

Service Manual

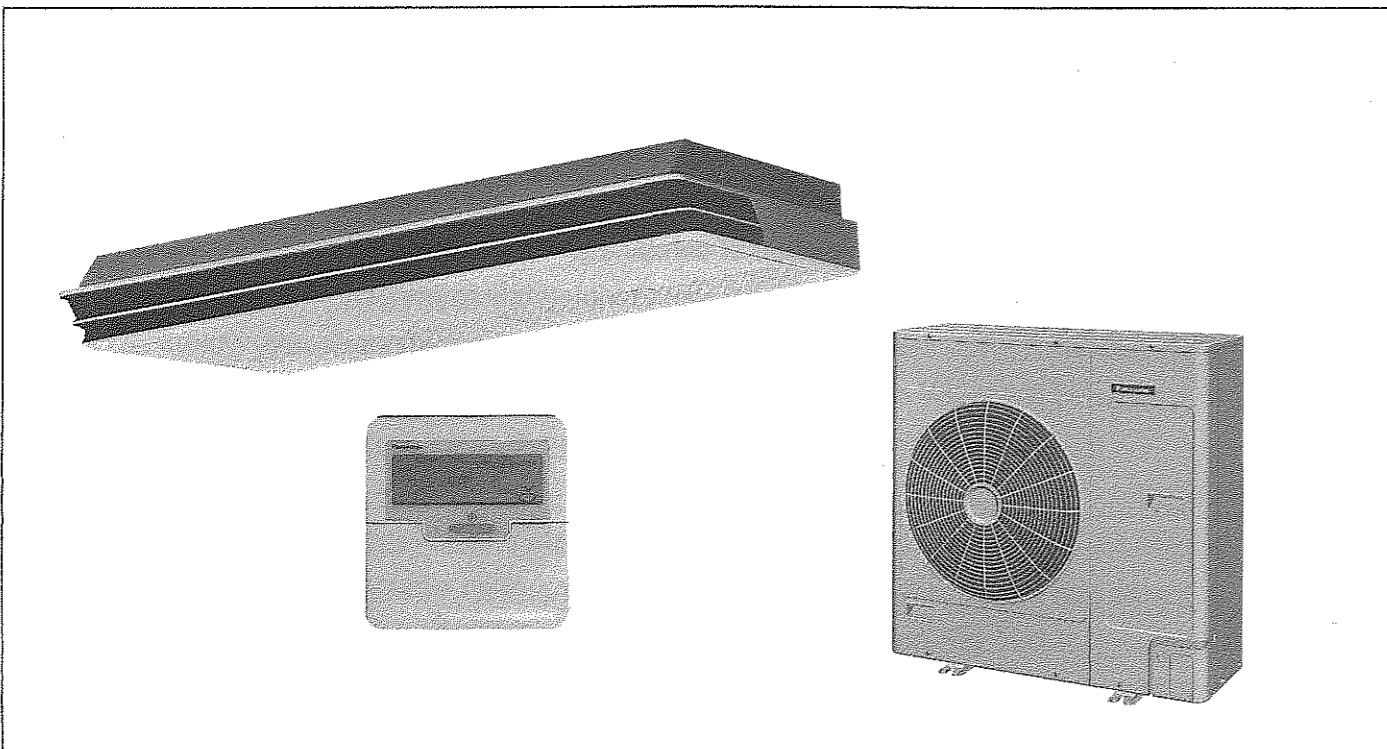
PACKAGED AIR CONDITIONER
CEILING TYPE

■HEAT PUMP MODEL

- | | |
|--------------------------|--------------------------|
| CS-80T32JP(CU-80C52HP) | CS-140T32JP(CU-140C53XP) |
| CS-80T32JP(CU-80C52XP) | CS-160T32JP(CU-160C53XP) |
| CS-112T32JP(CU-112C52XP) | |

■COOLING ONLY MODEL

- | | |
|------------------------|--------------------------|
| CS-50T32JP(CU-50C02HP) | CS-80T32JP(CU-80C02XP) |
| CS-71T32JP(CU-71C02HP) | CS-112T32JP(CU-112C02XP) |
| CS-71T32JP(CU-71C02XP) | CS-140T32JP(CU-140C03XP) |
| CS-80T32JP(CU-80C02HP) | CS-160T32JP(CU-160C03XP) |



Panasonic

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■ SERVICE INFORMATION

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

The new Cassette / new Outdoor models is possible to have address setting for twin /triple control or group control by automatically when main power supply switch 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.

[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.

So, please make sure the address setting.

1. LCD display of wired remote controller had not illuminate even if main power supply switch 'on'.
2. LCD display had indicated as normal illumination when power supply switch on, however outdoor unit can not have any operation.
(But, it is necessary to take 3 to 5 minutes for outdoor unit starting from the timing of remote controller on/off switch 'on'.)
3. P.C.board had memorized wrong setting information.
 - ① If main power supply switch on with wrong connection.
 - ② when change the connection or combination of units due to re-installation etc.
 - when change the system from twin to triple(triple to twin).
 - when change the system from group control to normal one to one system.
 - when made the replacement of units as master and slave etc.

[Caution of test operation]

Do not touch the remote controller switch and also not change the any wiring for one minutes from main power supply switch 'on'.
(Because of the unit having automatic address setting during this initial one minutes.)

[Caution during automatic address setting]

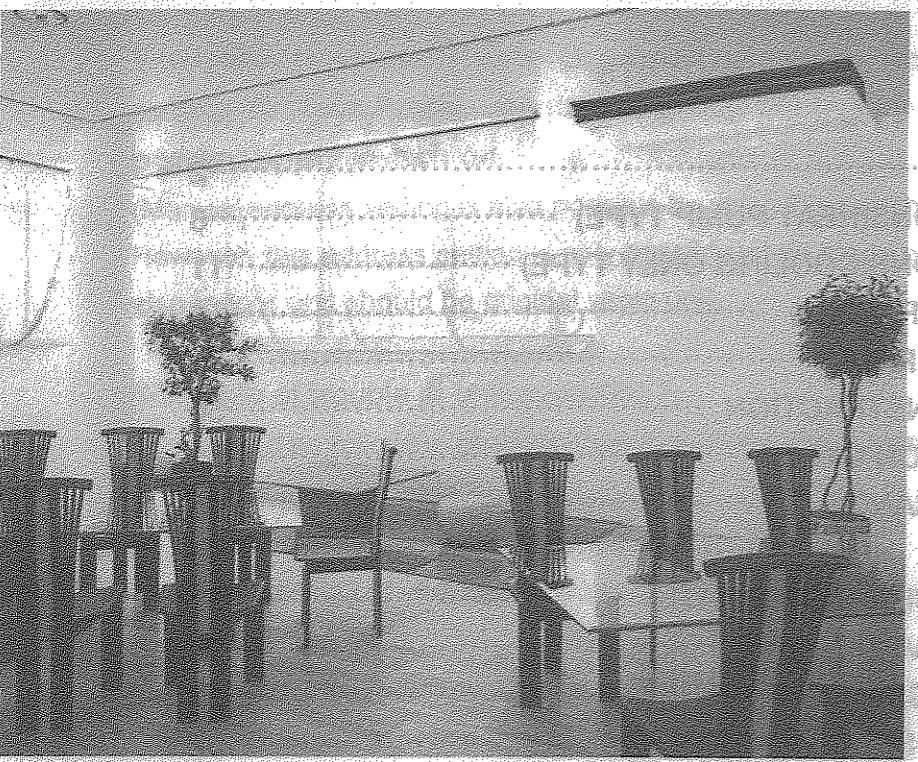
When main power supply switched had took 'on', P.C.board had automatically memorized the connected system.
Consequently, when took initial power supply 'on', it will become no interchangeability of units even same type, same capacity unit.
So, it will not be able to connect the unit to other system.

asystest intelligent "intelligent"

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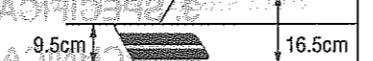
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Variety of excellent features



Slimline and light weight

The thickness is just 16.5 cm. The height appearing above the ceiling surface is 9.5 cm by embedding.



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.

Hot start system (heat pump models)

Dry mode function

Dry mode can make a comfortable indoor environment in the wet season.

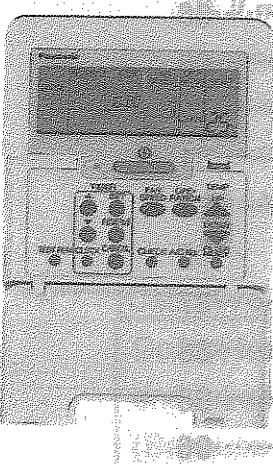
Automatic changeover function (heat pump models)

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

Selectable three air-flow directions

3-way blowing type with cooling and warming air blowing from both sides as well as from the front.

Wired Remote Controller



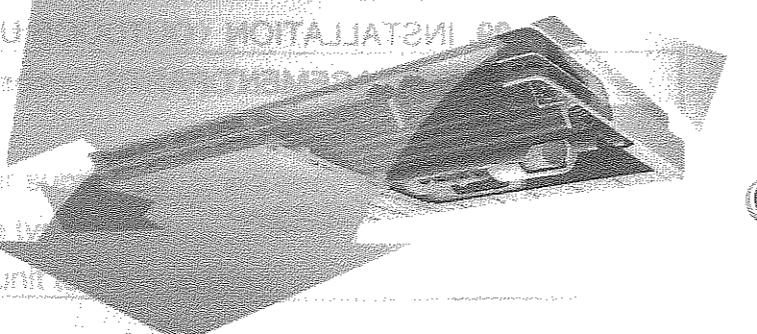
- The new design includes an easily-visible red pilot lamp. The power can be turned on and off at a single touch, without opening the cover.

- Has a built-in thermistor, allowing indoor temperature detection in accordance with indoor conditions by switching with main unit thermistor.

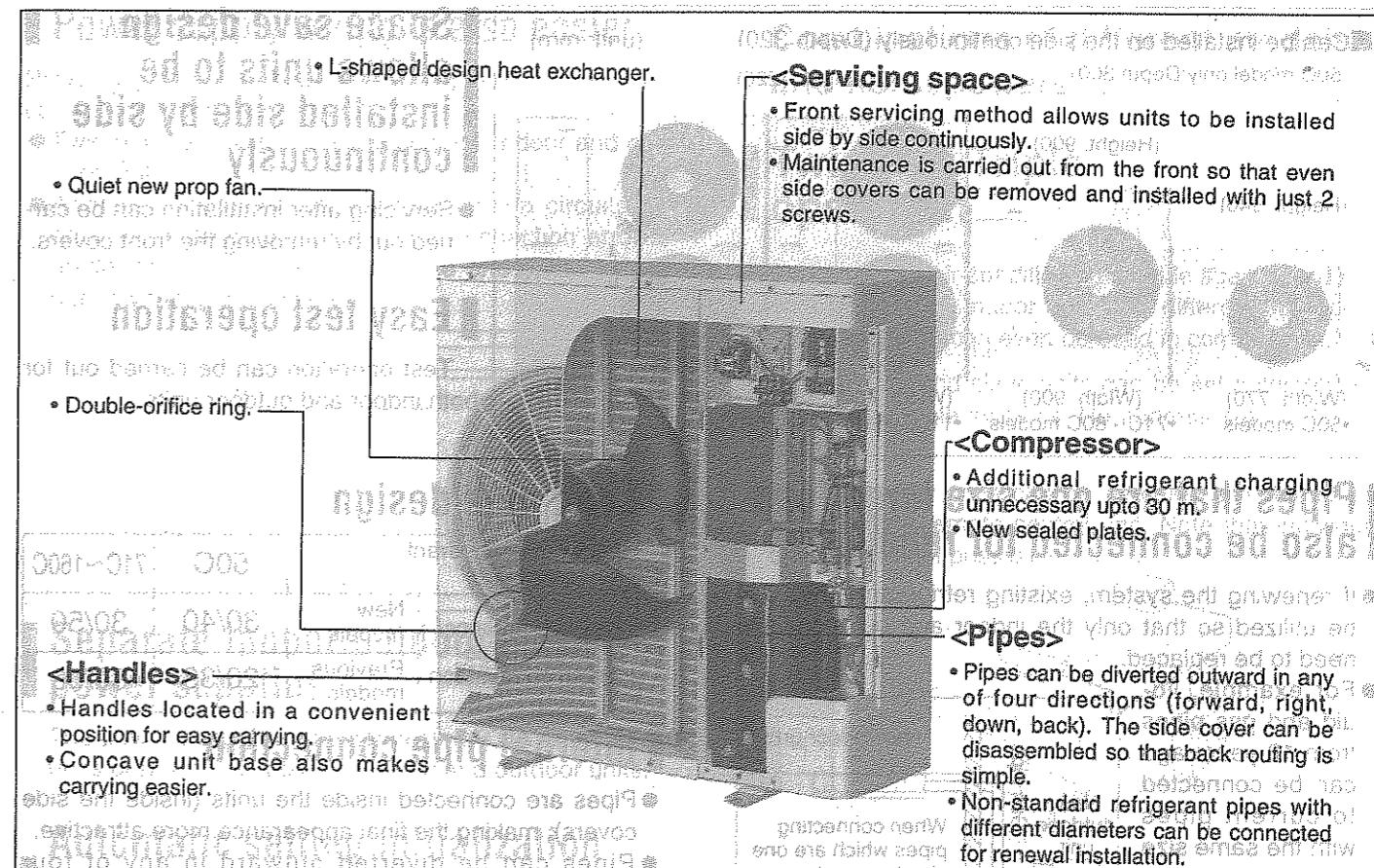
- Twin non-polar wires make installation work easy. (10 m cable supplied as an accessory.)

Common design for Indoor unit and Remote Controller.

The indoor unit and the wired remote controller are designed as a common specification between Cooling only and Heat Pump models.

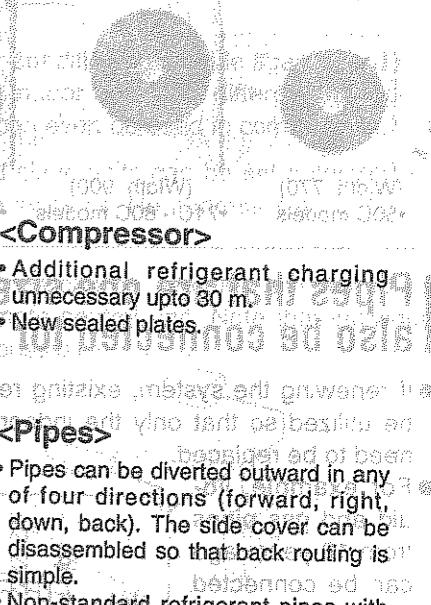


New low-noise outdoor units open up a new age - 46 dB for the 80C model!



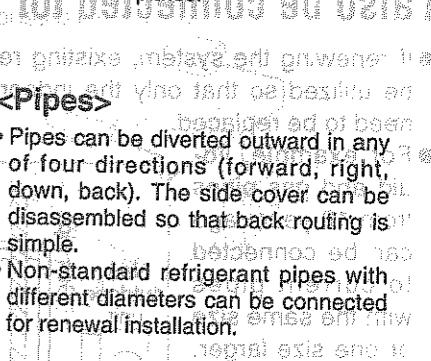
<Servicing space>

- Front servicing method allows units to be installed side by side continuously.
- Maintenance is carried out from the front so that even side covers can be removed and installed with just 2 screws.



<Compressor>

- Additional refrigerant charging unnecessary up to 30 m.
- New sealed plates.

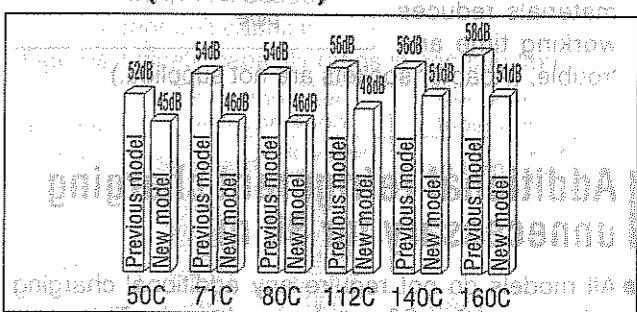


<Pipes>

- Pipes can be diverted outward in any of four directions (forward, right, down, back). The side cover can be disassembled so that back routing is simple.
- Non-standard refrigerant pipes with different diameters can be connected for renewal installation.



Noise data (Outdoor Unit)



[Product features]

Low-noise design improves comfort in surrounding areas

All models are quieter by 5 ~ 8 dB (compared to current models).

- (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 reducing 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 nighttime operation with lower outdoor air temperatures.

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.

High efficiency design

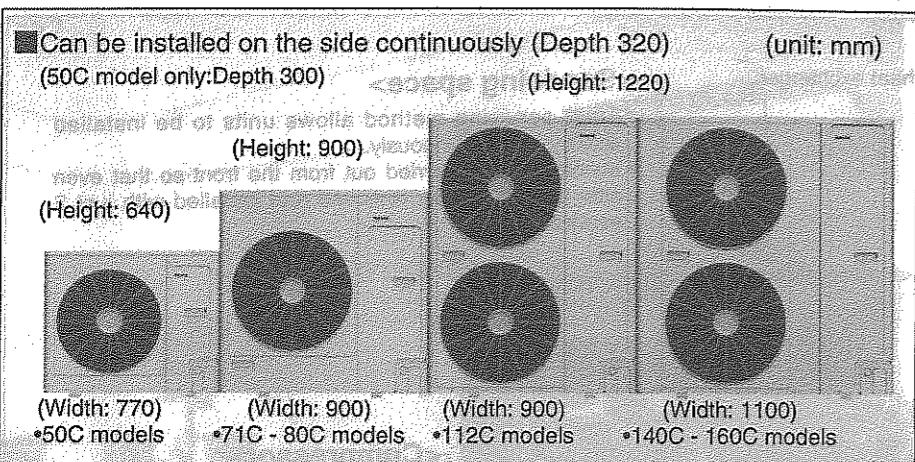
The EER had improved by 4% from previous (3HP) model.

Low ambient cooling operation.

Cooling is possible to temperatures as low as -5°C .

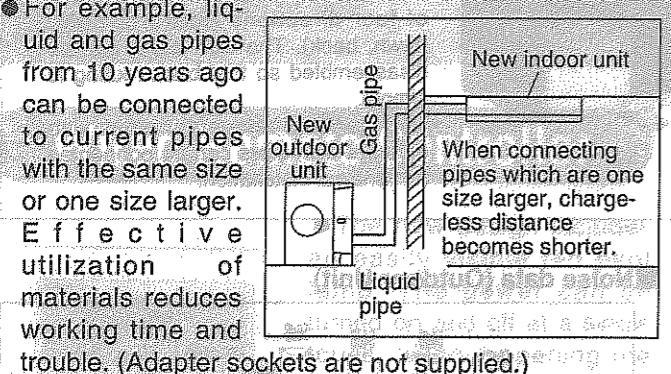


Greatly improved workability increases system renewal capability



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 and outdoor units need to be replaced.

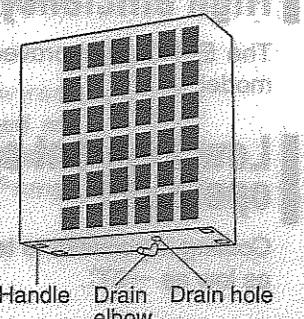


Additional refrigerant charging unnecessary for 30 m

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

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. By connecting a drain elbow and a discharge pipe, water leakages can be prevented even when the unit is installed against a wall.



Space save design allows units to be installed side by side continuously

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

Easy test operation

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

Long pipe design

Allowable refrigerant pipe length (m)	50C	71C~160C
Height difference/equivalent pipe length comparison	New models	30/40
	Previous models	20/35

Internal pipe connection

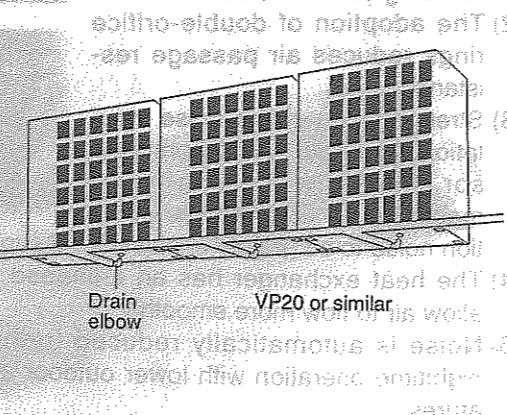
- Pipes are connected inside the units (inside the side covers), making the final appearance more attractive.
- Pipes can be diverted outward in any of four directions (forward, right, down, back).
- The liquid pipe diameters for 140C to 160C models have been made one size smaller, making installation work much easier.

Liquid-side pipe diameters (mm)

	140C, 160C
New models	9.52
Previous models	12.7

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 improves appearance.

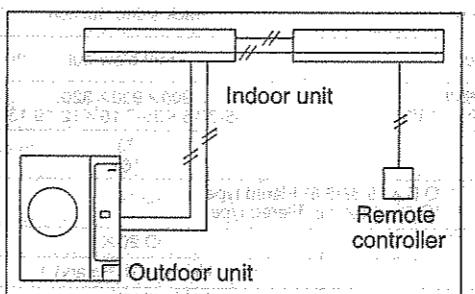


A brand-new control method using the latest technology

Power supply wiring is also easier

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

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



Separate indoor/outdoor unit power supplies

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

Automatic setting initialization function

(Remote controller and Indoor unit)

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

Branch pipe kit (optional accessory)

Model No.	Applicable outdoor	System
CZ-06BKDA	CU-112C, 140C, 160C	Twin
CZ-06BKTA	CU-160C	Triple

GROUP CONTROL EQUIPMENT.

Wired remote controller control

- Group control by one remote controller
- All air conditioner units are controlled as a whole by remote control.
- All indoor units operate in the same mode.
- A maximum of 16 units can be connected together (sequential starting).

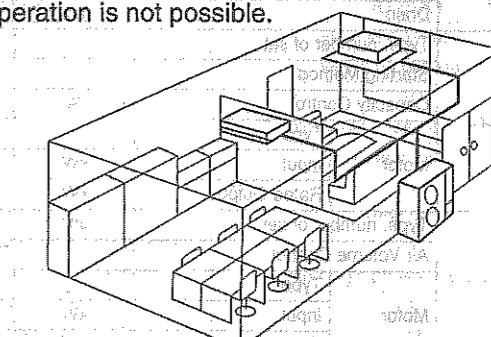
Twin remote controller separate control

- Each indoor unit can be operated by either of the two remote controller.
- Apart from timer setting time, displays for two remote controller are identical.
- Last button pressed has priority (main or slave is set at remote control unit).

Combinations of different models and horsepowers

Twin and Triple operation

- Simultaneous air conditioning of wide spaces and corners is possible. Indoor units with different horsepowers and models can even be used in combination.
- 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.



Twin and Triple combination table (Capacity ratio)

Outdoor unit	Simultaneous twin operation		Simultaneous triple operation	
	Standard	Horsepower difference	Standard	Horsepower difference
112C	(112C) 60T/50T	(112C) 60U/71T	(112C) 60T/50T	(112C) 60U/71T
140C	(140C) 71T/71T	(140C) 60T/50T	(140C) 60T/50T	(140C) 60U/71T
160C	(160C) 80T/80T	(160C) 60T/112T	(160C) 60T/50T	(160C) 60U/80T

(Figures indicate capacity ratios in combination.)

Optional wired remote controller

[Remote side]

- Optional wired remote controller Parts No.
- Remote controller CNR06-855930
- Wire code CNR46-938830

[Local side]

- Not needed

Optional wired remote controller

[Remote side]

- Optional wired remote controller Parts No.
- Remote controller CNR06-855930
- Wire code CNR46-938830

[Local side]

- Optional wired remote controller Parts No.
- Remote controller CNR06-855930
- Wire code CNR46-938830

2. SPECIFICATIONS (HEAT PUMP TYPE)

ITEM	MODEL	Indoor unit		Outdoor unit	
		Main body	CS-80T32JP	CU-80C52HP	
		Panel			
(1) Cooling Capacity	kW kcal/h BTU/h	7.30 6,300 25,200	7.30 6,300 25,200	7.30 6,300 25,200	7.30 6,300 25,200
(2) Cooling Capacity	kW kcal/h BTU/h	7.60 6,550 26,200	7.60 6,550 26,200	7.60 6,550 26,200	7.60 6,550 26,200
(3) Heating Capacity	kW kcal/h BTU/h	7.75 6,700 26,800	7.75 6,700 26,800	7.75 6,700 26,800	7.75 6,700 26,800
Refrigerant Charge-less	m	30	30	30	30
Standard Air Volume for High, Medium and Low Speed	m³/min cfm	Hi 19 671	Me 17 600	Lo 14 494	Hi 50 1765
Outside Static Pressure	mmAq in W.G.	0 0	0 0	0 0	0 0
Air Inlet		Bottom Suction	Back sided Suction		
Air Outlet		Front blow-out	Front blow-out		
Outside Dimension(H×W×D)	mm inch	165×1,260×650 6-1/2×49-19/32×25-19/32	900×900×320 35-7/16×35-7/16×12-19/32	900×900×320 35-7/16×35-7/16×12-19/32	900×900×320 35-7/16×35-7/16×12-19/32
Net Weight	kg lbs	27 59	73 161	27 59	73 161
Piping Connection	Refrigerant Gas Liquid	mm(inch) mm(inch)	O.D.Φ15.88(5/8) Flared type O.D.Φ9.52(3/8) Flared type	mm(inch) mm(inch)	O.D.Φ15.88(5/8) Flared type O.D.Φ9.52(3/8) Flared type
Drain		mm	O.D.Φ20	ID 20X1	O.D.Φ20
Type, number of set					Hermetic-1(Rotary),1
Starting Method					Direct on-line starting
Compressor	Capacity Control	%			0.100
	Type				2-pole single phase induction motor
Motor	Input	kW			Cool/Heat 2.73/2.49
	Rated Output	kW			2.0
Type, number of set	unit	Sirocco fan-4	Prop fan-1		Sirocco fan-4
Fan	Air Volume Control		Three-Step and Auto mode(Remote Controller)		Three-Step and Auto mode(Remote Controller)
	Type		2-pole single phase induction motor		2-pole single phase induction motor
Motor	Input	kW	0.14	0.11	0.14
	Rated Output	kW	0.06	0.05	0.06
Air-heat exchanger	Louver-fin type		Louver-fin type		Louver-fin type
Refrigerant Control	Capillary tube		Capillary tube		Capillary tube
Refrigeration oil(Charged)			DIAMOND MS32(N-1) (1.3)		DIAMOND MS32(N-1) (1.3)
Refrigerant(Charged)	kg lbs	R-22(3.8) (8.4)	R-22(3.8) (8.4)	R-22(3.8) (8.4)	R-22(3.8) (8.4)
Running Adjustment	Control Switch		Wired Remote Controller		Wired Remote Controller
	Room Temperature		Thermostat(Main Body)		Thermostat(Main Body)
Anti-vibration and Anti-sound Materials	Cabinet(urethane fram attached)		Compressor(Anti-vibration rubber)		Cabinet(urethane fram attached)
Safety Devices		Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Trans			Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Trans
External Finish		Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating		Steel plate, Galvanized steel plate finished with baked acrylic-resin
Air Filter(Factory set)		Polystyrene regin Honeycomb(Washable)			Polypropylene regin Honeycomb(Washable)
Noise level	dB(A)	Hi 46	Me 44	Lo 41	Hi 46

- (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) 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.32°C.D.B.(89.5°F.D.B.), 24°C.W.B.(75.2°F.W.B.)
- (3) 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.W.B.)
- (4)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
- (5) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL	CS-80T32JP,CU-80C52HP			
		Condition by JIS B 8616			
Volts	V	220	230	240	240
Phase		Single	Single	Single	3N
Power Consumption	kW	2.73 Cool 2.49 Heat	2.73 Cool 2.49 Heat	2.73 Cool 2.49 Heat	2.73 Cool 2.49 Heat
Running Current	A	12.0 Cool 12.3 Heat	11.6 Cool 12.0 Heat	11.6 Cool 11.7 Heat	11.6 Cool 11.7 Heat
Starting Current	A	56 Cool 103.4	56 Cool 100.5	56 Cool 98.1	56 Cool 88.7
Power Factor	%	92.0 Cool 92.0	90.2 Cool 90.2	90.2 Cool 90.2	90.2 Cool 88.7

*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

Panasonic Power source AC, 1~220V,230V,240V 50Hz

2. SPECIFICATIONS (HEAT PUMP TYPE)

ITEM	MODEL	Indoor unit		Outdoor unit	
		Main body	CS-80T32JP	CU-80C52XP	CU-80C52XP
		Panel			
(1) Cooling Capacity	kW kcal/h BTU/h	7.30 6,300 25,200	7.30 6,300 25,200	7.30 6,300 25,200	7.30 6,300 25,200
(2) Cooling Capacity	kW kcal/h BTU/h	7.60 6,550 26,200	7.60 6,550 26,200	7.60 6,550 26,200	7.60 6,550 26,200
(3) Heating Capacity	kW kcal/h BTU/h	7.75 6,700 26,800	7.75 6,700 26,800	7.75 6,700 26,800	7.75 6,700 26,800
Refrigerant Charge-less	m	30	30	30	30
Standard Air Volume for High, Medium and Low Speed	m³/min cfm	Hi 19 671	Me 17 600	Lo 14 494	Hi 50 1765
Outside Static Pressure	mmAq in W.G.	0 0	0 0	0 0	0 0
Air Inlet		Bottom Suction	Back sided Suction		
Air Outlet		Front blow-out	Front blow-out		
Outside Dimension(H×W×D)	mm inch	165×1,260×650 6-1/2×49-19/32×25-19/32	900×900×320 35-7/16×35-7/16×12-19/32	900×900×320 35-7/16×35-7/16×12-19/32	900×900×320 35-7/16×35-7/16×12-19/32
Net Weight	kg lbs	27 59	73 161	27 59	73 161
Piping Connection	Refrigerant Gas Liquid	mm(inch) mm(inch)	O.D.Φ15.88(5/8) Flared type O.D.Φ9.52(3/8) Flared type	mm(inch) mm(inch)	O.D.Φ15.88(5/8) Flared type O.D.Φ9.52(3/8) Flared type
Drain		mm	O.D.Φ20	ID 20X1	O.D.Φ20
Type, number of set					Hermetic-1(Rotary),1
Starting Method					Direct on-line starting
Compressor	Capacity Control	%			0.100
	Type				2-pole single phase induction motor
Motor	Input	kW			Cool/Heat 2.53/2.29
	Rated Output	kW			2.0
Type, number of set	unit	Sirocco fan-4	Prop fan-1		Sirocco fan-4
Fan	Air Volume Control		Three-Step and Auto mode(Remote Controller)		Three-Step and Auto mode(Remote Controller)
	Type		2-pole single phase induction motor		2-pole single phase induction motor
Motor	Input	kW	0.14	0.11	0.14
	Rated Output	kW	0.06	0.05	0.06
Air-heat exchanger	Louver-fin type		Louver-fin type		Louver-fin type
Refrigerant Control	Capillary tube		Capillary tube		Capillary tube
Refrigeration oil(Charged)			DIAMOND MS32(N-1) (1.3)		DIAMOND MS32(N-1) (1.3)
Refrigerant(Charged)	kg lbs	R-22(3.8) (8.4)	R-22(3.8) (8.4)	R-22(3.8) (8.4)	R-22(3.8) (8.4)
Running Adjustment	Control Switch		Wired Remote Controller		Wired Remote Controller
	Room Temperature		Thermostat(Main Body)		Thermostat(Main Body)
Anti-vibration and Anti-sound Materials	Cabinet(urethane fram attached)		Compressor(Anti-vibration rubber)		Cabinet(urethane fram attached)
Safety Devices		Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Trans			Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Trans
External Finish		Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating		Steel plate, Galvanized steel plate finished with baked acrylic-resin
Air Filter(Factory set)		Polystyrene regin Honeycomb(Washable)			Polypropylene regin Honeycomb(Washable)
Noise level	dB(A)	Hi 46	Me 44	Lo 41	Hi 46

- (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) 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.32°C.D.B.(89.5°F.D.B.), 24°C.W.B.(75.2°F.W.B.)
- (3) 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.W.B.)
- (4)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
- (5) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL	CS-80T32JP,CU-80C52XP			
		Condition by JIS B 8616			
Volts	V	220			

2. SPECIFICATIONS (HEAT PUMP TYPE)

ITEM	MODEL	Indoor unit		Outdoor unit	
		Main body	CS-112T32JP	CU-112C52XP	
		Panel			
(1) Cooling Capacity	kW kcal/h BTU/h		10.45 9,000 36,000		
(2) Cooling Capacity	kW kcal/h BTU/h		10.90 9,400 37,600		
(3) Heating Capacity	kW kcal/h BTU/h		11.15 9,600 38,400		
Refrigerant Charge-less	m		30	Refrigerant charge-less	
Standard Air Volume for High, Medium and Low Speed	m³/min cfm	Hi 30 1059	Me 25 883	Lo 20 706	Hi 75 2647
Outside Static Pressure	mmAq in.W.G.	0 0	0 0	Outside static pressure	
Air Inlet	Bottom Suction		Back sided Suction		
Air Outlet	Front blow-out		Front blow-out		
Outside Dimension(H×W×D)	mm inch	235×1,260×700 9-1/4×49-19/32×27-9/16		1220×900×320 48-1/32×35-7/16×12-19/32	
Net Weight	kg lbs	37 81		98 216	
Piping Connection	Refrigerant Gas (3/8) Liquid (3/8)	mm(inch) mm(inch)	O.D.Φ15.88(5/8) Flared type O.D.Φ9.52(3/8) Flared type		
	Drain	mm Ø 10	O.D.Φ20 mm	ID 20X1	
Type, number of set				Hermetic-1(Rotary),1	
Starting Method				Direct on-line starting	
Compressor	Capacity Control	%		0.100	
	Type			2-pole 3-phase induction motor	
Motor	Input	kW		Cool/Heat 2.75/2.77	
	Rated Output	kW		2.80	
Fan	Type	unit	Sirocco fan-3	Prop fan-2	
	Air Volume Control		Three-Step and Auto mode(Remote Controller)	Variable Control	
	Type		4-pole single phase induction motor	6-pole single phase induction motor	
Motor	Input	kW	0.18	0.11X2	
	Rated Output	kW	0.08	0.05X2	
Air-heat exchanger	Type		Louver-fin type	Louver-fin type	
Refrigerant Control			Capillary tube	Capillary tube	
Refrigeration oil(Charged)	l			SONTEX 200LT(1.24)	
Refrigerant(Charged)	kg lbs			R-22(4.7) (10.4)	
Running Adjustment	Control Switch		Wired Remote Controller		
	Room Temperature		Thermostat(Main Body)		
Anti-vibration and Anti-sound Materials			Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)	
Safety Devices				Internal protector for compressor, Internal thermostat for F.M., Crankcase heater, High pressure switch, Current Trans	
External Finish				Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)				Polypropylene regin Honeycomb(Washable)	
Noise level	dB(A)	Hi 48 Me 45 Lo 42		Hi 48 Me 46 Lo 42	Hi 50 Me 48 Lo 45

- (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. as based on outdoor unit condition (1) 35°C.D.B.(95°F.D.B.),24°C.W.B.(75.2°F.W.B.)
 (2) 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. as based on outdoor unit condition (2) 32°C.D.B.(89.5°F.D.B.),24°C.W.B.(75.2°F.W.B.)
 (3) 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.W.B.)
 (4)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
 (5) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL	CS-112T32JP,CU-112C52XP			
		Condition by JIS B 8616			
Volts	V	380	400	415	430
Phase		3N	3N	3N	3N
Power Consumption	kW	Cool 3.15 Heat 3.17	Cool 3.15 Heat 3.17	Cool 3.15 Heat 3.17	Cool 4.59 Heat 4.40
Running Current	A	Cool 5.6 Heat 5.7	Cool 5.4 Heat 5.5	Cool 5.3 Heat 5.4	Cool 8.20 Heat 8.10
Starting Current	A	Cool 48 Heat 55.5	Cool 48.2 Heat 84.2	Cool 48 Heat 82.7	Cool 6.10 Heat 6.00
Power Factor	%	Cool Heat 84.5	Cool Heat 83.2	Cool Heat 81.7	Cool Heat 79.4

*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

Panasonic Power source AC, 3N~380V,400V,415V 50Hz

2. SPECIFICATIONS (HEAT PUMP TYPE)

ITEM	MODEL	Indoor unit		Outdoor unit	
		Main body	CS-140T32JP	CU-140C53XP	
		Panel			
(1) Cooling Capacity	kW kcal/h BTU/h		13.00 11,200 44,800		
(2) Cooling Capacity	kW kcal/h BTU/h		13.40 11,550 46,200		
(3) Heating Capacity	kW kcal/h BTU/h		14.15 12,200 48,800		
Refrigerant Charge-less	m		30	Refrigerant charge-less	
Standard Air Volume for High, Medium and Low Speed	m³/min cfm	Hi 33 1165	Me 28 988	Lo 22 777	Hi 80 2825
Outside Static Pressure	mmAq in.W.G.	0 0	0 0	Outside static pressure	
Air Inlet	Bottom Suction		Back sided Suction		
Air Outlet	Front blow-out		Front blow-out		
Outside Dimension(H×W×D)	mm inch	235×1,600×700 9-1/4×63-27-9/16		1220×900×320 48-1/32×43-5/16×12-19/32	
Net Weight	kg lbs	45 99		113 249	
Piping Connection	Refrigerant Gas (3/8) Liquid (3/8)	mm(inch) mm(inch)	O.D.Φ15.88(5/8) Flared type O.D.Φ9.52(3/8) Flared type		
	Drain	mm Ø 10	O.D.Φ20 mm	ID 20X1	
Type, number of set				Hermetic-1(Rotary),1	
Starting Method				Direct on-line starting	
Compressor	Capacity Control	%		0.100	
	Type			2-pole 3-phase induction motor	
Motor	Input	kW		Cool/Heat 4.21/4.02	
	Rated Output	kW		2.80	
Fan	Type	unit	Sirocco fan-4	Prop fan-2	
	Air Volume Control		Three-Step and Auto mode(Remote Controller)	Variable Control	
	Type		4-pole single phase induction motor	6-pole single phase induction motor	
Motor	Input	kW	0.16	0.11X2	
	Rated Output	kW	0.11	0.05X2	
Air-heat exchanger	Type		Louver-fin type	Louver-fin type	
Refrigerant Control			Capillary tube	Capillary tube	
Refrigeration oil(Charged)	l			SONISO 4GDI-HT(1.8)	
Refrigerant(Charged)	kg lbs			R-22(5.7) (12.6)	
Running Adjustment	Control Switch		Wired Remote Controller		
	Room Temperature		Thermostat(Main Body)		
Anti-vibration and Anti-sound Materials			Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)	
Safety Devices				Internal protector for compressor, Internal thermostat for F.M., Crankcase heater, High pressure switch, Current Trans	
External Finish				Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)				Polypropylene regin Honeycomb(Washable)	
Noise level	dB(A)	Hi 48 Me 46 Lo 42		Hi 50 Me 48 Lo 45	

- (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. as based on outdoor unit condition (1) 35°C.D.B.(95°F.D.B.),24°C.W.B.(75.2°F.W.B.)
 (2) 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. as based on outdoor unit condition (2) 32°C.D.B.(89.5°F.D.B.),24°C.W.B.(75.2°F.W.B.)
 (3) 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.W.B.)
 (4)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
 (5) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL	CS-140T32JP,CU-140C53XP			
		Condition by JIS B 8616			
Volts	V	380	400	415	430
Phase		3N	3N	3N	3N
Power Consumption	kW	Cool 4.59 Heat 4.40	Cool 4.59 Heat 4.40	Cool 4.59 Heat 4.40	Cool 4.59 Heat 4.40
Running Current	A	Cool 8.20 Heat 8.10	Cool 8.10 Heat 8.00	Cool 8.00 Heat 7.90	Cool 8.00 Heat 7.90
Starting Current	A	Cool 6.2 Heat 8.50	Cool 6.2 Heat 8.1.8	Cool 6.2 Heat 7.9.8	Cool 6.2 Heat 7.7.5
Power Factor	%	Cool Heat 82.5	Cool Heat 79.4	Cool Heat 79.4	Cool Heat 77.5

*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

Panasonic Power source AC, 3N~380V,400V,415V 50Hz

2. SPECIFICATIONS (HEAT PUMP TYPE)

ITEM	MODEL CS-160T32JP, CU-160C53XP	Indoor unit		Outdoor unit	
		Main body	CS-160T32JP	CU-160C53XP	
		Panel			
(1) Cooling Capacity	0.03 0.05 0.08 kW kcal/h BTU/h	14.50 12,500 50,000			
(2) Cooling Capacity	0.03 0.05 0.08 kW kcal/h BTU/h	15.10 13,000 52,000			
(3) Heating Capacity	0.03 0.05 0.08 kW kcal/h BTU/h	15.70 13,500 54,000			
Refrigerant Charge-less	m	30			
Standard Air Volume for High, Medium and Low Speed	cm ³ /min cfm	Hi 35 BBB 1236	Me 30 BBB 1059	Lo 24 BBB 848	Hi 95 3355
Outside Static Pressure	mmHg in W.G.	0 0	0 0	0 0	0 0
Air Inlet	Bottom Suction	Bottom Suction	Back sided Suction		
Air Outlet	Front blow-out	Front blow-out	Front blow-out		
Outside Dimension(H×W×D) mm (inch)	235×1,600×700 9-1/4×63×27-9/16	1220×900×320 48-1/32×43-5/16×12-19/32			
Net Weight	kg lbs	47 103	118 260		
Piping Connection	Gas Liquid mm(inch) mm(inch)	O.D.φ19.05(3/4) Flared type O.D.φ19.52(3/8) Flared type			
Drain	mm	15×30 O.D.φ20	ID 20X1		
Type, number of set		—	—	Hermetic-1(Rotary),1	
Starting Method		—	—	Direct on-line starting	
Compressor	Capacity Control	%	—	0.100	
	Type		2-pole 3-phase induction motor		
Motor	Input	kW	—	Cool/Heat: 4.29/4.16	
	Rated Output	kW	—	4.5	
Fan	Type	unit	Sirocco fan-4	Prop fan-2	
	Motor	4-pole single phase induction motor	6-pole single phase induction motor		
	Input	kW	0.18	0.12×2	
	Rated Output	kW	0.12	0.05×2	
Air-heat exchanger		Louver-fin type	Louver-fin type		
Refrigerant Control		Capillary tube	Capillary tube		
Refrigeration oil(Charged)	kg lbs	—	SONTEX 200LT(1.77)		
Refrigerant(Charged)	kg lbs	—	R-22(5.4) (11.9)		
Running Adjustment	Control Switch	Wired Remote Controller			
	Room Temperature	Thermostat(Main Body)			
Anti-vibration and Anti-sound Materials		Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)		
Safety Devices		Internal protector for compressor, Internal thermostat for F.M., Crankcase heater, High pressure switch, Current Trans			
External Finish		Steel plate, Galvanized steel plate finished with baked acrylic resin	Powder coating		
Air Filter(Factory set)		Polypropylene resin Honeycomb(Washable)	—		
Noise level	dB(A)	Hi 52 Me 48 Lo 45	Hi 51		

- (1) Cooling capacities are based on indoor temp.27° CD.B.(80.6° FD.B.), 19.0° CW.B.(66.2° FW.B.) and outdoor air temp. 35° CD.B.(95° FD.B.), 24° CW.B.(75.2° FW.B.)
 (2) Cooling capacities are based on indoor temp.27° CD.B.(80.6° FD.B.), 19.0° CW.B.(66.2° FW.B.) and outdoor air temp. 32° CD.B.(89.5° FD.B.), 24° CW.B.(75.2° FW.B.)
 (3) Heating capacities are based on indoor temp.20° CD.B.(68.0° FD.B.) and outdoor air temp.7° CD.B.(44.6° FD.B.), 6° CW.B.(42.8° FW.B.)
 (4)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
 (5) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL CS-160T32JP,CU-160C53XP	Condition by JIS B 8616			
		V	380	400	415
Phase			3N	3N	3N
Power Consumption	KW	Cool	4.71	4.71	4.71
		Heat	4.58	4.58	4.58
Running Current	A	Cool	8.30	8.10	8.00
		Heat	8.10	7.90	7.80
Starting Current	A		61	61	61
Power Factor	%	Cool	86.2	83.9	81.9
		Heat	85.9	83.7	81.7

*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

Panasonic Power source AC, 3N~380V,400V,415V 50Hz

3. SPECIFICATIONS (COOLING ONLY TYPE)

ITEM	MODEL CS-50T32JP, CU-50C02HP	Indoor unit		Outdoor unit	
		Main body	CS-50T32JP	CU-50C02HP	
		Panel			
(1) Cooling Capacity	kW kcal/h BTU/h	5.20 4,500 18,000			
(2) Cooling Capacity	kW kcal/h BTU/h	5.35 4,620 18,480			
Refrigerant Charge-less	m	30			
Standard Air Volume for High, Medium and Low Speed	m ³ /min cfm	Hi 15 530	Me 13 459	Lo 11 388	Hi 32 1130
Outside Static Pressure	mmHg in W.G.	0 0			
Air Inlet	Bottom Suction			Bottom Suction	Back sided Suction
Air Outlet	Front blow-out			Front blow-out	Front blow-out
Outside Dimension(H×W×D)	mm inch	165×1,260×650 6-1/2×49-19/32×25-19/32		640×790×300 25-3/16×31-3/32×11-13/16	
Net Weight	kg lbs	26 57			50 110
Piping Connection	Refrigerant Gas Liquid mm(inch) mm(inch)			O.D.φ12.7(1/2) Flared type O.D.φ6.35(1/4) Flared type	
Drain	mm			O.D.φ20	ID 20X1
Type, number of set				—	Hermetic-1(Rotary),1
Starting Method				—	Direct on-line starting
Compressor	Capacity Control	%		—	0.100
	Type				2-pole single phase induction motor
Motor	Input	kW		—	Cool/ 1.69
	Rated Output	kW		—	1.5
Fan	Type	unit	Sirocco fan-4	Prop fan-1	
	Motor	4-pole single phase induction motor	6-pole single phase induction motor		
	Input	kW	0.18	0.12×2	
	Rated Output	kW	0.12	0.05×2	
Air-heat exchanger		Louver-fin type	Louver-fin type		
Refrigerant Control		Capillary tube	Capillary tube		
Refrigeration oil(Charged)	kg lbs	—	SONTEX 200LT(1.77)		
Refrigerant(Charged)	kg lbs	—	R-22(5.4) (11.9)		
Running Adjustment	Control Switch	Wired Remote Controller		Wired Remote Controller	
	Room Temperature	Thermostat(Main Body)		Thermostat(Main Body)	
Anti-vibration and Anti-sound Materials		Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)		
Safety Devices		Internal protector for compressor, Internal thermostat for F.M., Crankcase heater, High pressure switch, Current Trans		Internal protector for compressor, Internal thermostat for F.M., Crankcase heater, High pressure switch, Current Trans	
External Finish		Steel plate, Galvanized steel plate finished with baked acrylic resin	Powder coating		
Air Filter(Factory set)		Polypropylene resin Honeycomb(Washable)	—	Polypropylene resin Honeycomb(Washable)	
Noise level	dB(A)	Hi 44 Me 42 Lo 39		Hi 45	

- (1) Cooling capacities are based on indoor temp.27° CD.B.(80.6° FD.B.), 19.0° CW.B.(66.2° FW.B.) and outdoor air temp. 35° CD.B.(95° FD.B.), 24° CW.B.(75.2° FW.B.)
 (2) Cooling capacities are based on indoor temp.27° CD.B.(80.6° FD.B.), 19.0° CW.B.(66.2° FW.B.) and outdoor air temp. 32° CD.B.(89.5° FD.B.), 24° CW.B.(75.2° FW.B.)
 (3)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
 (4) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL CS-50T32JP,CU-50C02HP	Condition by JIS B 8616			
		V	220	230	240
Phase			Single	Single	Single
Power Consumption	KW	Cool	1.89	1.89	1.89
		Heat	9.1	8.8	8.5
Running Current	A	Cool	33.7	33.7	33.7
		Heat	94.4	93.4	92.6

*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.

Panasonic Power source AC, 1~220V,230V,240V 50Hz

3. SPECIFICATIONS (COOLING ONLY TYPE)

ITEM	MODEL	Indoor unit			Outdoor unit		
		Main body	CS-71T32JP		CU-71C02HP		
		Panel					
(1) Cooling Capacity		kW kcal/h BTU/h	6.50 5,600 22,400				
(2) Cooling Capacity		kW kcal/h BTU/h	6.70 5,800 23,200				
Refrigerant Charge-less		m	30				
Standard Air Volume for High, Medium and Low Speed		l/min cfm	Hi 19 671 Me 17 600 Lo 14 494		Hi 50 1766 Me 40 1200 Lo 14 494		
Outside Static Pressure		mmAq in W.G.	0 0				
Air Inlet			Bottom Suction		Back sided Suction		
Air Outlet			Front blow-out		Front blow-out		
Outside Dimension(H×W×D)		mm inch	165×1,260×650 6-1/2×49-19/32×25-19/32		900×900×320 35-7/16×35-7/16×12-19/32		
Net Weight		kg lbs	27 59		68 150		
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D.φ 15.88(5/8) Flared type O.D.φ 6.35(1/4) Flared type			
	Drain		mm	O.D.φ 20	ID 20X1		
	Type, number of set			—	Hermetic-1(Rotary), 1		
Compressor	Starting Method			—	Direct on-line starting		
	Capacity Control	%		—	0.100		
	Type			—	2-pole single phase induction motor		
	Motor	Input	kW	—	Wx	Cool/2.3	
		Rated Output	kW	—	Wx	1.9	
	Type, number of set	unit	Sirocco fan-4	Prop fan-1			
Fan	Air Volume Control		Three-Step and Auto mode(Remote Controller)				
	Type		2-pole single phase induction motor	6-pole single phase induction motor			
	Motor	Input	kW	0.14	Wx	0.11	
		Rated Output	kW	0.06	Wx	0.050	
Air-heat exchanger			Louver-fin type		Louver-fin type		
Refrigerant Control			Capillary tube		Capillary tube		
Refrigeration oil(Charged)		kg lbs	—	DIAMOND MS32(N-1)(1.3)			
Refrigerant(Charged)		kg lbs	—	R-22(2.7) (6.6)			
Running Adjustment	Control Switch		Wired Remote Controller		Wired Remote Controller		
	Room Temperature		Thermostat(Main Body)		Thermostat(Main Body)		
Anti-vibration and Anti-sound Materials			Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)			
Safety Devices			Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Trans				
External Finish			Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating			
Air Filter(Factory set)			Polypropylene resin Honeycomb(Washable)	—			
Noise level		dB(A)	Hi 46 Me 44 Lo 41	Hi 46 Me 44 Lo 41	Hi 46 Me 44 Lo 41	Hi 46 Me 44 Lo 41	Hi 46 Me 44 Lo 41

- (1) Cooling capacities are based on indoor temp.27°CDB.(80.6°FDB.), 19.0°CWB.(66.2°FWB.), and outdoor air temp.35°CDB.(95°FDB.), 24°CWB.(75.2°FWB.)
- (2) Cooling capacities are based on indoor temp.27°CDB.(80.6°FDB.), 19.0°CWB.(66.2°FWB.) and outdoor air temp.32°CDB.(89.5°FDB.), 24°CWB.(75.2°FWB.)
- (3)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
- (4) Net weight for indoor unit indicate main body and decorative panel.

3. SPECIFICATIONS (COOLING ONLY TYPE)

ITEM	MODEL	Indoor unit			Outdoor unit		
		Main body	CS-71T32JP		CU-71C02XP		
		Panel					
(1) Cooling Capacity		kW kcal/h BTU/h	6.50 5,600 22,400		6.50 5,600 22,400		
(2) Cooling Capacity		kW kcal/h BTU/h	6.70 5,800 23,200		6.70 5,800 23,200		
Refrigerant Charge-less		m	30		30		
Standard Air Volume for High, Medium and Low Speed		l/min cfm	Hi 19 671 Me 17 600 Lo 14 494		Hi 50 1766 Me 40 1200 Lo 14 494		
Outside Static Pressure		mmAq in W.G.	0 0		0 0		
Air Inlet			Bottom Suction		Back sided Suction		
Air Outlet			Front blow-out		Front blow-out		
Outside Dimension(H×W×D)		mm inch	165×1,260×650 6-1/2×49-19/32×25-19/32		900×900×320 35-7/16×35-7/16×12-19/32		
Net Weight		kg lbs	27 59		68 150		
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D.φ 15.88(5/8) Flared type O.D.φ 6.35(1/4) Flared type			
	Drain		mm	O.D.φ 20	ID 20X1		
	Type, number of set			—	Hermetic-1(Rotary), 1		
Compressor	Starting Method			—	Direct on-line starting		
	Capacity Control	%		—	0.100		
	Type			—	2-pole single phase induction motor		
	Motor	Input	kW	—	Wx	Cool/2.3	
		Rated Output	kW	—	Wx	1.9	
	Type, number of set	unit	Sirocco fan-4	Prop fan-1			
Fan	Air Volume Control		Three-Step and Auto mode(Remote Controller)				
	Type		2-pole single phase induction motor	6-pole single phase induction motor			
	Motor	Input	kW	0.14	Wx	0.11	
		Rated Output	kW	0.06	Wx	0.050	
Air-heat exchanger			Louver-fin type		Louver-fin type		
Refrigerant Control			Capillary tube		Capillary tube		
Refrigeration oil(Charged)		kg lbs	—	DIAMOND MS32(N-1)(1.3)			
Refrigerant(Charged)		kg lbs	—	R-22(2.7) (6.6)			
Running Adjustment	Control Switch		Wired Remote Controller		Wired Remote Controller		
	Room Temperature		Thermostat(Main Body)		Thermostat(Main Body)		
Anti-vibration and Anti-sound Materials			Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)			
Safety Devices			Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, High pressure switch, Current Trans				
External Finish			Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating			
Air Filter(Factory set)			Polypropylene resin Honeycomb(Washable)	—			
Noise level		dB(A)	Hi 46 Me 44 Lo 41	Hi 46 Me 44 Lo 41	Hi 46 Me 44 Lo 41	Hi 46 Me 44 Lo 41	Hi 46 Me 44 Lo 41

- (1) Cooling capacities are based on indoor temp.27°CDB.(80.6°FDB.), 19.0°CWB.(66.2°FWB.), and outdoor air temp.35°CDB.(95°FDB.), 24°CWB.(75.2°FWB.)
- (2) Cooling capacities are based on indoor temp.27°CDB.(80.6°FDB.), 19.0°CWB.(66.2°FWB.) and outdoor air temp.32°CDB.(89.5°FDB.), 24°CWB.(75.2°FWB.)
- (3)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
- (4) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL	Condition by JIS B 8616		
		V	220	230
Volts		V	Single	Single
Phase			Single	Single
Power Consumption	kW	Cool	2.50	2.50
Running Current	A	Cool	11.9	11.7
Starting Current	A	Cool	60	60
Power Factor	%	Cool	95.5	92.9
Panasonic	Power source		AC, 1~220V,230V,240V 50Hz	

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ELECTRICAL DATA(50Hz)

ITEM	MODEL	Condition by JIS B 8616		
		V	380	400
Phase			3N	3N
Power Consumption	kW	Cool	2.50	2.50
Running Current	A	Cool	4.50	4.40
Starting Current	A	Cool	27	27
Power Factor	%	Cool	84.4	82.0
Panasonic	Power source		AC, 3N~380V,400V,415V 50Hz	

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3. SPECIFICATIONS (COOLING ONLY TYPE)

ITEM	MODEL	Indoor unit		Outdoor unit	
		Main body	CS-80T32JP	CU-80C02HP	
		Panel			
(1) Cooling Capacity		kW kcal/h BTU/h	7.30 6,300 25,200		
(2) Cooling Capacity		kW kcal/h BTU/h	7.60 6,550 26,200		
Refrigerant Charge-less		m	30		
Standard Air Volume for High, Medium and Low Speed		m³/min cfm	Hi 19 671	Me 17 600	Lo 14 494
Outside Static Pressure		mmHg in.W.G.	0	0	0
Air Inlet		Bottom Suction	Back sided Suction		
Air Outlet		Front blow-out	Front blow-out		
Outside Dimension(H×W×D)		mm inch	165×1,260×650 6-1/2×49-19/32×25-19/32	900×900×320 35-7/16×35-7/16×12-19/32	
Net Weight		kg lbs	27 59	70 154	
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D.Φ 15.88(5/8) Flared type O.D.Φ 9.52(3/8) Flared type	
	Drain	mm	O.D.Φ 20	ID 20X1	
Compressor	Type			—	Hermetic-1(Rotary),1
Motor	Input	kW	—	0.73	Direct on-line starting
	Rated Output	kW	—	2.0	0.100
	Type, number of set	unit	Sirocco fan-4	Prop fan-1	
Fan	Air Volume Control		Three-Step and Auto mode(Remote Controller)		
	Type		2-pole single phase induction motor	6-pole single phase induction motor	
	Motor A	Input	0.14	0.11	
		Rated Output	0.06	0.05	
Air-heat exchanger		Louver-fin type	Louver-fin type		
Refrigerant Control		Capillary tube	—		
Refrigeration oil(Charged)		kg lbs	—	DIAMOND MS32(N-1)(1.3)	
Refrigerant(Charged)		kg lbs	—	R-22(3.8) (8.4)	
Running Adjustment	Control Switch		Wired Remote Controller		
	Room Temperature		Thermostat(Main Body)		
Anti-vibration and Anti-sound Materials		Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)		
Safety Devices		Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, Drain over-flow switch, High pressure switch, Current Trans			
External Finish		Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating		
Air Filter(Factory set)		Polypropylene resin Honeycomb(Washable)			
Noise level	dB(A)	Hi 46	Me 44	Lo 41	Hi 46

(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) 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. 32°C.D.B.(89.5°F.D.B.), 24°C.W.B.(75.2°F.W.B.)
 (3)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
 (4) Net weight for indoor unit indicate main body and decorative panel.

3. SPECIFICATIONS (COOLING ONLY TYPE)

ITEM	MODEL	Indoor unit		Outdoor unit	
		Main body	CS-80T32JP	CU-80C02XP	
		Panel			
(1) Cooling Capacity		kW kcal/h BTU/h	7.30 6,300 25,200		
(2) Cooling Capacity		kW kcal/h BTU/h	7.60 6,550 26,200		
Refrigerant Charge-less		m	30		
Standard Air Volume for High, Medium and Low Speed		m³/min cfm	Hi 19 671	Me 17 600	Lo 14 494
Outside Static Pressure		mmHg in.W.G.	0	0	0
Air Inlet		Bottom Suction	Back sided Suction		
Air Outlet		Front blow-out	Front blow-out		
Outside Dimension(H×W×D)		mm inch	165×1,260×650 6-1/2×49-19/32×25-19/32	900×900×320 35-7/16×35-7/16×12-19/32	
Net Weight		kg lbs	27 59	70 154	
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D.Φ 15.88(5/8) Flared type O.D.Φ 9.52(3/8) Flared type	
	Drain	mm	O.D.Φ 20	ID 20X1	
Compressor	Type			—	Hermetic-1(Rotary),1
Motor	Input	kW	—	0.73	Direct on-line starting
	Rated Output	kW	—	2.0	0.100
	Type, number of set	unit	Sirocco fan-4	Prop fan-1	
Fan	Air Volume Control		Three-Step and Auto mode(Remote Controller)		
	Type		2-pole single phase induction motor	6-pole single phase induction motor	
	Motor A	Input	0.14	0.11	
		Rated Output	0.06	0.05	
Air-heat exchanger		Louver-fin type	Louver-fin type		
Refrigerant Control		Capillary tube	—		
Refrigeration oil(Charged)		kg lbs	—	DIAMOND MS32(N-1)(1.3)	
Refrigerant(Charged)		kg lbs	—	R-22(3.8) (8.4)	
Running Adjustment	Control Switch		Wired Remote Controller		
	Room Temperature		Thermostat(Main Body)		
Anti-vibration and Anti-sound Materials		Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)		
Safety Devices		Internal protector for compressor, Internal thermostat for F.M, Crankcase heater, Drain over-flow switch, High pressure switch, Current Trans			
External Finish		Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating		
Air Filter(Factory set)		Polypropylene resin Honeycomb(Washable)			
Noise level	dB(A)	Hi 46	Me 44	Lo 41	Hi 46

(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) 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. 32°C.D.B.(89.5°F.D.B.), 24°C.W.B.(75.2°F.W.B.)
 (3)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
 (4) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL		CS-80T32JP,CU-80C02HP		Condition by JIS B 8616
	V	Phase	V	Phase	
Volts	220	Single	230	Single	
Power Consumption	kW Cool	2.73	2.73	Single	
Running Current	A Cool	12.0	11.8	Single	
Starting Current	A	56	56	Single	
Power Factor	% Cool	103.4	100.6	Single	
Panasonic	Power source	AC, 1~220V,230V,240V 50Hz			

ELECTRICAL DATA(50Hz)

ITEM	MODEL		CS-80T32JP,CU-80C02XP		Condition by JIS B 8616
	V	Phase	V	Phase	
Volts	380	3N	400	3N	
Power Consumption	kW Cool	2.73	2.73	3N	
Running Current	A Cool	4.6	4.50	3N	
Starting Current	A	26	26	3N	
Power Factor	% Cool	90.2	87.6	3N	
Panasonic	Power source	AC, 3N~380V,400V,415V 50Hz			

3. SPECIFICATIONS (COOLING ONLY TYPE)

ITEM	MODEL	Indoor unit		Outdoor unit	
		Main body	CS-112T32JP	CU-112C02XP	
		Panel			
(1) Cooling Capacity		kW kcal/h BTU/h	10.45 9,000 36,000		
(2) Cooling Capacity		kW kcal/h BTU/h	10.90 9,400 37,600		
Refrigerant Charge-less		m	30		
Standard Air Volume for High, Medium and Low Speed		m³/min cfm	Hi 30 1059	Me 25 883	Lo 20 706
Outside Static Pressure		mmHg in.W.G.	0 0	0 0	
Air Inlet		Bottom Suction		Back sided Suction	
Air Outlet		Front blow-out		Front blow-out	
Outside Dimension(H×W×D)		mm inch	165×1,260×650 6-1/2×49-19/32×25-19/32	1220×990×320 48-1/32×35-7/16×12-19/32	
Net Weight		kg lbs	37 81	95 209	
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D.Φ19.05(3/4) Flared type O.D.Φ9.52(3/8) Flared type	
	Drain	mm	—	O.D.Φ20 mm	ID 20X1
	Type, number of set	—	—	—	Hermetic-1(Scroll),1
	Starting Method	—	—	—	Direct on-line starting
Compressor	Capacity Control	%	—	—	0.100
	Type	—	—	2-pole 3-phase Induction motor	
	Motor	Input	kW	Cool/2.75	
		Rated Output	kW	2.80	
Fan	Type, number of set	unit	Sirocco fan-4	Prop fan-2	
	Air Volume Control	—	Three-Step and Auto mode(Remote Controller)	—	
	Type	—	4-pole single phase induction motor	—	
	Motor	Input	kW	0.18	0.11×2
		Rated Output	kW	0.08	0.05×2
Air-heat exchanger		Louver-fin type		Louver-fin type	
Refrigerant Control		Capillary tube		—	
Refrigeration oil(Charged)		l	—	SONETEX 200LT(1.24)	
Refrigerant(Charged)		kg lbs	—	R-22(4.7) (10.4)	
Running Adjustment	Control Switch	—	Wired Remote Controller	—	
	Room Temperature	—	Thermostat(Main Body)	—	
Anti-vibration and Anti-sound Materials		Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)		
Safety Devices		Internal thermostat for F.M., Crankcase heater, High pressure switch, Current Trans, Internal protector for compressor			
External Finish		Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating		
Air Filter(Factory set)		Polypropylene resin Honeycomb(Washable)	—		
Noise level		dB(A)	Hi 48 Me 46 Lo 42	Hi 48 Me 46 Lo 42	

- (1) Cooling capacities are based on indoor temp.27°C.D.B.(80.6°F.D.B.), 19.0°C.W.B.(66.2°F.W.B.), and outdoor air temp. 35°C.D.B.(95°F.D.B.), 24°C.W.B.(75.2°F.W.B.)
- (2) 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. 32°C.D.B.(89.5°F.D.B.), 24°C.W.B.(75.2°F.W.B.)
- (3)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
- (4) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL	Condition by JIS B 8516			
		V	380	400	415
Volts			3N	3N	3N
Phase			—	—	—
Power Consumption	kW	Cool	3.15	3.15	3.15
Running Current	A	Cool	5.60	5.40	5.30
Starting Current	A	—	48	48	48
Power Factor	%	Cool	95.5	84.2	82.7

*Power Factor means total figure of compressor, Indoor fan motor and outdoor fan motor.

Panasonic Power source AC, 3N~380V,400V,415V 50Hz

3. SPECIFICATIONS (COOLING ONLY TYPE)

ITEM	MODEL	Indoor unit		Outdoor unit	
		Main body	CS-140T32JP	CU-140C03XP	
		Panel			
(1) Cooling Capacity		kW kcal/h BTU/h	13.00 11,200 44,800		13.00 11,200 44,800
(2) Cooling Capacity		kW kcal/h BTU/h	13.40 11,550 46,200		13.40 11,550 46,200
Refrigerant Charge-less		m	—	30	—
Standard Air Volume for High, Medium and Low Speed		m³/min cfm	Hi 33 1165	Me 28 988	Lo 22 777
Outside Static Pressure		mmHg in.W.G.	0 0	0 0	
Air Inlet		Bottom Suction		Back sided Suction	
Air Outlet		Front blow-out		Front blow-out	
Outside Dimension(H×W×D)		mm inch	235×1,600×700 9-1/4×63×27-9/16	1220×1100×320 48-1/32×43-5/16×12-19/32	
Net Weight		kg lbs	45 99	110 242	
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D.Φ19.05(3/4) Flared type O.D.Φ9.52(3/8) Flared type	
	Drain	mm	—	O.D.Φ20	ID 20X1
	Type, number of set	—	—	—	Hermetic-1(Scroll),1
	Starting Method	—	—	—	Direct on-line starting
Compressor	Capacity Control	%	—	—	0.100
	Type	—	—	—	2-pole 3-phase Induction motor
	Motor	Input	kW	—	Cool/4.21
		Rated Output	kW	—	3.75
Fan	Type, number of set	unit	Sirocco fan-4	Prop fan-2	
	Air Volume Control	—	Three-Step and Auto mode(Remote Controller)	—	
	Type	—	4-pole single phase induction motor	—	6-pole single phase induction motor
	Motor	Input	kW	0.16	0.11×2
		Rated Output	kW	0.11	0.05×2
Air-heat exchanger		Louver-fin type		Louver-fin type	
Refrigerant Control		Capillary tube		—	
Refrigeration oil(Charged)		l	—	—	SUNISO 4GDI-HT(1.8)
Refrigerant(Charged)		kg lbs	—	—	R-22(5.2) (11.5)
Running Adjustment	Control Switch	—	Wired Remote Controller	—	
	Room Temperature	—	Thermostat(Main Body)	—	
Anti-vibration and Anti-sound Materials		Cabinet(urethane fram attached)	Compressor(Anti-vibration rubber)		
Safety Devices		Internal thermostat for F.M., Crankcase heater, High pressure switch, Current Trans, Internal protector for compressor			
External Finish		Steel plate, Galvanized steel plate finished with baked acrylic-resin	Powder coating		
Air Filter(Factory set)		Polypropylene resin Honeycomb(Washable)	—		
Noise level		dB(A)	Hi 48 Me 46 Lo 42	—	Hi 51

- (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) 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. 32°C.D.B.(89.5°F.D.B.), 24°C.W.B.(75.2°F.W.B.)
- (3)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
- (4) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

ITEM	MODEL	Condition by JIS B 8516			
		V	380	400	415
Volts			3N	3N	3N
Phase			—	—	—
Power Consumption	kW	Cool	4.59	4.59	4.59
Running Current	A	Cool	8.20	8.10	8.00
Starting Current	A	—	62	62	62
Power Factor	%	Cool	85.0	81.8	79.8

*Power Factor means total figure of compressor, Indoor fan motor and outdoor fan motor.

Panasonic Power source AC, 3N~380V,400V,415V 50Hz

3. SPECIFICATIONS (COOLING ONLY TYPE)

ITEM	MODEL	Indoor unit			Outdoor unit		
		CS-160T32JP			CU-160C03XP		
		Panel	30	30	30	30	30
(1) Cooling Capacity		kW kcal/h BTU/h	14.50 12,500 50,000				
(2) Cooling Capacity		kW kcal/h BTU/h	15.10 13,000 52,000				
Refrigerant Charge-less		m	30				
Standard Air Volume for High, Medium and Low Speed		m³/min cfm	Hi 35 1236	Me 30 1059	Lo 24 848	Hi 95 3355	Me 30 1059
Outside Static Pressure		mmHg in.W.G.	0	0	0	0	0
Air Inlet		mm inch	62	Bottom Suction	Back sided Suction		
Air Outlet		mm inch	62	Front blow-out	Front blow-out		
Outside Dimension(HXWxD)		mm inch	235×1,600×700 9-1/4×63×27-9/16		1220×1100×320 48-1/32×43-5/16×12-19/32		
Net Weight		kg lbs	45 99		115 253		
Piping Connection	Refrigerant	Gas Liquid	mm(inch) mm(inch)	O.D.φ19.05(3/4) Flared type O.D.φ9.52(3/8) Flared type			
	Drain	mm	600	O.D.φ20	ID 20×1		
Compressor	Type			Hermetic-1(Scroll),1			
	Starting Method			Direct on-line starting			
	Capacity Control	%		0.100			
	Type			2-pole 3-phase induction motor			
Motor	Input	kW		Cool/4.21			
	Rated Output	kW		3.75			
Fan	Type, number of set	unit	Sirocco fan-4	Prop fan-2			
	Air Volume Control		Three-Step and Auto mode(Remote Controller)				
	Type		4-pole single phase induction motor	6-pole single phase induction motor			
	Motor	kW	0.10	0.18	0.11×2		
	Rated Output	kW	0.10	0.12	0.05×2		
Air-heat exchanger		Louver-fin type		Louver-fin type			
Refrigerant Control		Capillary tube					
Refrigeration oil(Charged)		kg	—	SUNISO 4GSDID-K(1.6)			
Refrigerant(Charged)		lbs	—	R-22(5.4) (11.9)			
Running Adjustment	Control Switch			Wired Remote Controller			
	Room Temperature			Thermostat(Main Body)			
Anti-vibration and Anti-sound Materials		Cabinet(urethane fram attached)		Compressor(Anti-vibration rubber)			
Safety Devices		Indoor control fuse, Outdoor control fuse, High pressure switch Internal protector, Phase protector and Over current relay Internal thermostat for F.M.					
External Finish		Steel plate, Galvanized steel plate finished with baked acrylic-resin		Powder coating			
Air Filter(Factory set)		Polypropylene resin Honeycomb(Washable)					
Noise level	dB(A)	HI 52	ME 48	LO 45	HI 51		

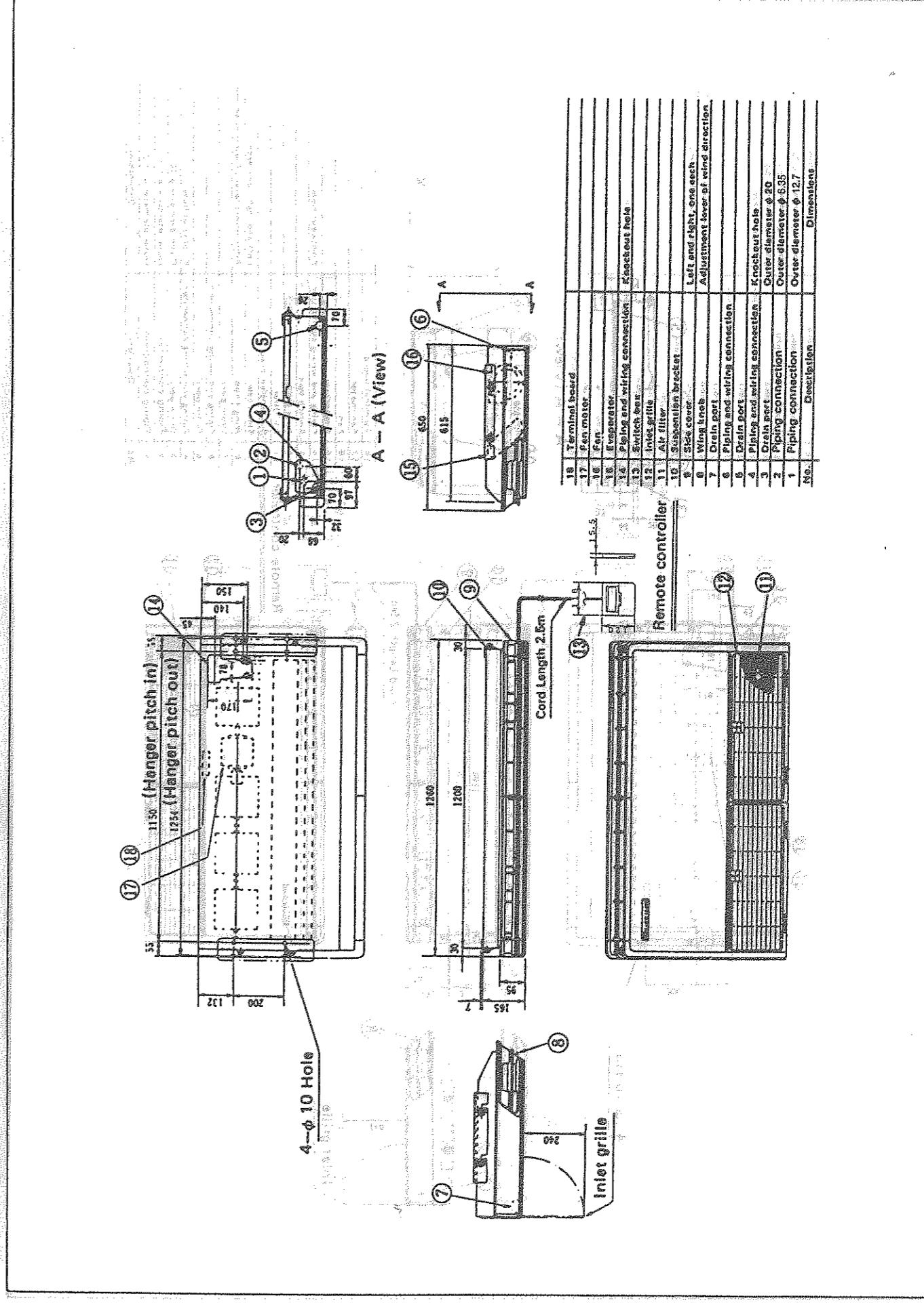
- (1) Cooling capacities are based on indoor temp.27°CDB.(80.6°FDB.), 19.0°CWB.(66.2°FWB.), and outdoor air temp. 35°CDB.(95°FDB.), 24°CWB.(75.2°FWB.)
- (2) Cooling capacities are based on indoor temp.27°CDB.(80.6°FDB.), 19.0°CWB.(66.2°FWB.) and outdoor air temp. 32°CDB.(89.5°FDB.), 24°CWB.(75.2°FWB.)
- (3)*1 Supply duct and fresh air duct are connectable. Supply duct requires the special parts.
- (4) Net weight for indoor unit indicate main body and decorative panel.

ELECTRICAL DATA(50Hz)

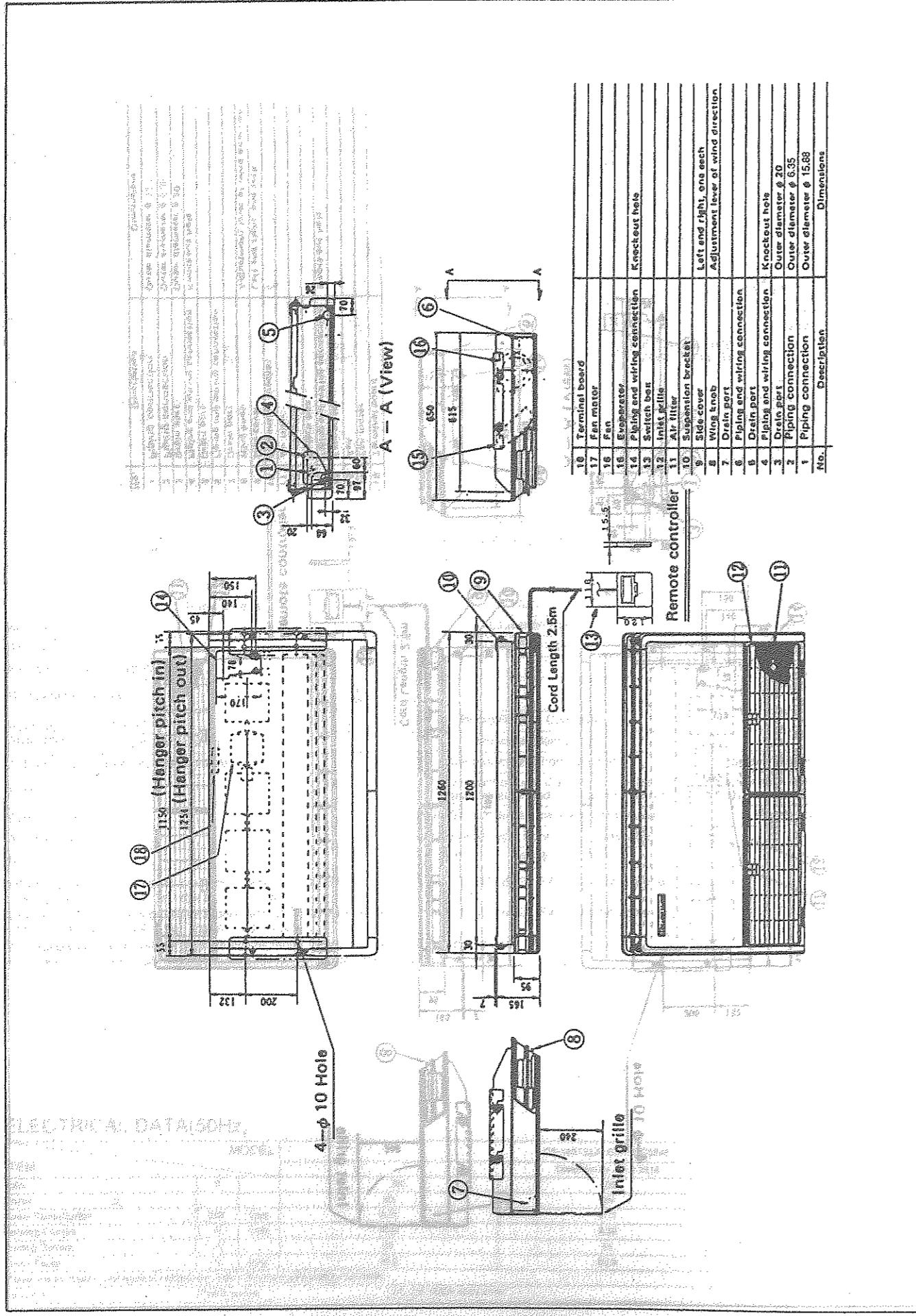
ITEM	MODEL	Condition by JIS B-8616		
		V	380	400
Volts		3N	3N	3N
Phase		4.71	4.71	4.71
Power Consumption	kW	Cool	6.30	6.30
Running Current	A	Cool	61	61
Starting Current	A	Cool	85.2	83.9
Power Factor	%	Cool	81.9	81.9
Panasonic	Power source	AC, 3N~380V,400V,415V		

4. TECHNICAL DRAWING

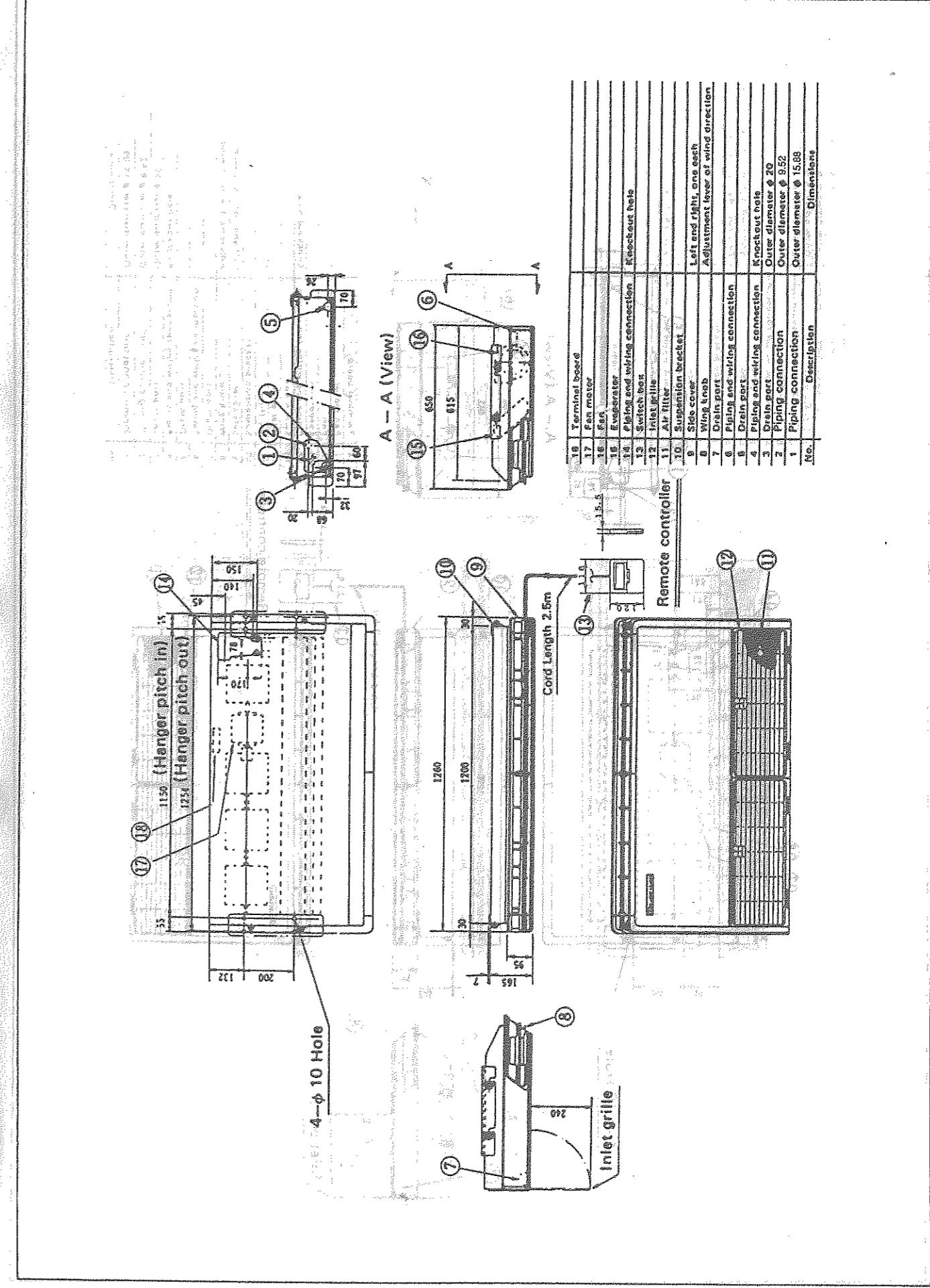
CS-50T32JP
OUTSIDE DIMENSIONS



CS-71T32JP
OUTSIDE DIMENSIONS

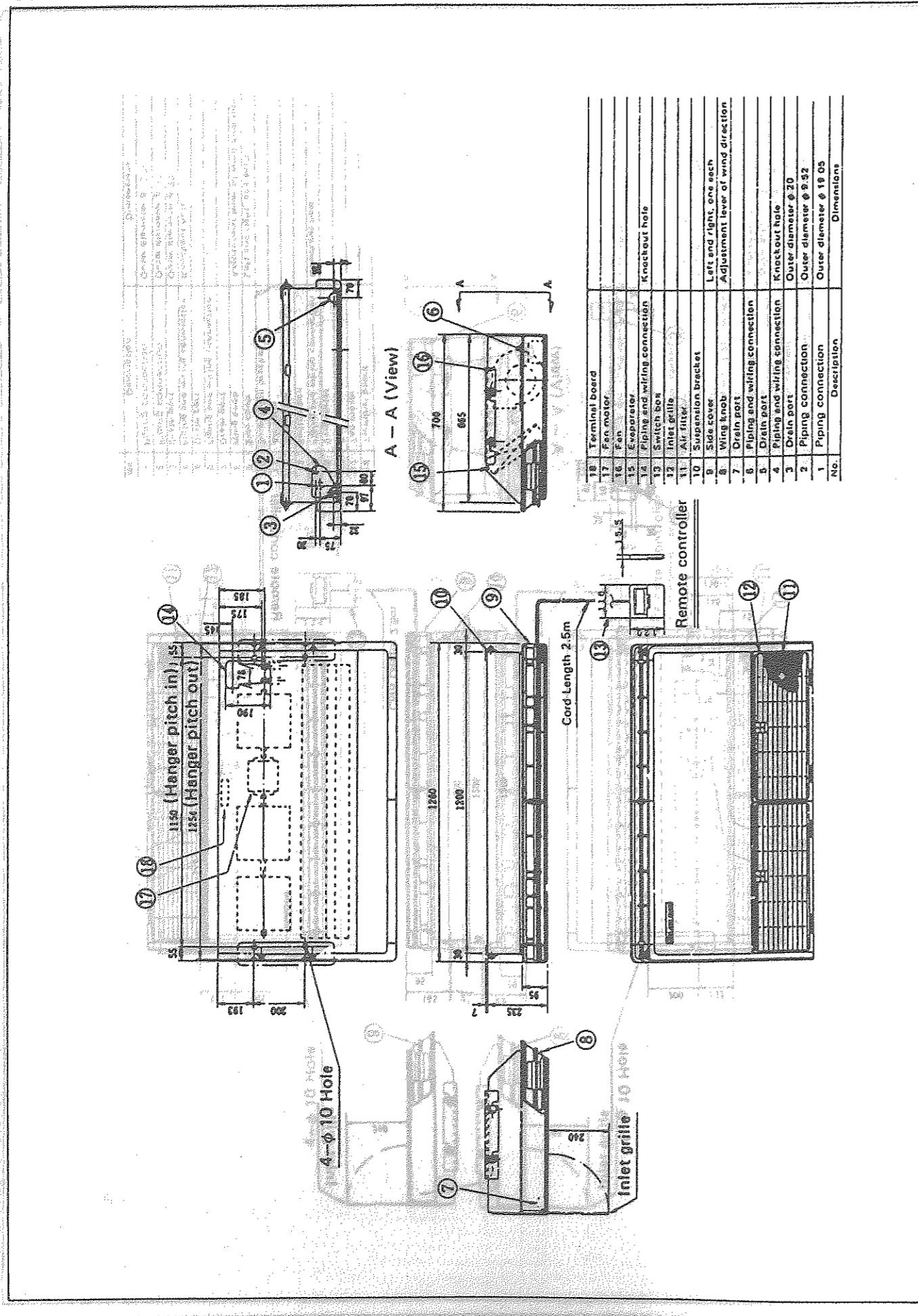


CS-80T32JP
OUTSIDE DIMENSIONS



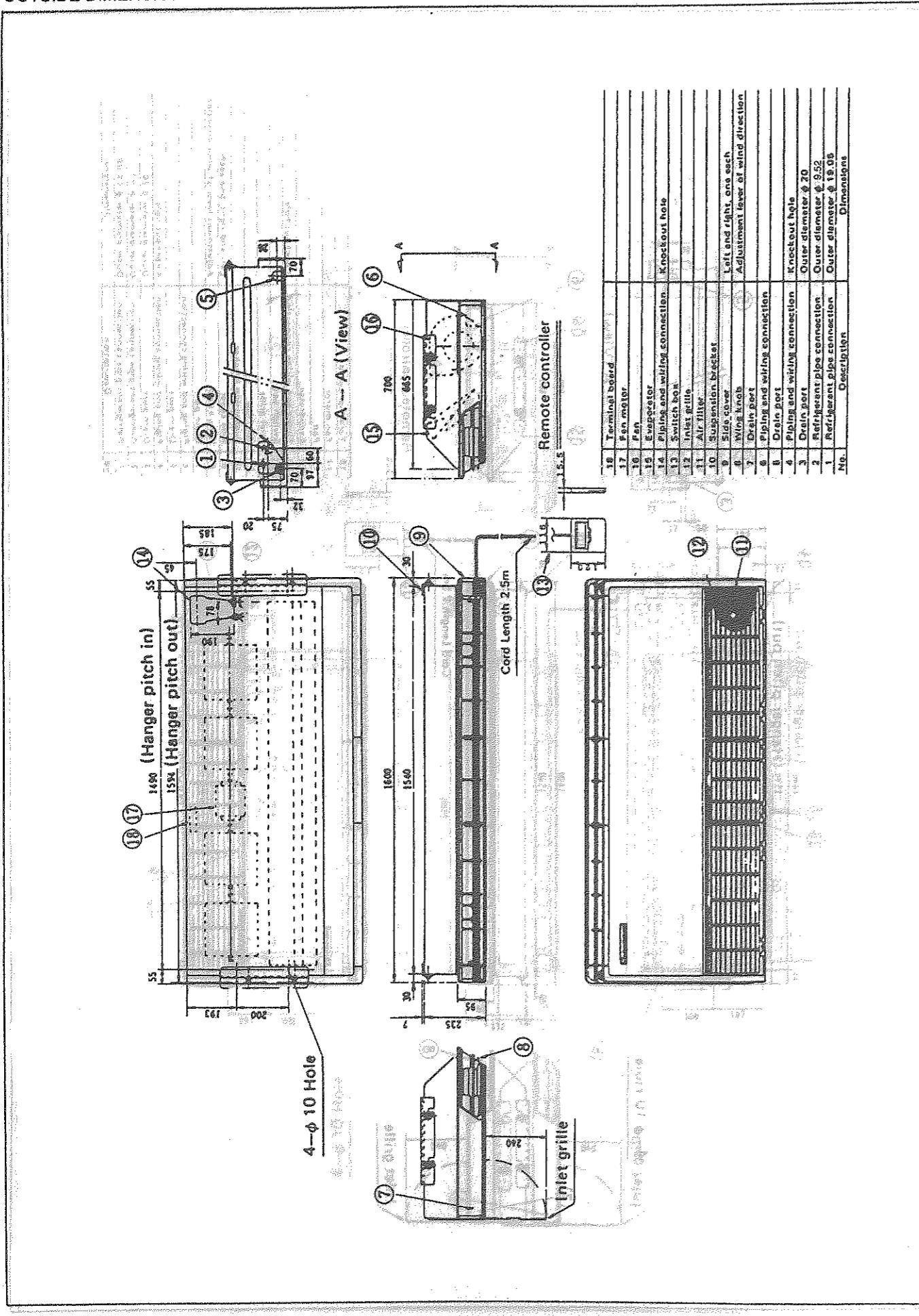
4. TECHNICAL DRAWING

CS-112T32JP
OUTSIDE DIMENSIONS



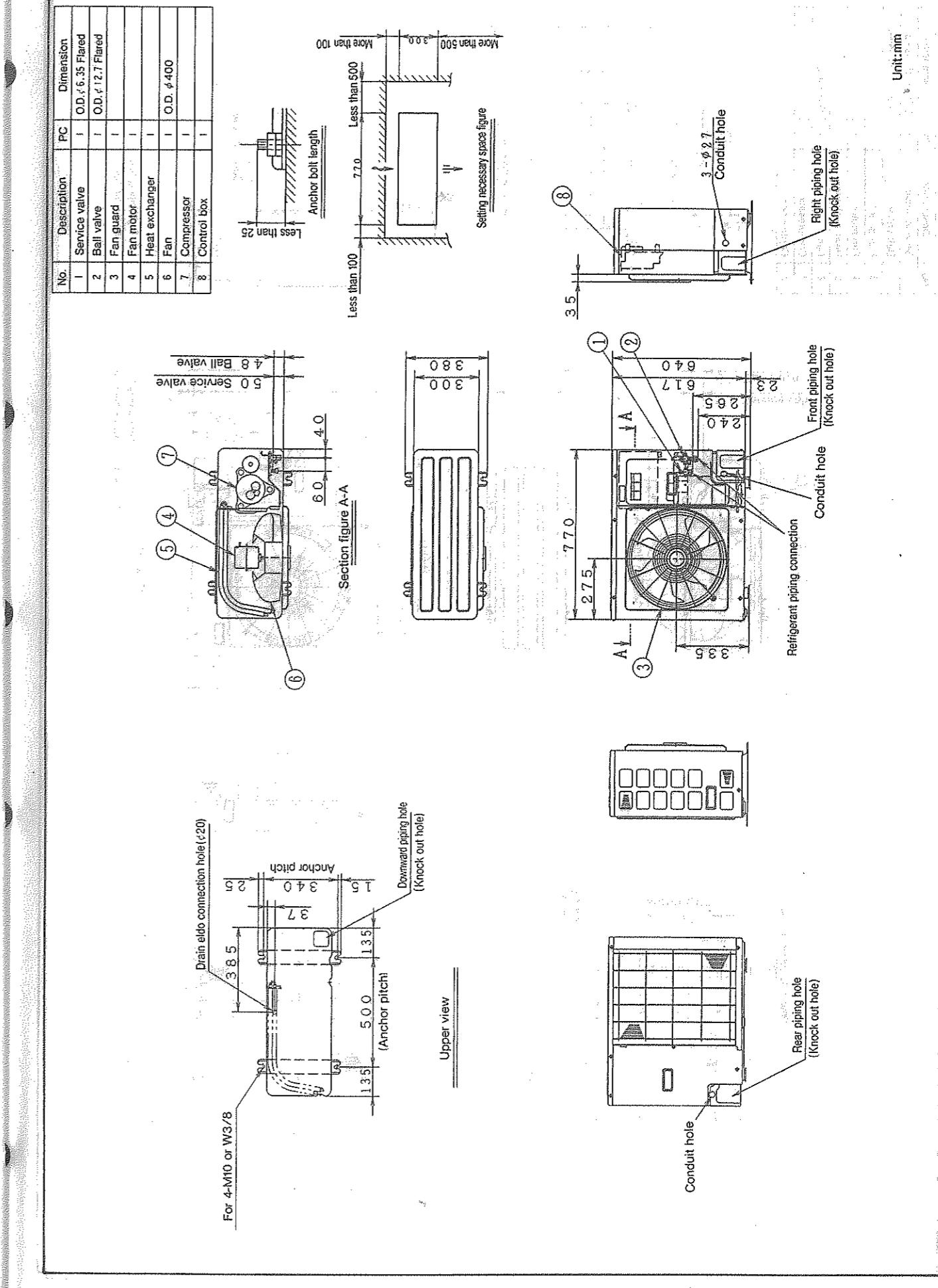
4. TECHNICAL DRAWING

CS-160T32JP
OUTSIDE DIMENSIONS



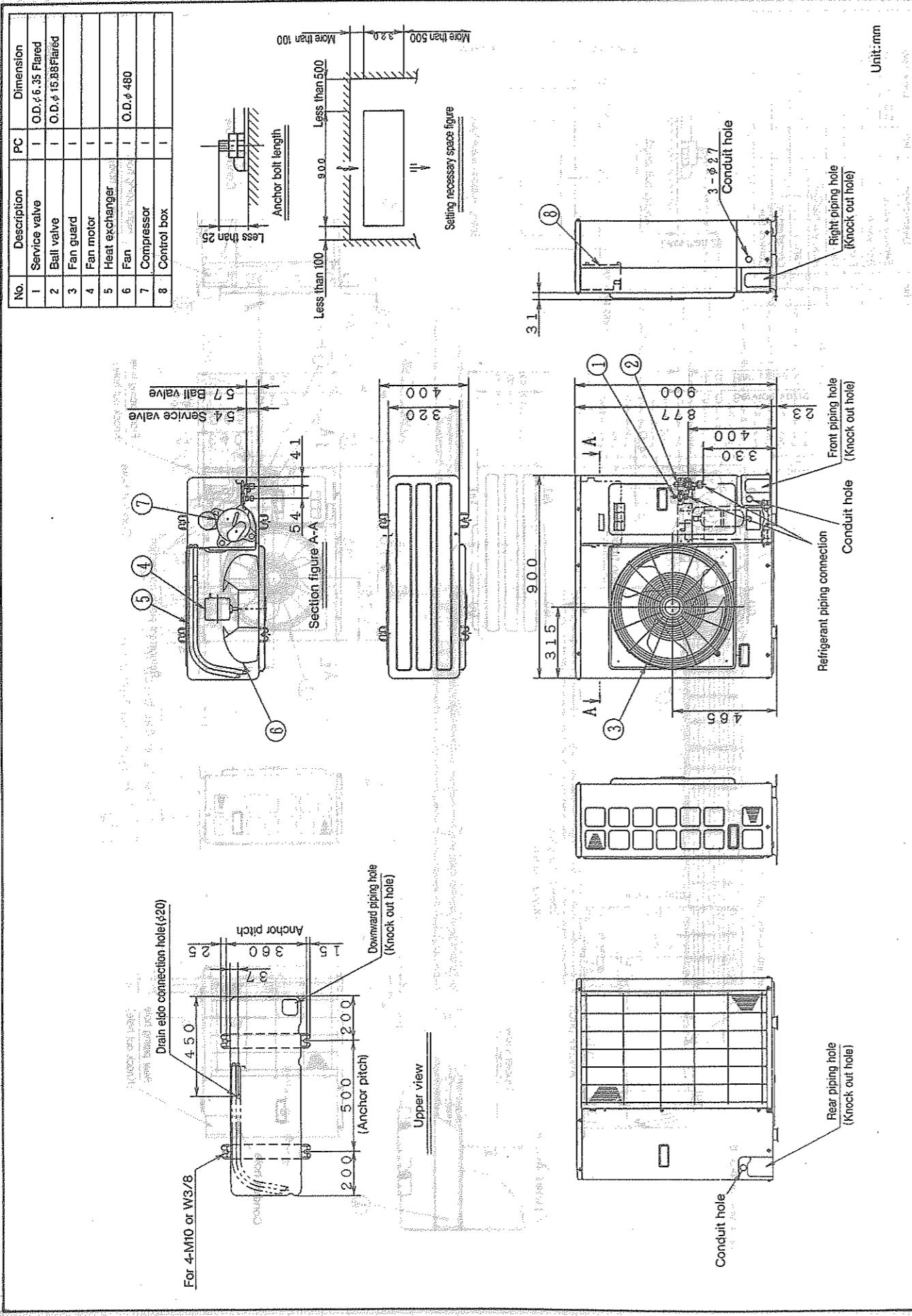
4. TECHNICAL DRAWING

CU-50C02HP



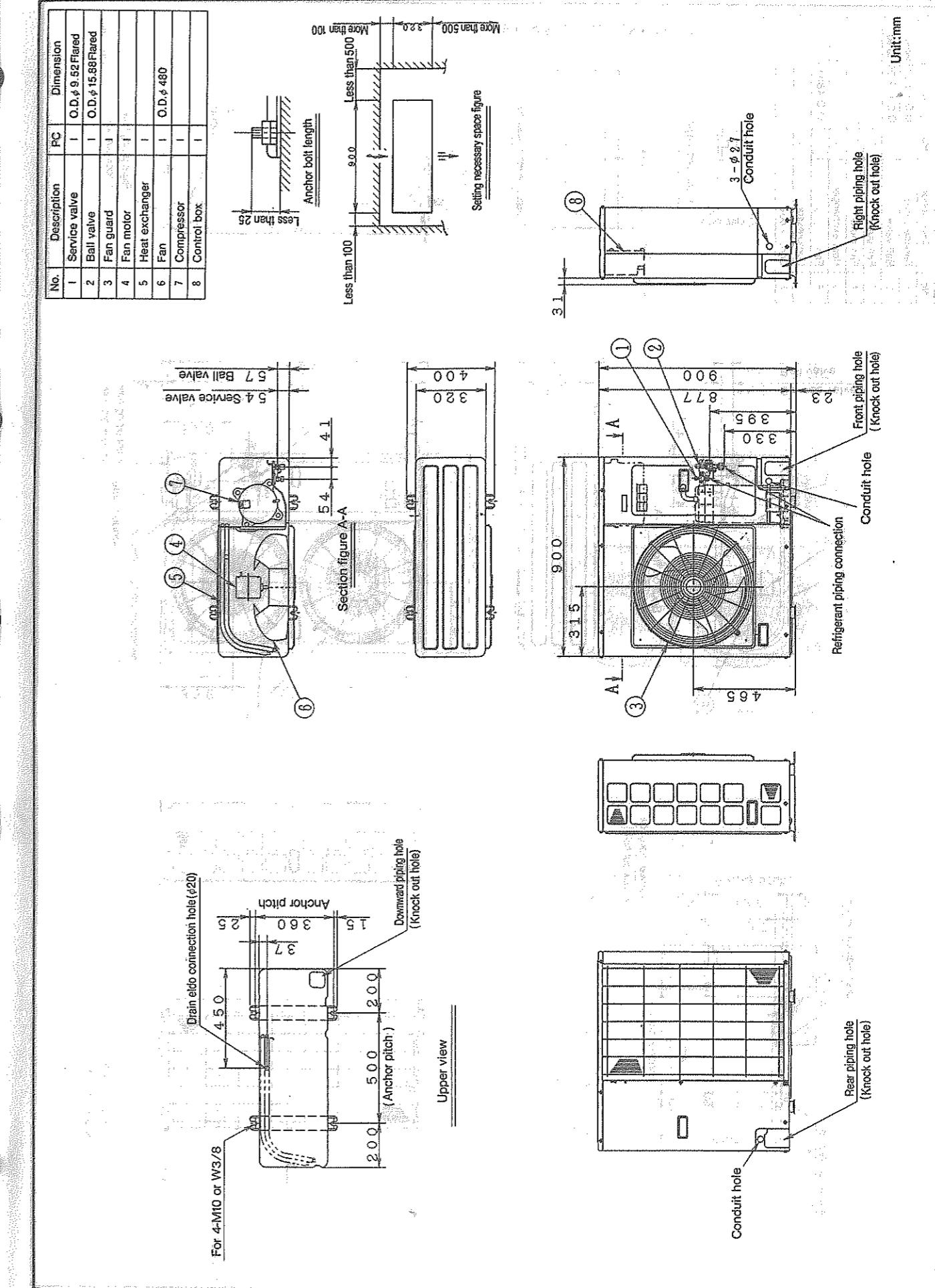
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CU-71C02HP, CU-71C02XP



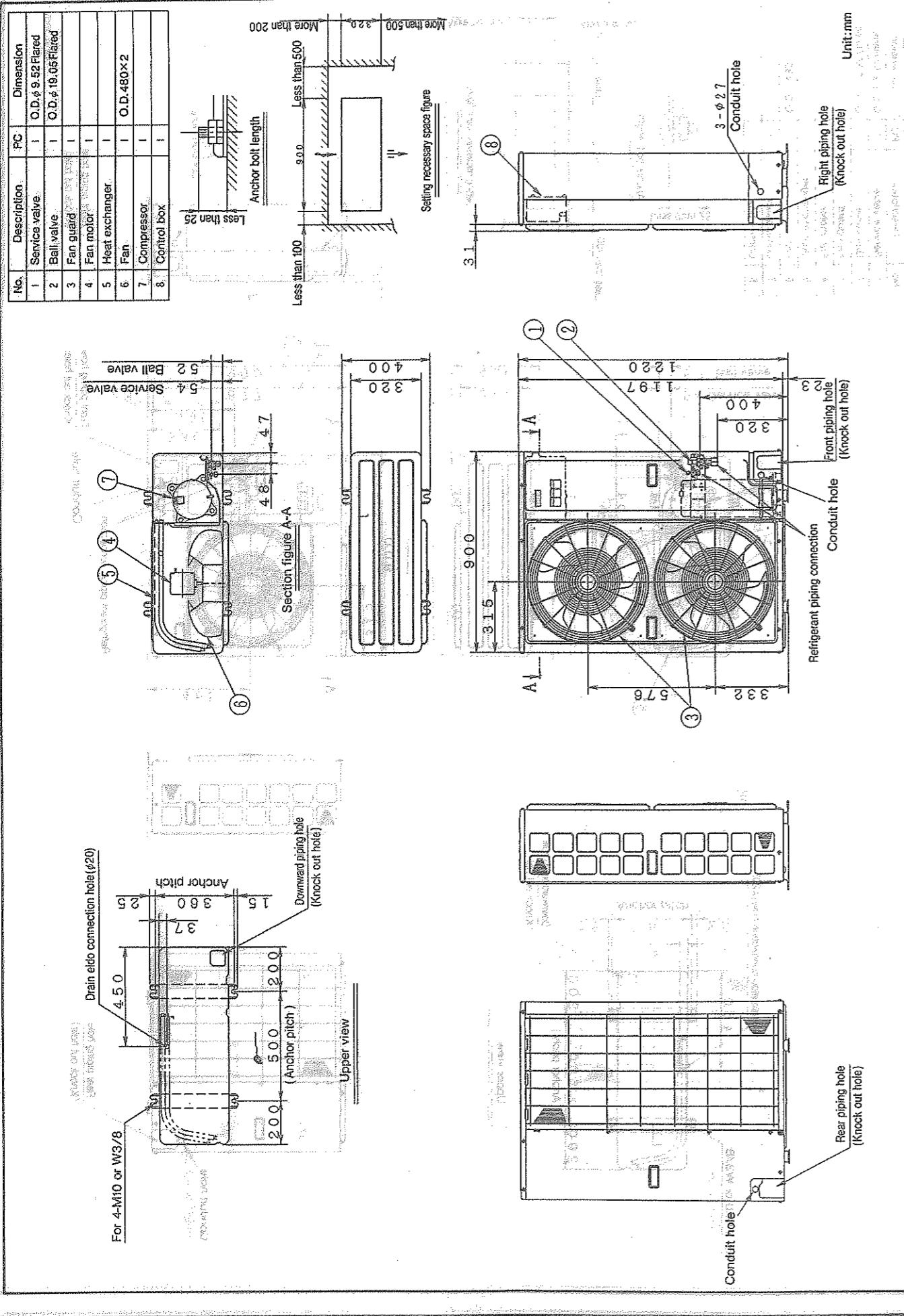
4. TECHNICAL DRAWING

CU-80C52HP, CU-80C52XP, CU-80C02HP, CU-80C02XP



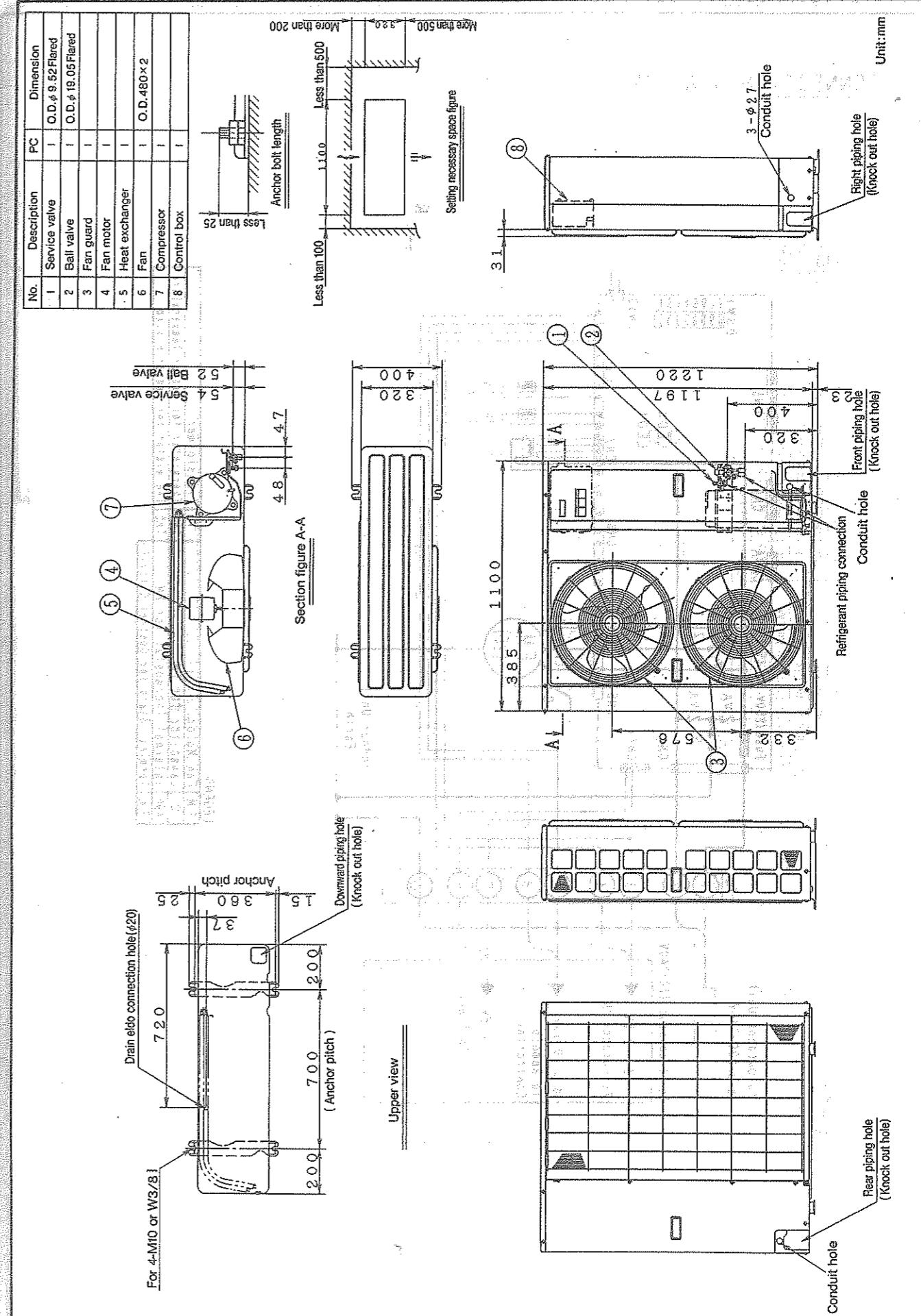
4. TECHNICAL DRAWING

CU-112C52XP, CU-112C02XP



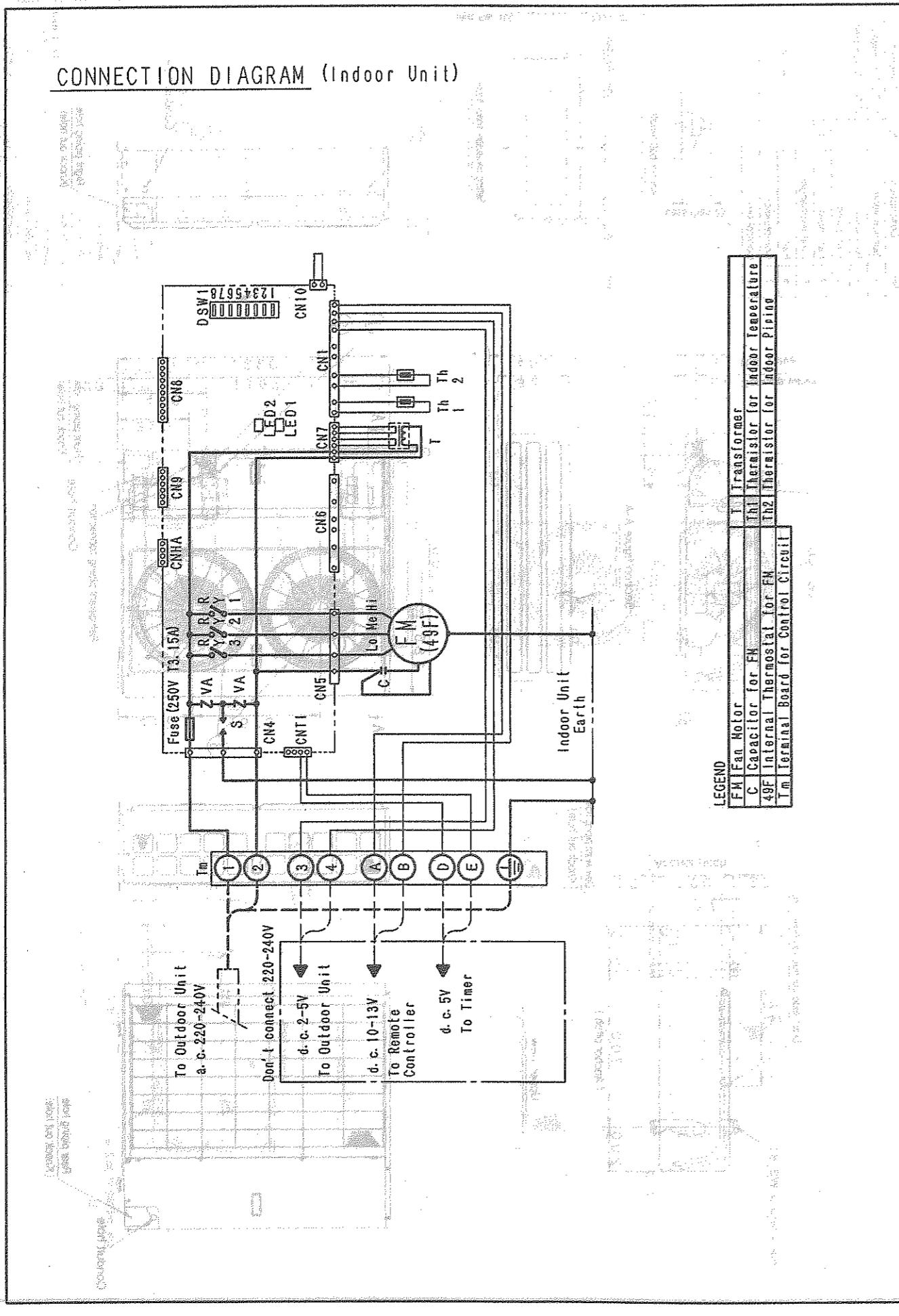
4. TECHNICAL DRAWING

CU-140C53XP,CU-114C03XP,CU-160C53XP,CU-160C03XP



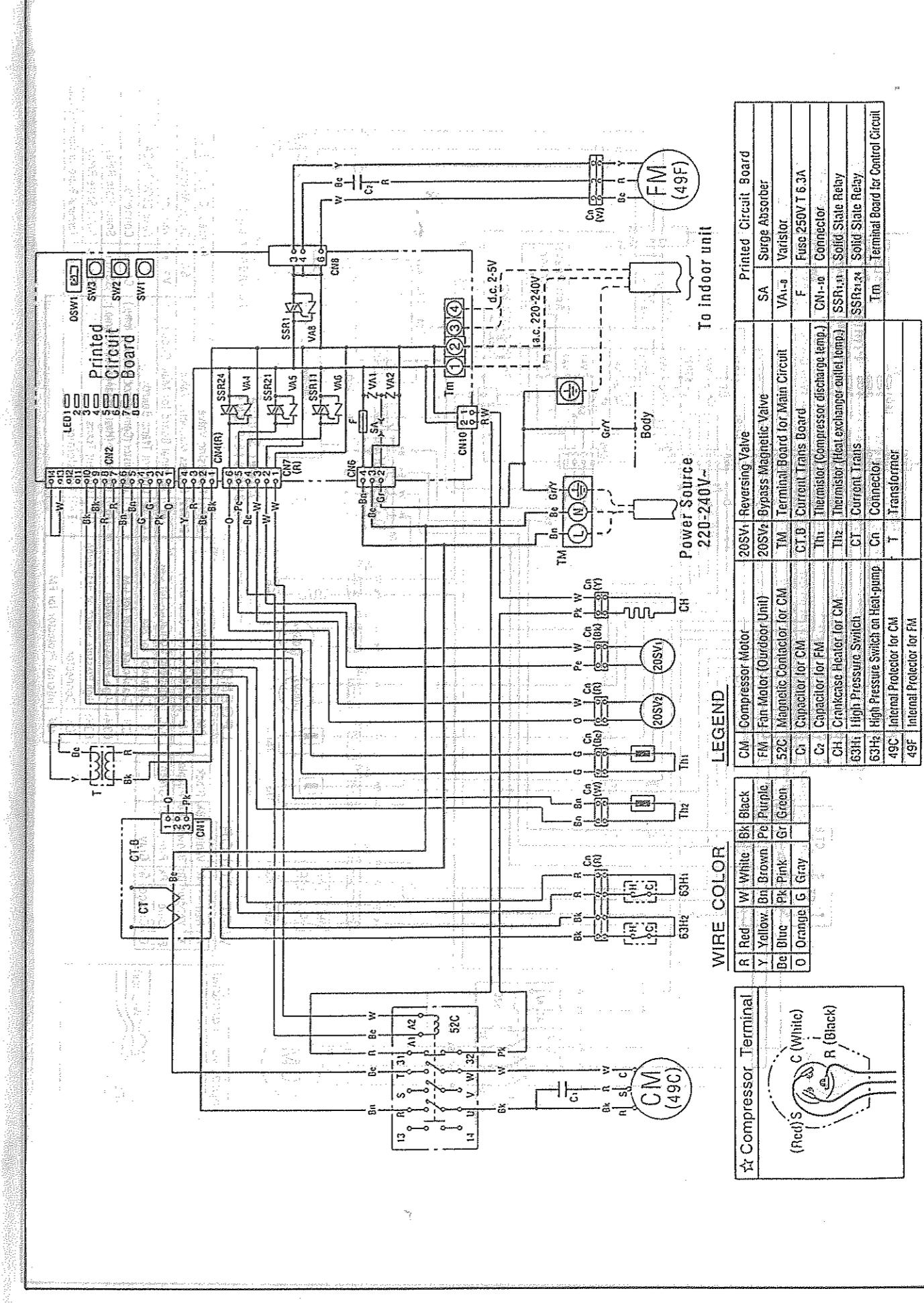
5. CIRCUIT DIAGRAM

CS-50T32JP, CS-71T32JP, CS-80T32JP
CS-112T32JP, CS-140T32JP, CS-160T32JP



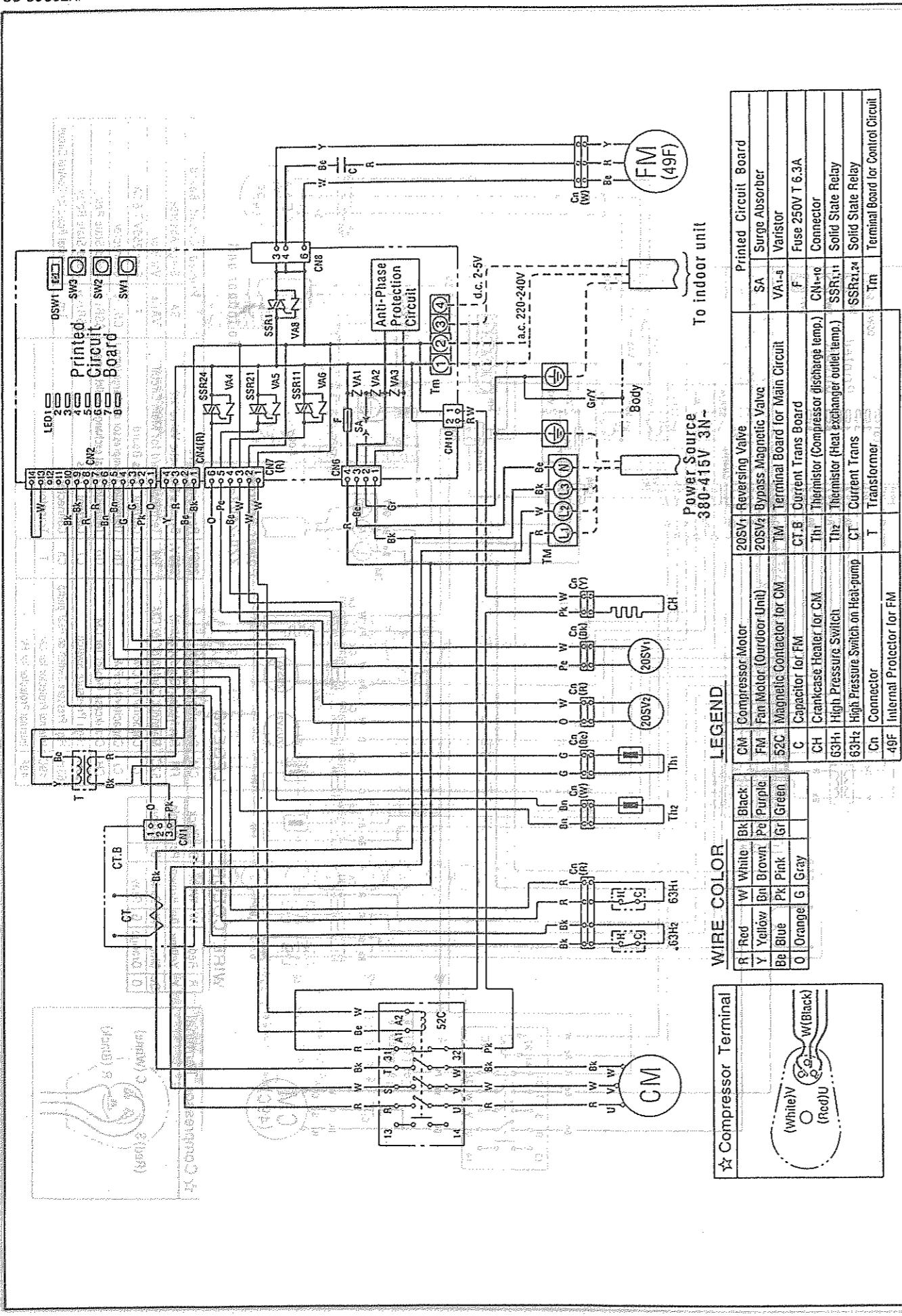
5. CIRCUIT DIAGRAM(HEAT PUMP TYPE)

CU-80C52HP



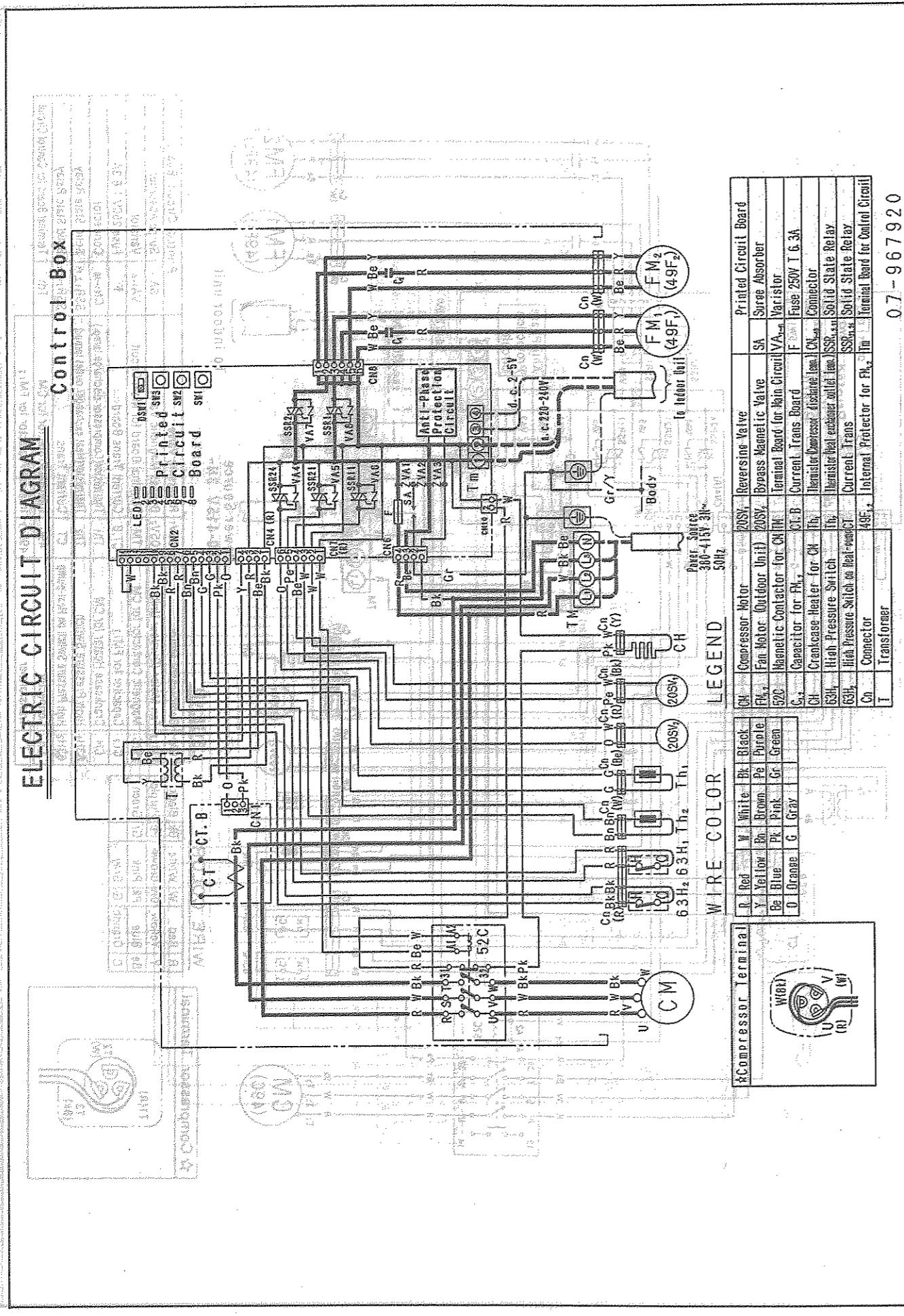
5. CIRCUIT DIAGRAM(HEAT PUMP TYPE)

CU-80C52XP



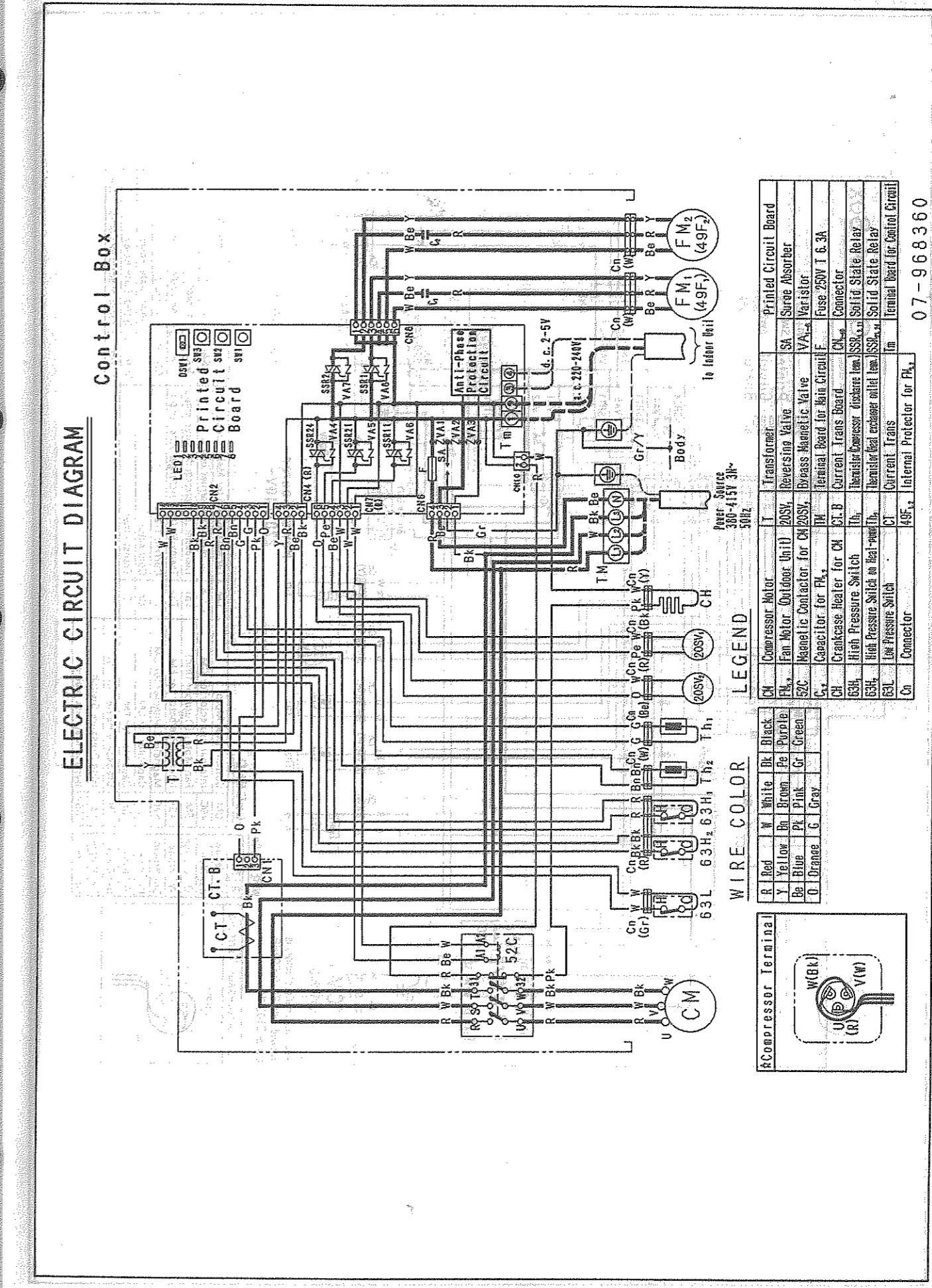
5. CIRCUIT DIAGRAM(HEAT PUMP TYPE)

CU-140C53XP

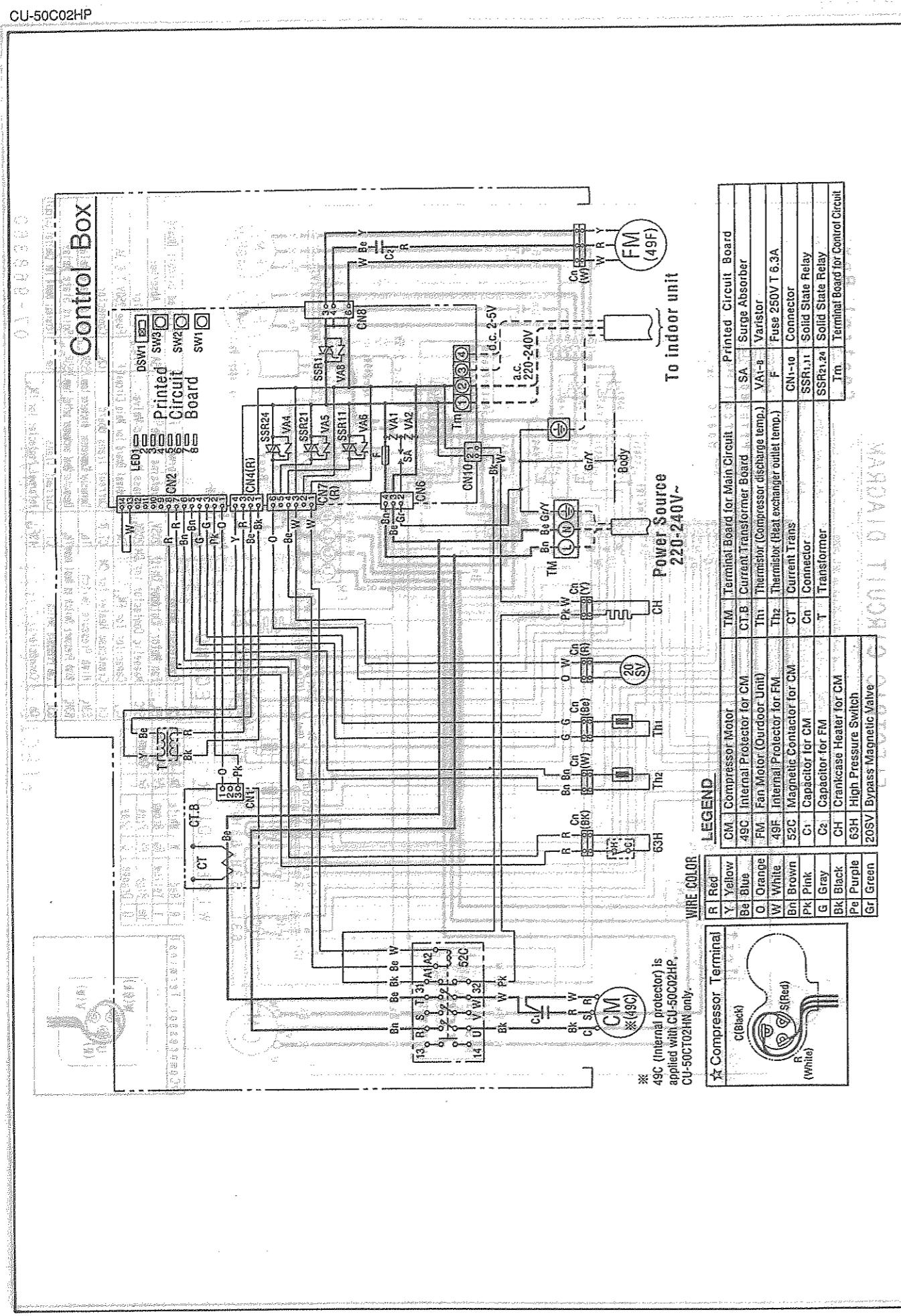


5. CIRCUIT DIAGRAM(HEAT PUMP TYPE)

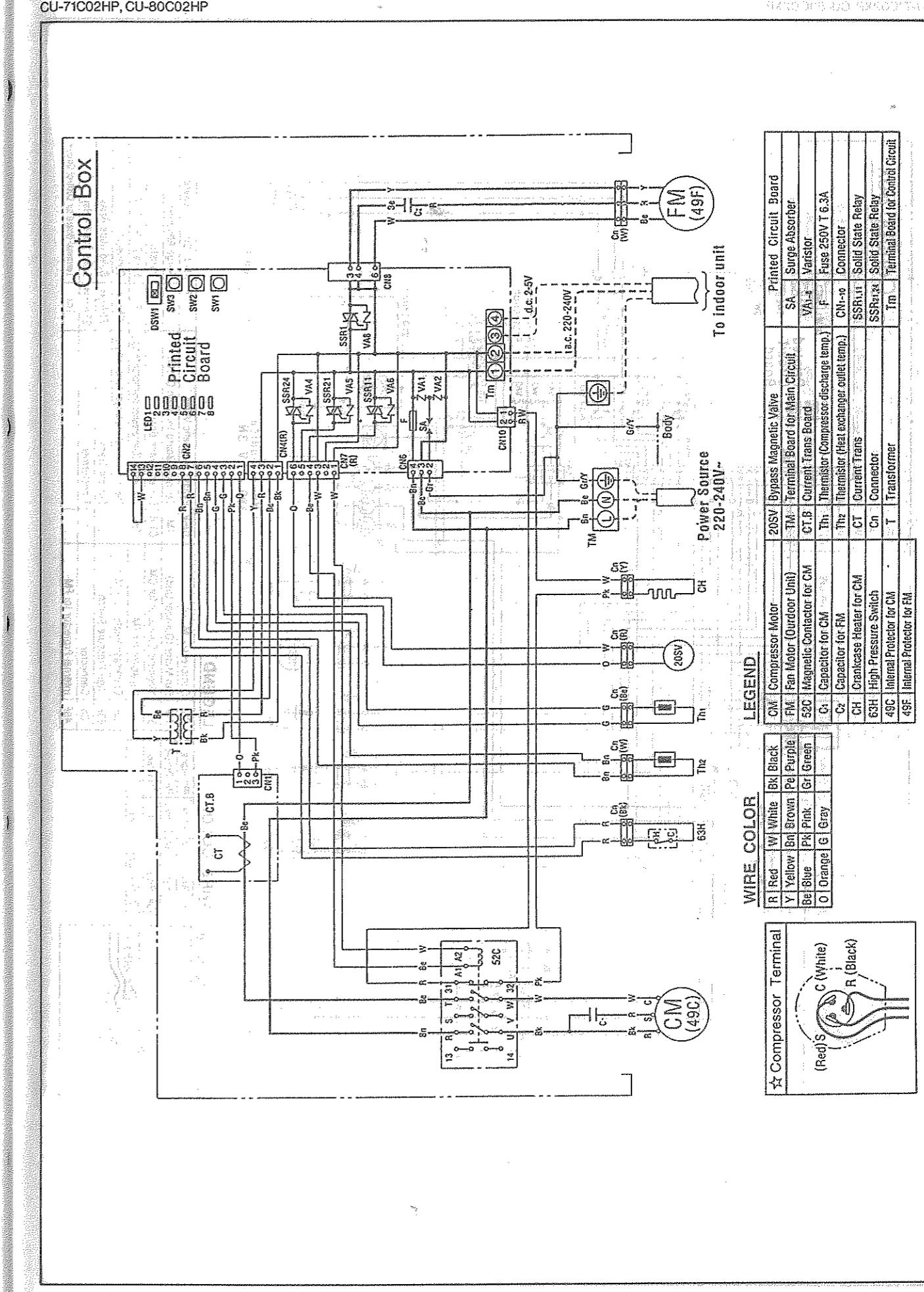
CU-160C53XP



5. CIRCUIT DIAGRAM(COOLING ONLY TYPE)

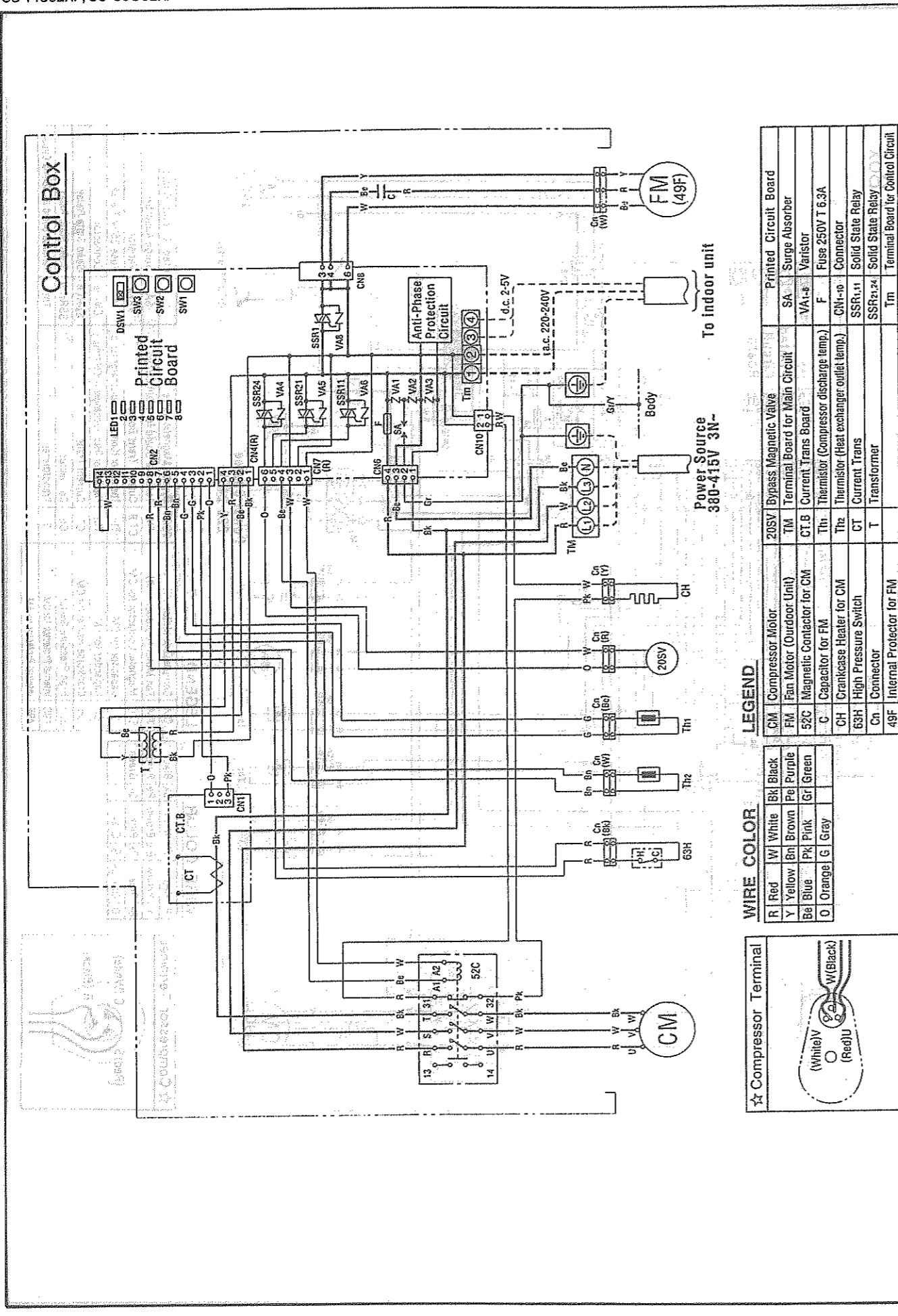


5. CIRCUIT DIAGRAM(COOLING ONLY TYPE)

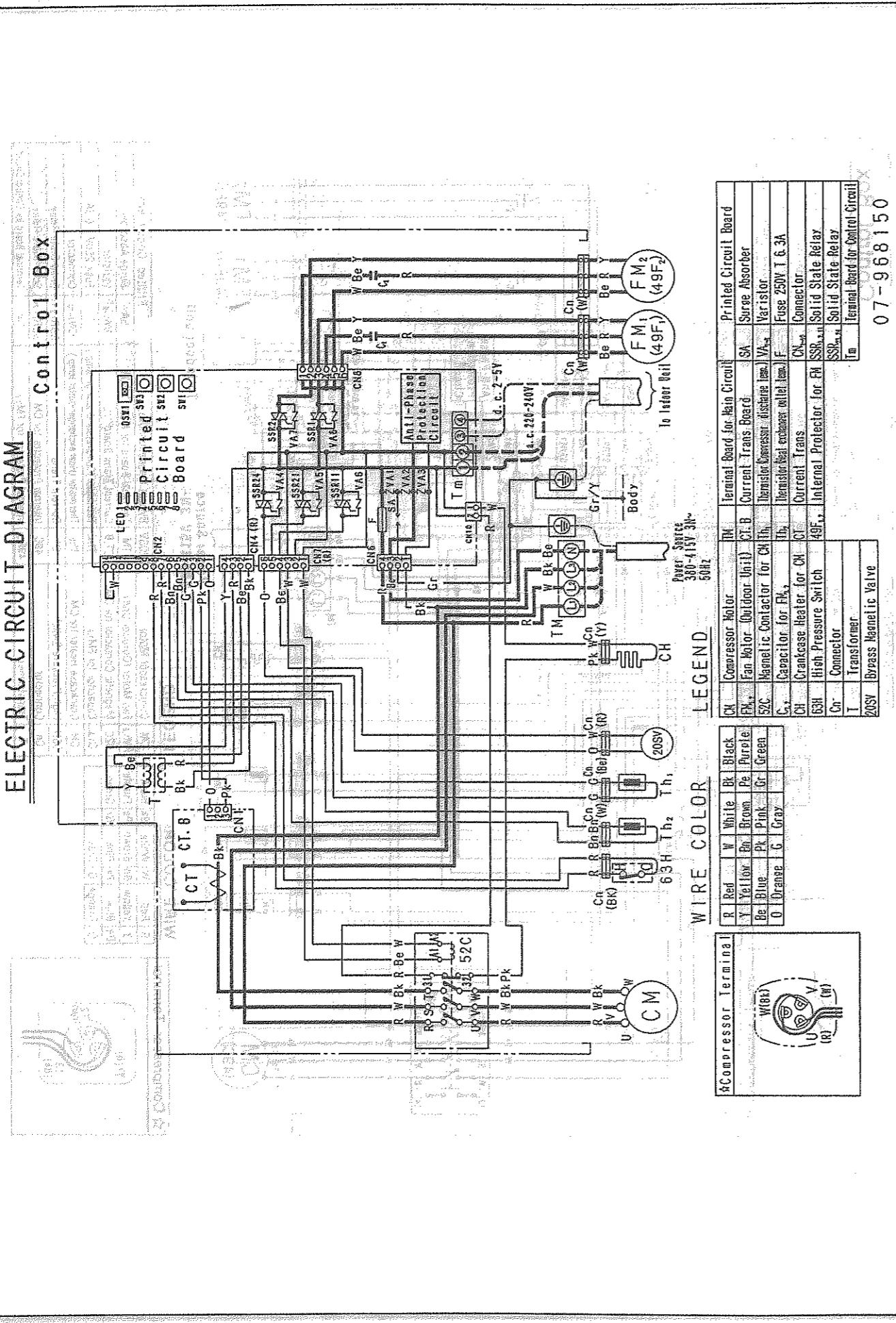


5. CIRCUIT DIAGRAM(COOLING ONLY TYPE)

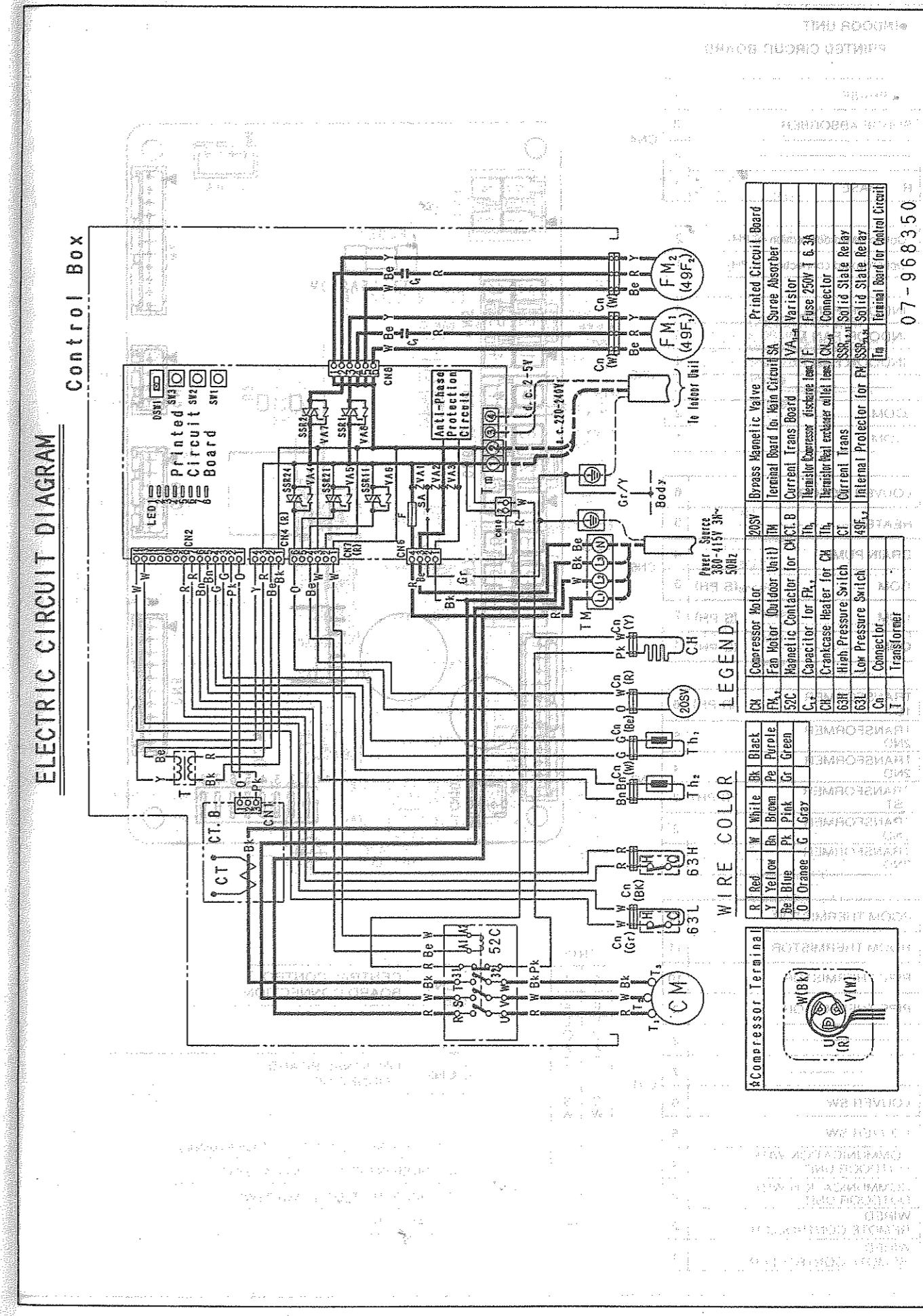
CU-71C02XP, CU-80C02XP



CU-140C03XP



CU-160C03XP



5. CIRCUIT DIAGRAM

■APPLICABLE MODEL
ALL MODEL

●INDOOR UNIT PRINTED CIRCUIT BOARD

S PHASE	4
SURGE ABSORBER	3
	2
R PHASE	1

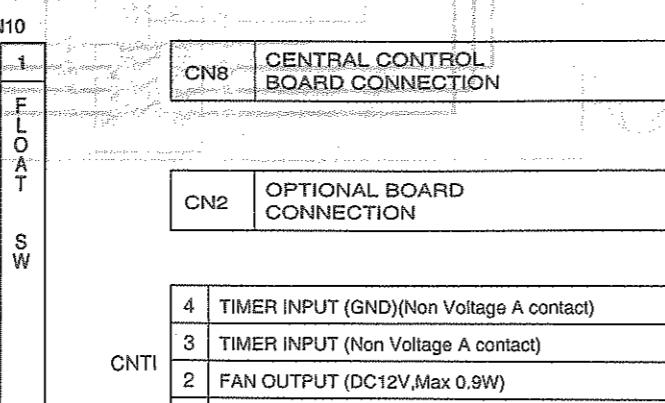
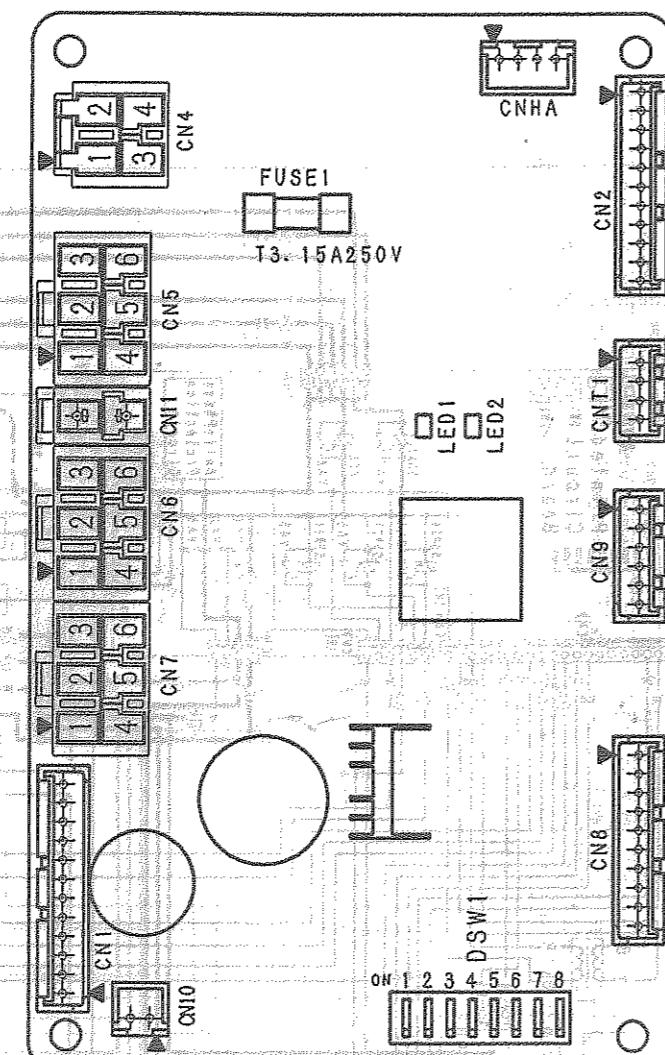
Option board connection (S PH)	2
Option board connection (R PH)	1

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

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

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

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



5. CIRCUIT DIAGRAM

■APPLICABLE MODEL
ALL MODEL

●OUTDOOR UNIT PRINTED CIRCUIT BOARD

*1: Heat pump model only
*2: CU-112C52XP, CU-112C02XP
CU-140C53XP, CU-140C03XP
CU-160C53XP, CU-160C03XP model only

TM1	COMMUNICATION WITH INDOOR UNIT
4	COMMUNICATION WITH INDOOR UNIT
3	COMMUNICATION WITH INDOOR UNIT
2	S Phase
1	R Phase

CN2	14 GND
13	LOW PRESSURE SW
12	GND
11	DEMAND INPUT
10	GND
9	HEATING PRESSURE SW
8	GND
7	HIGH PRESSURE SW
6	GND
5	PIPE TEMP SENSOR
4	GND
3	DISCHARGE TEMP SENSOR
2	GND
1	CT

CN4	4 TRANSFER 2ND(S)
3	TRANSFER 1ST(R)
2	TRANSFER 2ND(R)
1	TRANSFER 1ST(S)

CN7	6 LIQUID BYPASS valve(R)
5	REVEERSING valve(R)
4	COMPRESSOR relay(R)
3	LIQUID BYPASS valve(S)
2	REVERSING valve(S)
1	COMPRESSOR relay(S)

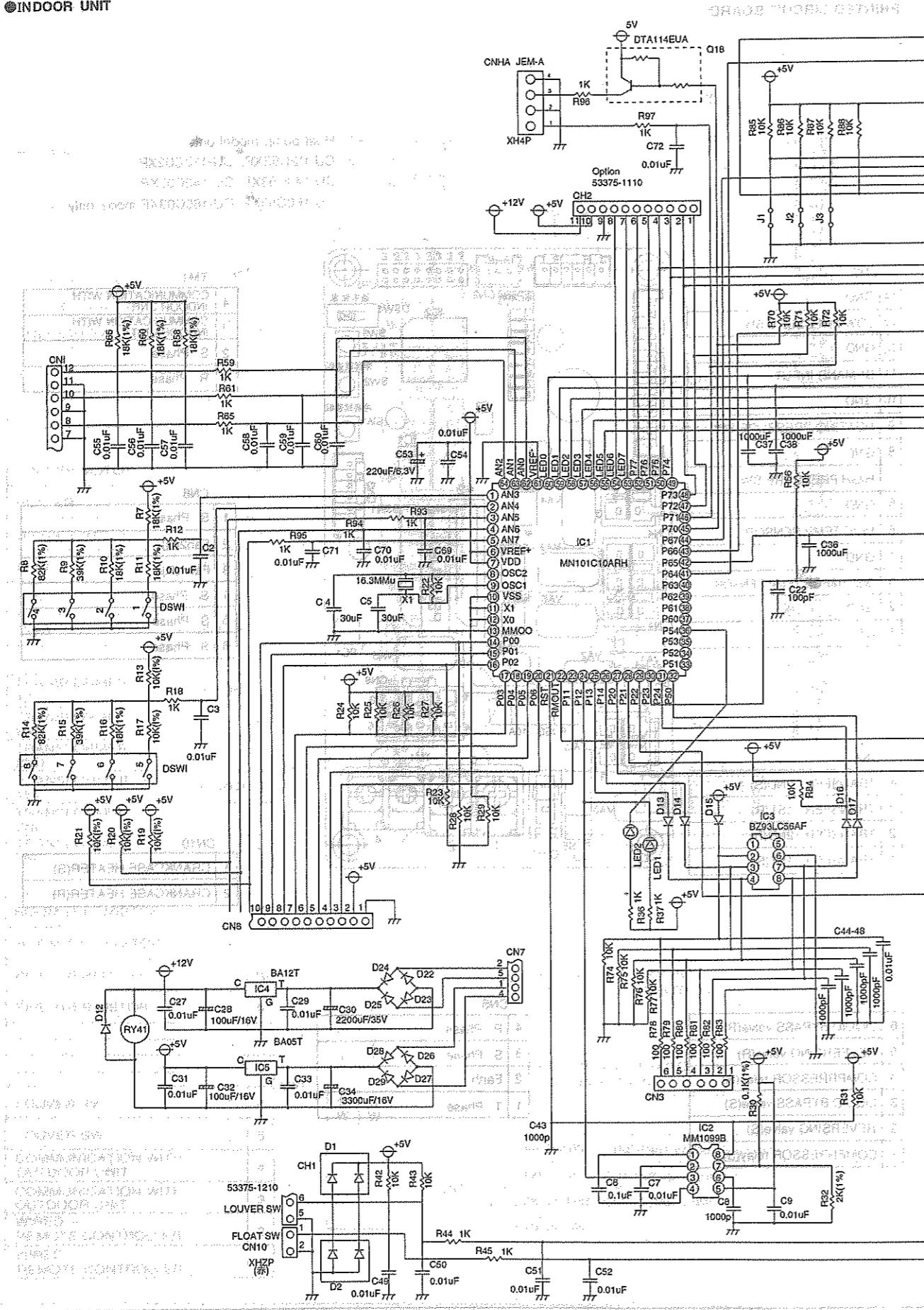
CN6	4 R Phase
3	S Phase
2	Earth
1	T Phase

CN10	1 CRANKCASE HEATER(S)
2	CRANKCASE HEATER(R)

5.CIRCUIT DIAGRAM

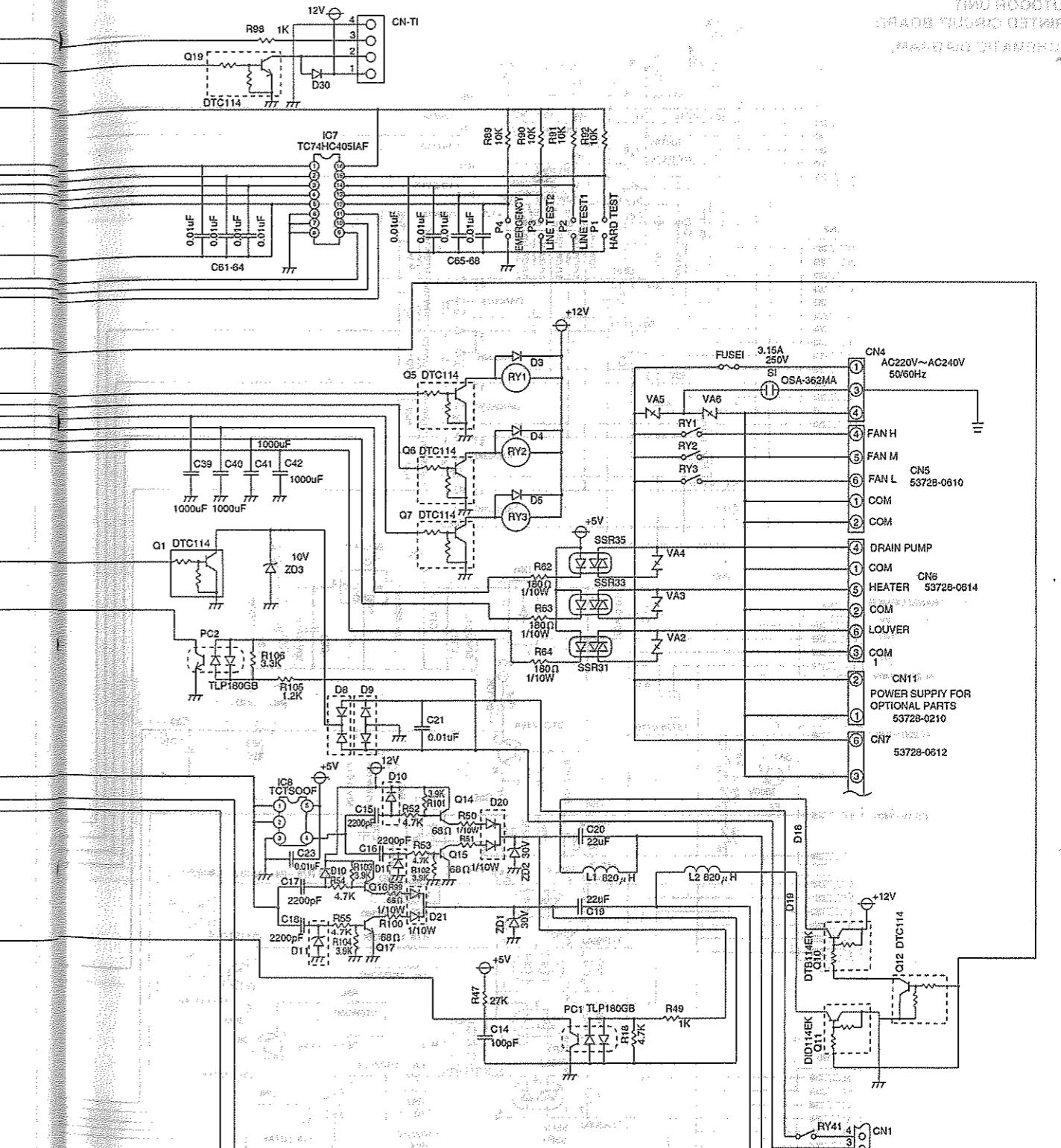
APPLICABLE MODEL
ALL MODEL

● INDOOR UNIT



5.CIRCUIT DIAGRAM

IGUM SUBAGUANGA
TWIN MODE TWO
TWIN MODE THREE
TWIN MODE FOUR

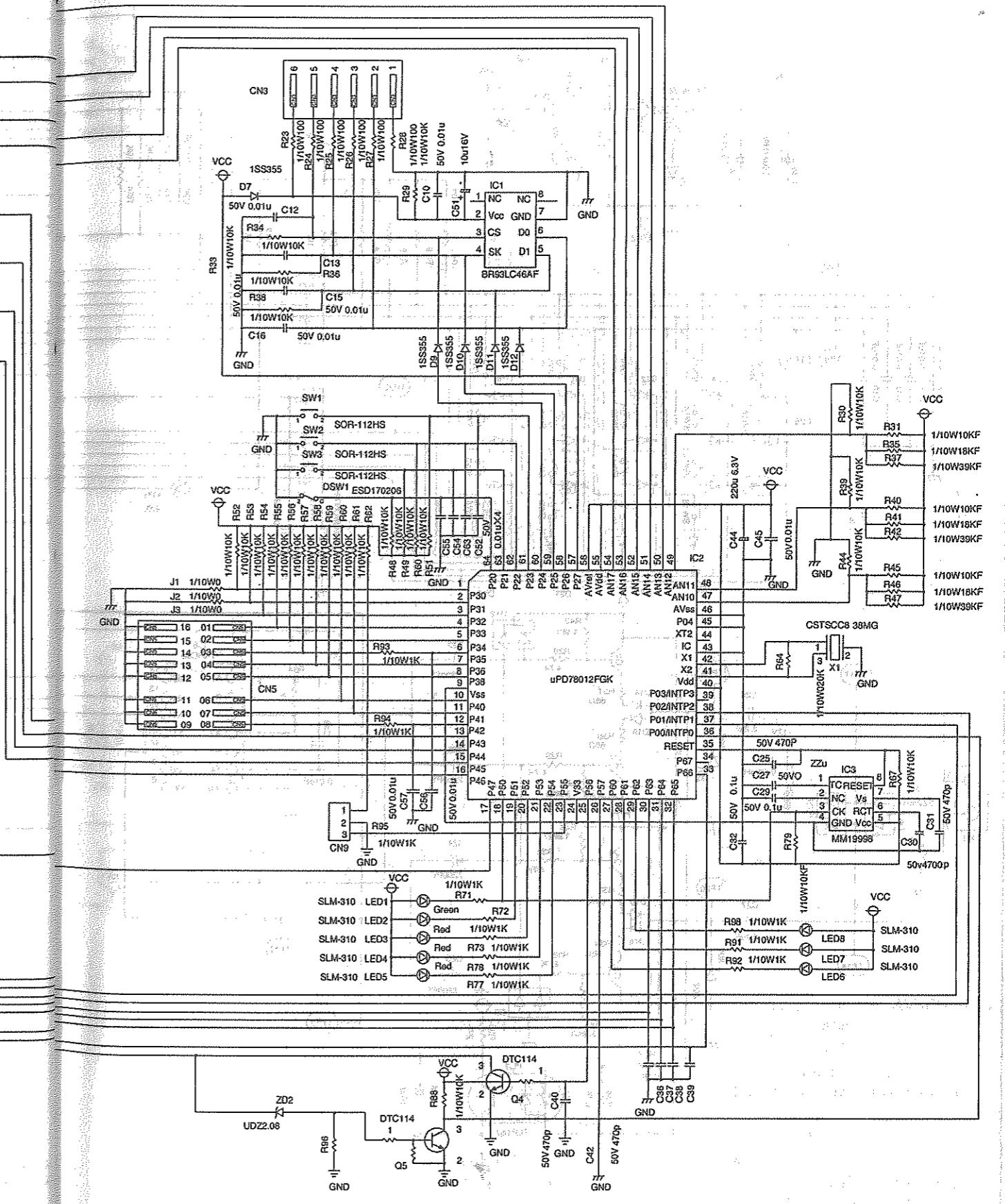
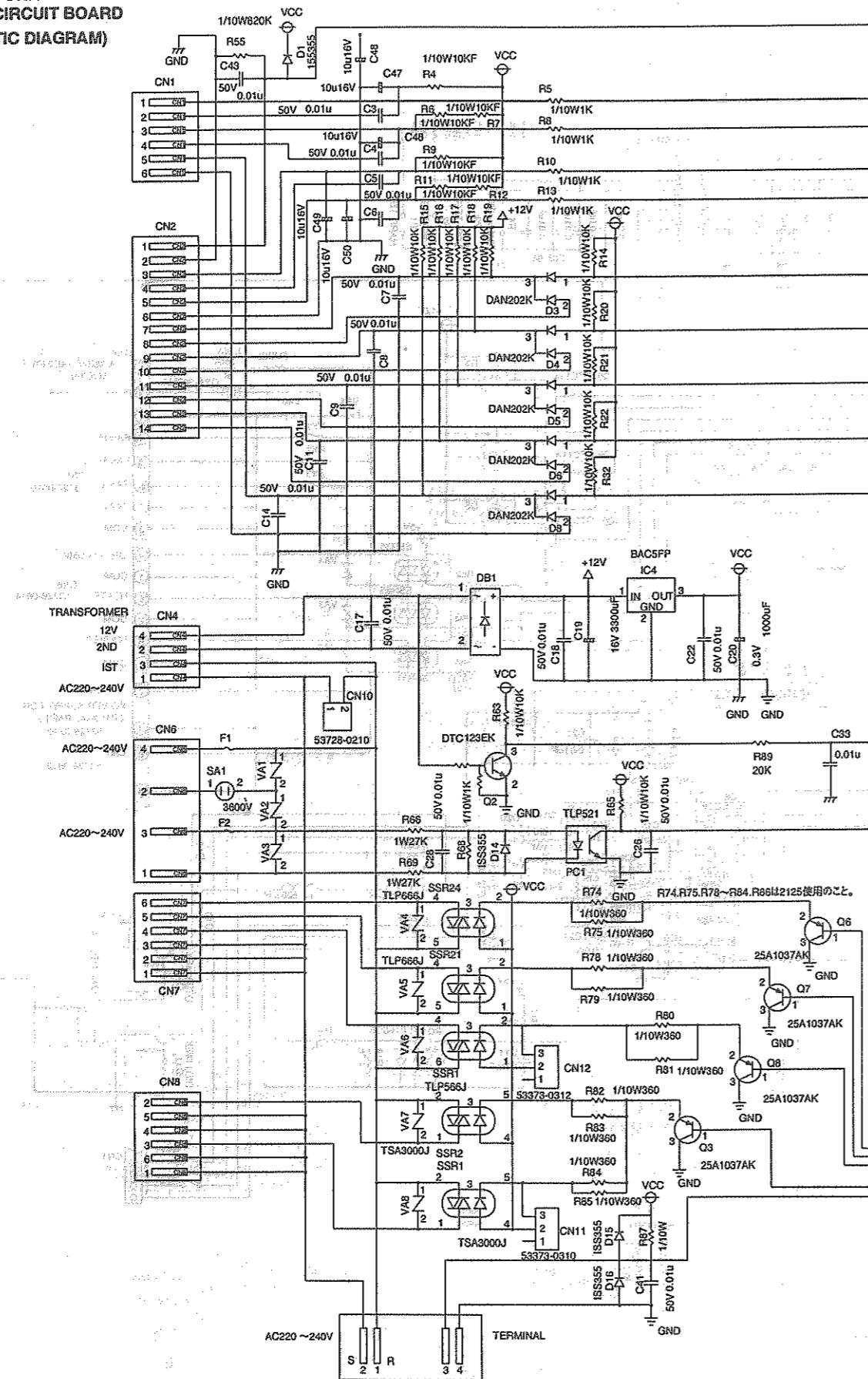


5. CIRCUIT DIAGRAM

5. CIRCUIT DIAGRAM

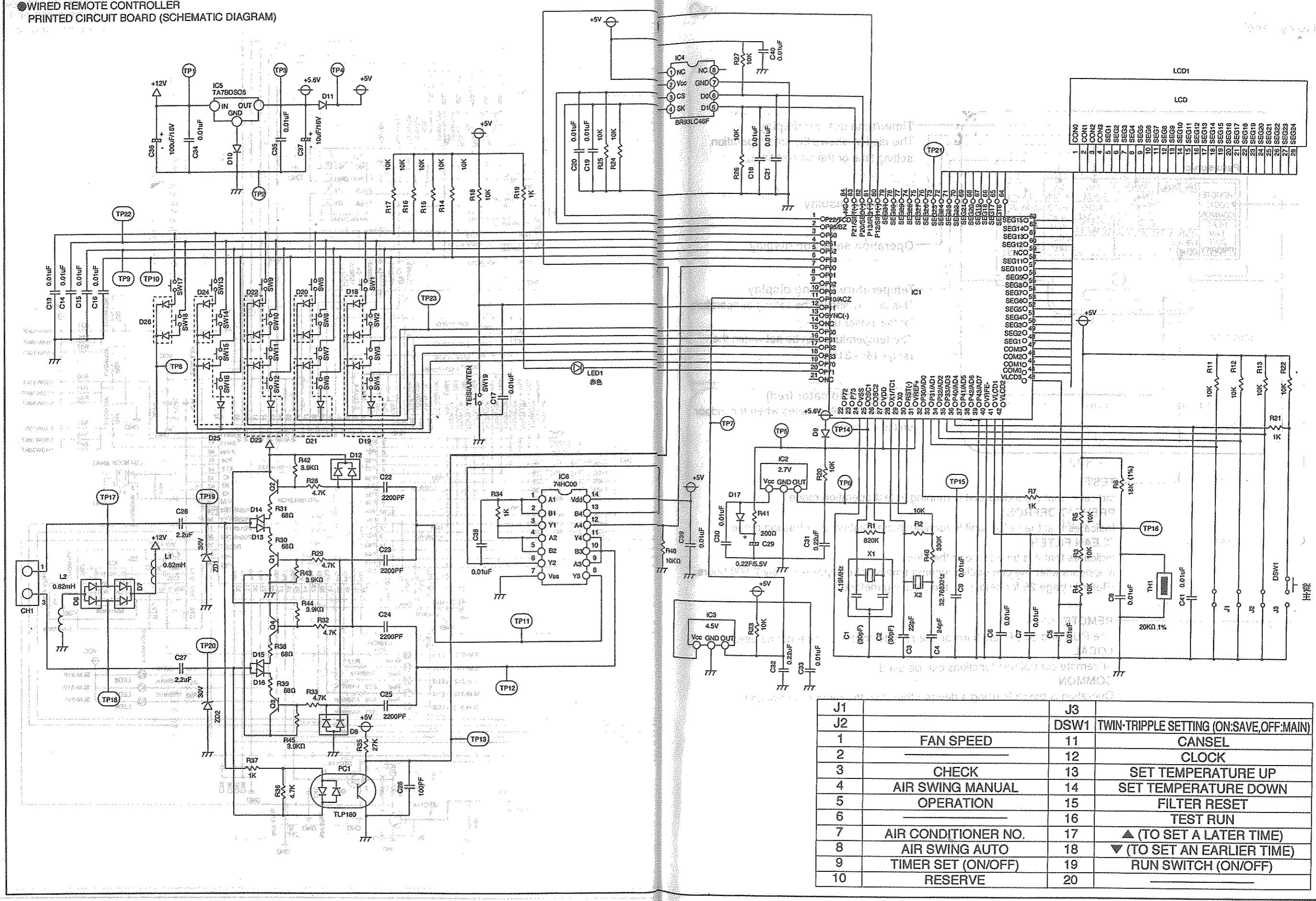
**■APPLICABLE MODEL
ALL MODEL**

OUTDOOR UNIT PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)



APPLICABLE MODEL

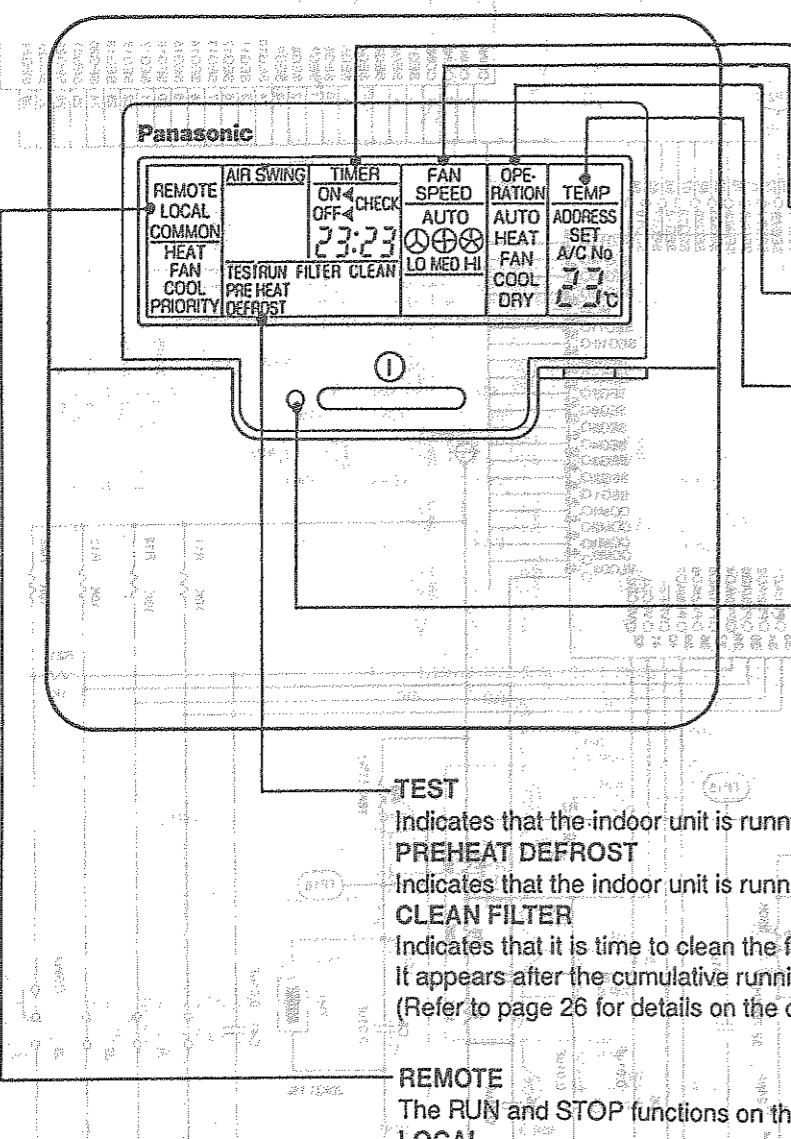
CS-40U32JP, CS-50U32JP, CS-71U32JP, CS-80U32JP, CS-112U32JP

**WIRED REMOTE CONTROLLER
PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)**

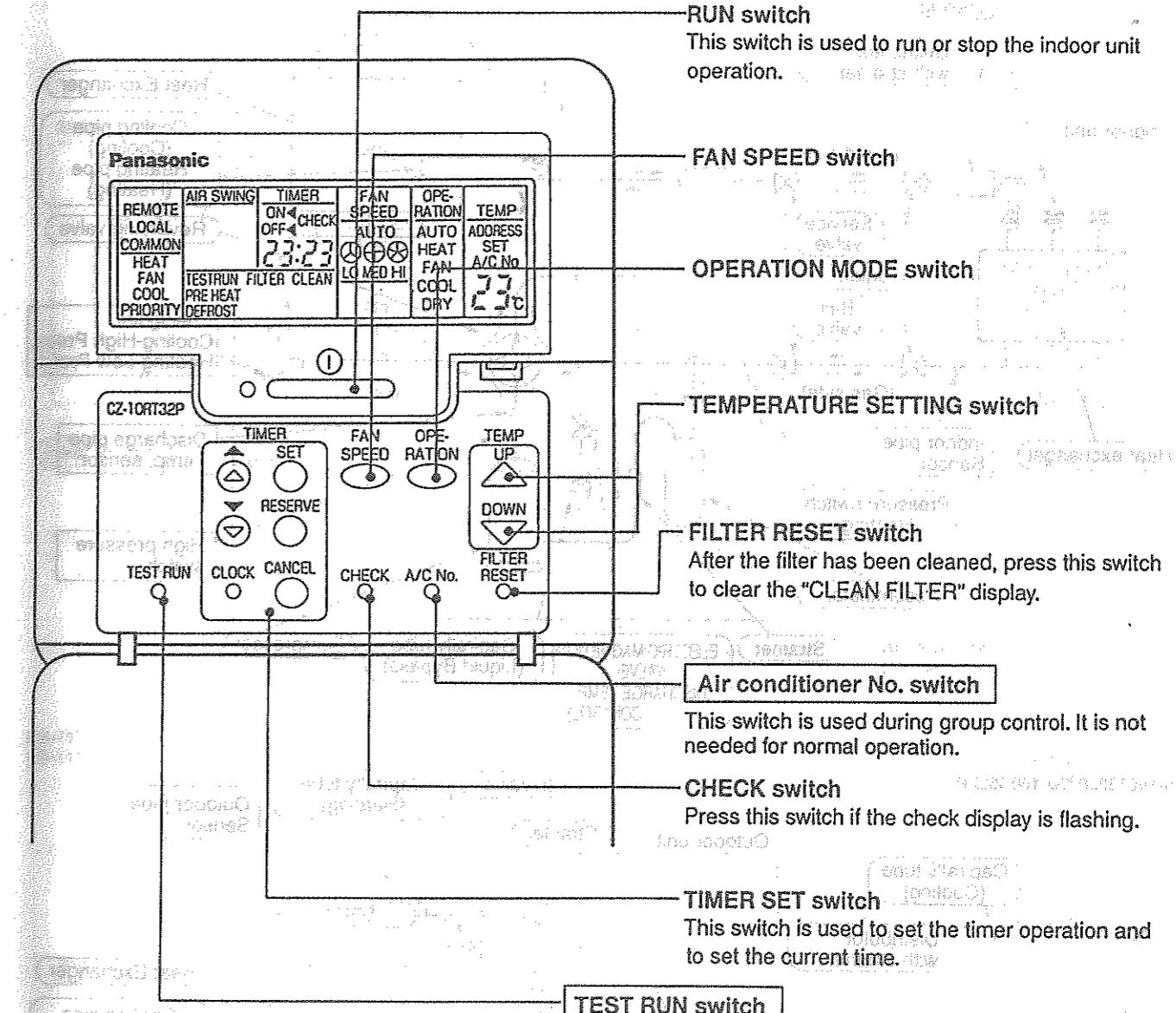
■Wired Remote Controller

Name and function of each part

Display panel

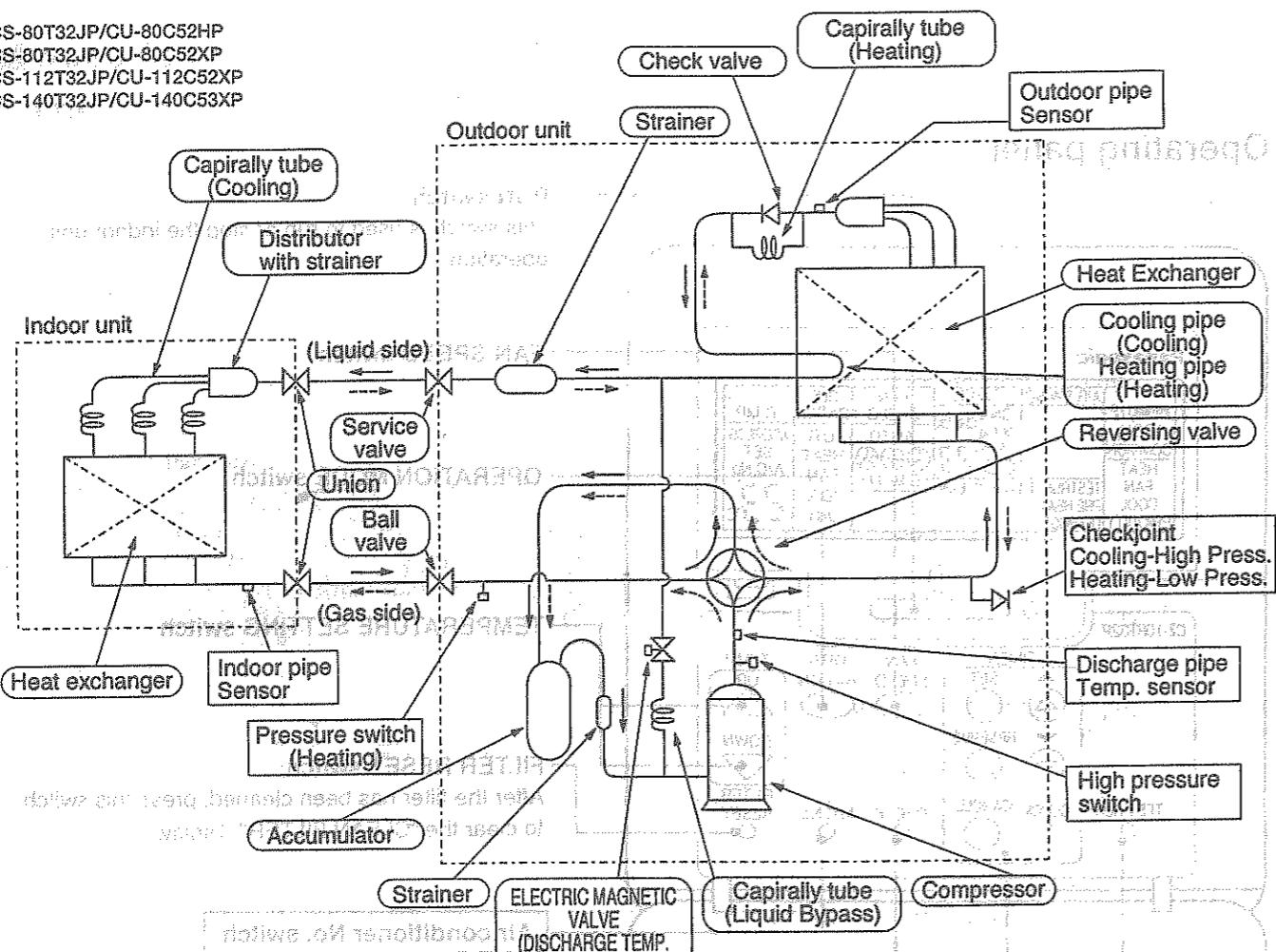


Operating panel

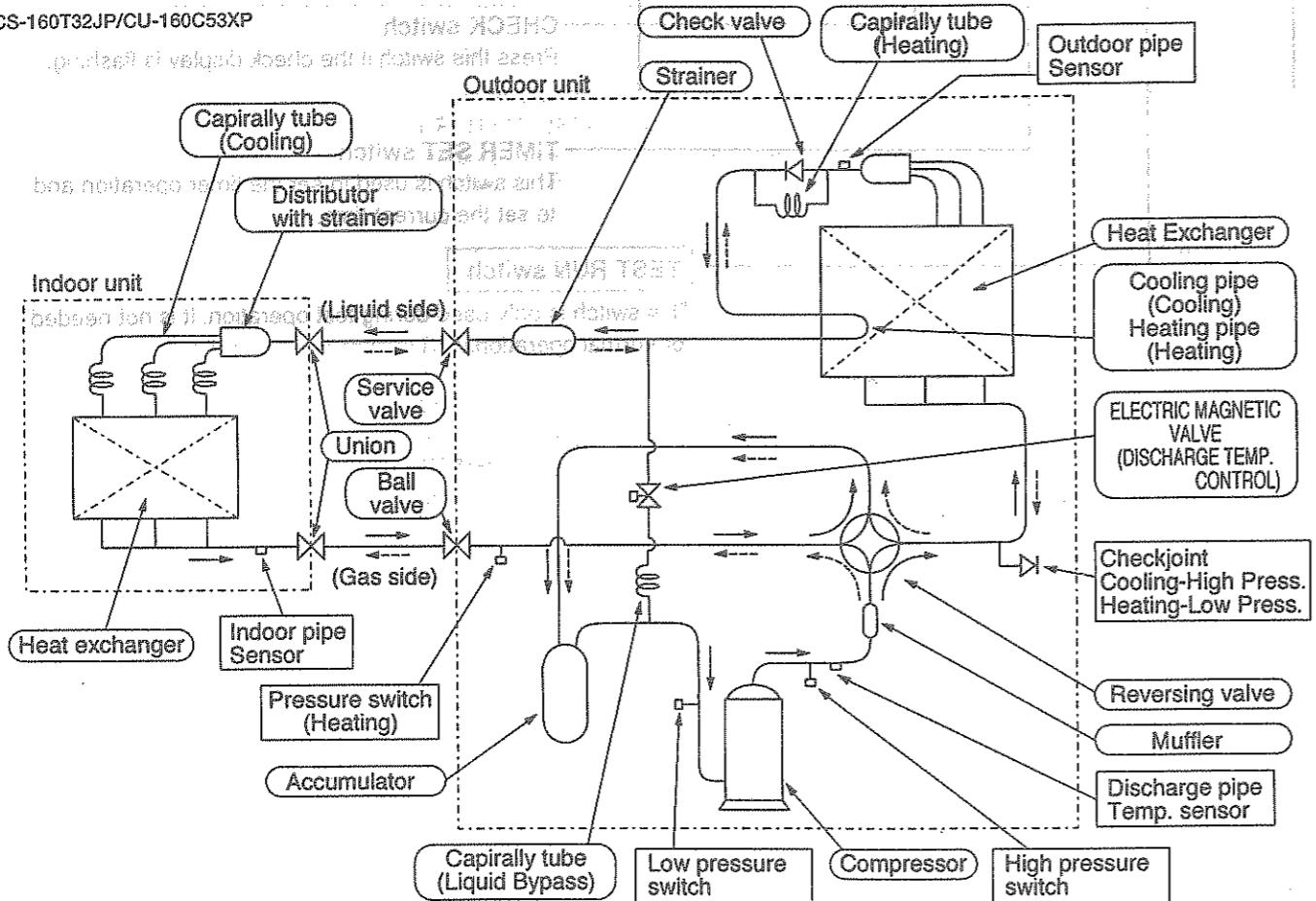


7. REFRIGERATION CYCLE(HEAT PUMP TYPE)

CS-80T32JP/CU-80C52HP
CS-80T32JP/CU-80C52XP
CS-112T32JP/CU-112C52XP
CS-140T32JP/CU-140C53XP

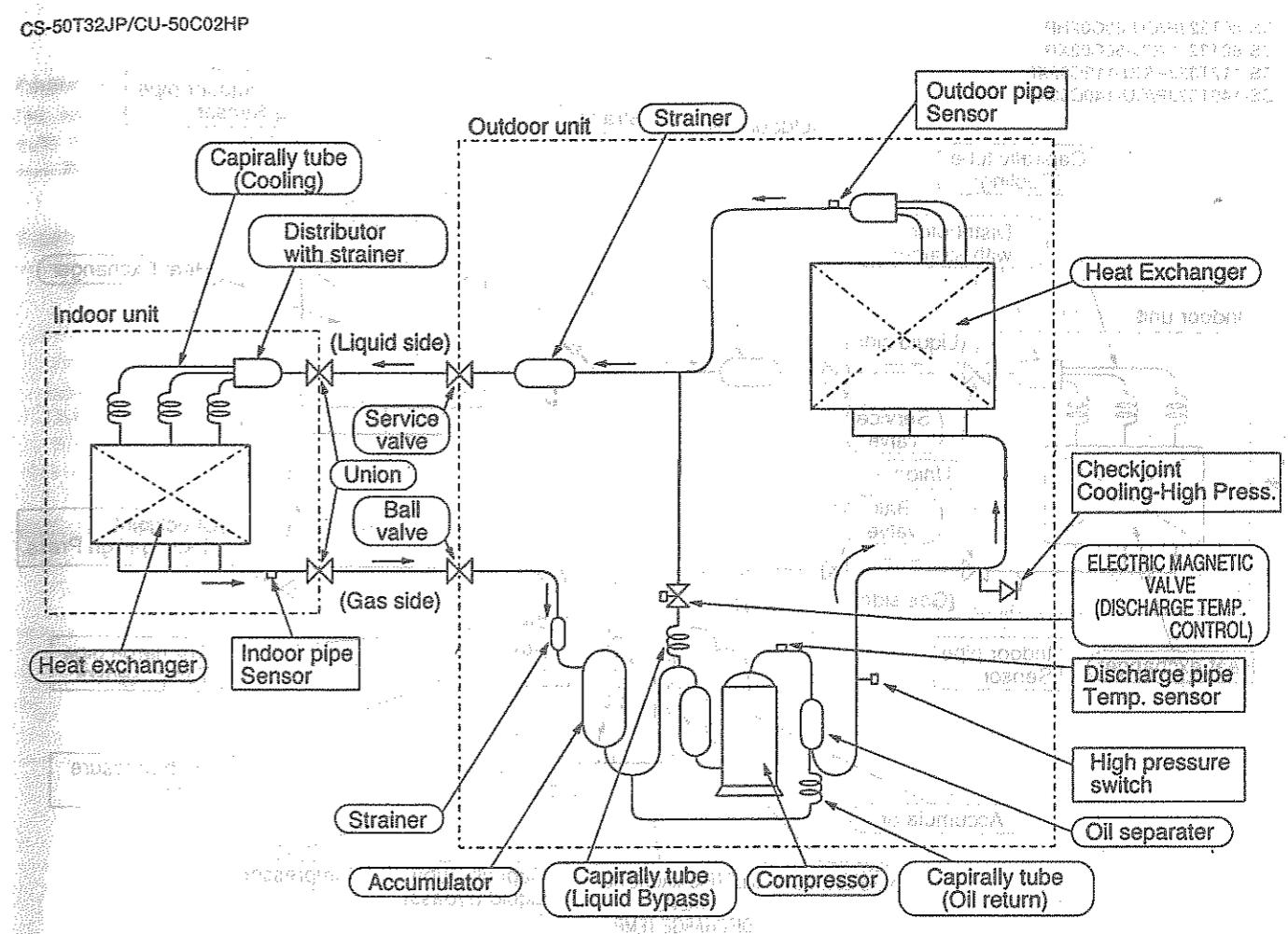


CS-160T32JP/CU-160C53XP

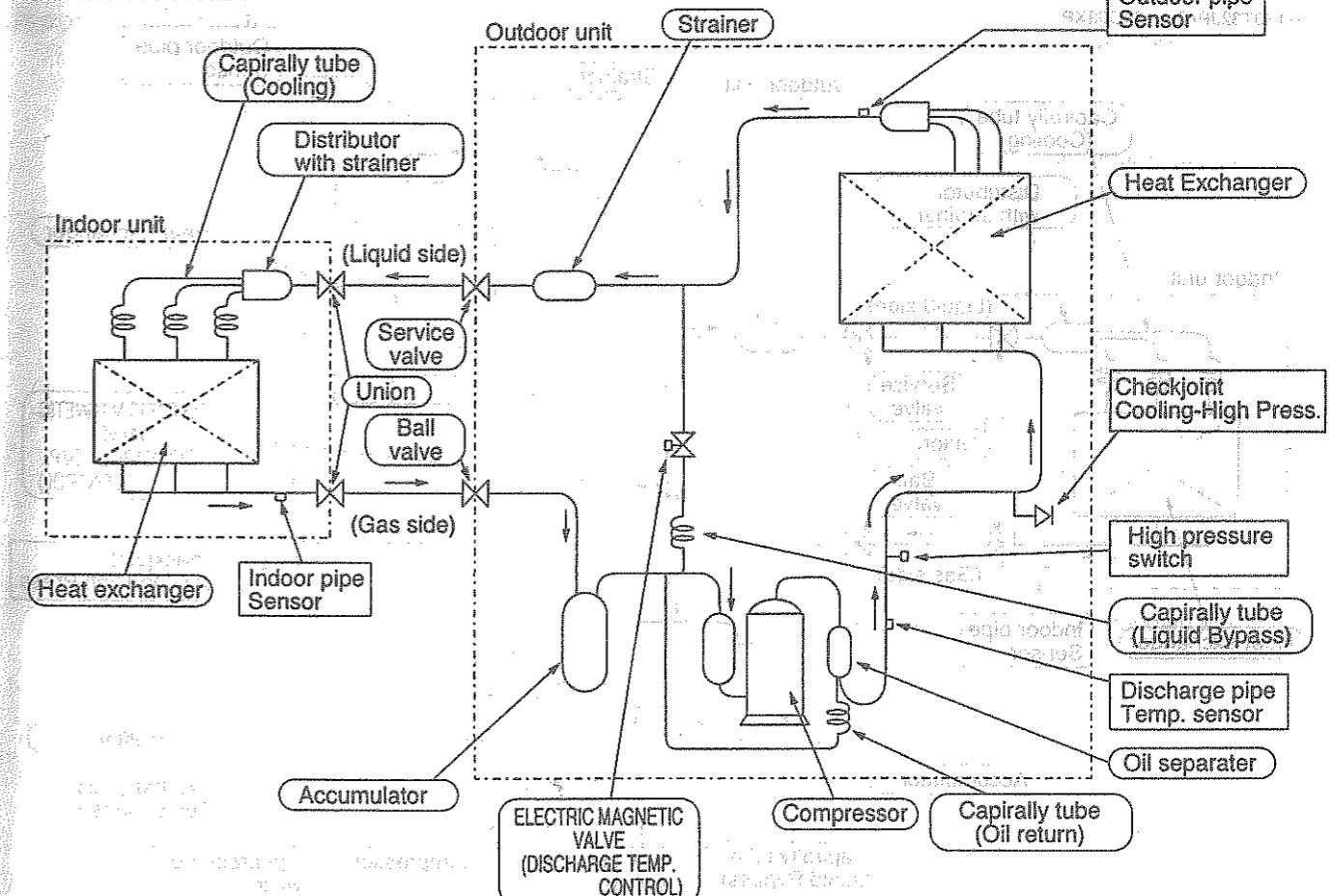


7. REFRIGERATION CYCLE(COOLING ONLY TYPE)

CS-50T32JP/CU-50C02HP

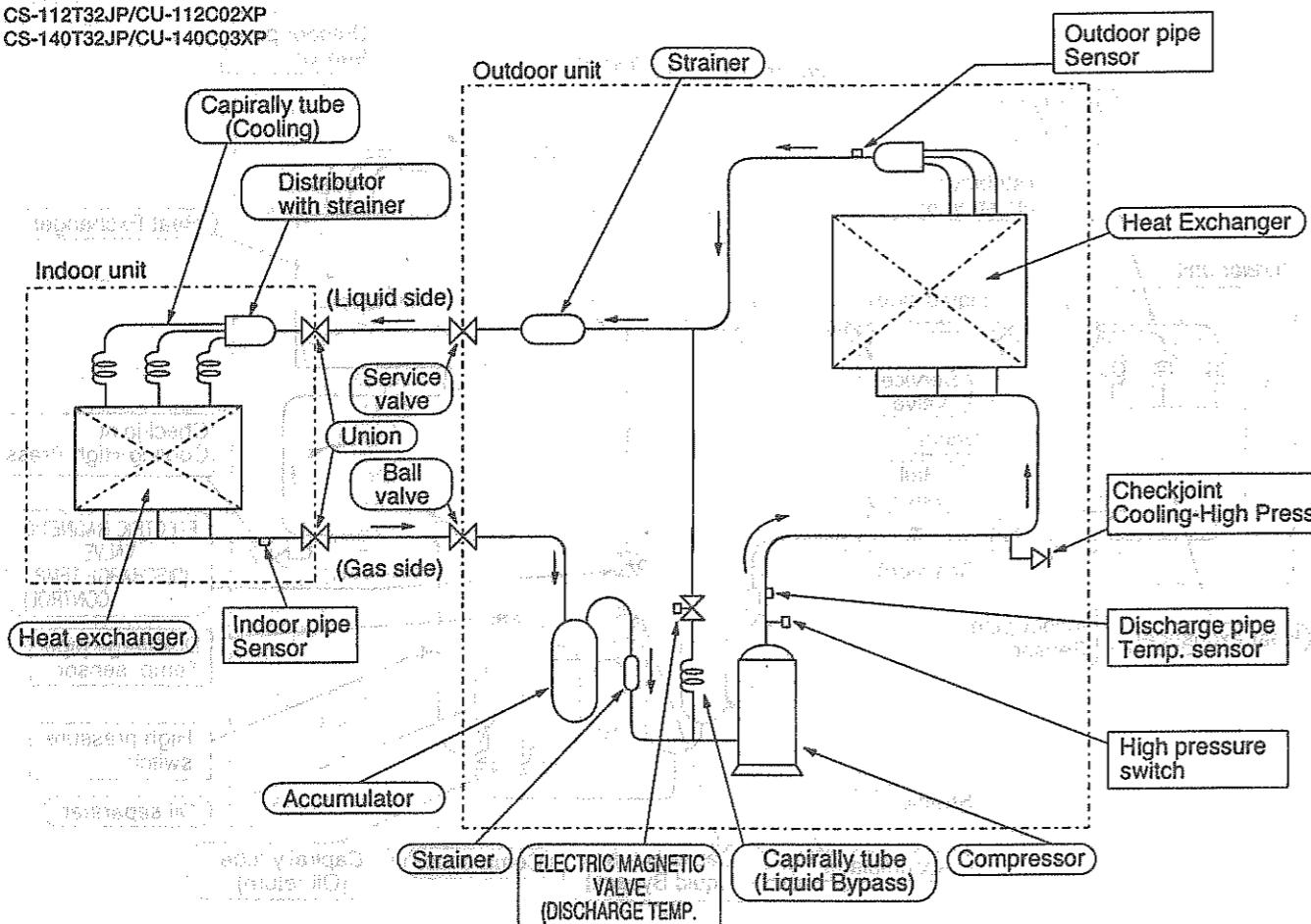


CS-71T32JP/CU-71C02HP
CS-71T32JP/CU-71C02XP

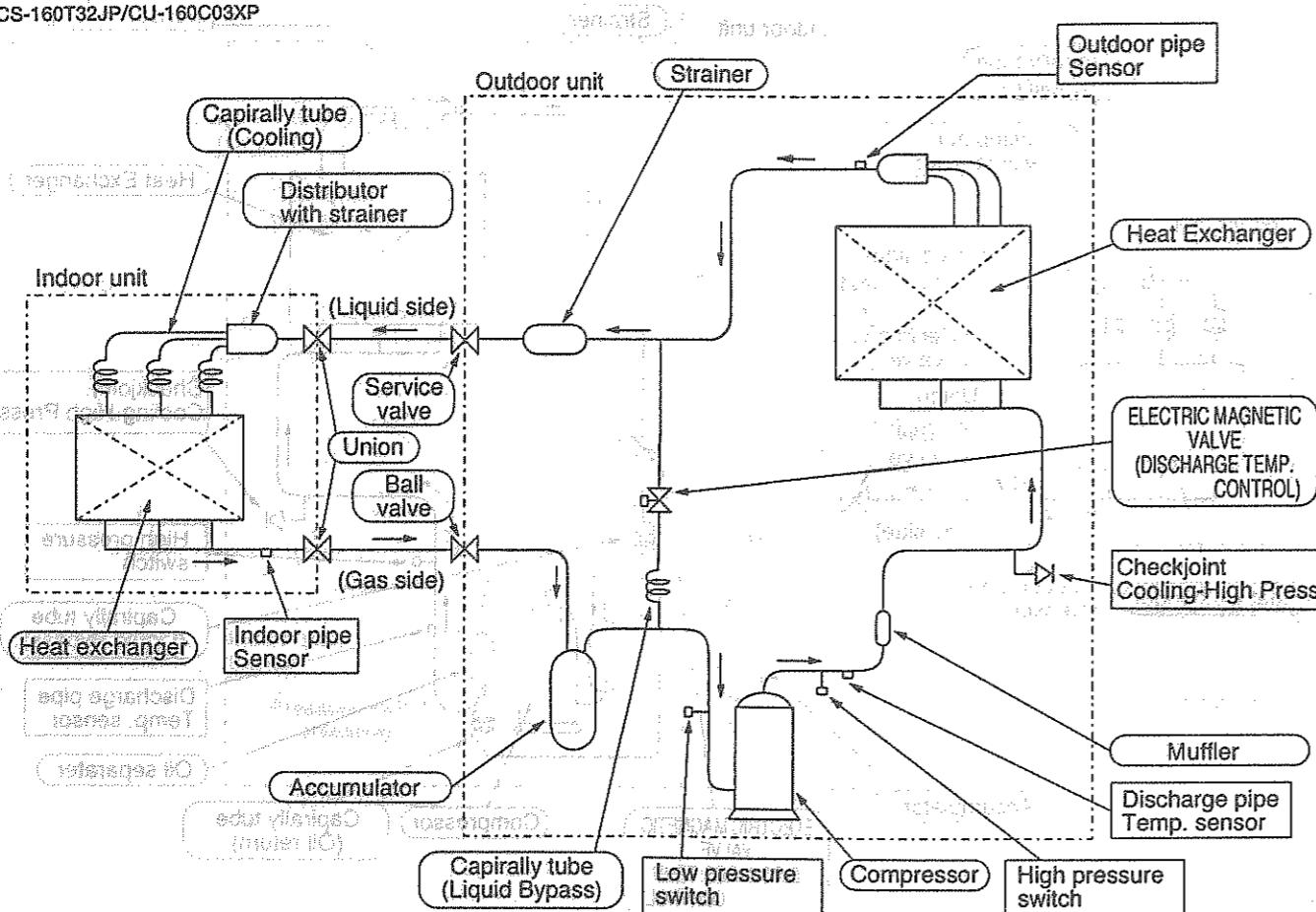


7. REFRIGERATION CYCLE (COOLING ONLY TYPE)

CS-80T32JP/CU-80C02HP
CS-80T32JP/CU-80C02XP
CS-112T32JP/CU-112C02XP
CS-140T32JP/CU-140C03XP



CS-160T32-IP/CLU-160C03XP



8. OPERATION RANGE

Power Supply

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

Однако это не означает, что введение в практику новых методов обучения не требует соответствующего изменения структуры и содержания учебных заведений.

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
80C52HP	1~220	50	242	198	80C52XP 112C52XP 140C53XP 160C53XP 71C02XP 80C02XP 112C02XP 140C03XP 160C03XP	3N~380	50	418	342
	1~230	50	253	207		3N~400	50	440	360
	1~240	50	254	216		3N~415	50	440	374

Indoor and Outdoor Temperature

All Models

Operating	Hz	Indoor Temp. (D.B./W.B.) (°C)		Outdoor Temp. (D.B./W.B.) (°C)	
		Maximum	Minimum	Maximum	Minimum
Cooling	50	32/22.5	21/15.5	43/-	-5/-
Heating	50	28/-	16/-	21/15.5	-15/-

■ Piping installation by existing piping

CU-C52, CU-C02 series changes the liquid pipe size of the previous series. It is possible to use the existing piping by adjusting the refrigerant gas volume.

Please do correct piping installation referring to the table below

Heat pump type	Cooling only type	Standard piping specification				Existing piping specification(Larger piping)			
		Liquid piping (φ mm)	Gas piping (φ mm)	Gas charge-less length (m)	Additional gas volume (g/m)	Liquid piping (φ mm)	Gas piping (φ mm)	Gas charge-less length (m)	Additional gas volume (g/m)
	CU-50C02HP	6.35	12.7	30	20	9.52	12.7	13	50
	CU-71C02HP, XP	6.35	15.88	30	20	9.52	15.88	13	50
CU-80C52HP, XP	CU-80C02HP, XP	9.52	15.88	30	50	12.7	15.88	17	100
CU-112C52XP	CU-112C02XP	9.52	19.05	30	50	12.7	19.05	17	100
CU-140C53XP	CU-140C03XP	9.52	19.05	30	50	12.7	19.05	17	100
CU-160C53XP	CU-160C03XP	9.52	19.05	30	50	12.7	19.05	17	100

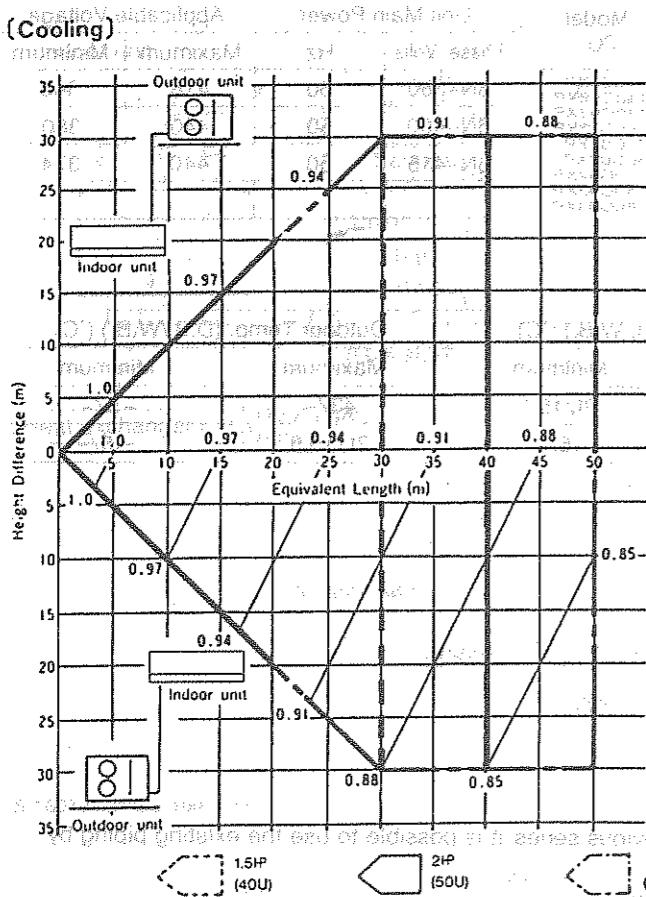
Attention

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

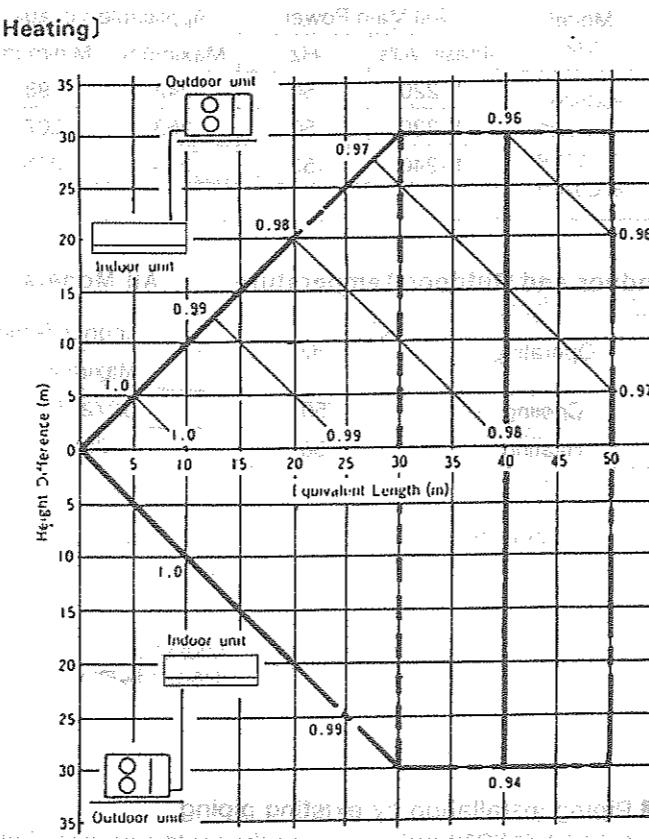
■ CORRECTION OF COOLING AND HEATING CAPACITIES

Correction of cooling and heating capacities according to the connecting pipe length.

The data of cooling capacities (marked on the name plate) are based on 5 meters connecting pipe and horizontal installation.



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



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.

■ REFRIGERANT ADDITIONAL CHARGE

• The piping length exceeds 30 meters.

APPLICABLE MODEL: ALL MODEL

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.

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
1.5~2.5HP	20g per lm
3~6HP	50g per lm

Example: CS-71U32JP

In case of 30 m long pipe (one-way), the amount of refrigerant to be replenished is: $(30-30) \times 20 = 0$ g

CS-140U32JP

In case of 50m long pipe (one-way), the amount of refrigerant to be replenished is: $(50-30) \times 50 = 2,000$ g

Model	Main Power Source		Compressor Motor		Evaporator Fan Motor		Condenser Fan Motor	
	Voltage (V)	Frequency (Hz)	S.C. (A)	R.C.(A) COOL/HEAT	IPT(KW)	R.C. (A)	IPT (KW)	R.C. (A)
CS-80T32JP	220	50	56.0	10.81/11.1	2.48/2.24	0.69	0.14	0.50
CS-80C52HP	230	50	56.0	10.61/10.8	2.48/2.24	0.69	0.14	0.50
CS-80T32JP	240	50	56.0	10.47/10.57	2.48/2.24	0.63	0.14	0.50
CS-80C52XP	380	50	26.0	4.20/4.10	2.48/2.24	0.69	0.14	0.50
CS-80C52XP	400	50	26.0	4.10/4.00	2.48/2.24	0.69	0.14	0.50
CS-80C52XP	415	50	26.0	4.02/3.92	2.48/2.24	0.63	0.14	0.50
CS-112T32JP	380	50	48.0	4.96/5.06	2.75/2.77	0.91	0.18	1.01
CS-112C52XP	400	50	48.0	4.77/4.87	2.75/2.77	0.87	0.18	1.01
CS-112C52XP	415	50	48.0	4.69/4.79	2.75/2.77	0.83	0.18	1.01
CS-140T32JP	380	50	62.0	7.62/7.52	4.21/4.02	0.77	0.16	0.96
CS-140C53XP	400	50	62.0	7.53/7.43	4.21/4.02	0.75	0.16	0.96
CS-140C53XP	415	50	62.0	7.44/7.34	4.21/4.02	0.71	0.16	0.96
CS-160T32JP	380	50	61.0	7.65/7.45	4.29/4.16	0.87	0.18	1.08
CS-160C53XP	400	50	61.0	7.46/7.26	4.29/4.16	0.83	0.18	1.08
CS-160C53XP	415	50	61.0	7.37/7.17	4.29/4.16	0.82	0.18	1.08
CS-50T32JP	220	50	33.7	8.12	1.69	0.66	0.13	0.32
CS-50C02HP	230	50	33.7	7.82	1.69	0.66	0.13	0.32
CS-50C02HP	240	50	33.7	7.55	1.69	0.63	0.13	0.32
CS-71T32JP	220	50	60.0	10.71	2.25	0.69	0.14	0.5
CS-71C02HP	230	50	60.0	10.51	2.25	0.69	0.14	0.5
CS-71C02HP	240	50	60.0	10.37	2.25	0.63	0.14	0.5
CS-80T32JP	220	50	56.0	10.81	2.48	0.69	0.14	0.5
CS-80C02HP	230	50	56.0	10.61	2.48	0.69	0.14	0.5
CS-80C02HP	240	50	56.0	10.47	2.48	0.63	0.14	0.5
CS-71T32JP	380	50	27.0	4.10	2.25	0.69	0.14	0.5
CS-71C02XP	400	50	27.0	4.00	2.25	0.69	0.14	0.5
CS-71C02XP	415	50	27.0	3.92	2.25	0.63	0.14	0.5
CS-80T32JP	380	50	26.0	4.20	2.48	0.69	0.14	0.5
CS-80C02XP	400	50	26.0	4.10	2.48	0.69	0.14	0.5
CS-80C02XP	415	50	26.0	4.02	2.48	0.63	0.14	0.5
CS-112T32JP	380	50	48.0	4.96	2.75	0.91	0.18	1.01
CS-112C02XP	400	50	48.0	4.77	2.75	0.87	0.18	1.01
CS-112C02XP	415	50	48.0	4.69	2.75	0.83	0.18	1.01
CS-140T32JP	380	50	62.0	7.62	4.21	0.77	0.16	0.96
CS-140C03XP	400	50	62.0	7.53	4.21	0.75	0.16	0.96
CS-140C03XP	415	50	62.0	7.44	4.21	0.71	0.16	0.96
CS-160T32JP	380	50	61.0	7.65	4.29	0.87	0.18	1.08
CS-160C03XP	400	50	61.0	7.46	4.29	0.83	0.18	1.08
CS-160C03XP	415	50	61.0	7.37	4.29	0.82	0.18	1.08

Legend : S.C. : Starting Current

R.C. : Running Current

IPT : Power Consumption

11. FAN PERFORMANCE

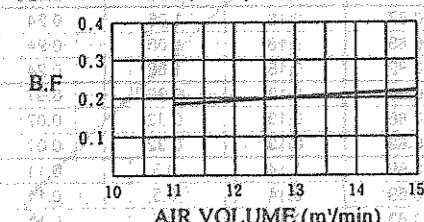
• FAN PERFORMANCE

●CS-50T32JP

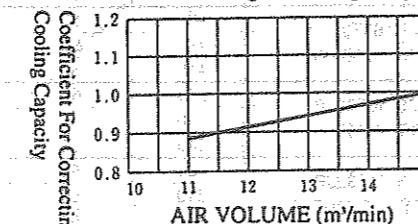
ITEM	Model	Indoor Unit			Outdoor Unit	
		CS-50T32JP			CU-40C52HP, CU-50C52HP	
Mode	Hi	Me	Lo	Hi		
Air Volume	m ³ /min	15	13	11	32	
Running Current	A	0.66	—	—	0.32	
Power Consumption	kW	0.13	0.11	0.08	0.07	
Fan Speed	r/min	1,400	1,230	970	900	

Bypass factor And Coefficient For Correcting Capacity according to Air volume change

Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity



11. FAN PERFORMANCE

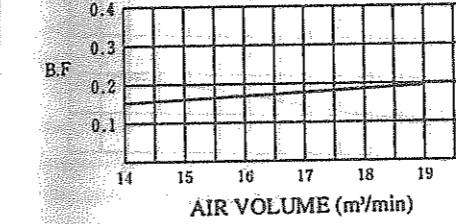
• FAN PERFORMANCE

●CS-80T32JP

ITEM	Model	Indoor Unit			Outdoor Unit	
		CS-80T32JP			CU-80C52HP, CU-80C52XP	
Mode	Hi	Me	Lo	Hi		
Air Volume	m ³ /min	19	17	14	50	
Running Current	A	0.69	—	—	0.50	
Power Consumption	kW	0.14	0.11	0.10	0.11	
Fan Speed	r/min	1,660	1,530	1,360	900	

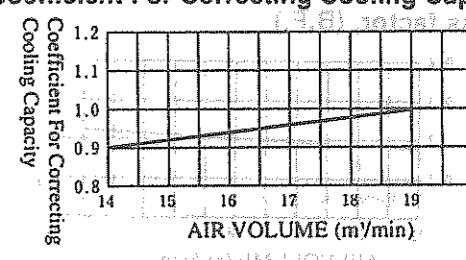
Bypass factor And Coefficient For Correcting Capacity according to Air volume change

Bypass factor. (B.F.)

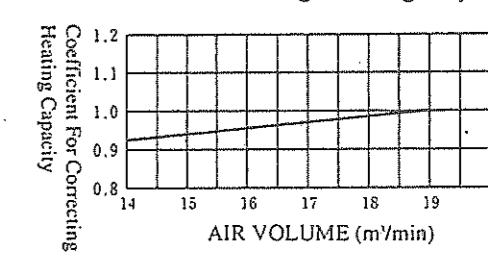


• FAN PERFORMANCE

Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity

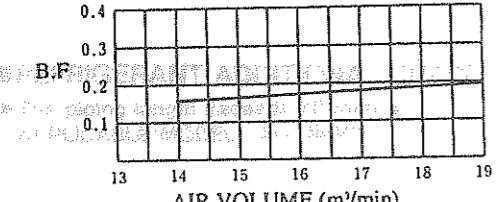


●CS-71T32JP

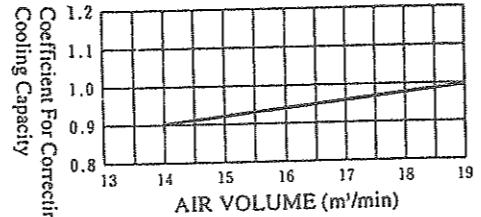
ITEM	Model	Indoor Unit			Outdoor Unit	
		CS-71T32JP			CU-71C52HP, CU-71C52XP	
Mode	Hi	Me	Lo	Hi		
Air Volume	m ³ /min	19	17	14	50	
Running Current	A	0.69	—	—	0.50	
Power Consumption	kW	0.14	0.11	0.10	0.11	
Fan Speed	r/min	1,660	1,530	1,360	900	

Bypass factor And Coefficient For Correcting Capacity according to Air volume change

Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity

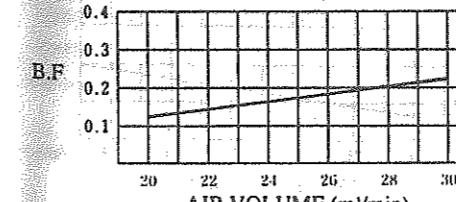


●CS-112T32JP

ITEM	Model	Indoor Unit			Outdoor Unit	
		CS-112T32JP			CU-112C52XP	
Mode	Hi	Me	Lo	Hi		
Air Volume	m ³ /min	30	25	20	75	
Running Current	A	0.87	—	—	1.01	
Power Consumption	kW	0.18	0.16	0.12	0.22	
Fan Speed	r/min	1,450	1,250	1,050	800	

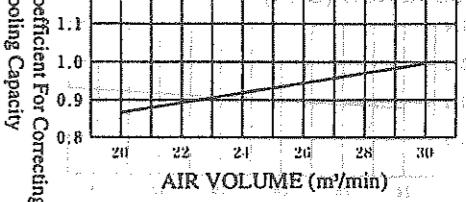
Bypass factor And Coefficient For Correcting Capacity according to Air volume change

Bypass factor. (B.F.)

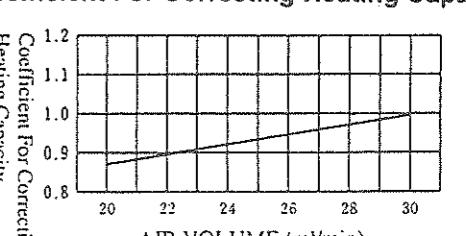


• FAN PERFORMANCE

Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity



Indoor Unit
Outdoor Unit
CU-40C52HP, CU-50C52HP
CU-80C52HP, CU-80C52XP
CU-71C52HP, CU-71C52XP
CU-112C52XP

11. FAN PERFORMANCE

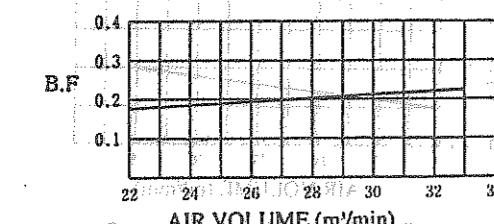
• FAN PERFORMANCE

●CS-140T32JP

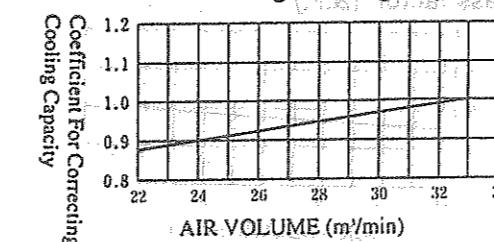
ITEM	Model	Indoor Unit			Outdoor Unit		
		CS-140T32JP			CU-140C53XP		
Mode	Hi	Me	Lo	Hi	Me	Lo	
Air Volume	m ³ /min	33	28	22	80	70	60
Power Consumption	KW	0.16	0.16	0.11	0.22	0.18	0.13
Fan Speed	r/min	1,420	1,250	1,050	810	700	550
Running Current	A	0.75	—	—	0.96	—	—

Bypass factor And Coefficient For Correcting Capacity according to Air volume change

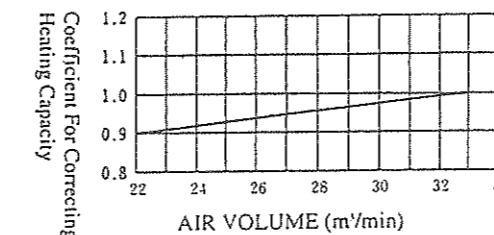
Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity

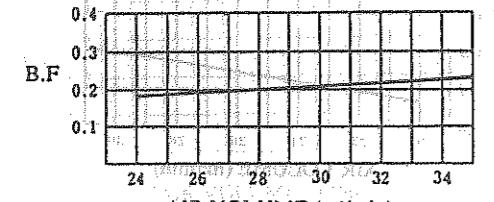


●CS-160T32JP

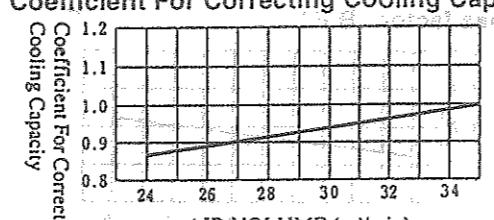
ITEM	Model	Indoor Unit			Outdoor Unit		
		CS-160T32JP			CU-160C53XP		
Mode	Hi	Me	Lo	Hi	Me	Lo	
Air Volume	m ³ /min	35	30	24	95	80	65
Power Consumption	KW	0.18	0.16	0.11	0.24	0.19	0.13
Fan Speed	r/min	1,400	1,200	960	880	700	550
Running Current	A	0.83	—	—	1.08	—	—

Bypass factor And Coefficient For Correcting Capacity according to Air volume change

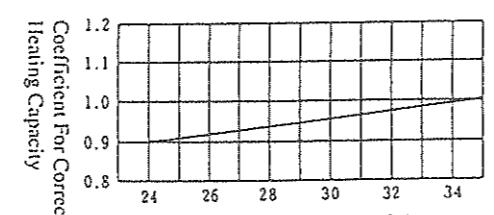
Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity



12. SAFETY DEVICE

• INDOOR UNIT

Indoor unit	Model	CS-50T32JP	CS-71T32JP	CS-71T32JP	CS-80T32JP	CS-80T32JP	CS-112T32JP	CS-140T32JP	CS-160T32JP
For fan motor protection									
Internal protector(49F)	OFF	°C	135	135	135	135	135	135	135
	ON	°C	86	86	86	86	86	86	86
For control protection									
Fuse	CUT	A	3	3	3	3	3	3	3

• OUTDOOR UNIT

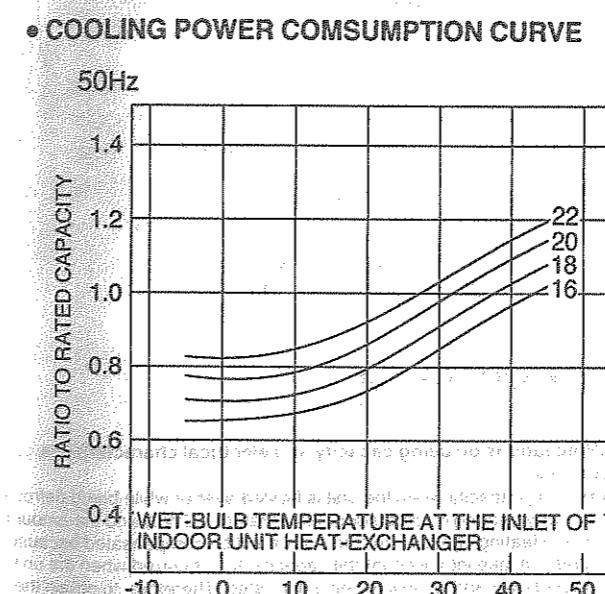
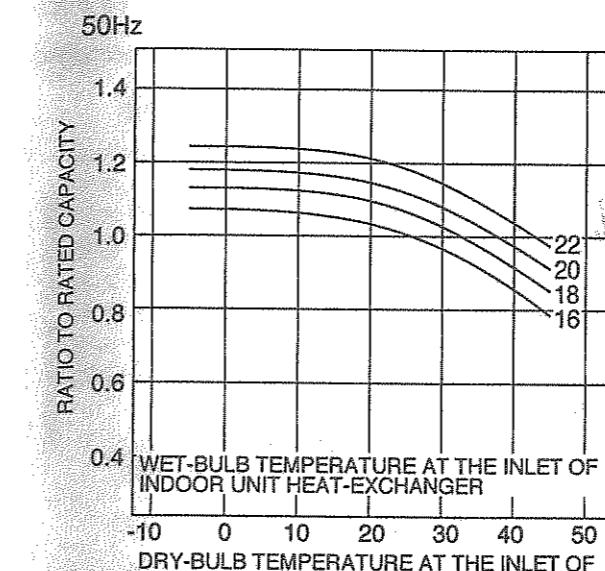
Outdoor unit	Heat pump model	Model	CU-50C02HP	CU-71C02HP	CU-71C02XP	CU-80C02HP	CU-80C02XP	CU-112C02XP	CU-140C03XP	CU-160C03XP
For refrigerant cycle										
High pressure switch(63H1)	OFF	*MPa	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	ON	*MPa	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
For compressor										
Over current protection										
Over current protector(CT)	OFF	A	13	19	9	20	9	10	13	13
	RESET	—	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic
Discharge temp. protection										
Discharge temperature thermistor(Th1)	Compressor OFF	°C	115	115	115	115	120	120	120	120
Discharge temp. control										
Discharge temperature thermistor(Th1)	Magnetic valve ON	°C	100	100	100	100	100	100	100	100
	Magnetic valve OFF	°C	70	70	70	70	70	70	70	70
Liquid compress protection										
Crankcase heater	—	W	25	37	37	37	37	37	41	41
Internal protector										
wind temperature	OFF	°C	160	170	—	165	—	135	120	120
	ON	°C	90	110	—	102	—	61	52	61
	Trip time		5~15sec(38A)			10~20sec(50A)		3~10sec(40A)	3~10sec(50A)	3~10sec(58A)
For fan motor protection										
Internal protector(49F)	OFF	°C	135	135	135	135	135	135	135	135
	ON	°C	86	86	86	86	86	86	86	86
Heating control (Heat pump model only)										
Pressure switch (Fan speed)(63H2)	OFF	*MPa	2.35	2.35	2.35	2.35				

COMPONENT SPECIFICATION

Unit Model	(Heat pump model)	CS-50T32JP	CS-71T32JP	CS-71T32JP	CS-80T32JP	CS-80T32JP	CS-112T32JP	CS-140T32JP	CS-160T32JP
Compressor Model		2K3C225A1B	NH-41VND	NH-41YDA	NH-44VND	NH-44YDA	ZR-45KC-TFD	NM-S0502HU5	JT170BC-YE
Compressor Type									
No. of Cylinders		1	1	1	1	1	1	1	1
Revolution	50Hz	rpm	2,850	2,900	2,900	2,900	2,900	2,900	2,900
Piston Displacement	50Hz	m³/h	5.37	7.27	7.27	7.73	7.73	10.73	14.0
Motor Type									
Starting Method									
Rated Output	KW	1.5	1.9	1.9	2.0	2.0	2.8	3.75	4.5
Poles	2	2	2	2	2	2	2	2	2
Insulation Class	E	E	E	E	E	E	E	E	E
Oil Type									
Charge	*	0.65	1.3	1.3	1.3	1.3	1.24	1.8	1.6
Evaporator									
Models	CS-50T32JP	CS-71T32JP	CS-71T32JP	CS-80T32JP	CS-80T32JP	CS-112T32JP	CS-140T32JP	CS-160T32JP	
Tube Material									
Outer Diameter	mm	9.53	9.53	9.53	9.53	9.53	9.53	9.53	9.53
Thickness	mm	0.35	0.3	0.35	0.3	0.3	0.3	0.28	0.28
Row		3	3	3	3	3	3	3	4
No. of Tubes/Evap.		20	20	20	21	21	30	30	38
Fin Material									
Thickness	mm	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Fin Pitch	No./inch	13	12	12	12	12	13	13	13
Fin Surface		Louver fin	Louver fin	Louver fin	Louver fin				
Total Face Area	m²	0.195	0.195	0.195	0.195	0.195	0.279	0.366	0.366
Evaporator Fan									
Type		Turbo fan							
No./Unit		4	4	4	4	4	4	4	4
Evaporator Fan Motor									
Starting Method									
Rated Output	KW	0.04	0.06	0.06	0.08	0.08	0.08	0.11	0.12
Poles	2	2	2	2	2	4	4	4	4
Phase		Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phase
Insulation Class	E	E	E	E	E	E	E	E	E
Condenser									
Models	(Heat pump model)	CU-50C02HP	CU-71C02HP	CU-71C02XP	CU-80C52HP	CU-80C52XP	CU-112C52XP	CU-140C53XP	CU-160C53XP
(Cooling only model)		CU-50C02HP	CU-71C02HP	CU-80C02HP	CU-80C02XP	CU-112C02XP	CU-140C03XP	CU-160C03XP	
Tube Material									
Outer Diameter	mm	9.5	9.52	9.52	9.52	9.52	9.52	9.52	9.52
Thickness	mm	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Row		2	2	2	2	2	2	2	2
No. of Tubes/Row		24	34	34	34	34	46	46	46
Fin Material									
Thickness	mm	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105
Fin Pitch	No./inch	14	12	12	12	12	14	14	14
Fin Surface		AX-Louver fin	X-Louver fin	X-Louver fin	X-Louver fin				
Total Face Area	m²	0.393	0.635	0.635	0.635	0.635	0.859	1.092	1.092
Fan									
Type		Prop Fan							
No./Unit		1	1	1	1	1	2	2	2
Fan Motor									
Starting Method									
Rated Output	KW	0.035	0.05	0.05	0.05	0.05	0.05 X 2	0.05 X 2	0.055 X 2
Poles	6	6	6	6	6	6	6	6	6
Phase		Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phase	Single-Phase
Insulation Class	E	E	E	E	E	E	E	E	E

COOLING CAPACITY CURVE, COOLING POWER CONSUMPTION TABLE
(WATER COOLED OUTDOOR UNIT) 50Hz

COOLING CAPACITY CURVE



RATED COOLING CAPACITY, RATED COOLING POWER CONSUMPTION

MODEL NAME	RATED HEATING STANDARD	
	CAPACITY(kW)	POWER CONSUMPTION(kW)
CS-80T32JP/CU-80C52HP	7.30	2.73
CS-80T32JP/CU-80C52XP	7.30	2.73
CS-112T32JP/CU-112C52XP	10.45	3.15
CS-140T32JP/CU-140C53XP	13.00	4.59
CS-160T32JP/CU-160C53XP	14.50	4.71
CS-50T32JP/CU-50C02HP	5.20	1.89
CS-71T32JP/CU-71C02XP	6.50	2.50
CS-80T32JP/CU-80C02XP	6.50	2.50
CS-80T32JP/CU-80C02HP	7.30	2.73
CS-112T32JP/CU-112C02XP	10.45	3.15
CS-140T32JP/CU-140C03XP	13.00	4.59
CS-160T32JP/CU-160C03XP	14.50	4.71

Actual cooling power consumption = cooling power consumption ratio × rated power consumption
= 1.04 × 2.73 = 2.84(kW)

Calculation of actual cooling capacity and power consumption Example CS-80T32JP/CU-80C52XP

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

Calculation method

Find the cooling capacity ratio and power consumption ratio from the cooling capacity graph and power consumption graph for model CS-80T32JP/CU-80C52XP

① The cooling capacity ratio indicated at the intersection between an outdoor unit heat exchanger inlet air temperature of 40°C on the horizontal axis and an indoor unit heat exchanger inlet temperature of 18°C is 0.90.

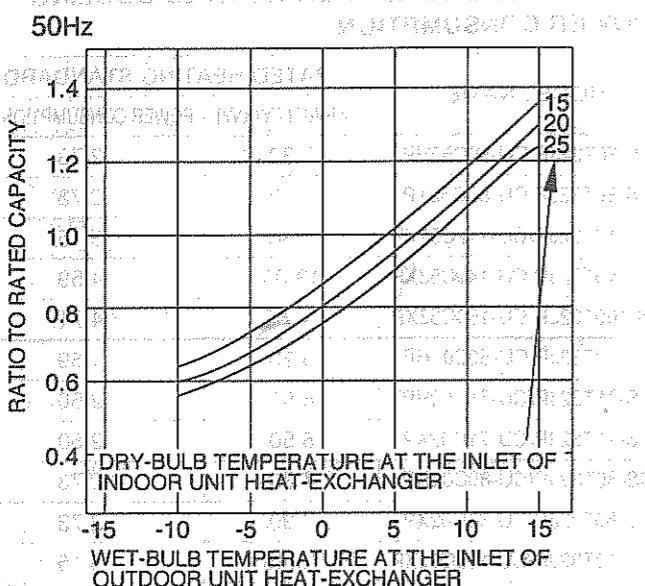
② The cooling power consumption ratio from the same intersection on the power consumption graph is 1.04.

Thus,
Actual cooling capacity = cooling capacity ratio × rated cooling capacity
= 0.90 × 7.30 = 6.57(kW)

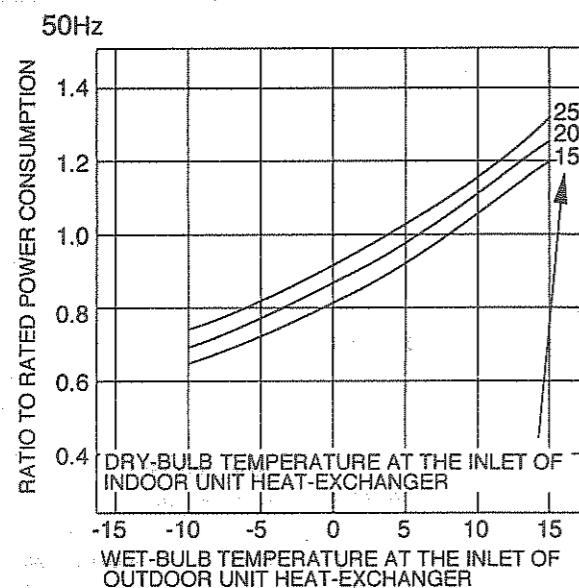
Actual cooling power consumption = cooling power consumption ratio × rated power consumption
= 1.04 × 2.73 = 2.84(kW)

■ HEATING CAPACITY CURVE, HEATING POWER CONSUMPTION CURVE (HEAT PUMP MODEL ONLY)

• HEATING CAPACITY CURVE



• HEATING POWER CONSUMPTION CURVE



• RATED HEATING CAPACITY, RATED HEATING POWER CONSUMPTION

MODEL NAME	RATED HEATING STANDARD	
	CAPACITY(kW)	POWER CONSUMPTION(kW)
CS-80T32JP/CU-80C52HP	7.75	2.49
CS-80T32JP/CU-80C52XP	7.75	2.49
CS-112T32JP/CU-112C52XP	11.15	3.17
CS-140T32JP/CU-140C53XP	14.15	4.40
CS-160T32JP/CU-160C53HP	15.70	4.58

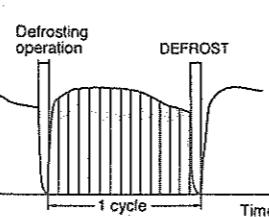
<Precautions on using capacity and electrical characteristics curves>

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

• Heating capacity compensation coefficient for heating in frosted situations

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

* 1
Integral heating capacity = (Heating capacity by heating capacity performance) × (Heating capacity compensation coefficient) <kW>



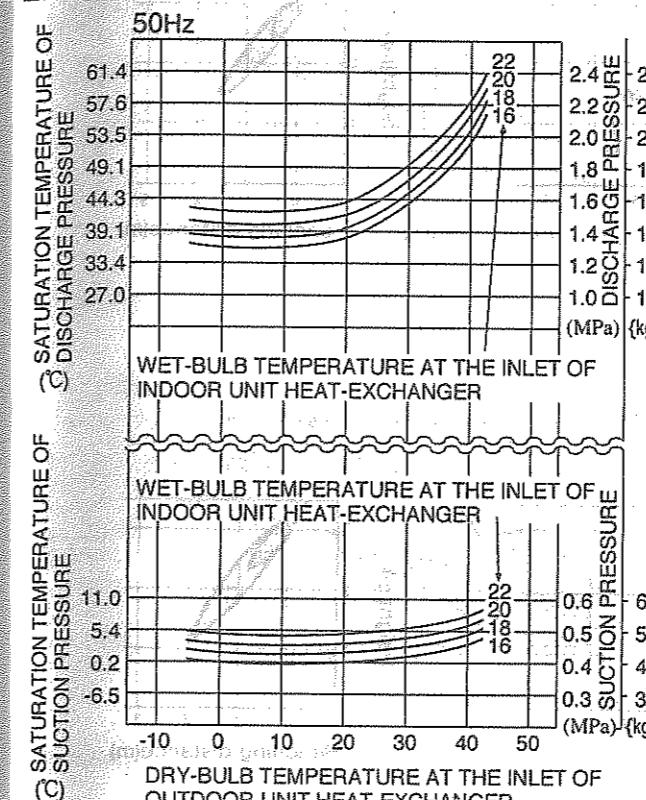
* 1
Integral heating capacity is obtained by integrating the capacity consumed in 1 defrost cycle into the normal heating capacity, and calculating this value as an hourly figure. One defrost cycle is determined as the time from when a defrost operation starts (heating starts) until the next heating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

■ SATURATION TEMPERATURE OF DISCHARGE AND SUCTION PRESSURE

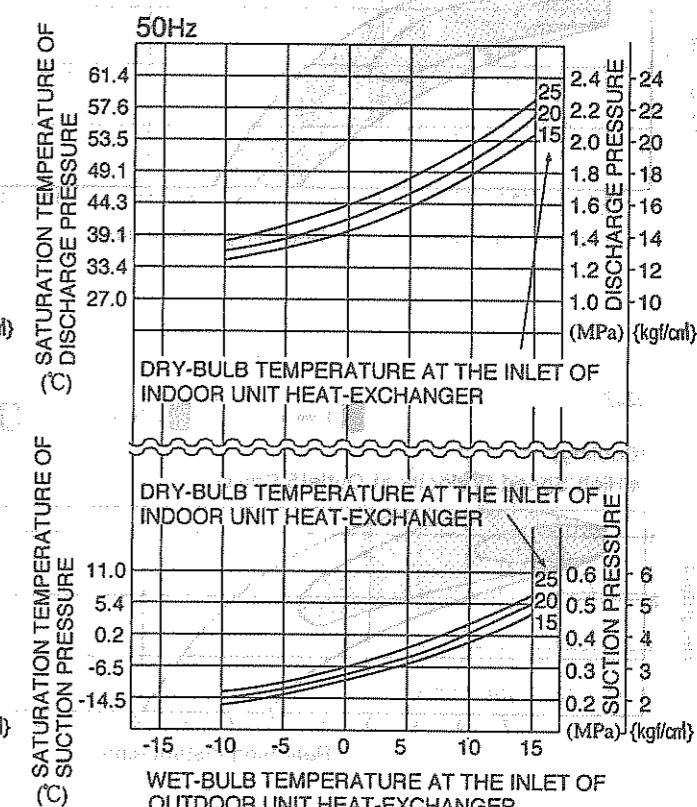
• Commonness TO THE ALL MODEL

• SATURATION TEMPERATURE OF DISCHARGE AND SUCTION PRESSURE

COOLING

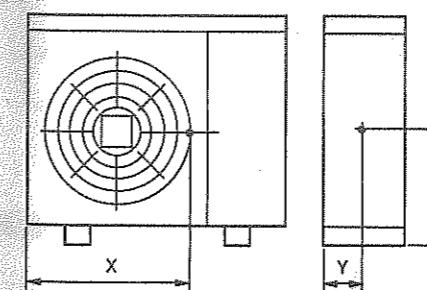


HEATING (Heat pump model only)

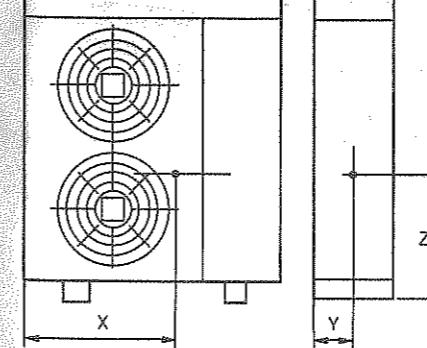


16. POSITION OF THE CENTER GRAVITY

50C~80C



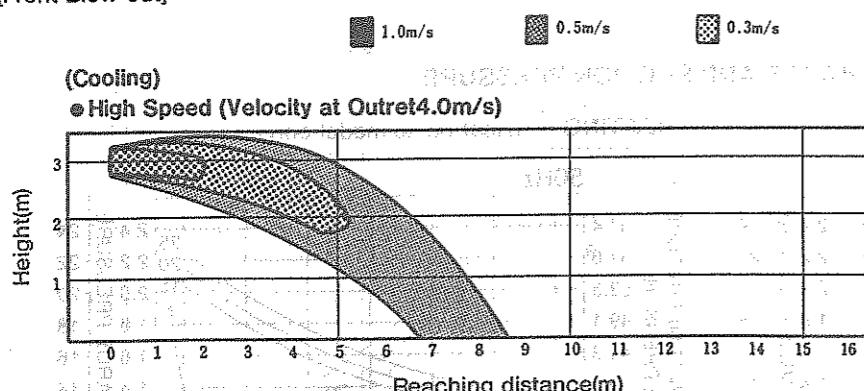
112C~160C



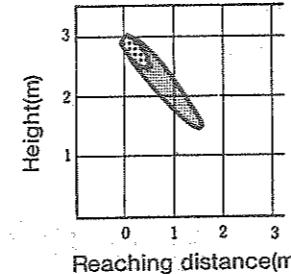
MODEL NAME	OUTSIDE DIMENSIONS			NET WEIGHT kg	CENTER OF GRAVITY		
	WIDTH	DEPTH	HEIGHT		X	Y	Z
CU-80C52HP	900	320	900	73	580	160	340
CU-80C52XP	900	320	900	73	580	160	340
CU-112C52XP	900	320	1220	98	590	160	460
CU-140C53XP	1100	320	1220	113	720	160	460
CU-160C53XP	1100	320	1220	118	720	160	460
CU-50C02HP	770	300	640	50	540	160	270
CU-71C02HP	900	320	900	68	560	160	360
CU-71C02XP	900	320	900	68	560	160	360
CU-80C02HP	900	320	900	70	580	160	340
CU-80C02XP	900	320	900	70	580	160	340
CU-112C02XP	900	320	1220	95	590	160	460
CU-140C03XP	1100	320	1220	110	720	160	460
CU-160C03XP	1100	320	1220	115	720	160	460

17. REACHING DISTANCE

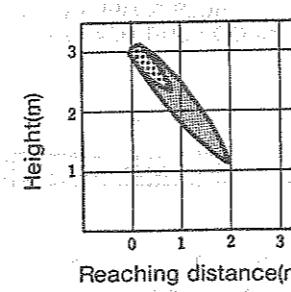
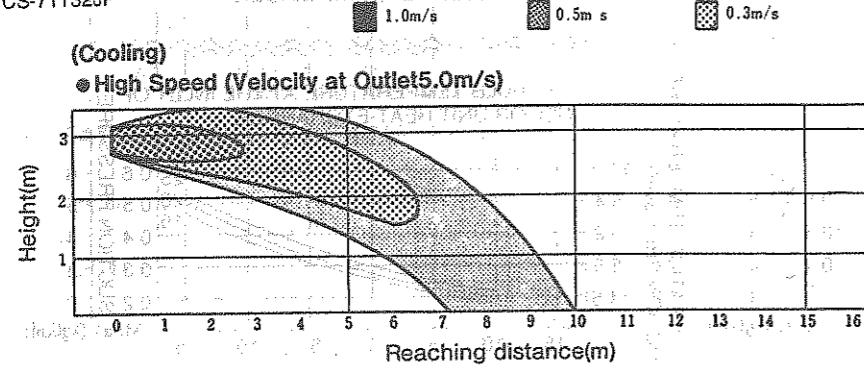
CS-50T32JP
[Front Blow-out]



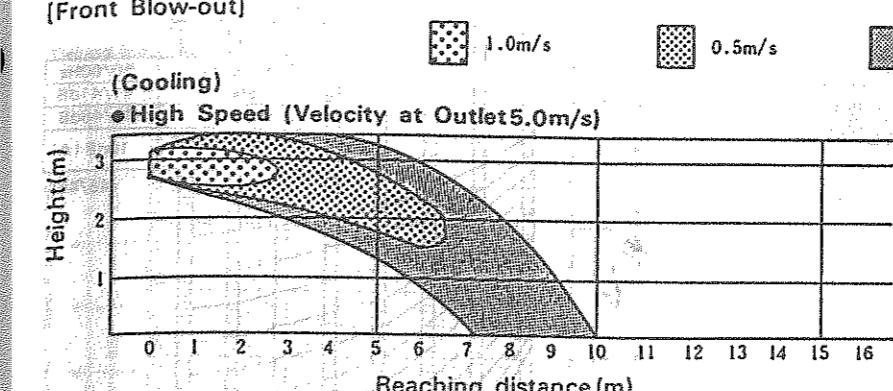
[Side Blow-out]



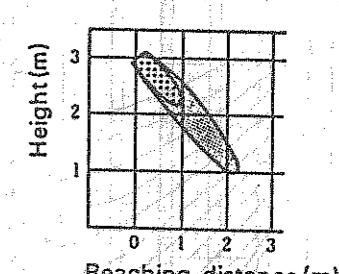
CS-71T32JP



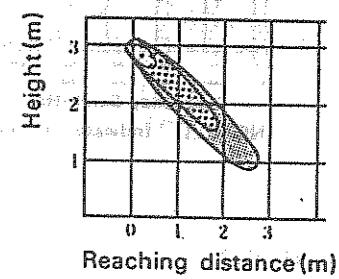
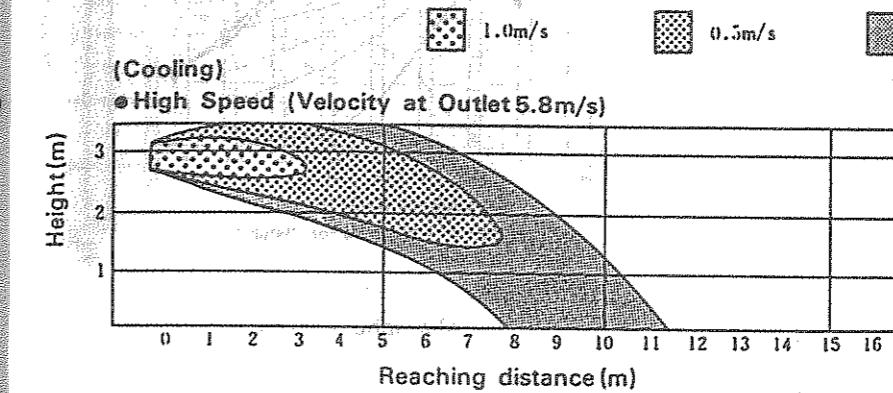
CS-80T32JP
[Front Blow-out]



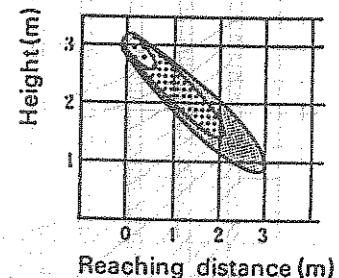
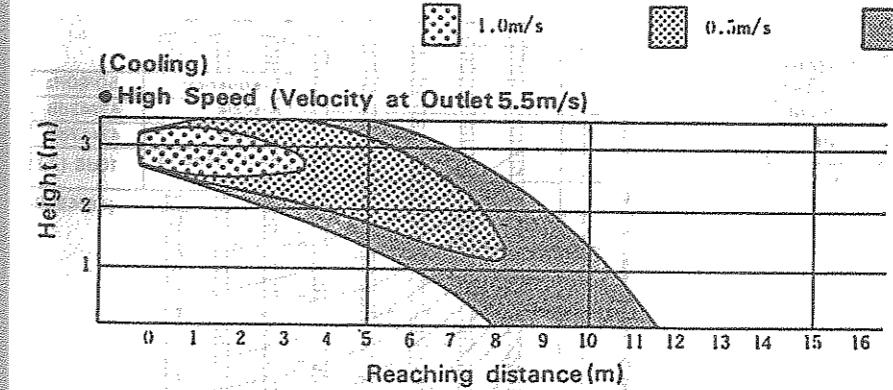
[Side Blow-out]



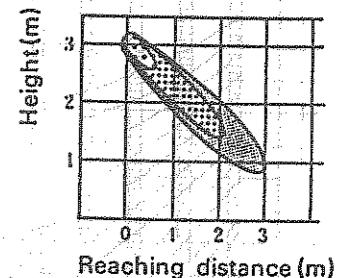
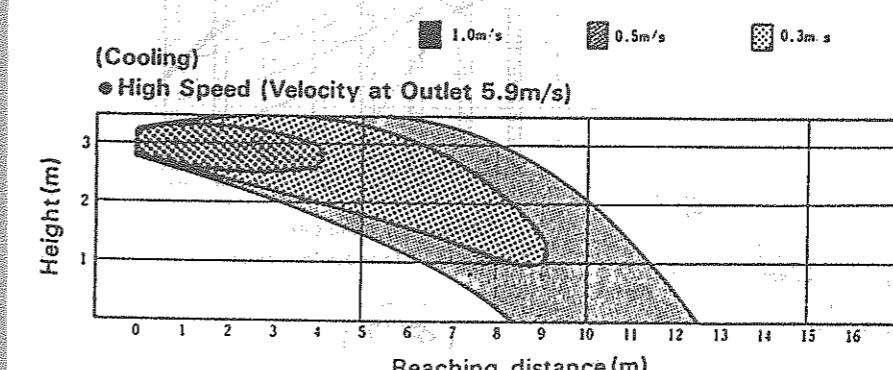
CS-112T32JP



CS-140T32JP

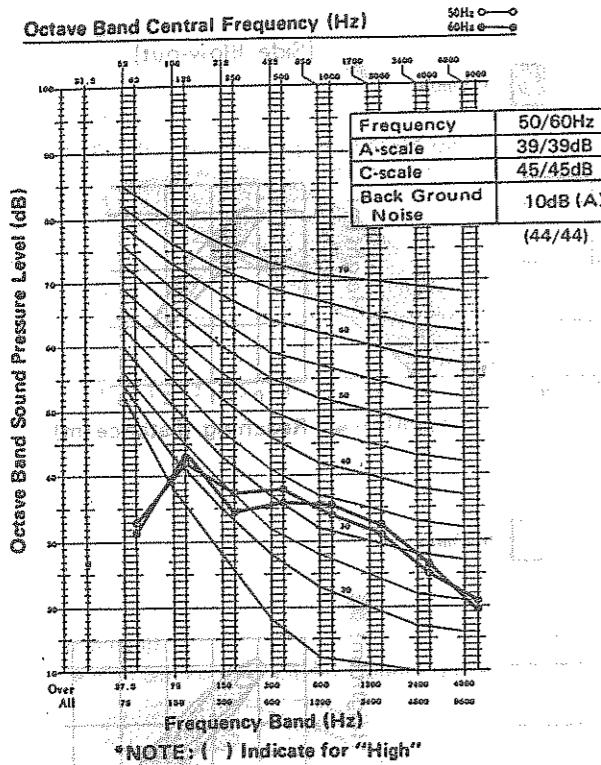


CS-160T32JP

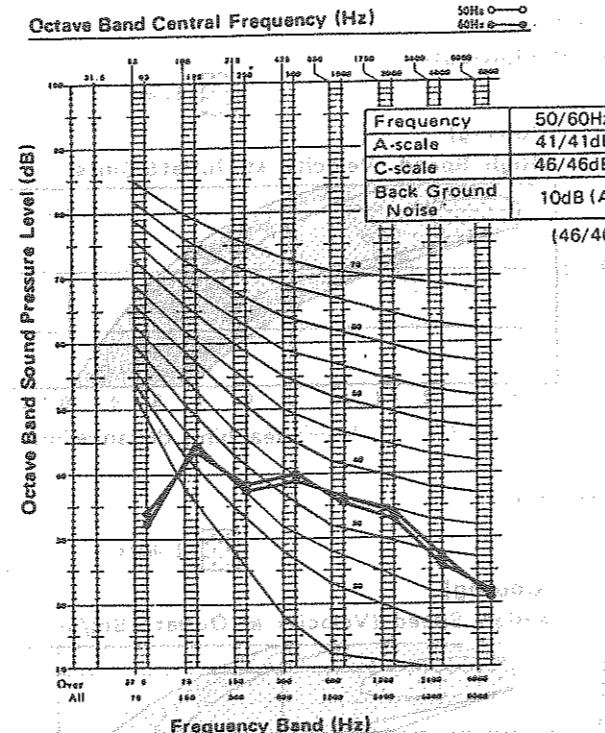


18. SOUND DATA

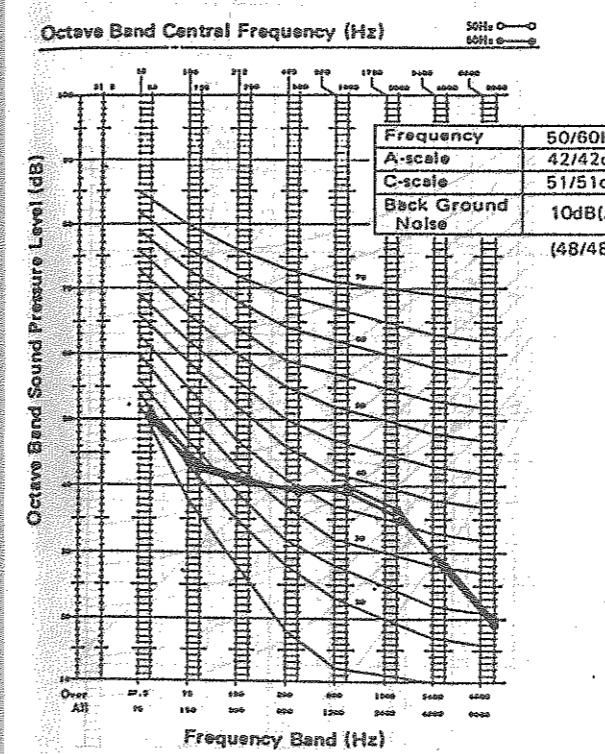
CS-50T32JP



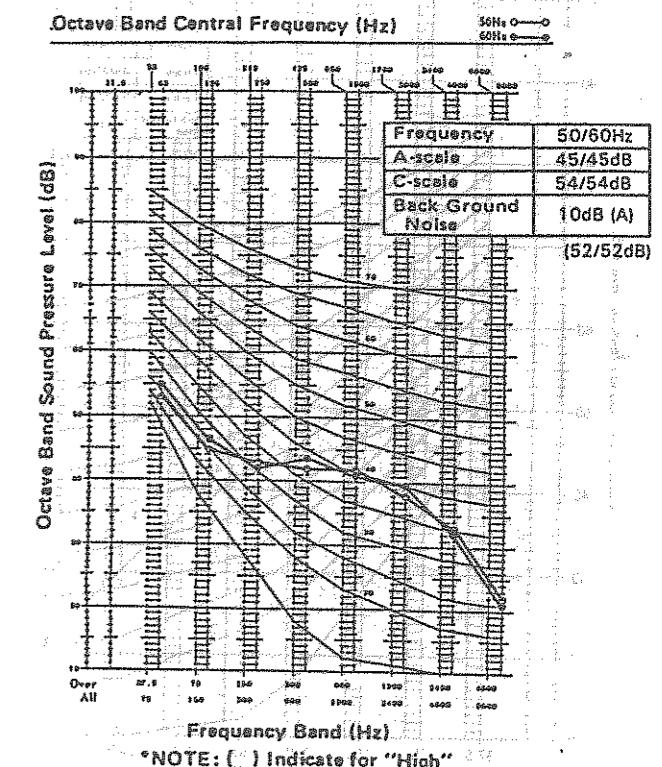
CS-71T32JP



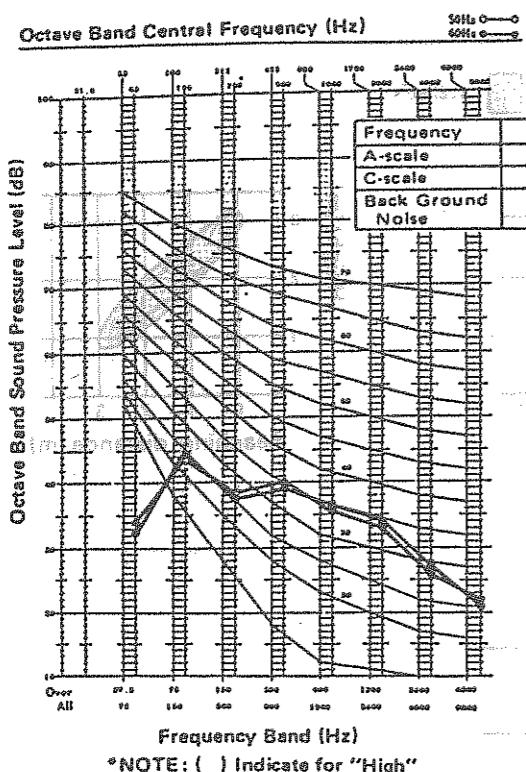
CS-140T32JP



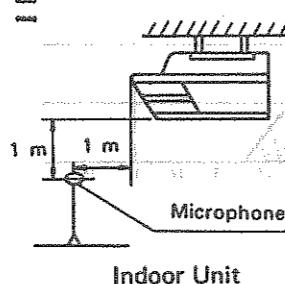
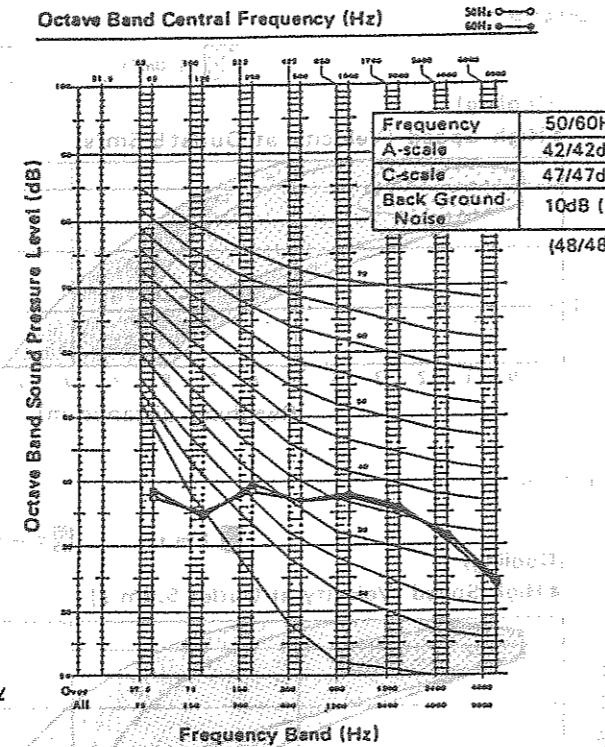
CS-160T32JP



CS-80T32JP



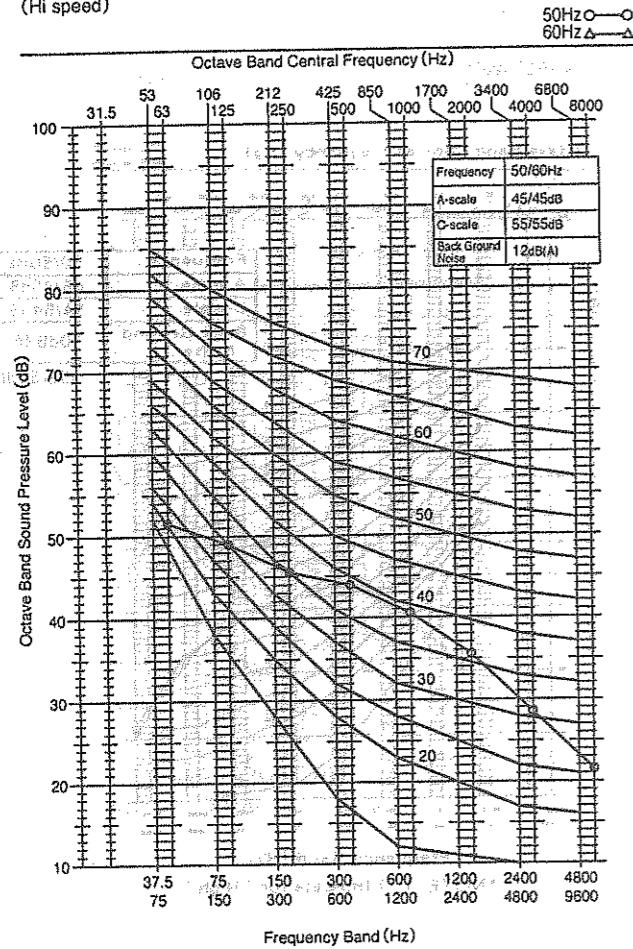
CS-112T32JP



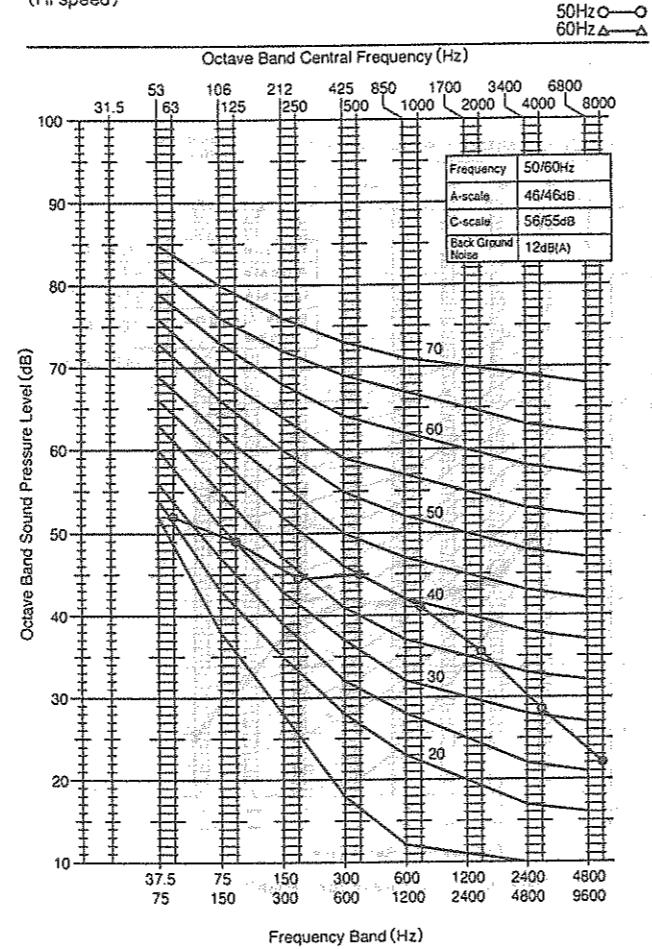
18. SOUND DATA

18. SOUND DATA

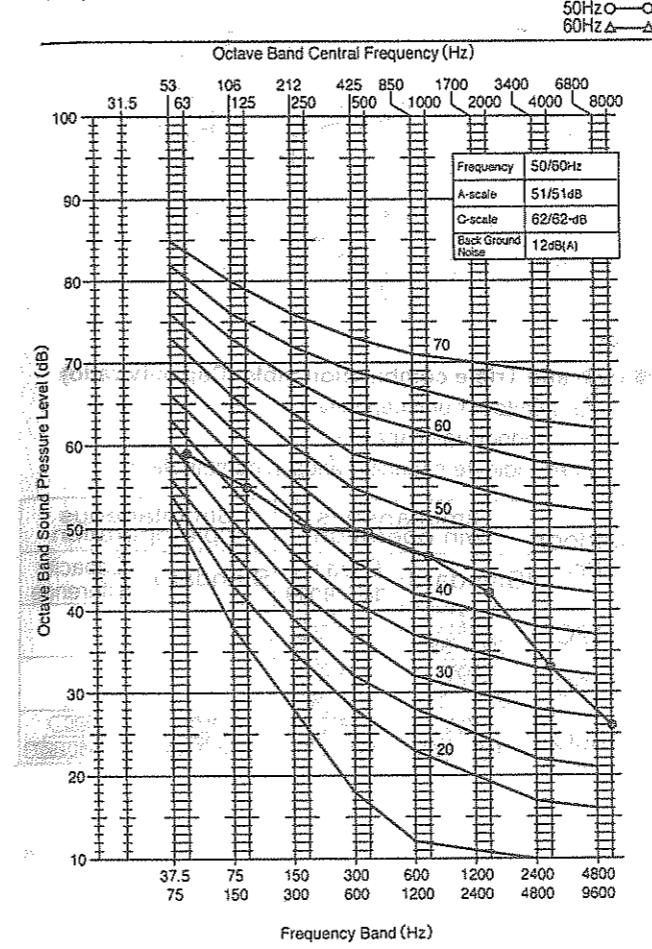
CU-50C02HP
(Hi speed)



CU-71C02HP, CU-71C02XP
(Hi speed)

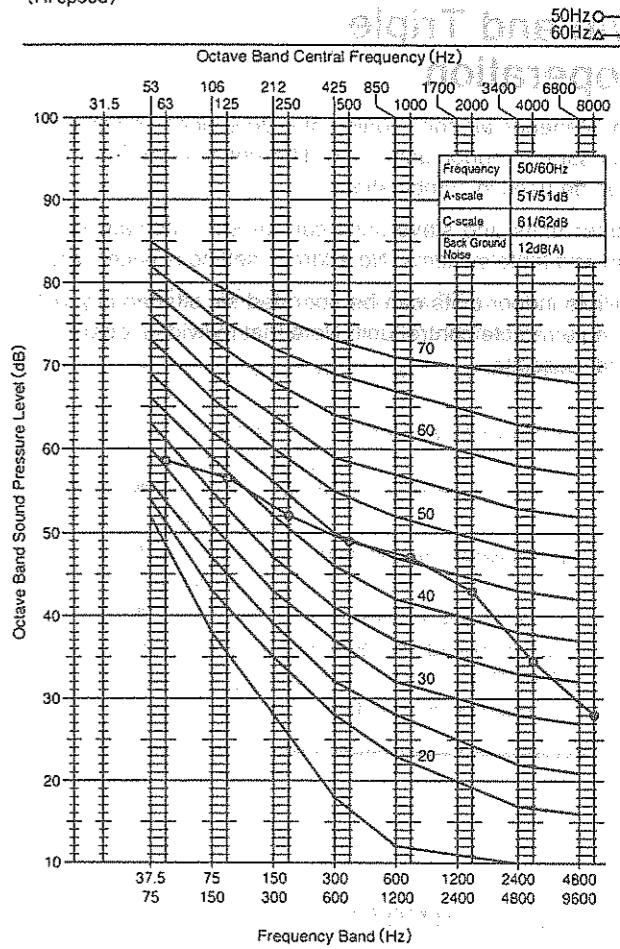


CU-140C53XP, CU-140C03XP
(Hi speed)

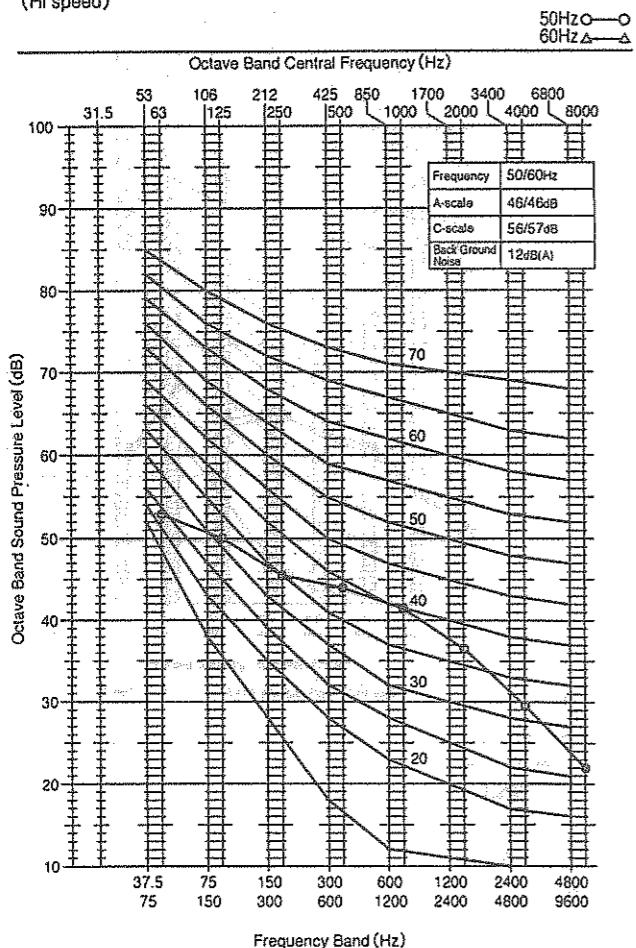


18. SOUND DATA

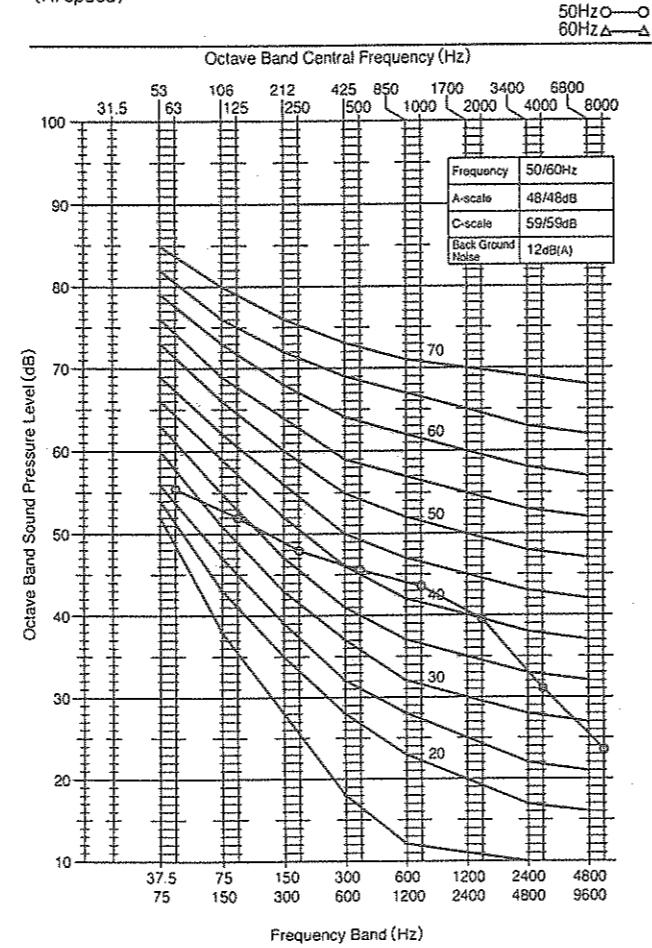
CU-160C53XP, CU-160C03XP
(Hi speed)



CU-80C52HP, CU-80C52XP, CU-80C02HP, CU-80C02XP
(Hi speed)



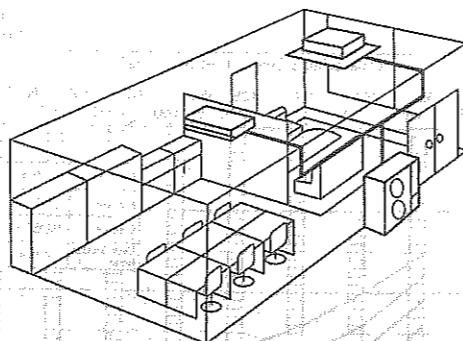
CU-112C52XP, CU-112C02XP
(Hi speed)



Twin and Triple

1 operation

- Simultaneous air conditioning of wide spaces and corners is possible. Indoor units with different horsepowers can even be used in combination.
- 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.



Twin and Triple combination table (Capacity ratio)

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

Outdoor unit	Simultaneous twin operation		Simultaneous triple operation	
	Standard	Capacity difference	Standard	Capacity difference
112C	112C 50U 50U	112C 40U 71T		
140C	140C 71T 71T	140C 50T 80T		
160C	160C 80T 80T	160C 50T 112T	160C 50T 50T 50T	160C 40U 40U 80T

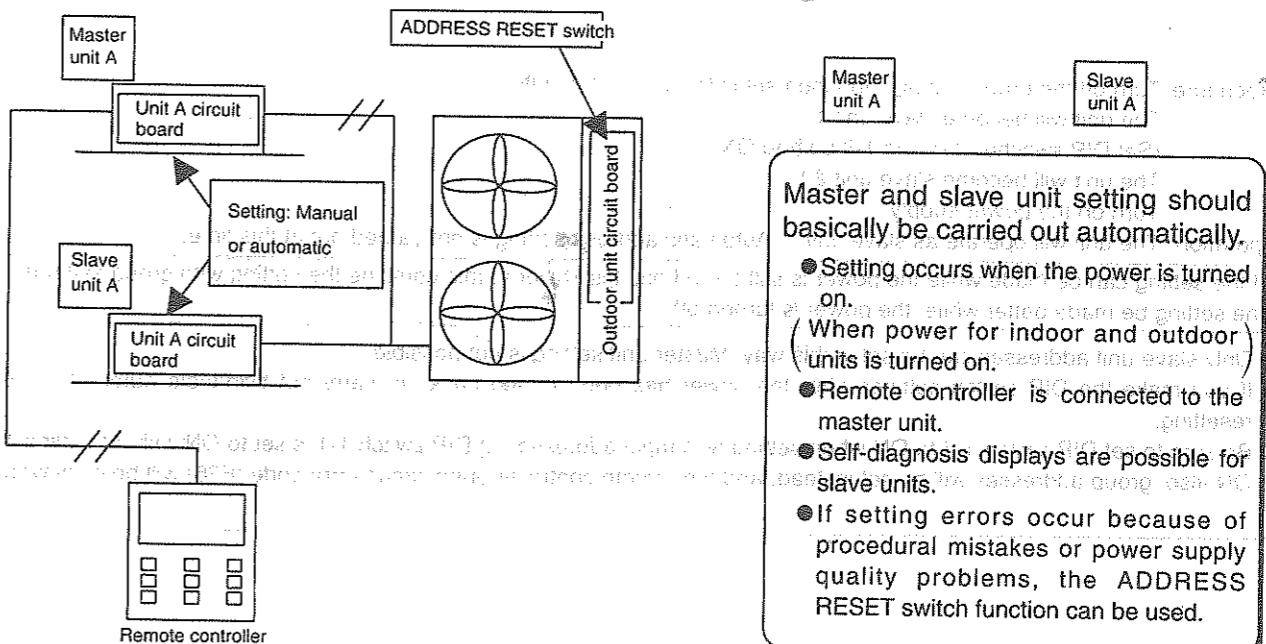
(Twin and triple operation setting)

- 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 and slave unit 2) at the indoor unit or remote controller.
- Install the remote control unit to the master unit. (It cannot be connected to slave units.)
If indoor unit models with louvers and models without louvers have been connected together, use an indoor unit with louvers 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 (slave unit 1 when connecting a triple system)	Slave unit 2 when connecting a triple system												
		ON	OFF	1	2	3	4	5	6	7	8			
	※ It is not necessary to operate any switches on the master unit. The unit connected to the remote controller will become the master unit.			Set No. 8 to ON. All other switches can be ignored. (No. 7 is already set to ON at the time of shipment.)	ON	OFF	1	2	3	4	5	6	7	8

If any settings other than those for slave unit 1 and slave unit 2 are used, the system will not operate correctly.

Recomienda que obtenga el manual de instrucciones para obtener más información.



Master and slave unit setting should basically be carried out automatically.

- Setting occurs when the power is turned on.
- When power for indoor and outdoor units is turned on, automatic unit setup occurs.
- Remote controller is connected to the master unit.
- Self-diagnosis displays are possible for slave units.
- If setting errors occur because of procedural mistakes or power supply quality problems, the ADDRESS RESET switch function can be used.

Automatic address setting for twin and triple systems

Procedimiento: Encienda la alimentación eléctrica para las unidades interior y exterior.

Operación: El procedimiento de configuración automática comenzará 10 a 30 segundos después de encender la alimentación, y se completará aproximadamente 1 minuto.

Si las unidades interior y exterior no pueden encenderse al mismo tiempo, encienda la alimentación eléctrica para la unidad exterior, la unidad interior conectada al control remoto, y luego las otras unidades interiores en ese orden.

Si el orden de encendido de la alimentación eléctrica es incorrecto, la configuración del master unit puede superponerse. En tal caso, encienda la alimentación eléctrica para todas las unidades en el orden correcto, o realice una configuración automática de dirección de red para doble/triple (pulse el interruptor DIP N.º 3 en la placa de circuito impreso de la unidad exterior continuamente durante 4 segundos o más).

- La unidad interior que está conectada al control remoto (receptor) tendrá prioridad para convertirse en la unidad master.
- El termostato de la unidad master será usado como termostato de temperatura interior. Si el termostato de la unidad master es encendido, los termostatos de las unidades esclavo no pueden ser ajustados incluso si están encendidos.
- Los ajustes de los interruptores DIP tienen prioridad en la configuración de direcciones de red para doble/triple.
- Si se realiza la configuración de dirección de red usando los interruptores DIP después de la configuración automática de dirección de red, utilice el interruptor DIP N.º 3 en la unidad exterior para realizar la configuración automática de dirección de red.
- Si deseas designar una unidad interior específica como la unidad master porque no se ha establecido una unidad master, utiliza los interruptores DIP en las unidades esclavo para establecer la configuración.

Si se realiza la configuración automática de dirección de red una vez y se establecen las direcciones de red en la EEPROM, las direcciones de red se almacenarán dentro de la EEPROM. Por lo tanto, no es necesario repetir la configuración automática de dirección de red si se apaga la alimentación y se vuelve a encender.

DIP switch settings for twin/triple 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.

(Set DIP switches 1-1 and 1-8 both to ON.)

The unit will become slave unit 2.)

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 controller open circuit error code (F26) will be displayed.

employees' stock options. Dowd not painted as good bbs after motorola

Automatic address resetting for twin/triple systems

Function

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

Procedure: Press the ADDRESS RESET switch SW3 (pushbutton 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/triple 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/triple address resetting is being carried out.
 - Do not turn off the power supply for at least 1 minute after automatic twin/triple address resetting has been carried out.

2 Piping connections

- The following table shows the pipe diameters for a twin-type system.
(The CZ-06BKDA branch pipe [sold separately] will be needed.)

Outdoor unit main pipe diameter (mm)		Indoor unit combinations			
		Standard		Horsepower difference	
Liquid side: $\phi 9.52$ Gas side: $\phi 19.05$	112C	Indoor unit capacity	50T	50T	40U
	Branch pipe diameter	Liquid side	$\phi 6.35$	$\phi 6.35$	
	Gas side	$\phi 12.7$	$\phi 12.7$		
Liquid side: $\phi 9.52$ Gas side: $\phi 19.05$	140C	Indoor unit capacity	71T	71T	50T
	Branch pipe diameter	Liquid side	$\phi 6.35$	$\phi 6.35$	
	Gas side	$\phi 15.88$	$\phi 15.88$		
Liquid side: $\phi 9.52$ Gas side: $\phi 19.05$	160C	Indoor unit capacity	80T	80T	50T
	Branch pipe diameter	Liquid side	$\phi 9.52$	$\phi 6.35$	
	Gas side	$\phi 15.88$	$\phi 12.7$		

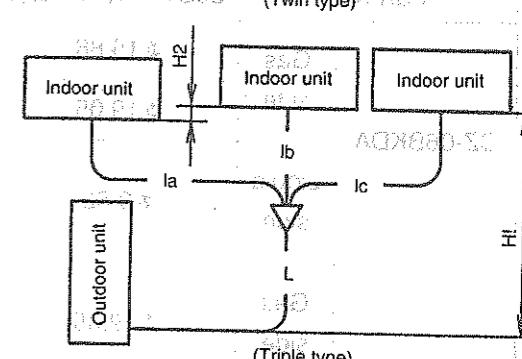
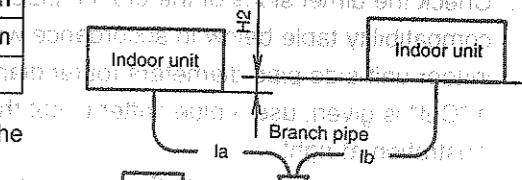
- The following table shows the pipe diameters for a triple-type system. (The CZ-06RKT-A branch pipe [soft])

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

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

NOTE:

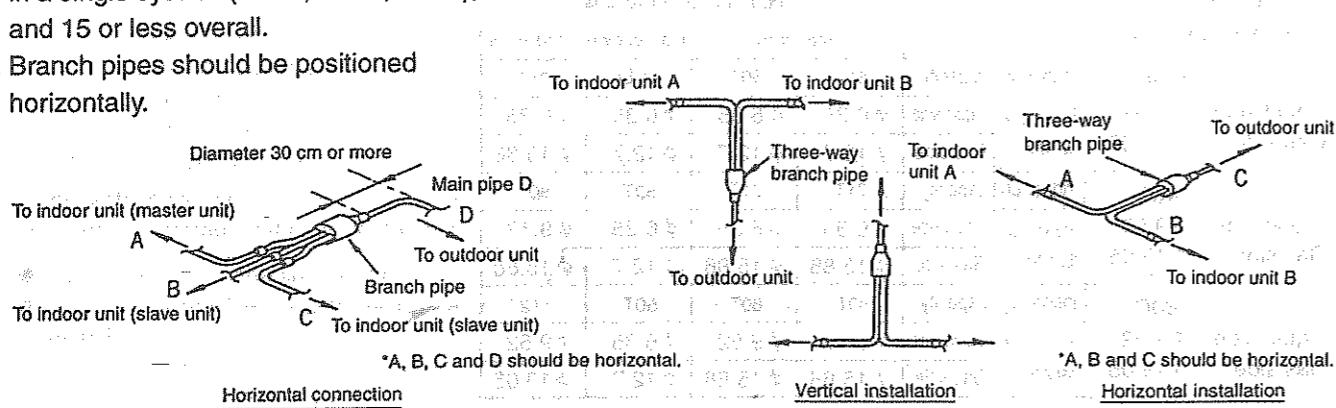
1. Use the main pipe to gain any rise or fall required for the pipes.
 2. The number of bends should be 8 or less in a single system ($L + l_a$, $L + l_b$, $L + l_c$), and 15 or less overall.
 3. Branch pipes should be positioned horizontally.



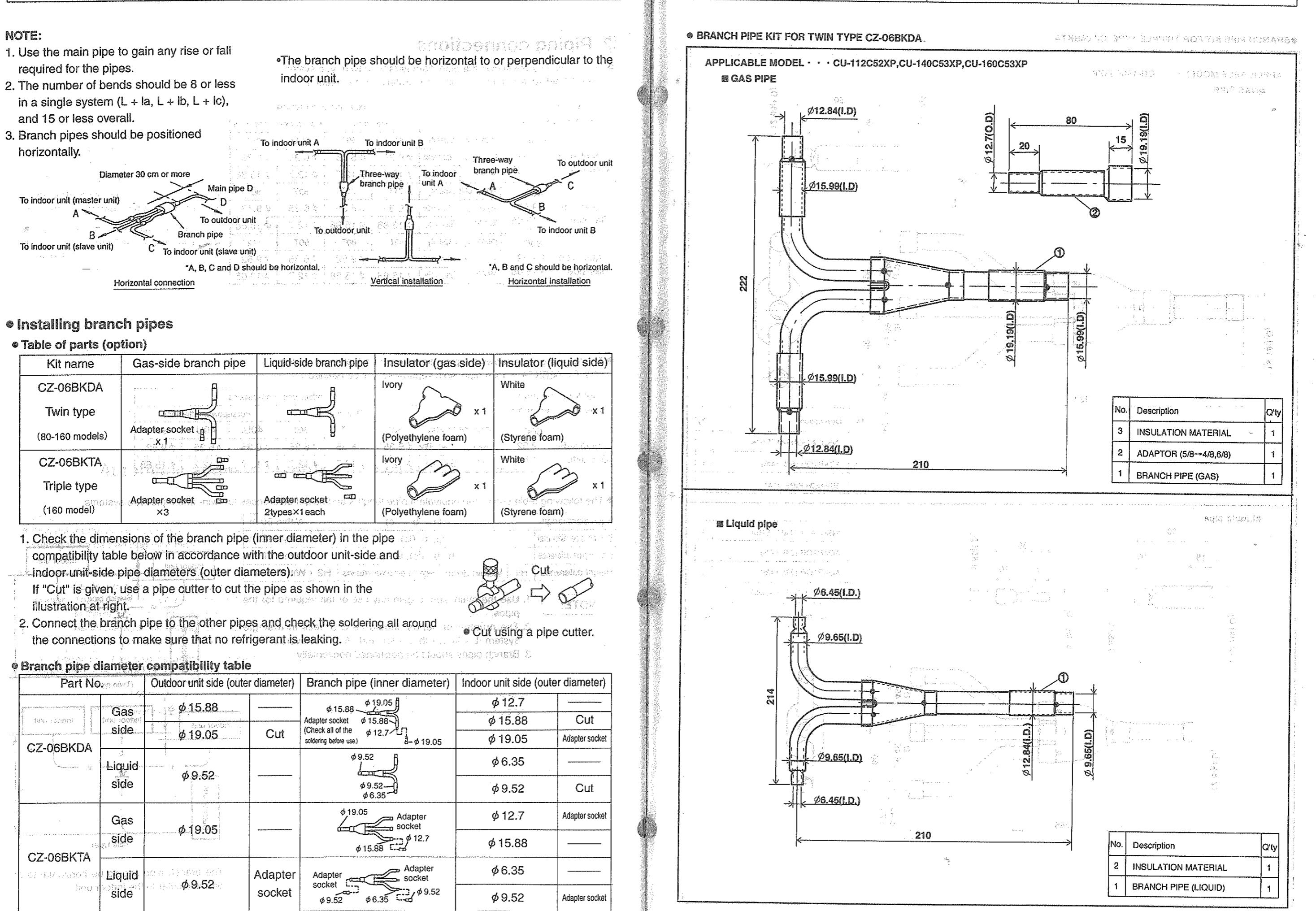
*The branch pipe should be horizontal to or perpendicular to the indoor unit.

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 ($L + l_a$, $L + l_b$, $L + l_c$), and 15 or less overall.
3. Branch pipes should be positioned horizontally.

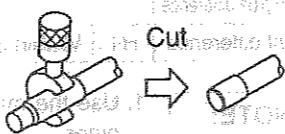


• The branch pipe should be horizontal to or perpendicular to the indoor unit.

**• Installing branch pipes****• Table of parts (option)**

Kit name	Gas-side branch pipe	Liquid-side branch pipe	Insulator (gas side)	Insulator (liquid side)
CZ-06BKDA Twin type (80-160 models)	Adapter socket x 1	Adapter socket 2types×1 each	Ivory (Polyethylene foam) x 1	White (Styrene foam) x 1
CZ-06BKTA Triple type (160 model)	Adapter socket x 3	Adapter socket 2types×1 each	Ivory (Polyethylene foam) x 1	White (Styrene foam) x 1

1. Check the dimensions of the branch pipe (inner diameter) in the pipe compatibility table below in accordance with the outdoor unit-side and indoor unit-side pipe diameters (outer diameters). If "Cut" is given, use a pipe cutter to cut the pipe as shown in the illustration at right.
2. Connect the branch pipe to the other pipes and check the soldering all around the connections to make sure that no refrigerant is leaking.

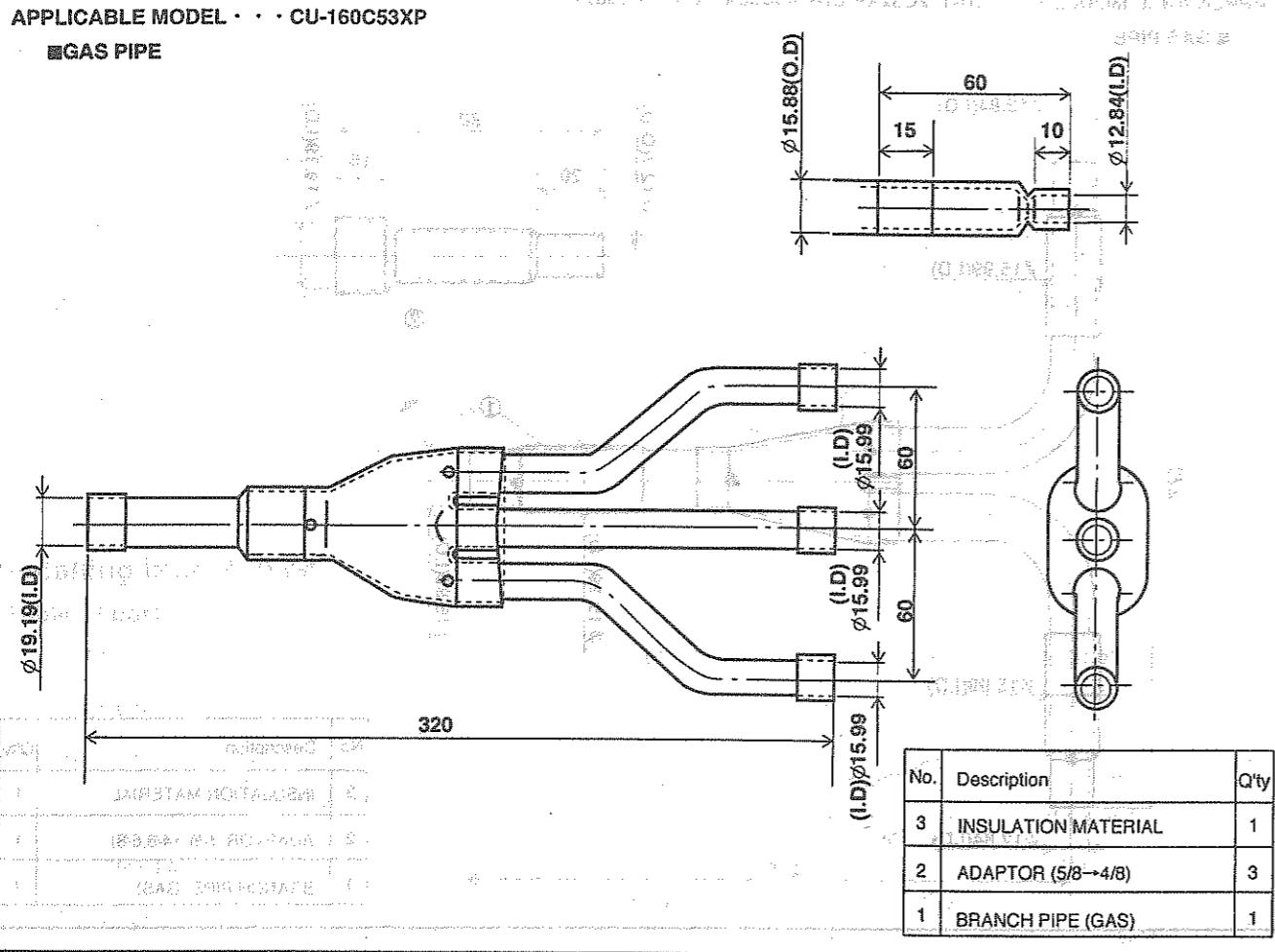
**• Branch pipe diameter compatibility table**

Part No.	Outdoor unit side (outer diameter)	Branch pipe (inner diameter)	Indoor unit side (outer diameter)
CZ-06BKDA	Gas side Ø15.88 Ø19.05	Ø15.88 Ø19.05 Cut	Ø12.7 Ø15.88 Ø19.05 Cut Ø12.7 Ø19.05 Adapter socket
	Liquid side Ø9.52	Ø9.52 Ø6.35	Ø6.35 Ø9.52 Cut
CZ-06BKTA	Gas side Ø19.05	Ø19.05 Adapter socket Ø15.88 Ø12.7 Ø15.88	Ø12.7 Ø15.88 Ø6.35 Ø9.52 Adapter socket
	Liquid side Ø9.52	Adapter socket Ø9.52 Ø6.35	Ø6.35 Ø9.52 Adapter socket

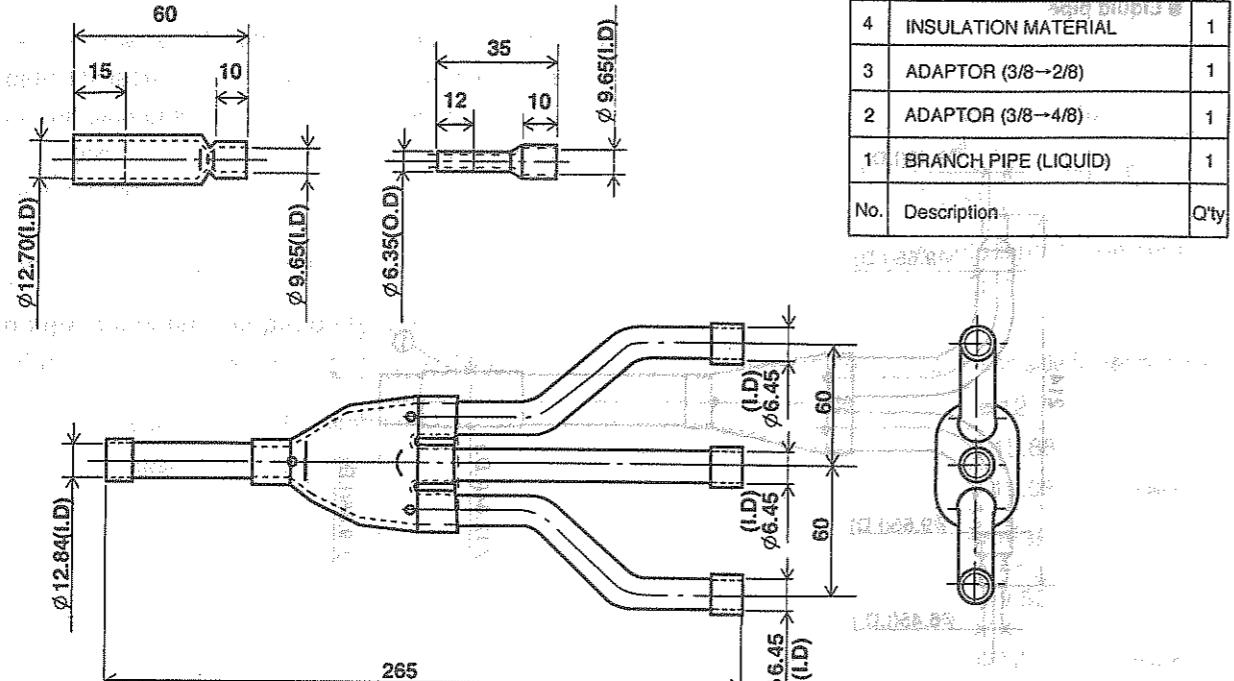
BRANCH PIPE KIT FOR TRIPPLE TYPE CZ-06BKTA

APPLICABLE MODEL • • CU-160C53XP

■ GAS PIPE



■ Liquid pipe



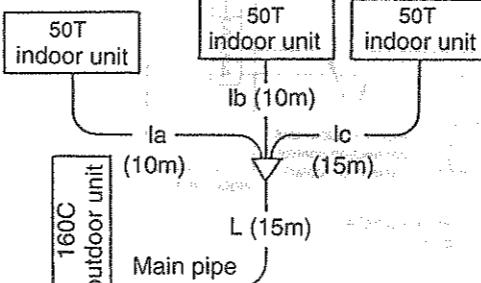
3 Refrigerant charging

For twin- and triple-type systems

The pipe length is the total of the branch pipe (L) and the junction pipes (la → lb → lc 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	φ 6.35	φ 9.52
Additional charging amount (kg/m)	0.02	0.05

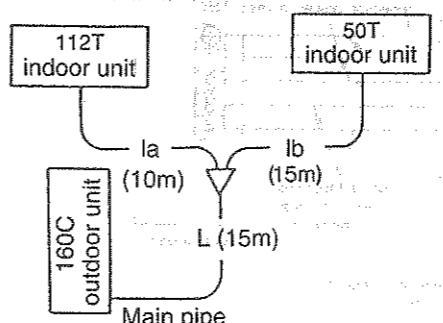
Example 1: For 160C outdoor unit with an equivalent pipe length of 50 m



(Triple type)

	Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe (kg)
Main pipe (L)	φ 9.52	15m	Not needed if within 30 m
(la)	φ 6.35	10m	Not needed if within 30 m
(lb)	φ 6.35	10m	If exceeds 30 m, 5 m × 0.02 = 0.1
(lc)	φ 6.35	15m	15m × 0.02 = 0.3
		50m	Total 0.4 kg

Example 2: For 160C outdoor unit with an equivalent pipe length of 40 m

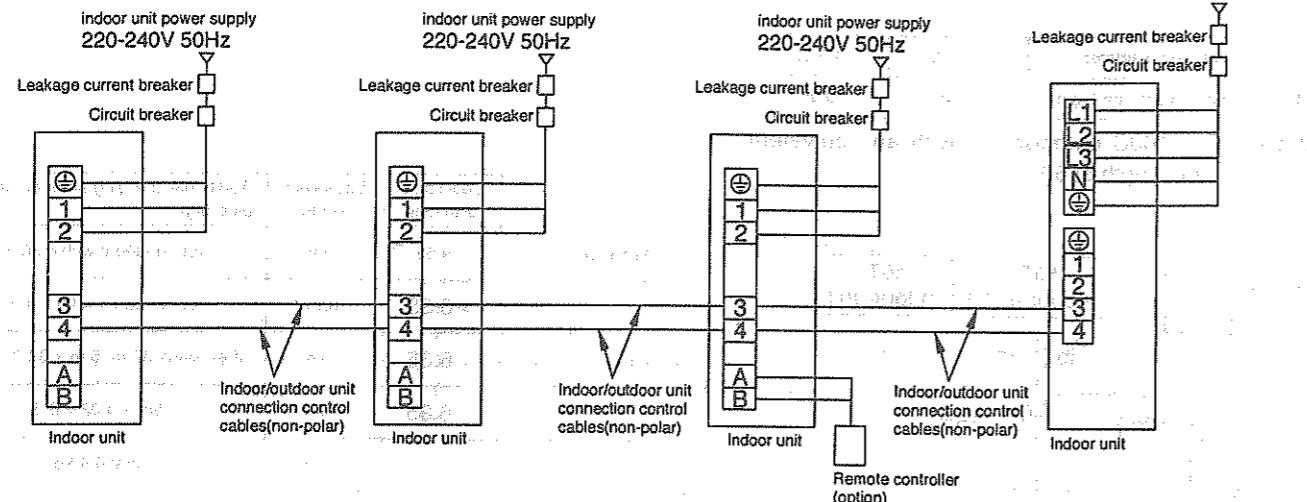


(Twin type)

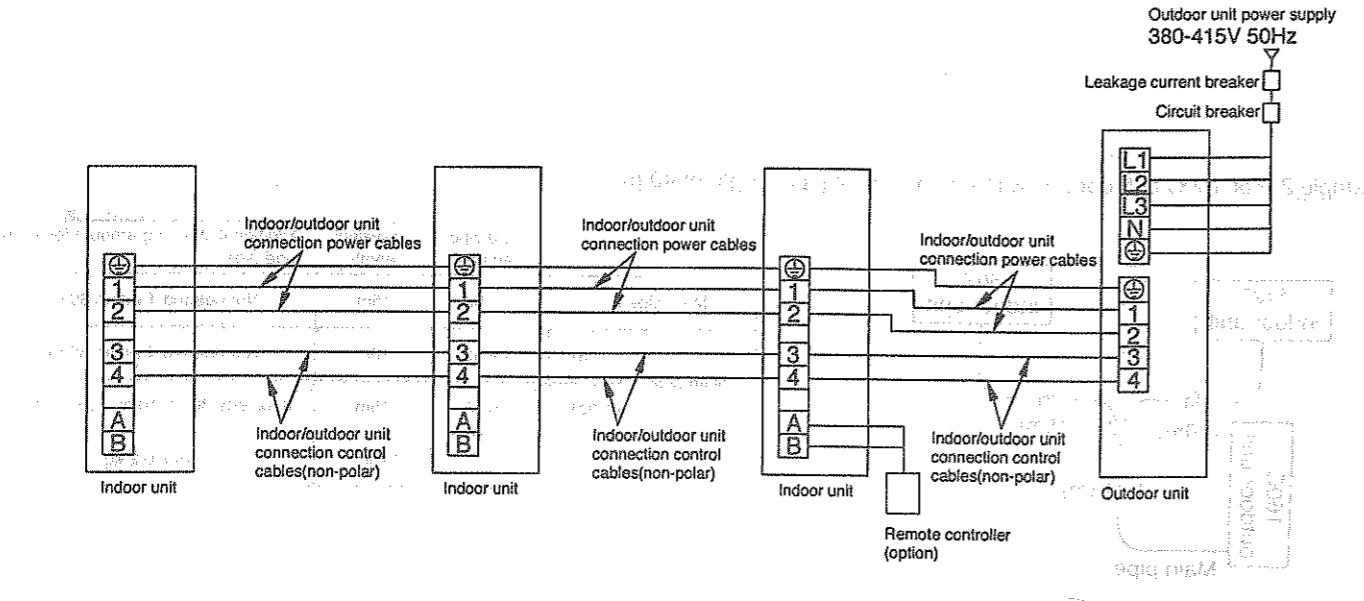
	Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe (kg)
Main pipe (L)	φ 9.52	15m	Not needed if within 30 m
(la)	φ 9.52	10m	Not needed if within 30 m
(lb)	φ 6.35	15m	If exceeds 30 m, 10 m × 0.02 = 0.2

4 Wiring

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

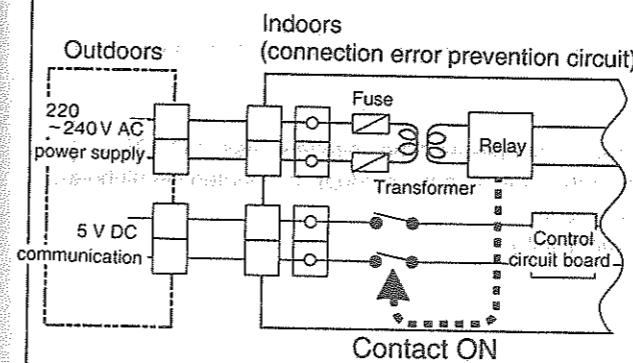


When only the outdoor unit draws power

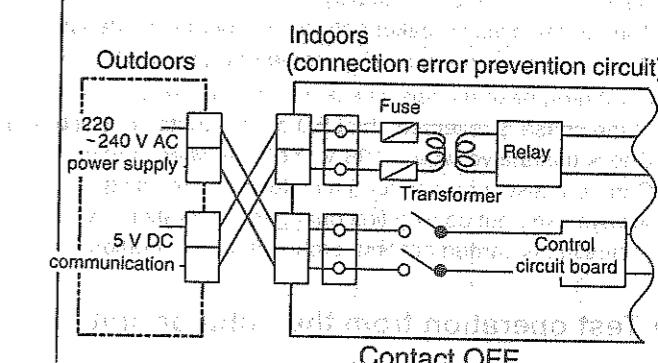


Improved quality of installation work through adoption of an "Connection error prevention" circuit which prevents wiring mistakes

<Correct wiring>



<Incorrect wiring>

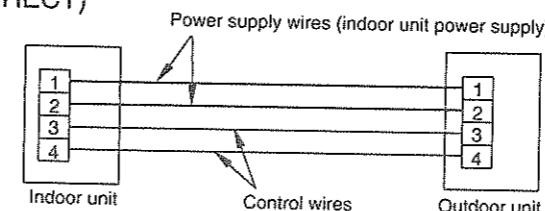


Connection errors with the control wires and the power supply wires will not only contribute to burning-out of the control circuit board, but can also cause large-scale working losses and affect reliability. If a circuit board with an "Connection error prevention" circuit is used, the relay will not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

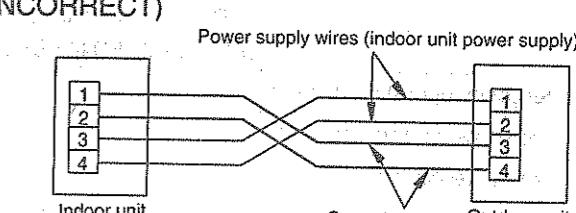
Prevention of connecting errors

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

(CORRECT)



(INCORRECT)



- Do not short the remote controller 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 controller.
- If nothing at all appears in the remote controller LCD, check the power supply for the indoor unit. Refer to "TROUBLE SHOOTING" at Page 101~107.

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 controller.
- (※1) U-NET transmission wires are the communication wires used for the central controller.

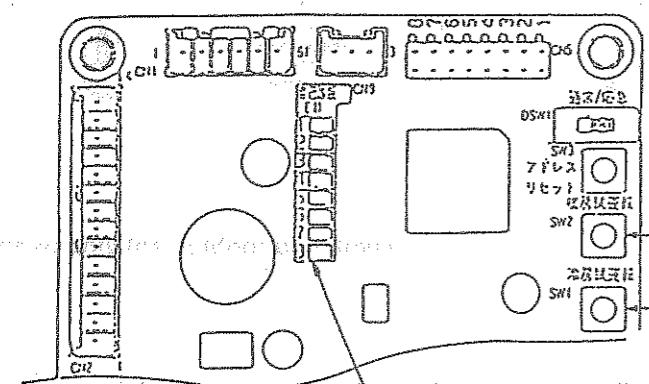
Test operation and self-diagnosis

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 198 V.)
- Carry out test operation for 5 minutes or more using the remote controller 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.)

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	-	-	-	-	-	-	

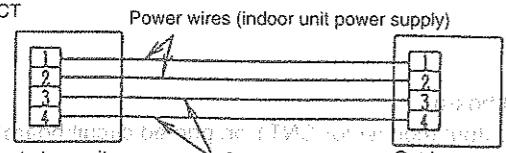
To cancel test operation, press the TEST or RUN switch once more while test operation is being carried out.

(Test operation will stop automatically after 30 minutes have passed.)

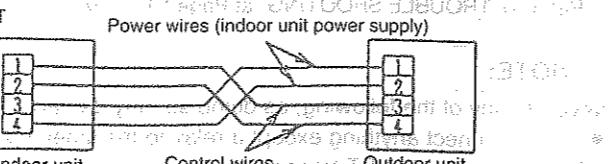
NOTE:1

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

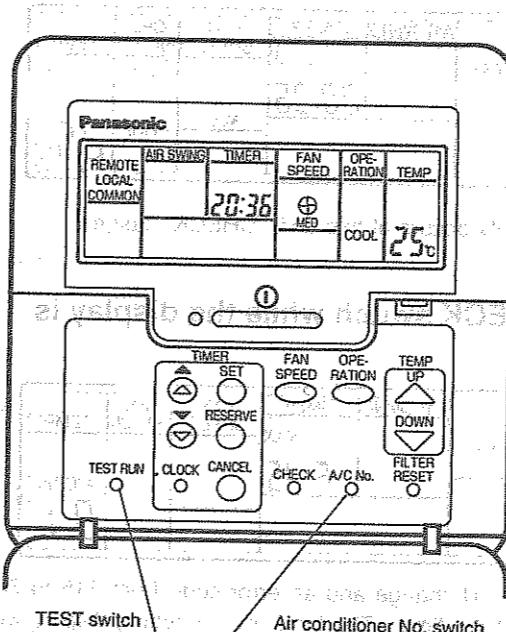


NOTE:2

Do not short the remote control unit wires to each other. (The protection circuit will be activated and the units will not operate.)

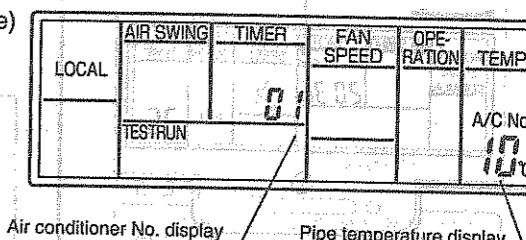
Once the cause of the short is eliminated, normal operation will then be possible.

Test operation using the wired remote controller



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

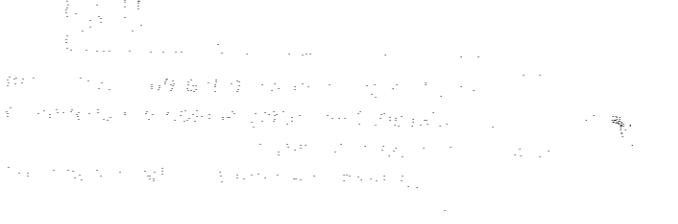
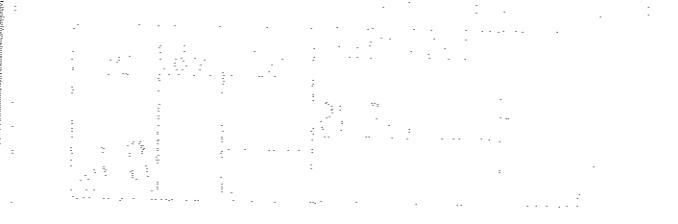
(Example)



- 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.
- 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.)

22. TROUBLESHOOTING

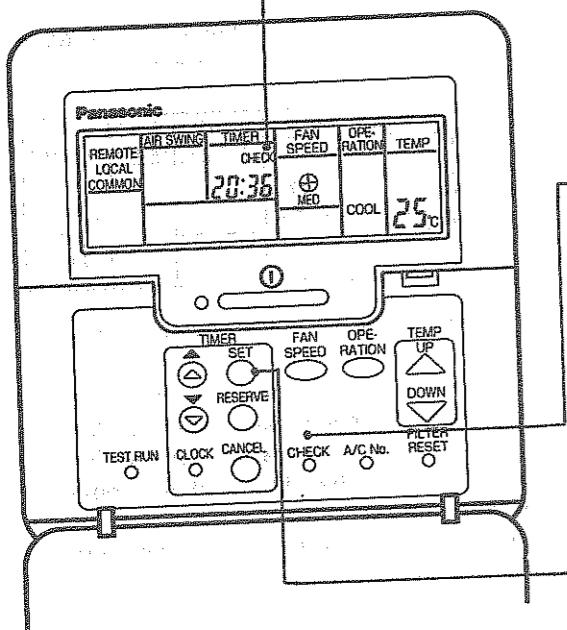


21. TEST OPERATION AND SELF DIAGNOSIS

Self-diagnosis function

- The wired remote controller 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)

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

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

Press the CHECK switch while the display is flashing.

(Example)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
	CHECK	F 15			A/C No 01

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

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

(Example)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
	CHECK	- 01			A/C No 01

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

(Last problem display: 1F15 - 1F49)

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

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

(Example of last problem display)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
	CHECK	1F 15			A/C No 01

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

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

(Example)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
	CHECK	1- 01			A/C No 01

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.)

21. TEST OPERATION AND SELF DIAGNOSIS

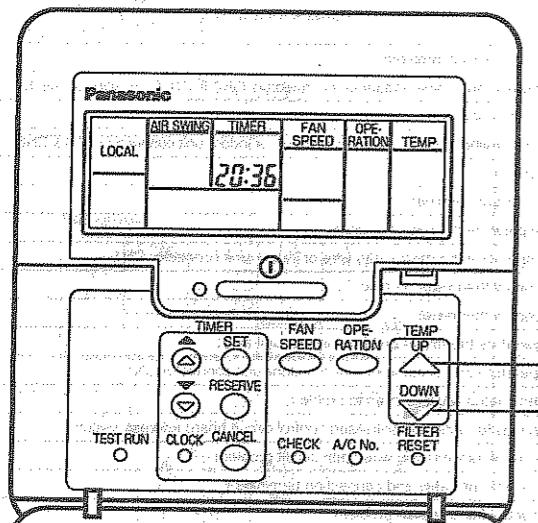
Self-diagnosis error code table

●: Flashing ○: Illuminated Blank: Off

Error display	Detail display	Printed circuit board self-diagnosis LED (red)								(Check location)	
		Wired		Wireless		Outdoor unit					
		Run LED	LED2	LED3	LED4	LED5	LED6	LED7	LED8		
F15	-01	●	●	●			●	(*)2	(*)2	Drain level float switch problem	
F16	-01	●	●		●		●	(*)2	(*)2	Drain pump and drain pipe, indoor unit connectors CN6 & CN10, or relay connector	
F17	-01	●	●	●	●		●	(*)2	(*)2	Louver switch problem	
F20	-01	●	●	●			●	(*)2	(*)2	Louver motor, veneer panel connection terminal, or indoor unit connectors CN1& CN6	
F21	-01	●	●		●		●	(*)2	(*)2	Option problem	
F25	-01	●	●		●		●	(*)2	(*)2	Option connection terminals	
F26	-01	●	●		●		●	(*)2	(*)2	Indoor temperature thermistor problem	
F27	-01	●	●		●		●	(*)2	(*)2	Indoor temperature thermistor lead wire or indoor unit connector CN1	
F29	-01	●	●		●		●	(*)2	(*)2	Remote control thermistor problem	
F30	-02	●	●		●		●	(*)2	(*)2	Pipe temperature thermistor problem (indoor unit side)	
F31	-02	●	●		●		●	(*)2	(*)2	Pipe temperature thermistor lead wire or indoor unit connector CN1	
F33	-01	●	●		●		●	(*)2	(*)2	Centralised control address overlap problem	
F33	-02	●	●		●		●	(*)2	(*)2	Check settings for optional centralised control circuit board address switch	
F40	-01	●	●		●		●	(*)2	(*)2	Remote control transmission wire open circuit problem	
F40	-06	●	●		●		●	(*)2	(*)2	Remote control unit cable and connection terminals	
F40	-07	●	●		●		●	(*)2	(*)2	Remote control transmission problem	
F41	-01	●	●		●		●	(*)2	(*)2	Indoor/outdoor unit transmission wire open circuit problem	
F41	-02	●	●		●		●	(*)2	(*)2	Indoor/outdoor unit connection cable and connection terminals, or indoor unit and outdoor unit power supplies	
F42	-01	●	●		●		●	(*)2	(*)2	Indoor/outdoor unit transmission problem	
F42	-02	●	●		●		●	(*)2	(*)2	Check the transmission wave pattern	
F49	-01	●	●		●		●	(*)2	(*)2	Indoor unit setting problem	
F49	-02	●	●		●		●	(*)2	(*)2	Abnormal setting of the indoor p.c. board	
F49	-12	●	●		●		●	(*)2	(*)2	Indoor unit setting problem	
F49	-02	●	●		●		●	(*)2	(*)2	Abnormal setting of the indoor p.c. board	
F49	-06	●	●		●		●	(*)2	(*)2	Remote control unit setting problem	
F49	-07	●	●		●		●	(*)2	(*)2	Abnormal setting of the remote controller	
F49	-12	●	●		●		●	(*)2	(*)2	Negative or open phase power supply	
F49	-02	●	●		●		●	(*)2	(*)2	Check the main power supply terminal board connections, and switch the main power supply phase.	
F49	-06	●	●		●		●	(*)2	(*)2	Poor power supply connection, or distorted voltage wave pattern	
F49	-07	●	●		●		●	(*)2	(*)2	Check the main power supply terminal board connections, and check the power supply wave pattern.	
F49	-12	●	●		●		●	(*)2	(*)2	Poor power supply connection	
F49	-02	●	●		●		●	(*)2	(*)2	Check the main power supply terminal board connections.	
F49	-06	●	●		●		●	(*)2	(*)2	High-pressure cut-off	
F49	-07	●	●		●		●	(*)2	(*)2	Refrigeration system, Obstructing of the heat radiation from outdoor unit	
F49	-12	●	●		●		●	(*)2	(*)2	Compressor overcurrent protection	
F49	-02	●	●		●		●	(*)2	(*)2	Open phase or lock in compressor, or blown main power supply fuse	
F49	-06	●	●		●		●	(*)2	(*)2	Compressor discharge temperature protection	
F49	-07	●	●		●		●	(*)2	(*)2	Insufficient gas	
F49	-12	●	●		●		●	(*)2	(*)2	Compressor discharge temperature thermistor problem	
F49	-02	●	●		●		●	(*)2	(*)2	Discharge temperature thermistor lead wire, outdoor unit connector CN2, or relay connector	
F49	-06	●	●		●		●	(*)2	(*)2	Heat exchanger outlet temperature thermistor problem (Outdoor unit)	
F49	-07	●	●		●		●	(*)2	(*)2	Heat exchanger outlet temperature thermistor lead wire, outdoor unit connector CN2, or relay connector	
F49	-12	●	●		●		●	(*)2	(*)2	High-pressure switch open circuit problem	
F49	-02	●	●		●		●	(*)2	(*)2	High-pressure switch lead wire, outdoor unit connector CN2, or relay connector	
F49	-06	●	●		●		●	(*)2	(*)2	Heating pressure switch open circuit problem	
F49	-07	●	●		●		●	(*)2	(*)2	Heating pressure switch lead wire, outdoor unit connector CN2, or relay connector	
F49	-12	●	●		●		●	(*)2	(*)2	Current detector open circuit or compressor current problem	
F49	-02	●	●		●		●	(*)2	(*)2	Outdoor unit connector CN2, compressor internal protection system activated, or blown main power supply fuse	
F49	-06	●	●		●		●	(*)2	(*)2	Outdoor unit setting problem	
F49	-07	●	●		●		●	(*)2	(*)2		

• Energy save setting

- Upper and lower limits can be set for the setting temperature during cooling and heating operation. (The factory shipment setting has an upper limit of 31°C and a lower limit of 16°C.)



1 While operation is stopped, press the UP and DOWN switches simultaneously.



The display will change.

(Example)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
				HEAT	28

2 To set an upper limit

Press the OPERATION MODE switch until HEAT is displayed.



Press the UP or DOWN switch to set the temperature.



Press the RESERVE switch to complete the upper limit setting.

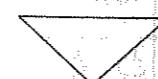
Example: If the heating display is set to 28°C, setting the temperature to higher than 28°C will not be possible.

*Upper and lower limits cannot be set at the same time.

• Switching to the remote controller thermistor

- The temperature detection thermistor used for detecting the indoor temperature can be switched between the thermistor at the indoor unit and the thermistor at the remote control unit. (The factory shipment setting is at the indoor unit side.)

1 While operation is stopped, press and hold the TEST RUN switch, UP switch and DOWN switches simultaneously.



The time display on the timer display panel will change.

(Example)

LOCAL	AIR SWING	TIMER	FAN SPEED	OPERATION	TEMP
		00			10

"00" ... Indoor unit thermostat detection setting

"01" ... Remote controller thermostat detection setting

Press the FORWARD or BACK timer switches to change the detection setting.

2 Press the RESERVE switch to complete the setting.

To change the setting, repeat the above operation.

(1) Setting group control for 1 remote control unit

- When using a remote-controlled 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 a basic requirement 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)

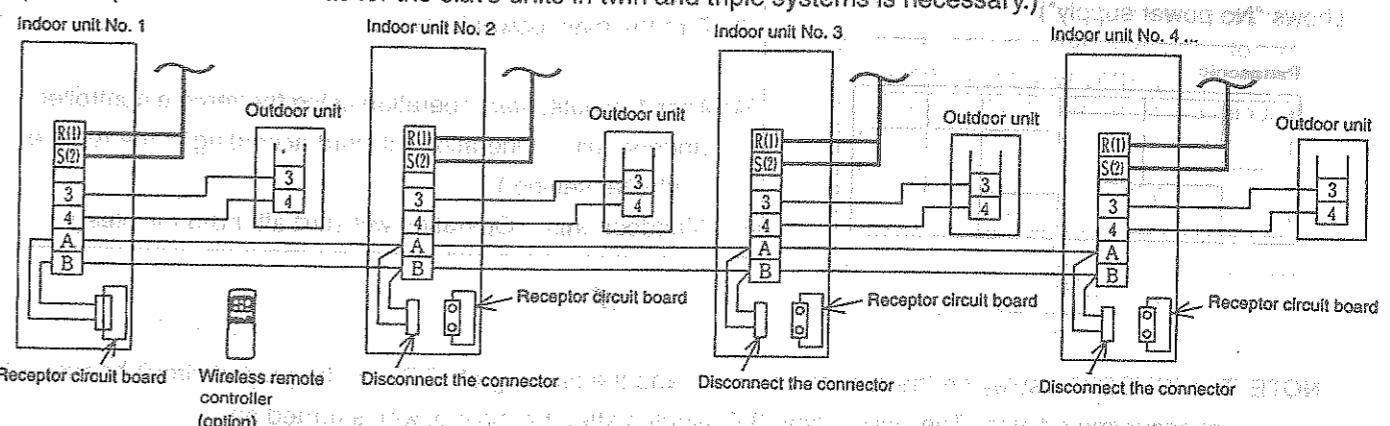
Indoor unit No.	1	2	3	4	5	6	7	8		
DIP switch (DSW1) setting on indoor unit printed circuit board	OFF ON	1 2 3 4 5 6 7 8	OFF ON	1 2 3 4 5 6 7 8	OFF ON	1 2 3 4 5 6 7 8	OFF ON	1 2 3 4 5 6 7 8	OFF ON	1 2 3 4 5 6 7 8
Manual setting	No operation necessary	1 is ON	2 is ON	1 and 2 are ON	3 is ON	1 and 3 are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

<Automatic address resetting for group control>

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

• Note with regard to the Mini-cassette

When carrying out group control of a Mini-cassette system using a single remote control unit, be sure to disconnect the connectors for all receptor circuit boards except the one for indoor unit No. 1 before turning on the power. (The same action as for the slave units in twin and triple systems is necessary.)



② Energy saving mode
③ 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).

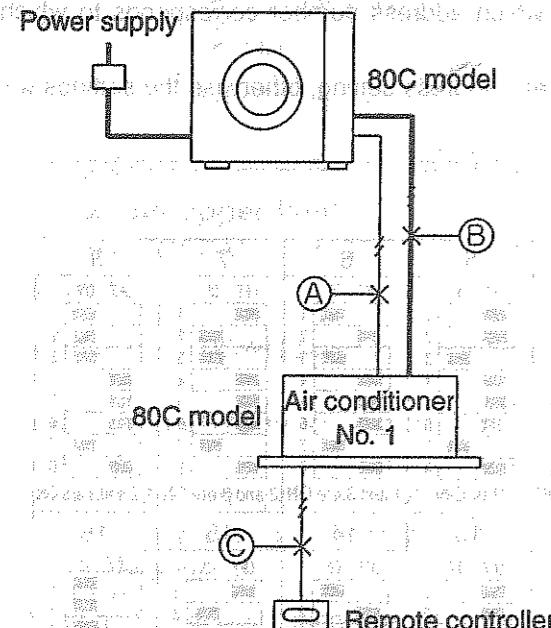
If operation is started by using the remote controller within 1 minute of turning on the power, the outdoor unit settings will not be made correctly and correct operation will not be possible.

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

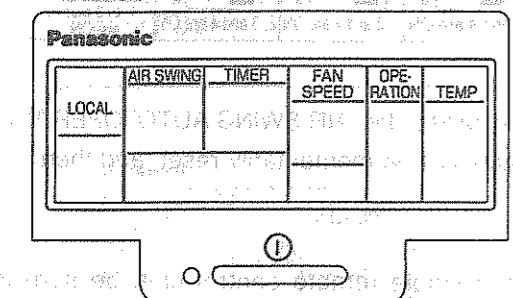
● For standard installation

(System example)

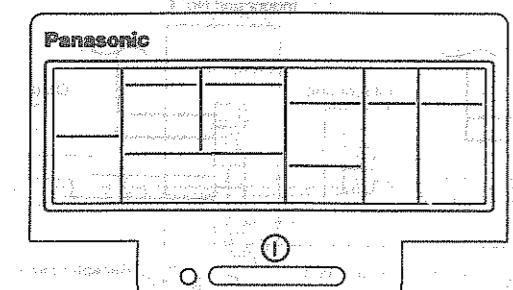
Outdoor unit No. 1



(When remote controller display shows "Power supply")



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



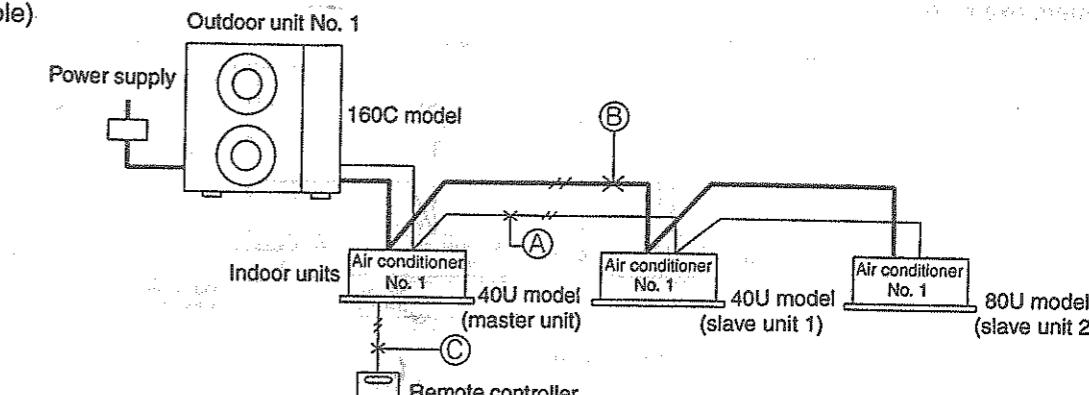
NOTE: The "CHECK" display on the remote controller and the flashing of LEDs on the printed circuit boards will not occur immediately. They will appear 3-6 minutes after the main power is turned on.

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 controller.
(Indoor unit ... Operation will start according to the remote controller setting.)
(Outdoor unit ... Operation will start after 3-5 minutes.)

● During twin/triple 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 controller display. If operation is then started in this condition, the combination of the 160C outdoor unit and the 40U indoor unit (master unit) will cause abnormal operation to occur.

If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop.

- Remote controller ... "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 controller ... "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 controller 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 controller.
(Indoor units ... Operation will start according to the remote controller setting.)
(Outdoor unit ... Operation will start after 3-5 minutes.)

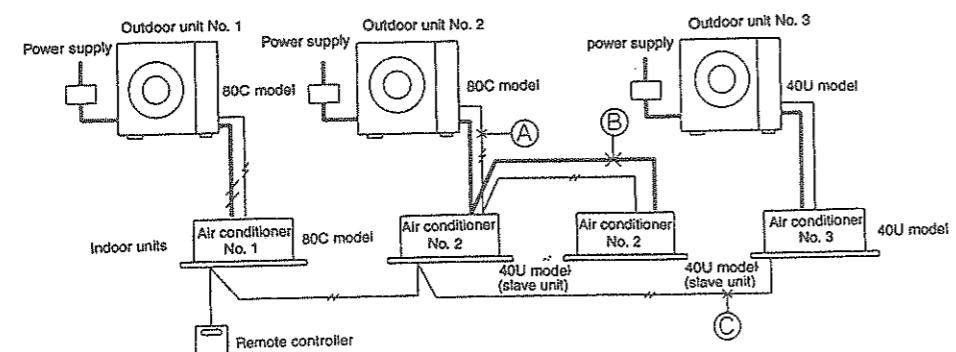
If slave units do not operate even after the wiring has been corrected (automatic addressing is not possible)

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 switch (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.

24. TROUBLE SHOOTING

● 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 controller "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 80C outdoor unit and the 40U 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 controller "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 controller connection cord is not connected (open circuit at section C)

Symptom: Nothing abnormal appears on the remote controller 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 controller.
(Indoor units . . . Operation will start according to the remote controller 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 'AIRSWING AUTO', 'OPERATION' and 'A/C No.' switches 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.

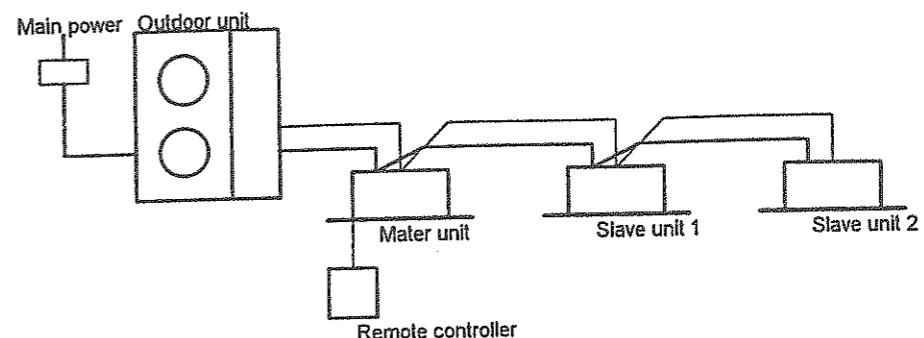
(Note on automatic address setting)

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 the same capacity.

24. TROUBLE SHOOTING

ADDRESS SETTING FOR TWIN/TRIPLE SYSTEM

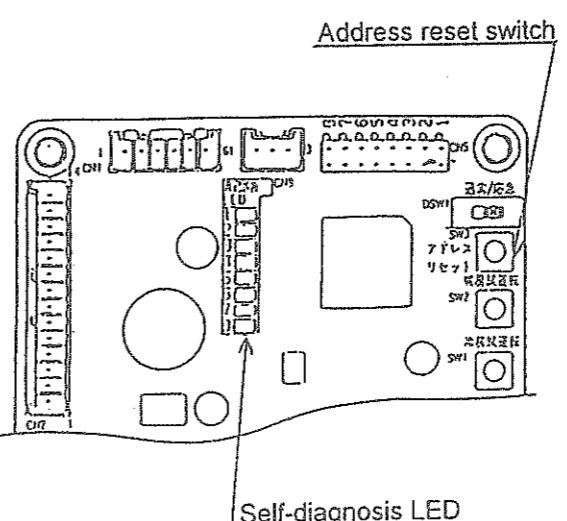
(Example)



1. Automatic address setting (no need to have dip-switch set)

If the wiring connected properly as above example, the address is set automatically by the main power supply. A indoor unit with remote controller 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.

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.

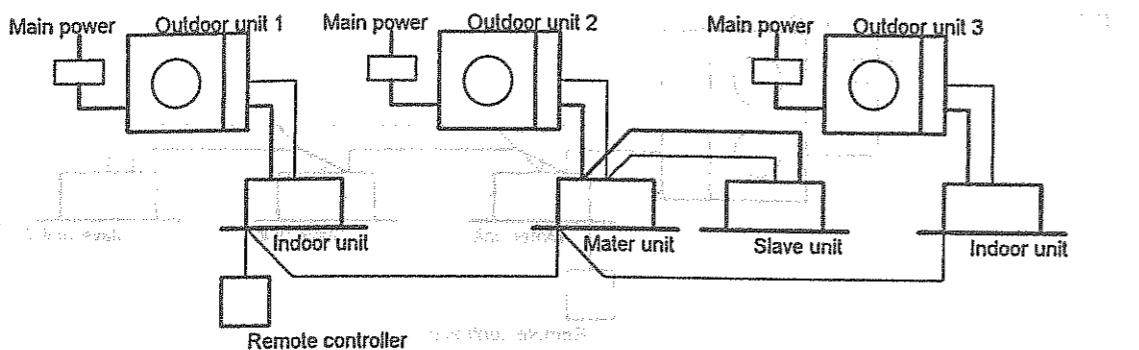
Manual address setting (by dip-switch DSW1)

When you set the address manually, set the dip-switch of the PC board in the indoor unit as follow:

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

ADDRESS SETTING FOR GROUP CONTROL SYSTEM

(Example)

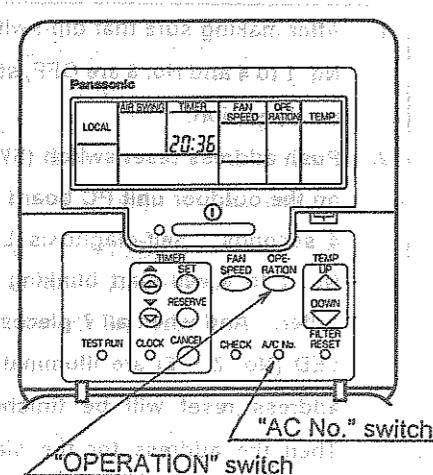


1. Automatic address setting (no need to have dip-switch set)

If the wiring connected properly as above example, the AC numbers are set automatically by the main power supply. A indoor unit with remote controller 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.

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 simultaneously the following switches: "AIR SWING", "OPERATION", and "AC No.". The address will be reset and new address will be set.

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

Manual address setting (by dip-switch DSW1)

When you set the address manually, set the dip-switch of the PC board in the indoor unit as follow:

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

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)	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8
Indoor unit No.	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)	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8	OFF ON 1 2 3 4 5 6 7 8
Indoor unit No.	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

Procedure for delete of memory at twin / triple control system.

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

Procedure for delete of memory at group control system.

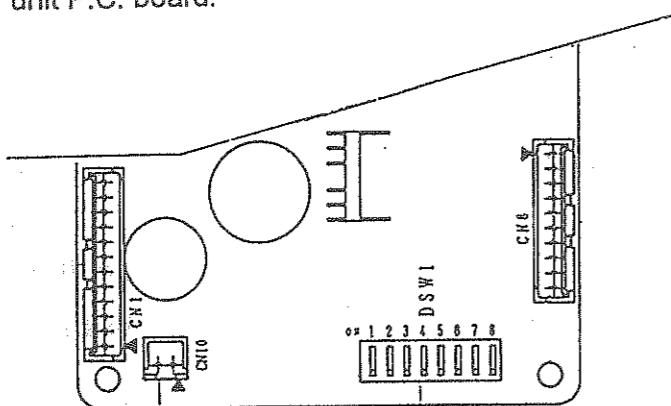
1. Set the 'off' position for main power supply switch .
2. Set the 'on' position for No.1 pin to No.4 pin of dip switch (DSW1) on indoor unit P.C.board. (No.8 pin of dip switch (DSW1) should be 'off' position)
3. Take main power supply switch 'on' for one minutes, and then main power supply switch off.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

(Important notice)

Above procedure is for delete of memory on indoor unit P.C. board. And it is not for Address reset.

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]

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.

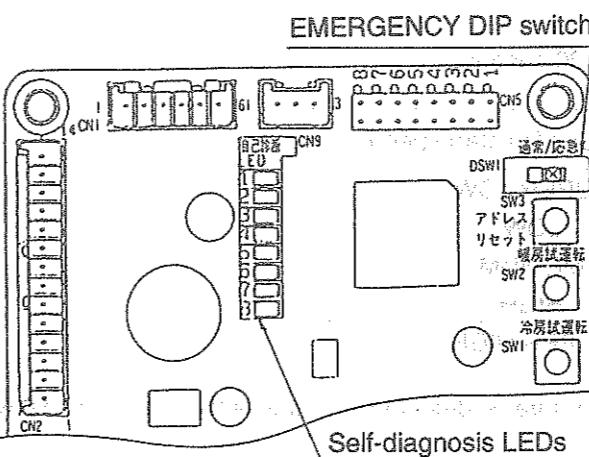
<Thermistor resistance table>

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 values 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

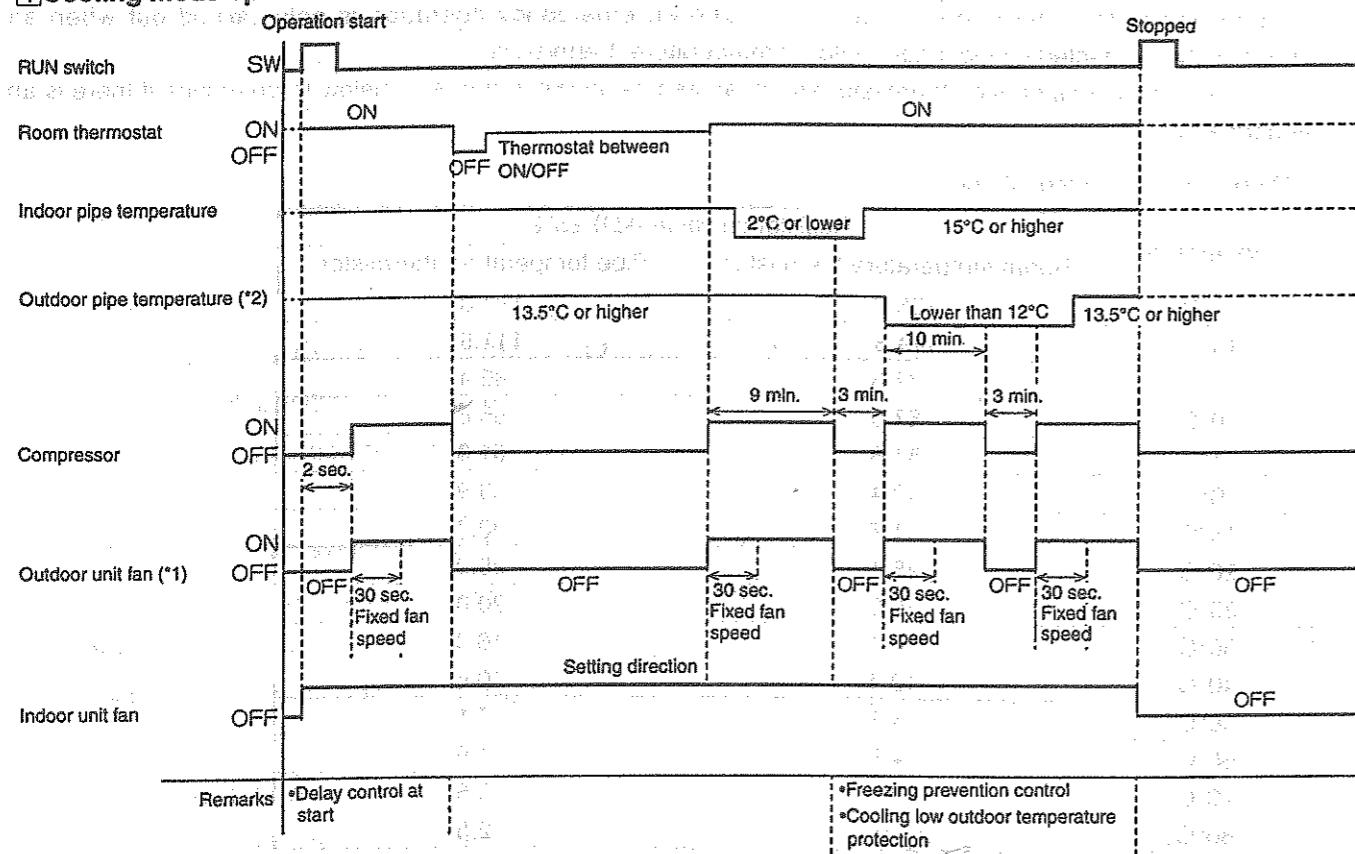
•Refer to the circuit diagram for the connection locations for each thermistor.

•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.

■Description of basic Functions

① Cooling mode operation time chart



(*) Outdoor unit fan start control during cooling

At the start of cooling mode and drying mode operation, the outdoor unit heat exchanger outlet temperature is detected in order to set the fan speed. Operation is carried out at the fan speed detected for 30 seconds.

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

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

(*) 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 canceled after 3 minutes (re-start prevention).

- Remote controller 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.

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.

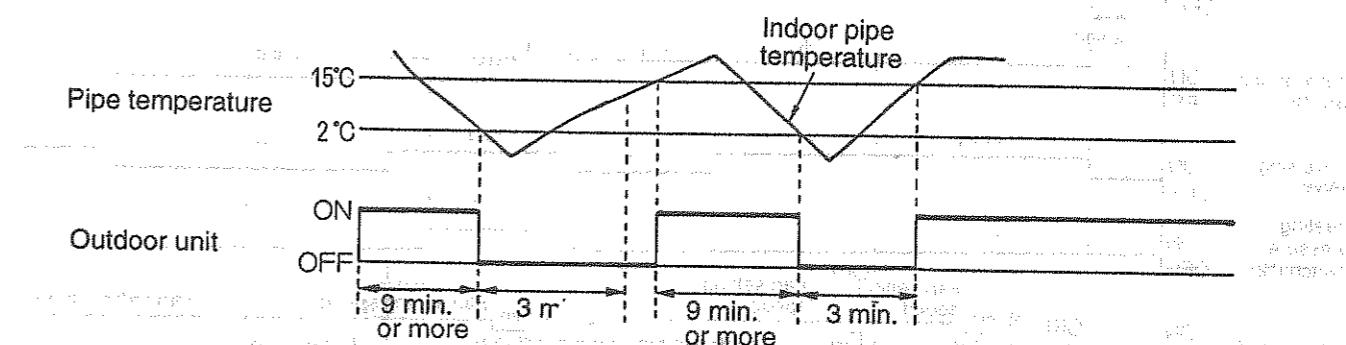
The indoor unit continues operating at the fan speed set by the remote control unit. (The remote control unit display does not change.)

③ Canceling

This control is canceled when the temperature detected by the indoor unit pipe temperature sensor is 15°C or higher.

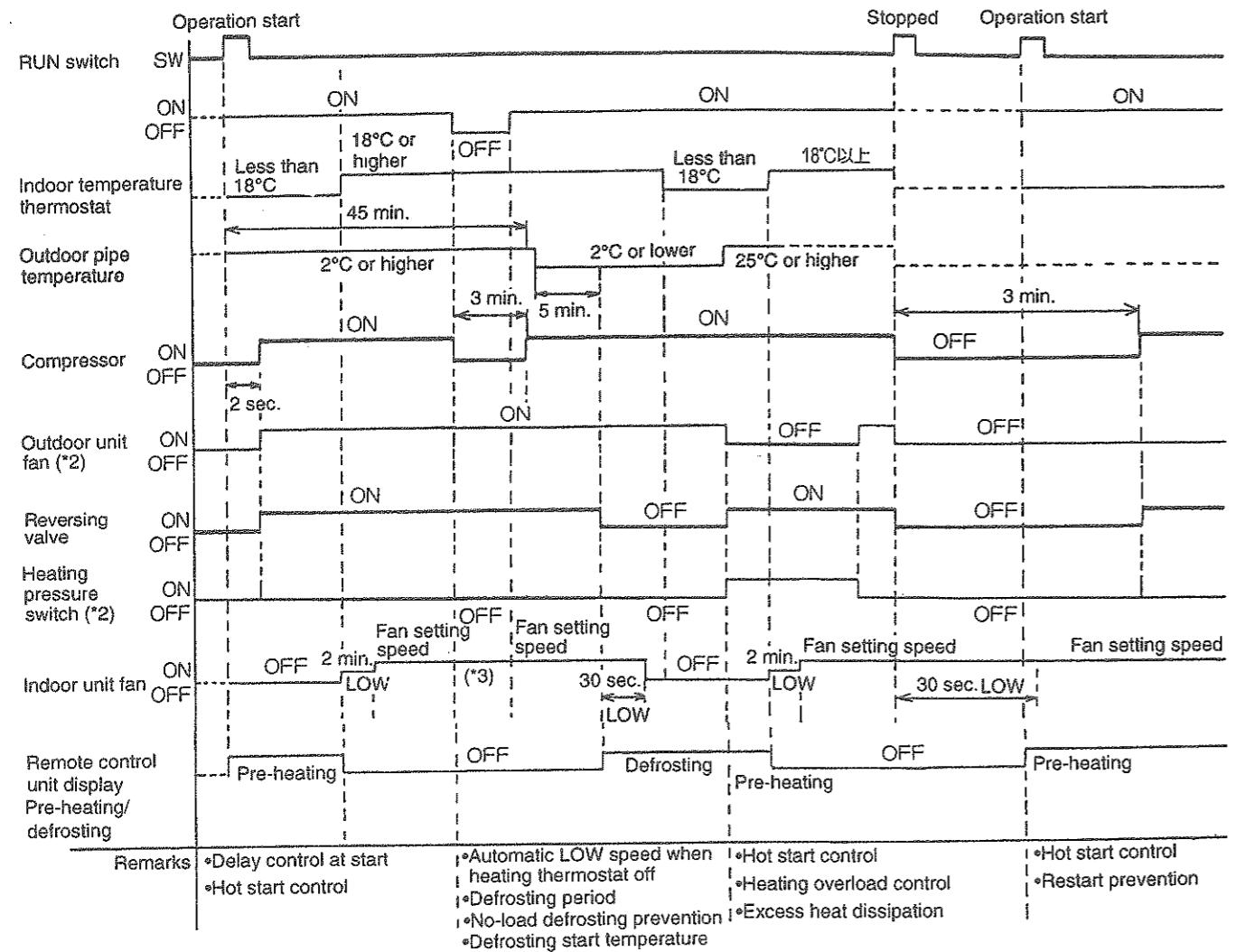
(If the outdoor unit stops even though the temperature is 15°C or higher, restart prevention control will activate and the outdoor unit will not start again for 3 minutes.)

(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.)

④ Heating mode operation time chart



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

(*) Refer to "⑨ Indoor thermostat characteristics"

(*)
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	Outdoor unit fan (Example)	ON (HI)	(MED)
ON (open) - OFF (closed)	One step down from fan speed before stopping	Heating pressure switch	ON	OFF
ON (open)	Stopped	ON	OFF	ON

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

⑤ Hot starting

1. When heating mode operation starts

① Start

Hot start control commences when heating mode operation starts.

② Operation

"PREHEAT" appears on the remote controller display. (Other displays remain unchanged.)

At the indoor unit, the indoor unit fan stops.

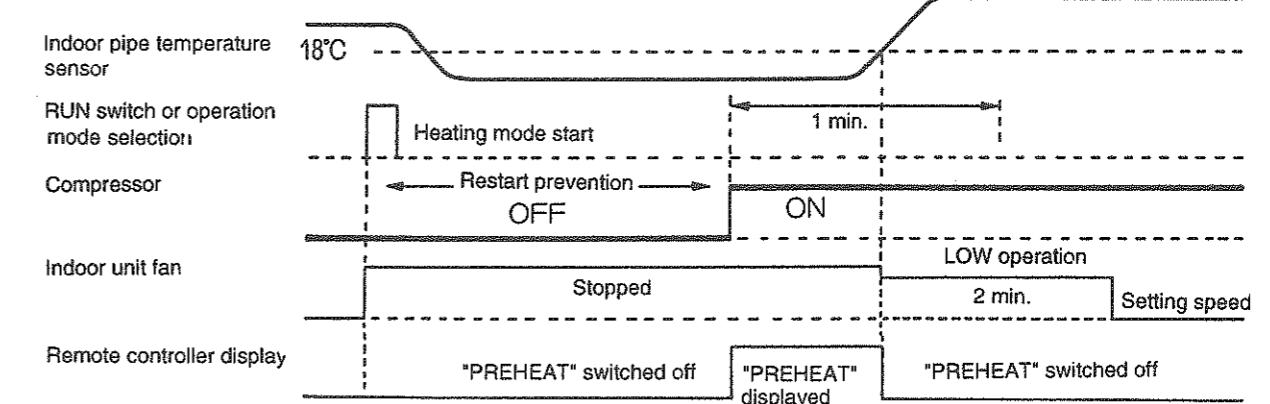
③ Canceling

After 1 minute has passed since heating mode operation started, or if the compressor has turned on, hot starting is canceled when the temperature detected by the indoor unit pipe temperature sensor is 18°C or higher.

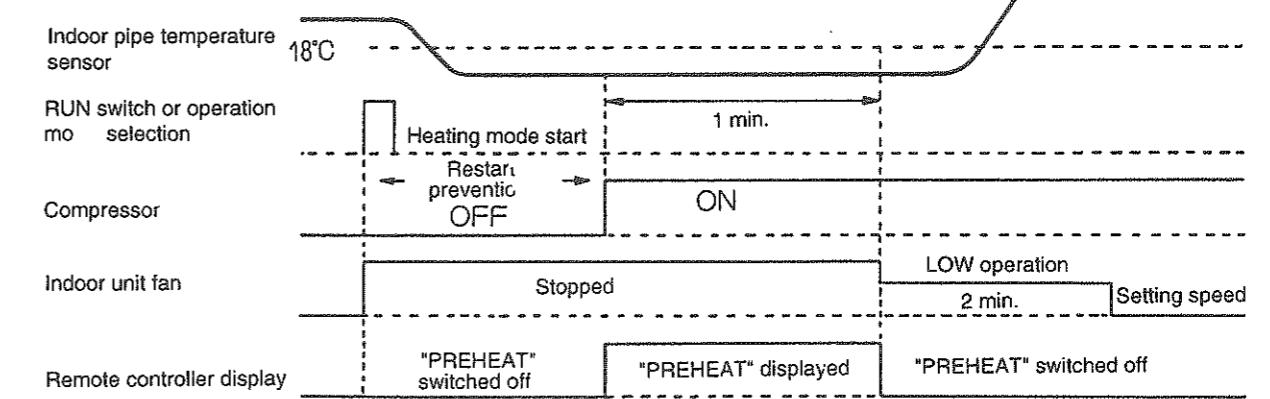
After cancellation, the "PREHEAT" display on the remote controller disappears and the louver operation returns to the previous setting.

(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 canceled by temperature>



<When hot start operation is canceled by time>



2. When defrosting is complete

① Start

Hot start control commences when defrosting is complete.

② Operation

"PREHEAT" appears on the remote controller display. (Other displays remain unchanged.)

At the indoor unit, the indoor unit fan stops.

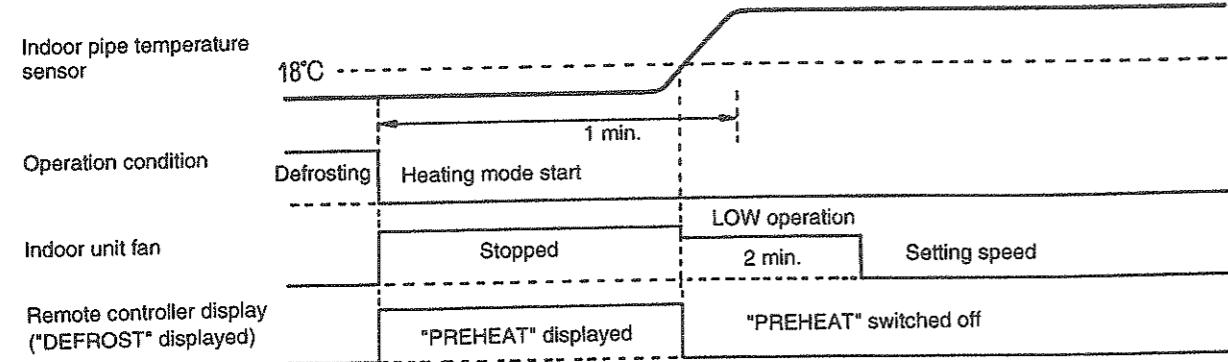
③ Canceling

Hot starting is canceled 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.

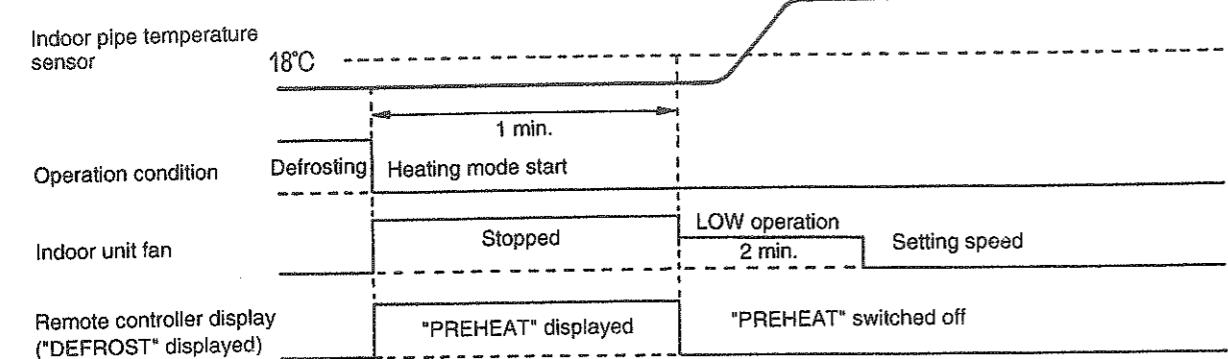
After cancellation, the "PREHEAT" display on the remote controller disappears and the louver operation returns to the previous setting.

(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 canceled by temperature>



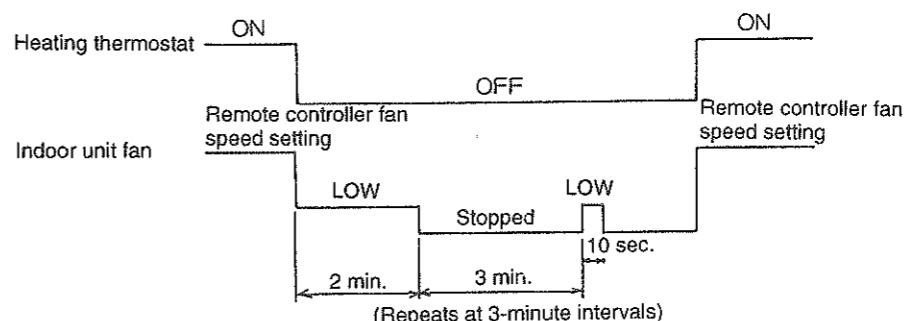
<When hot start operation is canceled by time>



⑥ 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.



⑦ 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

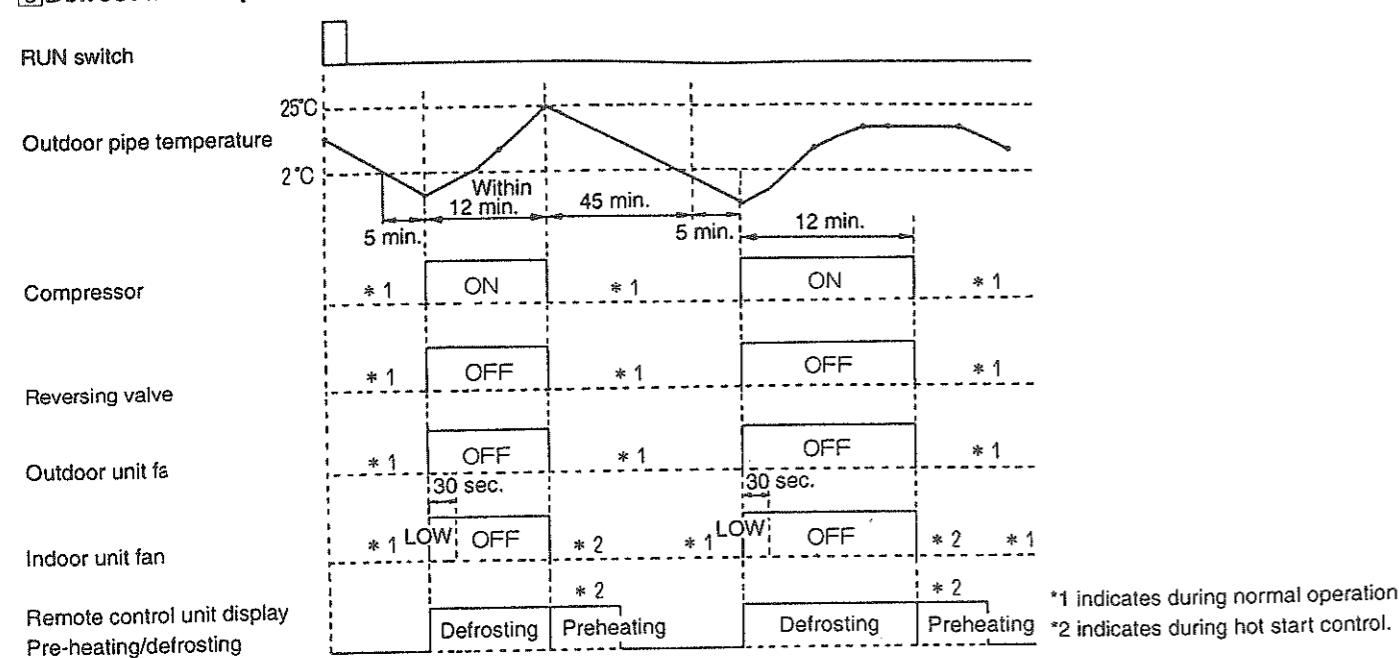
(LOW operation for 30 seconds)

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.)

⑧ Defrost mode operation time chart



1. Start and completion of defrosting

① 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.

② 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.

③ 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

① During defrosting, the outdoor unit turns on the compressor and turns off the outdoor unit fan and the reversing valve.

② 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.

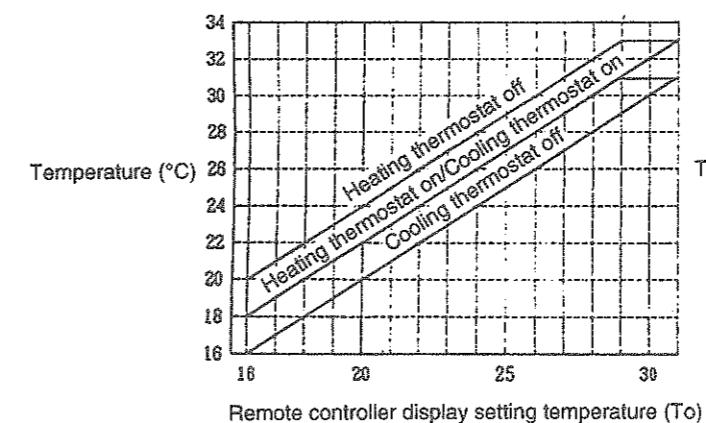
⑨ Indoor thermostat characteristics

1. Thermostat characteristics during cooling and heating modes

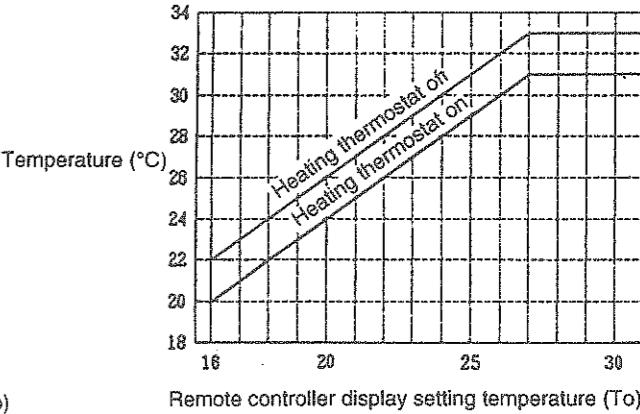
Operation mode	Setting temperature (To)	Room temperature (°C)		
		Operation	Differential	
			2.0K	4.0K
Cooling	16	O N	18.0	
		O F F	16.0	
	31	O N	33.0	
		O F F	31.0	
Heating *1	16	O N	18.0	20.0
		O F F	20.0	22.0
	29~31 *1(27~31)	O N	31.0	31.0
		O F F	33.0	33.0

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

① Settings at the start of automatic changeover operation

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

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

2 (°C): Thermostat differential

② Thermostat 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 canceled when operation is changed to another mode or when operation stops and the thermostat turns on.)

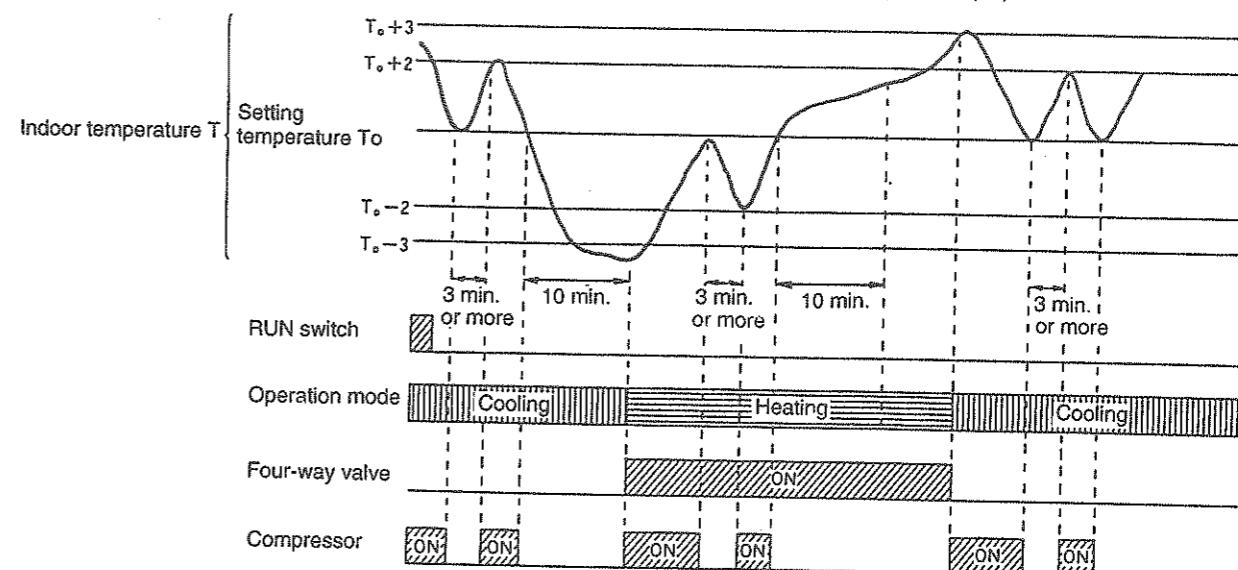
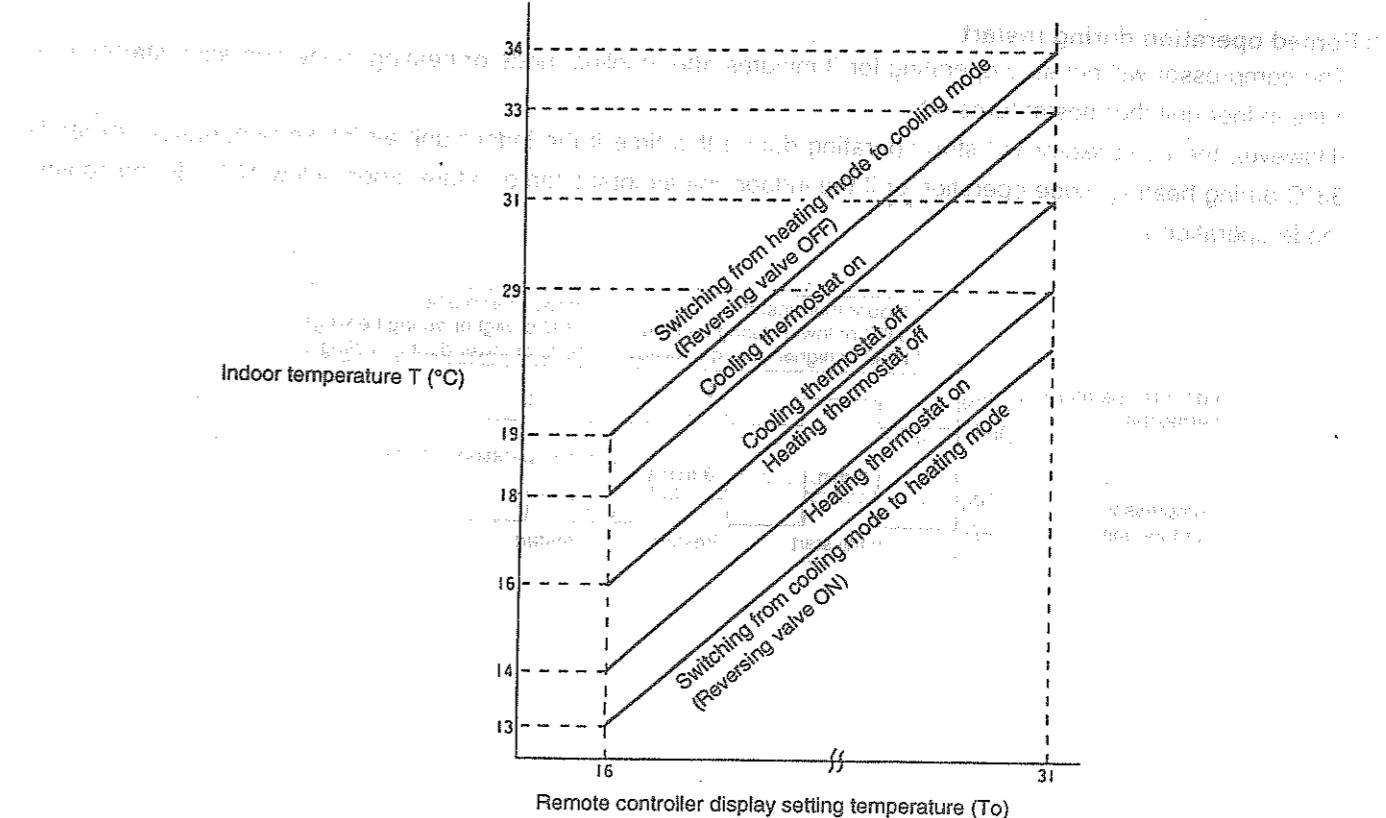
Indoor temperature (T) °C	Operation switching
$T \geq \text{Remote controller display temperature} + 3 (\text{°C})$	Heating mode → Cooling mode
$T \leq \text{Remote controller display temperature} - 3 (\text{°C})$	Cooling mode → Heating mode

③ Thermostat characteristics during cooling mode and heating mode operation

The thermostat on/off characteristics in both operation modes are given in the table below.

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

Indoor temperature thermostat characteristics during automatic changeover operation



Automatic cooling/heating mode operation time chart

[10] 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.

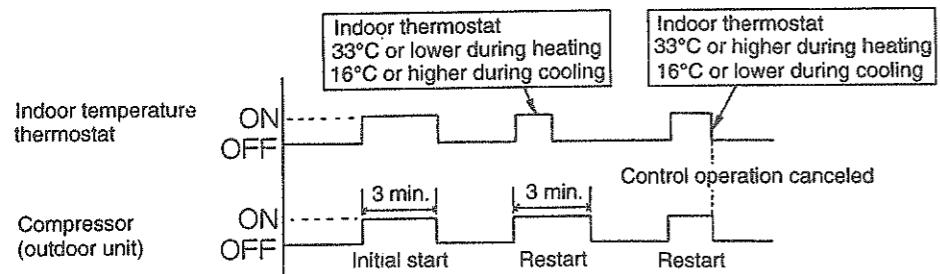
(Indoor temperature)-(Setting temperature) (Units: K)

	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		

[11] 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.)

**[13] 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.

[14] 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 Canceling

When the discharge temperature sensor detects a temperature of 70°C or lower, the liquid bypass valve is turned off.

[15] 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.

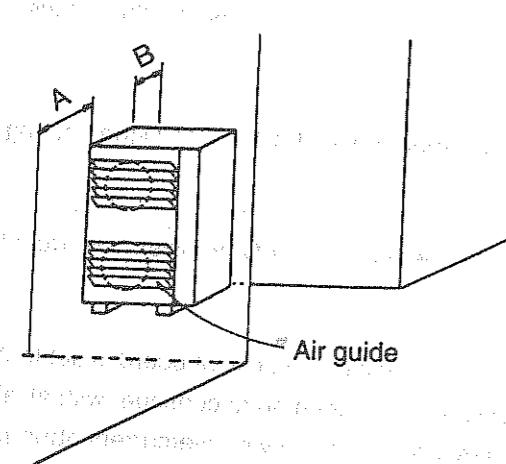
[16] DIP switch settings

• Indoor unit printed circuit board (DSW1)

No.	Setting type	Factory shipment	Remarks
1		OFF	
2	Group address setting (twin/triple address setting)	OFF	When group operation is being carried out using the remote controller, 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.)
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	Louver control	*OFF	
8	Twin/triple slave unit setting	OFF	When set to ON, the unit is designated as a slave unit.

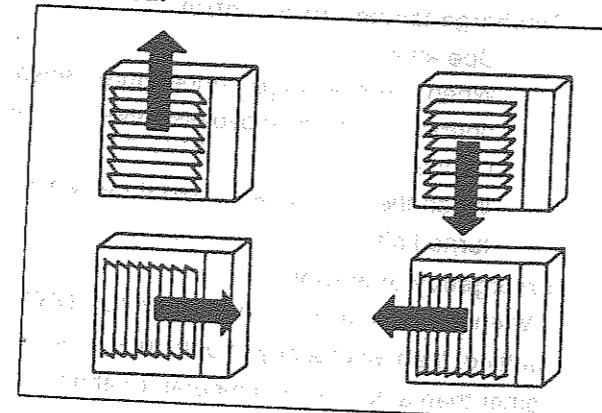
Air guide

In order to avoid hindering the dissipation of heat, if the distance between the front of the outdoor unit and an obstruction is A dimension but there is no obstruction to the right, left, or above the outdoor unit, use this air guide to provide a smooth flow of the exhaust air.



Air guider for outdoor units

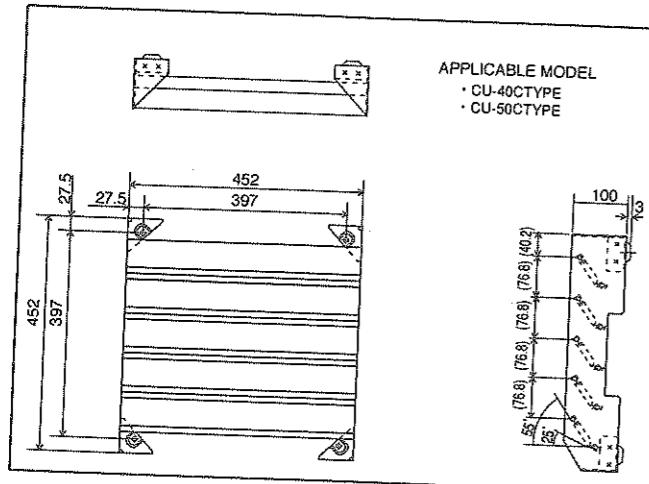
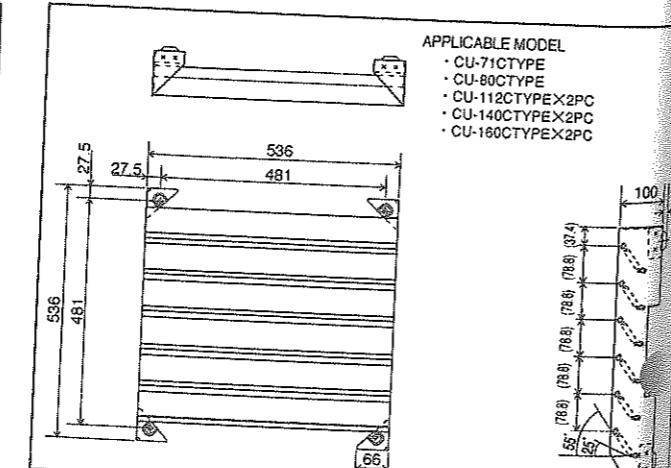
- The airflow can be changed to any direction by changing the direction in which the air guide is mounted.



MODEL NAME	PART NUMBER	A dimension	B dimension
CU-50C02HP	CZ-02AGA	50cm	10cm
CU-71C02HP			
CU-71C02XP			
CU-80C52HP	CZ-03AGA	50cm	10cm
CU-80C52XP	CU-80C02XP		
CU-112C52XP	CU-112C02XP		
CU-140C53XP	CU-140C03XP		
CU-160C53XP	CZ-06AGA	100cm	20cm
CU-160C03XP			

NOTE When installing the air guider

- If directing the air upward, there should be no obstacles above the outdoor unit.
- If directing the air to the left or right, there should be no obstacles at the left or right of the outdoor unit.
- 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.
- If connecting outdoor units in series, direct the air flow upward.

**CZ-02AGA
OUTSIDE DIMENSIONS**

**CZ-03AGA,CZ-06AGA
OUTSIDE DIMENSIONS**
**PACKAGED AIR CONDITIONER****CEILING TYPE
INSTALLATION MANUAL****MODEL****CS-50T32JP****CS-71T32JP****CS-80T32JP****CS-112T32JP****CS-140T32JP****CS-160T32JP**

Precautions in terms of safety

Air guide

Carry out the 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 much chance for leading to significant result such as fatality or serious injury if wrong installation should be carried out are listed by 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 "Prohibition".
	This mark means "Compulsion".

- 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.

Warnings	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.	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 the installation work with reliability according to this manual for installation work. Imperfection in installation leads to water leakage, electric shock, fire, etc.	Once installation work is complete, check that there are no refrigerant gas leaks. If refrigerant gas leaks into the room and comes into contact with sparks or flames from a fan heater, stove or kitchen range, it will cause toxic gases to be generated.
Carry out the installation with reliability on the place that bears the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.	
Cautions	
Carry out ground work. Do not connect the ground return to the gas pipe, water line pipe, lightning rod, ground return of the telephone.	
Electric work shall be carried out by the person 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.	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.
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.	Mounting of the earth leakage breaker is required. Omission in mounting of the earth leakage breaker may lead to electric shock.
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.	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.
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.	Position the indoor units, 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	Stopper for bracket	2
2	Drain hose	1
3	Thermal insulator for union	1
4	Banding clamper for insulator	2
5	Edging	1
6	Foam	2
7	Φ4 Tapping screw	3

Vacuum drying

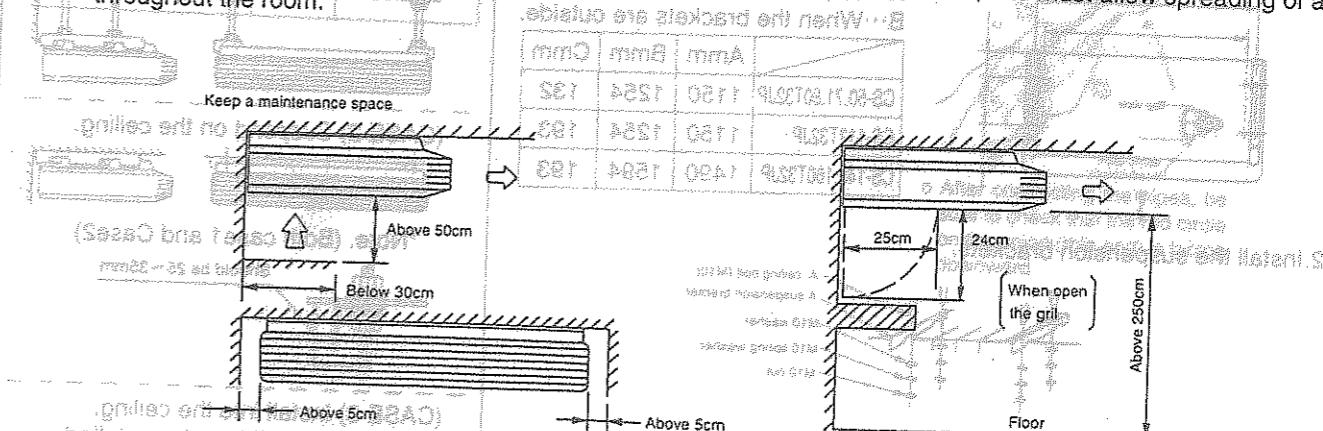
After completing the piping connection, the vacuum drying must be carried out.

2.SELECTING THE LOCATION OF THE INDOOR UNIT

CAUTION

Provide a check port on the piping side ceiling for repair and maintenance.
Use two wrenches and tighten with regular torque.

- Install the indoor unit the following conditions are satisfied, after receiving customer approval.
- The indoor unit must keep a maintenance space.
- The indoor unit must be free from any obstacles in path of the air inlet and outlet, and must allow spreading of air throughout the room.



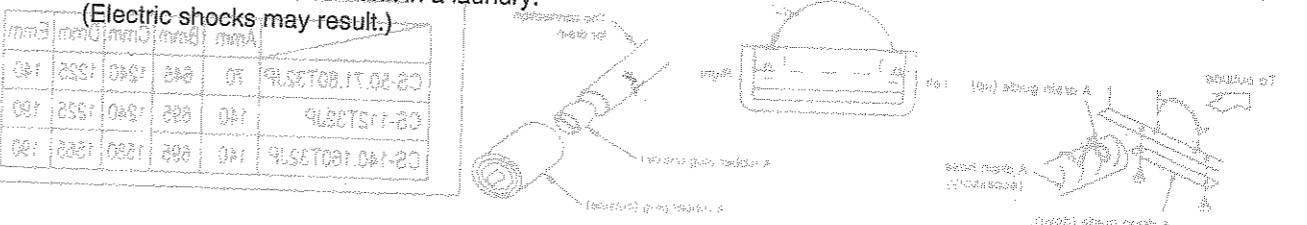
*If the height from floor to ceiling exceeds three meters, air flow distribution deteriorates and the effect is decreased.

- The installation position must be able to support a load four times the indoor unit weight.

- 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 allow easy draining.
- The indoor unit must allow easy connection to the outdoor unit.
- Place assuring the height in the ceiling shown in the upper figure or more.
- The indoor unit must be at least 3m away from any noise-generating equipment.

- The electrical wiring must be shielded with a steel conduit.
- If the power supply is subject to noise generation, add a suppressor.
- Do not install the indoor unit in a laundry.

(Electric shocks may result.)
001 0551 0051 000 01 91SET01 IT-DI-20
001 0551 0051 000 01 91SET01 IT-DI-20
001 0551 0051 000 01 91SET01 IT-DI-20



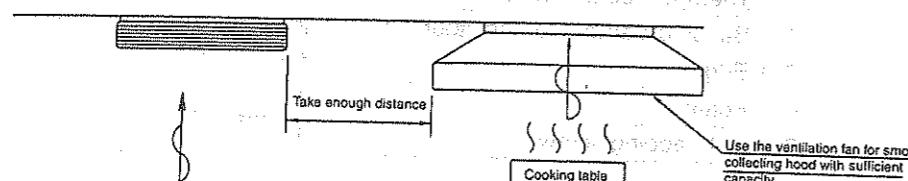
NOTE

● Throughly 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 heatexchanger and the drain pump, resulting in heat exchange reduction, spraying, dispersing of water drops, drain pump malfunction, etc.

In these cases, take the following actions:

- 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 in oily steam.



2. Avoid installing air conditioner in such circumstances where cutting oil mist or iron powder is in suspension in factories, etc.

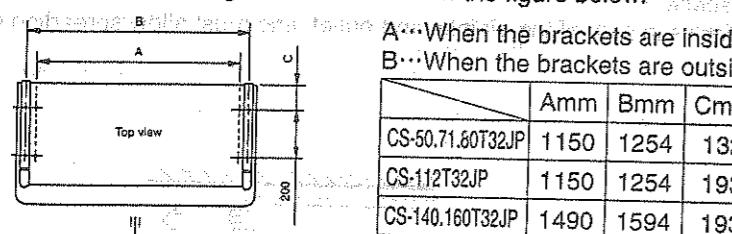
3. Avoid places where inflammable gas is generated, flows-in, contaminated, or leaked.

4. Avoid places where sulfurous acid gas or corrosive gas is generated.

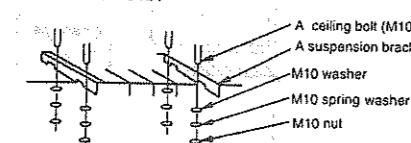
5. Avoid places near high frequency generators.

3. INSTALLATION OF INDOOR UNIT

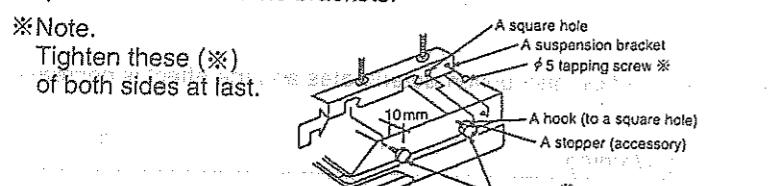
1. Positions for the ceiling bolts are shown in the figure below.



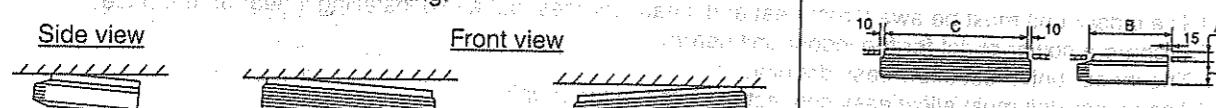
2. Install the suspension brackets.



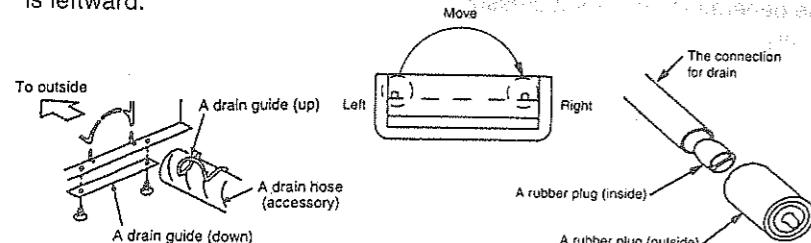
3. Suspend the unit with the brackets.



4. Pay special attention to facilitate draining.



5. Move rubber plugs to right and drain guides to left when drain is leftward.



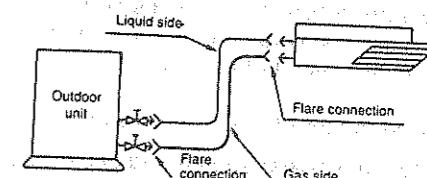
4. PIPING CONNECTION

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.

● Vacuum drying

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

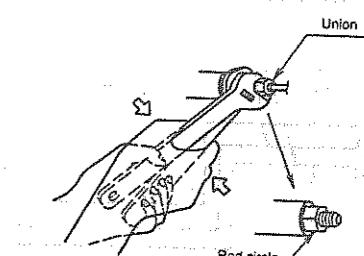
Model name	Liquid side piping	Gas side piping
CS-50T32JP	Φ6.35mm	Φ12.70mm
CS-71T32JP	Φ6.35mm	Φ15.88mm
CS-80T32JP	Φ9.52mm	Φ15.88mm
CS-112T32JP	Φ9.52mm	Φ19.05mm
CS-140T32JP		
CS-160T32JP		



CAUTION

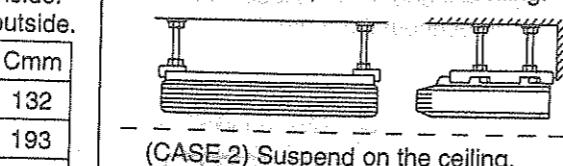
Use two wrenches and tighten with regular torque.

TIGHT TORQUE FOR FLARE NUT (N·m)		
2/8"	18	5/8"
3/8"	42	6/8"
4/8"	55	

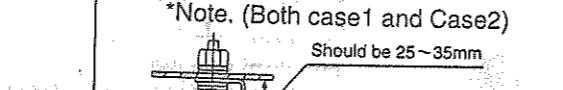


○ After connecting the pipes, be sure to check that the red circle on the union (thin end) is facing downward.

How to suspend the Air Conditioner (CASE 1) Suspend from the ceiling.



(CASE 2) Suspend on the ceiling.

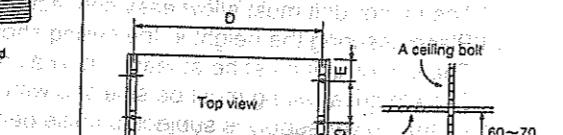
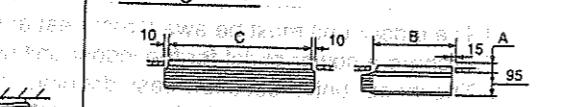


*Note. (Both case1 and Case2)
Should be 25~35mm

(CASE 3) Install into the ceiling. This unit is possible to be installed into the ceiling.

In this case make holes as shown in the figure below.
Specially made insulation and brackets (option) are needed.

Dimension of the hole & Position of ceiling bolts



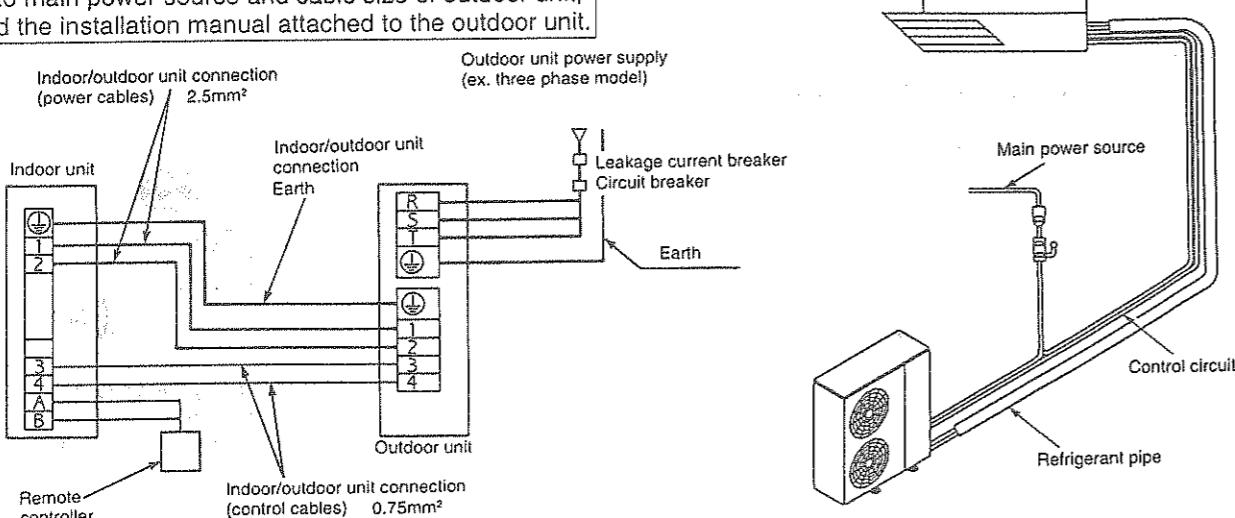
	Amm	Bmm	Cmm	Dmm	Emm
CS-50.71.80T32JP	70	645	1240	1225	140
CS-112T32JP	140	695	1240	1225	190
CS-140.160T32JP	140	695	1580	1565	190

5. 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 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.
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.

Be sure to turn off the main power before installing and connecting the remote control unit.

As to main power source and cable size of outdoor unit,
read the installation manual attached to the outdoor unit.



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.

Caution Be sure to install a leakage current breaker or circuit breaker to the main power supply, otherwise electric shocks may result.

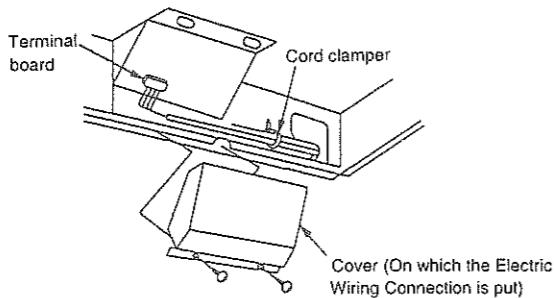
Caution Be sure to connect the unit to secure earth connection. (with a earth resistance of 100Ω or less)
If the earthing work is not carried out properly, electric shocks may result.

Caution 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.

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

CONNECTING THE WIRES TO THE CONTROL BOX

● Remove the two mounting screws, remove the control box cover, and then connect the wires by following the procedure given in the illustration.



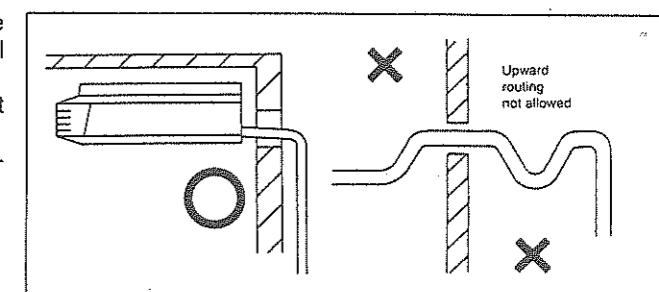
6. DRAIN PIPING WORK

INDOOR UNIT DRAIN PIPING

- Drain piping must have down-slope (1/50 to 1/100); be sure not to provide up-and-down slope to prevent reversal flow.
- During drain piping connection, be careful not to exert extra force on the drain port at indoor unit.
- The outside diameter of the drain connection at the indoor unit is 32mm.

Piping material: Polyvinyl chloride pipe and pipe fittings

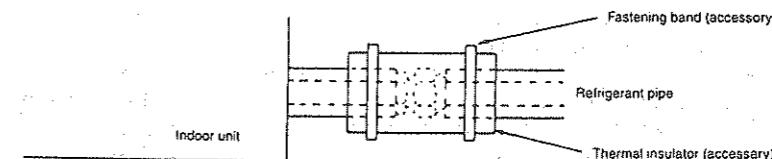
- Be sure to execute heat insulation on the drain piping.



Heat insulation material: Polyethylene foam with thickness more than 8mm

7. HEAT INSULATION

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 degree C).

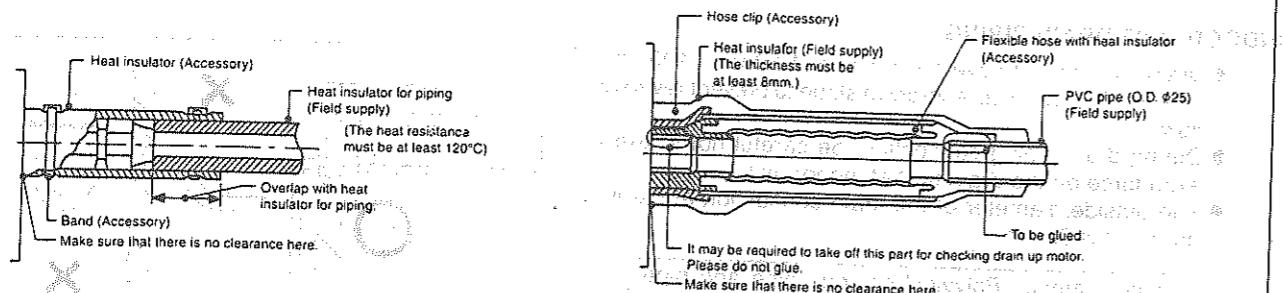


3. Precautions in high humidity circumstance:

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 degree 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.

KNOW DURING WORK



8. SELF-DIAGNOSES FUNCTION

SELF-DIAGNOSIS FUNCTION

- 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.
- The display screen on the wired remote control unit and the self-diagnosis LEDs (red) on the printed circuit board in the indoor unit can be used to indicate where the location of a problem is. Refer to the table below to remove the cause of the problem, and then re-start the air conditioner unit.
- If the "CHECK" display on the wired remote control unit is flashing, the details of the problem(s) are displayed on the timer display screen each time the CHECK button is pressed. Further details of the problem can be displayed by pressing the TIMER ON/OFF button while the general problem details are being displayed.
- If the "CHECK" display on the wired remote control unit 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. Press the CHECK button once more to return to the normal display.
- If the problem disappears and operation returns to normal, the CHECK display on the remote control unit will switch off, but the self-diagnosis LED will remain illuminated until operation is resumed.

Wired remote control unit display	Wireless receiver [RUN] LED	Indoor unit circuit board LED 1	Outdoor unit circuit board LED 2	Location of problem	Check location
Abnormal display	Detail display				
F15	-01	<input type="radio"/>	<input type="radio"/>	Drain level float switch problem	Drain pump and drain pipe, indoor unit connectors CN6 & CN10, or relay connector
F16	-01	<input type="radio"/>	<input type="radio"/>	Louver switch problem	Louver motor, veneer panel connection terminal, or indoor unit connectors CN1 & CN6
F17	-01	<input type="radio"/>	<input type="radio"/>	Option problem	Option connection terminals
F20	-01	<input type="radio"/>	<input type="radio"/>	Indoor temperature thermistor problem	Indoor temperature thermistor lead wire or indoor unit connector CN1
	-02	<input type="radio"/>	<input type="radio"/>	Remote control thermistor problem	Remote control thermistor
F21	-01	<input type="radio"/>	<input type="radio"/>	Pipe temperature thermistor problem (indoor unit side)	Pipe temperature thermistor lead wire or indoor unit connector CN1
F25	-01	<input type="radio"/>	<input type="radio"/>	Centralized control address overlap problem	Check settings for optional centralized control circuit board address switch
F26	-01	<input type="radio"/>	<input type="radio"/>	Remote control transmission wire open circuit problem	Remote control unit cable and connection terminals
	-02	<input type="radio"/>	<input type="radio"/>	Remote control transmission problem	Check the transmission wave pattern
F27	-01	<input type="radio"/>	<input type="radio"/>	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	<input type="radio"/>	<input type="radio"/>	Indoor/outdoor unit transmission problem	Check the transmission wave pattern
F29	-00	<input type="radio"/>	<input type="radio"/>	Setting problem	Contact the place of purchase.
F30~F49	-00	<input type="radio"/>	<input type="radio"/>	Outdoor unit problem	Refer to the section on outdoor unit self-diagnosis.

For further details, refer to the section on outdoor unit self-diagnosis.

9. USE OF TIMER (LOCAL ARRANGEMENTS)

Connect the contactor of the timer to "TM," \oplus and \ominus .

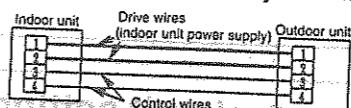


10. TEST OPERATION

- Test operation can be carried out using the remote control unit or at the outdoor unit. (If carrying out test operation at the outdoor unit, refer to "Test Operation" in the outdoor unit installation manual.)
- If using the remote control unit to carry out test operation, follow the procedure given below.

- First, press the RUN button.
- Then press the TEST button within 1 minute of pressing the RUN button.
- Next, select the operation modes. (When carrying out test operation, be sure to select cooling mode first, and run the units in this mode for 5 minutes or more.)
- The temperature of the indoor unit pipes will be shown on the temperature setting display. (At the start of test operation, it may take up to 1 minute for air conditioner number, switching time and other displays to appear.)
- After operation modes have been selected, momentarily stop the compressor.
- Press the RUN button or the TEST button once more to cancel test operation mode.

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.



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 canceled automatically after 30 minutes.)

NOTE 5 Test operation mode should always be canceled once test operation itself has been completed.

11. 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)
- Are there any faulty wiring?
- Are not terminal screws loosened?
- Is there any leakage of refrigerant?
- Tightening torque (N · cm / kgf · cm)
M4...118 (12), M5...196 (20)
M6...245 (25), M8...588 (61)

12. 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 Unit Installation Manual

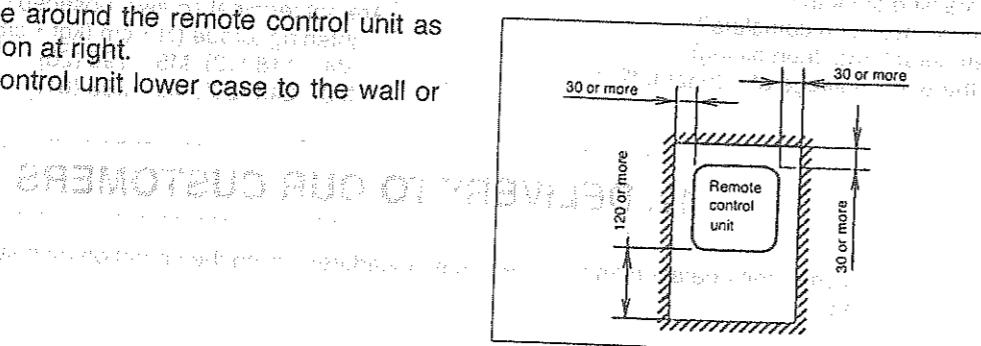
- Before installing the wired remote control unit, be sure to thoroughly read the "Notes with regard to safety" section of the Installation manual provided with the indoor unit.
- After installing the wired remote control unit, carry out a test operation to check that the remote control unit functions properly, and also explain the operation and cleaning procedures to the customer in accordance with the details in the 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 unit

Name	Qty	Diagram	Use	Name	Qty	Diagram	Use
Remote control unit	1		Operating the indoor units	4 mm screw	3		Installing the remote control unit to a wall
Remote control cord	1		Connecting the indoor unit and remote control unit (cord length 10 m)	M4 screw	3		Installing the remote control unit to an outlet box
				Round terminal	2		Connecting to indoor unit terminal block

2. Notes regarding wired remote control unit setting-up location

- Select a place where the remote control unit can be operated easily (after obtaining approval from the building's owner).
 - Install in a place which is away from direct sunlight and as free from humidity as possible.
 - Install in a place which is as flat as possible to avoid warping of the remote control unit. (If installed to a wall with an uneven surface, damage to the LCD case or operation problems may result.)
 - Install in a place where the LCD can be seen easily. If the remote control unit is installed somewhere which is too low or too high, it may be difficult to read the LCD. (Standard height from the floor is 1.2 to 1.5 meters.)
 - Avoid installing the remote control cord near refrigerant pipes or drain pipes.
 - Install the remote control cord at least 5 cm away from other electric wires (including stereo and TV cables) to avoid mis-operation (electromagnetic noise).
 - If passing the remote control cord through a wall, be sure to install a water trap above the cord.
 - For twin and triple types, only the main unit can be connected to the remote control unit. (The indoor unit connected to the remote control unit becomes the main unit, and connection is not possible to the sub units.)
 - Allow sufficient space around the remote control unit as shown in the illustration at right.
- Secure the remote control unit lower case to the wall or to an outlet.

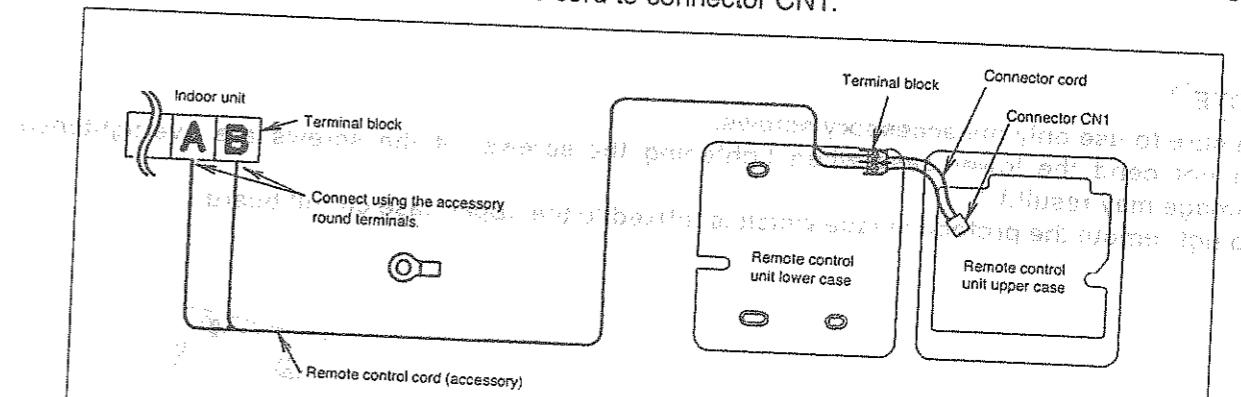


3. Remote control unit installation

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

Remote control unit wiring

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

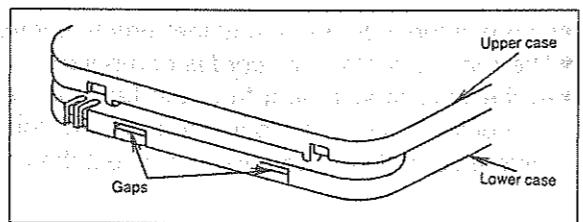


NOTE

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

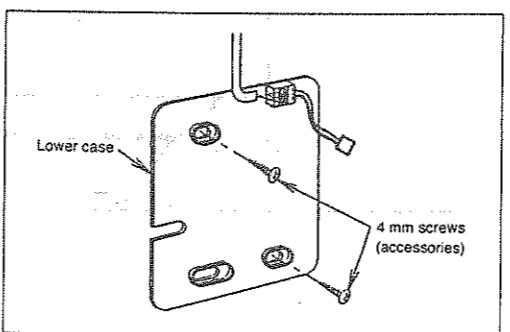
Remote control unit installation procedure

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

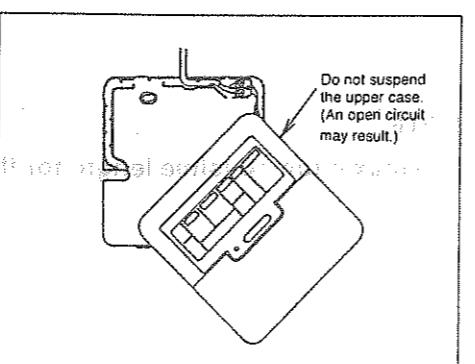


NOTE

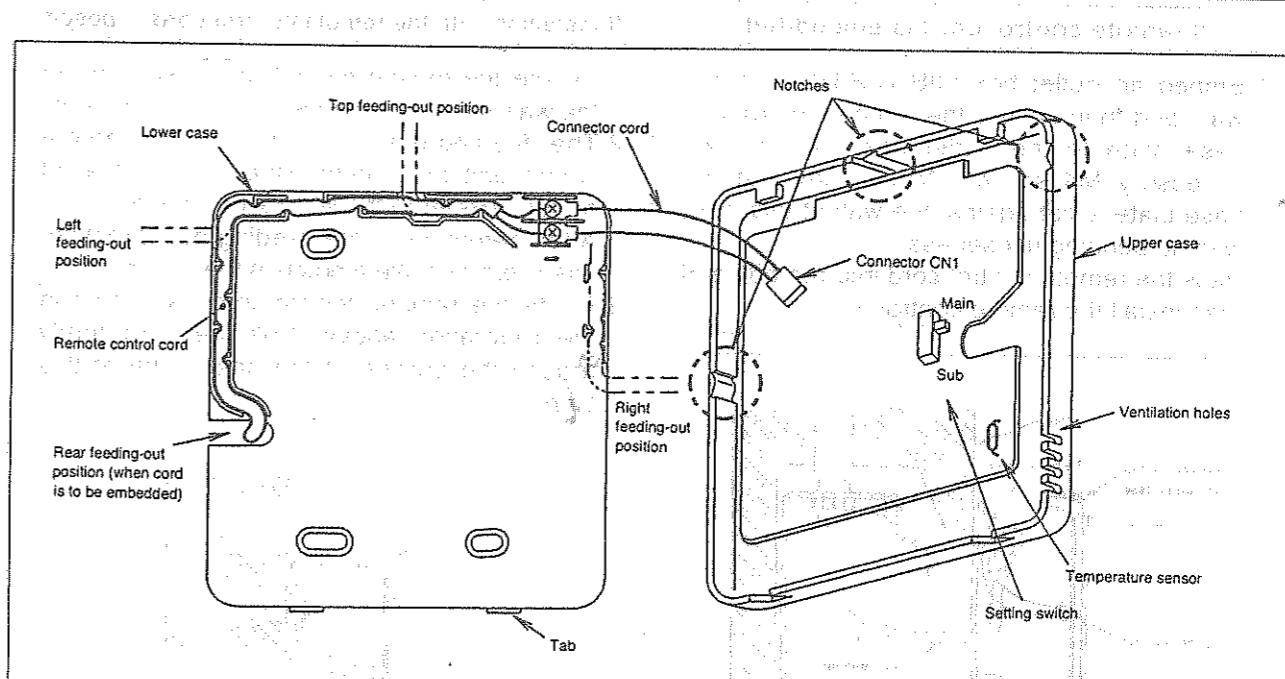
- ★ Be sure to use only the accessory screws.
- ★ Do not bend the lower case when tightening the screws. (If the screws are overtightened, damage may result.)
- ★ Do not remove the protective tape which is affixed to the upper case circuit board.



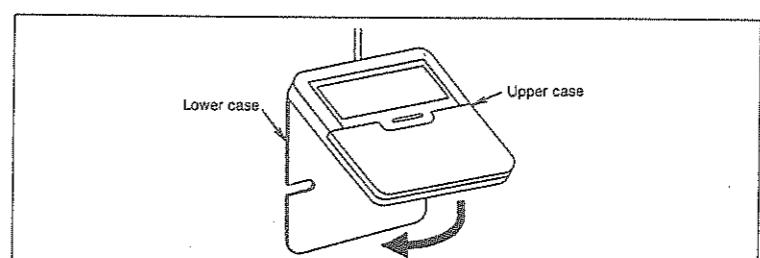
- If installing the remote control unit with the remote control unit cord exposed, use pliers to cut a notch into the upper case. (The feeding-out direction can be either up or to the left or right.)



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



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

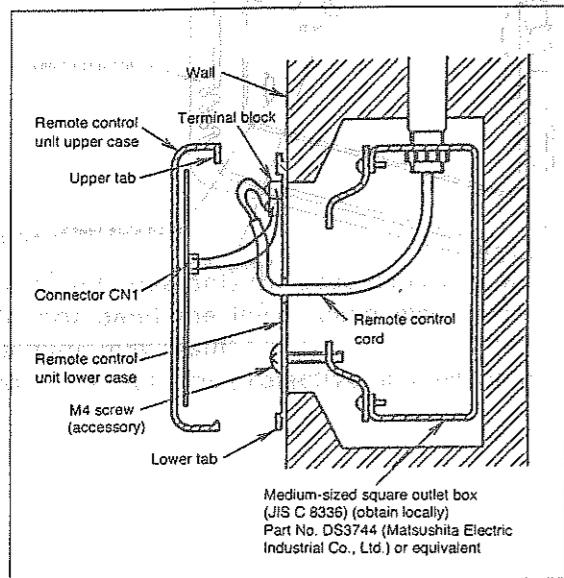


NOTE

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

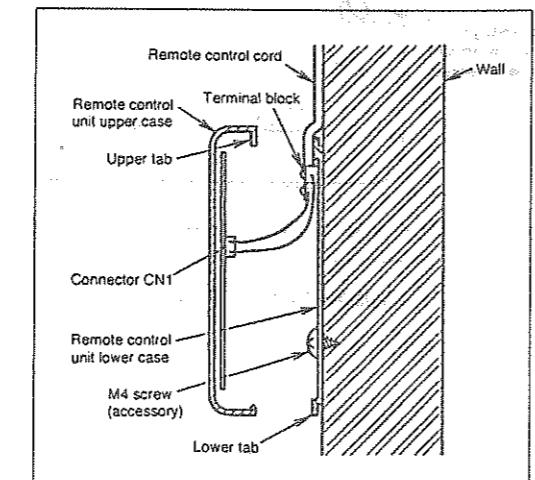
If remote control cord is embedded

1. Embed an outlet box (JIS C 8336) into the wall, and then secure the remote control unit base plate to the outlet box with the two accessory M4 screws. Make sure that the base plate is flat against the wall at this time, with no bending (looseness).
2. Pass the remote control cord into the box and then install the remote control unit.



If installing with the remote control cord exposed

1. Secure the remote control unit base plate to the wall with the two accessory 4 mm screws.
2. The feeding-out direction for the remote control unit cord 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 cord as shown in the illustration above. Pull the cord firmly around the outside of the base plate at this time.



4. Settings

2 Control using two remote control units

- Up to two remote control units can be installed for a single indoor unit, and either remote control unit can be used to operate the indoor unit.

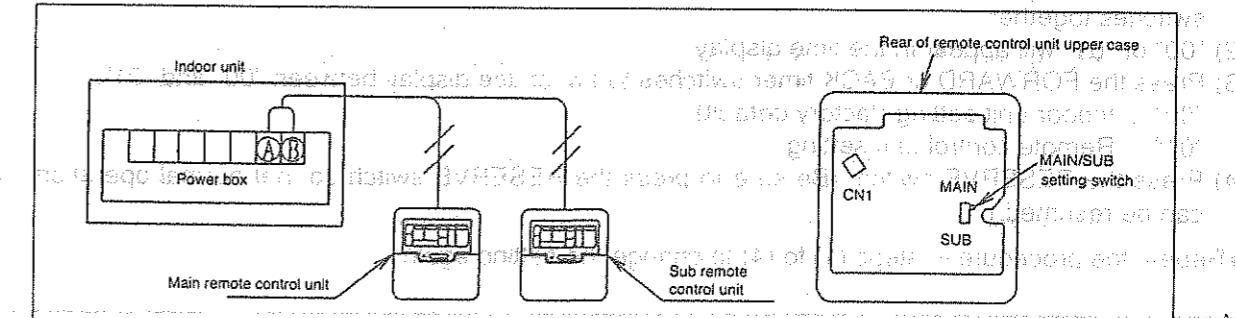
- The indoor unit can be operated with the last switch pressed having priority.

- (1) Decide which is to be the main and which is to be the sub remote control unit.

The main or sub status of the remote control unit is set automatically. The MAIN/SUB setting switch can also be used to make the setting manually; however if 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 control units.

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



Group control

- When using a remote-controlled 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.)
- During group control, the indoor unit address numbers are set automatically. However, you will not know at this time which address number corresponds to which indoor unit. Setting of address numbers can also be carried out manually using the DIP switches. Manual settings have priority, so after making a manual setting, so that if you then want automatic setting to be carried out, set indoor unit No. 1 of the indoor units to be controlled as a group using manual setting, and then carry out the procedure in "Automatic address resetting for group control".

Manual setting

Indoor unit No.	1	2	3	4	5	6	7	8
DIP switch (DSW1) setting on indoor unit printed circuit board	OFF ON 1 2 3 4 5 6 7 8							
Air conditioner No. setting	No operation necessary	1 is ON	2 is ON	1 and 2 are ON	3 is ON	1 and 3 are ON	2 and 3 are ON	1, 2 and 3 are ON
Indoor unit No.	9	10	11	12	13	14	15	16
DIP switch (DSW1) setting on indoor unit printed circuit board	OFF ON 1 2 3 4 5 6 7 8							
Air conditioner No. setting	4 is ON	1 and 4 are ON	2 and 4 are ON	1, 2 and 4 are ON	3 and 4 are ON	1, 3 and 4 are ON	2, 3 and 4 are ON	1, 2, 3 and 4 are 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 FAN SPEED ADJUST switch, AIR CONDITIONER NO. and OPERATION MODE switches simultaneously.

Switching the thermistor

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

- While operation is stopped, press and hold the STOP/RUN switch, and then press the UP and DOWN switches together.
- "00" or "01" will appear in the time display.
- 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
- 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.

Energy save setting

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

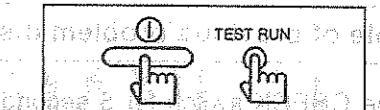
- While operation is stopped, press the UP and DOWN switches simultaneously.
- To set an upper limit (Setting a temperature above the energy save temperature will not be possible.)
Press the OPERATION MODE switch until HEAT is displayed.
Press the UP or DOWN switch to set the temperature.
Press the RESERVE switch.
- Example: If the heating display is set to 28°C, setting the temperature to higher than 28°C will not be possible.
- 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°C, setting the temperature to lower than 22°C will not be possible.
- 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).

5. Test operation

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

★ Test operation will be canceled automatically after 30 minutes.



If no remote control unit displays appear

- Check whether LED1 (green) on the indoor unit printed circuit board is illuminated or switched off. If it is switched off, check the circuits on the indoor unit printed circuit board.
- Check once more that the remote control cord is securely connected. (Check for loose terminals, poor contacts, connection positions on terminal block, etc.)
- If the above checks show that nothing is wrong but nothing appears on the remote control unit display, it is possible that the remote control unit was connected while the main power was still turned on. If such is the case, carry out the following.

★ Set DIP switch (DSW1) Nos. 1 to 4 to the ON position, and then turn the power back on. If the display appears after about 30 seconds, turn DIP switches 1 to 4 back to OFF.

6. Self-diagnosis function

The LED1 (green) indicators on the indoor unit and outdoor unit microprocessor circuit boards illuminate to indicate that the microprocessors 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 unit is flashing, the details of the problem(s) are displayed on the timer display screen each time the CHECK button is pressed.
- Further details of the problem can be displayed by pressing the TIMER ON/OFF button while the general problem details are being displayed.

Example of current problem display

- Press the CHECK button

- Continue pressing the TIMER ON/OFF switch while the problem details are being displayed.

Timer	Fan speed	Operation	Temperature setting
CHECK			Air conditioner No. 01

Timer	Fan speed	Operation	Temperature setting
-01			Air conditioner No. 01

If "CHECK" is not flashing on the timer display

- If the "CHECK" display on the wired remote control unit 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.
- Press the CHECK button once more to return to the normal display.

Example of previous problem display

- Press the CHECK switch for 5 seconds or → • Continue pressing the TIMER ON/OFF switch while the problem details are being displayed.

Timer	Fan speed	Operation	Temperature setting
CHECK			Air conditioner No. 01
Problem display → 1F26			

Timer	Fan speed	Operation	Temperature setting
CHECK			Air conditioner No. 01
Detail display → 1-01			

Example of abnormality display before previous display

- While the previous display still appears, → • Continue pressing the TIMER ON/OFF switch while the problem details are being displayed.

Timer	Fan speed	Operation	Temperature setting
CHECK			Air conditioner No. 01
Problem display → 2F26			

Timer	Fan speed	Operation	Temperature setting
CHECK			Air conditioner No. 01
Detail display → 2-01			

- The display can be switched between the previous problem and the one before that by pressing the FORWARD and BACK timer 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, the CHECK display on the remote control unit will switch off, but the self-diagnosis LED will remain illuminated until operation is resumed.

PACKAGED AIR CONDITIONERS**INSTALLATION MANUAL**

For outdoor unit

As to instructions for installation work of the indoor side unit, see the work manual come with indoor unit.

MODEL NAME

CU-C5*****
CU-C0*****
CU-CT0*****

Precautions in terms of safety

Carry out the 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 much 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 "Prohibition".
	This mark means "Compulsion".

- 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.

Warnings	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.	▲ 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 the installation work with reliability according to this manual for installation work. Imperfection in installation leads to water leakage, electric shock, fire, etc.	▲ Once installation work is complete, check that no refrigerant gas escapes. If it escapes in the room and comes into contact with sparks or flames from a fan heater, stove or kitchen range, it will cause toxic gases to be generated.
▲ Carry out the installation with reliability on the place that bears the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.	▲ Carry out ground work. Do not connect the ground return to the gas pipe, water line pipe, lightening rod, ground return of the telephone. Imperfection in ground return may lead to electric shock.
▲ 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.	▲ 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.
▲ Electric work shall be carried out by the person 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.	▲ Mounting of the earth leakage breaker is required. Omission in mounting of the earth leakage breaker may lead to electric shock.
▲ 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.	▲ 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.
▲ 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.	▲ Position the indoor units, 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.)
▲ When connecting the piping, do not use let any air or other substances into the refrigeration cycle (pipes) except for the specified refrigerant (R22). If air or other substances should get into the refrigeration cycle, it will cause a drop in system performance; it may also cause abnormally high pressure to build up within the refrigeration cycle, and breakages could thus result.	

1. Accessories supplied with outdoor unit

Part name	Qty.	Diagram	Application
Protective bushing	2		For protecting electrical wires
Binding strap	3		For tying electrical wires together

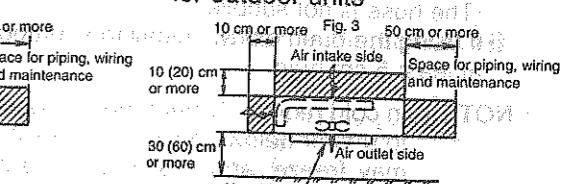
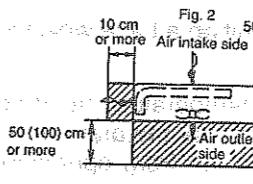
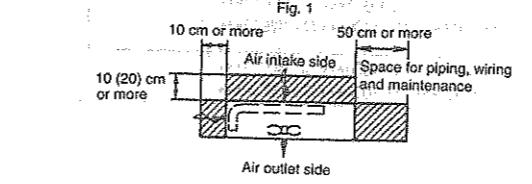
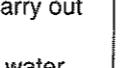
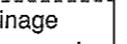
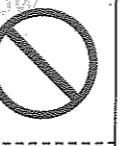
- The following parts are supplied as accessories with each outdoor unit. Check that all accessory parts are present before installing the outdoor unit.

Heat pump-types only			
Part name	Qty.	Diagram	Application
Drain elbow (with Ring seat)	1		For connecting the drain pipe

2. Selecting the outdoor unit installation location

- Select a location which satisfies the following condition, and then confirm with the customer that such a place is satisfactory before installing the outdoor unit.

- There should be sufficient ventilation.
- The outdoor unit should be sheltered as much as possible from rain and direct sunlight, and the air should be able to move around so that hot and cold air do not build up.
- There should be no animals or plants near the air outlet which could be adversely affected by hot or cold air coming out of the unit.
- The outlet air and operating noise should not be a nuisance to other occupants nearby.
- The location should be able to withstand the full weight and vibration of the outdoor unit, and it should also be level and safe for the unit to be installed.
- The intake and outlet should not be covered.
- There should be no danger of flammable gas or corrosive gas leaks.
- There should be as little back-ventilation (air blowing directly onto the fan) as possible. (If strong wind blows directly onto the fan, it may cause problems with normal operation.)
 - If you know which direction the prevailing wind comes from during the operating season, set the outdoor unit at a right-angle to this wind direction, or so that the air outlet faces toward a wall or fence.
 - If there are no obstructions near the outdoor unit and the wind direction is not constant, install an optional air guider.
- Do not allow any obstacles near the outdoor unit which will interfere with air flow around the air intake and air outlet.
- If installing in a location which is prone to snowfall, place the installation base as high as possible, and be sure to install a roof or enclosure which does not allow snow to accumulate.
- Avoid installing the unit in places where petroleum products (such as machine oil), salinity, sulfurous gases or high-frequency noise are present.
- Be sure to leave enough space around the outdoor unit to maintain proper performance and to allow access for routine maintenance.
 - Allow enough space from any obstacles as shown in Fig. 1.2 below in order to prevent short-circuits from occurring. (If installing more than one outdoor unit, make the necessary space available as outlined in 14.)
 - The height of any obstacles at the air intake and outlet sides should not be greater than the height of the outdoor unit.
 - When facing the air intake side toward a wall
 - When facing the air outlet side toward a wall



- If it is not possible to leave 50 (100) cm at the air intake 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.

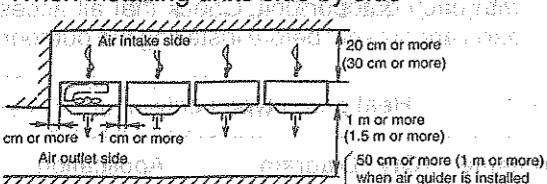
NOTE When installing the air guider

- If directing the air upward, there should be no obstacles above the outdoor unit.
- If directing the air to the left or right, there should be no obstacles at the left or right of the outdoor unit.
- 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.
- If connecting outdoor units in series, direct the air flow upward.

Air guider for outdoor units	
MODEL NAME	PART NUMBER
CU-40C5***	CU-40C0***
CU-50C5***	CU-50C0*** CU-50CT0***
CU-71C5***	CU-71C0*** CU-71CT0***
CU-80C5***	CU-80C0*** CU-80CT0***
CU-100C0***	CU-100CT0***
CU-112C5***	CU-112C0*** CU-112CT0***
CU-140C5***	CU-140C0*** CU-140CT0***
CU-160C5***	CU-160C0*** CU-160CT0***
	CZ-06AGA

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

- When installing units side by side



* Maintain sufficient space above the units.

Values inside brackets indicate distances when installing the CU-112/140/160C5*** or CU-100/112/140/160C0***

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

3. Transporting and installing the outdoor unit

● Transporting

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

● 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 W 3/8 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 right.) 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.)

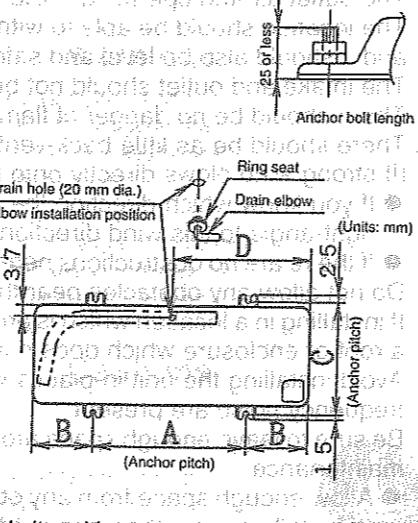
- If a drain pipe needs to be installed, insert the accessory drain elbow into the mounting hole at the bottom of the outdoor unit, and connect a hose with an inside diameter of 15 mm to this drain elbow. (The hose is not supplied.)

* If using the drain elbow, install the outdoor unit on a base which is at least 5 cm high.

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

CAUTION

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



MODEL NAME	Amm	Bmm	Cmm	Dmm
CU-40C5*** CU-40C0***	500	135	340	385
CU-50C5*** CU-50C0*** CU-50CT0***				
CU-71C5*** CU-71C0*** CU-71CT0***				
CU-80C5*** CU-80C0*** CU-80CT0***	500	200	360	450
CU-100C5*** CU-100C0*** CU-100CT0***				
CU-112C5*** CU-112C0*** CU-112CT0***				
CU-140C5*** CU-140C0*** CU-140CT0***	700	200	360	720
CU-160C5*** CU-160C0*** CU-160CT0***				

4. Connecting the pipes

- The refrigerant pipes are of particular importance. The installation work for refrigeration 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.

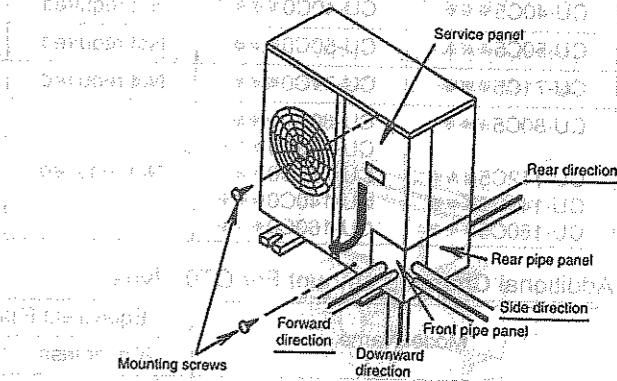
Model name	Pipe diameter (mm)		Equivalent length (m)	Difference of elevation (m)	Model name	Pipe diameter (mm)		Equivalent length (m)	Difference of elevation (m)
	Liquid-side pipes	Gas-side pipes				Liquid-side pipes	Gas-side pipes		
CU-40C5*** CU-40C0***	φ 6.35	φ 12.7	30	30	CU-80C5*** CU-80C0***	φ 9.52	φ 15.88	50	30
CU-50C5*** CU-50C0*** CU-50CT0***	φ 6.35	φ 12.7	40	30	CU-112C5*** CU-112C0*** CU-112CT0***	φ 9.52	φ 19.05	50	30
CU-71C5*** CU-71C0*** CU-71CT0***	φ 6.35	φ 15.88	50	30	CU-140C5*** CU-140C0*** CU-140CT0***	φ 9.52	φ 19.05	50	30

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]

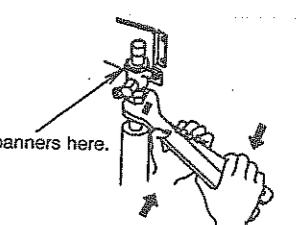
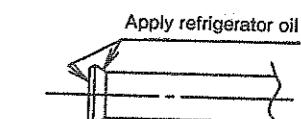
- (1) Remove the two mounting screws.
- (2) Slide the service panel downward to release the pawls. After this, pull the service panel toward you to remove it.



3. Notes when connecting the refrigeration 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 over-tightened, it may cause the flares to break or leak.)

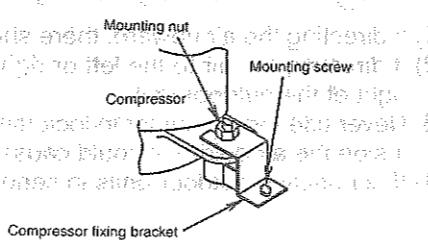
Flare nut tightening torque		N · m (kgf · cm)	
φ 6.35mm	18 {180}	φ 15.88mm	65 {650}
φ 9.52mm	42 {420}	φ 19.05mm	100 {1000}
φ 12.7mm	55 {550}		



4. After piping connection has been completed, make sure that terminal areas of the indoor and outdoor units are free from gas leakage by the use of nitrogen, etc.

Do not attach the spanners here.

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



5. Heat insulation



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.

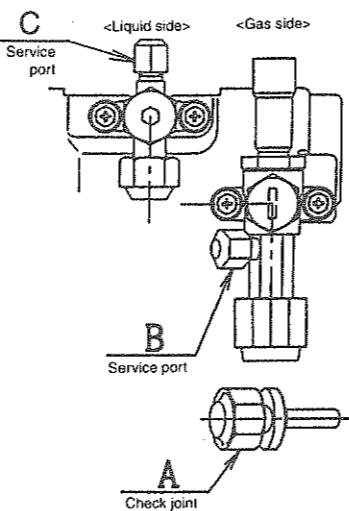
Liquid-side pipes	Material that can withstand 120°C or higher
Gas-side pipes	

6. Charging with refrigerant

◎ At the time of shipment from the factory, this unit is charged with enough refrigerant for an equivalent pipe length of 30 m or 20 m. (Refer to the following table)

Additional Charging amount For standard type

Model Name	Equivalent Piping Length		MAX Equivalent Length
	30m or less	30m or more	
CU-40C5***	CU-40C0***	Not required	30m
CU-50C5***	CU-50C0***	Not required	40m
CU-71C5***	CU-71C0***	Not required	50m
CU-80C5***	CU-80C0***		
CU-112C5***	CU-100C0***	0.02kg/m	
CU-140C5***	CU-112C0***	0.02kg/m	
CU-160C5***	CU-140C0***	0.05kg/m	
	CU-160C0***		50m



Additional Charging amount For CT0* type

Model Name	Equivalent Piping Length		MAX Equivalent Length
	20m or less	20m or more	
CU-50CT0***	Not required	0.02kg/m	40m
CU-71CT0***	Not required	0.02kg/m	50m
CU-80CT0***			
CU-100CT0***			
CU-112CT0***			
CU-140CT0***			
CU-160CT0***		0.05kg/m	50m

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 right.

Heat pump model

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

Cooling only model

	C	B
During cooling operation	High pressure	Low pressure

7. Electrical wiring



All electrical work must be carried out only by a qualified technician according to proper technical standards for electrical work and according to instructions given in the installation manual, and only the 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.



Be sure to install a leakage current breaker or circuit breaker to the main power supply, otherwise electric shocks may result.



Be sure to connect the unit to a secure earth connection. Use the special earthing screw to connect the unit to earth (with a earth resistance of 100 Ω or less) with a earthing wire as specified in the table below. If the earthing work is not carried out properly, electric shocks may result.

◎ 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 220V(or single-phase 220~240V) power supply.

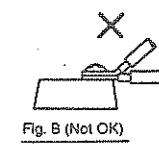
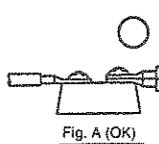
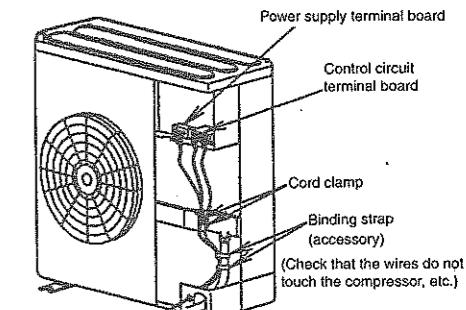
If the phase is reversed, the self-diagnosis function will be activated and the unit will not operate. In such cases, switch over any two of the power supply wires (L1(R), L2(S), L3(T)) (3-phase models only)
(Never operate the unit by pressing the electromagnetic switch.)

2. The binding screws inside the power supply box may become loosened due to vibration during transportation, so check that they are tightened securely.

3. Tighten the binding screws to the specified torque while referring to the table below.

4. 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.)

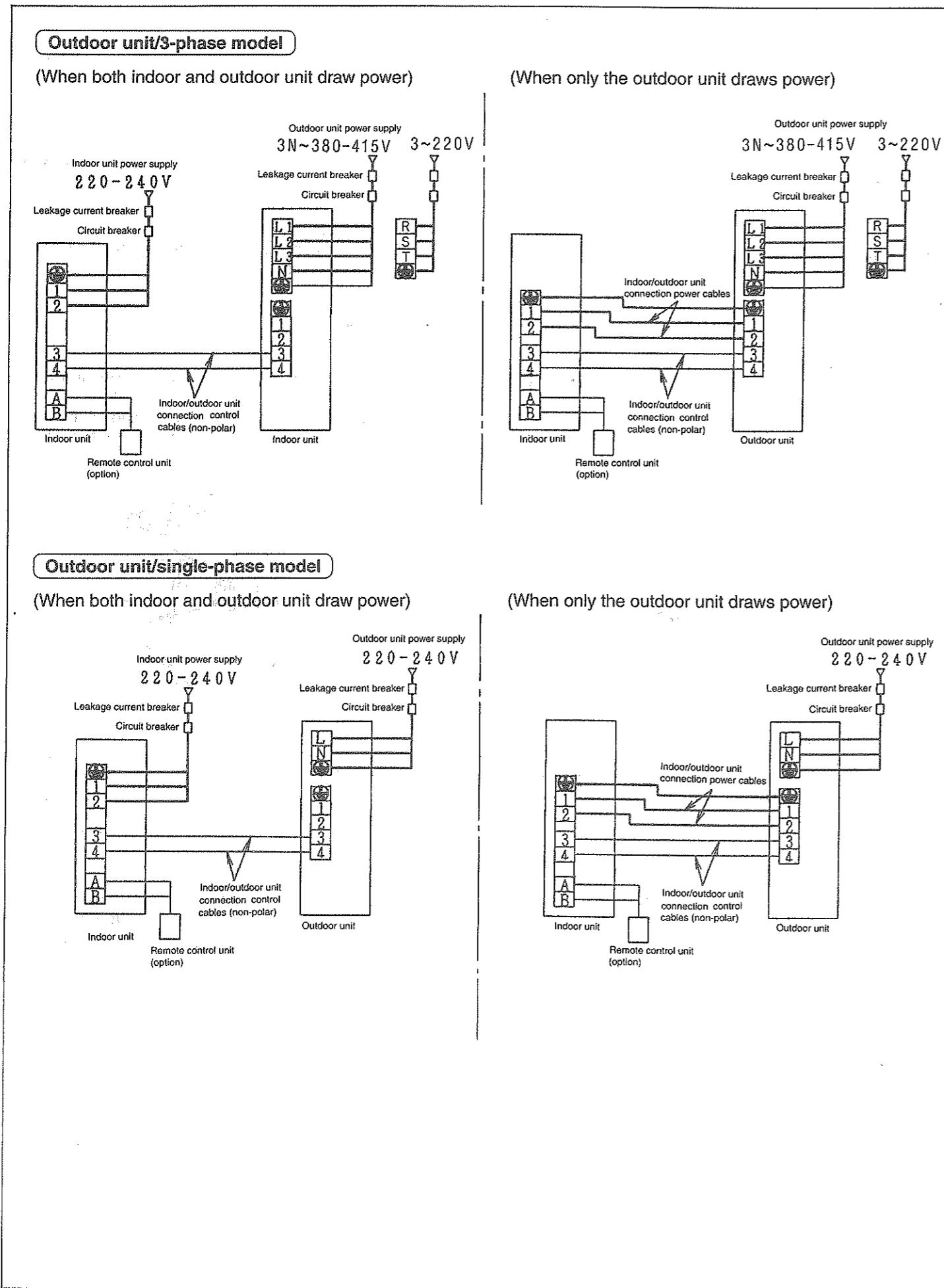
5. If momentarily turning on the power supply for both the indoor and outdoor units, do not turn the power off again until at least 1 minute has passed (except when a reversed phase has been detected).



WARNING Use only the specified cables for wiring connections. Connect the cables 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.

Nominal screw radius	Tightening torque N·cm (kgf·cm)
M 3	68~98 {7~10}
M 4	157~196 {16~20}
M 5	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.



© Power supply specifications

Model		(A)	Leakage breaker		Circuit breaker		Minimum power source cable size ^{※1}		Earthing cable size	Indoor/outdoor unit connection power cables terminals (1)-(2)	Indoor/outdoor unit connection power cables terminals (3)-(4)
			Switch(A)	Fuse(A)	(mm)	(mm ²)					
40C(1.5HP)	Single phase	220~240V	30	30	20	2.0	3.5				
50C(2HP)	Single phase	220~240V	30	30	30	2.6	5.5				
71C(2.5HP)	Single phase	220~240V	40	60	40	2.6	5.5				
	Three phase	220V	20	30	20	2.0	3.5				
		380~415V	15	15	15	1.6	2.0				
80C(3HP)	Single phase	220~240V	40	60	40	2.6	5.5				
	Three phase	220V	30	30	30	2.6	5.5				
		380~415V	20	30	20	2.0	3.5				
100C(3.5HP)	Single phase	220~240V	40	60	60	3.2	8.0				
	Three phase	220V	40	60	40	2.6	5.5				
		380~415V	30	30	20	2.0	3.5				
112C(4HP)	Three phase	220V	40	60	40	2.6	5.5				
		380~415V	30	30	20	2.0	3.5				
140C(5HP)	Three phase	220V	50	60	50	3.2	8.0				
		380~410V	30	30	30	2.6	5.5				
160C(6HP)	Three phase	220V	60	60	60	3.2	8.0				
		380~415V	40	40	40	2.6	5.5				

*1 Cable size is based on overall length 20m.

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. Select the particular size of electrical wire for power supply wiring in accordance with the standards of the given nation and region.

Connecting power supply cables

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



Caution

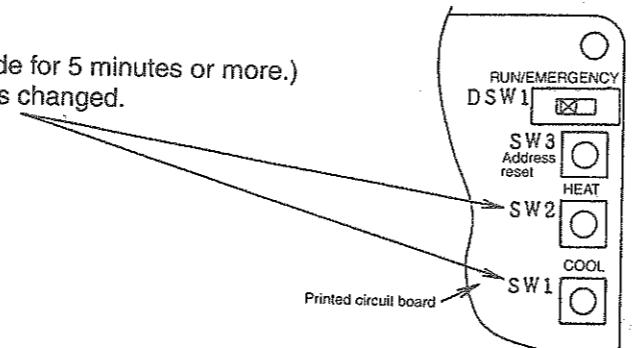
- Never operate the unit by pressing the electromagnetic switch.
- Never correct the phase by switching over any of the wires inside the unit.

8. Precautions with regard to test operation

Caution

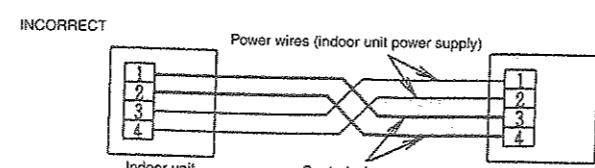
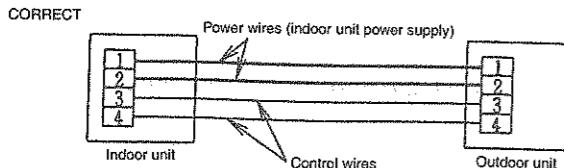
- Always be sure to use a properly-insulated tool to operate the switch on the circuit board. (Do not use your finger or a metallic object.)
 - Never turn on the power supply until all installation work has been completed.
 - Open the circuit breaker before test operation extends past 6 hours. (The crankcase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

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.



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 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.

Emergency operation

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	

	Thermistor	Cooling operation	Heating operation
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.

Self-diagnosis function

- The display screen on the wired remote control unit and the self-diagnosis LEDs (red) on the outdoor unit printed circuit board in the outdoor unit can be used to indicate where the location of a problem is. Refer to the table below to remove the cause of the problem, and then re-start the air conditioner system.

○...flashing, Blank....off

- 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.

Wired remote control unit display	Outdoor unit printed circuit board LED	Location of problem	Check location
Abnormal display	LED2 LED3 LED4 LED5 LED6 LED7 LED8		
F15 -01	○	Drain level float switch problem	Drain pump and drain pipe, indoor unit connectors CN6 & CN10, or relay connector
F16 -01	○	Louver switch problem	Louver motor, decorative panel connection terminal, or indoor unit connectors CN1 & CN6
F17 -01	○ ○	Option problem	Option connection terminals
F20 -01	○ ○ ○	Indoor temperature thermistor problem	Indoor temperature thermistor lead wire or indoor unit connector CN1
F20 -02	○ ○ ○	Remote control thermistor problem	Remote control thermistor
F21 -01	○ ○ ○	Pipe temperature thermistor problem (indoor unit side)	Pipe temperature thermistor lead wire or indoor unit connector CN1
F25 -01	○	Centralised control address overlap problem	Check settings for optional centralised control circuit board address switch
F26 -01	○	Remote control transmission wire open circuit problem	Remote control unit cable and connection terminals
F26 -02	○	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
F27 -02	○ ○ ○	Indoor/outdoor unit transmission problem	Check the transmission wave pattern
F29 -01	○ ○ ○	Indoor unit setting problem	Contact the place of purchase
F29 -02	○ ○ ○	Indoor unit setting problem	Contact the place of purchase
-12	○ ○ ○	Remote control unit setting problem	Contact the place of purchase
F30 -01	○ ○ ○	Open phase, or reversed phase of power supply	Check the main power supply terminal board connections, or switch over any two of the power supply wires
F30 -02	○ ○ ○	Poor power supply connection, or distorted voltage wave pattern	Check the main power supply terminal board connections, and check the power supply wave pattern
F30 -06	○ ○ ○	Poor power supply connection	Check the main power supply terminal board connections
F30 -07	○ ○ ○	Intake pressure protection	Insufficient gas
F31 -01	○ ○ ○	High-pressure cut-off	Refrigeration system
F33 -01	○ ○ ○	Compressor overcurrent protection	Open phase or lock in compressor, or blown main power supply fuse
F33 -02	○ ○ ○	Compressor discharge temperature protection	Insufficient gas
F40 -41	○ ○ ○	Compressor discharge temperature thermistor problem	Discharge temperature thermistor lead wire, outdoor unit connector CN2, or relay connector
F40 -61	○ ○ ○	Heat exchanger outlet temperature thermistor problem	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
F41 -03	○ ○ ○	Heating pressure switch open circuit problem	Heating pressure switch lead wire, outdoor unit connector CN2, or relay connector
F41 -12	○ ○ ○	Low-pressure switch open circuit problem	Low-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	Contact the place of purchase
F49 -02	○ ○ ○	Outdoor unit setting problem	Contact the place of purchase

- If the problem disappears and operation returns to normal, the CHECK display on the remote control unit will switch off, but the self-diagnosis LED will remain illuminated until operation is resumed.

- If the outdoor unit is being run in emergency operation mode or test operation mode, the outdoor unit LEDs will flash, but this does not indicate the presence of an abnormality.

Outdoor unit printed circuit board LED	LED2	LED3	LED4	LED5	LED6	LED7	LED8
Display during emergency operation	○	○	○	○	○	○	○
From outdoor unit during cooling test operation	○	○	○	○	○	○	○
From outdoor unit during heating test operation	○	○	○	○	○	○	○

9. 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 data, etc.
- Carry out the measurement regarding room temperature, outside air temperature, suction and air discharge temperature, wind velocity, wind volume, voltage, current, presence of abnormal vibration, operating pressure, piping temperature, compressive pressure, airtight pressure as items to be measured.
- As to the structure and appearance, check following items.

- Short circuit of the blowout air.
- Smooth flow of the drain.
- Reliable thermal insulation.
- Leakage of refrigerant.
- Mistake in wiring.
- Reliable connection of the ground wire.
- Looseness in terminal screw, fastening torque M4...157~196N·cm (16~20kgf·cm)
- M5...196~245·cm (20~25kgf·cm)

10. 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.

As to parts to be sold separately

We are preparing air guide 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.