CT. B	Current Trans Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermister(Compressor discharge temp.)	VA_{1-3}	Varistor
C_1	Capacitor for CM	Th_2	Thermister(Heat exchanger outlet temp.)	F	Fuse 250V T 6.3A
C_2	Capacitor for FM	CT	Current Trans	CN_{1-8}	Connector
CH	Crankcase Heater for CM	Cn	Connector	$SSR_{1,11}$	Solid State Relay
63H	High Pressure Switch	T	Transformer	Tm	Terminal Board for Control Circuit
49C	Internal Protector for CM				
49F	Internal Protector for FM				

ELECTRIC CIRCUIT DIAGRAM





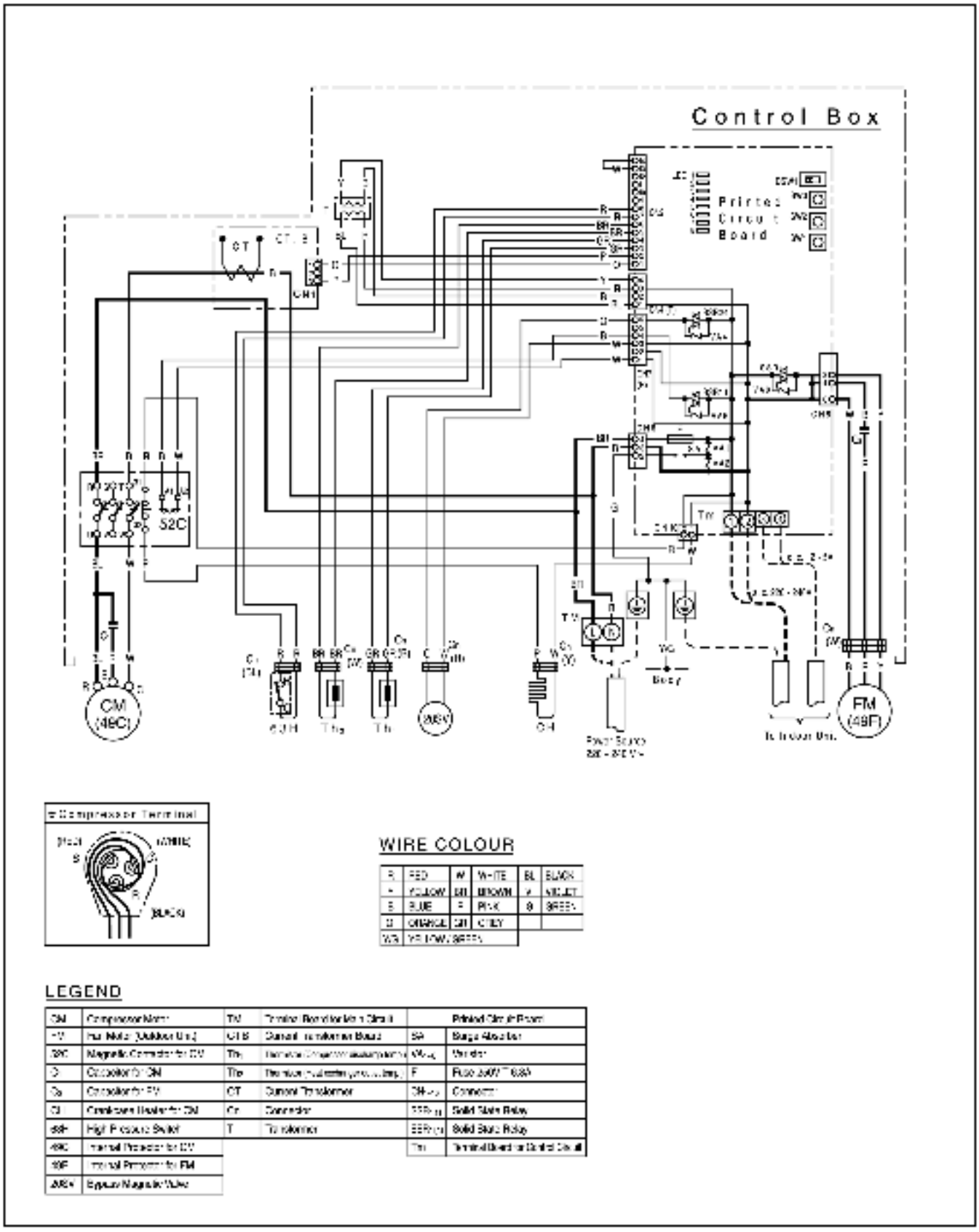
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GRAY		
Y/G	YELLOW / GREEN				

LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit		Printed Circuit Board
FM	Fan Motor (Outdoor Unit)	CT. B	Current Trans Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor(Compressor discharge temp.)	VA_{1-3}	Varistor
C	Capacitor for FM	Th_2	Thermistor(Heat exchanger outlet temp.)	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	CT	Current Trans	$CN_{2,4,5,7,10}$	Connector
63H	High Pressure Switch	T	Transformer	$SSR_{1,11}$	Solid State Relay
Cn	Connector	26S	Bimetal Thermostat for CM	Tm	Terminal Board for Control Circuit
49F	Internal Protector for FM				

CU-V28BBP5



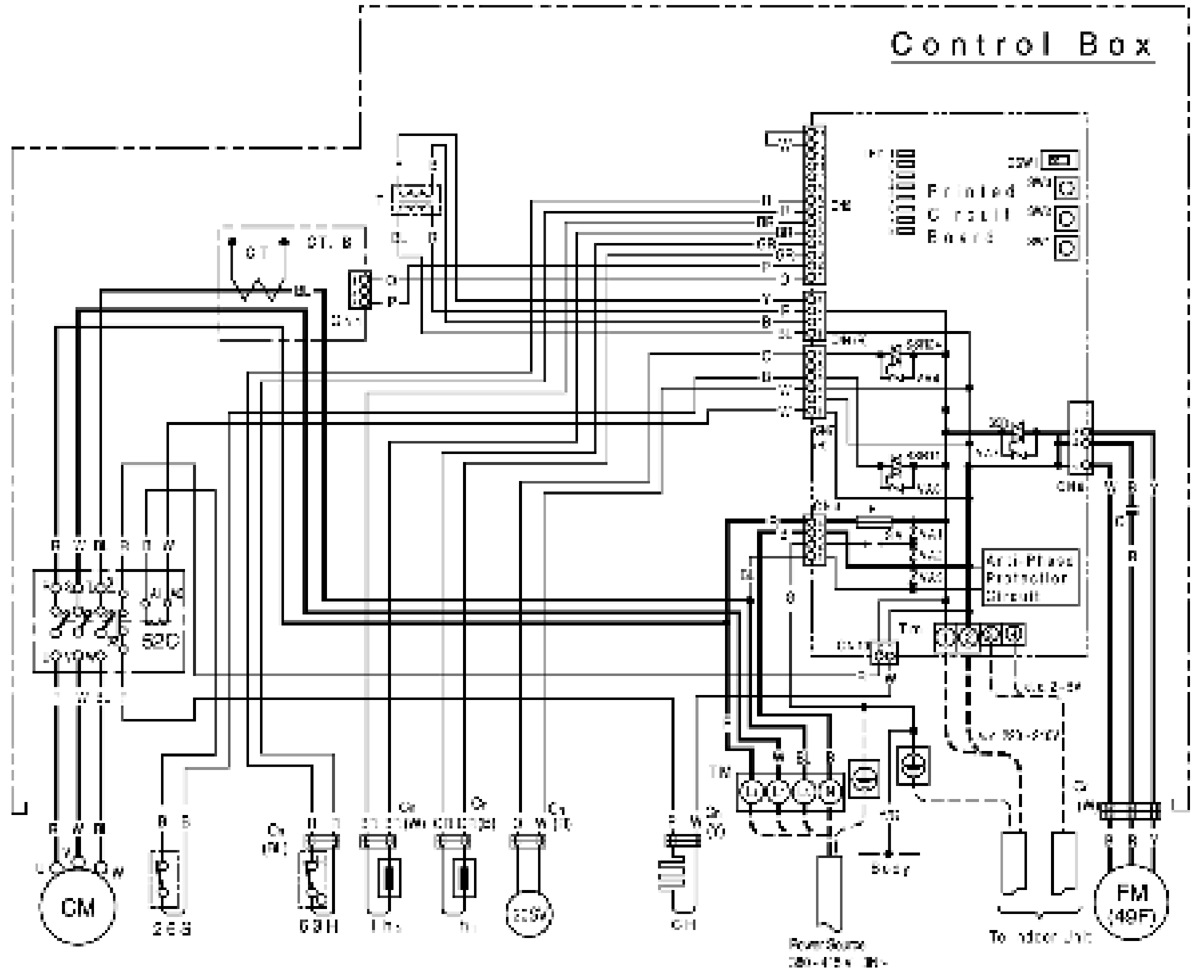
WIRE COLOUR

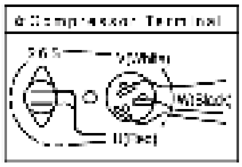
R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GY	GREY		
Y/G	YELLOW/GREEN				

LEGEND

CM	Compressor Motor	TV	Terminal Board for Control Circuit	Printed Circuit Board	
FM	Fan Motor (Outdoor Unit)	CTS	Current Transformer Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th	Thermistor (Heat Exchanger)	VA	Varistor
C	Capacitor for CM	Tho	Thermistor (Outside Air)	F	Fuse 250V T 6.3A
Cs	Capacitor for FM	CT	Current Transformer	CN--	Connector
CI	Crankcase Heater for CM	Cr	Connector	SSR1	Solid State Relay
dSP	High Pressure Switch	T	Transformer	SSR2	Solid State Relay
49C	Thermal Protector for CM			TH	Terminal Board for Control Circuit
49F	Thermal Protector for FM				
20S	Bypass Magnetic Valve				

CU-V28BBP8



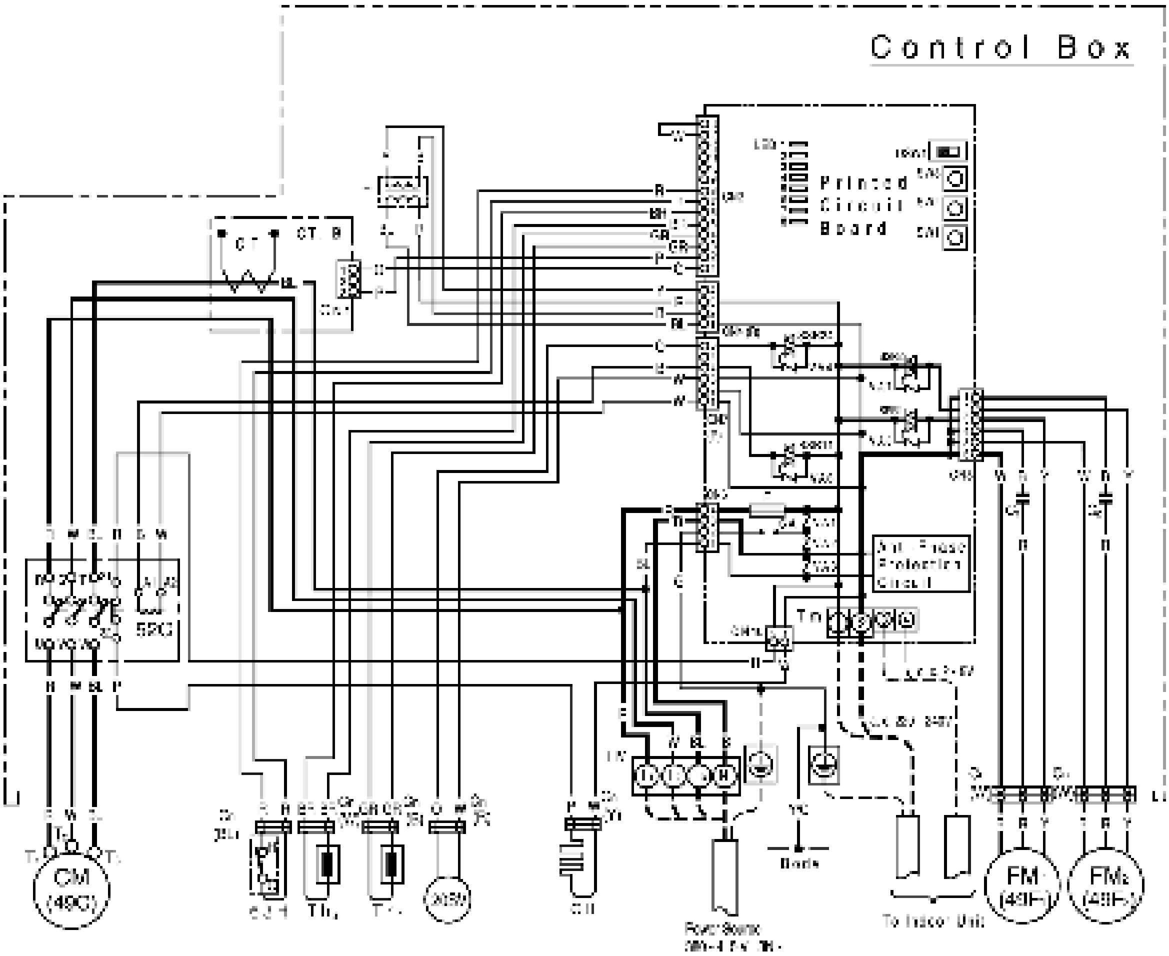


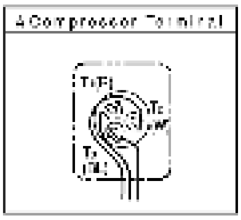
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
YG	YELLOW/GREEN				

LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit		Printed Circuit Board
FM	Fan Motor (Outdoor Unit)	CT.B	Current Transformer Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	$VA_{(1-2)}$	Varistor
C	Capacitor for FM	Th_2	Thermistor (Heat exchanger temp.)	F	Fuse 250V 1.5A
CH	Crankcase Heater for CM	CT	Current Transformer	$CN_{(1-9)}$	Connector
63H	High Pressure Switch	T	Transformer	$SSR_{(1-4)}$	Solid State Relay
Cn	Connector	26S	Simple Thermostat for CM	$SSR_{(5)}$	Solid State Relay
49F	Internal Protector for FM			Tm	Terminal Board for Control Circuit
20SV	Bypass Magnetic Valve				





WIRE COLOUR

R	RED	W	WHITE	B	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
BL	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW-GREEN				

LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit	Printed Circuit Board	
$FM_{1,2}$	Fan Motor (Outdoor Unit)	CTB	Current Transformer Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	VA_{1-5}	Varistor
$C_{1,2}$	Capacitor for $FM_{1,2}$	Th_2	Thermistor (Heat exchanger outlet temp.)	F	Fuse 250V T6.3A
CH	Crank case Heater for CM	CT	Current Transformer	CN_{1-9}	Connector
63H	High Pressure Switch	49C	Internal Protector for CM	$SSR_{1,2,3}$	Solid State Relay
Cn	Connector	$49F_{1,2}$	Internal Protector for FM	$SSR_{4,5}$	Solid State Relay
T	Transformer			Tm	Terminal Board for Control Circuit
20SV	Bypass Magnetic Valve				

● **INDOOR UNIT**
PRINTED CIRCUIT BOARD

S PHASE		4
SURGE ABSORBER		3
———————		2
R PHASE		1

CN4

Option board connection(S PH)	2
Option board connection(R PH)	1

INDOOR FAN L		6
INDOOR FAN M		5
INDOOR FAN H		4
———————		3
COM		2
COM		1

CN5

LOUVRE MOTOR		6
HEATER		5
DRAIN PUMP		4
COM	(S PH)	3
COM	(S PH)	2
COM	(S PH)	1

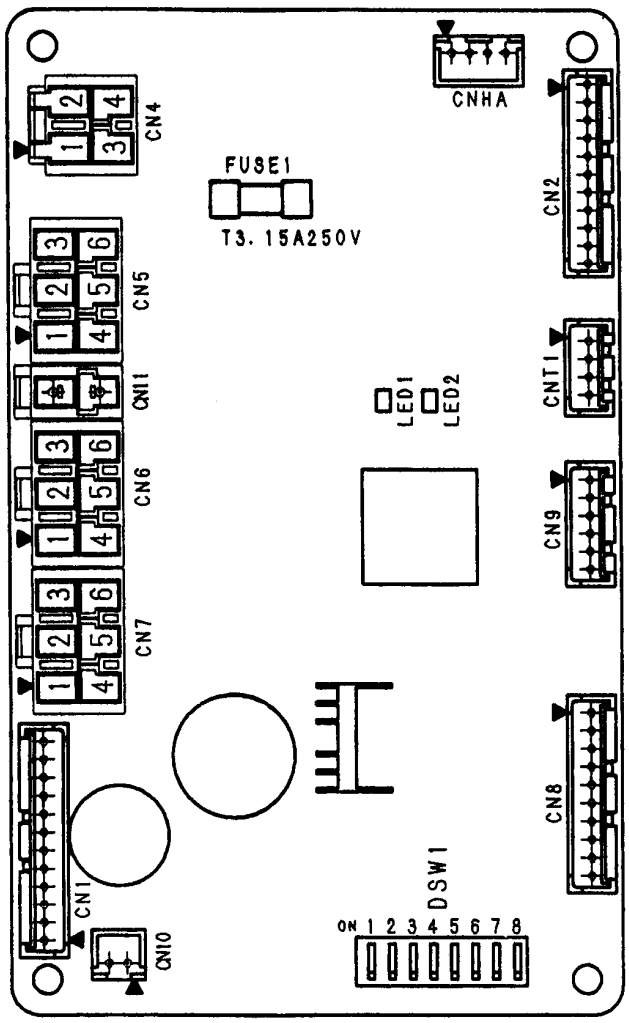
CN6

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

CN7

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

CN1



CN10

2	1
FLOAT SW	FLOAT SW

CN8	CENTRAL CONTROL BOARD CONNECTION

CN2	OPTIONAL BOARD CONNECTION

CNT1

4	TIMER INPUT (GND)(Non Voltage A contact)
3	TIMER INPUT (Non Voltage A contact)
2	FAN OUTPUT (DC12V, Max 0.9W)
1	FAN OUTPUT

● OUTDOOR UNIT
PRINTED CIRCUIT BOARD

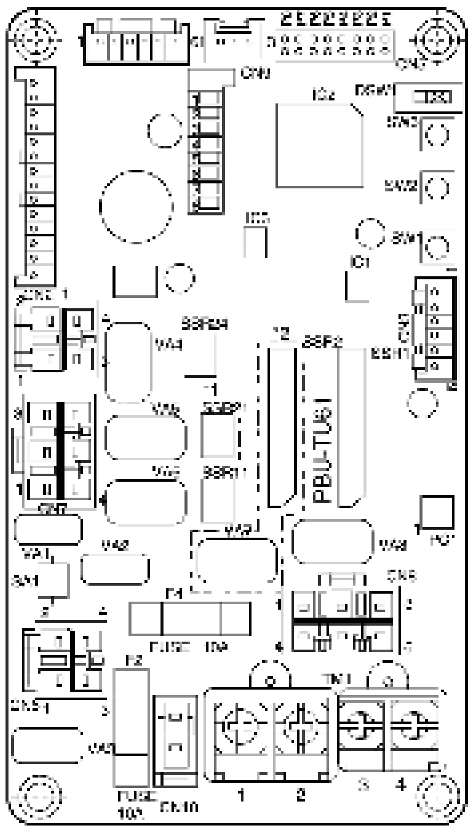
*1. HEAT PUMP MODEL ONLY
*2. CU-34BB type } Model only
CU-43BB type }

CN2

————————	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
CT	1

TM1

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



CN9

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

CN4

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

CN10

CRANKCASE HEATER(S)	1
CRANKCASE HEATER(R)	2

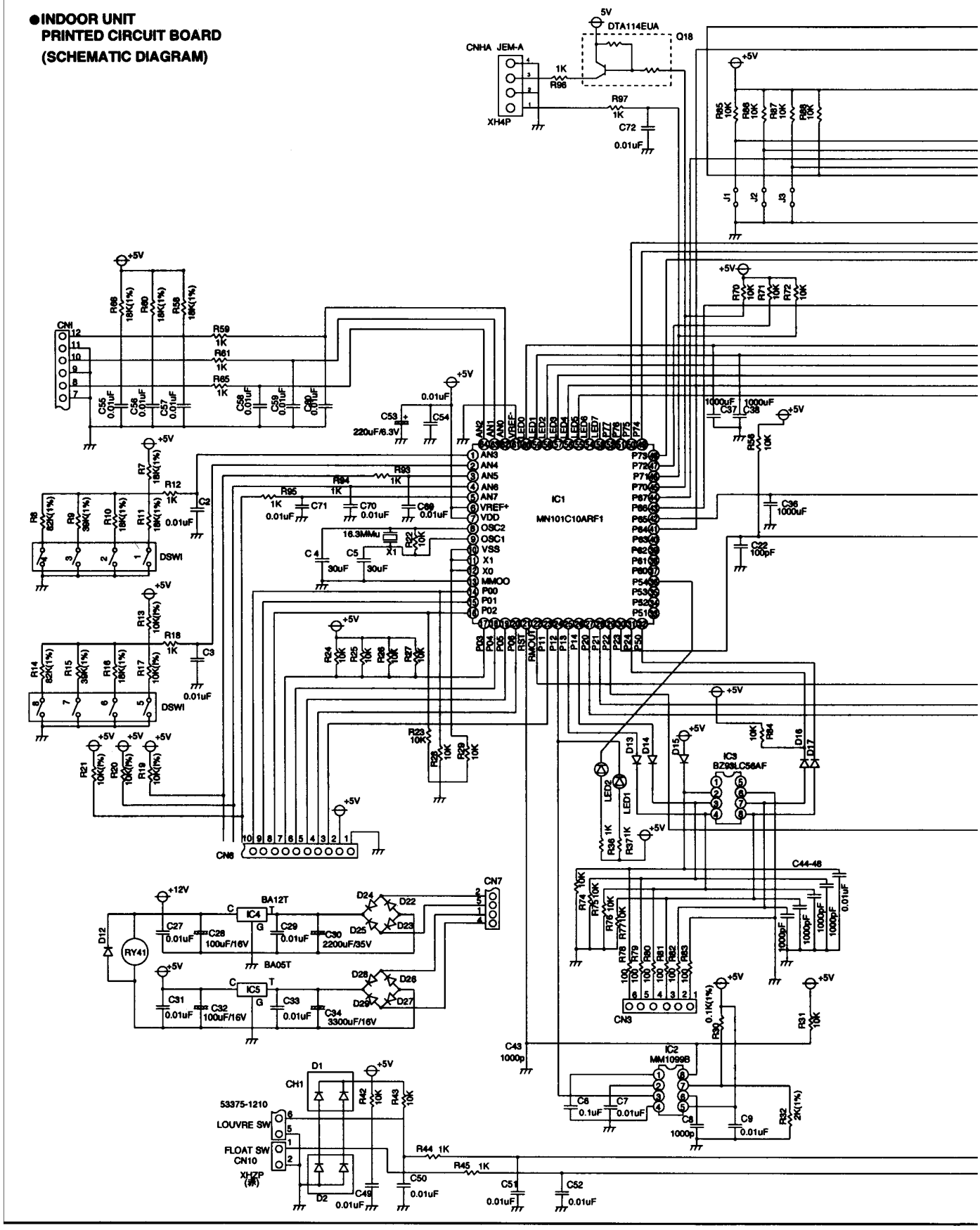
CN7

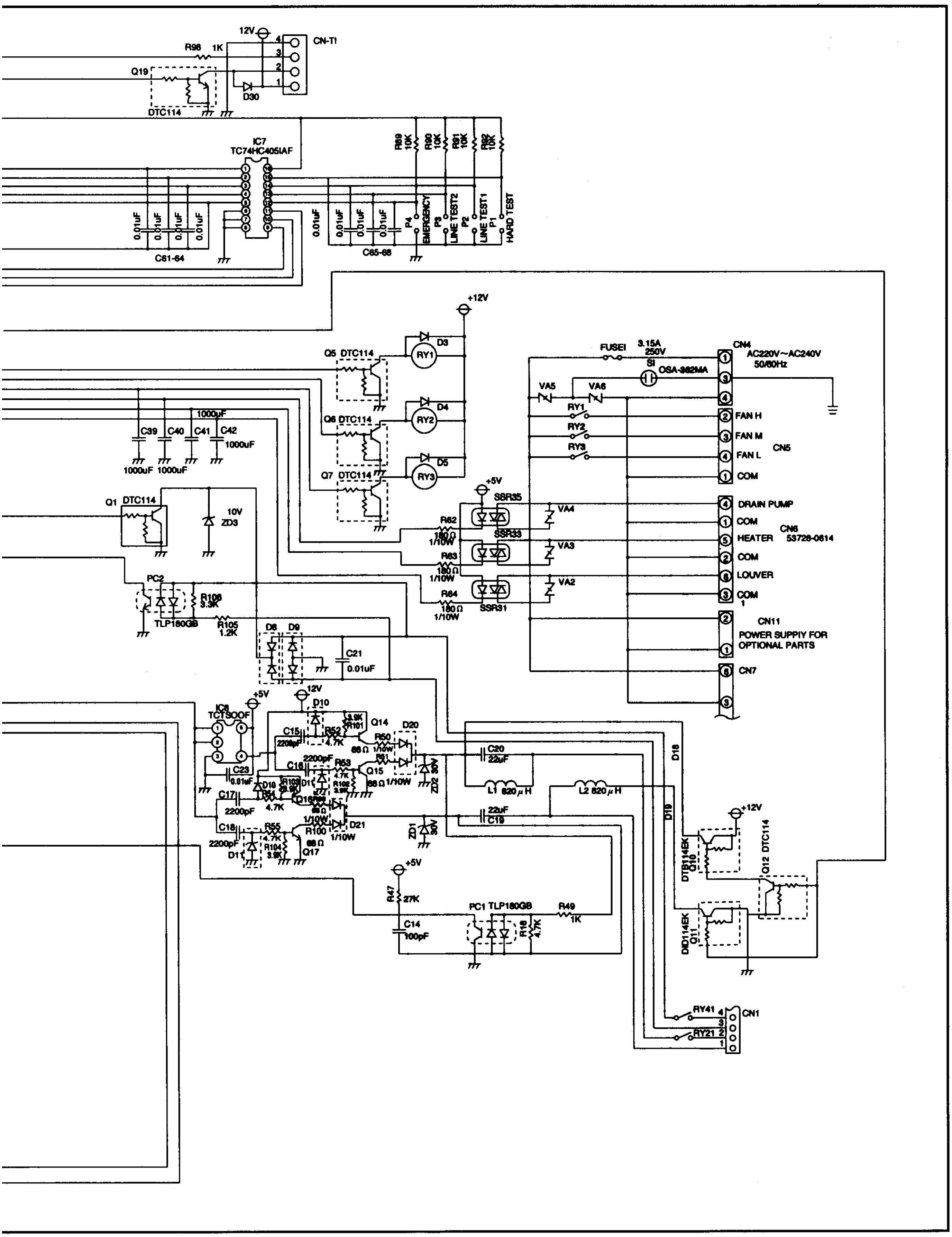
LIQUID BYPASS valve(R)	6
REVERSING valve(R)	5
COMPRESSOR relay(R)	4
LIQUID BYPASS valve(S)	3
REVERSING valve(S)	2
COMPRESSOR relay(S)	1

CN6

R Phase	4
S Phase	3
Earth	2
T Phase	1

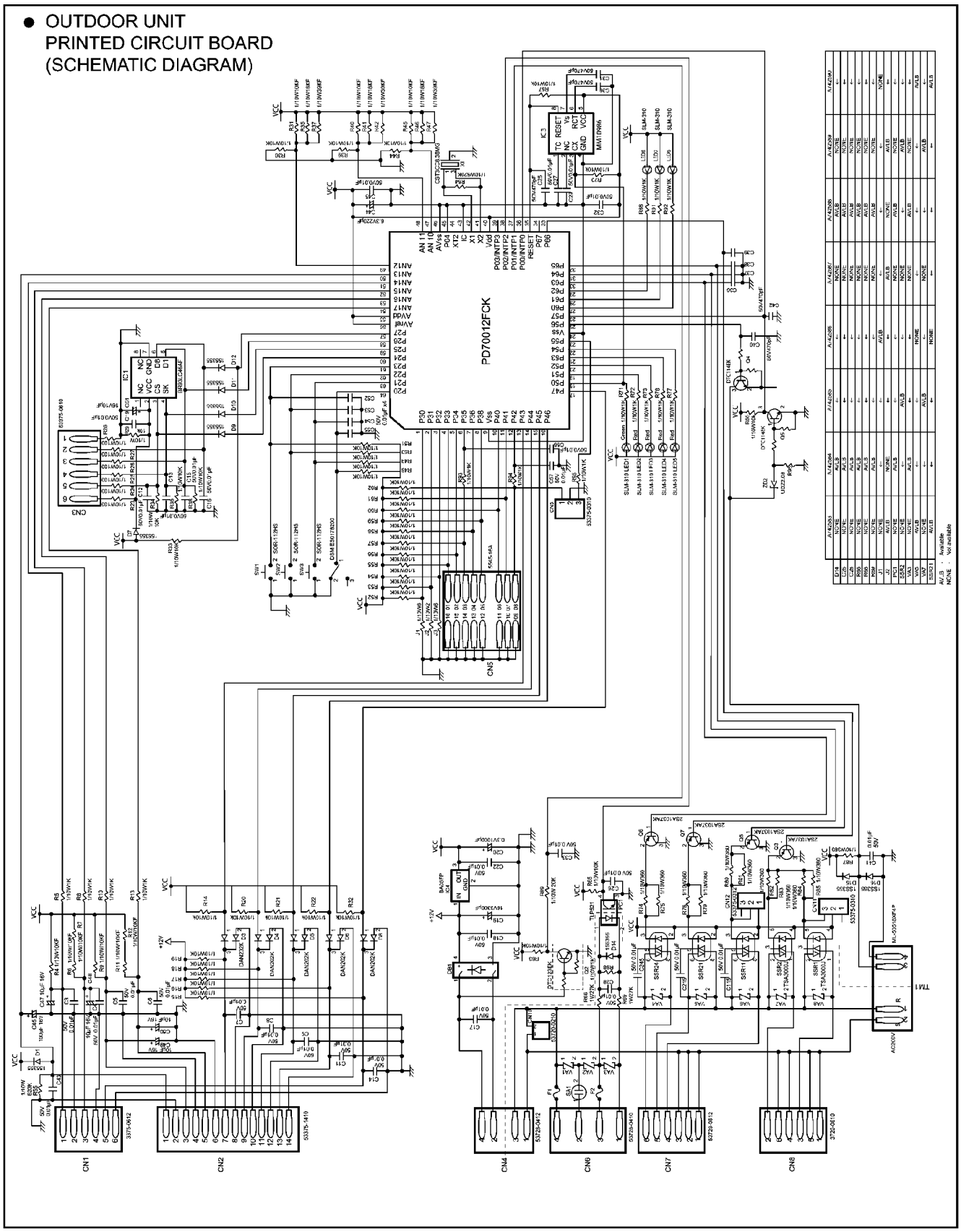
●INDOOR UNIT PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)





12V
CN-T1
R98 1K
Q19
D30
DTC114
IC7
TC74HC405IAF
R89 10K
R90 10K
R91 10K
R92 10K
0.01uF
C61-64
C65-68
P4
EMERGENCY
P3
LINE TEST2
P2
LINE TEST1
P1
HARD TEST
+12V
Q5 DTC114
Q6 DTC114
Q7 DTC114
RY1
RY2
RY3
D3
D4
D5
C39
C40
C41
C42
1000uF
Q1 DTC114
10V
ZD3
FUSE1
3.15A
250V
SI
OSA-362MA
CN4
AC220V~AC240V
50/60Hz
VA5
VA6
FAN H
FAN M
FAN L
COM
CN5
+5V
SSR35
SSR33
SSR31
VA4
VA3
VA2
R62
R63
R64
180Ω
1/10W
DRAIN PUMP
HEATER
CN6
53726-0614
LOUVER
CN11
POWER SUPPIY FOR
OPTIONAL PARTS
CN7
PC2
R106
3.3K
TLP180GB
R105
1.2K
D8
D9
C21
0.01uF
IC8
TCTSOOF
D10
Q14
D20
C15
2200pF
R52
4.7K
R50
68Ω 1/10W
C16
R53
Q15
C20
22uF
L1 820μH
L2 820μH
ZD2 30V
C23
C17
C18
R54
R55
Q16
Q17
R100
D21
ZD1 30V
C19
D18
D19
DTB114EK
Q10
Q12 DTC114
DID114EK
Q11
R47
27K
C14
100pF
PC1 TLP180GB
R49
1K
R18
4.7K
RY41
RY21
CN1

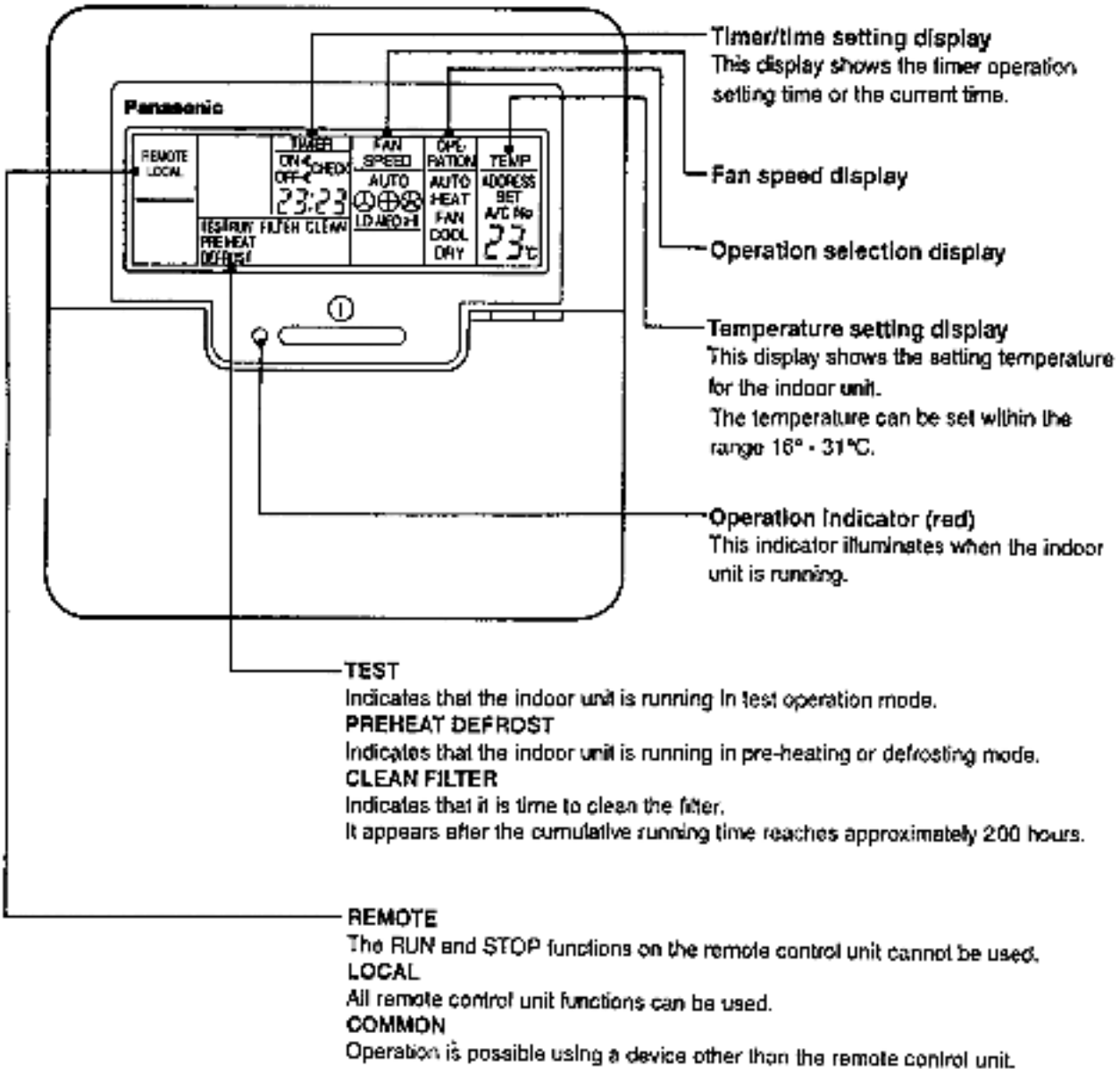
● OUTDOOR UNIT
PRINTED CIRCUIT BOARD
(SCHEMATIC DIAGRAM)

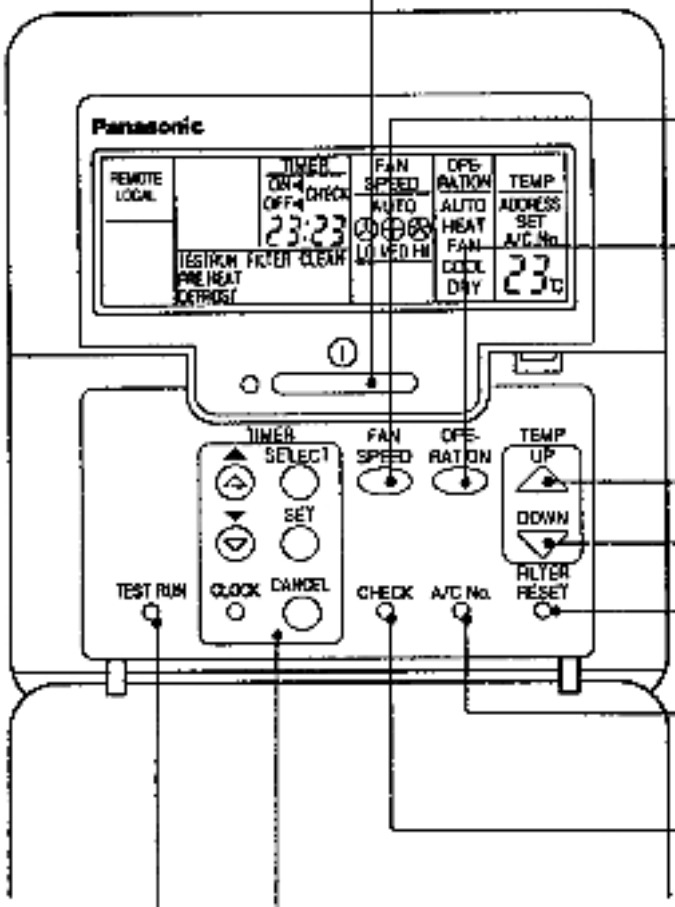


7 OPERATING INSTRUCTION

7.1. Wired Remote Control

Name and function of each part





RUN switch
This switch is used to run or stop the indoor unit operation.

FAN SPEED switch

OPERATION MODE switch

TEMPERATURE SETTING switch

FILTER RESET switch
After the filter has been cleaned, press this switch to clear the "CLEAN FILTER" display.

Air conditioner No. switch
This switch is used during group control. It is not needed for normal operation.

CHECK switch
Press this switch if the check display is flashing.

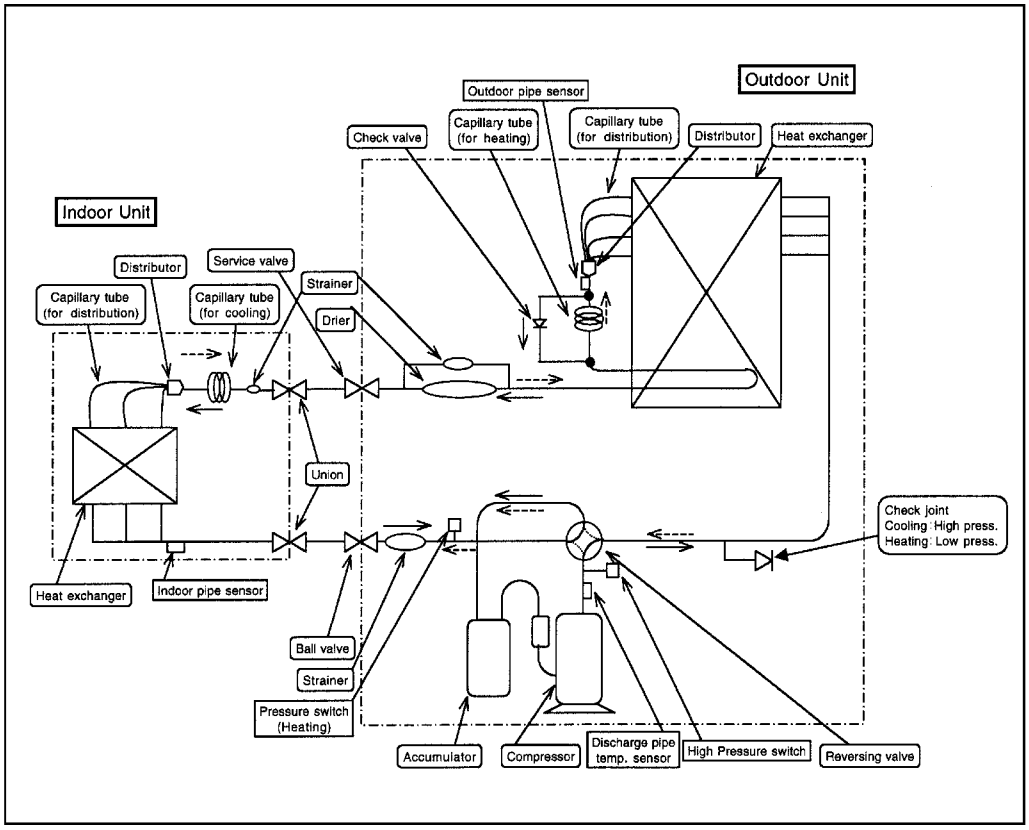
TIMER SET switch
This switch is used to set the timer operation and to set the current time.

TEST RUN switch
This switch is only used during test operation. It is not needed for normal operation.

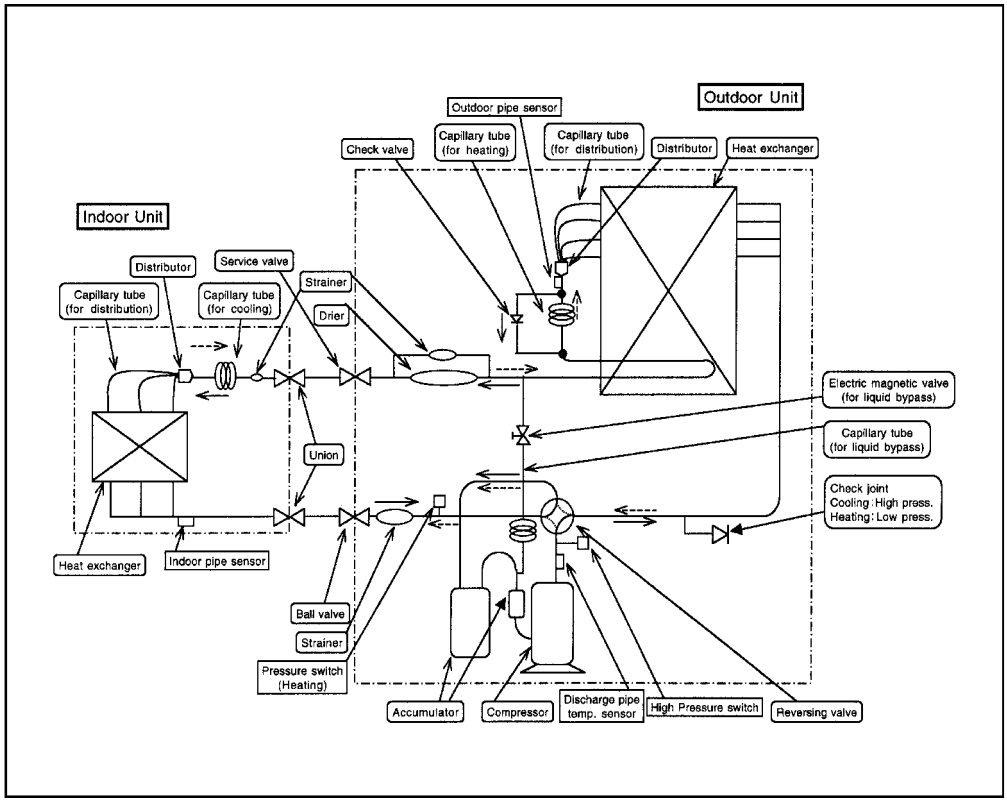
8 REFRIGERATION CYCLE

8.1. Heating Model

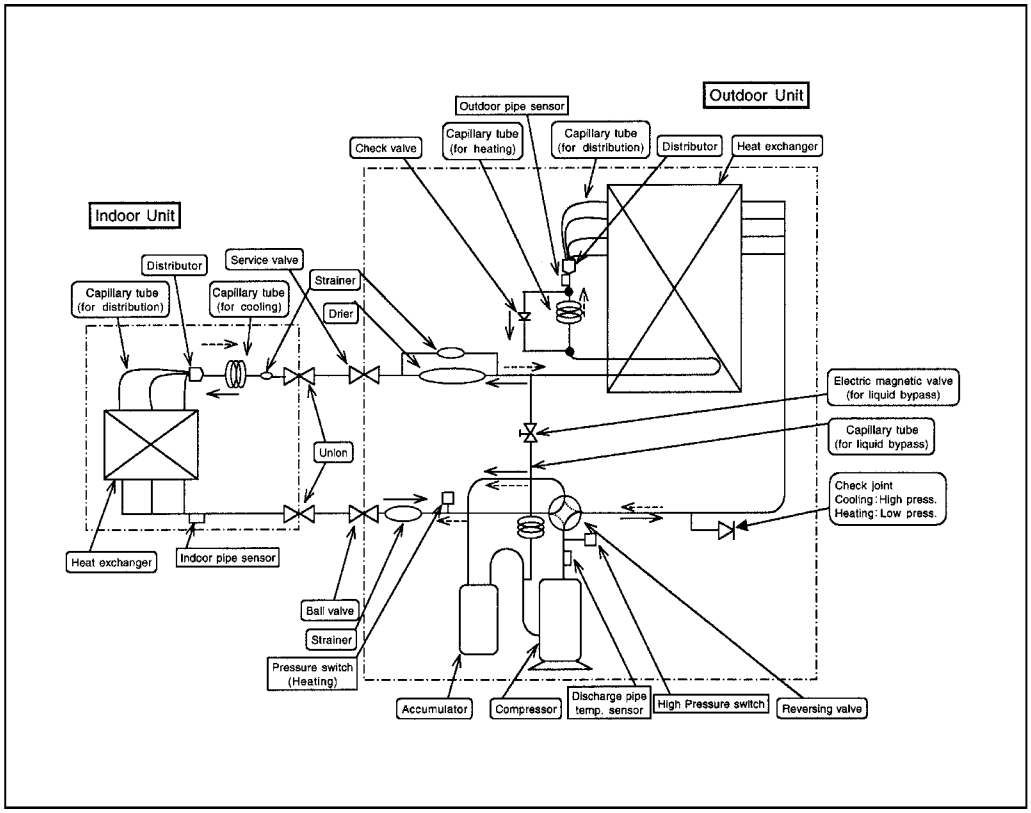
CS-W24BD2P / CU-W24BBP5



CS-W28BD2P / CU-W28BBP5, 8

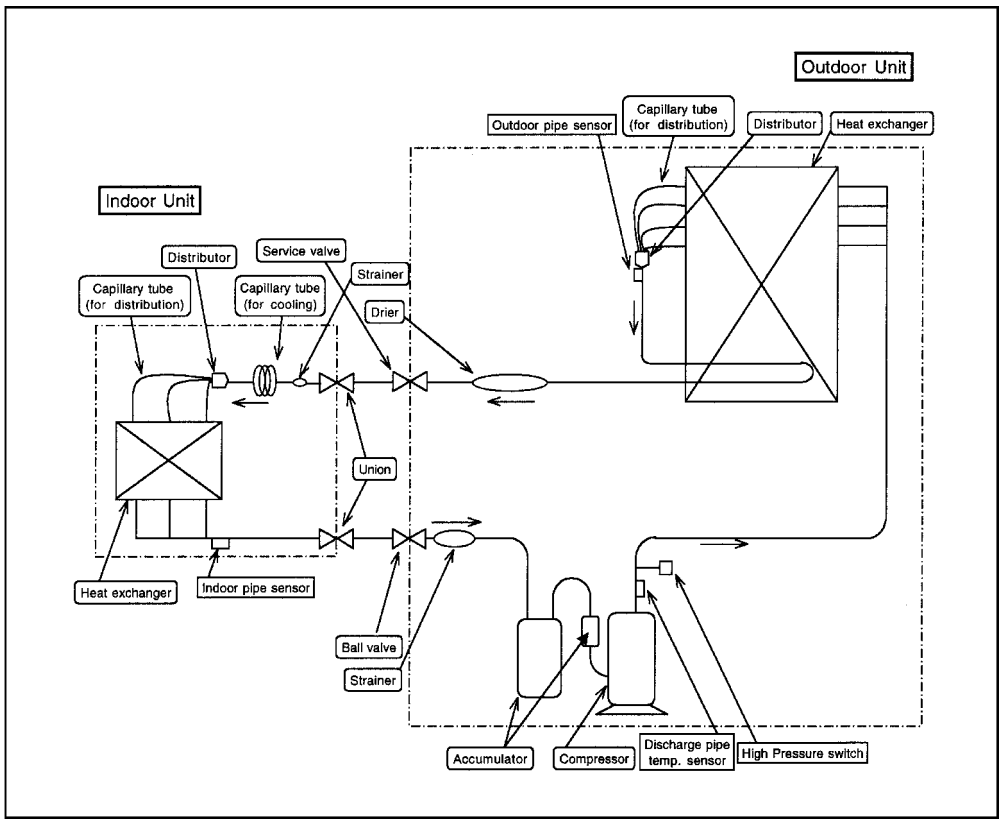


CS-W34BD2P / CU-W34BBP8
CS-W43BD2P / CU-W43BBP8

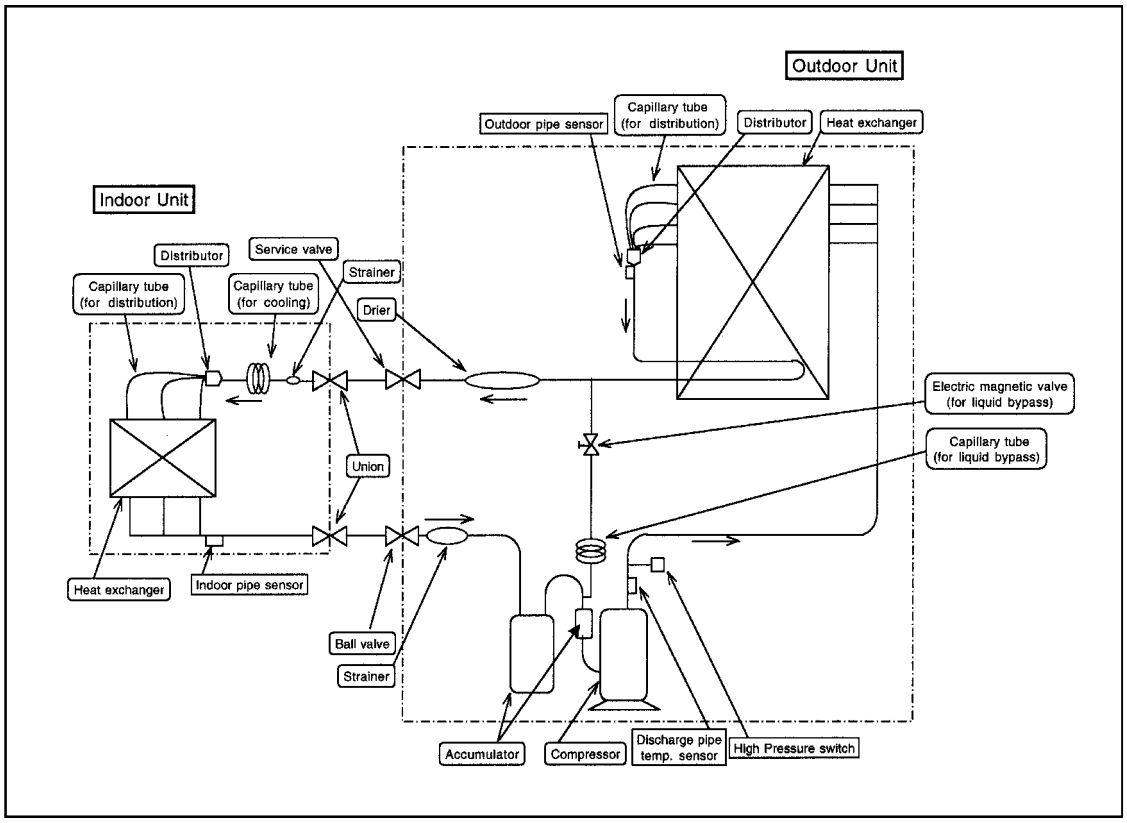


8.2. Cooling Only Model

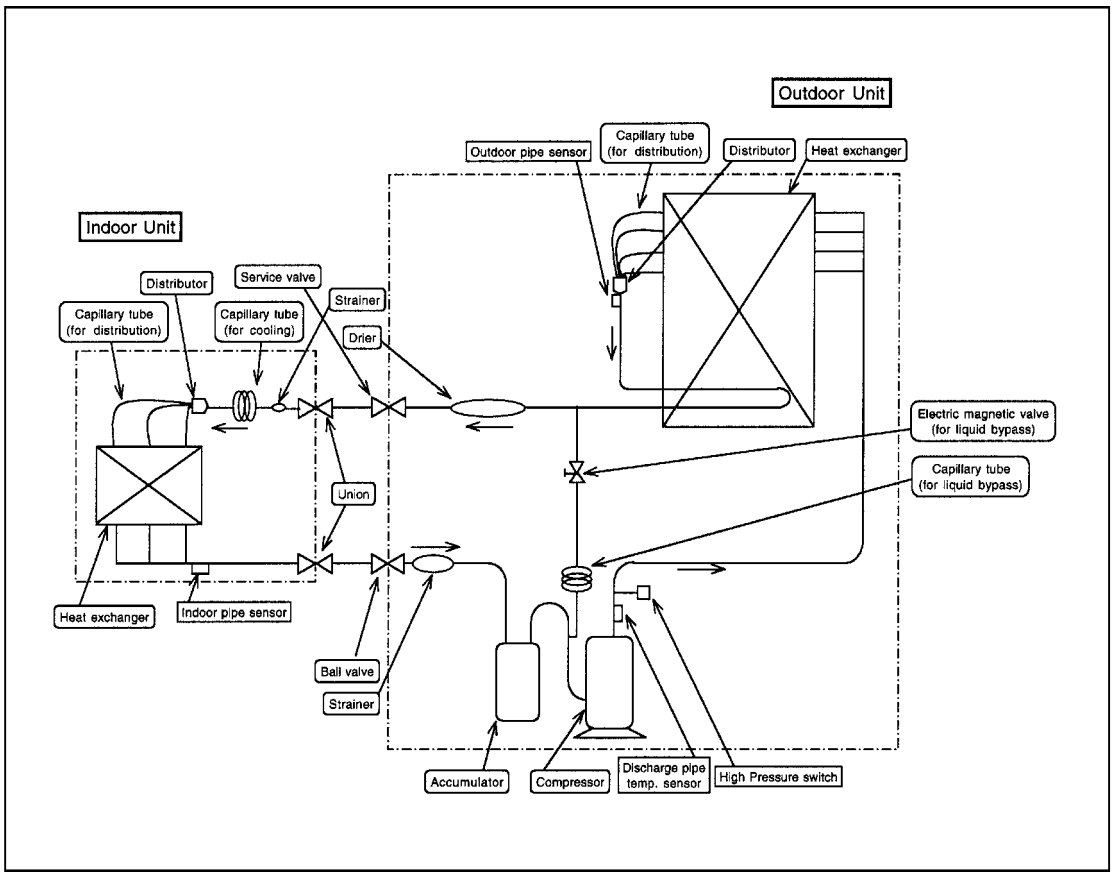
CS-W24BD2P / CU-V24BBP5, 8



CS-W28BD2P / CU-V28BBP5, 8



CS-W34BD2P / CU-V34BBP8
CS-W43BD2P / CU-V43BBP8



9 OPERATION RANGE

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 Voltage	
	Phase, Volts	Hz	Maximum	Minimum		Phase, Volts	Hz	Maximum	Minimum
W24BBP5	1~220	50	242	198	W28BBP8	3N~380	50	418	342
W28BBP5	1~230	50	253	207	W34BBP8	3N~400	50	440	360
V24BBP5	1~240	50	264	216	W43BBP8	3N~415	50	457	374
V28BBP5					V24BBP8				
					V28BBP8				
					V34BBP8				
					V43BBP8				

Indoor and Outdoor Temperature

■ Cooling only type

Model 50Hz ... V24BBP5 (8), V28BBP5 (8), V34BBP8, V43BBP8

Operating	Hz	Indoor Temp. (D.B./W.B.) (°C)		Outdoor Temp. (D.B./W.B.) (°C)	
		Maximum	Minimum	Maximum	Minimum
Cooling	50	32/23	21/15	43/-	-5/-

■ Heat pump type

Model 50Hz ... W24BBP5, W28BBP5 (8), W34BBP8, W43BBP8

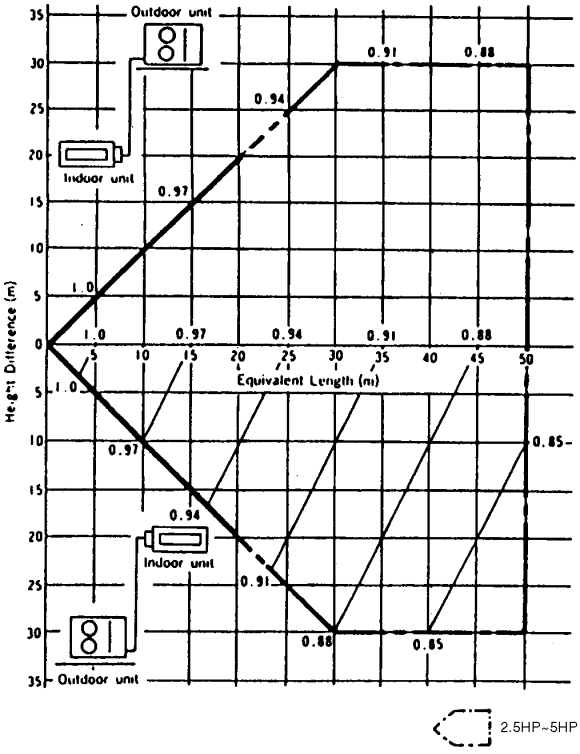
Operating	Hz	Indoor Temp. (D.B./W.B.) (°C)		Outdoor Temp. (D.B./W.B.) (°C)	
		Maximum	Minimum	Maximum	Minimum
Cooling	50	32/23	21/15	43/-	-5/-
Heating	50	27/-	16/-	24/18	-10/-

10 PIPE LENGTH

10.1. 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 7.5 metres connecting pipe and horizontal installation.

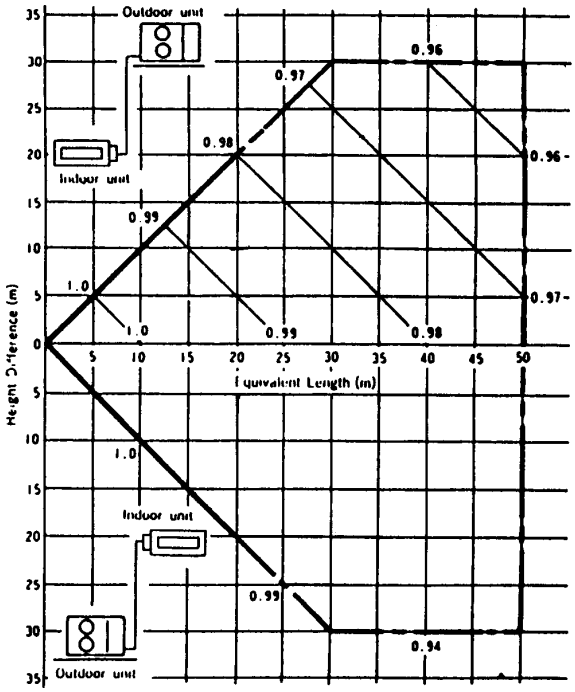
(Cooling)



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.

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
3~5HP	50g per 1m

Example:
CS-W24BD2P
In case of 30 m long pipe (one-way), the amount of refrigerant to be replenished is:
(30 - 30) x 20 = 0g
CS-W43BD2P
In case of 50m long pipe (one-way), the amount of refrigerant to be replenished is:
(50 - 30) x 50 = 1,000g

10.2. 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.

10.3. Piping installation by existing piping

■ Cooling only type (50Hz)

Model Name	Standard piping specification			
	Liquid piping (dia.mm)	Gas piping (dia.mm)	Gas charge-less length (m)	Additional gas volume (g/m)
CU-V24BBP5	6.35	15.88	30	20
CU-V24BBP8	6.35	15.88	30	20
CU-V28BBP5	9.52	15.88	30	50
CU-V28BBP8	9.52	15.88	30	50
CU-V34BBP8	9.52	19.05	30	50
CU-V43BBP8	9.52	19.05	30	50

■ Heat pump type (50Hz)

Model Name	Standard piping specification			
	Liquid piping (dia.mm)	Gas piping (dia.mm)	Gas charge-less length (m)	Additional gas volume (g/m)
CU-W24BBP5	6.35	15.88	30	20
CU-W28BBP5	9.52	15.88	30	50
CU-W28BBP8	9.52	15.88	30	50
CU-W34BBP8	9.52	19.05	30	50
CU-W43BBP8	9.52	19.05	30	50

⚠ 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.

11 OPERATING CHARACTERISTIC

HEAT PUMP MODEL

Model	Main Power Source		Compressor Motor			Indoor Unit Fan Motor		Outdoor Unit Fan Motor		Electrical Data (50Hz) R.C (A)	Electrical Data (50Hz) IPT (kW)
	Voltage (V)	Frequency (Hz)	S.C. (A)	R.C.(A) COOL / HEAT	IPT(kW) COOL / HEAT	R.C. (A)	IPT (kW)	R.C. (A)	IPT (kW)	COOL / HEAT	COOL / HEAT
CS-W24BD2P	220	50	64	10.5 / 10.7	2.31 / 2.35	0.79	0.15	0.46	0.10	11.7 / 11.9	2.56 / 2.60
CU-W24BBP5	230	50	66	9.9 / 10.1	2.29 / 2.33	0.84	0.16	0.47	0.11	11.2 / 11.4	2.56 / 2.60
	240	50	68	9.5 / 9.6	2.28 / 2.32	0.87	0.17	0.48	0.11	10.8 / 10.9	2.56 / 2.60
CS-W28BD2P	220	50	68	11.9 / 12.6	2.60 / 2.76	0.77	0.16	0.46	0.10	13.1 / 13.8	2.86 / 3.02
CU-W28BBP5	230	50	70	11.2 / 11.9	2.58 / 2.74	0.80	0.17	0.47	0.11	12.5 / 13.2	2.86 / 3.02
	240	50	72	11.2 / 11.4	2.57 / 2.73	0.82	0.18	0.48	0.11	12.5 / 12.7	2.86 / 3.02
CS-W28BD2P	380	50	28	4.19 / 4.09	2.46 / 2.60	0.77	0.16	0.46	0.10	4.60 / 4.50	2.72 / 2.86
CU-W28BBP8	400	50	29	4.18 / 4.08	2.44 / 2.58	0.80	0.17	0.47	0.11	4.60 / 4.50	2.72 / 2.86
	415	50	30	4.17 / 4.07	2.43 / 2.57	0.82	0.18	0.48	0.11	4.60 / 4.50	2.72 / 2.86
CS-W34BD2P	380	50	39	3.94 / 4.24	3.39 / 3.58	1.35	0.29	0.91	0.20	6.20 / 6.50	3.88 / 4.07
CU-W34BBP8	400	50	41	3.90 / 4.20	3.36 / 3.55	1.36	0.31	0.94	0.21	6.20 / 6.50	3.88 / 4.07
	415	50	42	3.86 / 4.16	3.33 / 3.52	1.37	0.32	0.97	0.23	6.20 / 6.50	3.88 / 4.07
CS-W43BD2P	380	50	58	6.91 / 7.11	3.91 / 4.08	1.67	0.36	0.99	0.22	7.80 / 8.00	4.49 / 4.66
CU-W43BBP8	400	50	58	6.90 / 7.10	3.88 / 4.05	1.67	0.38	1.02	0.23	7.80 / 8.00	4.49 / 4.66
	415	50	58	6.90 / 7.10	3.85 / 4.02	1.66	0.39	1.04	0.25	7.80 / 8.00	4.49 / 4.66

COOLING ONLY MODEL

CS-W24BD2P	220	50	64	10.5	2.31	0.79	0.15	0.46	0.10	11.7	2.56
CU-V24BBP5	230	50	66	9.9	2.29	0.84	0.16	0.47	0.11	11.2	2.56
	240	50	68	9.5	2.28	0.87	0.17	0.48	0.11	10.8	2.56
CS-W24BD2P	380	50	27	2.85	2.17	0.79	0.15	0.46	0.10	4.10	2.42
CU-V24BBP8	400	50	28	2.79	2.15	0.84	0.16	0.47	0.11	4.10	2.42
	415	50	29	2.75	2.14	0.87	0.17	0.48	0.11	4.10	2.42
CS-W28BD2P	220	50	68	12.7	2.60	0.77	0.16	0.46	0.10	13.1	2.86
CU-V28BBP5	230	50	70	12.1	2.58	0.80	0.17	0.47	0.11	12.5	2.86
	240	50	72	12.1	2.57	0.82	0.18	0.48	0.11	12.5	2.86
CS-W28BD2P	380	50	28	3.37	2.46	0.77	0.16	0.46	0.10	4.60	2.72
CU-V28BBP8	400	50	29	3.33	2.44	0.80	0.17	0.47	0.11	4.60	2.72
	415	50	30	3.30	2.43	0.82	0.18	0.48	0.11	4.60	2.72
CS-W34BD2P	380	50	39	5.45	3.39	1.35	0.29	0.91	0.20	6.20	3.88
CU-V34BBP8	400	50	41	5.43	3.36	1.36	0.31	0.94	0.21	6.20	3.88
	415	50	42	5.42	3.33	1.37	0.32	0.97	0.23	6.20	3.88
CS-W43BD2P	380	50	58	6.91	3.91	1.67	0.36	0.99	0.22	7.80	4.49
CU-V43BBP8	400	50	58	6.90	3.88	1.67	0.38	1.02	0.23	7.80	4.49
	415	50	58	6.90	3.85	1.66	0.39	1.04	0.25	7.80	4.49

Legend:

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

12 FAN PERFORMANCE

● **CS-W24BD2P**

Model		CS-W24BD2P				
External Static Pressure	Fan Speed	Current (A)	Power Consumption (kW)	Power Factor (%)	RPM (r/min)	Air Volume (m^3/min)
98pA (10mmAq)	Hi	0.83	0.18	94.2	1370	18
74Pa (7.5mmAq)	Me	0.55	0.12	94.8	1200	16
59Pa (6mmAq)	Lo	0.48	0.10	90.5	1080	14

● **CS-W28BD2P**

Model		CS-W28BD2P				
External Static Pressure	Fan Speed	Current (A)	Power Consumption (kW)	Power Factor (%)	RPM (r/min)	Air Volume (m^3/min)
98pA (10mmAq)	Hi	0.80	0.18	97.8	1400	20
74Pa (7.5mmAq)	Me	0.53	0.12	98.4	1240	18
59Pa (6mmAq)	Lo	0.46	0.10	94.5	1130	16

● **CS-W34BD2P**

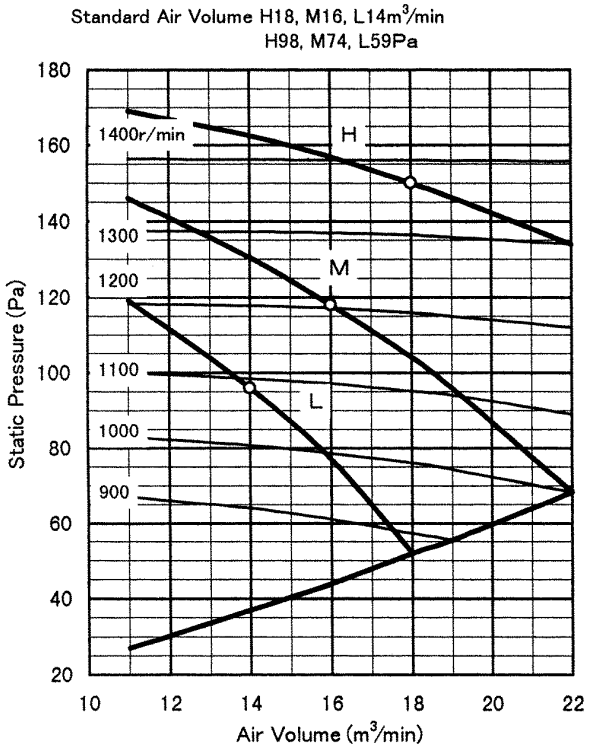
Model		CS-W34BD2P				
External Static Pressure	Fan Speed	Current (A)	Power Consumption (kW)	Power Factor (%)	RPM (r/min)	Air Volume (m^3/min)
147pA (15mmAq)	Hi	1.36	0.31	99.1	1380	33
123Pa (12.5mmAq)	Me	1.07	0.24	97.5	1240	28
98Pa (10mmAq)	Lo	0.87	0.19	94.9	1100	23

● **CS-W43BD2P**

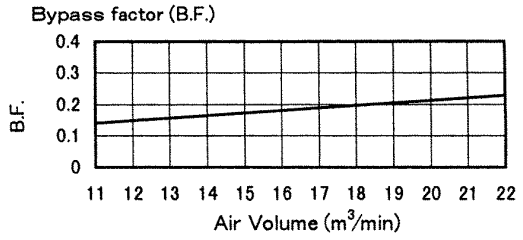
Model		CS-W43BD2P				
External Static Pressure	Fan Speed	Current (A)	Power Consumption (kW)	Power Factor (%)	RPM (r/min)	Air Volume (m^3/min)
147pA (15mmAq)	Hi	1.67	0.38	98.9	1420	36
123Pa (12.5mmAq)	Me	1.32	0.30	98.8	1280	31
98Pa (10mmAq)	Lo	1.15	0.26	98.3	1130	26

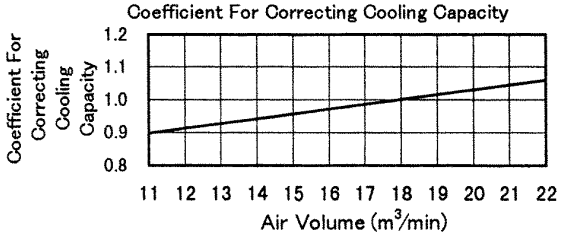
● CS-W24BD2P

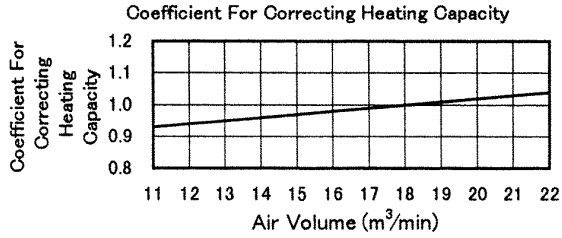
Fan Performance Curve



Bypass factor And Coefficient For Correcting Capacity according to Air Volume Change

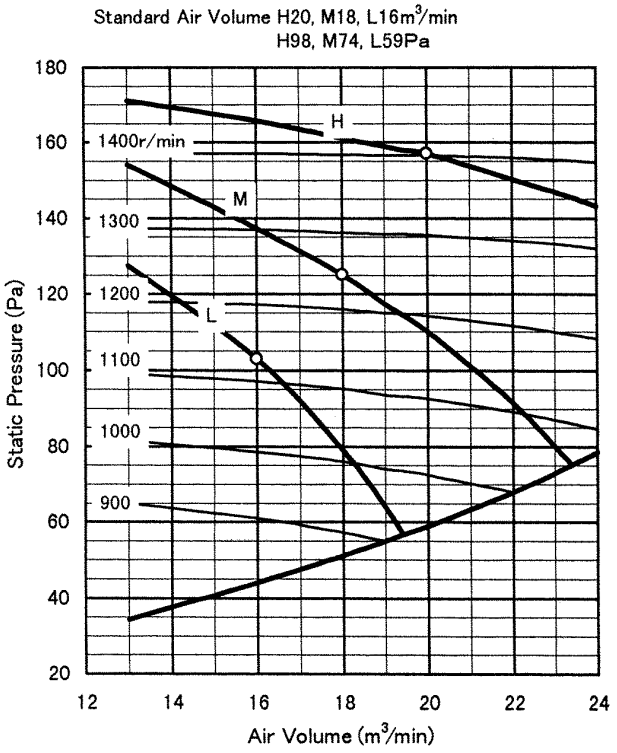


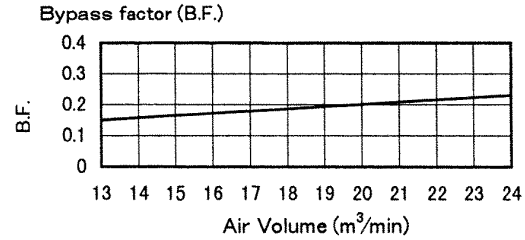


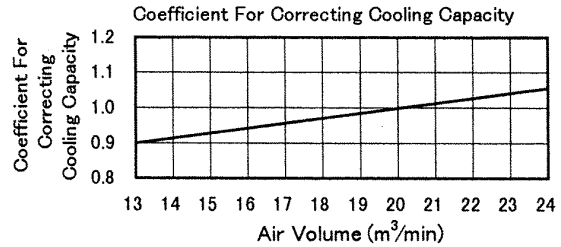


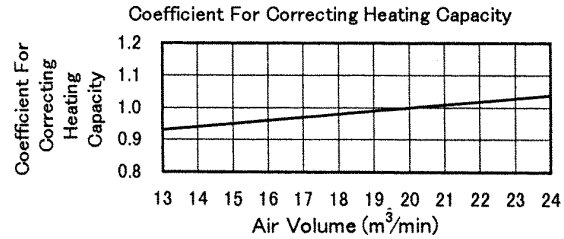
●CS-W28BD2P

Fan Performance Curve



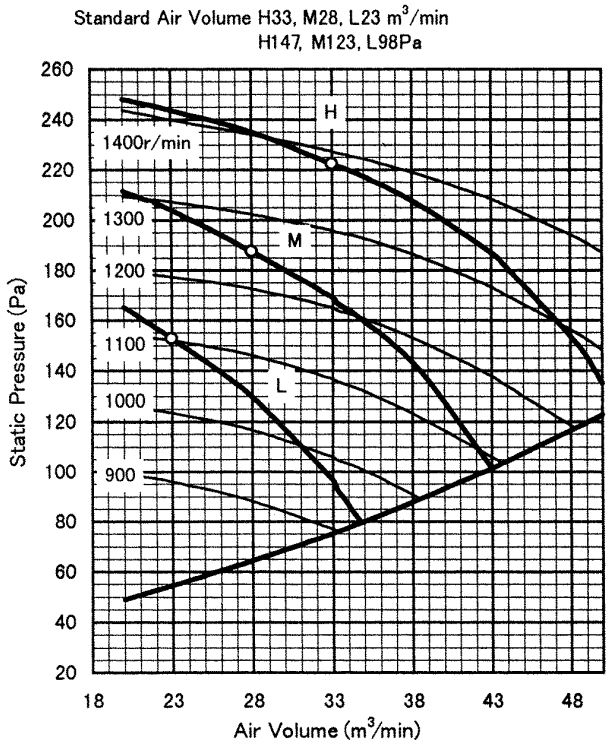






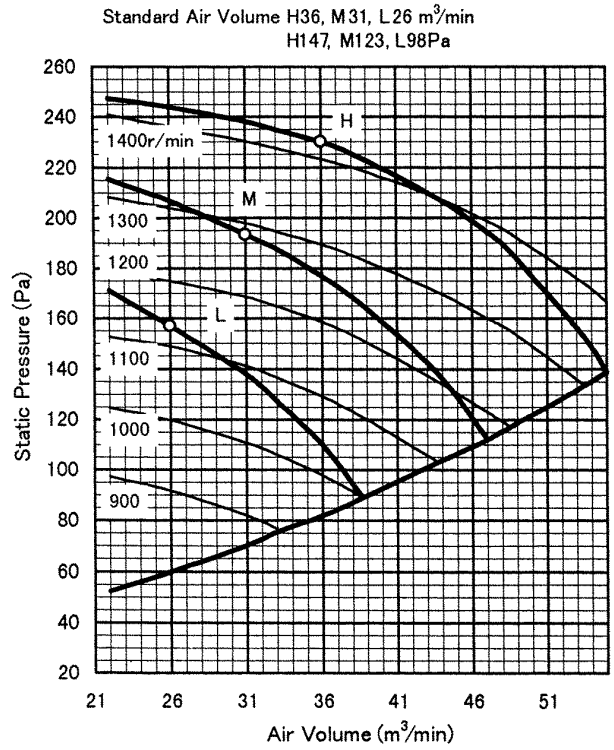
●CS-W34BD2P

Fan Performance Curve

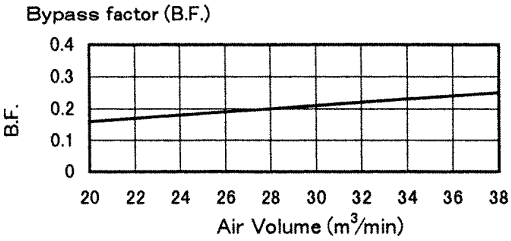


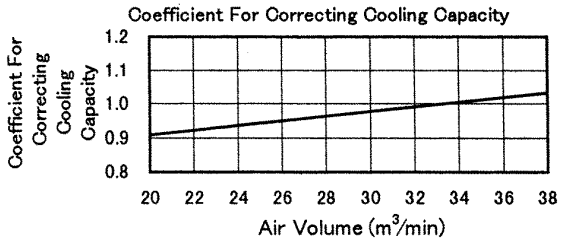
●CS-W43BD2P

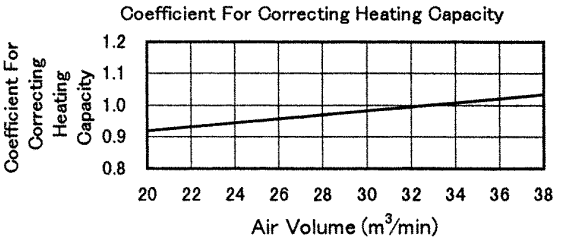
Fan Performance Curve

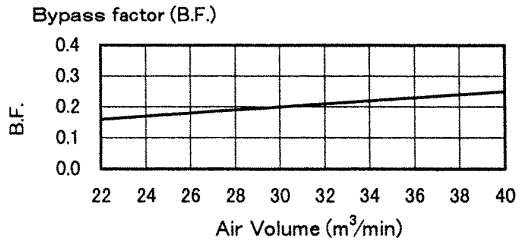


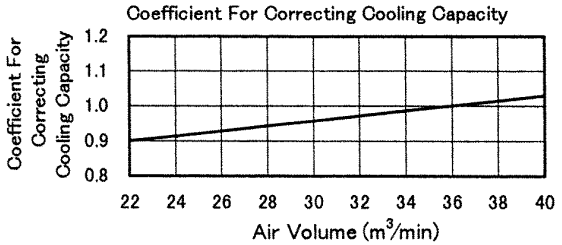
Bypass factor And Coefficient For Correcting Capacity according to Air Volume Change

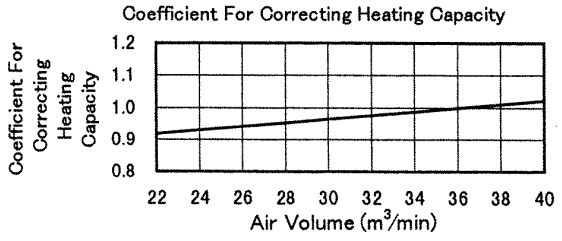












13 SAFETY DEVICE

• INDOOR UNIT

Indoor unit		Model	CS-W24BD3P	CS-W24BD3P	CS-W28BD3P	CS-W28BD3P	CS-W34BD3P	CS-W43BD3P
For fan motor protection								
Internal	OFF	°C	135	135	135	135	135	135
Protector (49F)	ON	°C	87	87	87	87	87	87
For control protection								
Fuse	CUT	A	3.15	3.15	3.15	3.15	5	5

• OUTDOOR UNIT

Outdoor unit	Heat pump model	50Hz	CU-W24BBP5	-	CU-W28BBP5	CU-W28BBP8	CU-W34BBP8	CU-W43BBP8
	Cooling only model	50Hz	CU-V24BBP5	CU-V24BBP8	CU-V28BBP5	CU-V28BBP8	CU-V34BBP8	CU-V43BBP8
For refrigerant cycle								
High pressure	OFF	MPa	3.1	3.1	3.1	3.1	3.1	3.1
switch (63H1)	ON	MPa	2.3	2.3	2.3	2.3	2.3	2.3
For compressor Over current protection								
Heat pump model	OFF	A	17	-	23	8	11	13
Cooling only model	OFF	A 50Hz	17	7	23	8	11	13
	RESET	-	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic
Discharge temp. protection								
Discharge temperature thermistor (Th1)	Com-pressor OFF	°C	115	115	120	120	120	120
Liquid compress protection Crankcase heater	Input power	W	31~37	31~37	31~37	31~37	34~41	34~41
Compressor protection								
Internal protector	OFF	°C 50Hz	160	120	160	120	145	135
	ON	°C 50Hz	90	90	90	90	61	61
	Trip time	°C	5-15sec/ 74A	-	5-15sec/ 74A	-	3-10sec/ 37A	2-10sec/ 45A
For fan motor protection								
	OFF	°C 50Hz	135	135	135	135	135	135
Internal protector (49F)	ON	°C 50Hz	85	85	85	85	85	85
Heating control (Heat pump only)								
Pressure switch	OFF	MPa	2.35	2.35	2.35	2.35	2.35	2.35
(Fan speed)(63H2)	ON	MPa	1.96	1.96	1.96	1.96	1.96	1.96
Cooling control								
Heat exchanger outlet temperature thermistor (Th2)	Control method		Th ≥ 30°C---High speed Th<30°C---5 speed step control					
For control protection								
Fuse	CUT	A	6.3	6.3	6.3	6.3	6.3	6.3

14 COMPONENT SPECIFICATION

Compressor

Models	Heat pump model	50Hz	CU-W24BBP5	CU-W28BBP5 CU-W28BBP8	CU-W34BBP8	CU-W43BBP8
	Cooling only model	50Hz	CU-V24BBP5 CU-V24BBP8	CU-V28BBP5 CU-V28BBP8	CU-V34BBP8	CU-V43BBP8
		60Hz	-	-	-	-
Compressor Model		single-phase	NE41VNHMT	NE44VNHMT	ZR48KCE-TFD	ZR57KCE-TFD
		3-phase	NE41YDNMT	NE44YDNMT	-	-
Compressor Type			ROTARY		SCROLL	
No. of Cylinders			1	1	1	1
Revolution		r/min.	2,900	2,900	2,900	2,900
Piston Displacement		m^3/min.	7.27	7.73	11.39	13.42
Motor Type						
	Starting Method		Direct on-line Starting			
	Rated Output	kW	1.9	2.0	3.0	3.5
	Poles		2	2	2	2
	Insulation Glass		E	E	E	E
Revolution		MEL56	MEL56	MEL56	MMMAPOE	MMMAPOE
Revolution		L	1.3	1.3	1.3	2.0

Evaporator

Models (Cooling Only Model)		CS-W24BD2P	CS-W28BD2P	CS-W34BD2P	CS-W43BD2P
Tube Material		Copper Tube			
Outer Diameter	mm	9.5	9.5	9.5	9.5
Thickness	mm	0.28	0.28	0.28	0.28
Row		3	3	2	3
No. of Tubes/Row		10	10	16	16
Fin Material		Aluminium			
Thickness	mm	0.11	0.11	0.11	0.11
Fin Pitch	No./inch	14	14	14	14
Fin Surface		Louvre-fin	Louvre-fin	Louvre-fin	Louvre-fin
Total Face Area	m^2	0.218	0.218	0.358	0.358
Evaporator Fan		Sirocco Fan			
Type					
No./Unit		2	2	2	2
Evaporator Fan motor		Direct On-Line Starting			
Starting					
Rated Output	kW	0.075	0.075	0.25	0.35
Poles		4	4	4	4
Phase		Single-Phase	Single-Phase	Single-Phase	Single-Phase
Insulation		E	E	E	E

Condenser

Models	Heat pump model		CU-W24BBP5	CU-W28BBP5 CU-W28BBP8	CU-W34BBP5 CU-W34BBP8	CU-W43BBP8
	Cooling only model		CU-V24BBP5 CU-V24BBP8	CU-V28BBP5 CU-V28BBP8	CU-V34BBP5 CU-V34BBP8	CU-V43BBP8
Tube Material			Copper tube			
Outer Diameter		mm	9.52	9.52	9.52	9.52
Thickness		mm	0.3	0.3	0.3	0.3
Row			2	2	2	2
No. of Tubes/Row			34	34	46	46
Fin Material			Aluminium			
Thickness		mm	0.105	0.105	0.105	0.105
Fin Pitch		No./inch	14	14	14	14
Fin Surface			X-Louvre-fin	X-Louvre-fin	X-Louvre-fin	X-Louvre-fin
Total Face Area		m^2	0.61	0.61	0.82	1.05
Fan						
Type			Propeller Fan			
No.of unit			1	1	2	2
Fan Motor						
Starting Method			Direct on-line Starting			
Rated Output		kW	0.055	0.055	0.055 X 2	0.055 X 2
Poles			6	6	6	6
Phase			Single-Phase	Single-Phase	Single-Phase	Single-Phase
Insulation Class			E	E	E	E

15 CAPACITY AND POWER CONSUMPTION

■ PERFORMANCE DATA

COOLING PERFORMANCE

Model	Cooling capacities are based conditions
CS-W24BD2P	● Indoor temp. 27°C D.B. 19°C W.B. ● Outdoor temp. 35°C D.B. ● Standard air volume 18 m^3/min ● External Static Pressure (98Pa)
Cooling capacity	
6.3kW	

Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			43°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	6.56	4.39	2.17	6.30	1.50	2.29	5.93	4.21	2.46	5.48	4.00	2.66	5.10	3.82	2.74
	19	6.93	3.67	2.30	2.31	1.26	2.43	6.37	3.63	2.61	5.94	3.50	2.82	5.57	3.40	2.90
	22	7.56	3.10	2.48	2.52	1.07	2.62	7.02	3.16	2.82	6.57	3.09	3.04	6.18	3.03	3.07
25	17	6.48	5.12	2.16	4.16	1.75	2.29	5.87	4.87	2.46	5.44	4.63	2.64	5.10	4.44	2.73
	19	6.93	4.51	2.30	4.49	1.54	2.44	6.33	4.37	2.62	5.90	4.19	2.81	5.55	4.06	2.90
	22	7.56	3.70	2.48	4.89	1.26	2.63	6.97	3.69	2.83	6.25	3.44	3.01	6.16	3.51	3.03
27	17	6.40	6.08	2.15	6.16	5.97	2.29	5.81	5.81	2.46	5.40	5.40	2.63	5.11	5.11	2.72
	19	6.94	5.28	2.30	6.68	5.21	2.45	6.30	5.04	2.63	5.86	4.80	2.81	5.54	4.66	2.91
	22	7.55	4.31	2.48	7.30	4.31	2.64	6.92	4.22	2.84	5.94	3.74	3.04	6.14	3.99	3.08
29	17	6.39	6.07	2.14	6.16	5.97	2.27	5.83	5.83	2.42	5.44	5.44	2.59	5.17	5.17	2.68
	19	6.93	6.37	2.28	6.68	6.28	2.42	6.32	6.07	2.59	5.91	5.79	2.76	5.61	5.61	2.86
	22	7.52	5.04	2.51	7.27	5.01	2.67	6.89	4.89	2.85	6.24	4.55	3.02	6.14	4.60	3.08
32	17	6.38	6.06	2.13	6.16	5.97	2.25	5.84	5.84	2.40	5.47	5.47	2.56	5.22	5.22	2.65
	19	6.92	6.57	2.27	6.68	6.48	2.41	6.33	6.33	2.56	5.94	5.94	2.73	5.66	5.66	2.83
	22	7.50	6.23	2.54	7.25	6.16	2.69	6.87	5.97	2.86	6.44	5.73	3.05	6.14	5.58	3.16

Model	Cooling capacities are based conditions
CS-W28BD2P	● Indoor temp. 27°C D.B. 19°C W.B. ● Outdoor temp. 35°C D.B. ● Standard air volume 20 m^3/min ● External Static Pressure (98Pa)
Cooling capacity	
7.1kW	

Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			43°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	7.39	4.95	2.30	7.10	4.90	2.43	6.68	4.74	2.61	6.18	4.51	2.82	5.74	4.31	2.93
	19	7.81	4.14	2.44	7.56	4.16	2.58	7.18	4.09	2.77	6.69	3.95	2.96	6.27	3.83	3.05
	22	8.52	3.49	2.63	8.29	3.57	2.78	7.91	3.56	2.99	7.41	3.48	3.12	6.97	3.41	3.14
25	17	7.30	5.77	2.29	7.02	5.69	2.43	6.61	5.49	2.61	6.13	5.21	2.79	5.75	5.00	2.87
	19	7.81	5.08	2.44	7.54	5.05	2.59	7.14	4.93	2.78	6.65	4.72	2.95	6.26	4.57	3.03
	22	8.52	4.17	2.63	8.26	4.21	2.79	7.86	4.16	3.00	7.05	3.88	3.02	6.95	3.96	3.06
27	17	7.21	6.85	2.28	6.94	6.73	2.43	6.55	6.55	2.61	6.09	6.09	2.75	5.76	5.76	2.82
	19	7.82	5.95	2.44	7.53	5.87	2.59	7.10	5.68	2.79	6.60	5.41	2.94	6.25	5.25	3.01
	22	8.51	4.85	2.63	8.23	4.85	2.80	7.80	4.76	3.01	6.69	4.21	3.11	6.92	4.50	3.13
29	17	7.20	6.84	2.27	6.94	6.73	2.41	6.57	6.57	2.57	6.14	6.14	2.67	5.83	5.83	2.81
	19	7.81	7.18	2.42	7.53	7.08	2.57	7.12	6.84	2.75	6.66	6.52	2.86	6.32	6.32	3.01
	22	8.48	5.68	2.67	8.19	5.65	2.83	7.76	5.51	3.03	7.03	5.13	3.03	6.92	5.19	3.17
32	17	7.19	6.83	2.26	6.94	6.73	2.39	6.58	6.58	2.54	6.17	6.17	2.62	5.88	5.88	2.81
	19	7.80	7.41	2.41	7.53	7.30	2.55	7.14	7.14	2.72	6.69	6.69	2.80	6.38	6.38	3.00
	22	8.46	7.02	2.69	8.17	6.94	2.85	7.74	6.73	3.04	7.26	6.46	3.12	6.92	6.29	3.35

Model	Cooling capacities are based conditions
CS-W34BD2P	● Indoor temp. 27°C D.B. 19°C W.B. ● Outdoor temp. 35°C D.B. ● Standard air volume 33 m^3/min ● External Static Pressure (147Pa)
Cooling capacity	
10.0kW	

Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			43°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	10.4	6.97	3.47	10.0	6.90	3.67	9.41	6.68	3.94	8.70	6.35	4.25	8.09	6.07	4.42
	19	11.0	5.83	3.68	10.7	5.86	3.89	10.1	5.76	4.18	9.42	5.56	4.46	8.83	5.39	4.64
	22	12.0	4.92	3.97	11.7	5.02	4.20	11.1	5.02	4.52	10.4	4.90	4.82	9.80	4.81	4.87
25	17	10.3	8.13	3.45	9.90	8.01	3.67	9.32	7.73	3.94	8.64	7.34	4.22	8.10	7.05	4.40
	19	11.0	7.15	3.68	10.6	7.12	3.90	10.1	6.94	4.20	9.36	6.65	4.47	8.82	6.44	4.66
	22	12.0	5.88	3.97	11.6	5.93	4.21	11.1	5.86	4.53	9.90	5.46	4.75	9.8	5.58	4.79
27	17	10.2	9.70	3.44	9.80	9.48	3.66	9.22	9.22	3.94	8.57	8.57	4.18	8.11	8.11	4.37
	19	11.0	8.38	3.68	10.6	8.27	3.92	10.0	8.00	4.21	9.30	7.63	4.47	8.80	7.39	4.67
	22	12.0	6.83	3.97	11.6	6.84	4.23	11.0	6.70	4.55	9.42	5.94	4.83	9.80	6.34	4.86
29	17	10.1	9.60	3.42	9.80	9.48	3.63	9.25	9.25	3.88	8.64	8.64	4.11	8.21	8.21	4.29
	19	11.0	10.1	3.65	10.6	10.0	3.88	10.0	9.60	4.15	9.37	9.19	4.39	8.91	8.91	4.58
	22	11.9	8.00	4.03	11.5	7.96	4.27	10.9	7.76	4.57	9.90	7.23	4.84	9.70	7.31	4.96
32	17	10.1	9.60	3.41	9.80	9.48	3.61	9.27	9.27	3.84	8.69	8.69	4.06	8.28	8.28	4.23
	19	11.0	10.4	3.64	10.6	10.3	3.86	10.0	10.0	4.10	9.42	9.42	4.34	8.98	8.98	4.52
	22	11.9	9.90	4.06	11.5	9.80	4.30	10.9	9.48	4.58	10.2	9.10	4.84	9.70	8.86	5.05

Model	Cooling capacities are based conditions
CS-W43BD2P	● Indoor temp. 27°C D.B. 19°C W.B. ● Outdoor temp. 35°C D.B. ● Standard air volume 36 m^3/min ● External Static Pressure (147Pa)
Cooling capacity	
12.5kW	

Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)														
		25°C			30°C			35°C			40°C			43°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	13.0	8.72	4.28	12.5	2.96	4.53	11.8	8.35	4.87	10.9	7.94	5.25	10.1	7.58	5.46
	19	13.7	7.28	4.54	4.60	2.50	4.80	12.6	7.20	5.16	11.8	6.95	5.57	11.0	6.74	5.73
	22	15.0	6.15	4.91	5.00	2.11	5.19	13.9	6.27	5.58	13.0	6.13	6.01	12.3	6.01	6.13
25	17	12.9	10.2	4.27	4.30	3.50	4.53	11.6	9.70	4.87	10.8	9.18	5.23	10.1	8.81	5.43
	19	13.8	8.94	4.54	4.50	3.04	4.82	12.6	8.67	5.18	11.7	8.31	5.56	11.0	8.05	5.75
	22	15.0	7.35	4.90	4.90	2.50	5.20	13.8	7.33	5.60	12.4	6.82	6.01	12.2	6.97	6.09
27	17	12.7	12.1	4.25	4.20	4.10	4.53	11.5	11.5	4.87	10.7	10.7	5.20	10.1	10.1	5.40
	19	13.8	10.5	4.54	13.3	3.5	4.84	12.5	10.0	5.20	11.6	9.53	5.56	11.0	9.24	5.77
	22	15.0	8.54	4.90	5.00	2.89	5.22	13.7	8.37	5.62	11.8	7.42	6.00	12.2	7.92	6.12
29	17	12.7	12.0	4.22	4.20	4.10	4.48	11.6	11.6	4.79	10.8	10.8	5.11	10.3	10.3	5.30
	19	13.7	12.6	4.51	4.50	4.20	4.79	12.5	12.0	5.12	11.7	11.5	5.47	11.1	11.1	5.66
	22	14.9	10.0	4.97	5.00	3.40	5.28	13.7	9.70	5.64	12.4	9.03	6.02	12.2	9.14	6.19
32	17	12.7	12.0	4.21	4.10	4.10	4.46	11.6	11.6	4.74	10.9	10.9	5.06	10.3	10.3	5.23
	19	13.7	13.0	4.50	4.60	4.40	4.76	12.6	12.6	5.07	11.8	11.8	5.40	11.2	11.2	5.59
	22	14.9	12.4	5.02	14.4	4.30	5.31	13.6	11.9	5.66	12.8	11.4	6.03	12.2	11.1	6.24

HEATING PERFORMANCE

Model	Heating capacities are based conditions
CS-W24BD2P	● Indoor temp. 20°C D.B. ● Outdoor temp. 7°C D.B. 6°C W.B. ● Standard air volume 18 m^3/min ● External Static Pressure (98Pa)
Heating capacity	
7.1kW	

Inlet Air		Outdoor Temperature (°C W.B.)							
External Static Pressure (Pa)	Entering Air	-6°C		0°C		6°C		12°C	
Air Volume (m^3/min)	Dry Bulb (°C)	H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
98Pa 18m^3/min	15	5.04	1.86	6.11	2.12	7.46	2.46	8.88	2.87
	20	4.69	2.25	5.75	2.25	7.10	2.59	8.45	3.03
	25	4.33	2.07	5.40	2.38	6.75	2.72	8.09	3.10

Model	Heating capacities are based conditions
CS-W28BD2P	● Indoor temp. 20°C D.B. ● Outdoor temp. 7°C D.B. 6°C W.B. ● Standard air volume 20 m^3/min ● External Static Pressure (98Pa)
Heating capacity	
8.0kW	

Inlet Air		Outdoor Temperature (°C W.B.)							
External Static Pressure (Pa)	Entering Air	-6°C		0°C		6°C		12°C	
Air Volume (m^3/min)	Dry Bulb(°C)	H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
98Pa 20m^3/min	15	5.68	2.03	6.88	2.31	8.40	2.68	10.0	3.13
	20	5.28	2.45	6.48	2.45	8.00	2.82	9.52	3.30
	25	4.88	2.26	6.08	2.59	7.60	2.96	9.12	3.60

Model	Heating capacities are based conditions
CS-W34BD2P	● Indoor temp. 20°C D.B. ● Outdoor temp. 7°C D.B. 6°C W.B. ● Standard air volume 33 m^3/min ● External Static Pressure (147Pa)
Heating capacity	
11.2kW	

Inlet Air		Outdoor Temperature (°C W.B.)							
External Static Pressure (Pa)	Entering Air	-6°C		0°C		6°C		12°C	
Air Volume (m^3/min)	Dry Bulb(°C)	H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
147Pa 33m^3/min	15	7.95	3.03	9.63	3.45	11.8	4.00	14.0	4.67
	20	7.39	3.66	9.07	3.66	11.2	4.21	13.3	4.93
	25	6.83	3.37	8.51	3.87	10.6	4.42	12.8	4.83

Model	Heating capacities are based conditions
CS-W43BD2P	● Indoor temp. 20°C D.B. ● Outdoor temp. 7°C D.B. 6°C W.B. ● Standard air volume 36 m^3/min ● External Static Pressure (147Pa)
Heating capacity	
14.0kW	

Inlet Air		Outdoor Temperature (°C W.B.)							
External Static Pressure (Pa)	Entering Air	-6°C		0°C		6°C		12°C	
Air Volume (m^3/min)	Dry Bulb(°C)	H.C.	IPT	H.C.	IPT	H.C.	IPT	H.C.	IPT
147Pa 36m^3/min	15	9.90	3.79	12.0	4.31	14.7	5.00	17.5	5.84
	20	9.24	4.58	11.3	4.58	14.0	5.26	16.7	6.15
	25	8.54	4.21	10.6	4.84	13.3	5.52	16.0	6.27

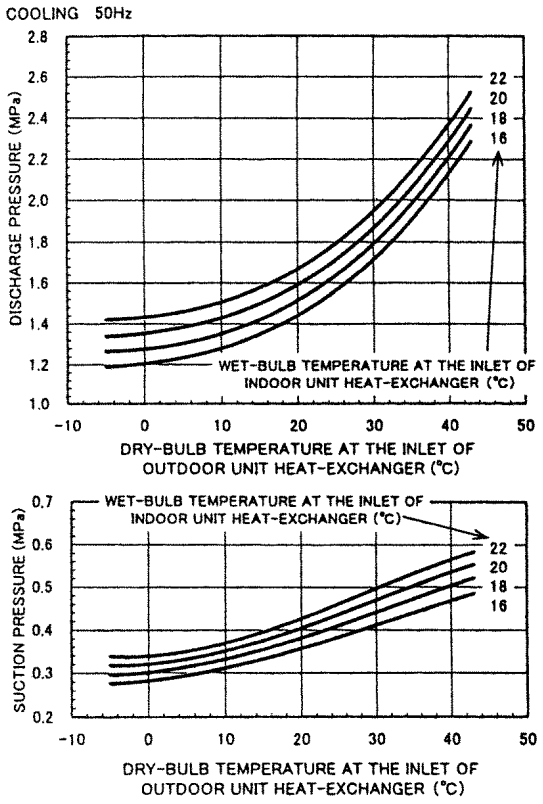
16 DISCHARGE AND SUCTION PRESSURE

16.1. SATURATION TEMPERATURE OF DISCHARGE AND SUCTION PRESSURE

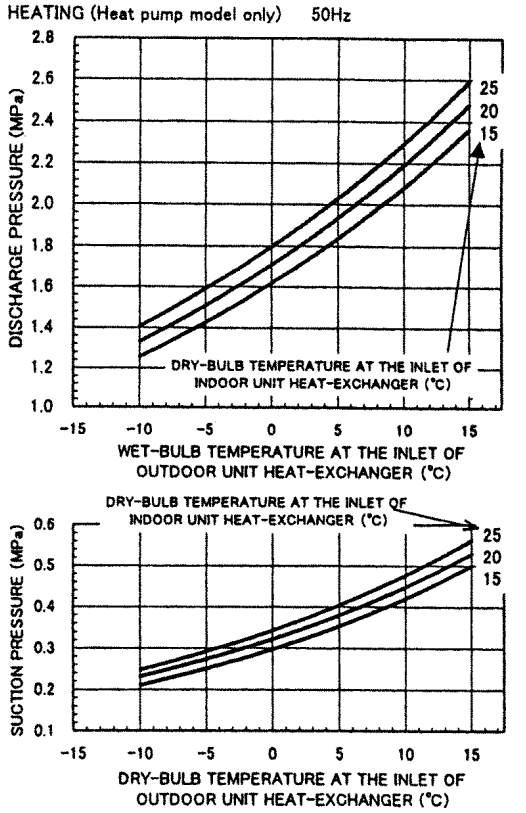
● **Commonness TO ALL THE MODELS**

● **SATURATION TEMPERATURE OF DISCHARGE AND SUCTION PRESSURE**

SATURATION OF DISCHARGE AND SUCTION PRESSURE



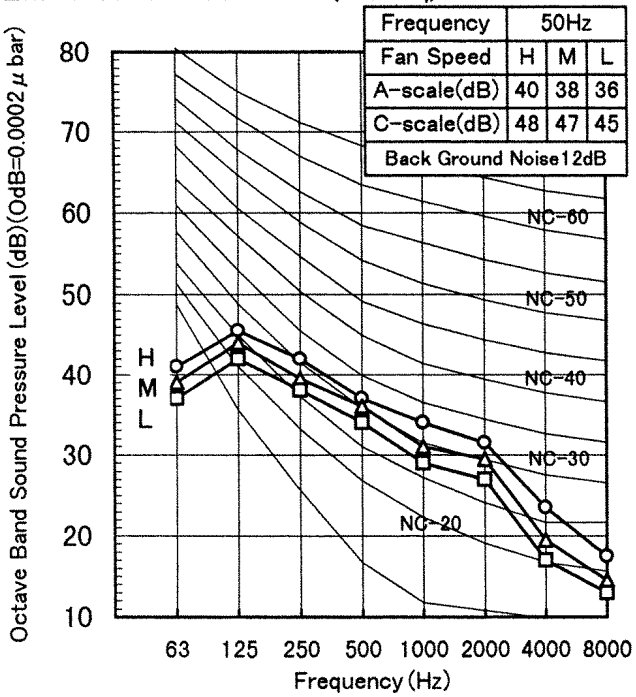
SATURATION OF DISCHARGE AND SUCTION PRESSURE



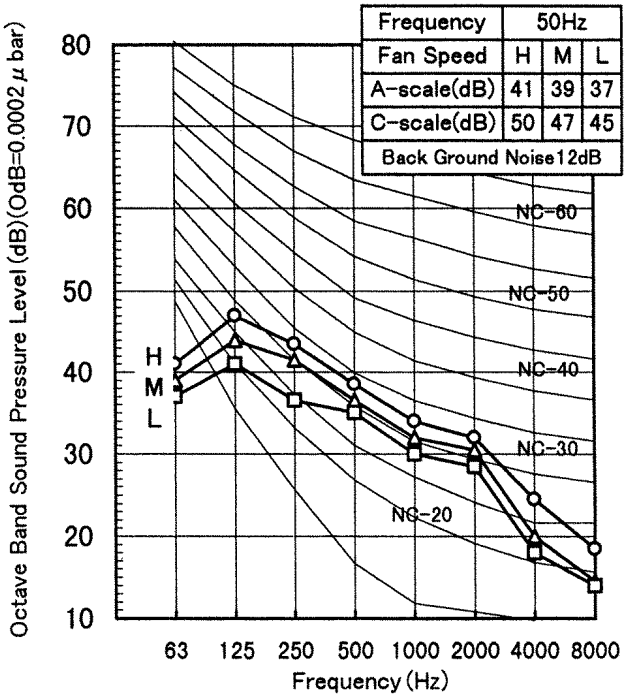
* **For intake temperature, consult the pressure - Enthalpy Table (R407C) at the end.**

17 SOUND DATA

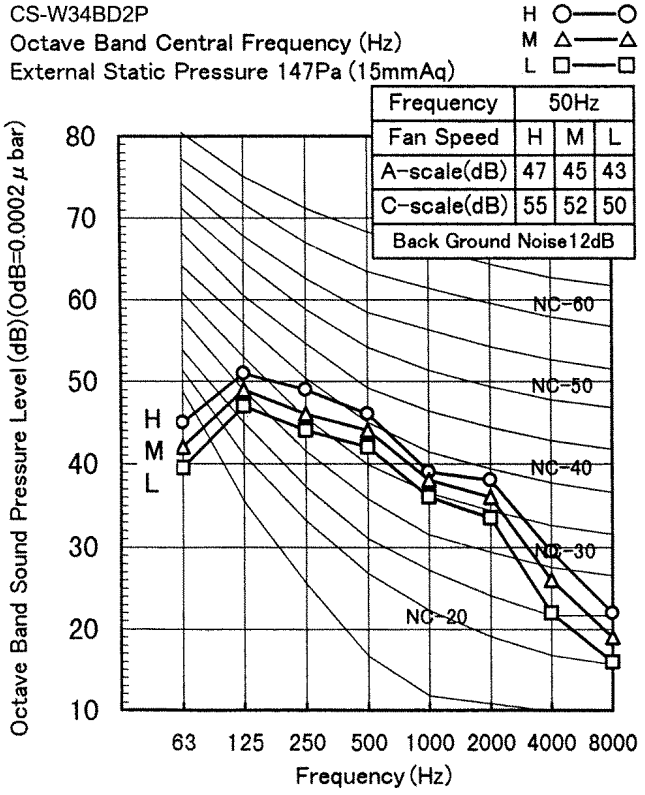
CS-W24BD2P
Octave Band Central Frequency (Hz)
External Static Pressure 98Pa (10mmAq)



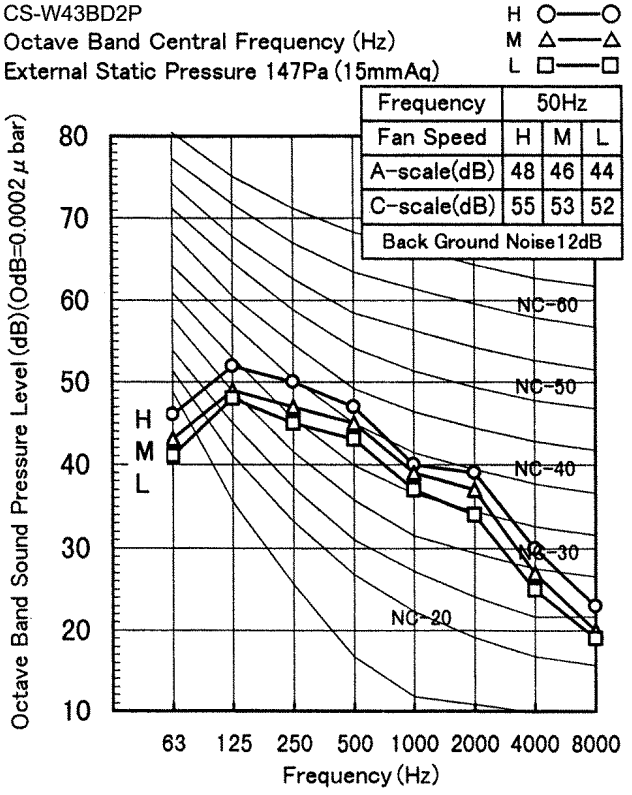
CS-W28BD2P
Octave Band Central Frequency (Hz)
External Static Pressure 98Pa (10mmAq)



CS-W34BD2P
Octave Band Central Frequency (Hz)
External Static Pressure 147Pa (15mmAq)



CS-W43BD2P
Octave Band Central Frequency (Hz)
External Static Pressure 147Pa (15mmAq)

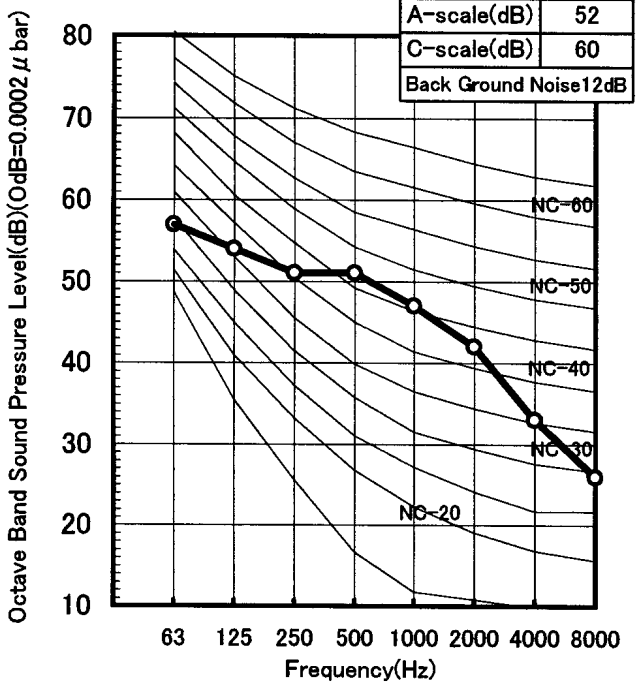


CU-W24BBP5(Cooling)

Octave Band Central Frequency(Hz)

H O——O

Frequency	50Hz
Fan Speed	H
A-scale(dB)	52
C-scale(dB)	60
Back Ground Noise12dB	

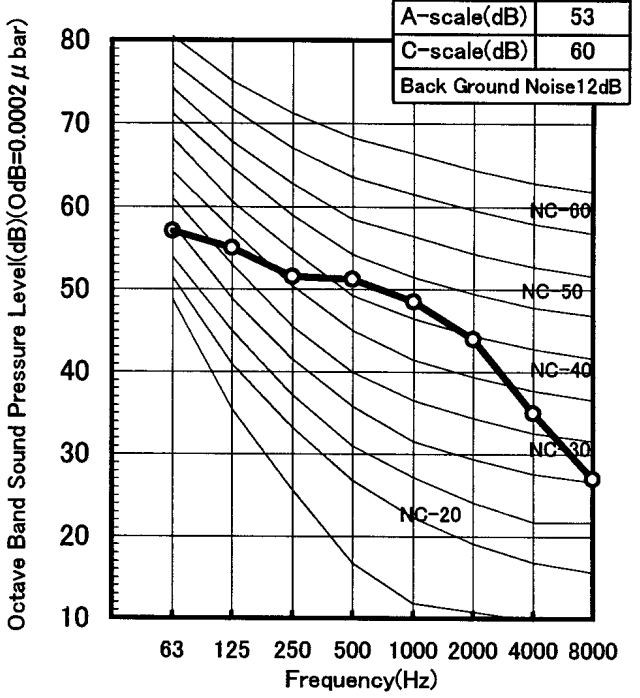


CU-W24BBP5(Heating)

Octave Band Central Frequency(Hz)

H O——O

Frequency	50Hz
Fan Speed	H
A-scale(dB)	53
C-scale(dB)	60
Back Ground Noise12dB	

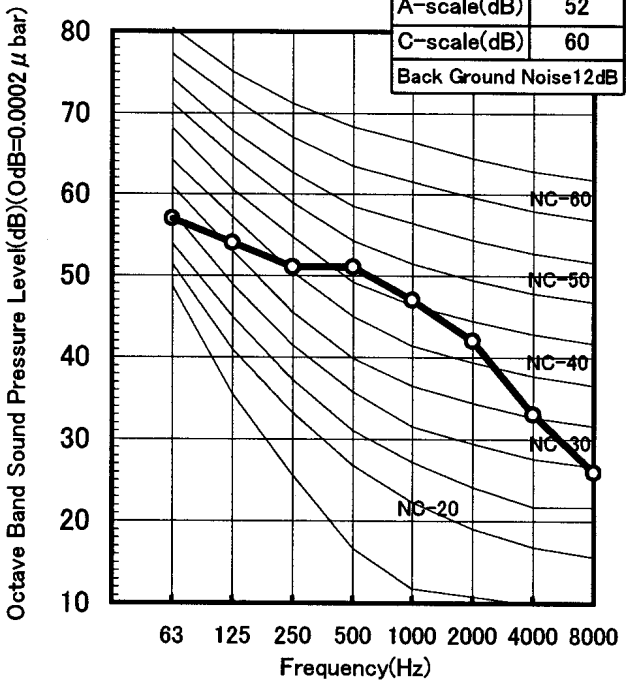


CU-V24BBP8(Cooling)

Octave Band Central Frequency(Hz)

H O——O

Frequency	50Hz
Fan Speed	H
A-scale(dB)	52
C-scale(dB)	60
Back Ground Noise12dB	

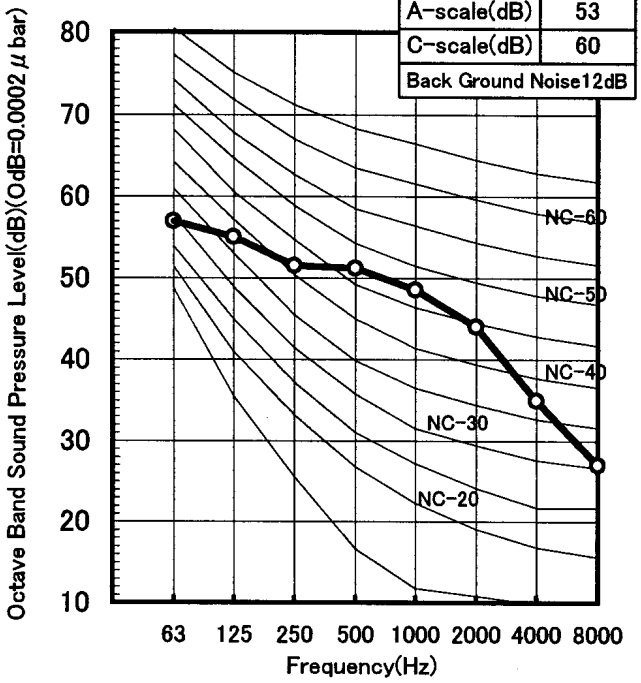


CU-W28BBP5,8(Cooling)

Octave Band Central Frequency(Hz)

H O——O

Frequency	50Hz
Fan Speed	H
A-scale(dB)	53
C-scale(dB)	60
Back Ground Noise12dB	

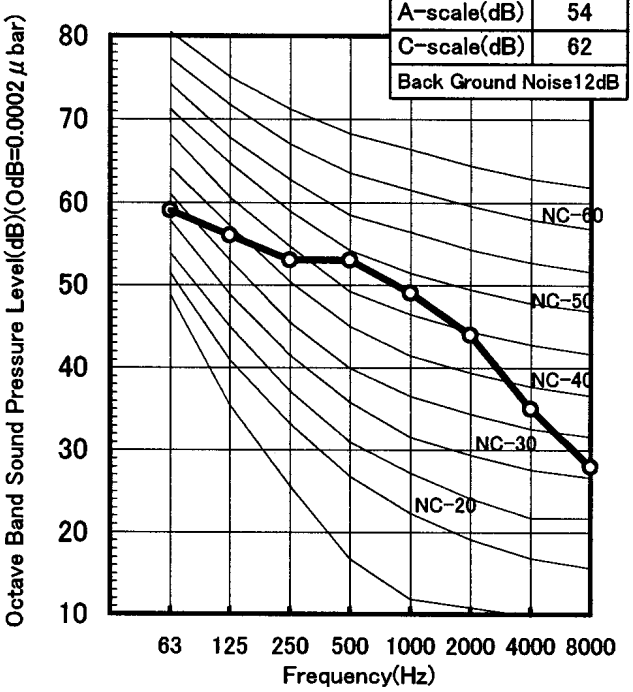


CU-W28BBP5,8(Heating)

Octave Band Central Frequency(Hz)

H O——O

Frequency	50Hz
Fan Speed	H
A-scale(dB)	54
C-scale(dB)	62
Back Ground Noise12dB	

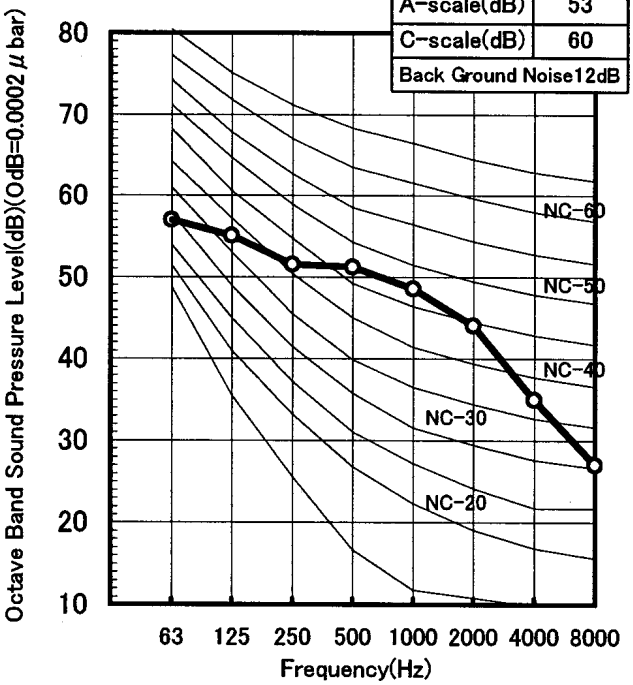


CU-V28BBP5,8(Cooling)

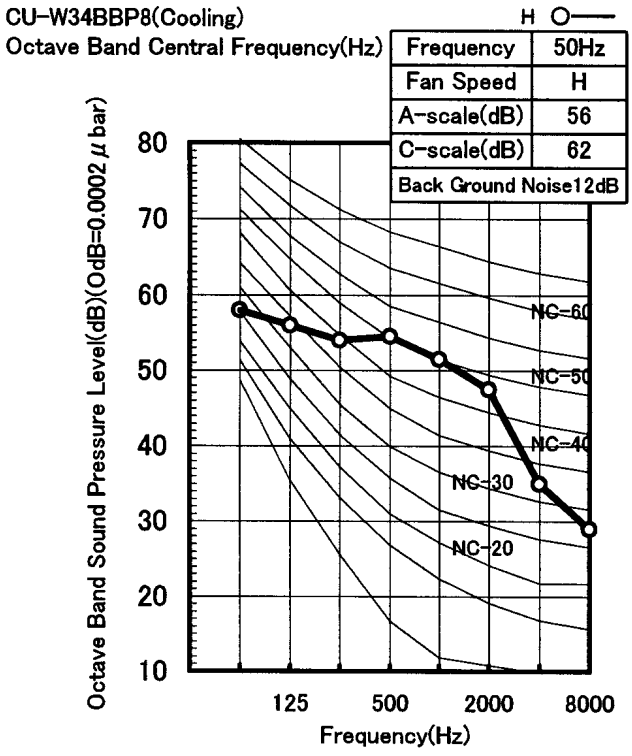
Octave Band Central Frequency(Hz)

H O——O

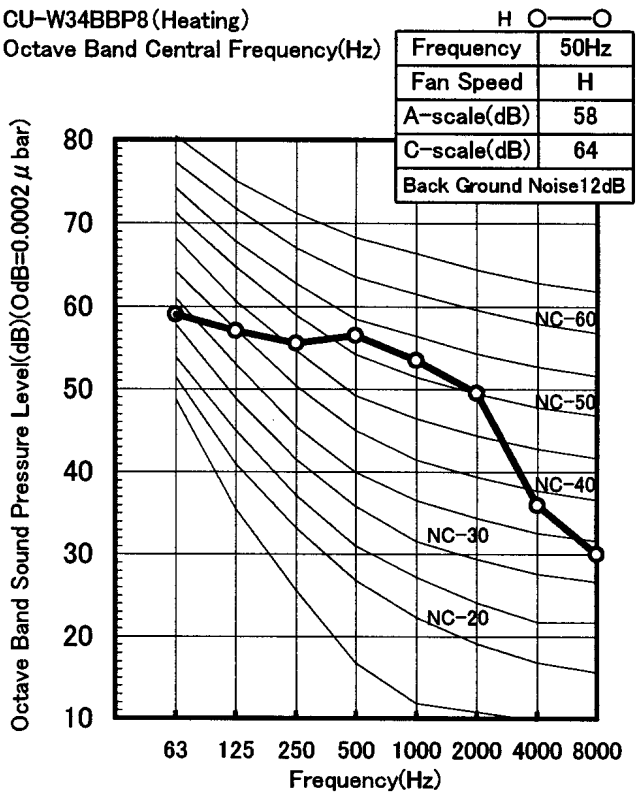
Frequency	50Hz
Fan Speed	H
A-scale(dB)	53
C-scale(dB)	60
Back Ground Noise12dB	



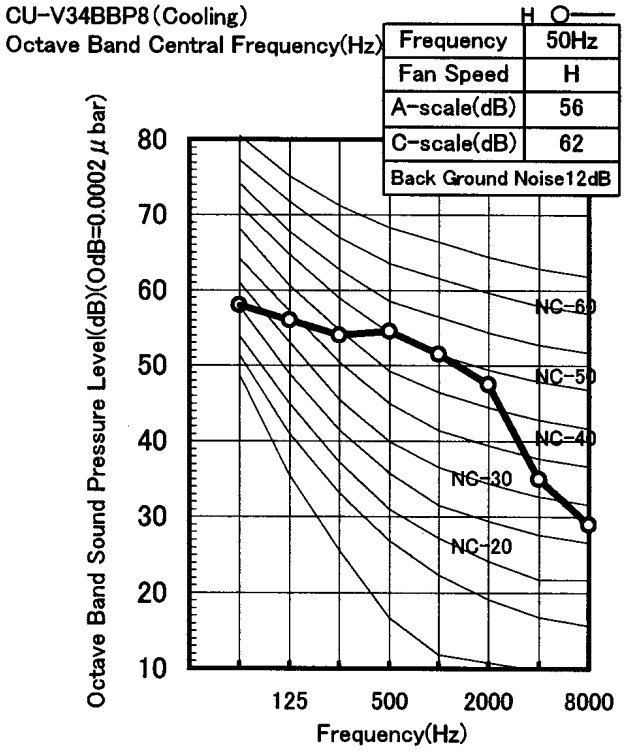
CU-W34BBP8(Cooling)



CU-W34BBP8(Heating)



CU-V34BBP8(Cooling)

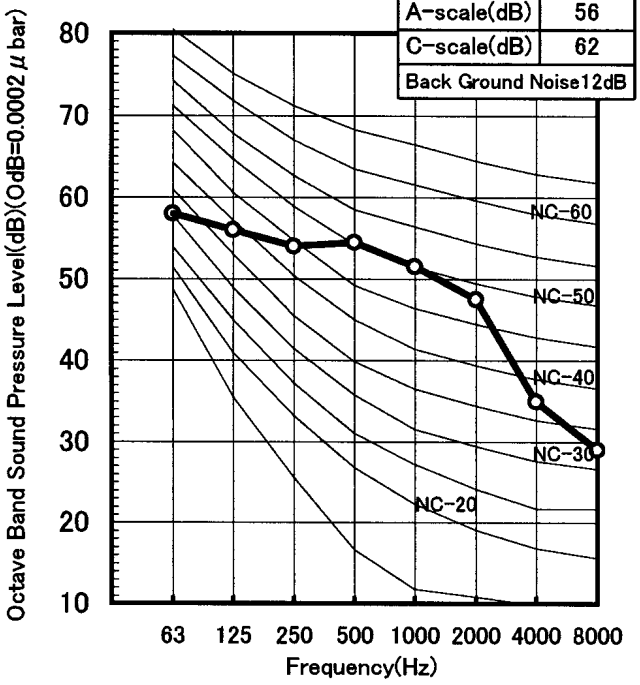


CU-W43BBP8(Cooling)

Octave Band Central Frequency(Hz)

H O——O

Frequency	50Hz
Fan Speed	H
A-scale(dB)	56
C-scale(dB)	62
Back Ground Noise12dB	

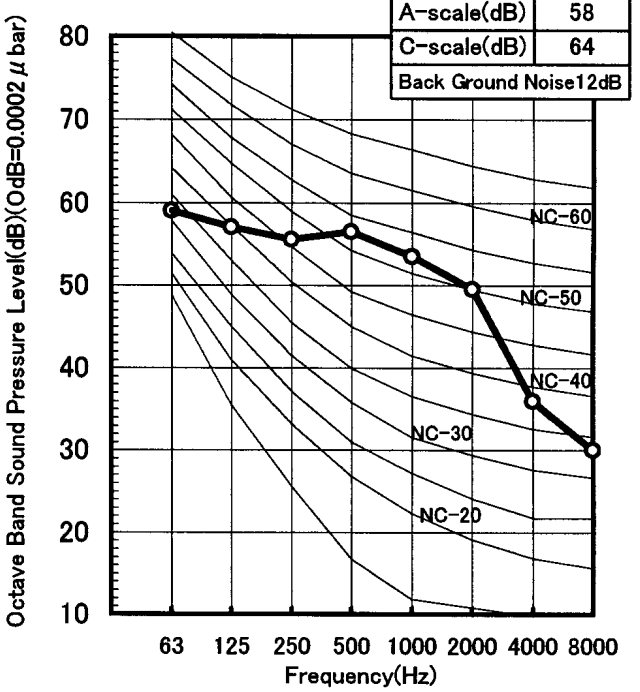


CU-W43BBP8(Heating)

Octave Band Central Frequency(Hz)

H O——O

Frequency	50Hz
Fan Speed	H
A-scale(dB)	58
C-scale(dB)	64
Back Ground Noise12dB	

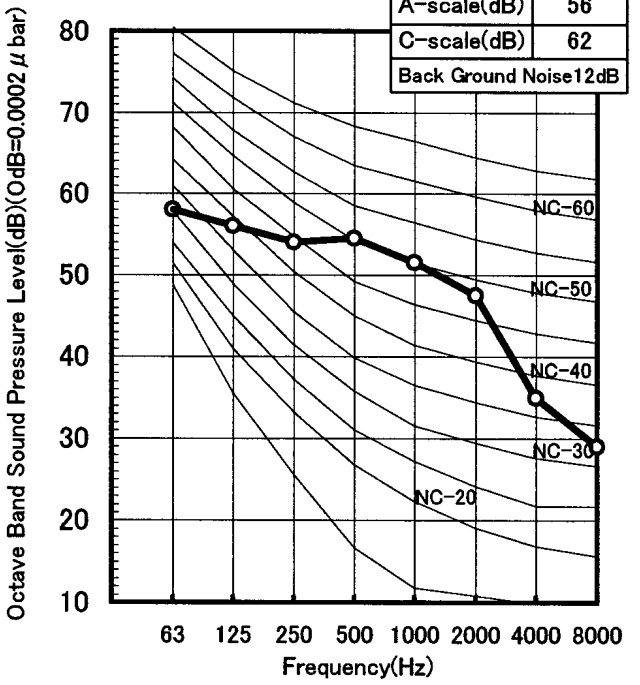


CU-V43BBP8(Cooling)

Octave Band Central Frequency(Hz)

H O——O

Frequency	50Hz
Fan Speed	H
A-scale(dB)	56
C-scale(dB)	62
Back Ground Noise12dB	

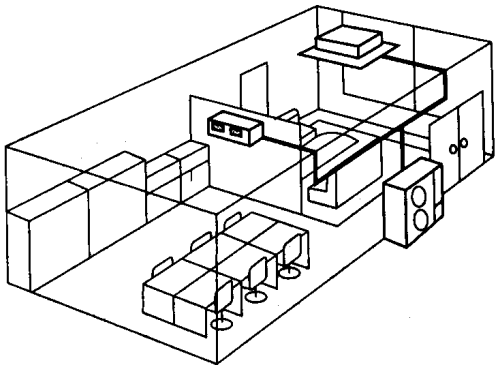


18 TWIN OPERATION

18.1. TWIN

18.1.1. 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.



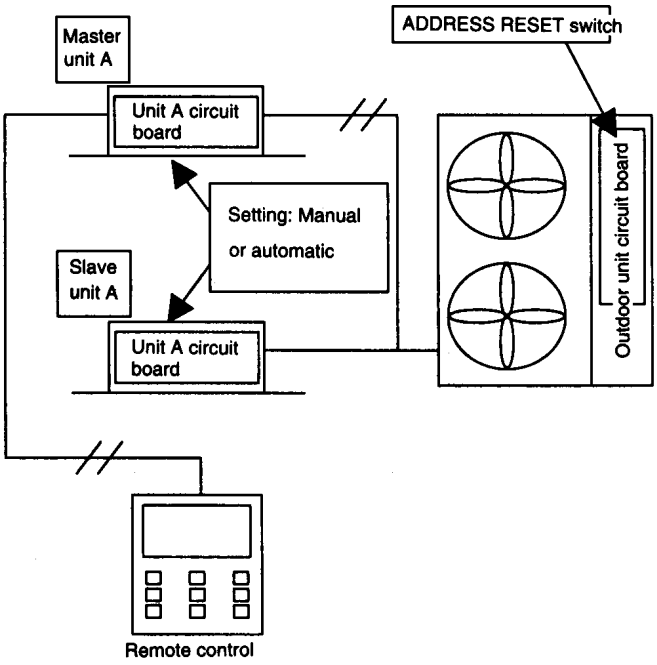
: Outdoor unit capacity
: Indoor unit capacity
(Figures indicate capacity ratios in combination.)

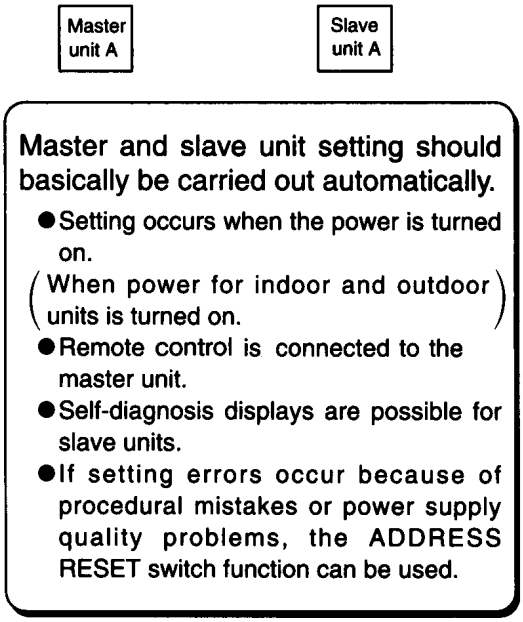
OUTDOOR UNIT	SIMULTANEOUS TWIN OPERATION
	STANDARD
43BB	43BB 24BD2 24BD2

(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.)
- No distinction is made between master units and slave units (slave unit 1) at the indoor unit or remote control.
- Install the remote control unit to the master unit. (It cannot be connected to slave units.)
  If indoor unit models with louvres and models without louvres have been connected together, use an indoor unit louvres as the master unit.
- 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 4 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.

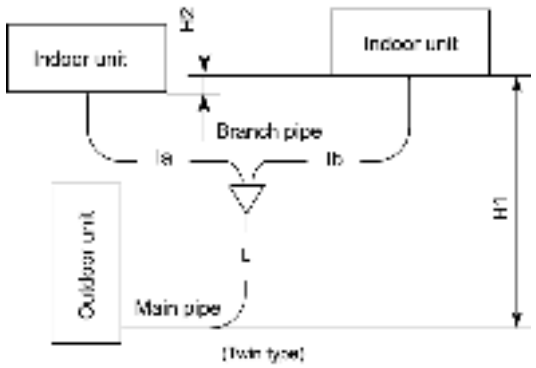
18.2. Piping connections

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

Outdoor unit main pipe diameter (mm)				Indoor unit combinations	
43BB		Indoor unit capacity (HP)		24BD	24BD
Liquid side:	ø 9.52	Branch pipe diameter	Liquid side	ø 6.35	ø 6.35
Gas side:	ø 19.05		Gas side	ø 15.88	ø 15.88

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

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

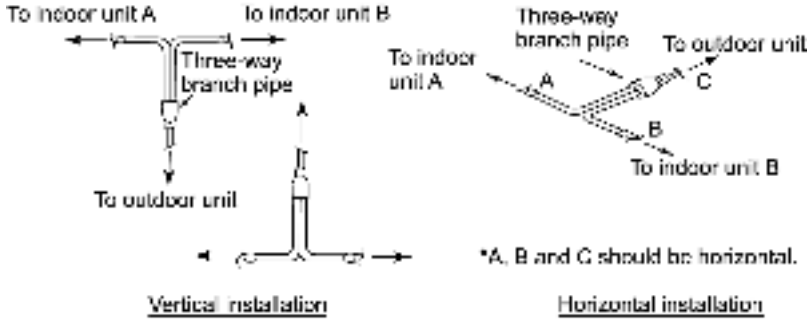


* The branch pipe should be horizontal to or perpendicular to the indoor unit.

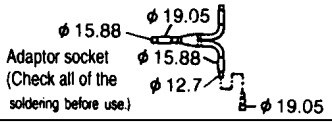
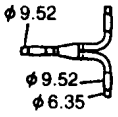
NOTE:

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 + la, L + lb), 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

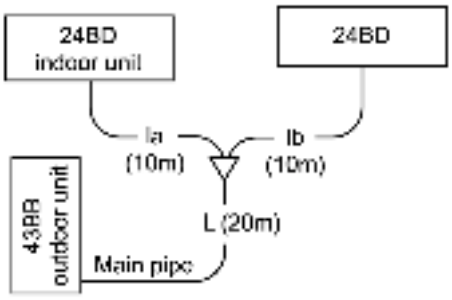
	Outdoor unit side (outer diameter)		Branch pipe (inner diameter)	Indoor unit side (outer diameter)	
Gas side	ϕ 15.88	———		ϕ 12.7	———
	ϕ 19.05	Cut		ϕ 15.88	Cut
				ϕ 19.05	Adaptor socket
Liquid side	ϕ 9.52	———		ϕ 6.35	———
				ϕ 9.52	Cut

18.3. Refrigerant charging

- For twin 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	ø6.35	ø9.52
Additional charging amount (kg/m)	0.02	0.05

Example 1: For 43BB outdoor unit with an equivalent pipe length of 40 m



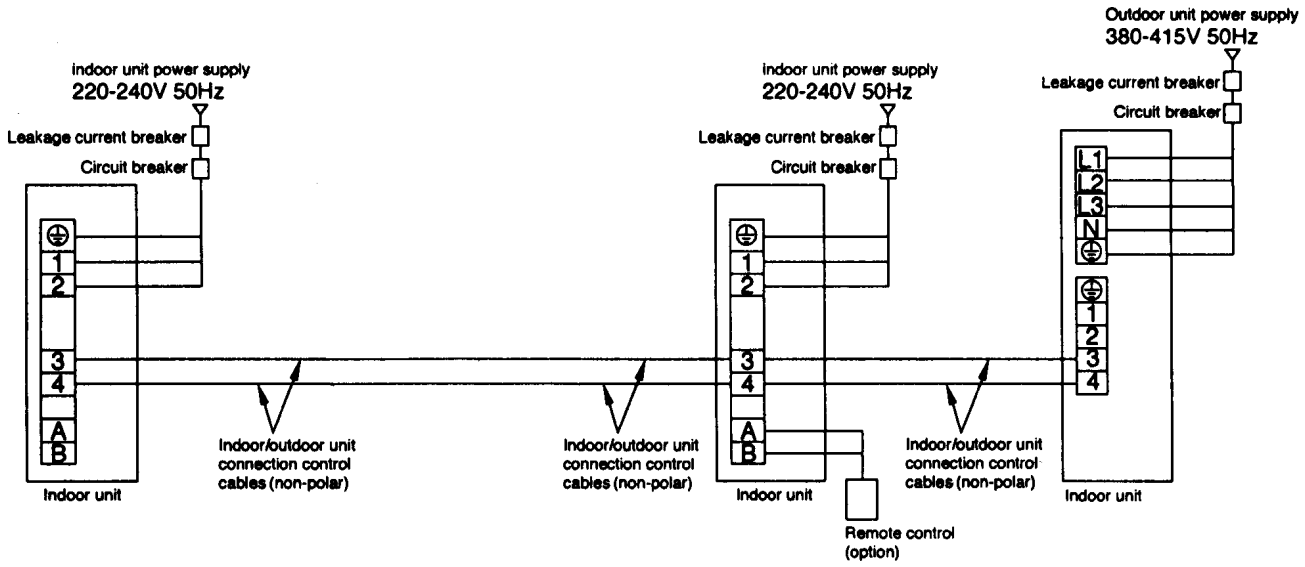
(Twin type)

		Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe (kg)
Main pipe (L)		ø9.52	20m	Not needed if within 30m
Main pipe	(Ia)	ø6.35	10m	Not needed if within 30m
	(Ib)	ø6.35	10m	If exceeds 30m, 10m × 0.02 = 0.2
———			40m	Total 0.2 kg

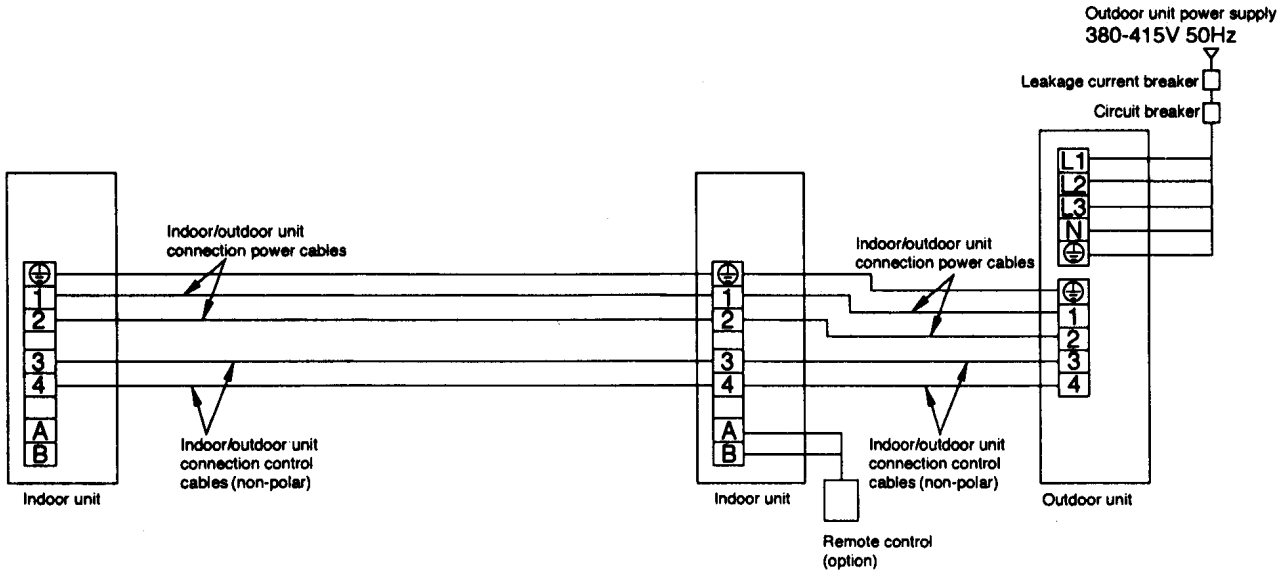
18.4. Wiring

When both indoor and outdoor unit draw power

(Example: 3 Phase power supply model)

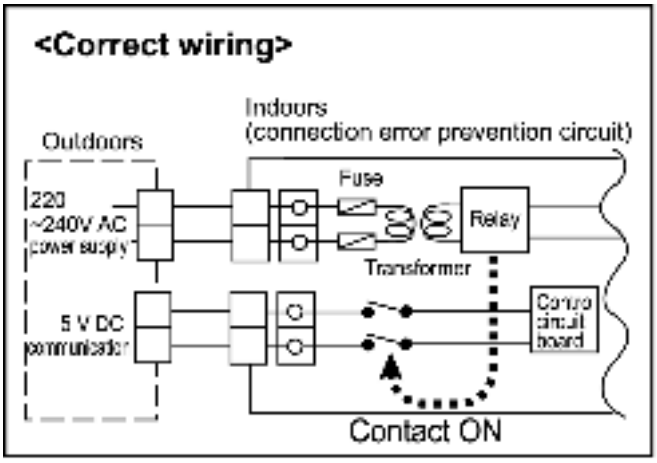


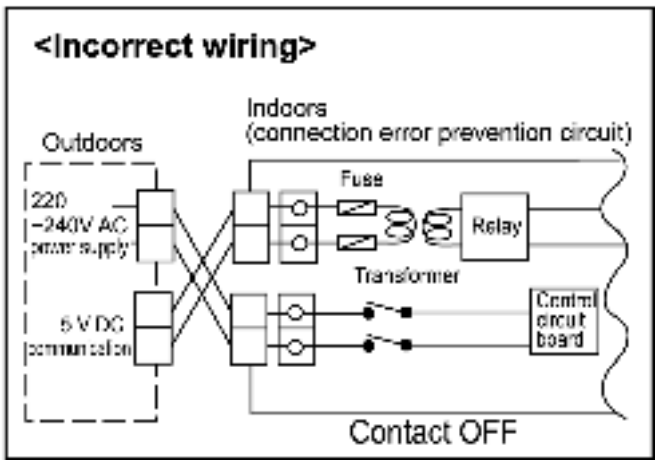
When only the outdoor unit draws power



19 WIRING MISTAKE PREVENTION

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

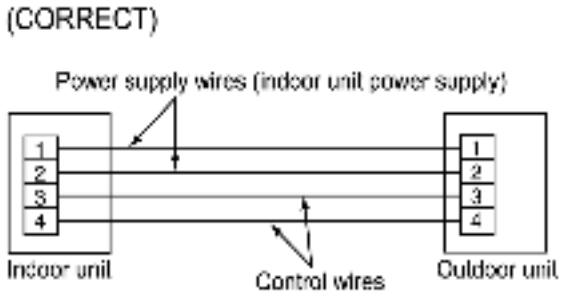


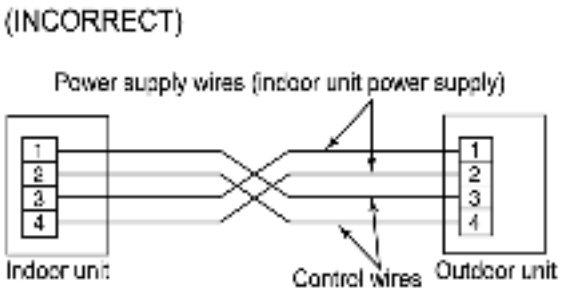


Connection errors with the control wires and the power supply wires will not only contribute to burning-out of the control circuit board, but can also cause large-scale working losses and affect reliability. If a circuit board with a “Connection error prevention” circuit is used, the relay will not operate 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, connnect 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.

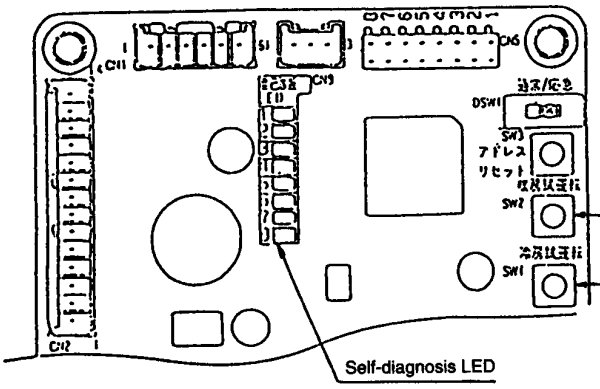
20 TEST OPERATION AND SELF DIAGNOSIS

20.1. 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.)

20.2. Test operation from the outdoor unit

(Outdoor unit printed circuit board)



<Heating operation>
● Press the HEAT test operation switch for 1 second.
The LEDs on the printed circuit board will flash as indicated in the table below.

<Cooling operation>
● Press the COOL test operation switch for 1 second.
The LEDs on the printed circuit board will flash as indicated in the table below.

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

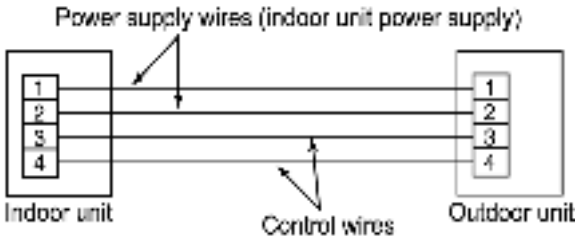
	LEDs on outdoor unit printed circuit board						
	LED2	LED3	LED4	LED5	LED6	LED7	LED8
Emergency operation display			☼	☼	☼		
Cooling test operation from outdoor unit	☼	☼	☼				
Heating test operation from outdoor unit					☼	☼	☼

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.)

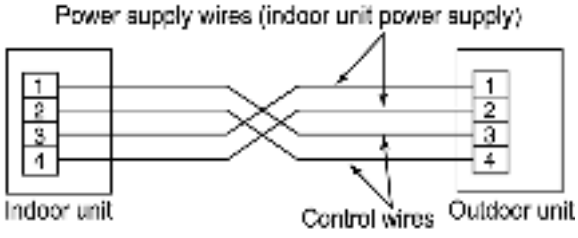
NOTE:

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)

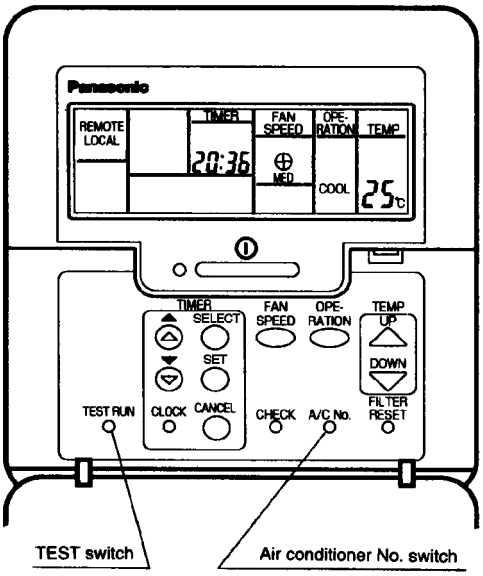


(INCORRECT)



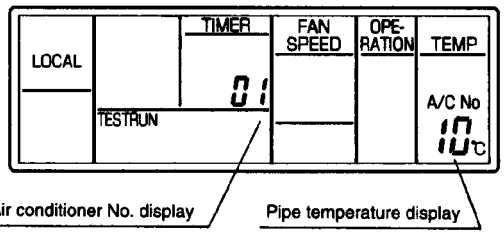
2. Do not short the remote control unit wires to each other. (The protection circuit will be activated and the units will not operate.)
   Once the cause of the short is eliminated, normal operation will then be possible.

20.3. 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.

(Example)

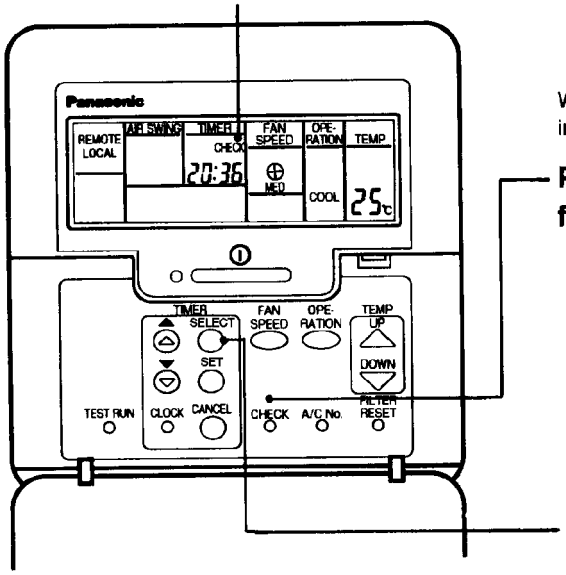


- During group control, the number appearing in the timer display will change each time the air conditioner No. switch is pressed, and the pipe temperature for the indoor unit corresponding to the number displayed will appear in the temperature setting display.

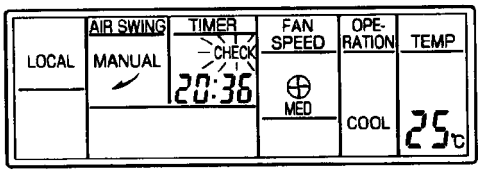
4. Check that the temperature in the pipe temperature display starts dropping after operation has been continuing for some time.
   (The temperature will increase during heating operation.)

- 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

Display



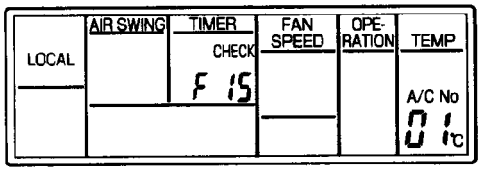
(Example)



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

Press the CHECK switch while the display is flashing.

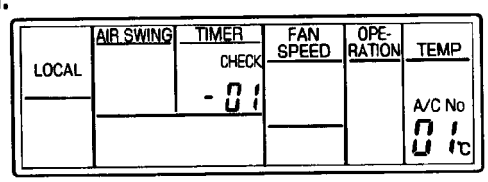
(Example)



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)



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.

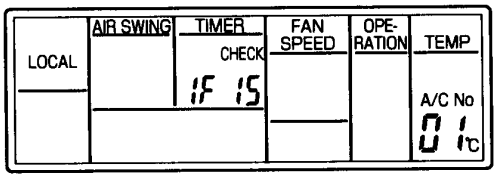
- After checking the error display and the detail display, refer to the self-diagnosis error code table on the following page and check the location of the problem.
- If the problem is repaired and operation returns to normal, the CHECK display on the remote control will put out, but the self-diagnosis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

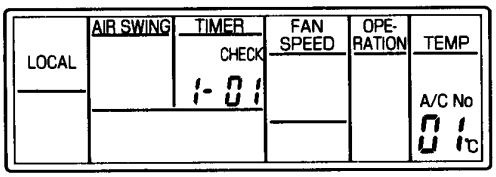
Press the CHECK button once more to return to the normal display.

(Example of last problem display)



An error code from 1F15 to 1F49 will be displayed.
(The temperature setting display will also change to show the air conditioner No.)

(Example)



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 Blank: Off

Remote control display		Printed circuit board self-diagnosis LED (red)								Error display
Wired		Indoor unit	Outdoor unit							(Check location)
Error display	Detail display	LED2	LED2	LED3	LED4	LED5	LED6	LED7	LED8	
F17	–01	☼	☼	☼			○	(※2)	(※2)	Option problem Option connection terminals
F20	–01	☼	☼			☼		(※2)	(※2)	Indoor temperature thermistor problem Indoor temperature thermistor lead wire or indoor unit connector CN1
	–02	☼	☼		○	○		(※2)	(※2)	Remote control thermistor problem Remote control thermistor
F21	–01	☼		☼		☼		(※2)	(※2)	Pipe temperature thermistor problem (indoor unit side) Pipe temperature thermistor lead wire or indoor unit connector CN1
F25	–01	☼			○			(※2)	(※2)	Centralised control address overlap problem Check settings for optional centralised control circuit board address switch
F26	–01	☼		☼				(※2)	(※2)	Remote control transmission wire open circuit problem Remote control unit cable and connection terminals
	–02	☼	☼					(※2)	(※2)	Remote control transmission problem Check the transmission wave pattern
F27	–01	☼		☼				☼		Indoor/outdoor unit transmission wire open circuit problem Indoor/outdoor unit connection cable and connection terminals, or indoor unit and outdoor unit power supplies.
	–02	☼	☼					○		Indoor/outdoor unit transmission problem Check the transmission wave pattern.
F29	–01	☼		☼		☼	☼	(※2)	(※2)	Indoor unit setting problem Abnormal setting of the indoor p.c.board
	–02	☼	☼			☼	☼	(※2)	(※2)	Indoor unit setting problem Abnormal setting of the indoor p.c.board.
	–12	☼	☼		☼	☼	☼	(※2)	(※2)	Remote control unit setting problem Abnormal setting of the remote control.
F30	–02	☼	☼		☼		☼	☼		Negative or open phase power supply Check the main power supply terminal board connections, and switch the main power supply phase
	–06	☼		☼	☼		☼	☼		Poor power supply connection, or distorted voltage wave pattern Check the main power supply terminal board connections, and check the power supply wave pattern.
	–07	☼	☼	☼	☼		☼	☼		Poor power supply connection Check the main power supply terminal board connections.
F31	–02	☼		☼			☼	☼		High-pressure cut-off Refrigeration system. Obstructing of the heat radiation from outdoor unit
F33	–01	☼	☼				☼	☼		Compressor overcurrent protection Open phase or lock in compressor, or blown main power supply fuse
	–02	☼	☼	☼			☼	☼		Compressor discharge temperature protector Insufficient gas
F40	–41	☼	☼			☼		☼		Compressor discharge temperature thermistor problem Discharge temperature thermistor lead wire, outdoor unit connector CN2, or relay connector
	–61	☼		☼		☼		☼		Heat exchanger outlet temperature thermistor problem (Outdoor unit) Heat exchanger outlet temperature thermistor lead wire, outdoor unit connector CN2, or relay connector
F41	–02	☼	☼		☼	☼		☼		High-pressure switch open circuit problem High-pressure switch lead wire, outdoor unit connector CN2, or relay connector
	–03	☼		☼	☼	☼		☼		Heating pressure switch open circuit problem Heating pressure switch lead wire, outdoor unit connector CN2, or relay connector
F42	–01	☼	☼	☼		☼		☼		Current detector open circuit or compressor current problem Outdoor unit connector CN2, compressor internal protection system activated, or blown main power supply fuse
F49	–01	☼		☼		☼	☼	☼		Outdoor unit setting problem Abnormal setting of the outdoor p.c.board
	–02	☼	☼			☼	☼	☼		Outdoor unit setting problem Abnormal setting of the outdoor p.c.board

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.

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

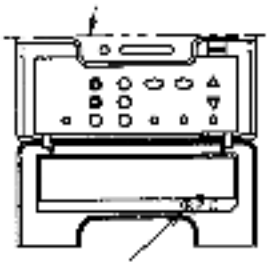
● The LED1 (green) illuminates to indicate that the microprocessor on the microprocessor circuit board is operating normally.
If the LED is switched off or is flashing irregularly, check the power supply, and turn it off and then back on again.

21 SETTING OF SAVE ENERGY AND THERMISTOR SWITCH

21.1. 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.

Remote control unit



There is 「RP1」marking.

・Upper and lower limits can be set for the setting temperature during cooling and heating operation (Energy save setting)

(1) While operation is stopped・press the UP and DOWN switches simultaneously.

(2) '0' (zero) will flash in the clock display at this time・so press the RESERVE switch.

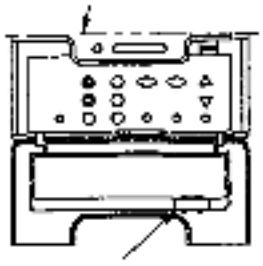
(3) To set an upper limit (Setting a temperature above the energy save temperature will not be possible.)
Press the OPERATION MODE switch until HEAT is displayed.
Press the UP or DOWN switch to set the temperature.
Press the RESERVE switch.
Example:If the heating display is set to 28℃・setting the temperature to higher than 28℃ will not be possible.

(4) To set a lower limit (Setting a temperature below the energy save temperature will not be possible.)
Press the OPERATION MODE switch until COOL is displayed.
Press the UP or DOWN switch to set the temperature
Press the RESERVE switch.
Example:If the cooling display is set to 22℃・setting the temperature to lower than 22℃ will not be possible.

(5) If the CLEAR switch is pressed during steps (3) or (4) above・the energy save setting will be cleared.

★Press the RESERVE switch or the CLEAR switch to return to normal operation mode after making an energy save setting in steps (3) to (5).

Remote control unit



There is not 「RP1」marking.

・Upper and lower limits can be set for the setting temperature during cooling and heating operation (Energy save setting)

(1) While operation is stopped・press the UP and DOWN switches simultaneously.

(2) To set an upper limit (Setting a temperature above the energy save temperature will not be possible.)
Press the OPERATION MODE switch until HEAT is displayed
Press the UP or DOWN switch to set the temperature.
Press the RESERVE switch.
Example:If the heating display is set to 28℃・setting the temperature to higher than 28℃ will not be possible.

(3) To set a lower limit (Setting a temperature below the energy save temperature will not be possible.)
Press the OPERATION MODE switch until COOL is displayed.
Press the UP or DOWN switch to set the temperature
Press the RESERVE switch.
Example:If the cooling display is set to 22℃・setting the temperature to lower than 22℃ will not be possible.

(4) If the CLEAR switch is pressed during steps (2) or (3) above・the energy save setting will be cleared

★Press the RESERVE switch or the CLEAR switch to return to normal operation mode after making an energy save setting in steps (2) to (4).

22 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.

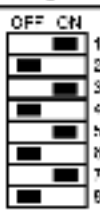
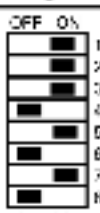
Automatic setting for group control

- 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)

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

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 H EAT 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.

23 TROUBLE SHOOTING

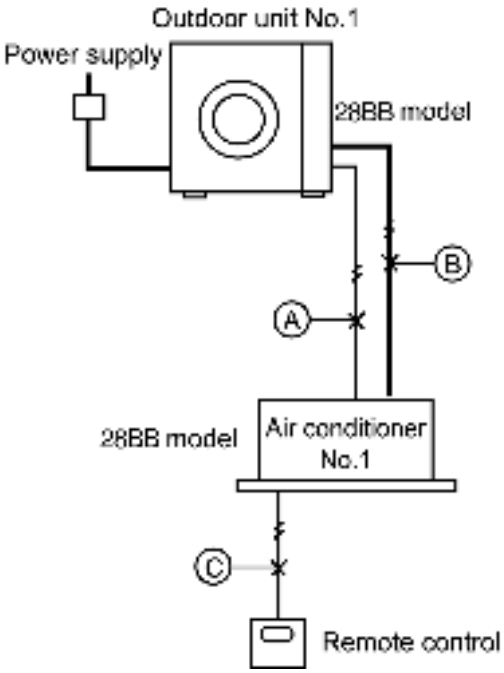
If test operation does not proceed correctly

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.

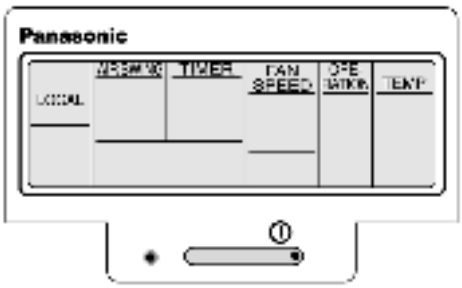
- **For standard installation**

(System example)

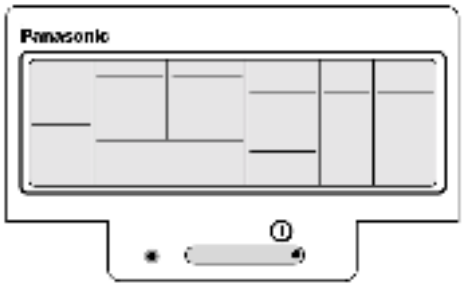


1. The main power is turned on while the indoor-outdoor transmission wires are not connected (open circuit at section A)
   Symptom:
   Remote control unit... “CHECK” flashes
   NOTE:
   Indoor unit... LED2 on printed circuit board flashes
   Outdoor unit... LED3 and LED7 on printed circuit board flash
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”)



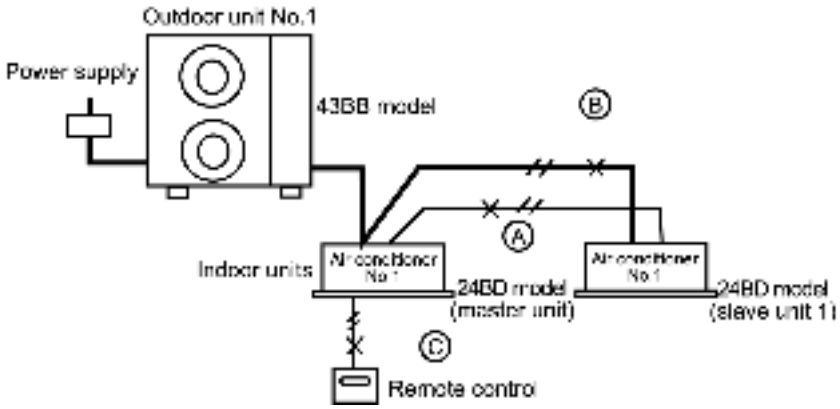
Remedy

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.

● **During twin operation**
(System example)



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 43BB outdoor unit and the 24BD 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

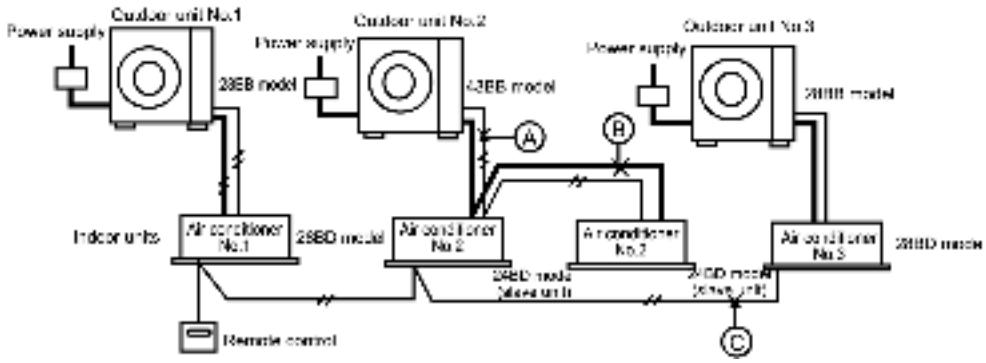
1. Turn off the main power.
↓
2. Connect the disconnected wires correctly.
↓
3. Turn the main power back on.
↓
4. After 1 minute, start operation using the remote control.
(Indoor units... Operation will start according to the remote control setting.)
(Outdoor unit... Operation will start after 3-5 minutes.)

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)

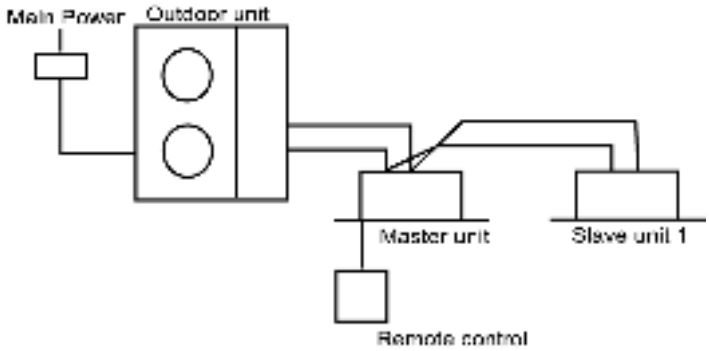
1. Check that DIP switches 1 to 4 and DIP switch 8 are all set to OFF, and then stop operation.
   ↓
2. Press the “AIRSWING AUTO”, “OPERATION” and “A/C No.” buttons simultaneously.
   The addresses will be momentarily reset, and then automatic address setting will be carried out once more.

The above procedure cannot be used to carry out automatic address resetting of twin/triple control.

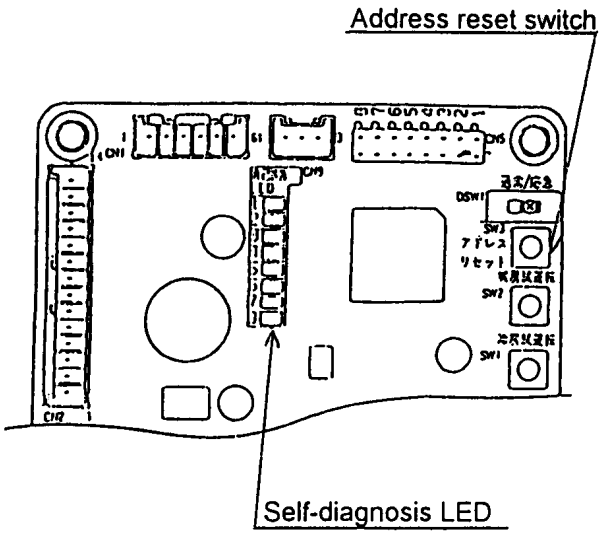
(Note on automatic address setting)

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 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)



Reset the address as the following procedure:

1. **After making sure that dip-switch No. 1 to 4 and No. 8 are OFF, stop the operation.**
2. **Push address reset switch (SW3) on the outdoor unit PC board for 4 seconds. Self-diagnosis LED No. 2 to 8 will start blinking by order. And when all 7 pieces of LED (No. 2 ~ 8) are illuminated, address reset will be finished. Then the address for the slave unit will be reset.**

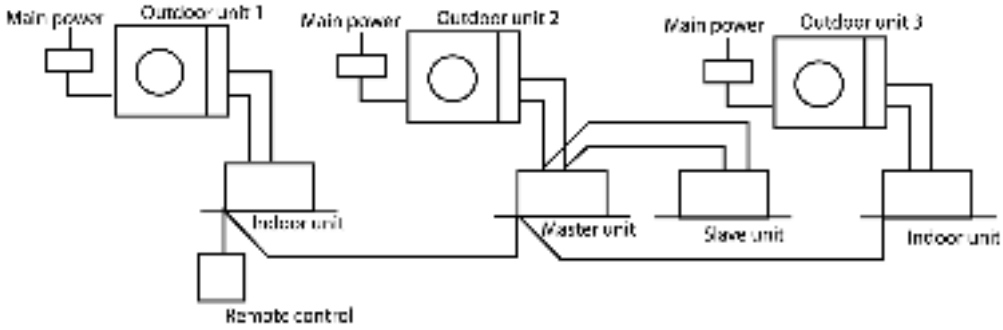
Important: The address for the group control cannot be reset, using the above mentioned procedure.

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)
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

● **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
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

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 Change	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 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

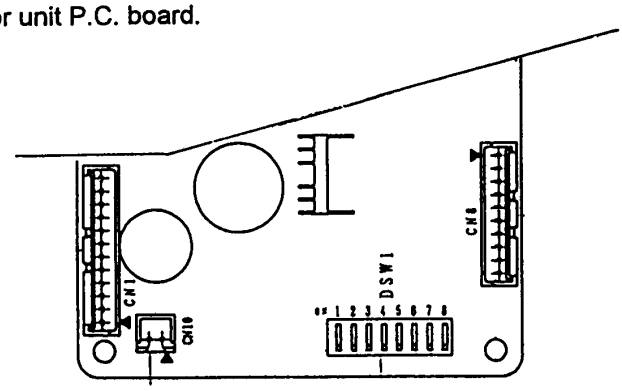
1. Set the “OFF” position for main power supply switch.
2. Set the “ON” position for No. 1 pin to No. 4 pin of dip switch (DSW1) on indoor unit P.C. board.
   (No. 8 pin of dip switch (DSW1) should be “OFF” position)
3. Take main power supply switch “ON” for one minute, and then main power supply switch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

23.1. 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]

24 EMERGENCY OPERATION

Emergency operation

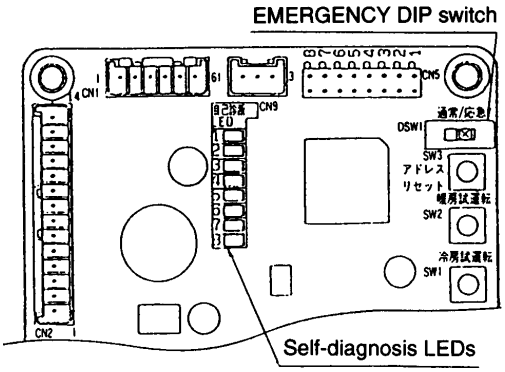
- Emergency operation of outdoor unit
  Emergency operation can be carried out by setting the DSW1 switch on the printed circuit board inside the outdoor unit to the EMERGENCY position. However, emergency operation is only carried out when an abnormality is detected by the indoor/outdoor temperature 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.

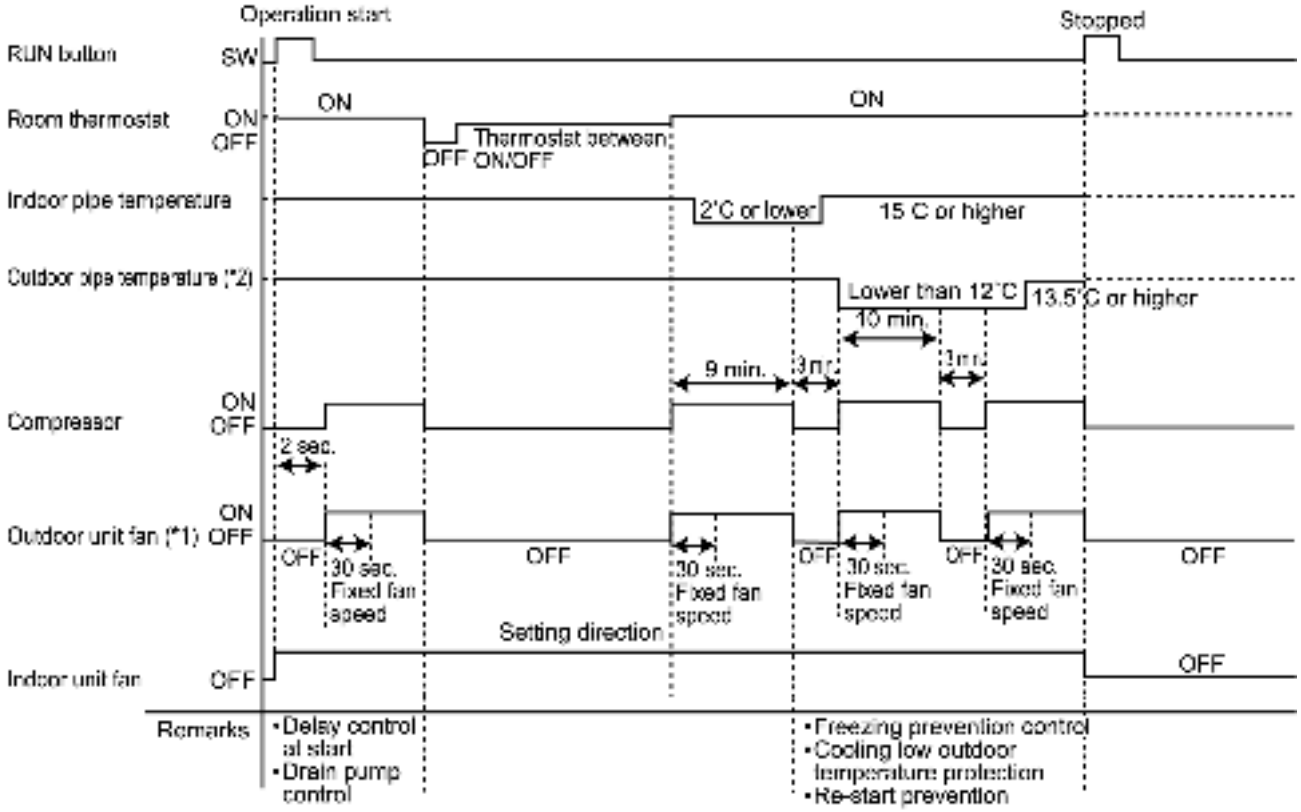
NOTE:

- 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.

25 CONTROL

25.1. Description of basic Functions

25.1.1. 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°C	SUPER LOW
0°C ≤ T < 10°C	LOW
10°C ≤ T < 20°C	MEDIUM
20°C ≤ T < 25°C	HIGH
25°C ≤ 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

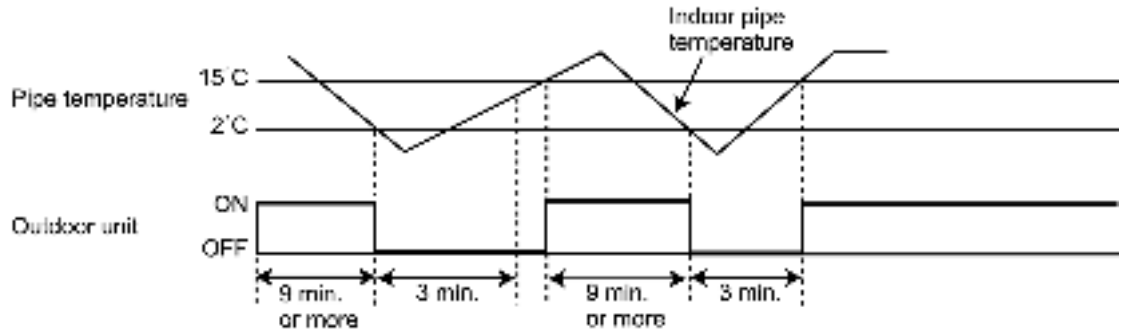
When the heat exchanger outlet temperature drops to less than 12°C for a continuous period of 10 minutes, the outdoor unit stops running.

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.

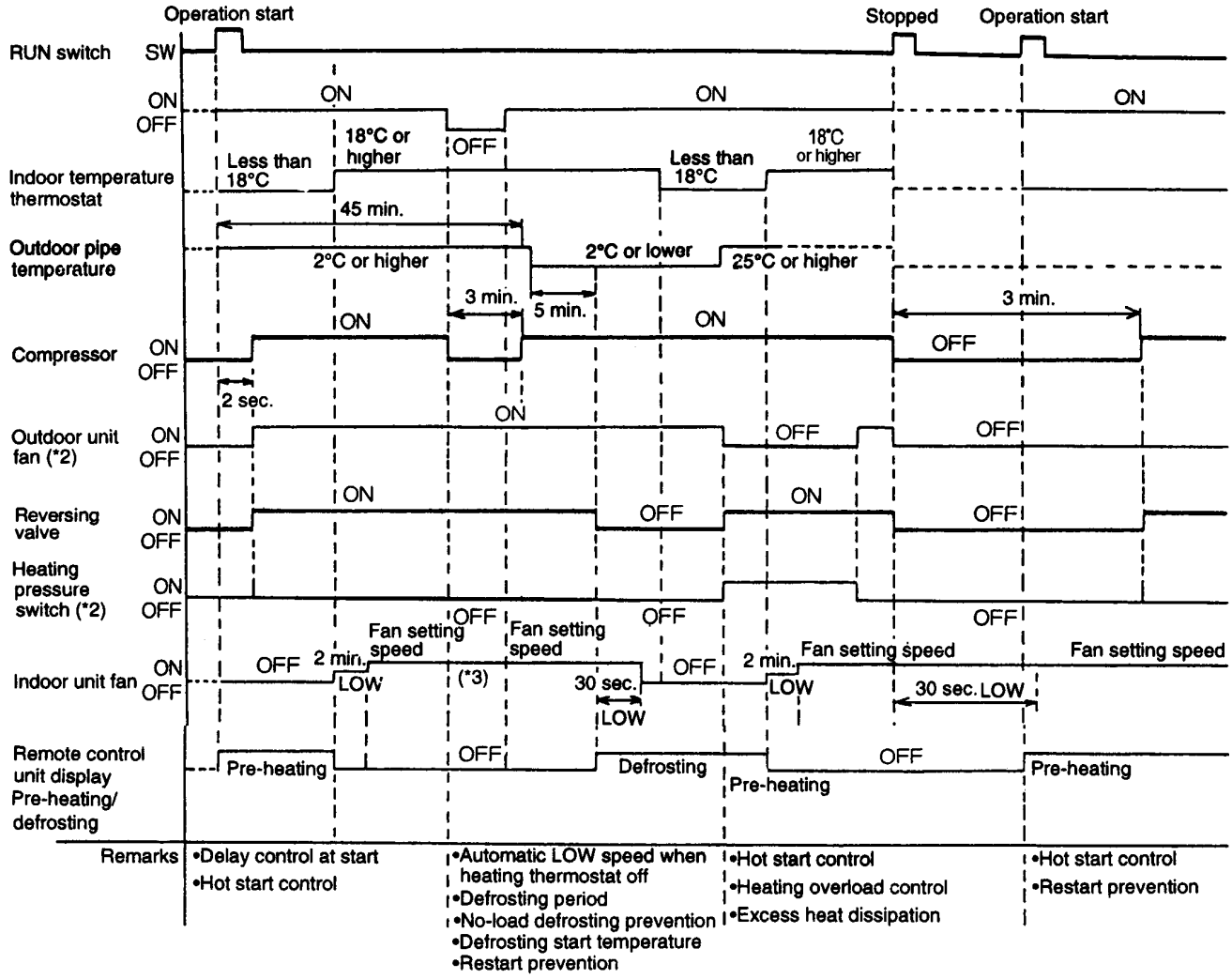
25.2. Freezing prevention control

1. Operation
   During cooling mode operation, after 9 minutes have passed since the compressor turned on, the outdoor units stops 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 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.)

25.3. 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"

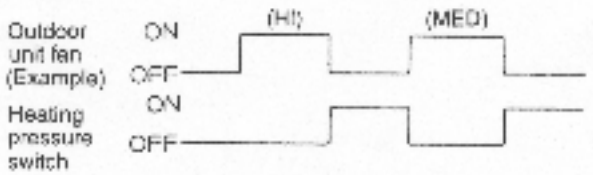
(*4) Refer to "9 Indoor thermostat characteristics"

(*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



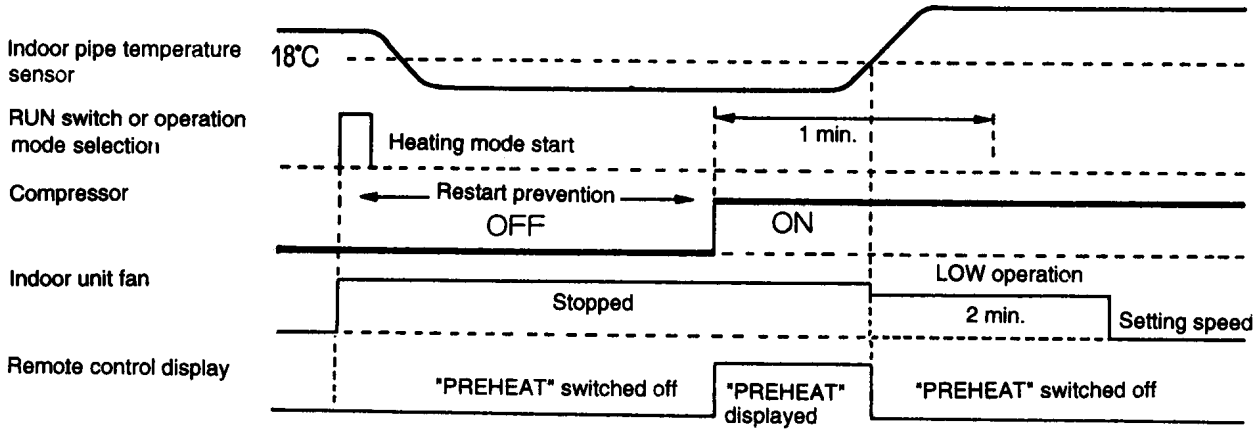
The heating pressure switch turns on at 2.35 MPa and off at 1.96 MPa.

25.4. Hot starting

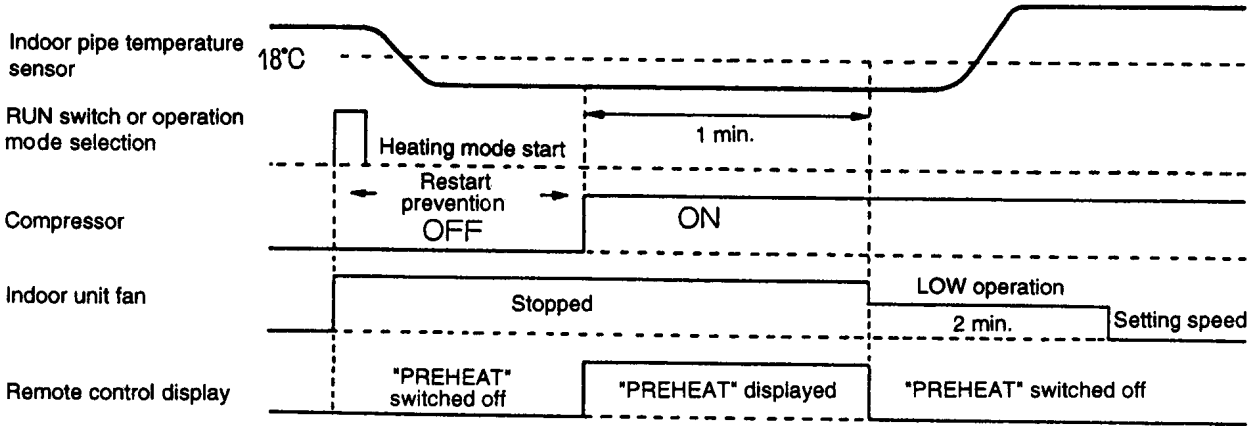
1. When heating mode operation starts

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°).

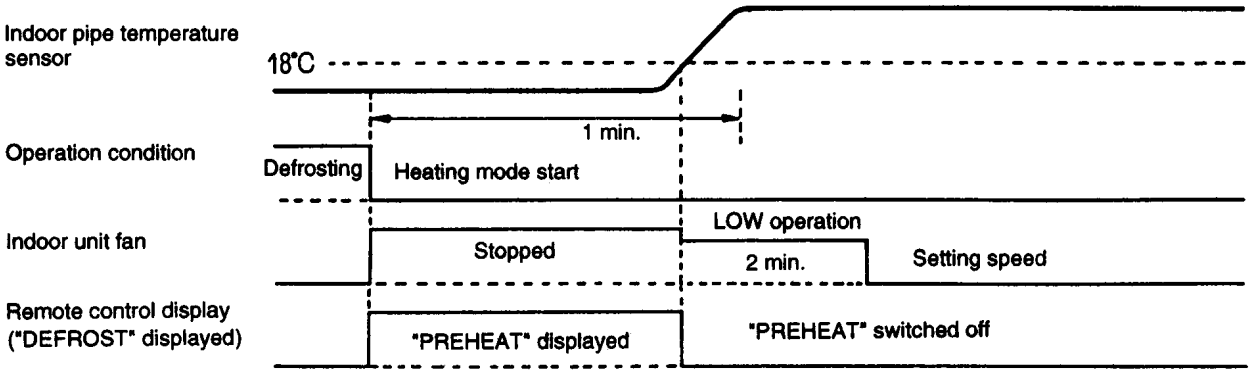
3. Cancelling

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.

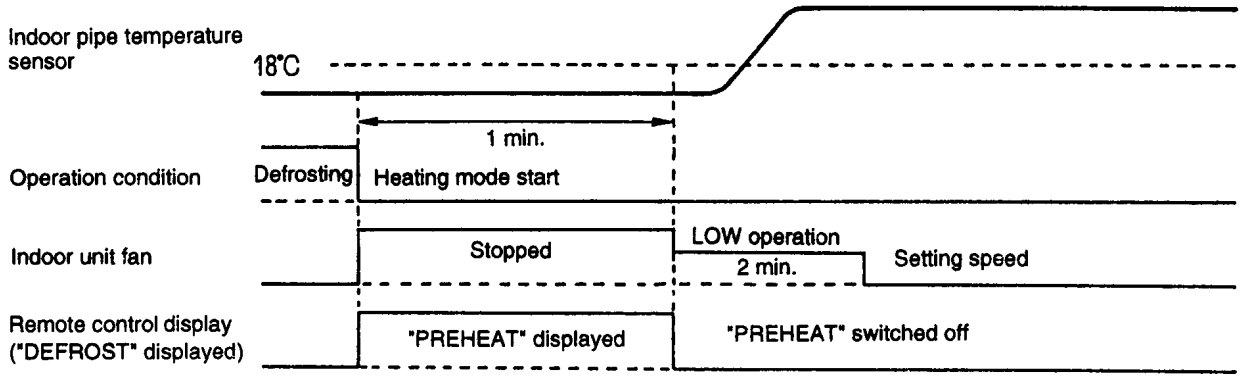
After cancellation, the “PREHEAT” display on the remote control disappears and the louvre operation returns to the previous setting.

(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 >

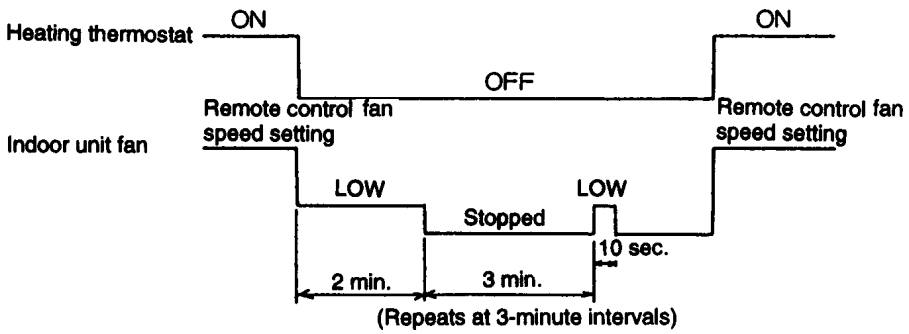


<When hot start operation is cancelled by time>



25.5. 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.

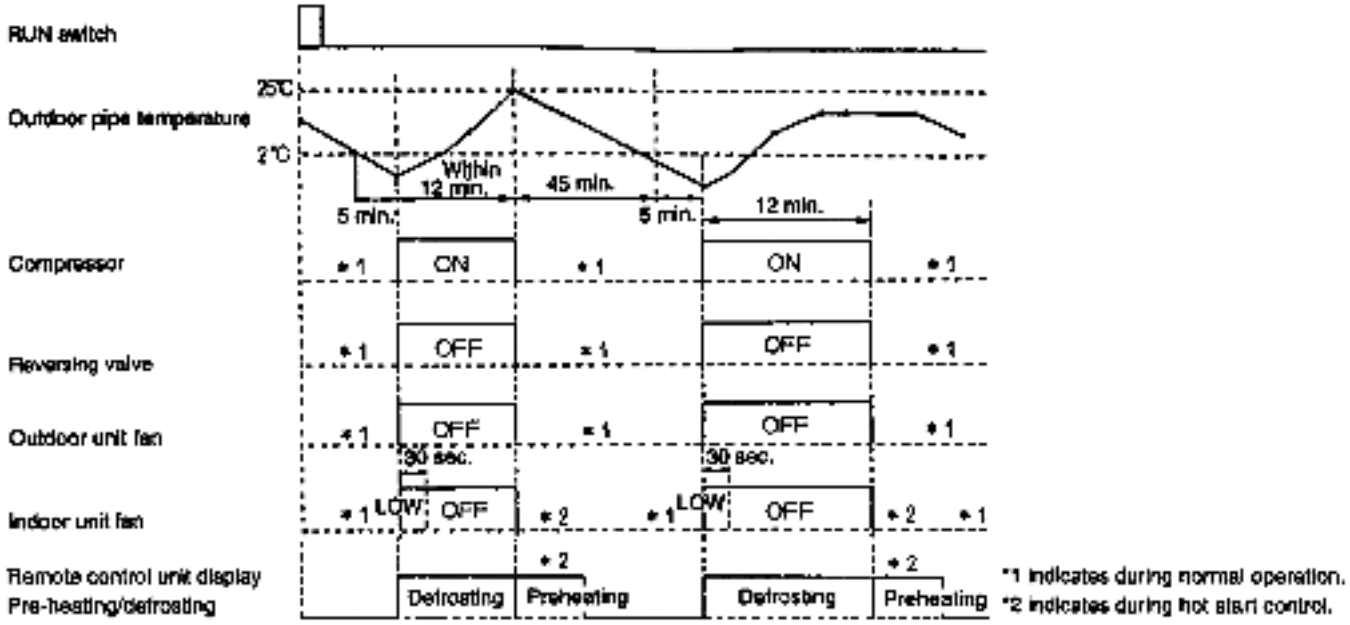


25.6. Excess heat dissipation for indoor unit

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.)

25.7. 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.)

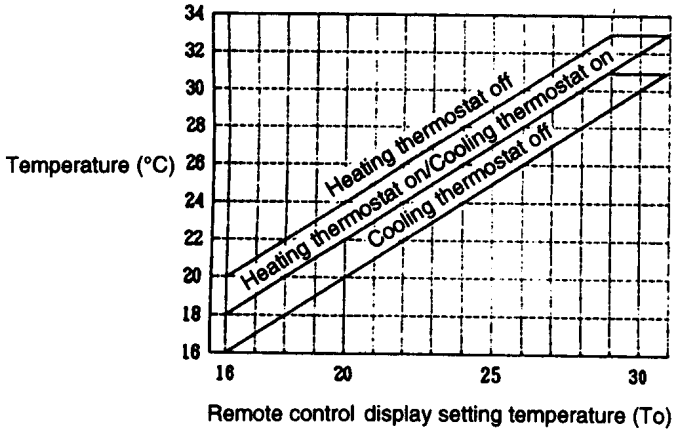
25.8. Indoor thermostat characteristic

1. Thermostat characteristic during cooling and heating modes

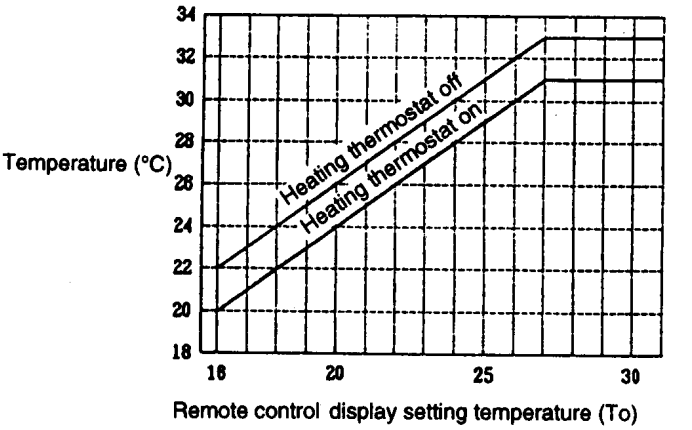
Operation mode	Setting temperature (To)	Room temperature (°C)		
		Operation	Differential	
			2.0K	4.0K
Cooling	16	O N	18.0	———
		O F F	16.0	———
	31	O N	33.0	———
		O F F	31.0	———
Heating *1	16	O N	18.0	20.0
		O F F	20.0	22.0
	29~31 *1(27~31)	O N	31.0	31.0
		O F F	33.0	33.0

*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 ≧ 28	Cooling thermostat on	LO, Louvre horizontal
*②	28 > T ≧ 25	Cooling thermostat on 10 min./fan 5 min., alternate operation	LO, Louvre horizontal
*③	25 > T ≧ 21	Cooling thermostat on 5 min./fan 10 min., alternate operation	LO, Louvre horizontal
④	21 ≧ 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 < remote control display temperature - 2 (°C)	Heating mode operation, thermostat on
Remote control display temperature ≧ T	Heating mode operation, thermostat off (fan mode operation)
Remote control display temperature ≦ T	Cooling mode operation, thermostat off (fan mode operation)
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.

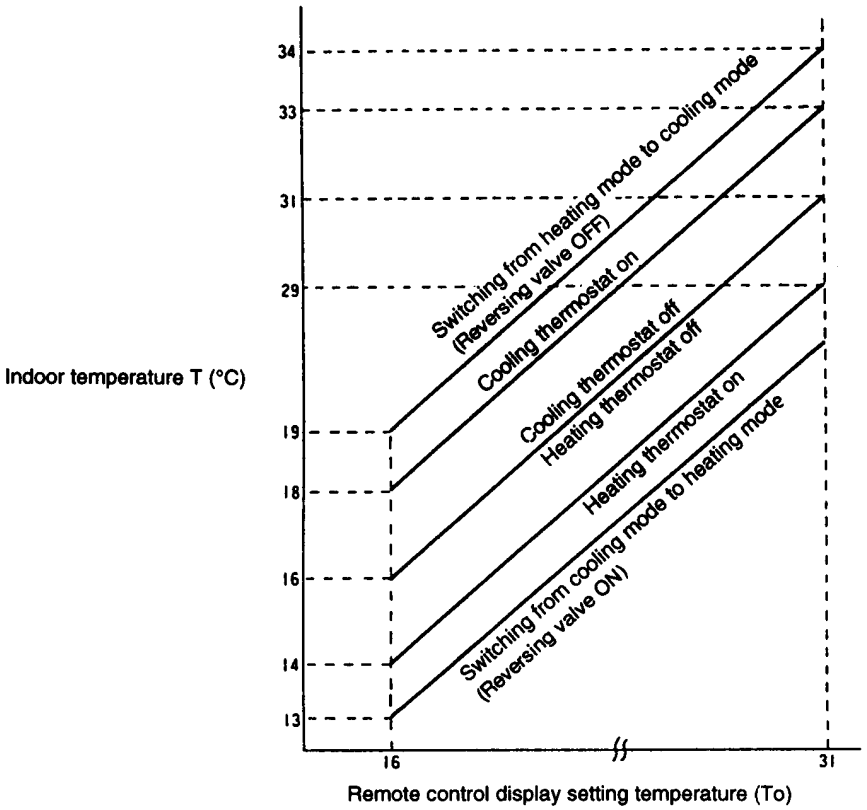
(The 10-minute timer is cancelled when operation is changed to another mode or when operation stops and the thermostat turns on.)

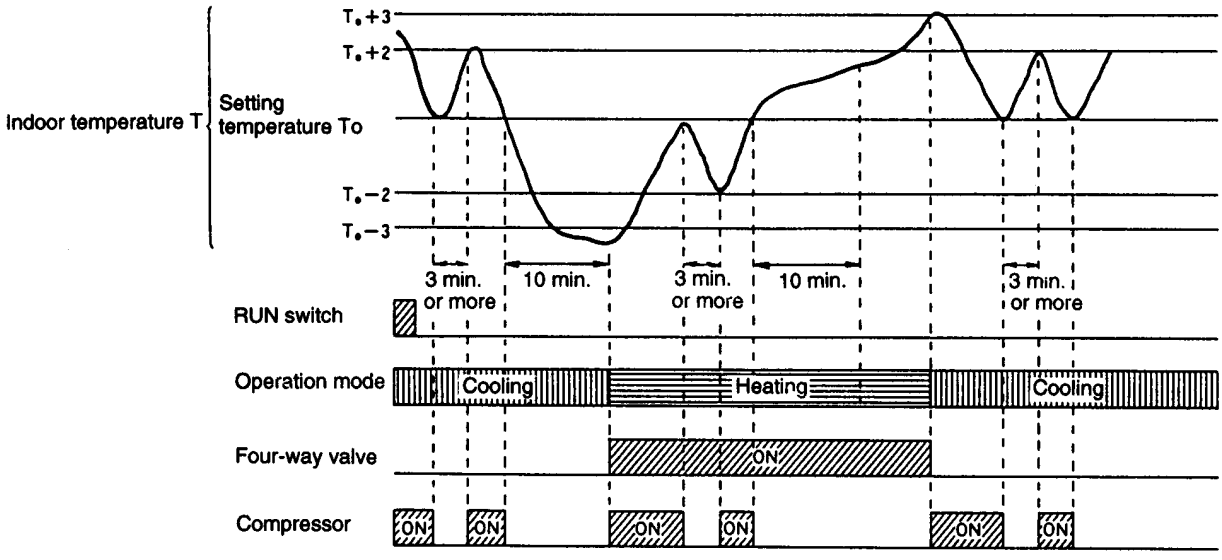
Indoor temperature (T) °C	Operation switching
T ≧ Remote control display temperature + 3 (°C)	Heating mode → Cooling mode
T ≦ Remote control display temperature - 3 (°C)	Cooling mode → Heating mode

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 > Remote control unit display temperature + 2 (°C)	Cooling thermostat on
	T ≦ Remote control unit display temperature	Cooling thermostat off
Heating mode	T < Remote control unit display temperature - 2 (°C)	Heating thermostat on
	T ≧ Remote control unit display temperature	Heating thermostat off

Indoor temperature thermostat characteristics during automatic changeover operation





Automatic cooling/heating mode operation time chart

25.9. Indoor unit fan control

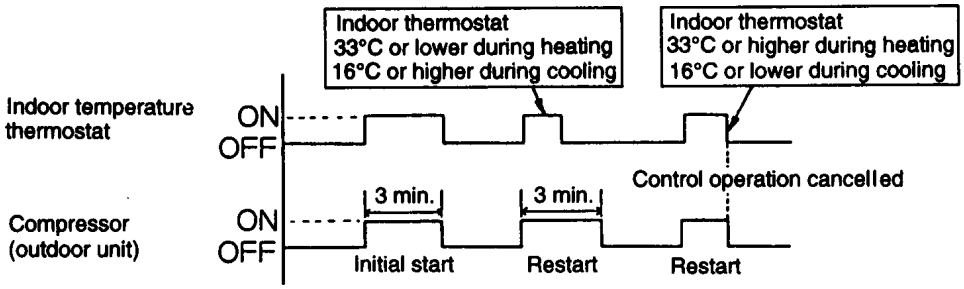
1. Fixing at LO, MED or HI
   When LO,MED or HI is set, the relay switches and operation is carried out at that setting.
2. Automatic fan speed
   When set to AUTO, the indoor unit fan operation changes as shown in the table below.

(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		

25.10. 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.)



25.11. 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.

25.12. 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.

25.13. 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.

25.14. 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.

26 INSTALLATION (INDOOR UNIT)

Precautions in terms of safety

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

- Precautions shown here are differentiated between ⚠Warnings and ⚠Cautions, those that have mush chance for leading to significant result such as fatality or serious injury if wrong installation should be 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 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, not only make sure that the unit is free from any abnormal condition through the execution of dry 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 and electric circuit diagram.

⚠ Warnings

▲ 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.

▲ 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.

▲ Carry out the installation work with reliability on the place that bears the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.

▲ 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.

▲ Electric work shall be carried out by the persion qualified 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.

▲ Wiring shall be connected securely using specified cables and fix them securely so that external force of the ecales may not transfer to the terminal connection section, 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.

▲ Securely attach the protective covers for the outdoor unit connection cable 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.

▲ Switch off all supplies before accessing any electrical part.

⚠ Warnings

▲ 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.

▲ Once installation work is complete, check that there are no refrigerant gas into the room and comes into contact with sparks or flame from a fan heater, stove or kitchen range, it will cause toxic gases to be generated.

▲ When performing piping work do not mix air excepl specified refrigerant (R407C) if refrigeration cycle, it causes capacily down, and risk of explosion and injury due to high tention inside refreigeration cycle.

▲ Any electric work should only be carried out by a qualified technician.

⚠ Cautions

▲ Carry out earthing work
Do not connect the earth return to the gas pipe, water line pipe, lightening rod, earth return of the telephone.
Imperfection in earth return may lead to electric shock.

▲ 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.

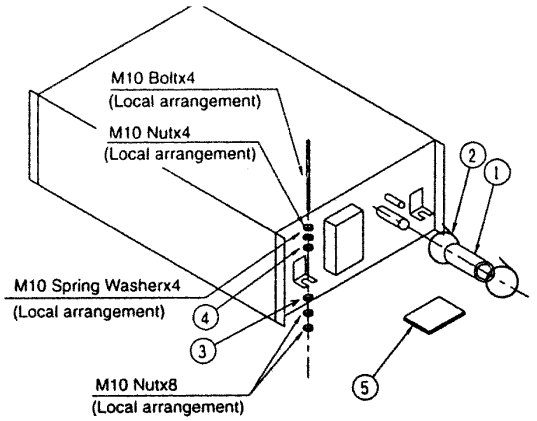
▲ Mounting of the earth leakage breaker is required. Omission in mounting of the earth leakage breaker may lead to electric shock.

▲ 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.

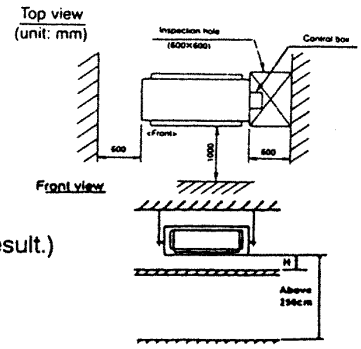
▲ Position the indoor unit, outdoor units, power cords and indoor/outdoor unit connection cables so that they are at least 1 meter away from televisions and radios. This is to avoid problems such as interference with picture and/or sound. (however, note that depending on the electromagnetic wave conditions, interference may still occur even if the separation distance is more than 1 meter.)

1. ACCESSORIES PACKED IN THE INDOOR UNIT CONTAINER

NO.	Parts name	Q'ty
1	Thermal insulator for refrigerant pipe	1
2	Hose clip for thermal insulator	2
3	M10 Flange washer	4
4	M10 Flat washer	4
5	Thermal insulator for drainage hole	1



2. SELECTING THE LOCATION OF THE INDOOR UNIT

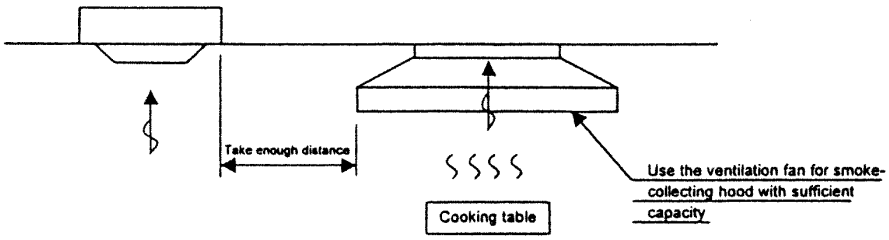


- The place shall easily bear a load exceeding four times the indoor unit's weight.
- The place shall be able to inspect the unit as the figure.
- The place where the unit shall be levelled.
- The place shall allow easy water drainage. (Suitable dimension "H" is necessary to get slope to drain as figure.)
- The place shall easily connect with the outdoor unit.
- The place where the unit is not affected by an electrical noise.
- Do not install the indoor unit in a laundry area. (Electric shocks may result.)
- The indoor unit must be free from any obstacles in path of air inlet and outlet, and must allow spreading of air throughout the room.
- The indoor unit must be away from heat and steam sources, but avoid installing it near an entrance.
- Prepare a power outlet for the indoor unit nearby.
- The indoor unit must be at least 3m away from any noise-generating equipment. The electrical wiring must be shielded with steel conduit.
- If the power supply is subject to noise generation, add a suppressor.

✳ If the height from floor to ceiling exceeds three metres, air flow distribution deteriorates and the effect is decreased.

NOTE • Thoroughly study the following installation locations:

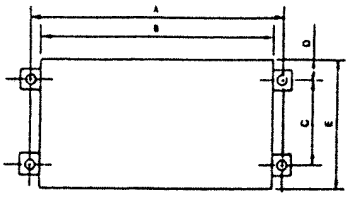
1. In such places as restaurants and kitchens, considerable amount of oil steam and flour adhere to the turbo fan, the fin of the heat exchanger and the drain pump, resulting in heat exchange reduction, spraying, dispersing of water drops, drain pump malfunction, etc.
   - Make sure that the ventilation fan for smoke-collecting hood on a cooking table has sufficient capacity so that it draws oily steam which should not flow into the suction of the air-conditioner.
   - Make enough distance from cooking room to install the airconditioner in such place where it may not suck oily steam.



2. Avoid installing air conditioner in such circumstances where cutting oil mist or iron powder is in suspension in factories, etc.
3. Avoid places where inflammable gas is generated, flows-in, contaminated, or leaked.
4. Avoid places where sulphurous acid gas or corrosive gas is generated.
5. Avoid places near high frequency generators.

3. INSTALLATION OF INDOOR UNIT

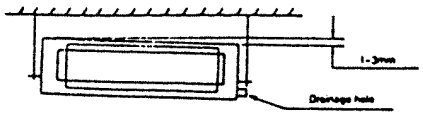
POSITION OF SUSPENSION BOLT



(unit:mm)

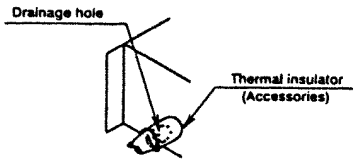
	A	B	C	D	E
CS-W24BD2P CS-W28BD2P	1060	1000	430	35	500
CS-W34BD2P CS-W43BD2P	1060	1000	540	55	650

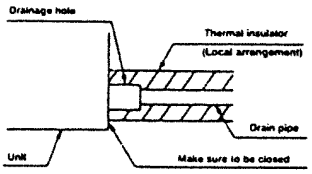
- Apply a joint-canvas between the unit and duct to absorb unnecessary vibration.
- Install the unit leaning to a drainage hole side as a figure for easy water drainage.

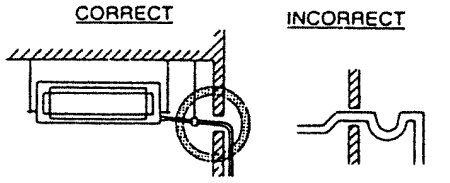


4. INDOOR UNIT DRAIN PIPING

- 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.



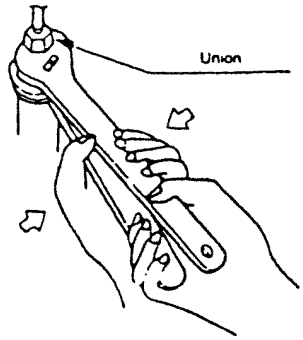




(GOOD) (NO GOOD)

5. PIPING CONNECTION

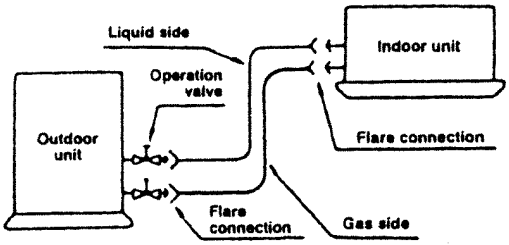
1. Form the piping according to its routing. Avoid bending and bending back the same piping point more than three times. (This will result in hardening the pipe.)
2. After deforming the piping, align centers of the union fitting of the indoor unit and the piping, and tighten them firmly with wrenches.
3. Connect pipe to the service valve or ball valve which is located below the outdoor unit.
4. After completed 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-W24BD2P	ϕ6.35	ϕ15.88
CS-W28BD2P	ϕ9.52	ϕ15.88
CS-W34BD2P CS-W43BD2P	ϕ9.52	ϕ19.05

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 the liquid and gas side valves.



CAUTION

Use two wrenches and tighten with regular torque.

Flare nut fastening torque N-m (kgf-cm)			
ϕ 6.35mm	18 (180)	ϕ 15.88mm	65 (660)
ϕ 9.52mm	42 (430)	ϕ 19.05mm	100 (1020)
ϕ 12.7mm	55 (560)		

6. 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.

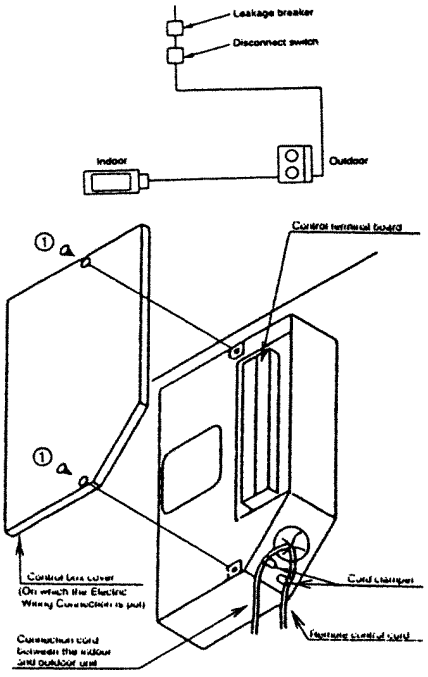
WIRING CONNECTION

<INDOOR UNIT>

- Remove the control box cover for electrical connection between the indoor and outdoor unit. (Remove two screws ①).
- Use the cord clamper to fix the cord.

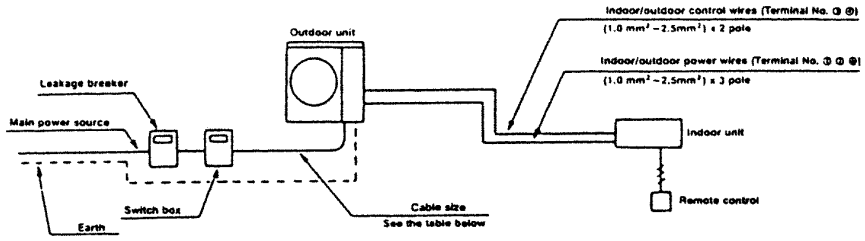
Caution

Make sure that screws of the terminal are free from looseness. Fastening torque
M4 ... 118N•cm (12kgf•cm)
M5 ... 196N•cm (20kgf•cm)



7. 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 during 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.



⚠ Warning	All electric work must be carried out by a qualified technician according to proper technical standards for electrical work and according to installation manual for installation work, and proper specified circuits must be used. If circuits with insufficient capacity are used, or if electrical work is not carried out properly, electric shocks or fire may result.

- Use a standard power cord for Europe (such as H05RN-F or H07RN-F which confirms to CENELEC (HAR) rating specifications.)

Cautions

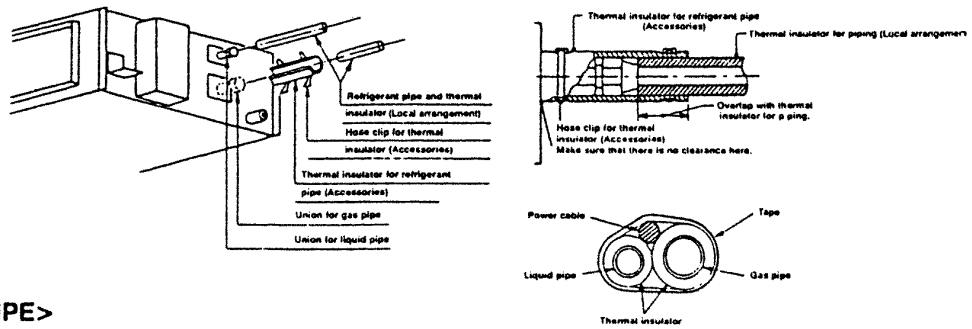
⃠ • Where ground work (earth) is carried out, do not connect the ground return to the gas pipe, water line pipe, grounded circuit of the telephone and lightning rod, or ground circuit of other product in which earth leakage breaker is incorporated. (Such action is prohibited by statute, etc.)

⚠ • 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.

8. HEAT INSULATION

THERMAL INSULATION

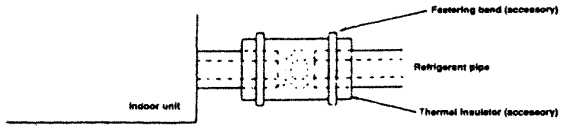
<INDOOR UNIT>



<REFRIGERANT PIPE>

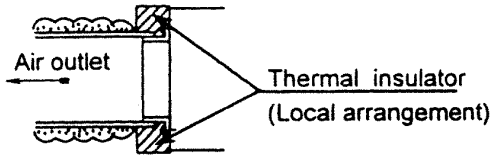
- Insulate and tape both the gas piping and liquid piping.

1. For the 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 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.

4. The duct connection of the air outlet needs thermal insulation.

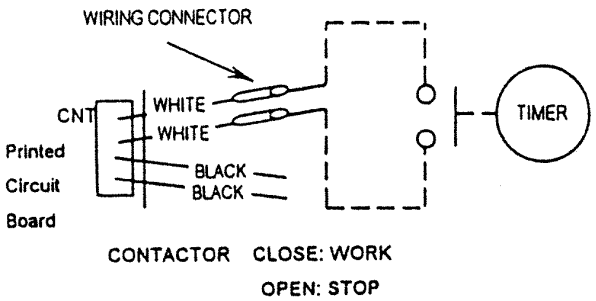


9. USE OF TIMER INPUT•FAN OUTPUT

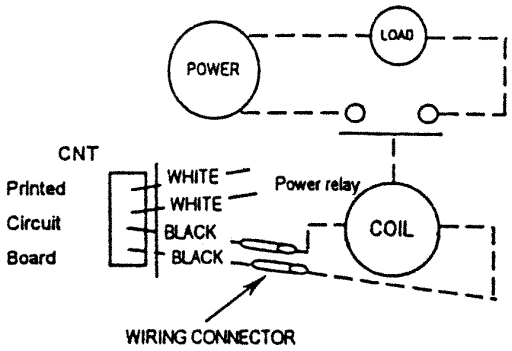
Refer to the following diagram for connecting to Printed Circuit Board.

<TIMER INPUT> Connect to the white cord

<FAN OUTPUT> Connect to the black cord
Power relay (arrangement): (coil spec. DC12V 0.9W)



Connect another circuit contactor of the timer.



10. 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.
- Measuring 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})
M3..... 69-98 { 7-10 }
M4...157-196 { 16-20 }
M5...196-245 { 20-25 }

11. DELIVERY TO OUR CUSTOMERS

- Teach the customer 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.

Wired Remote Control Installation Manual

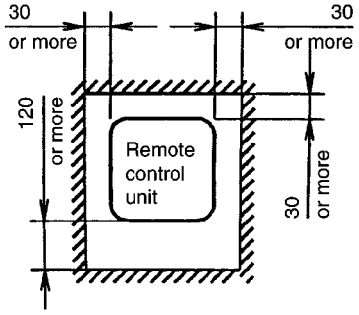
- Before installing the wired remote control, be sure to thoroughly read the "Notes with regard to safety" section of the installation manual provided with the indoor unit.
- After installing the wired remote control, carry out a test operation to check that the remote control functions properly, and also explain the operation and cleaning procedures to the customer in accordance with the details in instruction manual. Furthermore, ask the customer to keep this installation manual and the instruction manual in a safe place for later reference.

1. ACCESSORIES SUPPLIED WITH WIRED REMOTE CONTROL

Name	Q'ty	Diagram	Remark	Name	Q'ty	Diagram	Remark
Remote control	1			4mm screw	3		Installing the remote control to a wall
				M4 screw	3		Installing the remote control to an outlet box
Remote control cable	1		Length (10m)	Round terminal	2		Connecting to indoor unit terminal block

2. NOTES REGARDING WIRED REMOTE CONTROL SETTING-UP LOCATION

- Select a place where the remote control 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.
  (If installed to a wall 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 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 cable near refrigerant pipes or drain pipes.
- Install the remote control cable 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 cable through a wall, be sure to install a water trap above the cable.
- Allow sufficient space around the remote control as shown in the illustration at right.
  Secure the remote control lower case to the wall or to an outlet.

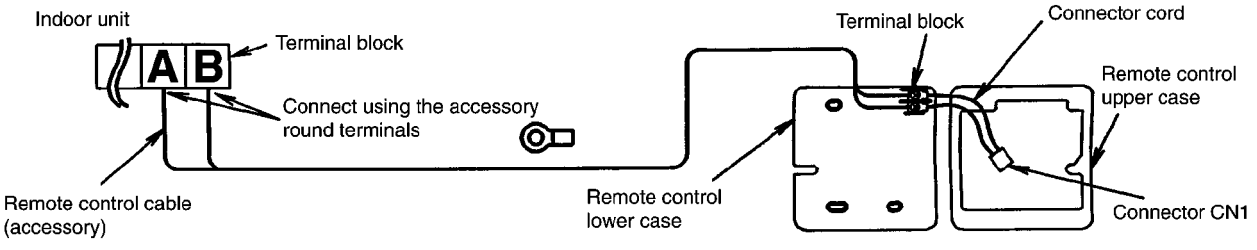


3. REMOTE CONTROL INSTALLATION

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

Remote control wiring

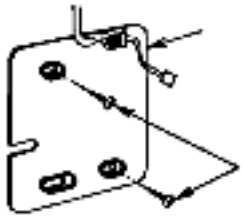
- Connect the indoor unit and the remote control as shown in the illustration below.
- The remote control cable is non-polar.
- At the time of shipment from the factory, the connector cable used to connect the terminal block and connector CN1 is disconnected. When connecting the remote control wiring and installing the remote control, be sure to connect the cord to the connector CN1.



NOTE The maximum possible length for the remote control cable is 200 m.

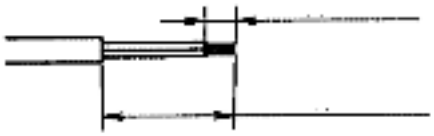
Remote control installation procedure

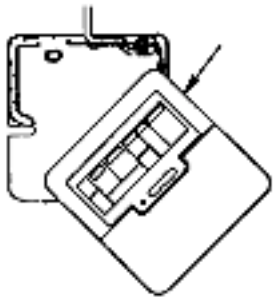
- Remove the remote control lower case.
  (Insert a flat-tipped screwdriver or similar 2 to 3 mm into one of the gaps at the bottom of the case, and then twist the screwdriver to open. [Refer to the illustration at right.])
  Be careful not to damage the lower case.
- Secure the lower case to the wall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



NOTE

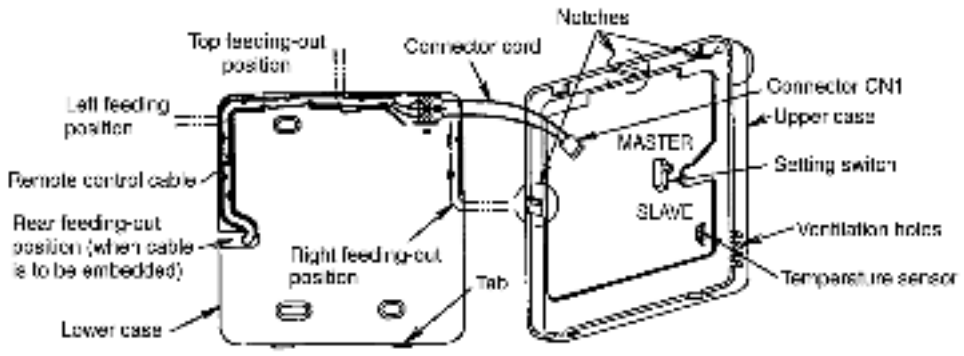
- Be sure to use only the accessory screws.
- Do not bend the lower case when tightening the screws. (If the screws are overtightened, damage may result.)
- Do not remove the protective tape which is affixed to the upper case circuit board.

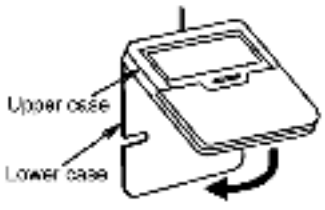




- If installing the remote control with the remote control cable exposed, use pliers to cut a notch into the upper case. (The feeding-out direction can be either up or to the left or right)
- Strip the end of the remote control cable which is to be connected to the remote control. (Refer to the illustration at right)
- Route the remote control cable 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 will not operate.)

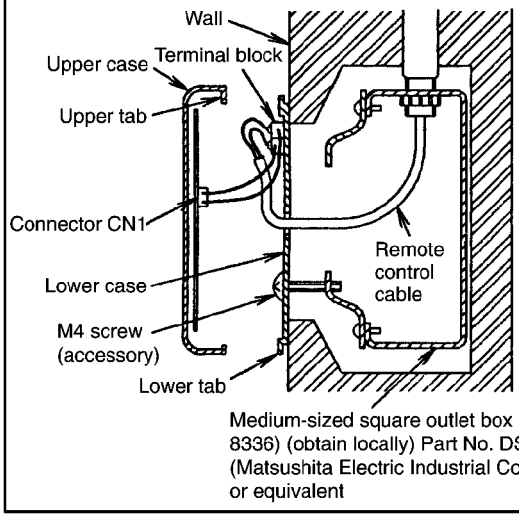
NOTE After connecting the connector, do not suspend the upper case by its own weight, otherwise the connector cord may break.

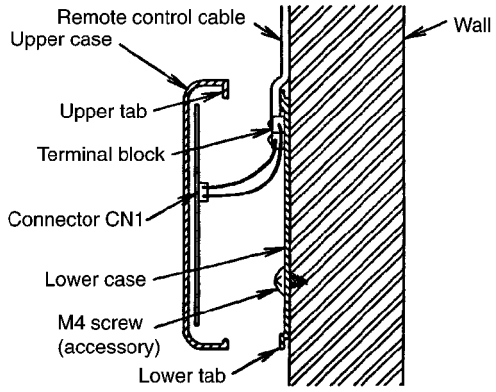




- If controlling using two remote controls, refer to "Control using two remote controls" in "4 Settings".
- Secure the upper case to the lower case.
  (Hook the upper tab of the upper case into the lower case, and then push the upper case until it snaps shut onto the lower case tab, while being careful not to clamp the remote control cable and the connector cord.)

If remote control cable is embedded	If installing with the remote control cable exposed
1. Embed an outlet box (JIS C 8336) into the wall, and then secure the remote control 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) 2. Pass the remote control cable into the box and then install the remote control.	1. Secure the remote control base plate to the wall with the two accessory 4 mm screws. 2. The feeding-out direction for the remote control cable can be either up or to the left or right. (Refer to the illustration above.) After determining the feeding-out direction, use pliers to make a notch in the cover. 3. Route the remote control cable as shown in the illustration above. Pull the cord firmly around the outside of the base plate at this time.

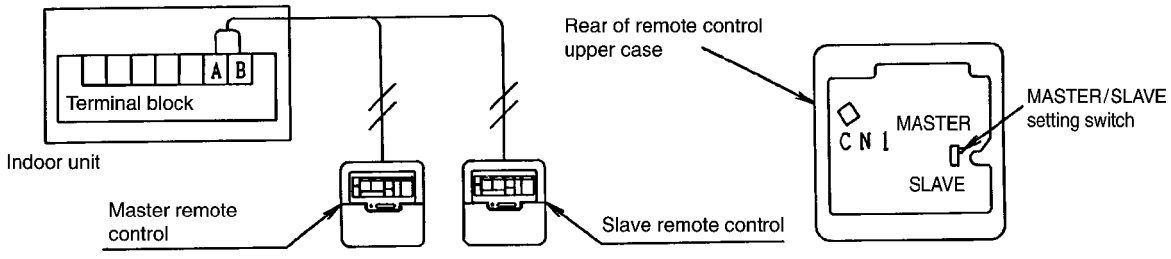




4. SETTINGS

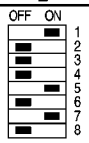
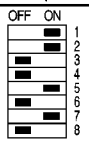
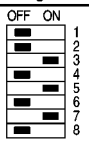
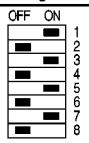
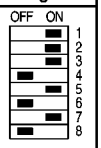
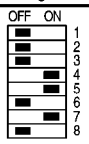
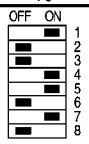
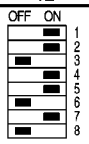
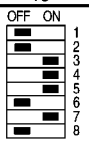
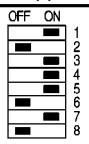
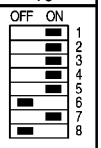
Control using two remote control

- Up to two remote controls can be installed for a single indoor unit, and either remote control 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 master and which is to be the slave remote control.
  The master or slave states of the remote control is set automatically. The MASTER/SLAVE setting switch can also be use to make the setting manually, however if a manual setting is made, that manual setting has priority.
  Be sure to turn off the main power before making a manual setting.
  (2) Connect the remote controls.
  Connect both remote control to terminals (A) and (B) on the indoor unit terminal block (non-polar).



Group control

- All in group will be remote control thermistor setting when using the remote control thermistor.
- Up to a maximum of 16 indoor units can be connected at the time of group control.
  (Do not connect heat pump unit with cooling only unit.)
- Indoor unit No. is possible to set automatically at the time of group control. However, which indoor unit will be which number is unknown.
  Indoor unit No. is also possible to set manually with DIP switches. Since manual address setting is priority, when performing automatic address setting after doing manual setting turn off all DIP switches from No. 1 to No. 4, and then stop the operation and press three switches such as [AIR SWING AUTO] [OPERATION] • [A/C No.] at the same time.
  (Do not use manual address setting and automatic address setting together.)

Manual Setting	Indoor unit No.	1	2	3	4	5	6	7	8
	DIP switch (DSW1) address setting on indoor unit printed circuit board.								
	A/C No. setting	Unnecessary operation	1 ~ ON	2 ~ ON	1, 2 ~ ON	3 ~ ON	1, 3 ~ ON	2, 3 ~ ON	1, 2, 3 ~ ON
	Indoor unit No.	9	10	11	12	13	14	15	16
	DIP switch (DSW1) address setting on indoor unit printed circuit board.								
	A/C No. setting	4 ~ ON	1, 4 ~ ON	2, 4 ~ ON	1, 2, 4 ~ ON	3, 4 ~ ON	1, 3, 4 ~ ON	2, 3, 4 ~ ON	1, 2, 3, 4 ~ ON

Automatic address resetting for group control

- The address settings for group control (air conditioner Nos. 1 to 16) can be reset automatically.
  (1) While operation is stopped, press the AUTO switch. A/C NO. and OPERATION switches simultaneously.

Switching the thermistor

- The temperature detection thermistor can be switched between the thermistor at the indoor unit and the thermistor at the remote control. However, do not switch to the remote control thermistor if using two remote controls.
  (1) While operation is stopped, press and hold the TEST RUN switch, and then press the UP and DOWN switches together.
  (2) "00" or "01" will appear in the time display.
  (3) Press the ▲ or ▼ timer switches to switch display between "00" and "01".
  "00" ... Indoor unit setting (factory default)
  "01" ... Remote control setting
  (4) Press the SET switch. (Be sure to press the SET switch so that normal operation mode can be resumed.)
- Repeat the procedure in steps (1) to (4) to change the setting again.

Energy save setting

- Upper and lower limits can be set for the setting temperature during cooling and heating operation (Energy save setting)
  (1) While operation is stopped, press the UP and DOWN switches simultaneously.
  (2) "0" (zero) will flash in the clock display at this time, so press the SET switch.
  (3) To set an upper limit (Setting a temperature above the energy save temperature will not be possible).
  Press the OPERATION switch unit HEAT is displayed.
  Press the UP or DOWN switch to set the temperature.
  Press the SET switch.
  Example: If the heating display is set to 28°C , setting the temperature to higher than 28°C will not be possible.
  (4) To set a lower limit (Setting a temperature below the energy save temperature will not be possible).
  Press the OPERATION switch unit COOL is displayed.
  Press the UP or DOWN switch to set the temperature.
  Press the SET switch.
  Example: If the cooling display is set to 22°C, setting the temperature to lower than 22°C will not be possible.
  (5) If the CANCEL switch is pressed during steps (3) or (4) above, the energy save setting will be cleared.
- Press the SET switch or the CANCEL switch to return to normal operation mode after making an energy save setting in steps (3) to (5).

5. TEST OPERATION

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

If no remote control 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 cable is securely connected. (Check for loose terminals, poor contacts, connection positions terminal block, etc.)

- If the above checks show that nothing is wrong but nothing appears on the remote control display, it is possible that the remote control was connected while the main power was still turned on.
  If such is the case, carry out the following.
- Set DIP switch (DSW1) No. 1 to 4 the ON position, and then turn on the main power. If the display appears after about 30 seconds, turn DIP switches 1 to 4 to OFF position.

6. SELF-DIAGNOSIS FUNCTION

The LED1 (green) indicators on the indoor unit and outdoor unit printed circuit boards illuminate to indicate that the printed circuit boards are operating normally. If the LEDS are switched off or are flashing irregularly, check the power supply, and turn it off and then back on again.

If "CHECK" is flashing on the timer

- If the "CHECK" display on the wired remote control is flashing, the details of the problem(s) are displayed on the timer display screen each time the CHECK switch is pressed.
- Further details of the problem can be displayed by pressing the SELECT switch while the general problem details are being displayed.

Example of current problem display

Press the CHECK switch. → Continue pressing the SELECT switch while the problem details are being display.

	TIMER	FAN SPEED	OPE-RATION	TEMP		TIMER	FAN SPEED	OPE-RATION	TEMP
Problem display →	CHECK F 26			A/C No. 01	Detail display →	CHECK – 01			A/C No. 01

If "CHECK" is not flashing on the timer

- If the "CHECK" display on the wired remote control is not flashing, press the CHECK switch 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 display for the previous problem and the problem before that by pressing the timer ▲ or ▼ switches.
- Press the CHECK switch once more to return to the normal display.

Example of previous problem display

Press the CHECK switch for 5 seconds or more. → Continue pressing the SELECT switch while the problem details are being display.

	TIMER	FAN SPEED	OPE-RATION	TEMP		TIMER	FAN SPEED	OPE-RATION	TEMP
Problem display →	CHECK 1 F 26			A/C No. 01	Detail display →	CHECK 1 – 01			A/C No. 01

Example of abnormality display before previous display

While the previous display still appears, press the ▲ switch. → Continue pressing the SELECT switch while the problem details are being display.

	TIMER	FAN SPEED	OPE-RATION	TEMP		TIMER	FAN SPEED	OPE-RATION	TEMP
Problem display →	CHECK 2 F 26			A/C No. 01	Detail display →	CHECK 2 – 01			A/C No. 01

- The display can be switched between the previous problem and the one before that by pressing ▲ and ▼ switches.
- After eliminating the cause of the problem, press the CHECK switch once more to return to the normal display.
- If the problem disappears and operation returns to normal, CHECK display on the remote control will switch off, but the self-diagnosis LED will remain illuminated until operation is resumed.

27 INSTALLATION (OUTDOOR UNIT)

AIR CONDITIONERS OUTDOOR UNIT INSTALLATION INSTRUCTIONS

REFRIGERANT
R 407C

HP	Model Name	
2 HP	CU-W18BBP5	CU-V18BBP5
2.5 HP	CU-W24BBP5	CU-V24BBP5 CU-V24BBP8
3 HP	CU-W28BBP5 CU-W28BBP8	CU-V28BBP5
4 HP	CU-W34BBP8	CU-V34BBP8
5 HP	CU-W43BBP8	CU-V43BBP8

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 trial 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 eventual equivalent requirements.

▲ 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 water leakage, electric shock, fire, etc.

▲ 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.

▲ Carry out the installation work with reliability on the place that can bear the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.

▲ 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.

▲ The unit must be installed in accordance with applicable national and local regulations.
Any electrical work should only be carried out by qualified technician and use exclusive circuits without fail.
Presence of insufficient capacity in power circuit or imperfection in execution leads to electric shock, fire, etc.

▲ 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.

▲ 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.

▲ 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.

▲ Switch off all supplies before accessing any electrical part.

⚠ Warnings	⚠ Cautions
▲ 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.	▲ 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.
▲ 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.	▲ 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.
▲ When performing piping work do not mix air except for specified refrigerant (R407C) in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle.	▲ Mounting of the earth leakage circuit breaker is required. Omission in mounting of the earth leakage circuit breaker may lead to electric shock.
	▲ 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.
	▲ 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.)

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
Bonding 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 seal)

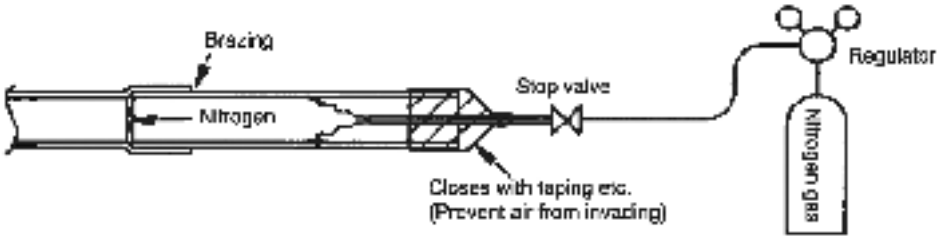
2. BEFORE INSTALLATION WORK

- This product is using new refrigeration (R407C). The basic way of installation work is the same as usual, but water and impurities should be controlled more strictly than before due to characteristic of refrigerating machine oil. Therefore, selection of materials to use and processing, storing and brazing need appropriate construction and control.

1. Tools and materials.
   There are tools and materials for both new refrigeration and usual refrigeration you can use together and for either two of them you can use. Use the below for new refrigeration.
   - Vacuum pump (with back flow preventor system)
   - Gauge manifold
   - Gas leakage detection warning device
   - Charge hose

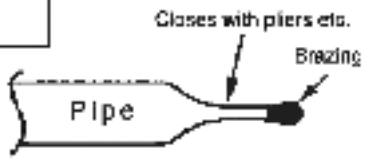
2. Installation work
   ① Brazing work
   Brazing work needs replacing air inside pipe with nitrogen gas in order to prevent oxidization scale from occurring. This is called nitrogen replacement, and one of very important work in brazing refrigerant piping. (Oxidation preventive is not possible to use)

(Work method)

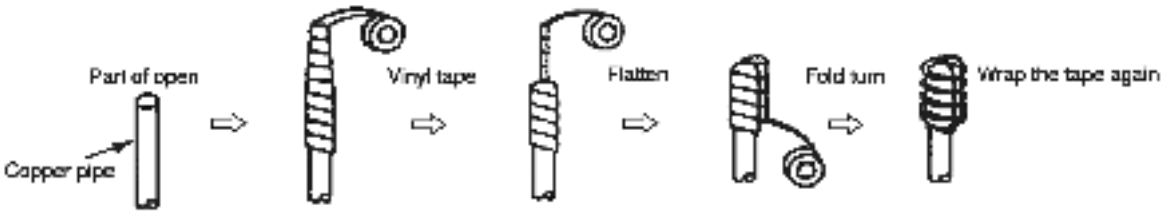


② Prevention measure for refrigerant piping
Prevention measure for refrigerant piping is very important work to prevent water-dust-rubbish from getting in. All piping terminals needs sealing such as shown below.

Place	Period of work	Method of seal
Outside	More than 1 month	Pinch
	Less than 1 month	Pinch or taping
Inside	Not specified	



- How to pinch
  Close terminal part of piping with pliers and seal the gap with brazing.
- How to tape
  Seal terminal part of piping with vinyl tape.



8. Vacuum pumping
The purpose of vacuum pumping work is to remove and dry air inside the piping or nitrogen at air tightness test. Perform the work carefully.

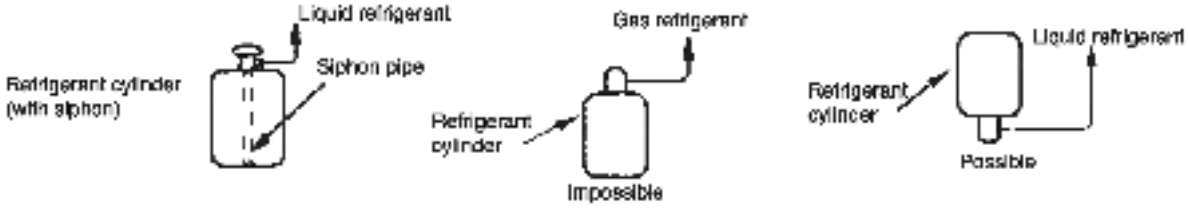
⚠ Caution	Use the vacuum pump with the backflow prevention mechanism to prevent backflow of oil.

Vacuuming time	60 minutes or more

※ Vacuum pump capacity 60 l/min or more

4. Refrigerant filling
Refrigerant filling must be done in the state of liquid refrigerant. If this is done in gas refrigerant, the balance of refrigerant composition will collapse and damage the operation.

For the use of a gas cylinder without siphon inside, turn it upside down and use it.
(We recommend manifold with sight glass.)



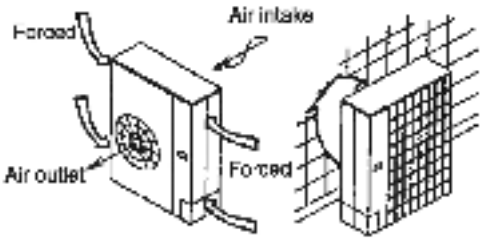
CAUTION Do not use a "CHARGE CYLINDER".

⚠ Caution	As a rule, please collect all existing refrigerants in the system outside the system when the refrigerant leakage occurs by the system. After that, please fill new refrigerant of a regulated amount again.

3. 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.

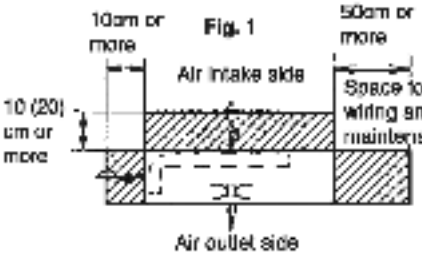
1. There should be sufficient ventilation.
2. The outdoor unit should be sheltered as much as possible from rain and direct sunlight, and the air should be able to move around so that hot and cold air do not build up.
3. There should not be animals or plants near the air outlet which could be adversely affected by hot or cold air coming out from the unit.
4. The outlet air and operating noise should not be a nuisance to other occupants nearby.
5. 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.



6. The intake and outlet should not be covered.
7. There should not be danger of flammable gas or corrosive gas leaks.
8. 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.
9. Do not allow any obstacles near the outdoor unit which will interfere with air flow around the air intake and air outlet.
10. 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.
11. Avoid installing the unit in places where petroleum products (such as machine oil), salinity, sulphurous, gases or high-frequency noise are present.
12. 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.

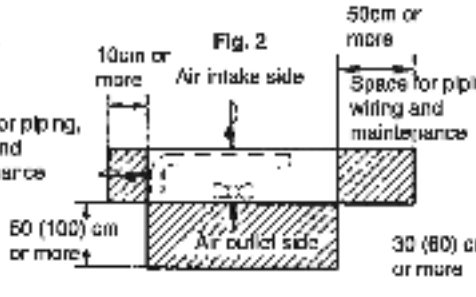
- When facing the air intake side toward a wall.

Fig. 1



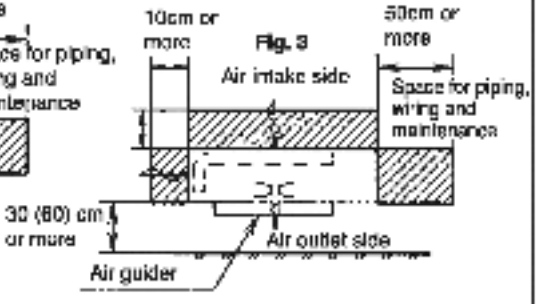
- When facing the air outlet side toward a wall.

Fig. 2



- When using an optional air guider for outdoor units.

Fig. 3



※ Maintain sufficient space above the unit.

13. If 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.

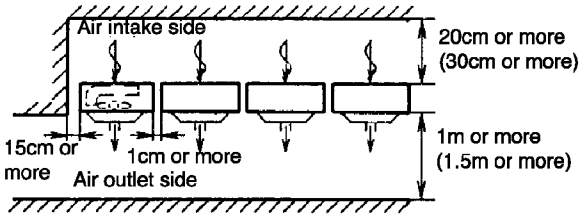
Air guider for outdoor units

Model Name		Part No.
CU-W18BBP5	CU-V18BBP5	CZ-UF01P
CU-W24BBP5	CU-V24BBP5	
	CU-V24BBP8	
CU-W28BBP5	CU-V28BBP5	
CU-W28BBP8	CU-V28BBP8	

Model Name		Part No.
CU-W34BBP8	CU-V34BBP8	CZ-UF01P (2 sets)
CU-W43BBP8	CU-V43BBP8	

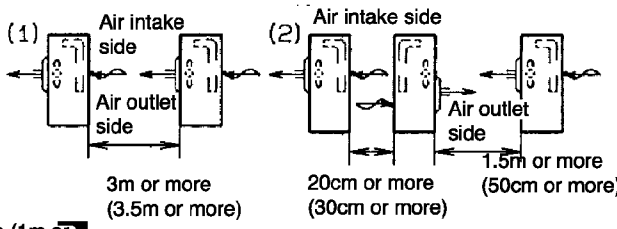
14.If installing more than one outdoor unit, allow enough space around each unit as shown below.

• When installing units side by side



[50cm or more (1m or more)
When air guider is installed (direct air flow upward)]

• When installing units facing each other



[1m or more (1.5m or more)
When air guider is installed (direct air flow upward)]

[50cm or more (1m or more)
When air guider is installed (direct air flow upward)]

* Maintain sufficient space above the unit.

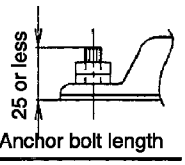
Values inside brackets indicate distances when installing the 4HP-5HP.

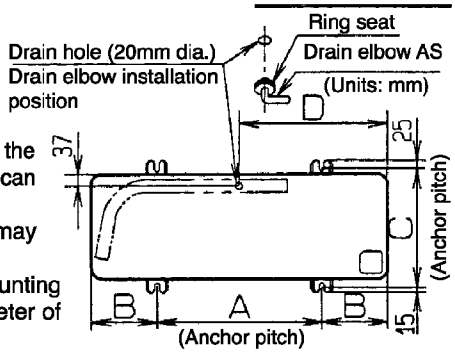
- The distance given above are the minimum distance required in order to maintain proper performance.
  Allow as much space as possible in order to get the best performance from the units.

4. 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.)





* 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.

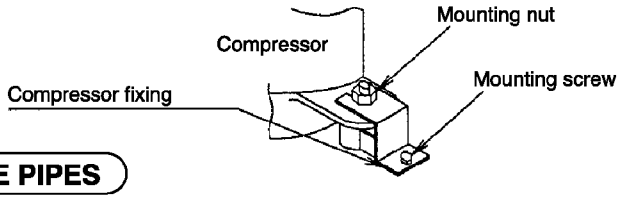
NOTE In cold regions (where the outdoor air temperature can drop to 0°C or below continuously for 2-3 days), the drain water may freeze, and this may prevent the fan from operating. Do not use the drain elbow in such cases.

Anchor bolt position

Model Name		Amm	Bmm	Cmm	Dmm
CU-W18BBP5	CU-V18BBP5	500	200	360	450
CU-W24BBP5	CU-V24BBP5				
	CU-V24BBP8				
CU-W28BBP5	CU-V28BBP5				
CU-W28BBP8	CU-V28BBP8				
CU-W34BBP8	CU-V34BBP8	700	200	360	720
CU-W43BBP8	CU-V43BBP8				

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.



5. CONNECTING THE PIPES

- 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 oxidization 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.

1. Refer to the table below for the pipe diameters equivalent lengths and indoor/outdoor unit difference of elevation.

Model Name		Pipe diameter (mm)		Equivalent length (m)	Difference of elevation (m)
		Liquid-side pipes	Gas-side pipes		
CU-W18BBP5	CU-V18BBP5	ø6.35	ø12.70	40	30
CU-W24BBP5	CU-V24BBP5	ø6.35	ø15.88	50	30
	CU-V24BBP8				
CU-W28BBP5	CU-V28BBP5	ø9.52	ø15.88	50	30
CU-W28BBP8	CU-V28BBP8				
CU-W34BBP8	CU-V34BBP8	ø9.52	ø19.05	50	30
CU-W43BBP8	CU-V43BBP8				

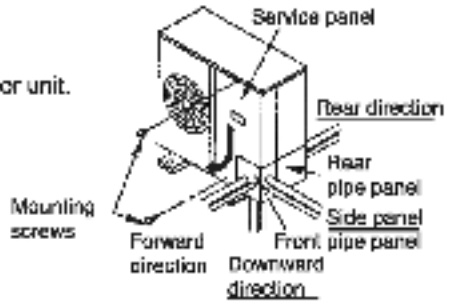
2. Local pipes can project in any of four directions.
   - Make holes in the pipe panels for the pipes to pass through.
   - Be sure to install the pipe panels to prevent rain from getting inside the outdoor unit.

   [Removing the service panel].

   (1) Remove the two mounting screws.

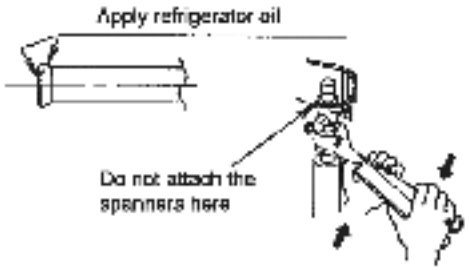
   (2) Slide the service panel downward to release the pawls.

   After this, pull the service panel toward you to remove it.



3. 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)		

4. 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.
5. Air purge within connection piping shall be carried out by evacuation.

6. HEAT INSULATION

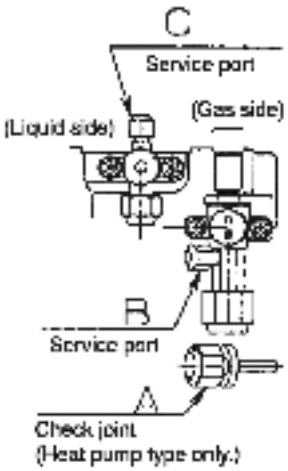
⚠ Caution	Use a material with good heat-resistant properties as the heat insulation for the pipes. Be sure to insulate both the gas-side and liquid-side pipes. If the pipes are not adequately insulated, condensation or water leakages may occur.

Liquid-side pipes	Material that can withstand 120°C or higher
Gas-side pipes	

7. 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-W18BBP5	CU-V18BBP5	0.02kg/m	40m
CU-W24BBP5	CU-V24BBP5 CU-V24BBP8	0.02kg/m	50m
CU-W28BBP5 CU-W28BBP8 CU-W34BBP9 CU-W49BBP8	CU-V28BBP5 CU-V28BBP8 CU-V34BBP9 CU-V49BBP8	0.05kg/m	



- Pump down operation
  - Operate the pump down according to the following procedures.

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. Set the liquid side 3-way valve to the close position and until when the gauge indicates at 0.1Mpa (1kg/cm²G). 4. Immediately set the gas side valve to the close position and press the COOL switch (stop the operation unit)	When the valve is shut halfway, the compressor is occasionally damaged.

The pump down is completed above.

CHECKING THE 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.

Heat pump model

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

Cooling model only

	C	B
During cooling operation	High pressure	Low pressure

8. ELECTRICAL WIRING

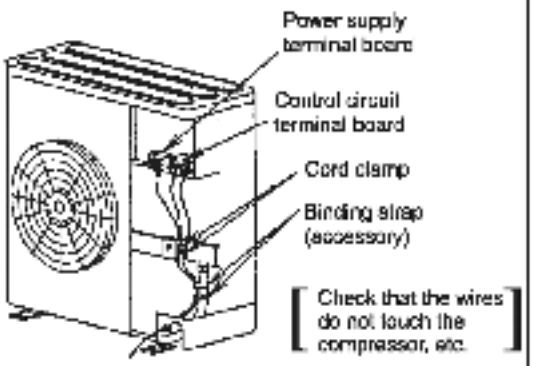
⚠ Warning	The units must be connected to the supply cables for fixed wiring by qualified technician. Feed the power source to the unit via a distribution switch board designed for this purpose, the switch should disconnected all poles with a contact separation of at least 3mm. When the supply cable is damaged, it must be replaced by qualified technician.
⚠ Caution	Be sure to install a current leakage breaker, main switch and fuse to the main power supply, otherwise electric shocks may result.
⚠ Caution	Be sure to connect the unit to secure earth connection. If the earthing work is not carried out properly, electric shocks may result. ⏚
⚠ Warning	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.

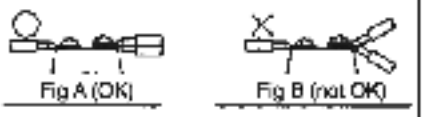
- Connect the power supply wiring and indoor/outdoor unit connection wiring according to the electrical circuit diagram instructions.
- Clamp the wires securely to the terminal connections using cord clamps so that no undue force is placed on the wires.
- Once all wiring work has been completed, tie 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 valve 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).



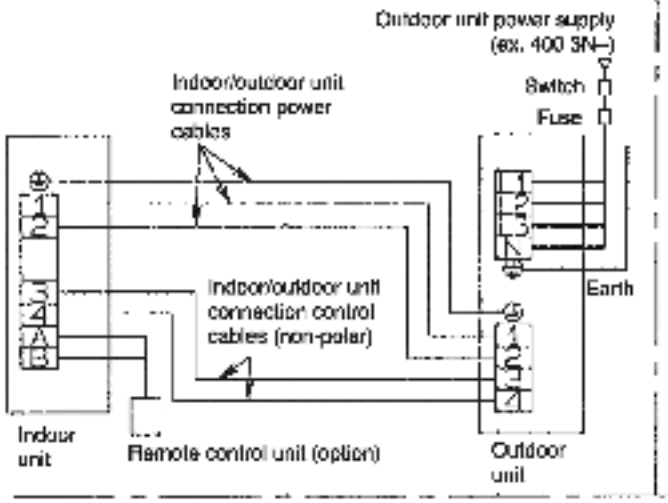


⚠ Warning	Use only the specified cables for wiring connections. Connect the cable securely, and secure them properly so that no undue force will be applied to the terminal connections. If the terminals are loose or if the wires are not connected securely, fire may result.

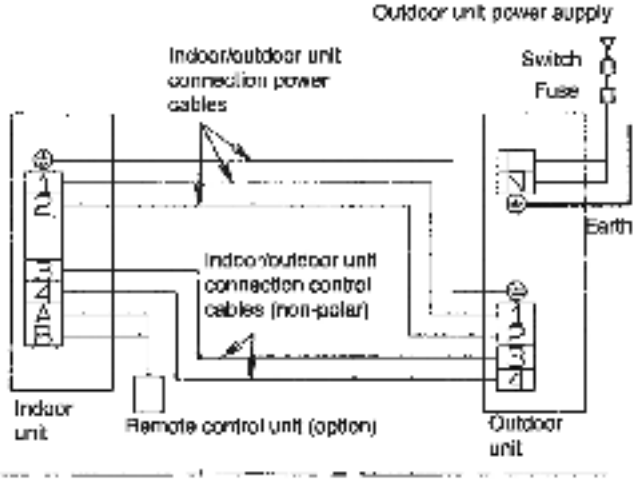
Terminal screw	Tightening torque N•cm {kgf•cm}
M3	69~98 {7~10}
M4	157~196 {16~20}
M5	196~245 {20~25}

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	4mm² cable based on length (m)	Indoor/outdoor unit connection power cables (terminals ①②⏚)	Indoor/outdoor unit connection power cables (terminals ③④)	Maximum permissible impedance (Ω)
				Switch (A)	Fuse (A)					
CU-W18BB25	CU-V18BB25	220V-240V~	20	20	20		17			0.04
CU-W24BB25	CU-V24BB25	220V-240V~	30	30	30		13			0.04
	CU-V24BB28	380V-415V 3N~	10	10	10		41			0.025
CU-W28BB25	CU-V28BB25	220V-240V~	30	30	30	4mm²	11	2.5mm² x 3	1.0mm² x 2	0.04
CU-W28BB28	CU-V28BB28	380V-415V 3N~	10	10	10		38			0.025
CU-W34BB28	CU-V34BB28	380V-415V 3N~	15	15	15		25			0.025
CU-W43BB28	CU-V43BB28	380V-415V 3N~	20	20	20		20			0.025

NOTE

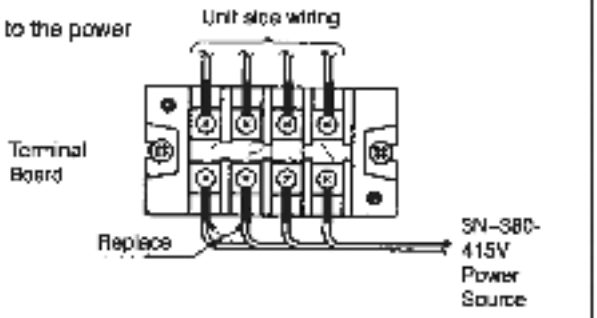
1. Where ground work (earth) is carried out, do not connect the ground return to the gas pipe, water line pipe, grounded circuit of the telephone and lightning rod, or ground circuit of other product in which earth leakage breaker is incorporated. (Such action is prohibited by statute, etc.)
2. In order 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.

9. 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

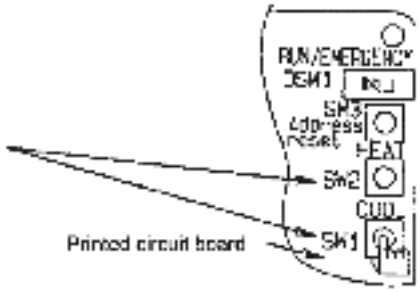
- Never operate the unit by pressing the electromagnetic switch.
- Never correct the phase by switching over any of the wires inside the unit.



10. 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 circuit-breaker 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.)

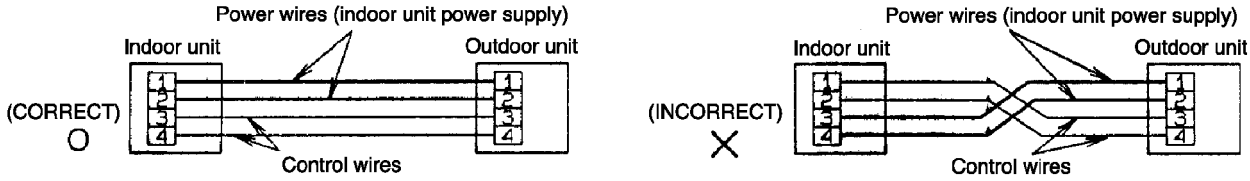


✳ The compressor will stop momentarily when the operation mode is changed.

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.

11. 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 blow-out air.
  - ❑ Smooth flow of the drain
  - ❑ Reliable thermal insulation
  - ❑ Leakage of refrigerant
  - ❑ Mistake in wiring
  - ❑ Reliable connection of the grand wire
  - ❑ Looseness in terminal screw, fastening torque

    M3… 69-98N•cm{7-10kgf•cm} M4…157-196N•cm{16-20kgf•cm}
    M5…196-245N•cm{20-25kgf•cm}

12. 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.

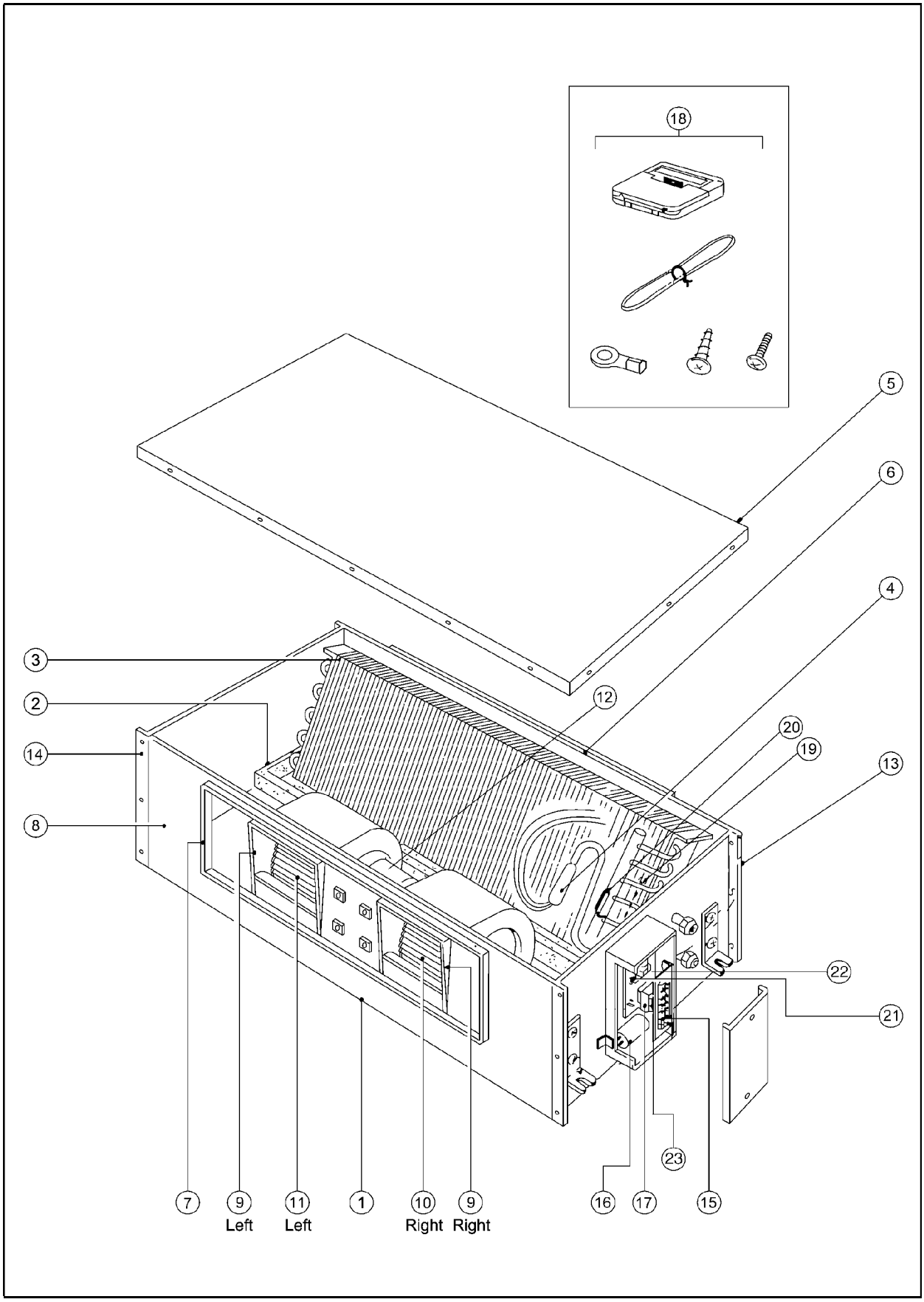
13. AS TO PARTS TO BE SOLD SEPARATELY

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.

28 REPLACEMENT PARTS

28.1. INDOOR UNIT

CS-W24BD2P, CS-W28BD2P, CS-W34BD2P, CS-W43BD2P



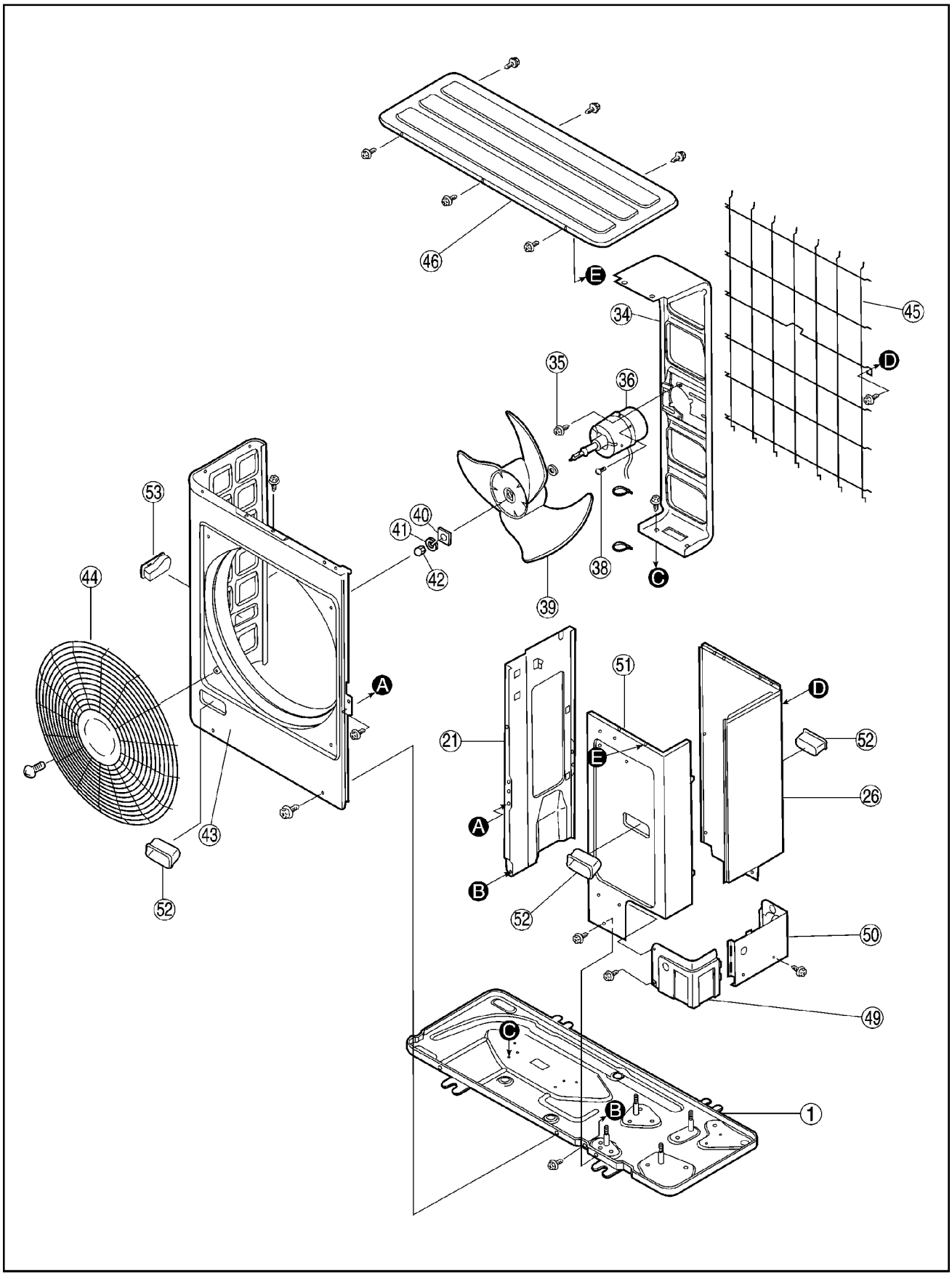
CS-W24BD2P, CS-W28BD2P, CS-W34BDP, CS-W43BD2P

REF. NO.	PARTS NAME	PARTS NUMBER	QUANTITY PER 1 UNIT			
			CS-W24BD2P	CS-W28BD2P	CS-W34BD2P	CS-W43BD2P
1	Cabinet (Bottom)	P42-T02170	----	----	1	1
		P42-T03010	1	1	----	----
2	Drain pan	P42-T02370	1	1	----	----
		P42-T02700	----	----	1	1
3	Evaporator	P45-T07300	1	1	----	----
		P45-T07310	----	----	1	----
		P45-T07320	----	----	----	1
4	Distributor ass'y.	P45-T07150	1	----	----	----
		P45-T07160	----	1	----	----
		P45-T07170	----	----	1	----
		P45-T07180	----	----	----	1
5	Cabinet (Top)	P02-T07490	----	----	1	1
		P02-T07570	1	1	----	----
6	Cabinet (Rear)	P42-T03380	1	1	----	----
		P42-T03400	----	----	1	1
7	Duct flange ass'y.	P42-T02150	----	----	1	1
	(Outlet)	P42-T02390	1	1	----	----
8	Fan Base ass'y	P45-T04270	----	----	1	1
		P45-T04490	1	1	----	----
9	Casing ass'y	P45-T04260	----	----	2	2
10	Casing R ass'y.	P45-T06760	1	1	----	----
11	Casing L ass'y.	P45-T06770	1	1	----	----
12	Fan motor	P06-T04311	1	1	----	----
		P06-T04321	----	----	1	----
		P06-T04331	----	----	----	1
13	Panel side R ass'y.	P42-T02980	----	----	1	1
		P42-T03300	1	1	----	----
14	Panel side L ass'y.	P42-T02200	----	----	1	1
		P42-T03000	1	1	----	----
15	Terminal board	P06-T04680	1	1	1	1
16	Capacitor	P06-T04630	1	----	----	1
		P06-T04640	----	1	1	----
		P06-T04660	----	----	----	1
17	Transformer	P06-T04300	1	1	1	1
18	Remote control (P)	A75C2240	1	1	1	1
19	Thermistor ass'y.	06-854510	1	1	1	1
20	Coil sensor	06-853760	1	1	1	1
21	PCB assembly	A53D003A	1	1	1	1
22	Noise filter	A491018 (P46-T06120	1	1	1	1
23	PCB fuse (250V T3.15A)	----	1	1	1	1
24	Fuse (250V T5A)	P06-T04740	----	----	1	1

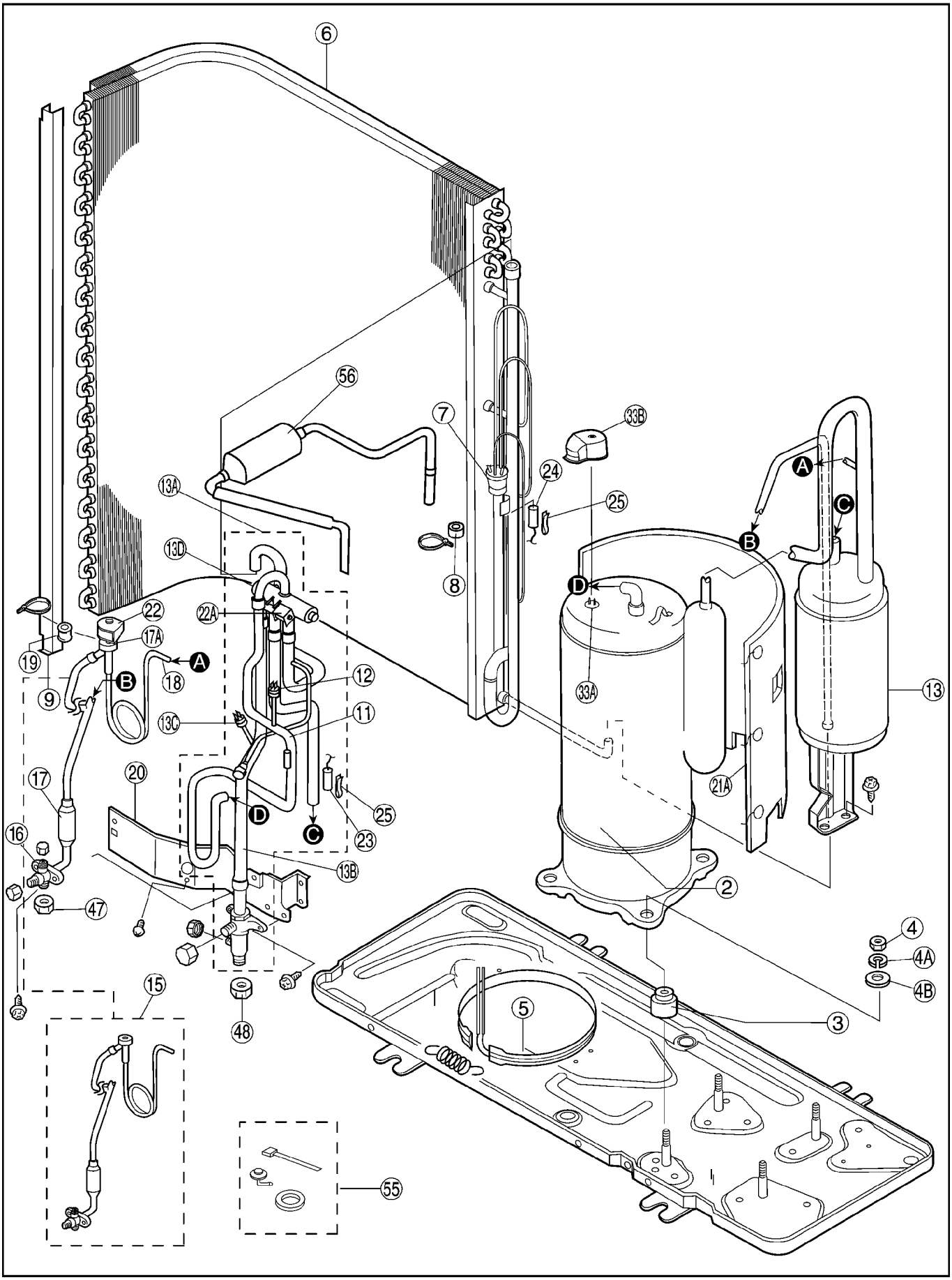
All parts are supplied by Taiwan (Tamaco).

28.2. OUTDOOR UNIT

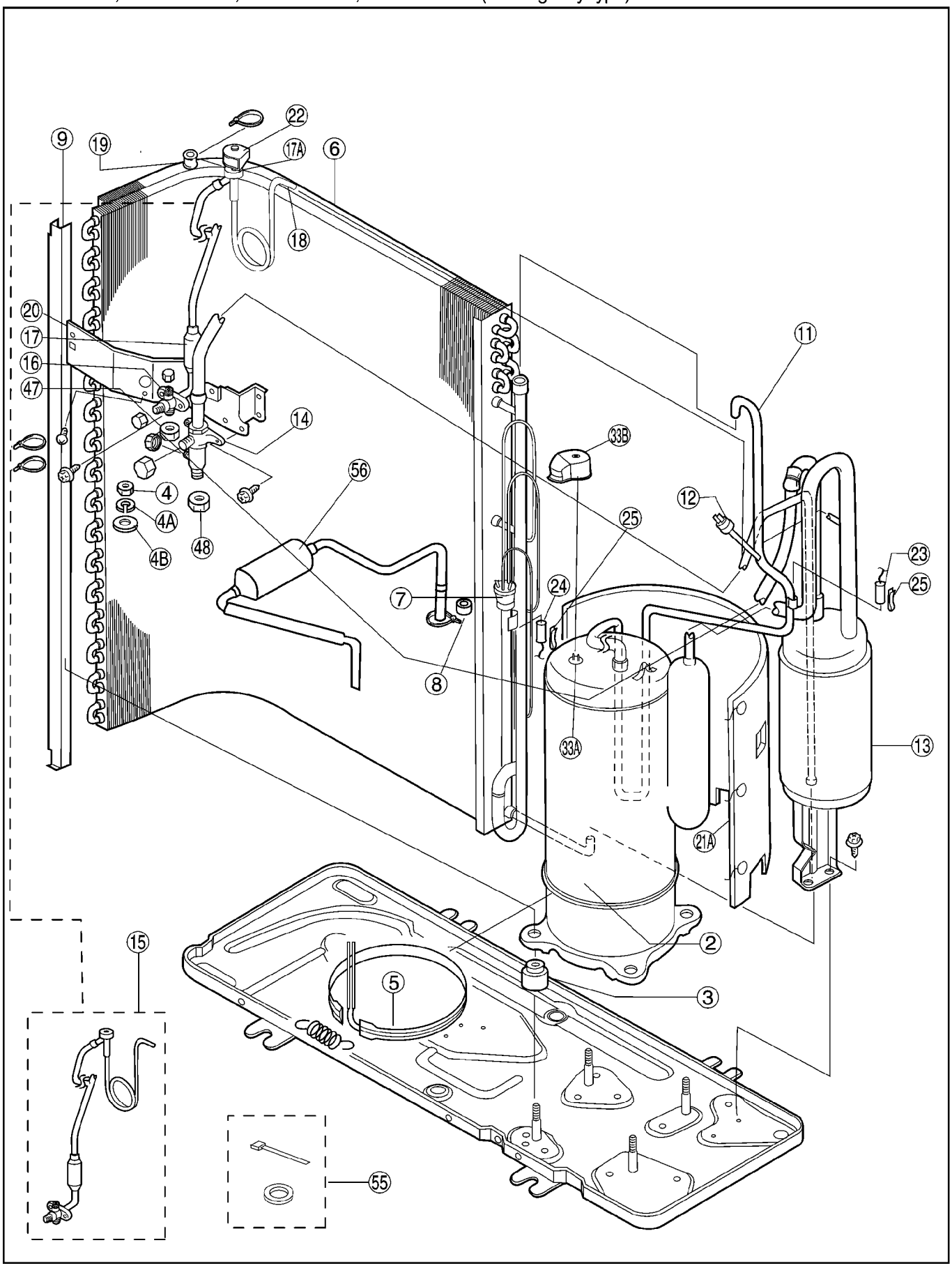
CU-W24BBP5, CU-V24BBP5,
CU-W28BBP5, CU-W28BBP8, CU-V28BBP5, CU-V28BBP8



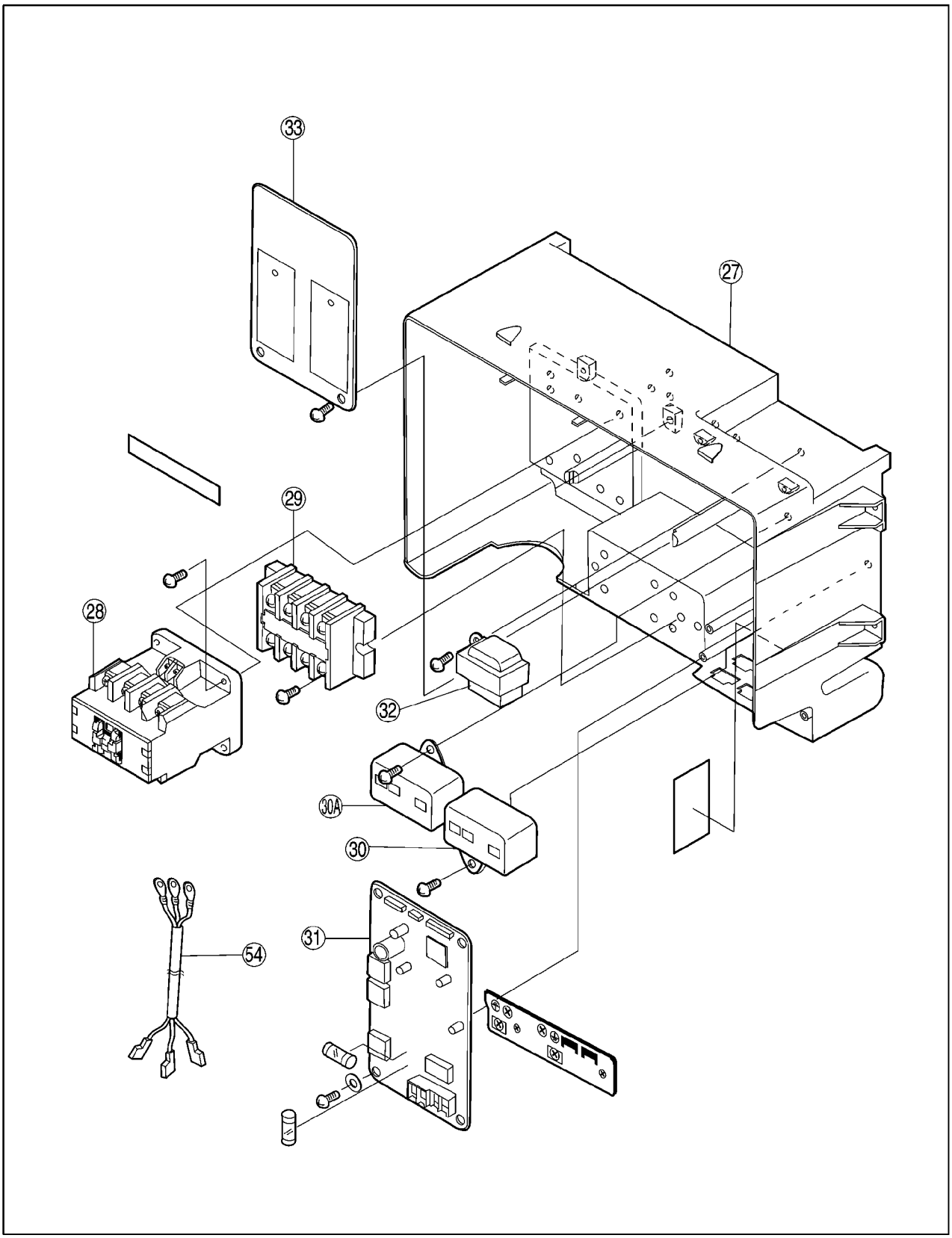
CU-W24BBP5, CU-W28BBP5, CU-W28BBP8 (Heat pump type)



CU-V24BBP5, CU-V24BBP8, CU-V28BBP5, CU-V28BBP8 (Cooling only type)



CU-W24BBP5, CU-V24BBP5,
CU-W28BBP5, CU-W28BBP8, CU-V28BBP5, CU-V28BBP8



CU-W24BBP5, CU-W28BBP5, CU-W28BBP8

NO.	PART DESCRIPTION	QTY.	CU-W24BBP5	CU-W28BBP5	CU-W28BBP8
1	BASE PAN ASS'Y	1	CWD52K1038A	←	←
2	COMPRESSOR	1	NE41VNHMT	NE44VNHMT	NE44YDNMT
3	ANTI-VIBRATION BUSHING	4	CWH501018	←	←
4	NUT FOR COMP. MOUNT.	3	XNG8	←	←
4a	WASHER for COMPRESSOR	3	XWA8	←	←
4b	SP WASHER	3	CWH571018	←	←
5	CRANKCASE HEATER	1	CWA341005	←	←
6	CONDENSER COMPLETE	1	CWB32C1194	CWB32C1195	←
7	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1073	CWT07K1074	←
8	PIPE HOLDER RUBBER	1	CWG251016	←	←
9	CONDENSER SIDE PLATE	1	CWD911122	←	←
11	TUBE ASS'Y (PRESSURE SWITCH)	1	CWT022593	←	←
12	HIGH PRESSURE SWITCH	1	CWA101003	←	←
13	ACCUMULATOR	1	CWB131007A	CWB131008A	←
13a	4-WAYS VALVE COMPLETE	1	CWB00C1005	CWB00C1006	←
13b	TUBE ASS'Y (PRESS.SW + VALVE)	1	CWT022595	←	←
13c	HEATING PRESSURE SWITCH	1	CWA101004	←	←
13d	4-WAYS VALVE	1	CWB00003	←	←
15	TUBE ASS'Y (VALVE+STRAINER)	1	CWT022627	CWT022628	←
16	3-WAYS VALVE	1	CWB011089	CWB011090	←
17	STRAINER	1	CWB111005	←	←
17a	2-WAYS VALVE	1	-	CWB02229	←
18	CAPILLARY TUBE for VALVE	1	CWB15K1065	CWB15K1037	←
19	PIPE HOLDER RUBBER	1	CWG251013	←	←
20	HOLDER-SERVICE VALVE	1	CWD911124	←	←
21	SOUND-PROOF BOARD ASS'Y	1	CWH151016	←	←
21a	SOUND PROOF MATERIAL-COMP	1	CWG302098	←	←
22	V-COIL COMPLETE	1	-	CWA43C2068	←
22a	V-COIL COMPLETE (4 WAY VALVE)	1	CWA43C2060	←	←
23	PIPING SENSOR (DISCHARGE)	1	CWA501042	←	←
24	PIPING SENSOR (COIL)	1	CWA501043	←	←
25	SPRING FOR SENSOR	2	CWH711010	←	←
26	CABINET REAR PLATE	1	CWE02C1005	←	←
27	CONTROL BOARD	1	CWH141004	←	←
28	COMPRESSOR RELAY	1	CWA001005	←	CWA001007
29	TERMINAL BOARD ASS'Y	1	CWA28K1027	←	CWA28K1029
30	CAPACITOR-FAN MOTOR	1	DS461305QP-A (3.0/460)	←	←
30a	CAPACITOR-COMP (MF/V)	1	DS441456CPNB (45/440)	DS441506CPNB (50/440)	-
31	ELECTRONIC CONTROLLER	1	CWA742583	←	CWA742584
32	TRANSFORMER	1	CWA401029	←	←
33	CURRENT TRANSFORMER BOARD	1	CWA742592	CWA742591	CWA742592
33a	OVERLOAD PROTECTOR	1	-	-	CWA121075
33b	TERMINAL COVER	1	CWH171019	←	CWH171022
34	BRACKET FAN MOTOR	1	CWD541027	←	←
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←	←
36	FAN MOTOR	1	CWA951078	←	←
38	SCREW-FAN MOTOR	4	CWH55442	←	←
39	PROPELLER FAN	1	CWH001007	←	←
40	WASHER for P.FAN	1	CWH571013	←	←
41	SPRING WASHER for P.FAN	1	XWB10B	←	←
42	NUT for PROPELLER FAN	1	CWH56033	←	←
43	P.FAN AIR GUIDER PLATE	1	CWE061036A	←	←
44	FAN GUARD	1	CWD041014A	←	←
45	CONDENSER GUARD	1	CWD041015A	←	←
46	CABINET TOP PLATE COMPLETE	1	CWE03C1004	←	←
47	FLARE NUT (1/4") / (3/8")	1	CWH6002140	CWT25005	←
48	FLARE NUT (5/8")	1	CWT25004	←	←
49	PIPE COVER (FRONT)	1	CWD601017A	←	←
50	PIPE COVER (BACK)	1	CWD601018A	←	←
51	CABINET FRONT PLATE	1	CWE06C1033	←	←
52	HANDLE	3	CWE161008	←	←
53	HANDLE	1	CWE161009	←	←
54	LEADWIRE-COMPRESSOR	1	CWA67C3657	←	CWA67C3665
55	ACCESSORY COMPLETE	1	CWH82C1105	←	←
	INSTALLATION INSTRUCTION	1	CWF612270	←	←
56	DRYER	1	CWB101013	CWB101014	←

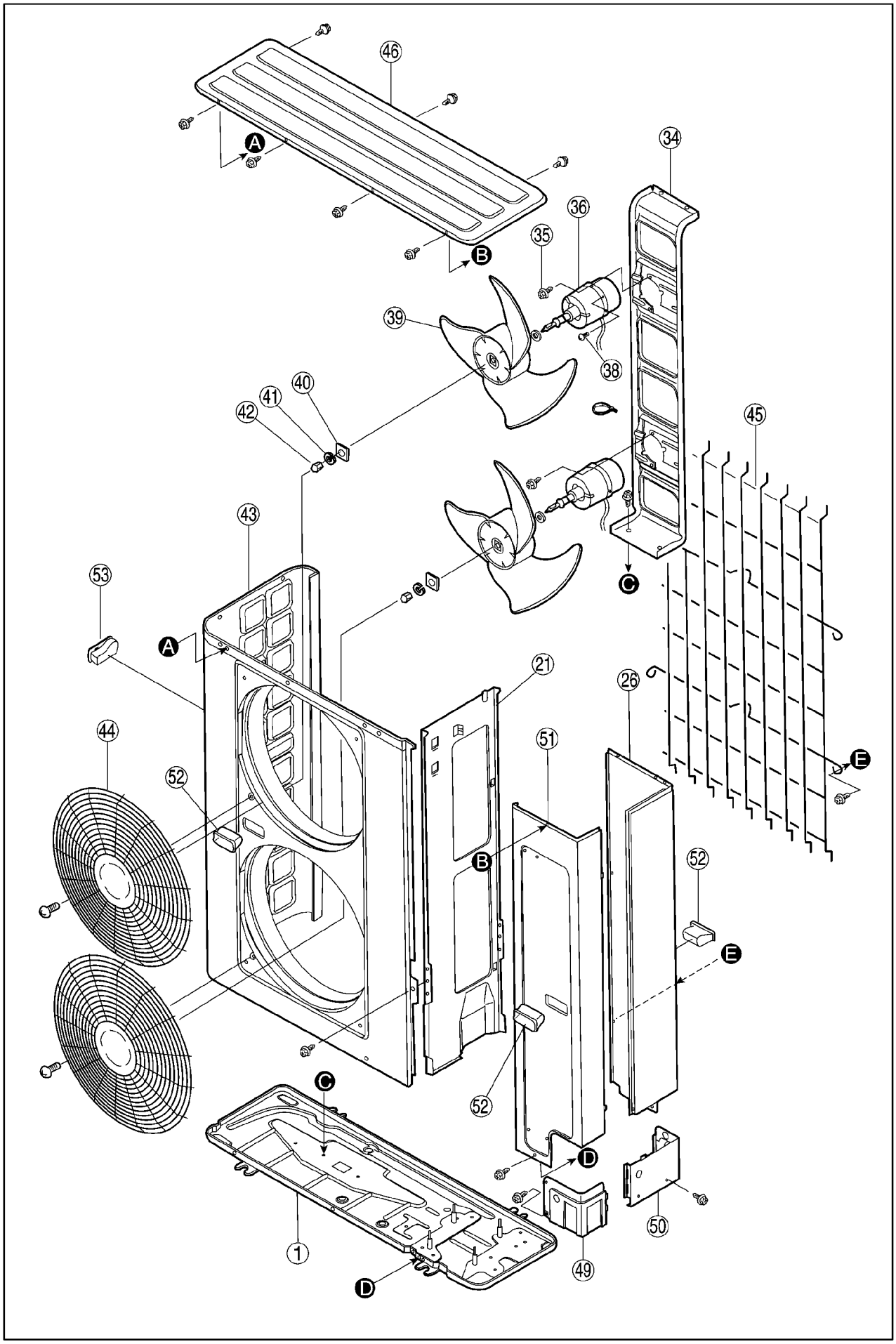
All parts are supplied from MACC Malaysia (Vendor Code : 086)

CU-V24BBP5, CU-V24BBP8, CU-V28BBP5, CU-V28BBP8

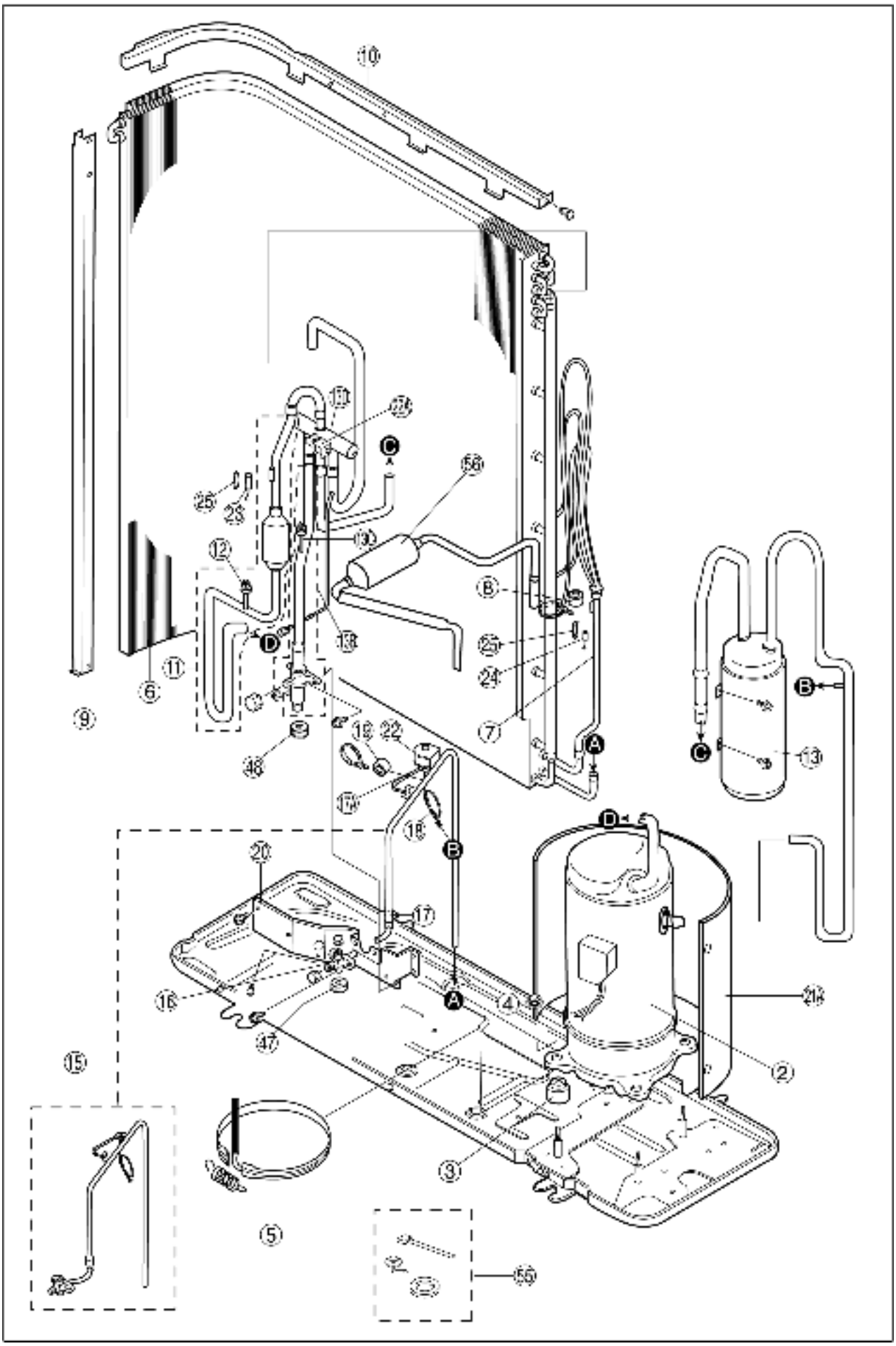
NO.	PART DESCRIPTION	QTY.	CU-V24BBP5	CU-V24BBP8	CU-V28BBP5	CU-V28BBP8
1	BASE PAN ASS'Y	1	CWD52K1038A	←	←	←
2	COMPRESSOR	1	NE41VNHMT	NE41YDNMT	NE44VNHMT	NE44YDNMT
3	ANTI-VIBRATION BUSHING	4	CWH501018	←	←	←
4	NUT FOR COMP. MOUNT.	3	XNG8	←	←	←
4a	WASHER for COMPRESSOR	3	XWA8	←	←	←
4b	SP WASHER	3	CWH571018	←	←	←
5	CRANKCASE HEATER	1	CWA341005	←	←	←
6	CONDENSER COMPLETE	1	CWB32C1189	←	CWB32C1190	←
7	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1078	←	CWT07K1081	←
8	PIPE HOLDER RUBBER	1	CWG251016	←	←	←
9	CONDENSER SIDE PLATE	1	CWD911122	←	←	←
11	TUBE ASS'Y (PRESSURE SWITCH)	1	CWT022584	←	←	←
12	HIGH PRESSURE SWITCH	1	CWA101003	←	←	←
13	ACCUMULATOR	1	CWB131007A	←	CWB131008A	←
14	TUBE ASS'Y (3 WAYS VALVE)	1	CWT022585	←	CWT022591	←
15	TUBE ASS'Y (VALVE+STRAINER)	1	CWT022583	←	CWT022589	←
16	3-WAYS VALVE	1	CWB011087	←	←	←
17	STRAINER	1	NOT AVAILABLE	←	←	←
17a	2-WAYS VALVE	1	-	-	CWB02299	←
18	CAPILLARY TUBE for VALVE	1	CWB15K1065	←	CWB15K1068	←
19	PIPE HOLDER RUBBER	1	CWG251013	NOT AVAILABLE	CWG251013	←
20	HOLDER-SERVICE VALVE	1	CWD911124	←	←	←
21	SOUND-PROOF BOARD ASS'Y	1	CWH151016	←	←	←
21a	SOUND PROOF MATERIAL-COMP	1	CWG302098	←	←	←
22	V-COIL COMPLETE	1	-	-	CWA43C2068	←
23	PIPING SENSOR (DISCHARGE)	1	CWA501042	←	←	←
24	PIPING SENSOR (COIL)	1	CWA501043	←	←	←
25	SPRING FOR SENSOR	2	CWH711010	←	←	←
26	CABINET REAR PLATE	1	CWE02C1005	←	←	←
27	CONTROL BOARD	1	CWH141004	←	←	←
28	COMPRESSOR RELAY	1	CWA001005	CWA001007	CWA001005	CWA001007
29	TERMINAL BOARD ASS'Y	1	CWA28K1027	CWA28K1029	CWA28K1027	CWA28K1029
30	CAPACITOR-FAN MOTOR	1	DS461305QP-A (3.0/460)	←	←	←
30a	CAPACITOR-COMP (MF/V)	1	DS441456CPNB (45/440)	-	DS441506CPNB (50/440)	-
31	ELECTRONIC CONTROLLER	1	CWA742587	CWA742588	CWA742587	CWA742588
32	TRANSFORMER	1	CWA401029	←	←	←
33	CURRENT TRANSFORMER BOARD	1	CWA742592	←	CWA742591	CWA742592
33a	OVERLOAD PROTECTOR	1	-	CWA121075	-	CWA121075
33b	TERMINAL COVER	1	CWH171019	CWH171022	CWH171019	CWH171022
34	BRACKET FAN MOTOR	1	CWD541027	←	←	←
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←	←	←
36	FAN MOTOR	1	CWA951078	←	←	←
38	SCREW-FAN MOTOR	4	CWH55442	←	←	←
39	PROPELLER FAN	1	CWH001007	←	←	←
40	WASHER for P.FAN	1	CWH571013	←	←	←
41	SPRING WASHER for P.FAN	1	XWB10B	←	←	←
42	NUT for PROPELLER FAN	1	CWH56033	←	←	←
43	P.FAN AIR GUIDER PLATE	1	CWE061036A	←	←	←
44	FAN GUARD	1	CWD041014A	←	←	←
45	CONDENSER GUARD	1	CWD041015A	←	←	←
46	CABINET TOP PLATE COMPLETE	1	CWE03C1004	←	←	←
47	FLARE NUT (1/4") / (3/8")	1	CWH6002140	←	CWT25005	←
48	FLARE NUT (5/8")	1	CWT25004	←	←	←
49	PIPE COVER (FRONT)	1	CWD601017A	←	←	←
50	PIPE COVER (BACK)	1	CWD601018A	←	←	←
51	CABINET FRONT PLATE	1	CWE06C1033	←	←	←
52	HANDLE	3	CWE161008	←	←	←
53	HANDLE	1	CWE161009	←	←	←
54	LEADWIRE-COMPRESSOR	1	CWA67C3657	CWA67C3665	CWA67C3657	CWA67C3665
55	ACCESSORY COMPLETE	1	CWH82C1105	←	←	←
	INSTALLATION INSTRUCTION	1	CWF612270	←	←	←
56	DRYER	1	CWB101013	←	CWB101014	←

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

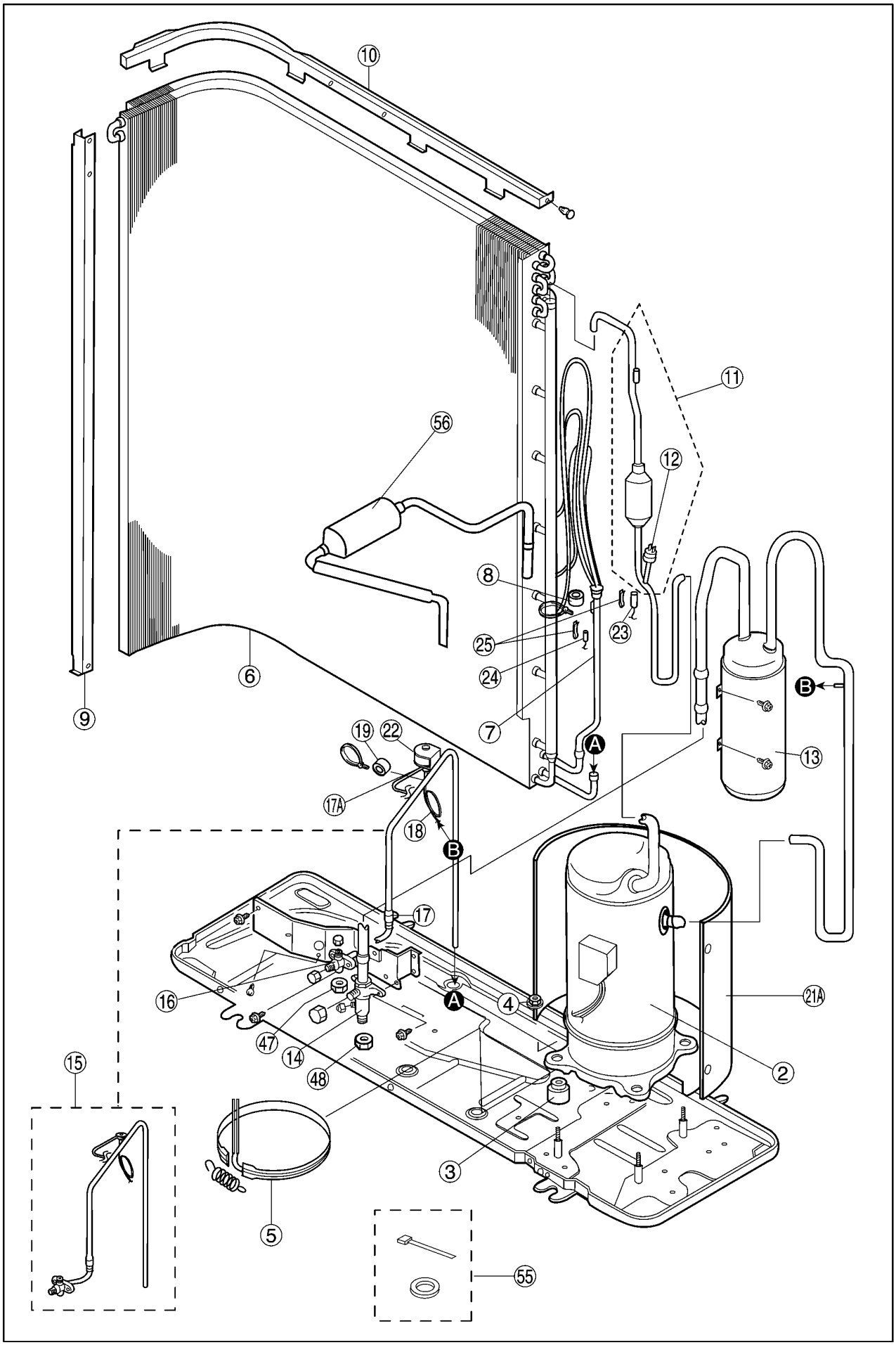
CU-W34BBP8, CU-V34BBP8, CU-W43BBP8, CU-V43BBP8



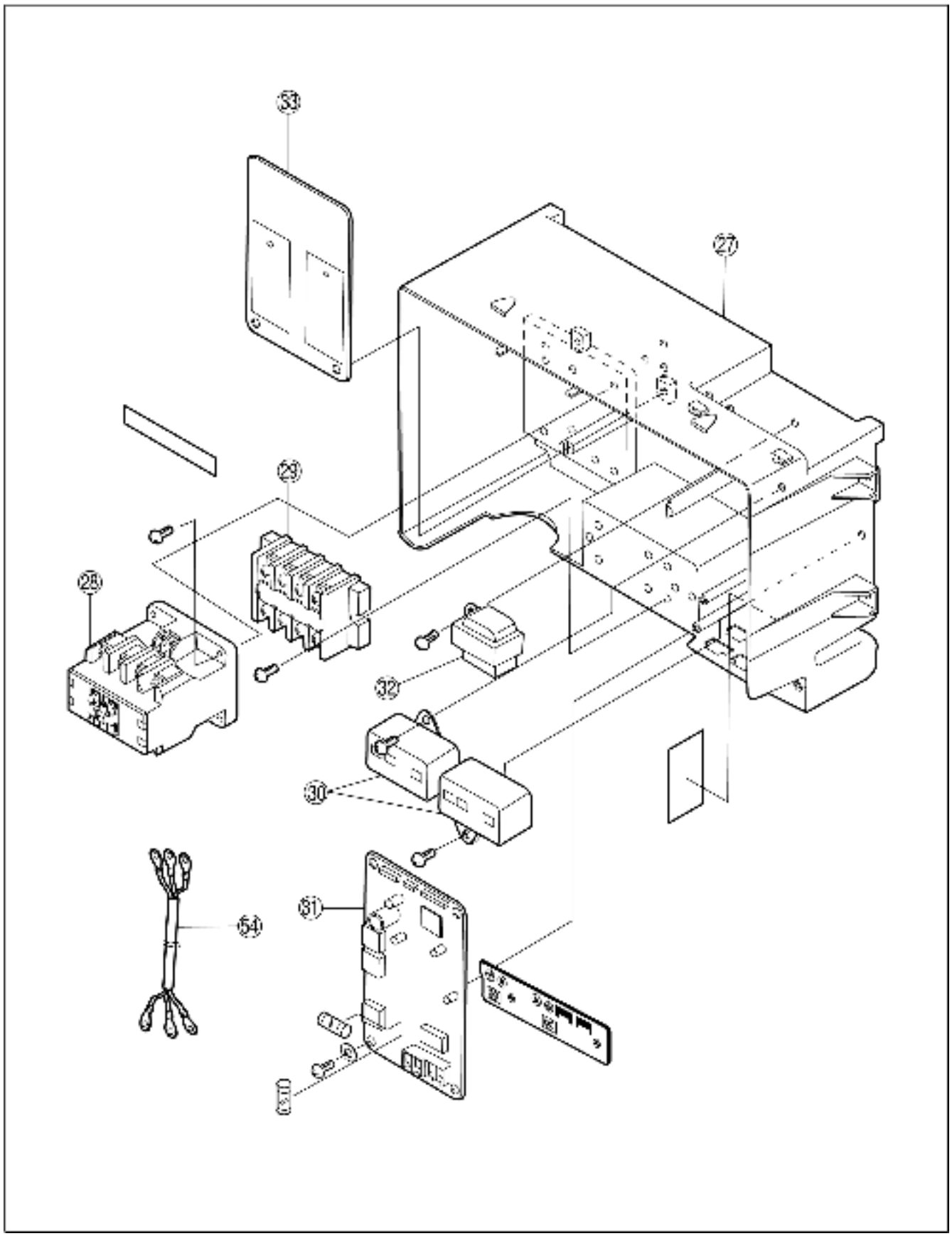
CU-W34BBP8, CU-W43BBP8 (Heat pump type)



CU-V34BBP8, CU-V43BBP8 (Cooling only type)



CU-W34BBP8, CU-V34BBP8, CU-W43BBP8, CU-V43BBP8



CU-W34BBP8, CU-W43BBP8

NO.	PART DESCRIPTION	QTY.	CU-W34BBP8	CU-W43BBP8
1	BASE PAN ASS'Y	1	CWD52K1039A	CWD52K1040A
2	COMPRESSOR	1	ZR48KCE-TFD	ZR57KCE-TFD
3	ANTI-VIBRATION BUSHING	4	CWH501020	←
4	NUT FOR COMP. MOUNT.	3	CWH4582065	←
5	CRANKCASE HEATER	1	CWA341004	CWA341002
6	CONDENSER COMPLETE	1	CWB32C1196	CWB32C1197
7	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1075	CWT07K1076
8	PIPE HOLDER RUBBER	1	CWG251016	CWG251021
9	CONDENSER SIDE PLATE	1	CWD911123	←
10	CONDENSER TOP PLATE	1	CWD911132	CWD911133
11	TUBE ASS'Y (PRESSURE SWITCH)	1	CWT022615	CWT022618
12	HIGH PRESSURE SWITCH	1	CWA101003	←
13	ACCUMULATOR	1	CWB13K1022	CWB13C1020
13b	TUBE ASS'Y (PRESS.SW + VALVE)	1	CWT022617	CWT022620
13c	HEATING PRESSURE SWITCH		CWA101004	←
13d	4-WAYS VALVE	1	CWB001014	CWB001015
15	TUBE ASS'Y (VALVE+STRAINER)	1	CWT022629	←
16	3-WAYS VALVE		CWB011091	←
17	STRAINER		CWB111005	←
17a	2-WAYS VALVE		CWB02299	←
18	CAPILLARY TUBE for VALVE	1	CWB15K1037	CWB15K1039
19	PIPE HOLDER RUBBER	1	CWG251015	←
20	HOLDER-SERVICE VALVE	1	CWD911131	←
21	SOUND-PROOF BOARD ASS'Y	1	CWH15K1010	←
21a	SOUND PROOF MATERIAL-COMP.	1	CWG302101	CWG302103
22	V-COIL COMPLETE	1	CWA43C2067	←
22a	V-COIL COMPLETE-4 WAY VALVE	1	CWA43C2063	←
23	PIPING SENSOR (DISCHARGE)	1	CWA501044	←
24	PIPING SENSOR (COIL)	1	CWA501045	←
25	SPRING FOR SENSOR	2	CWH711010	←
26	CABINET REAR PLATE	1	CWE021012A	CWE02C1010
27	CONTROL BOARD	1	CWH141004	←
28	COMPRESSOR RELAY	1	CWA001005	←
29	TERMINAL BOARD ASS'Y	1	CWA28K1029	←
30	CAPACITOR-FAN MOTOR	2	DS461305QP-A (3.0/460)	DS461355QP-A (3.5/460)
31	ELECTRONIC CONTROLLER	1	CWA742585	←
32	TRANSFORMER	1	CWA401029	←
33	CURRENT TRANSFORMER BOARD	1	CWA742592	←
34	BRACKET-FAN MOTOR	1	CWD541028	←
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←
36	FAN MOTOR	2	CWA951078	←
38	SCREW-FAN MOTOR	8	CWH55442	←
39	PROPELLER FAN	2	CWH001007	←
40	WASHER for P.FAN	2	CWH571013	←
41	SPRING WASHER for P.FAN	2	XWB10B	←
42	NUT for PROPELLER FAN	2	CWH56033	←
43	P.FAN AIR GUIDER PLATE	1	CWE061042A	CWE061044A
44	FAN GUARD	2	CWD041014A	←
45	CONDENSER GUARD	1	CWD041016A	CWD041017A
46	CABINET TOP PLATE COMPLETE	1	CWE03C1004	CWE03C1005
47	FLARE NUT (3/8")	1	CWT25005	←
48	FLARE NUT (6/8")	1	CWT251012	←
49	PIPE COVER (FRONT)	1	CWD601017A	←
50	PIPE COVER (BACK)	1	CWD601018A	←
51	CABINET FRONT PLATE	1	CWE061046A	←
52	HANDLE	3	CWE161008	←
53	HANDLE	1	CWE161009	←
54	LEADWIRE-COMPRESSOR	1	CWA67C3656	←
55	ACCESSORY COMPLETE	1	CWH82C1105	←
	INSTALLATION INSTRUCTION	1	CWF612270	←
56	DRYER	1	CWB101014	←

The above parts are kept for seven years in accordance with MEI service policy.

CU-V34BBP8, CU-V43BBP8

NO.	PART DESCRIPTION	QTY.	CU-V34BBP8	CU-V43BBP8
1	BASE PAN ASS'Y	1	CWD52K1039A	CWD52K1040A
2	COMPRESSOR	1	ZR48KCE-TFD	ZR57KCE-TFD
3	ANTI-VIBRATION BUSHING	4	CWH501020	←
4	NUT FOR COMP. MOUNT.	3	CW4582065	←
5	CRANKCASE HEATER	1	CWA341004	CWA341002
6	CONDENSER COMPLETE	1	CWB32C1191	CWB32C1192
7	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1079	CWT07K1080
8	PIPE HOLDER RUBBER	1	CWG251016	CWG251021
8	PIPE HOLDER RUBBER	1	CWG251015	←
9	CONDENSER SIDE PLATE	1	CWD911123	←
10	CONDENSER TOP PLATE	1	CWD911132	CWD911133
11	TUBE ASS'Y(PRESSURE SW+RCVR)	1	CWT022607	CWT022611
12	HIGH PRESSURE SWITCH	1	CWA101003	←
13	ACCUMULATOR	1	CWB131014A	CWB131015A
14	TUBE ASS'Y (3 WAY VALVE-GAS)	1	CWT022606	←
15	TUBE ASS'Y (VALVE+STRAINER)	1	CWT022609	←
16	3-WAYS VALVE	1	CWB011091	←
17	STRAINER	1	CWB111010	←
17a	2-WAYS VALVE	1	CWB02299	←
18	CAPILLARY TUBE for VALVE	1	CWB15K1037	CWB15K1039
19	PIPE HOLDER RUBBER	1	CWG251015	←
21	SOUND-PROOF BOARD ASS'Y	1	CWH15K1010	←
21a	SOUND PROOF MATERIAL-COMP.	1	CWG302101	CWG302103
22	V-COIL COMPLETE	1	CWA43C2067	←
23	PIPING SENSOR (DISCHARGE)	1	CWA501044	←
24	PIPING SENSOR (COIL)	1	CWA501045	←
25	SPRING FOR SENSOR	2	CWH711010	←
26	CABINET REAR PLATE	1	CWE021012A	CWE02C1009
27	CONTROL BOARD	1	CWH141004	←
28	COMPRESSOR RELAY	1	CWA001005	←
29	TERMINAL BOARD ASS'Y	1	CWA28K1029	←
30	CAPACITOR-FAN MOTOR	2	DS461305QP-A (3.0/460)	DS461355QP-A (3.5/460)
31	ELECTRONIC CONTROLLER	1	CWA742586	←
32	TRANSFORMER	1	CWA401029	←
33	CURRENT TRANSFORMER BOARD	1	CWA742592	←
34	BRACKET FAN MOTOR	1	CWD541028	←
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←
36	FAN MOTOR	2	CWA951078	←
38	SCREW-FAN MOTOR	8	CWH55442	←
39	PROPELLER FAN	2	CWH001007	←
40	WASHER for P.FAN	2	CWH571013	←
41	SPRING WASHER for P.FAN	2	XWB10B	←
42	NUT for PROPELLER FAN	2	CWH56033	←
43	P.FAN AIR GUIDER PLATE	1	CWE061042A	CWE061044A
44	FAN GUARD	2	CWD041014A	←
45	CONDENSER GUARD	1	CWD041016A	CWD041017A
46	CABINET TOP PLATE COMPLETE	1	CWE03C1004	CWE03C1005
47	FLARE NUT (3/8")	1	CWT25005	←
48	FLARE NUT (6/8")	1	CWT251012	←
49	PIPE COVER (FRONT)	1	CWD601017A	←
50	PIPE COVER (BACK)	1	CWD601018A	←
51	CABINET FRONT PLATE	1	CWE061046A	←
52	HANDLE	3	CWE161008	←
53	HANDLE	1	CWE161009	←
54	LEADWIRE-COMPRESSOR	1	CWA67C3656	←
55	ACCESSORY COMPLETE	1	CWH82C1105	←
	INSTALLATION INSTRUCTION	1	CWF612270	←
56	DRYER	1	CWB101014	←

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