ORDER NO. PACD 990103CO

Service Manual

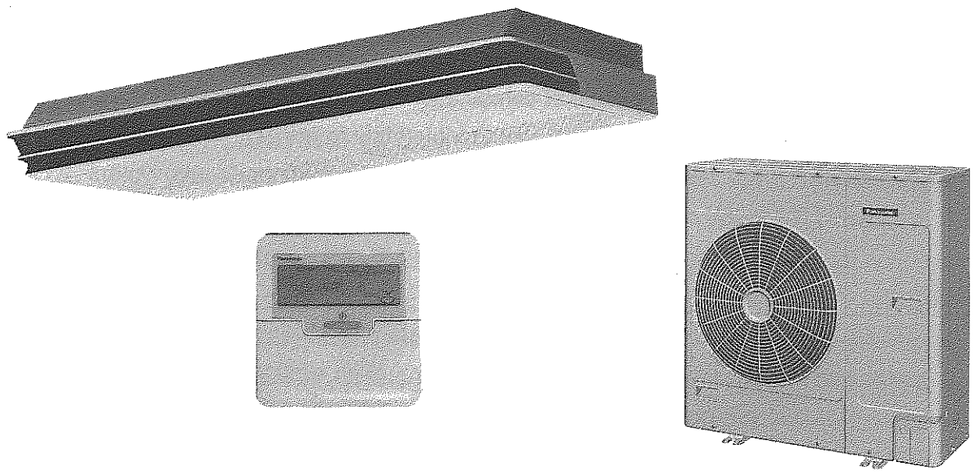
PACKAGED AIR CONDITIONER
CEILING TYPE

■HEAT PUMP MODEL

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

■COOLING ONLY MODEL

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

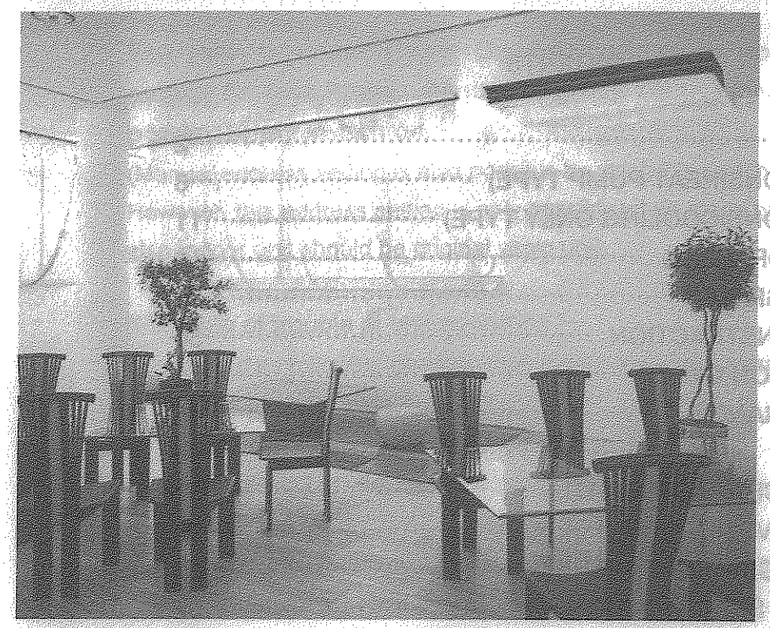
[Caution during automatic address setting]

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.

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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.

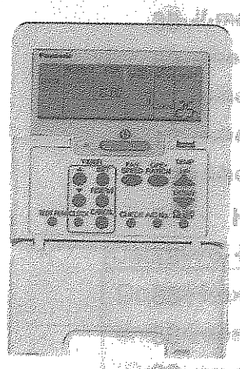
Automatic changeover function (heat pump models)

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.

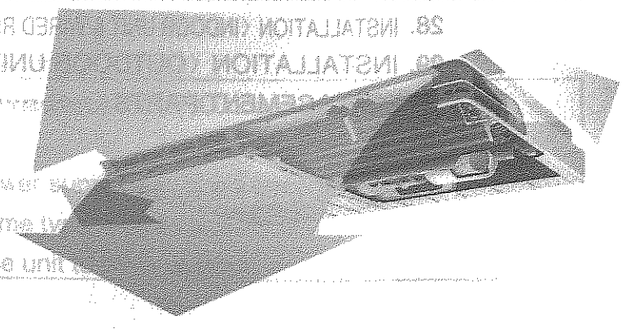
Wired Remote Controller



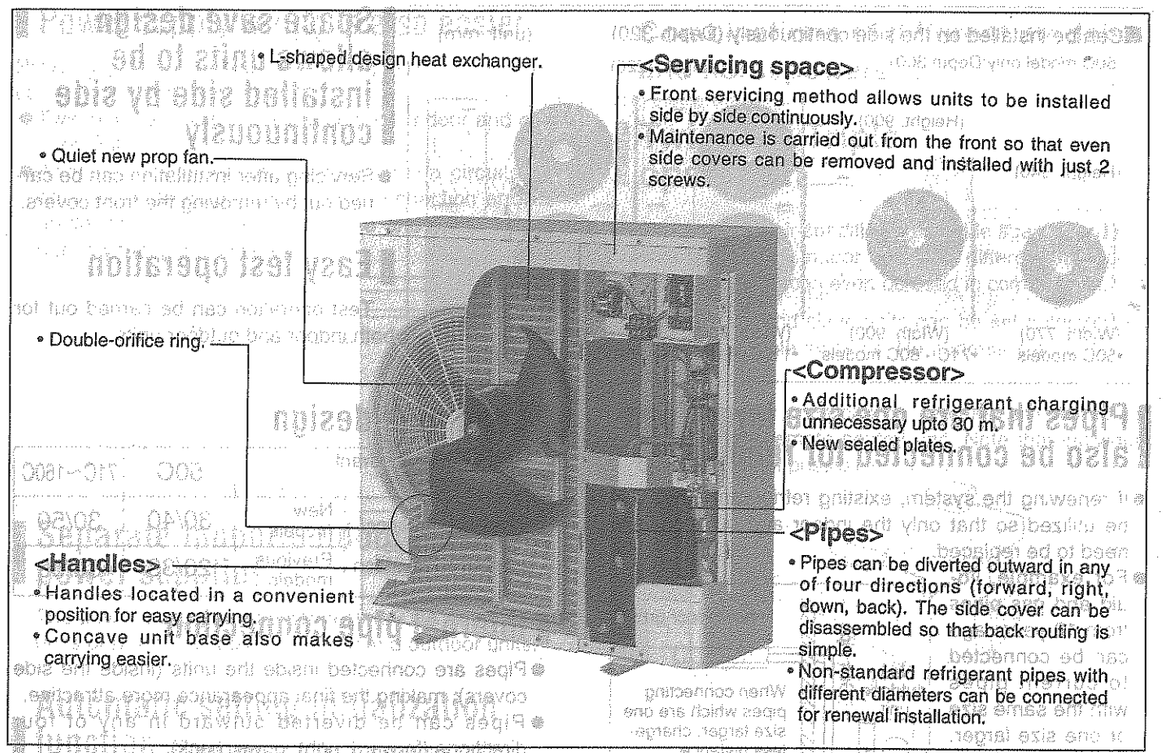
- The new design includes an easily-visible red pilot lamp. The power can be turned on and off at a single touch, without opening the cover.
- Has a built-in thermistor, allowing indoor temperature detection in accordance with indoor conditions by switching with main unit thermistor.
- Twin non-polar wires make installation work easy. (10 m cable supplied as accessory.)

Common design for Indor 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!

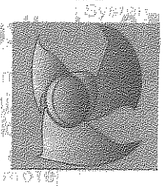


[Product features]

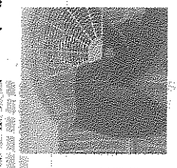
Low-noise design improves comfort in surrounding areas

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.

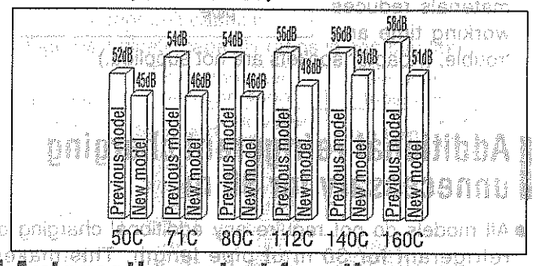


(2) The adoption of double-orifice rings reduces air passage resistance.



(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.

■Noise data (Outdoor Unit)



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

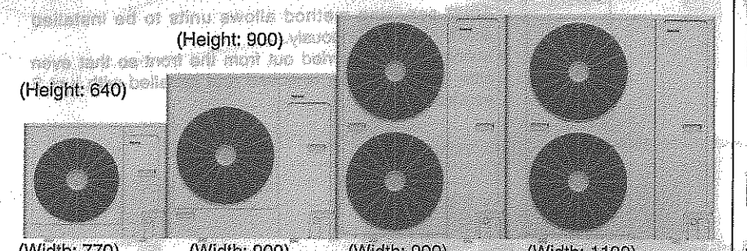
The EER had improved by 4% from previous (3HP). model

Low ambient cooling operation.

Cooling is possible to temperatures as low as −5℃.

Greatly improved workability increases system renewal capability

■Can be installed on the side continuously (Depth 320) (unit: mm)
(50C model only:Depth 300)



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

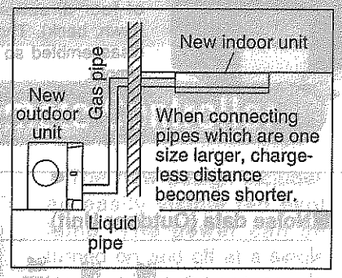
- Servicing after installation can be carried out by removing the front covers.

Easy test operation

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

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

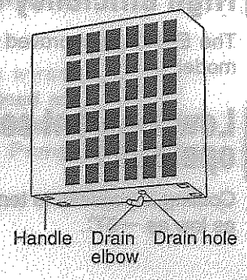


Additional refrigerant charging unnecessary for 30 m

- 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.



Long pipe design

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

Internal pipe connection

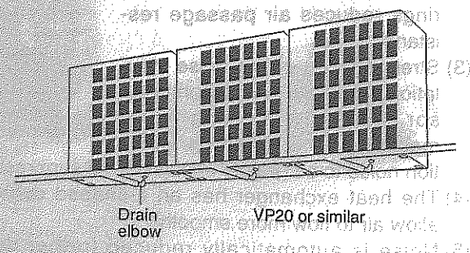
- Pipes are connected inside the units (inside the side covers), making the final appearance more attractive.
- Pipes can be diverted outward in any of four directions (forward, right, down, back).
- The liquid pipe diameters for 140C to 160C models have been made one size smaller, making installation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

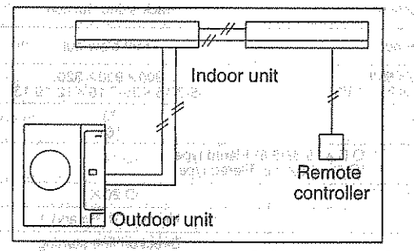


A brand-new control method using the latest technology

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 con-nected 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.

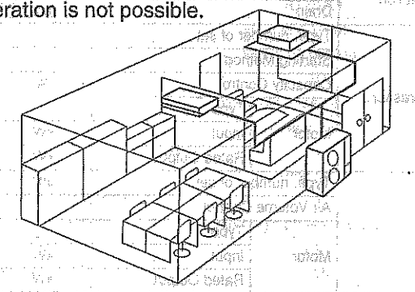
■**Branch pipe kit (optional accessory)**

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

Combinations of different models and horsepowers

Twin and Triple operation

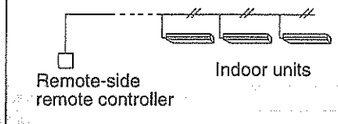
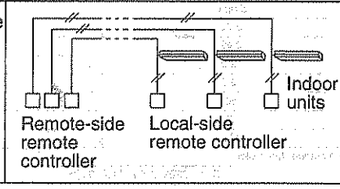
- Simultaneous air conditioning of wide spaces and corners is possible. Indoor units with different horsepowers and models can even be used in combination.
- Master units and slave-units can be set automatically in twin and triple systems. No address setting is necessary.
- Multiple indoor units can 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 capacity
▭ : Indoor unit capacity
(Figures indicate capacity ratios in combination.)

Outdoor unit	Simultaneous twin operation		Simultaneous triple operation	
	Standard	Horsepower difference	Standard	Horsepower difference
112C	112C (50T 50T)	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)

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)		[Remote side] ●Optional wired remote controller Parts No. ・Remote controller CNR06-855930 ・Wire code CNR46-938830 [Local side] Not needed
	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).		[Remote side] ●Optional wired remote controller [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	
(2)Cooling Capacity			kW kcal/h BTU/h	7.60 6,550 26,200	
(3)Heating Capacity			kW kcal/h BTU/h	7.75 6,700 26,800	
Retrigerant Charge-less			m	30	
Standard Air Volume for High, Medium and Low Speed			m³/min cfm	Hi 19 Me 17 Lo 14 671 600 494	Hi50 1765
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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 35-7/16×35-7/16×12-19/13
Net Weight			kg lbs	27 59	73 161
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 20×1
Compressor	Type, number of set			—	Hermetic-1(Rotary),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0.100
	Motor	Type		—	2-pole single phase induction motor
		Input	kW	—	Cool/Heat 2.73/2.49
		Rated Output	kW	—	2.0
Fan	Type, number of set		unit	Sirocco fan-4	Prop fan-1
	Air Volume Control			Three-Step and Auto mode(Remote Controller)	—
	Motor	Type		2-pole single phase induction motor	6-pole single phase induction motor
		Input	kW	0.14	0.11
		Rated Output	kW	0.06	0.05
Air-heat exchanger				Louver-fin type	Louver-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigeration oil(Charged)			ℓ	—	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, High pressure switch, Current Trans	
External Finish				Steel plate, Golvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)				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° 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-80T32JP,CU-80C52HP		
			Condition by JIS B 8616		
Volts	V		220	230	240
Phase			Single	Single	Single
Power Consumption	kW	Cool	2.73	2.73	2.73
		Heat	2.49	2.49	2.49
Running Current	A	Cool	12.0	11.8	11.6
		Heat	12.3	12.0	11.7
Starting Current	A		56	56	56
Power Factor	%	Cool	103.4	100.6	98.1
		Heat	92.0	90.2	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
			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	
(3)Heating Capacity			kW kcal/h BTU/h	7.75 6,700 26,800	
Retrigerant Charge-less			m	30	
Standard Air Volume for High, Medium and Low Speed			m³/min cfm	Hi 19 Me 17 Lo 14 671 600 494	Hi50 1765
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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	73 161
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 20×1
Compressor	Type, number of set			—	Hermetic-1(Rotary),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0.100
	Motor	Type		—	2-pole single phase induction motor
		Input	kW	—	Cool/Heat 2.53/2.29
		Rated Output	kW	—	2.0
Fan	Type, number of set		unit	Sirocco fan-4	Prop fan-1
	Air Volume Control			Three-Step and Auto mode(Remote Controller)	—
	Motor	Type		2-pole single phase induction motor	6-pole single phase induction motor
		Input	kW	0.14	0.11
		Rated Output	kW	0.06	0.05
Air-heat exchanger				Louver-fin type	Louver-fin type
Refrigerant Control				Capillary tube	Capillary tube
Refrigeration oil(Charged)			ℓ	—	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 thermostat for F.M, Crankcase heater, High pressure switch, Current Trans	
External Finish				Steel plate, Golvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)				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° 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-80T32JP,CU-80C52XP		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	2.73	2.73	2.73
		Heat	2.49	2.49	2.49
Running Current	A	Cool	4.6	4.5	4.4
		Heat	4.5	4.4	4.3
Starting Current	A		26	26	26
Power Factor	%	Cool	90.2	87.6	86.3
		Heat	84.1	81.7	80.6

*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-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	
Standard Air Volume for High, Medium and Low Speed			m³/min cfm	Hi 30 Me 25 Lo 20 1059 883 706	Hi75 2647
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	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 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 20×1
Compressor	Type, number of set			—	Hermetic-1(Rotary),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0-100
	Motor	Type		—	2-pole 3-phase induction motor
		Input	kW	—	Cool/Heat 2.75/2.77
		Rated Output	kW	—	2.80
Fan	Type, number of set		unit	Sirocco fan-3	Prop fan-2
	Air Volume Control			Three-Step and Auto mode(Remote Controller)	—
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction 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	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, Golvanized 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

(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-112T32JP,CU-112C52XP Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	3.15	3.15	3.15
		Heat	3.17	3.17	3.17
Running Current	A	Cool	5.6	5.4	5.3
		Heat	5.7	5.5	5.4
Starting Current	A		48	48	48
Power Factor	%	Cool	86.5	84.2	82.7
		Heat	84.5	83.2	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

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	
Standard Air Volume for High, Medium and Low Speed			m³/min cfm	Hi 33 Me 28 Lo 22 1165 988 777	Hi 80 2825
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	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 Liquid	mm(inch) mm(inch)	O.D ϕ 15.05(3/4) Flared type O.D ϕ 9.52(3/8) Flared type	
	Drain		mm	O.D ϕ 20	ID 20×1
Compressor	Type, number of set			—	Hermetic-1(Rotary),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0-100
	Motor	Type		—	2-pole 3-phase induction motor
		Input	kW	—	Cool/Heat 4.21/4.02
		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)	—
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction 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	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, High pressure switch, crankcase heater, Current Trans	
External Finish				Steel plate, Golvanized 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

(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-140T32JP,CU-140C53XP Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	4.59	4.59	4.59
		Heat	4.40	4.40	4.40
Running Current	A	Cool	8.20	8.10	8.00
		Heat	8.10	8.00	7.90
Starting Current	A		62	62	62
Power Factor	%	Cool	85.0	81.8	79.8
		Heat	82.5	79.4	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				Indoor unit	Outdoor unit
			Main body	CS-160T32JP	CU-160C53XP
			Panel		
(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	
(3)Heating Capacity			kW kcal/h BTU/h	15.70 13,500 54,000	
Retrigerant Charge-less			m	30	
Standard Air Volume for High, Medium and Low Speed			m³/min cfm	Hi 35 Me 30 Lo 24 1236 1059 848	Hi 95 3355
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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	47 103	118 260
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 20×1
Compressor	Type, number of set			—	Hermetic-1(Rotary),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0,100
	Motor	Type		—	2-pole 3-phase induction motor
		Input	kW	—	Cool/Heat 4.29/4.16
		Rated Output	kW	—	4.5
Fan	Type, number of set		unit	Sirocco fan-4	Prop fan-2
	Air Volume Control			Three-Step and Auto mode(Remote Controller)	—
	Motor	Type		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)			ℓ	—	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, Golvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)				Polypropylene regin 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		
Volts	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				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	
Retrigerant Charge-less			m	30	
Standard Air Volume for High, Medium and Low Speed			m³/min cfm	Hi 15 Me 13 Lo 11 530 459 388	Hi 32 1130
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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	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 20×1
Compressor	Type, number of set			—	Hermetic-1(Rotary),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0,100
	Motor	Type		—	2-pole single phase induction motor
		Input	kW	—	Cool/ 1.69
		Rated Output	kW	—	1.5
Fan	Type, number of set		unit	Sirocco fan-4	Prop fan-1
	Air Volume Control			Three-Step and Auto mode(Remote Controller)	—
	Motor	Type		2-pole single phase induction motor	6-pole single phase induction motor
		Input	kW	0.13	0.07
		Rated Output	kW	0.04	0.035
Air-heat exchanger				Louver-fin type	Louver-fin type
Refrigerant Control				Capillary tube	—
Refrigeration oil(Charged)			ℓ	—	ATMOS M60(0.67)
Refrigerant(Charged)			kg lbs	—	R-22(2.2) (4.9)
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, Golvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)				Polypropylene regin 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		
Volts	V		220	230	240
Phase			Single	Single	Single
Power Consumption	kW	Cool	1.89	1.89	1.89
Running Current	A	Cool	9.1	8.8	8.5
Starting Current	A		33.7	33.7	33.7
Power Factor	%	Cool	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	
Retrigerant Charge-less				m	30	
Standard Air Voiume for High. Medium and Low Speed				m³/min cfm	Hi 19 Me 17 Lo 14 671 600 494	Hi 50 1766
Outside Static Pressure				mmAq in W.G.	0 0	—
Air Iniet					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 20×1
Compressor	Type, number of set				—	Hermetic-1(Rotary),1
	Starting Method				—	Direct on-line starting
	Capacity Control			%	—	0.100
	Motor	Type			—	2-pole single phase induction motor
		Input		kW	—	Cool/ 2.3
		Rated Output		kW	—	1.9
Fan	Type, number of set			unit	Sirocco fan-4	Prop fan-1
	Air Volume Control				Three-Step and Auto mode(Remote Controller)	—
	Motor	Type			2-pole single phase induction motor	6-pole single phase induction motor
		Input		kW	0.14	0.11
		Rated Output		kW	0.06	0.050
Air-heat exchanger					Louver-fin type	Louver-fin type
Refrigerant Control					Capillary tube	—
Refrigeration oil(Charged)				ℓ	—	DIAMOND MS32(N-1)(1.3)
Refrigerant(Charged)				kg lbs	—	R-22(2.7) (6.0)
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, Golvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)					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° 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-71T32JP,CU-71C02HP Condition by JIS B 8616		
Volts	V		220	230	240
Phase			Single	Single	Single
Power Consumption	kW	Cool	2.50	2.50	2.50
Running Current	A	Cool	11.9	11.7	11.5
Starting Current	A		60	60	60
Power Factor	%	Cool	95.5	92.9	90.6

*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-71C02XP
			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	
Retrigerant Charge-less			m	30	
Standard Air Voiume for High. Medium and Low Speed			m³/min cfm	Hi 19 Me 17 Lo 14 671 600 494	Hi 50 1766
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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 20×1
Compressor	Type, number of set			—	Hermetic-1(Rotary),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0.100
	Motor	Type		—	2-pole single phase induction motor
		Input	kW	—	Cool/ 2.28
		Rated Output	kW	—	1.9
Fan	Type, number of set		unit	Sirocco fan-4	Prop fan-1
	Air Volume Control			Three-Step and Auto mode(Remote Controller)	—
	Motor	Type		2-pole single phase induction motor	6-pole single phase induction motor
		Input	kW	0.14	0.11
		Rated Output	kW	0.06	0.050
Air-heat exchanger				Louver-fin type	Louver-fin type
Refrigerant Control				Capillary tube	—
Refrigeration oil(Charged)			ℓ	—	DIAMOND MS32(N-1)(1.3)
Refrigerant(Charged)			kg lbs	—	R-22(2.7) (6.6)
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 thermostat for F.M, Crankcase heater, High pressure switch, Current Trans	
External Finish				Steel plate, Golvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)				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° 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-71T32JP,CU-71C02XP Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	2.50	2.50	2.50
Running Current	A	Cool	4.50	4.40	4.30
Starting Current	A		27	27	27
Power Factor	%	Cool	84.4	82.0	80.9

*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-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	
Retrigerant Charge-less			m	30	
Standard Air Volume for High. Medium and Low Speed			m³/min cfm	Hi 19 Me 17 Lo 14 671 600 494	Hi 50 1766
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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 20×1
Compressor	Type, number of set			—	Hermetic-1(Rotary),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0.100
	Motor	Type		—	2-pole single phase induction motor
		Input	kW	—	Cool/ 2.73
		Rated Output	kW	—	2.0
Fan	Type, number of set		unit	Sirocco fan-4	Prop fan-1
	Air Volume Control			Three-Step and Auto mode(Remote Controller)	—
	Motor	Type		2-pole single phase induction motor	6-pole single phase induction motor
		Input	kW	0.14	0.11
		Rated Output	kW	0.06	0.05
Air-heat exchanger				Louver-fin type	Louver-fin type
Refrigerant Control				Capillary tube	—
Refrigeration oil(Charged)			ℓ	—	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, Golvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)				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° 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-80T32JP,CU-80C02HP Condition by JIS B 8616		
Volts	V		220	230	240
Phase			Single	Single	Single
Power Consumption	kW	Cool	2.73	2.73	2.73
Running Current	A	Cool	12.0	11.8	11.6
Starting Current	A		56	55	56
Power Factor	%	Cool	103.4	100.6	98.1
*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-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	
Retrigerant Charge-less			m	30	
Standard Air Volume for High. Medium and Low Speed			m³/min cfm	Hi 19 Me 17 Lo 14 671 600 494	Hi 50 1766
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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 20×1
Compressor	Type, number of set			—	Hermetic-1(Rotary),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0.100
	Motor	Type		—	2-pole 3-phase induction motor
		Input	kW	—	Cool/ 2.53
		Rated Output	kW	—	2.0
Fan	Type, number of set		unit	Sirocco fan-4	Prop fan-1
	Air Volume Control			Three-Step and Auto mode(Remote Controller)	—
	Motor	Type		2-pole single phase induction motor	6-pole single phase induction motor
		Input	kW	0.14	0.11
		Rated Output	kW	0.06	0.050
Air-heat exchanger				Louver-fin type	Louver-fin type
Refrigerant Control				Capillary tube	—
Refrigeration oil(Charged)			ℓ	—	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 thermostat for F.M, Crankcase heater, Drain ov.r-flow switch, High pressure switch, Current Trans	
External Finish				Steel plate, Golvanized steel plate finished with baked acrylic-resin	Powder coating
Air Filter(Factory set)				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° 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-80T32JP,CU-80C02XP Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	2.73	2.73	2.73
Running Current	A	Cool	4.6	4.50	4.40
Starting Current	A		26	26	26
Power Factor	%	Cool	90.2	87.6	86.3
*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-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	
Retrigerant Charge-less			m	30	
Standard Air Volume for High. Medium and Low Speed			m³/min cfm	Hi 30 Me 25 Lo 20 1059 883 706	Hi 75 2647
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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 ϕ 19.05(3/4) Flared type O.D ϕ 9.52(3/8) Flared type	
	Drain		mm	O.D ϕ 20	ID 20×1
Compressor	Type, number of set			—	Hermetic-1(Scroll),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0.100
	Motor	Type		—	2-pole 3-phase induction 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)	—
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction 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, Golvanized 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 48

(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-112U32JP,CU-112C02XP		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
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	85.5	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	
(2)Cooling Capacity			kW kcal/h BTU/h	13.40 11,550 46,200	
Retrigerant Charge-less			m	30	
Standard Air Volume for High. Medium and Low Speed			m³/min cfm	Hi 33 Me 28 Lo 22 1165 988 777	Hi 80 2825
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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 ϕ 19.05(3/4) Flared type O.D ϕ 9.52(3/8) Flared type	
	Drain		mm	O.D ϕ 20	ID 20×1
Compressor	Type, number of set			—	Hermetic-1(Scroll),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0.100
	Motor	Type		—	2-pole 3-phase induction 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)	—
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction 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, Golvanized 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 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)*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-140T32JP,CU-140C03XP		
			Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
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
			Main body	CS-160T32JP	CU-160C03XP
			Panel		
(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	
Retrigerant Charge-less			m	30	
Standard Air Volume for High, Medium and Low Speed			m³/min cfm	Hi 35 Me 30 Lo 24 1236 1059 848	Hi 95 3355
Outside Static Pressure			mmAq in W.G.	0 0	—
Air Iniet				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	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	O.D φ20	ID 20×1
Compressor	Type, number of set			—	Hermetic-1(Scroll),1
	Starting Method			—	Direct on-line starting
	Capacity Control		%	—	0,100
	Motor	Type		—	2-pole 3-phase induction 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)	
	Motor	Type		4-pole single phase induction motor	6-pole single phase induction motor
		Input	kW	0.18	0.11×2
		Rated Output	kW	0.12	0.05×2
Air-heat exchanger				Louver-fin type	Louver-fin type
Refrigerant Control				Capillary tube	—
Refrigeration oil(Charged)			ℓ	—	SUNISO 4GSDID-K(1.6)
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				Indoor control fuse, Outdoor control fuse, High pressure switch Internal protector, Phase protector and Over current velay for comp 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 regin 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)*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)

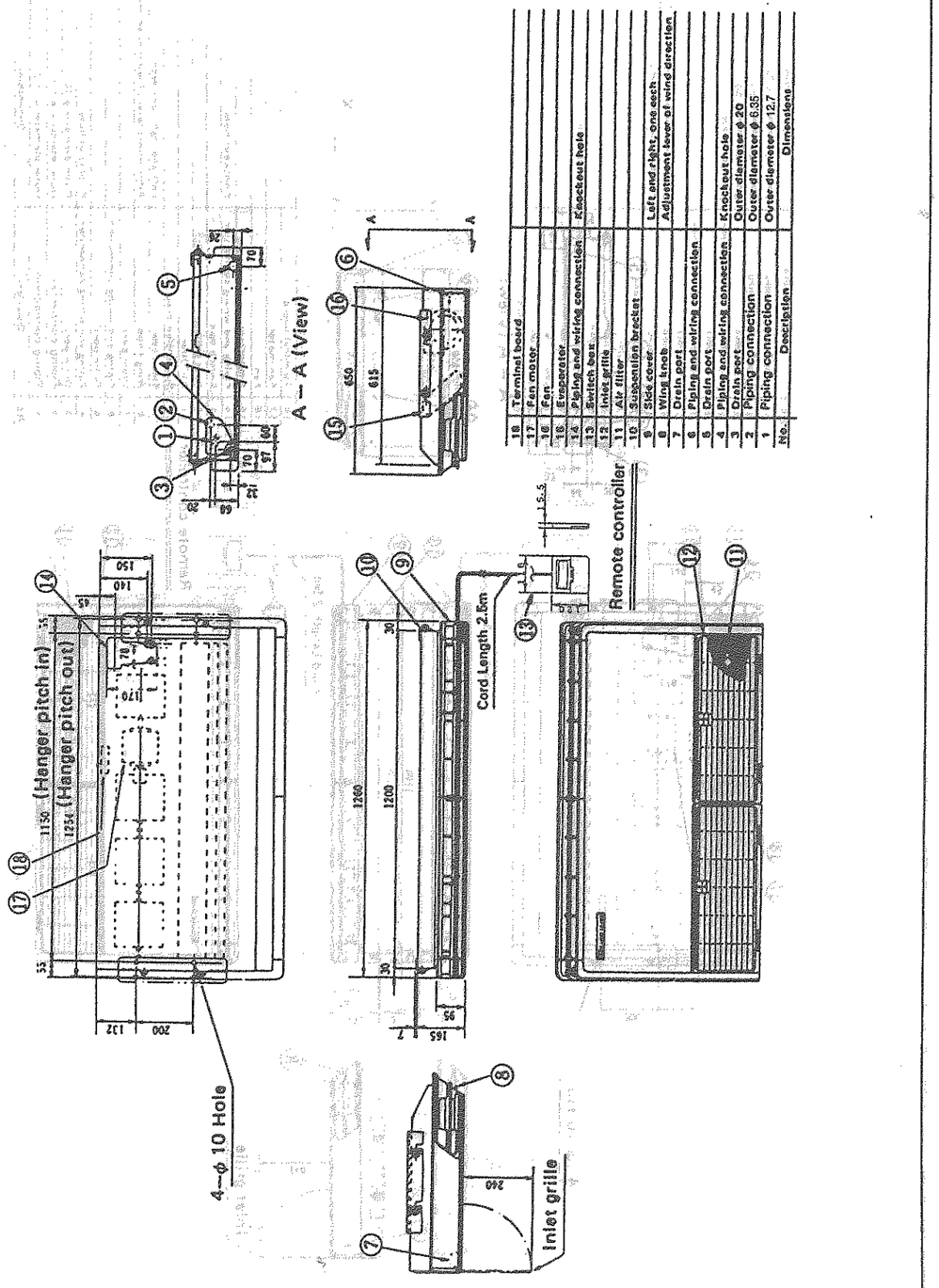
ITEM \ MODEL			CS-160T32JP,CU-160C03XP Condition by JIS B 8616		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	4.71	4.71	4.71
Running Current	A	Cool	8.30	8.30	8.30
Starting Current	A		61	61	61
Power Factor	%	Cool	86.2	83.9	81.9

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

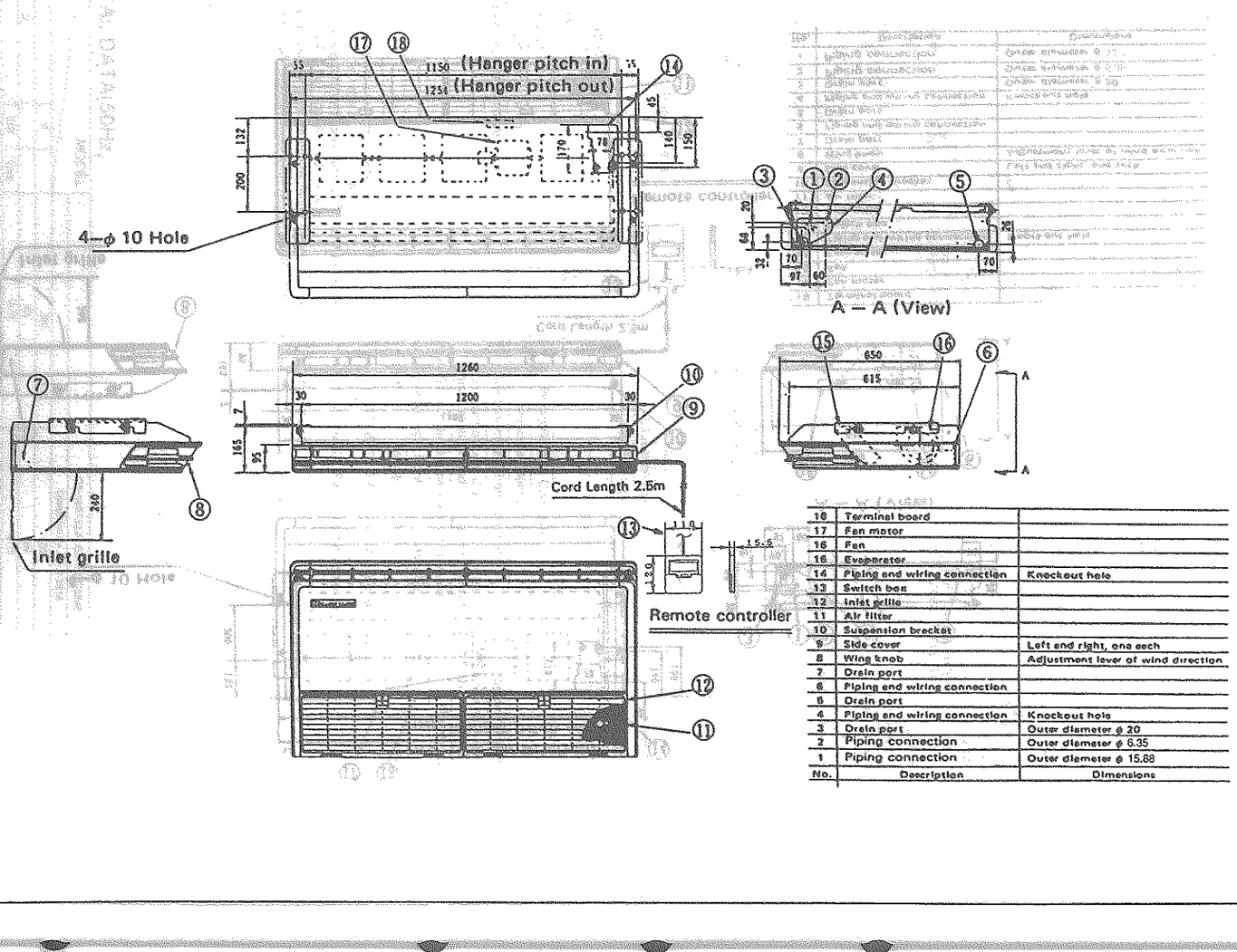
Panasonic	Power source	AC, 3N~380V,400V,415V

4. TECHNICAL DRAWING

CS-50T32JP
OUTSIDE DIMENSIONS

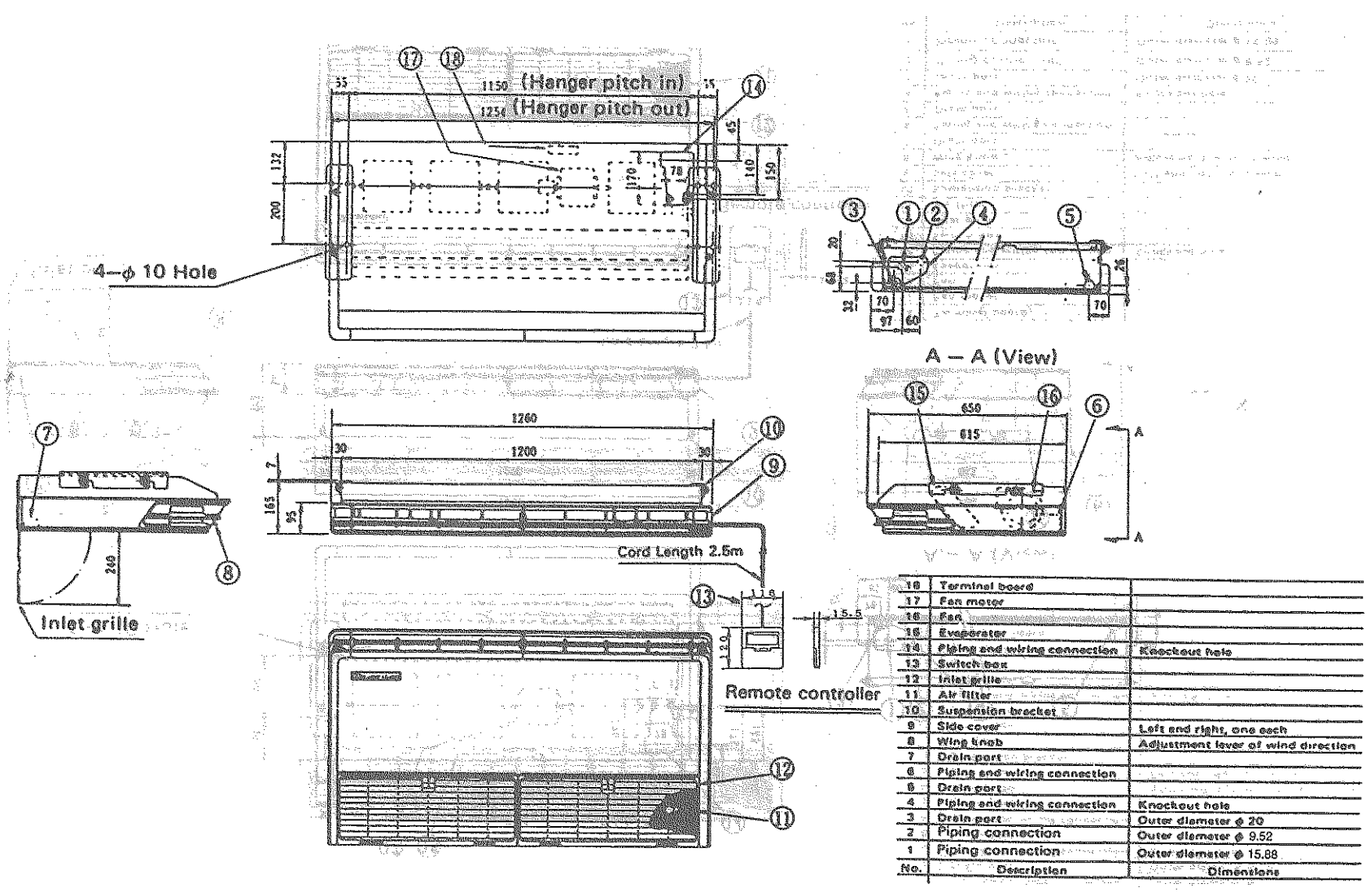


CS-71T32JP
OUTSIDE DIMENSIONS



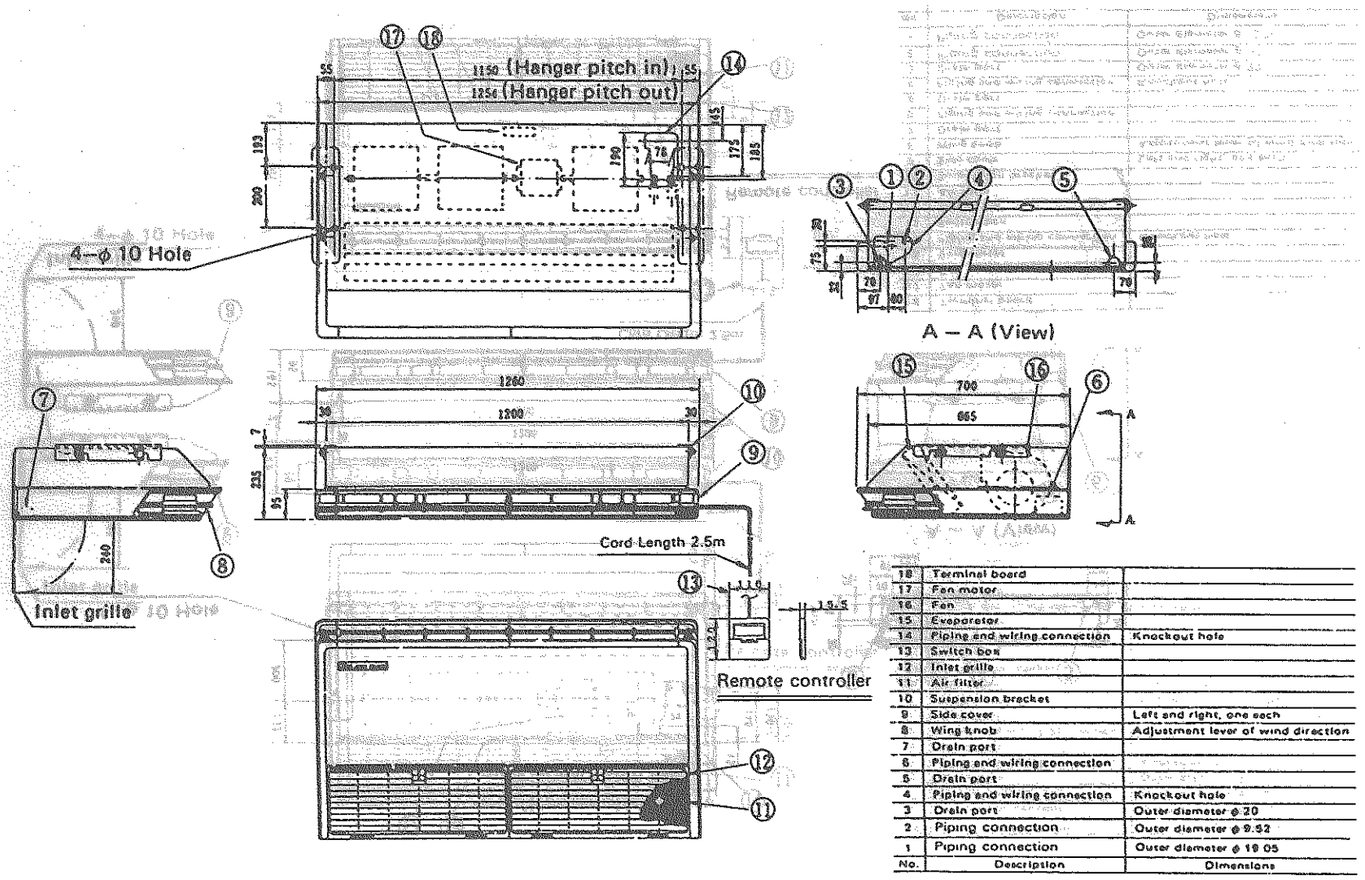
No.	Description	Dimensions
18	Terminal board	
17	Fan motor	
16	Fan	
15	Evaporator	
14	Piping and wiring connection	Knockout hole
13	Switch box	
12	Inlet grille	
11	Air filter	
10	Suspension bracket	
9	Side cover	Left and right, one each
8	Wing knob	Adjustment lever of wind direction
7	Drain port	
6	Piping and wiring connection	
5	Drain port	
4	Piping and wiring connection	Knockout hole
3	Drain port	Outer diameter ϕ 20
2	Piping connection	Outer diameter ϕ 6.35
1	Piping connection	Outer diameter ϕ 15.88

CS-80T32JP
OUTSIDE DIMENSIONS



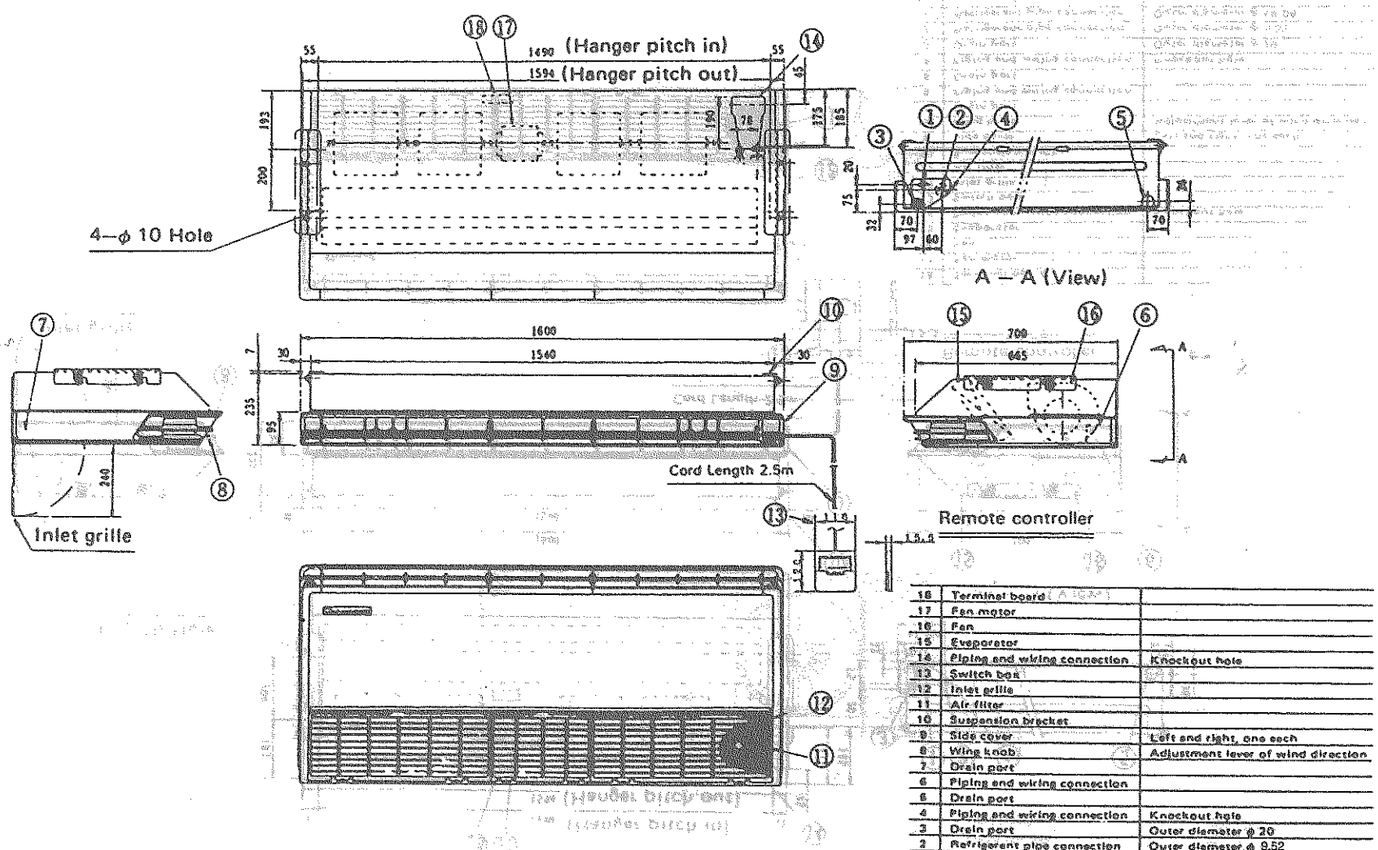
No.	Description	Dimensions
18	Terminal board	
17	Fan motor	
16	Fan	
15	Evaporator	
14	Piping and wiring connection	Knockout hole
13	Switch box	
12	Inlet grille	
11	Air filter	
10	Suspension bracket	
9	Side cover	Left and right, one each
8	Wing knob	Adjustment lever of wind direction
7	Drain port	
6	Piping and wiring connection	
5	Drain port	
4	Piping and wiring connection	Knockout hole
3	Drain port	Outer diameter ϕ 20
2	Piping connection	Outer diameter ϕ 9.52
1	Piping connection	Outer diameter ϕ 15.88

CS-112T32JP
OUTSIDE DIMENSIONS



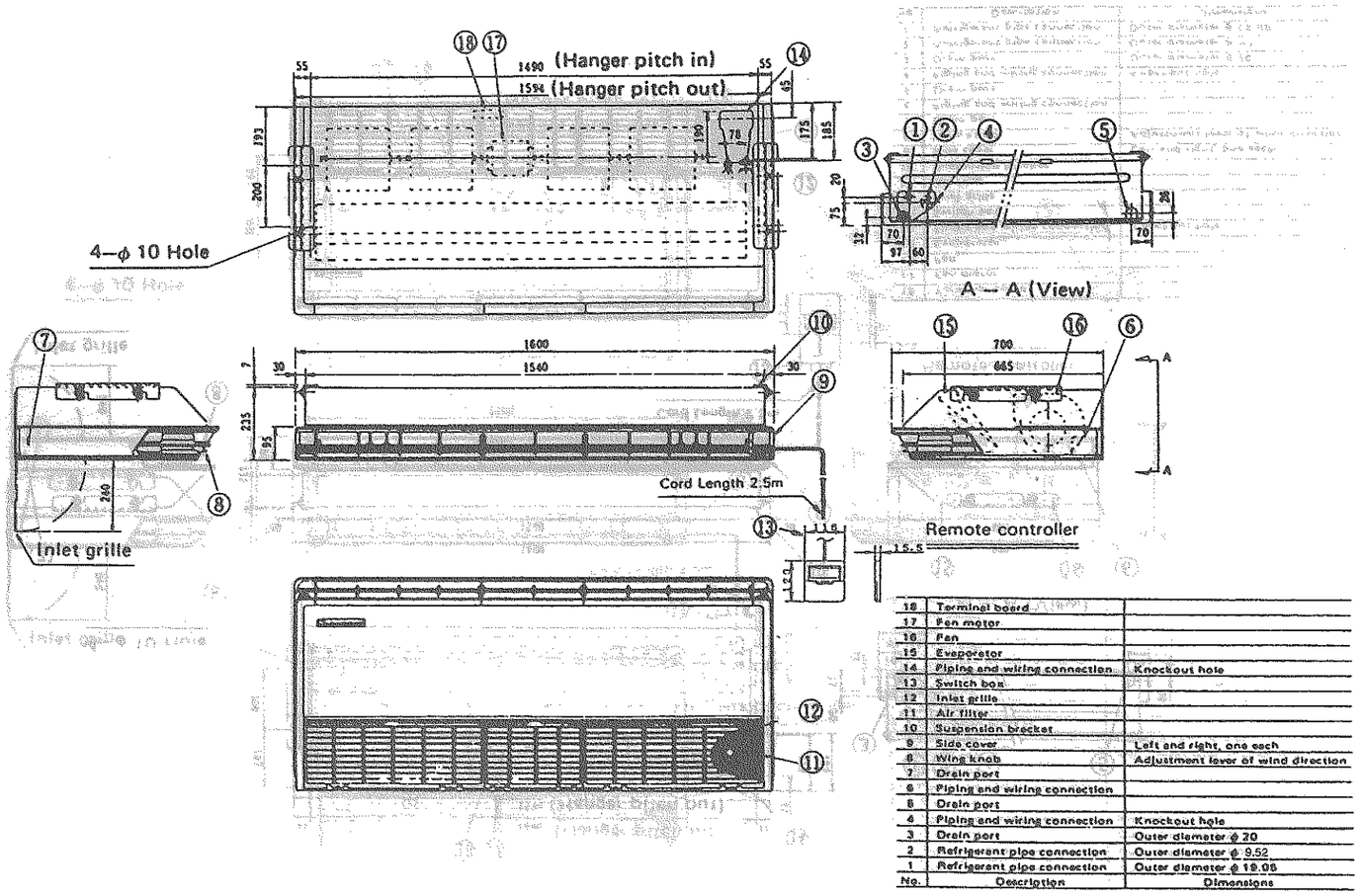
No.	Description	Dimensions
18	Terminal board	
17	Fan motor	
16	Fan	
15	Evaporator	
14	Piping and wiring connection	Knockout hole
13	Switch box	
12	Inlet grille	
11	Air filter	
10	Suspension bracket	
9	Side cover	Left and right, one each
8	Wing knob	Adjustment lever of wind direction
7	Drain port	
6	Piping and wiring connection	
5	Drain port	
4	Piping and wiring connection	Knockout hole
3	Drain port	Outer diameter φ 20
2	Piping connection	Outer diameter φ 9.52
1	Piping connection	Outer diameter φ 19.05

CS-140T32JP
OUTSIDE DIMENSIONS



No.	Description	Dimensions
18	Terminal board	
17	Fan motor	
16	Fan	
15	Evaporator	
14	Piping and wiring connection	Knockout hole
13	Switch box	
12	Inlet grille	
11	Air filter	
10	Suspension bracket	
9	Side cover	Left and right, one each
8	Wing knob	Adjustment lever of wind direction
7	Drain port	
6	Piping and wiring connection	
5	Drain port	
4	Piping and wiring connection	Knockout hole
3	Drain port	Outer diameter φ 20
2	Refrigerant pipe connection	Outer diameter φ 9.52
1	Refrigerant pipe connection	Outer diameter φ 19.05

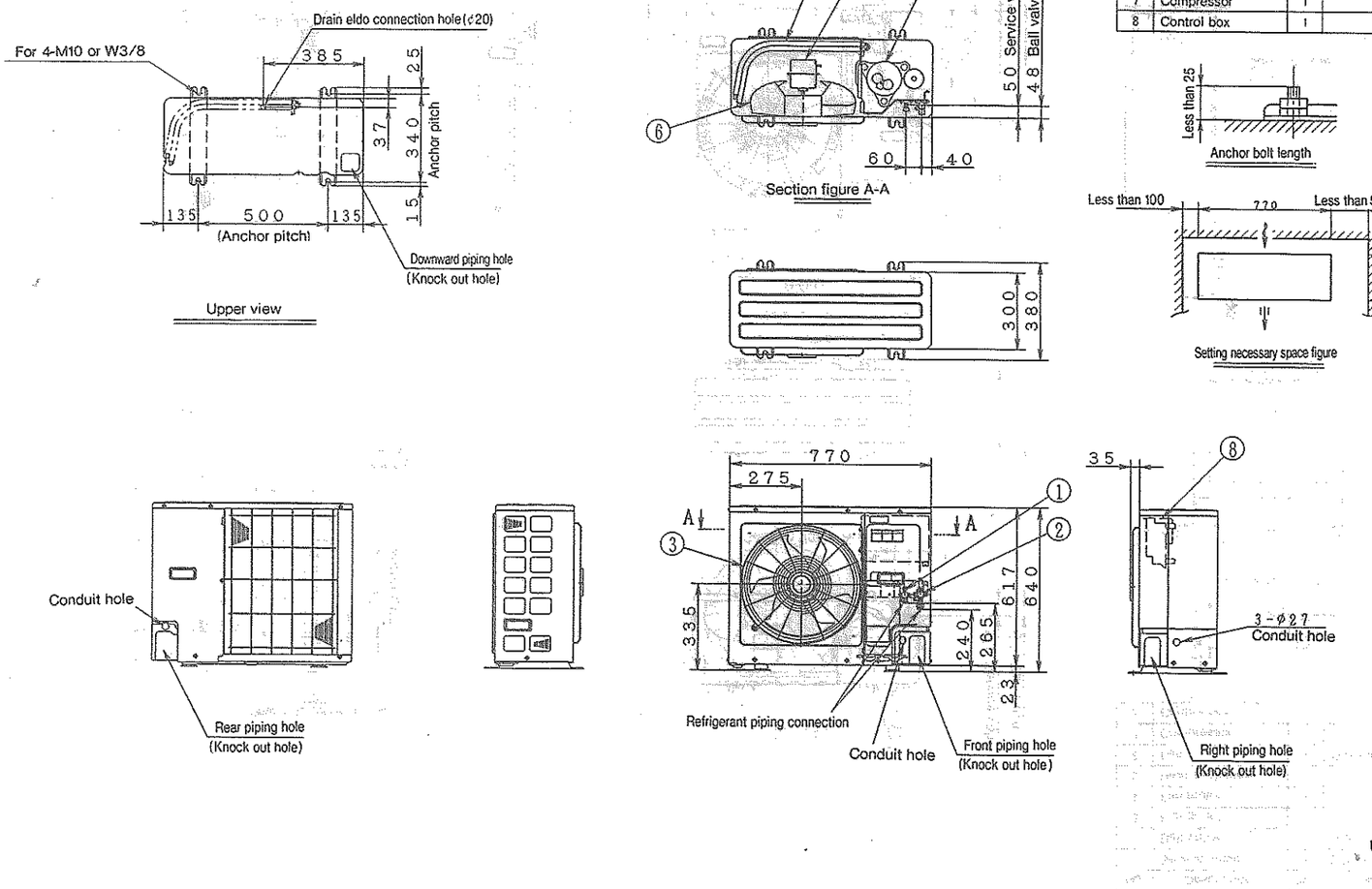
CS-160T32JP
OUTSIDE DIMENSIONS



No.	Description	
18	Terminal board	
17	Fan motor	
16	Fan	
15	Evaporator	
14	Piping and wiring connection	Knockout hole
13	Switch box	
12	Inlet grille	
11	Air filter	
10	Suspension bracket	
9	Side cover	Left and right, one each
8	Wing knob	Adjustment lever of wind direction
7	Drain port	
6	Piping and wiring connection	
5	Drain port	
4	Piping and wiring connection	Knockout hole
3	Drain port	Outer diameter φ 20
2	Refrigerant pipe connection	Outer diameter φ 9.52
1	Refrigerant pipe connection	Outer diameter φ 19.05
No.	Description	Dimensions

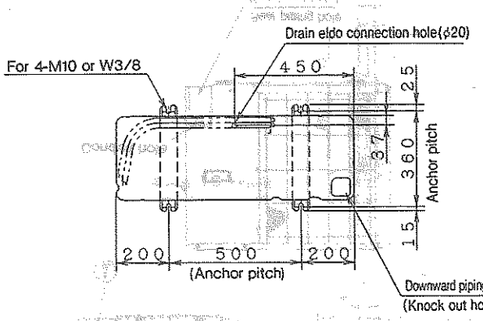
CU-50C02HP

No.	Description	PC	Dimension
1	Service valve	1	O.D.φ6.35 Flared
2	Ball valve	1	O.D.φ12.7 Flared
3	Fan guard	1	
4	Fan motor	1	
5	Heat exchanger	1	
6	Fan	1	O.D. φ400
7	Compressor	1	
8	Control box	1	

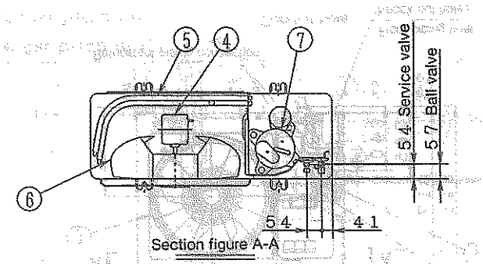


CU-71C02HP,CU-71C02XP

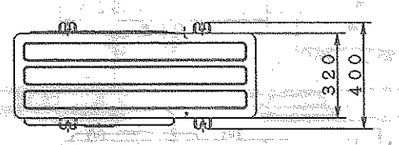
No.	Description	PC	Dimension
1	Service valve	1	O.D.ϕ6.35 Flared
2	Ball valve	1	O.D.ϕ15.88 Flared
3	Fan guard	1	
4	Fan motor	1	
5	Heat exchanger	1	
6	Fan	1	O.D.ϕ480
7	Compressor	1	
8	Control box	1	

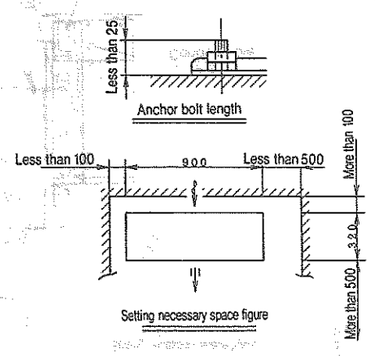


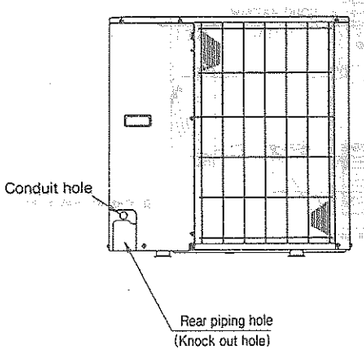
Upper view

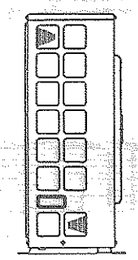


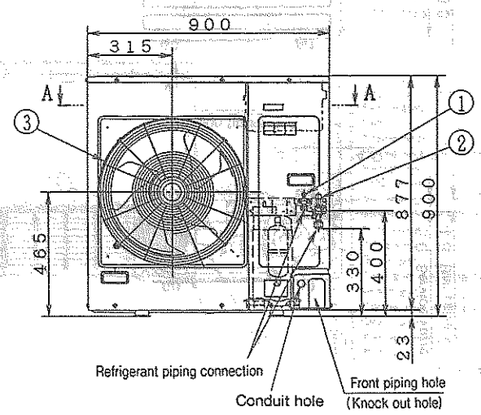
Section figure A-A

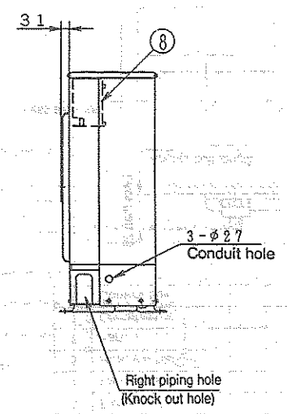








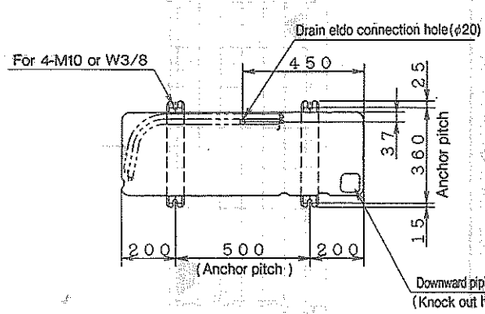




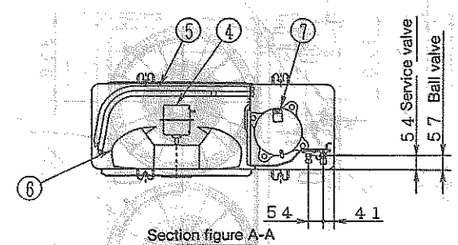
Unit:mm

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

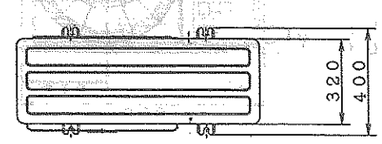
No.	Description	PC	Dimension
1	Service valve	1	O.D.ϕ9.52 Flared
2	Ball valve	1	O.D.ϕ15.88 Flared
3	Fan guard	1	
4	Fan motor	1	
5	Heat exchanger	1	
6	Fan	1	O.D.ϕ480
7	Compressor	1	
8	Control box	1	

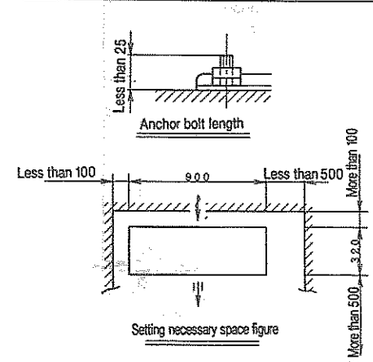


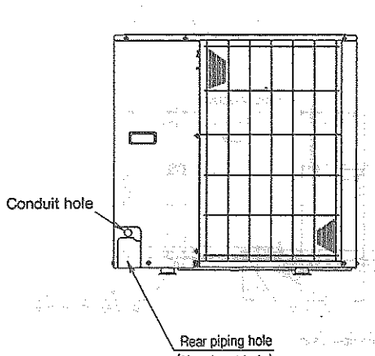
Upper view

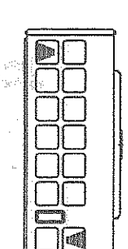


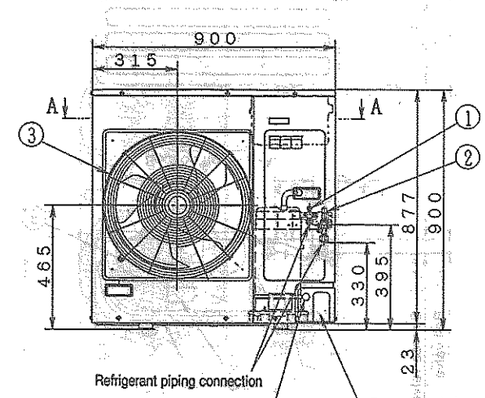
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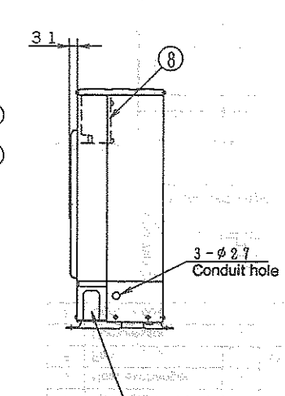








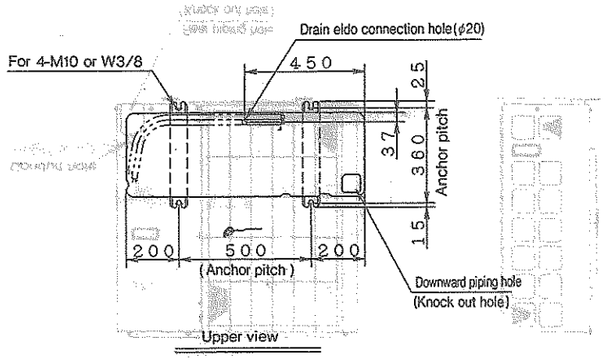


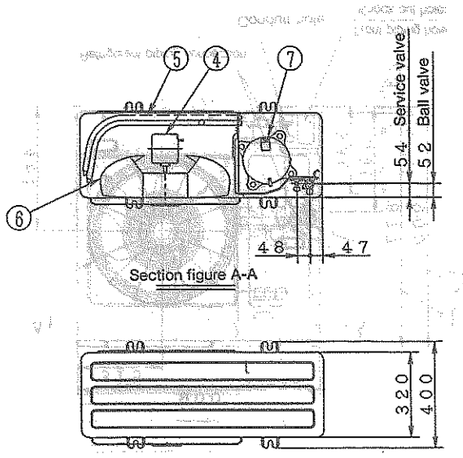


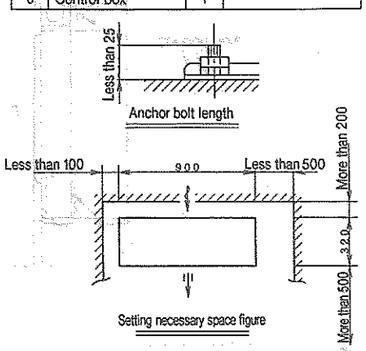
Unit:mm

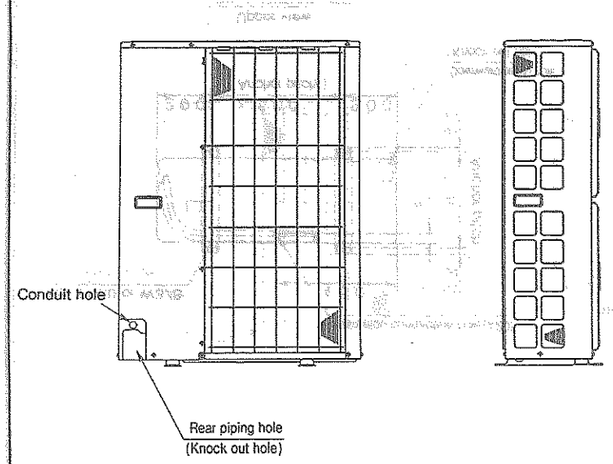
CU-112C52XP, CU-112C02XP

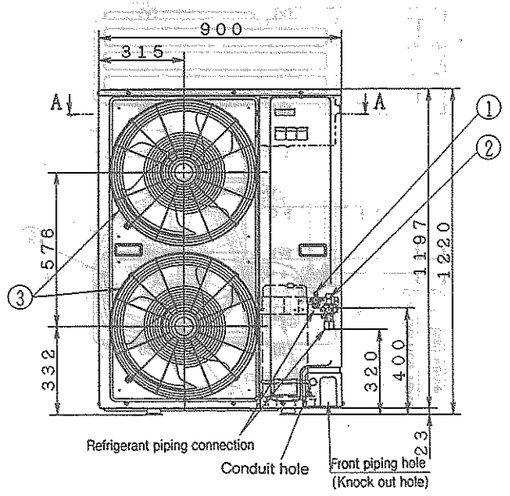
No.	Description	PC	Dimension
1	Service valve	1	O.D.φ9.52 Flared
2	Ball valve	1	O.D.φ19.05 Flared
3	Fan guard	1	
4	Fan motor	1	
5	Heat exchanger	1	
6	Fan	1	O.D.480×2
7	Compressor	1	
8	Control box	1	

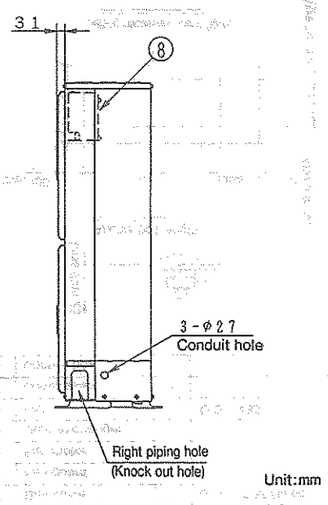








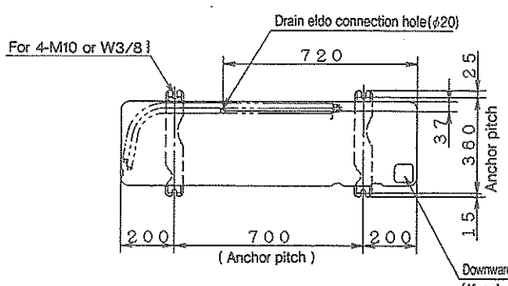


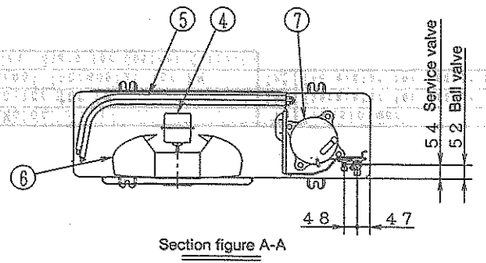


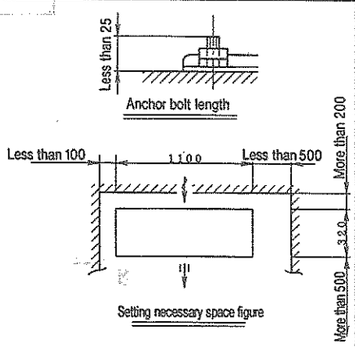
Unit:mm

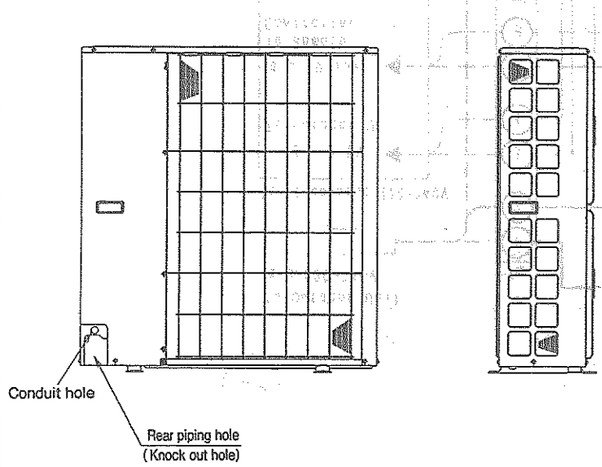
CU-140C53XP, CU-114C03XP, CU-160C53XP, CU-160C03XP

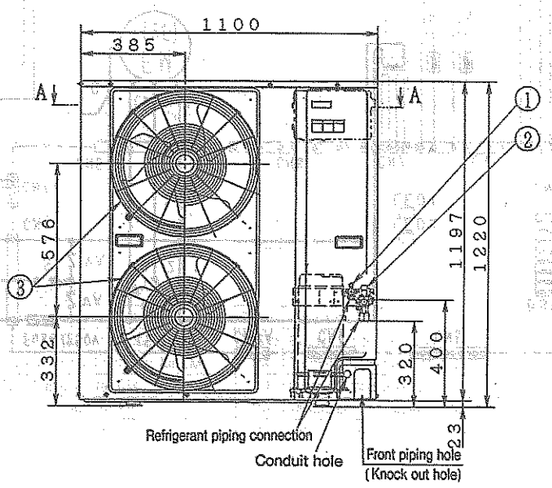
No.	Description	PC	Dimension
1	Service valve	1	O.D.φ9.52 Flared
2	Ball valve	1	O.D.φ19.05 Flared
3	Fan guard	1	
4	Fan motor	1	
5	Heat exchanger	1	
6	Fan	1	O.D.480×2
7	Compressor	1	
8	Control box	1	

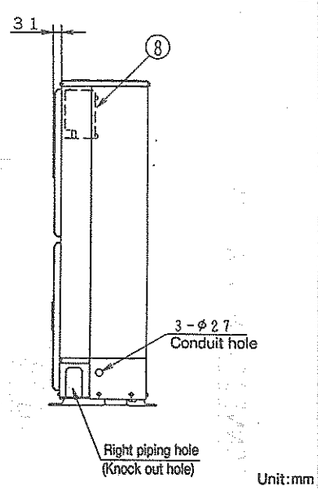








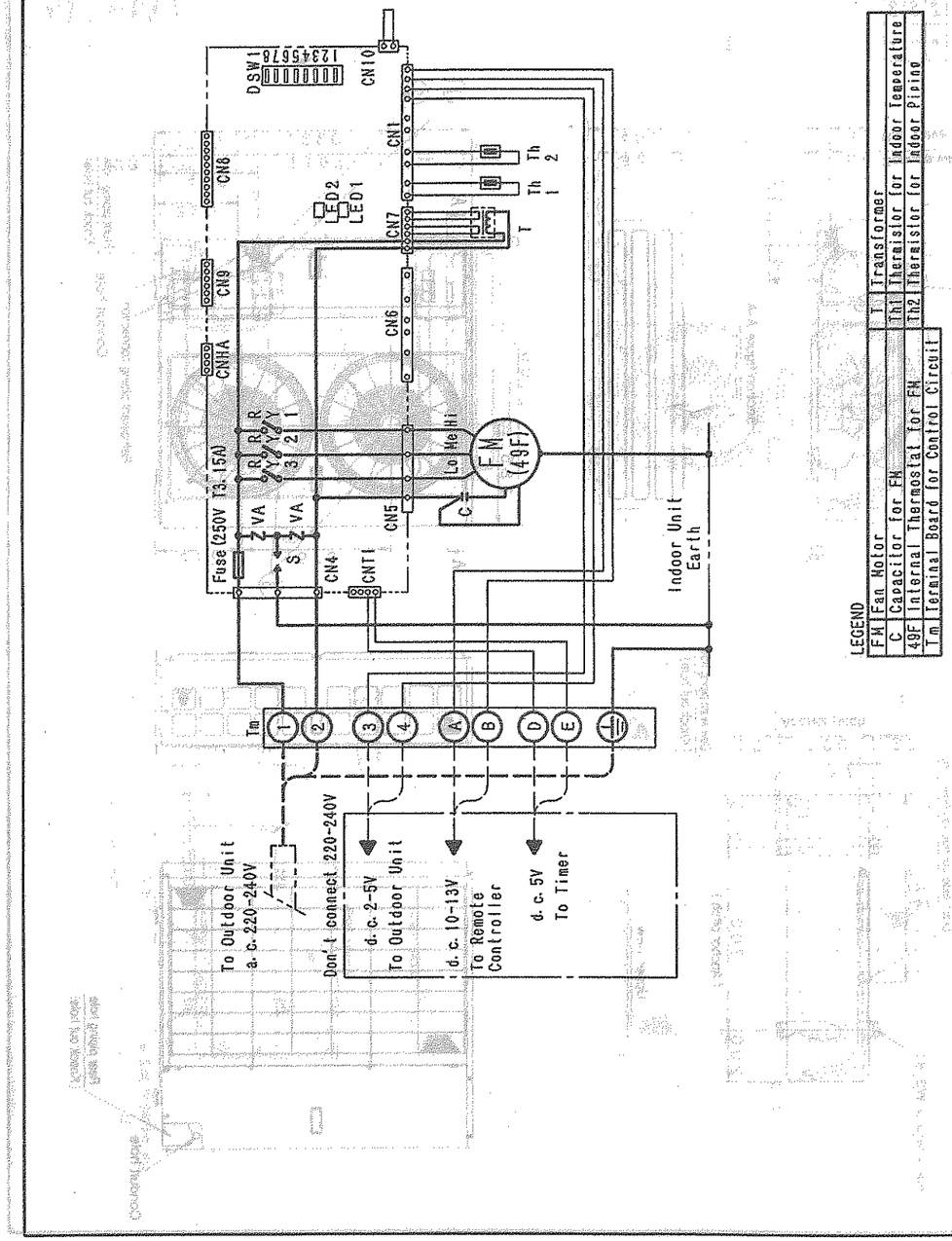




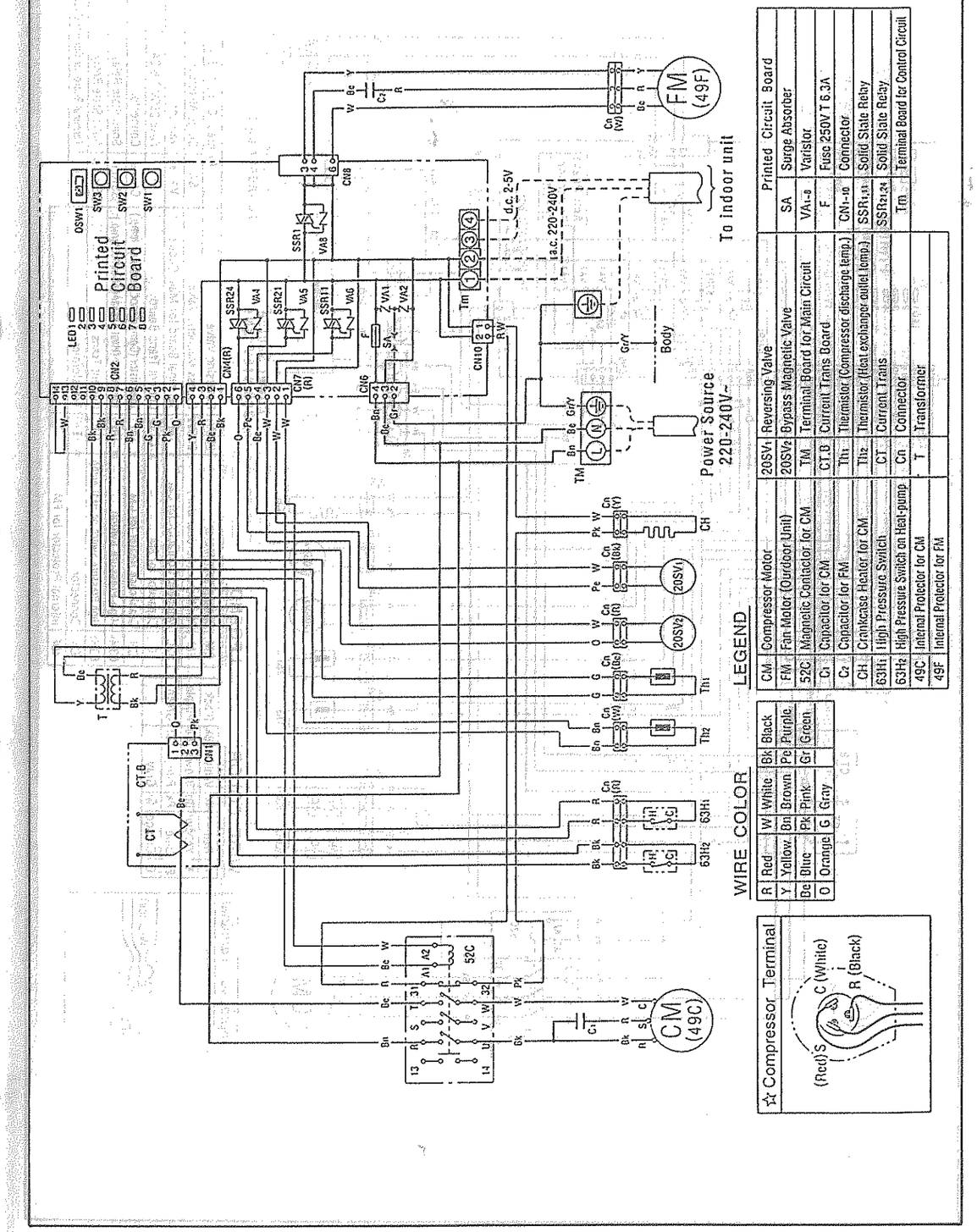
Unit:mm

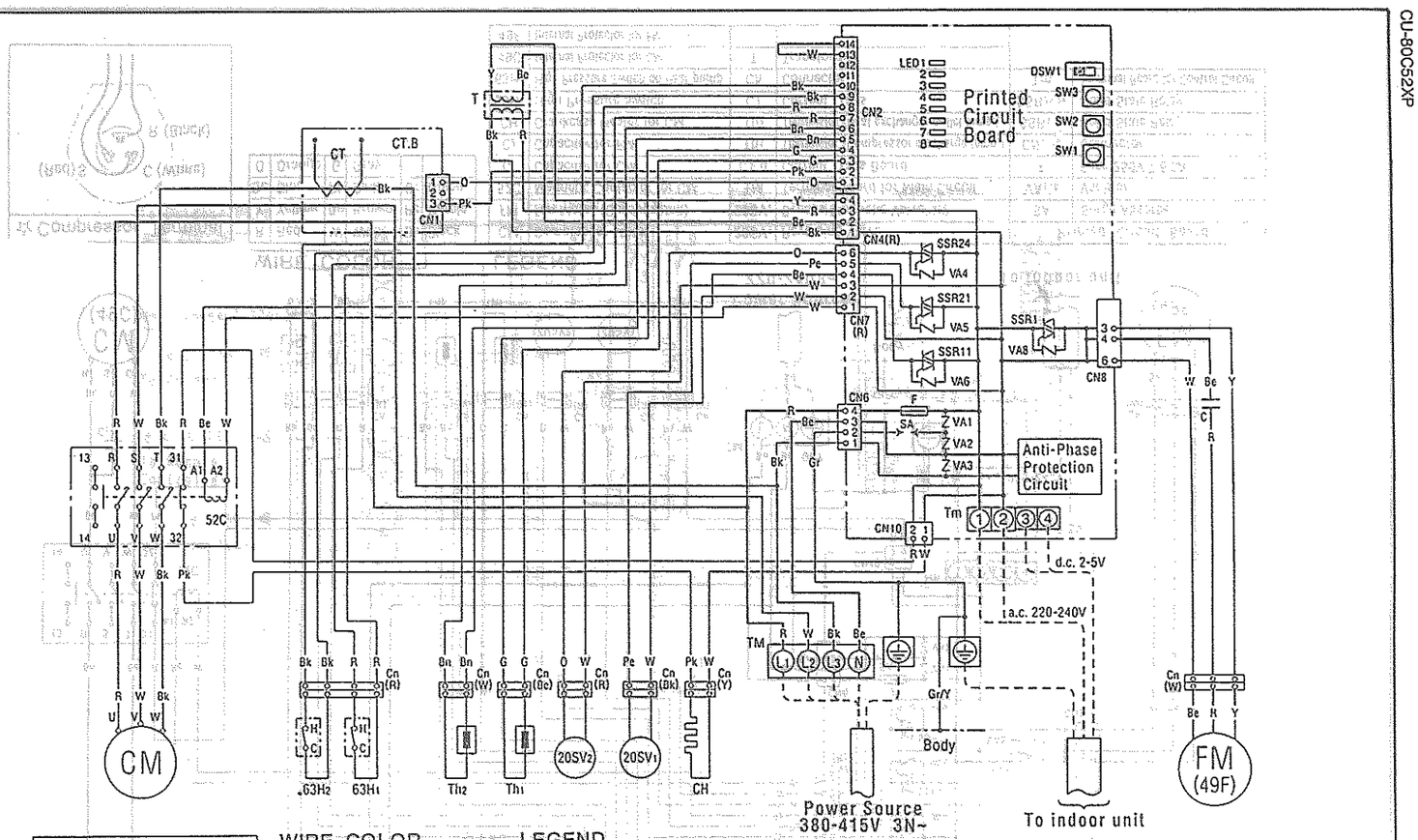
CS-50T32JP, CS-71T32JP, CS-80T32JP
CS-112T32JP, CS-140T32JP, CS-160T32JP

CONNECTION DIAGRAM (Indoor Unit)

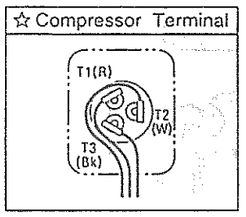


CU-80C52HP





☆ Compressor Terminal

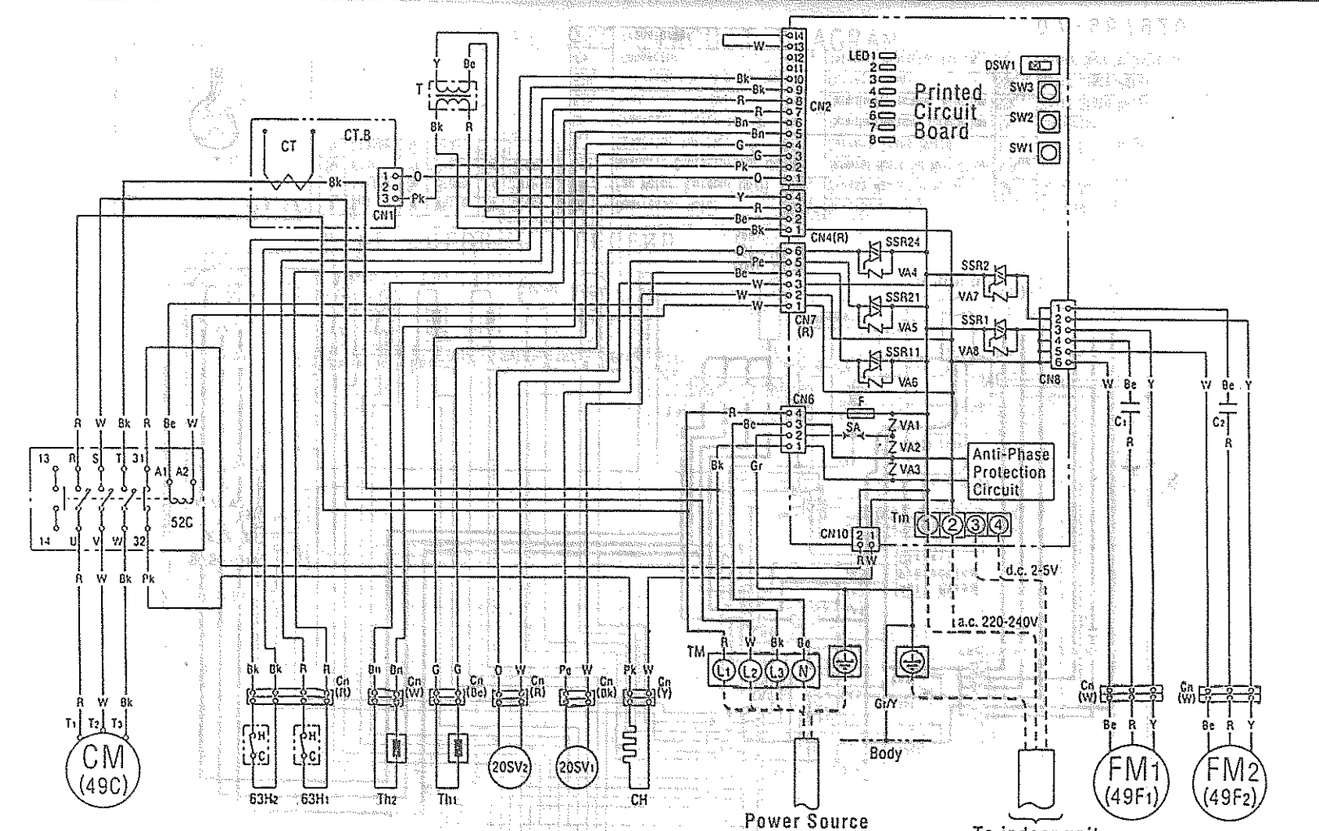


WIRE COLOR

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

LEGEND

CM	Compressor Motor	20SV1	Reversing Valve	Printed Circuit Board	
FM1,2	Fan Motor (Ourdoor Unit)	20SV2	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	VA1-8	Varistor
C1,2	Capacitor for FM1,2	CT.B	Current Trans Board	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th1	Thermistor(Compressor discharge temp.)	CN1-10	Connector
63H1	High Pressure Switch	Th2	Thermistor(Heat exchanger outlet temp.)	SSR1,2,11	Solid State Relay
63H2	High Pressure Switch on Heat-pump	CT	Current Trans	SSR21,24	Solid State Relay
Cn	Connector	49C	Internal Protector for CM	Tm	Terminal Board for Control Circuit
T	Transformer	49F1,2	Internal Protector for FM1,2		



☆ Compressor Terminal

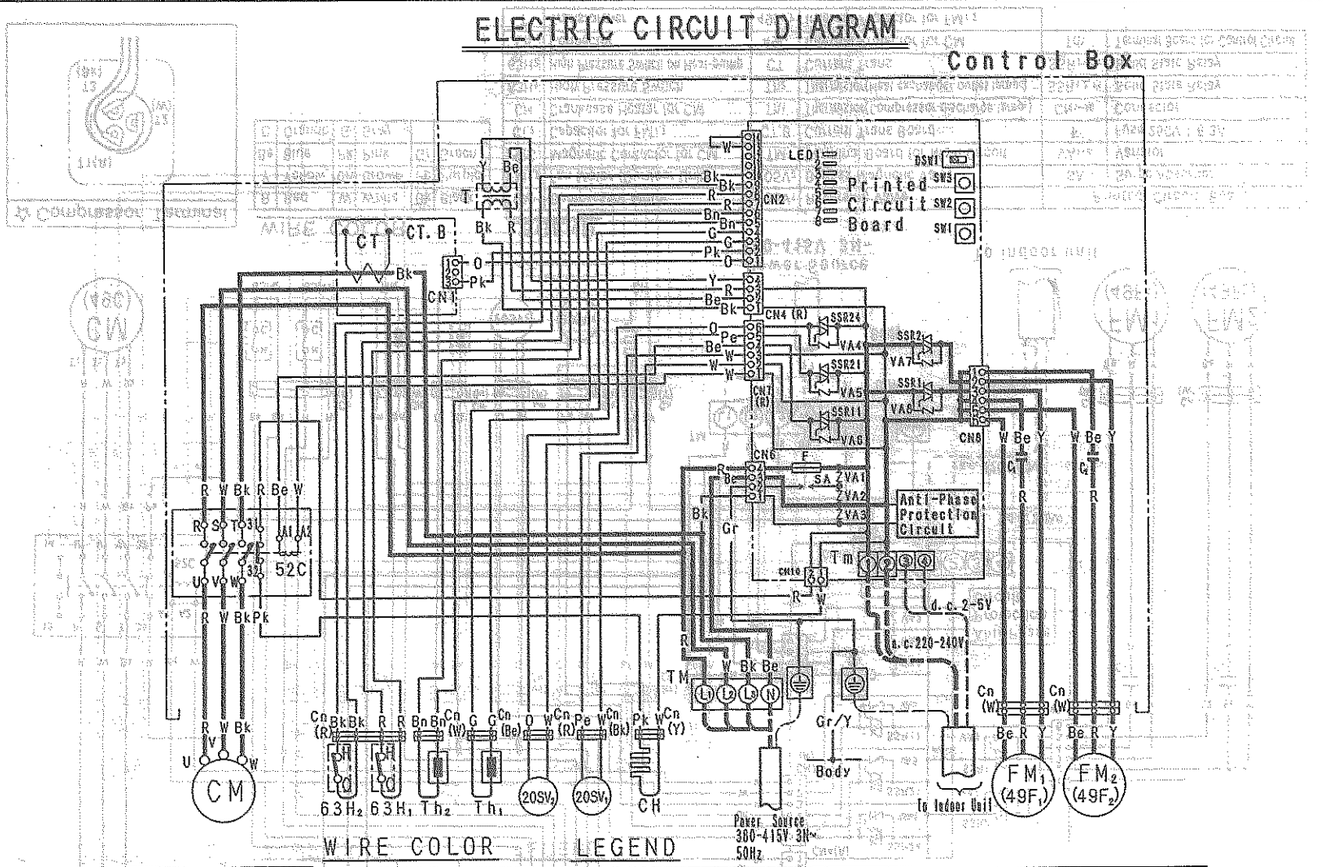
WIRE COLOR

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

LEGEND

CM	Compressor Motor	20SV1	Reversing Valve	Printed Circuit Board	
FM1,2	Fan Motor (Ourdoor Unit)	20SV2	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	VA1-8	Varistor
C1,2	Capacitor for FM1,2	CT.B	Current Trans Board	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th1	Thermistor(Compressor discharge temp.)	CN1-10	Connector
63H1	High Pressure Switch	Th2	Thermistor(Heat exchanger outlet temp.)	SSR1,2,11	Solid State Relay
63H2	High Pressure Switch on Heat-pump	CT	Current Trans	SSR21,24	Solid State Relay
Cn	Connector	49C	Internal Protector for CM	Tm	Terminal Board for Control Circuit
T	Transformer	49F1,2	Internal Protector for FM1,2		

ELECTRIC CIRCUIT DIAGRAM



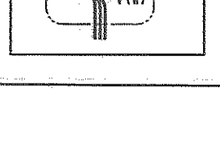
WIRE COLOR

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

LEGEND

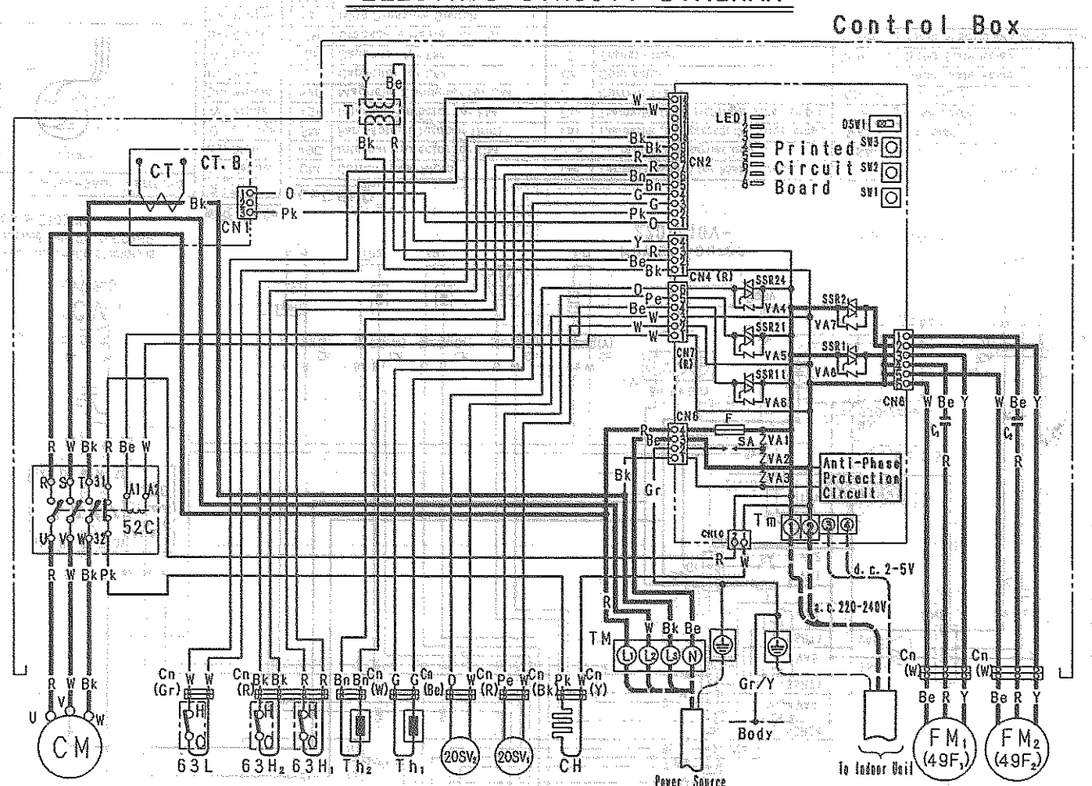
CM	Compressor Motor	$20SV_1$	Reversing Valve	Printed Circuit Board	
$FM_{1,2}$	Fan Motor (Outdoor Unit)	$20SV_2$	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	VA_{1-6}	Varistor
$C_{1,2}$	Capacitor for $FM_{1,2}$	CT. B	Current Trans Board	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th_1	Thermistor(Compressor discharge temp.)	CN_{1-8}	Connector
$63H_1$	High Pressure Switch	Th_2	Thermistor(Heat exchanger outlet temp.)	$SSR_{1,11}$	Solid State Relay
$63H_2$	High Pressure Switch on Heat-pump	CT	Current Trans	$SSR_{21,24}$	Solid State Relay
63L	Low Pressure Switch	$49F_{1,2}$	Internal Protector for $FM_{1,2}$	Tm	Terminal Board for Control Circuit
Cn	Connector				
T	Transformer				

※Compressor Terminal



07-967920

ELECTRIC CIRCUIT DIAGRAM



WIRE COLOR

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

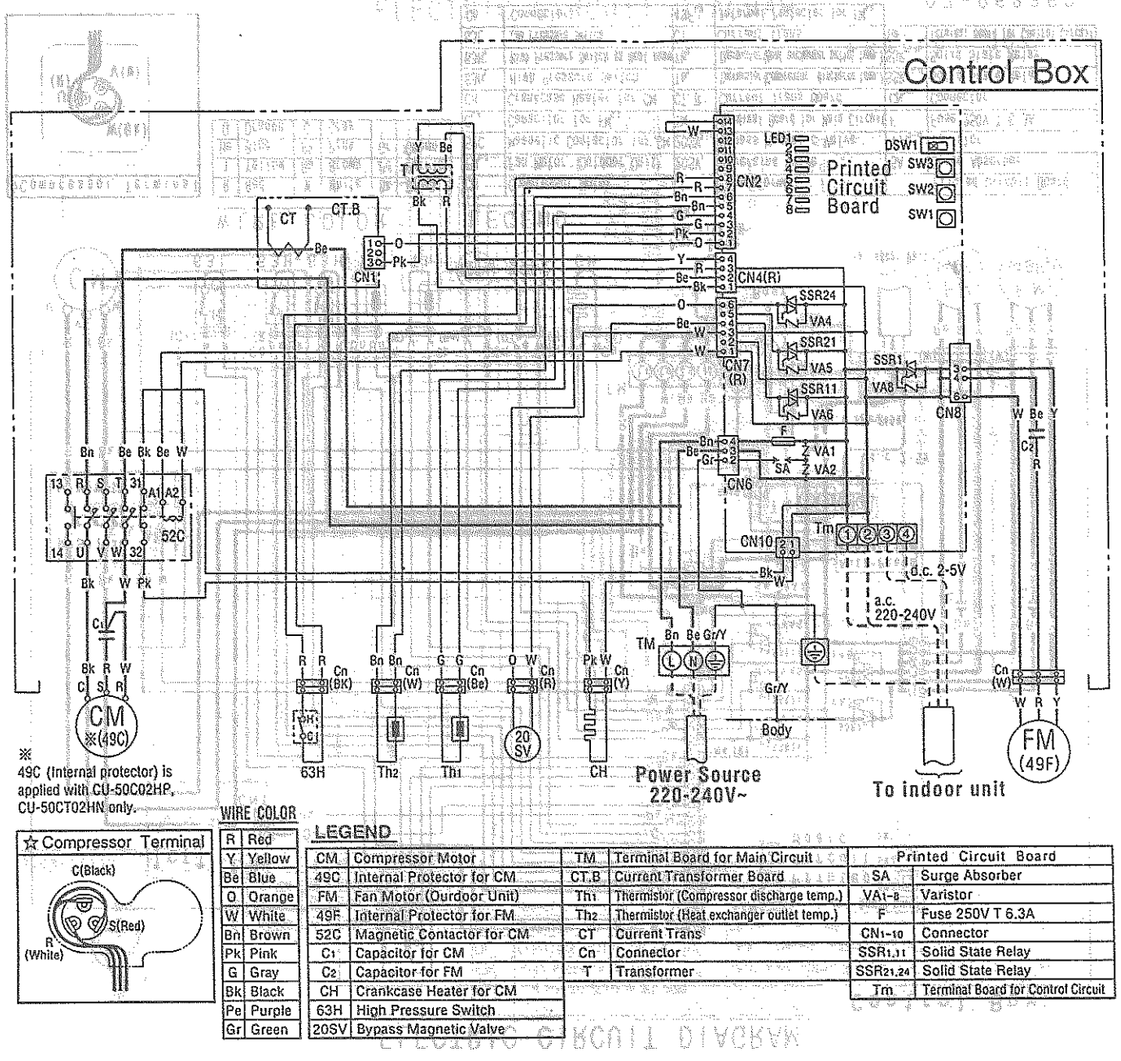
LEGEND

CM	Compressor Motor	T	Transformer	Printed Circuit Board	
$FM_{1,2}$	Fan Motor (Outdoor Unit)	$20SV_1$	Reversing Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	$20SV_2$	Bypass Magnetic Valve	VA_{1-6}	Varistor
$C_{1,2}$	Capacitor for $FM_{1,2}$	TM	Terminal Board for Main Circuit	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	CT. B	Current Trans Board	CN_{1-8}	Connector
$63H_1$	High Pressure Switch	Th_1	Thermistor(Compressor discharge temp.)	$SSR_{1,11}$	Solid State Relay
$63H_2$	High Pressure Switch on Heat-pump	Th_2	Thermistor(Heat exchanger outlet temp.)	$SSR_{21,24}$	Solid State Relay
63L	Low Pressure Switch	CT	Current Trans	Tm	Terminal Board for Control Circuit
Cn	Connector	$49F_{1,2}$	Internal Protector for $FM_{1,2}$		

※Compressor Terminal

07-968360

CU-50C02HP



※ 49C (Internal protector) is applied with CU-50C02HP, CU-50CT02HN only.

☆ Compressor Terminal

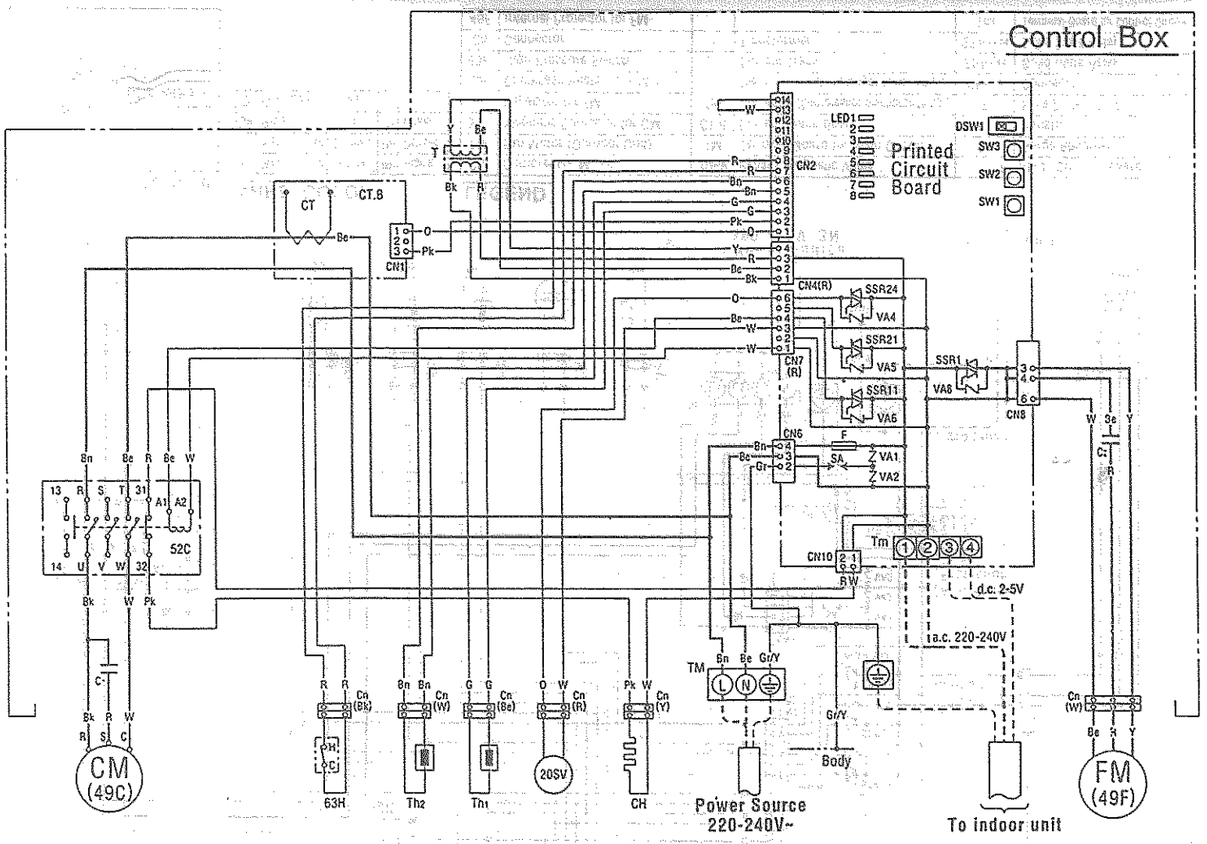
WIRE COLOR

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

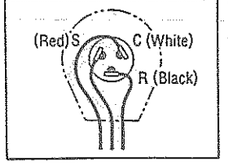
LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit	Printed Circuit Board	
49C	Internal Protector for CM	CT.B	Current Transformer Board	SA	Surge Absorber
FM	Fan Motor (Ourdoor Unit)	Th1	Thermistor (Compressor discharge temp.)	VA1~8	Varistor
49F	Internal Protector for FM	Th2	Thermistor (Heat exchanger outlet temp.)	F	Fuse 250V T 6.3A
52C	Magnetic Contactor for CM	CT	Current Trans	CN1~10	Connector
C1	Capacitor for CM	Cn	Connector	SSR1,11	Solid State Relay
C2	Capacitor for FM	T	Transformer	SSR21,24	Solid State Relay
CH	Crankcase Heater for CM			Tm	Terminal Board for Control Circuit
63H	High Pressure Switch				
20SV	Bypass Magnetic Valve				

CU-71C02HP, CU-80C02HP



☆ Compressor Terminal

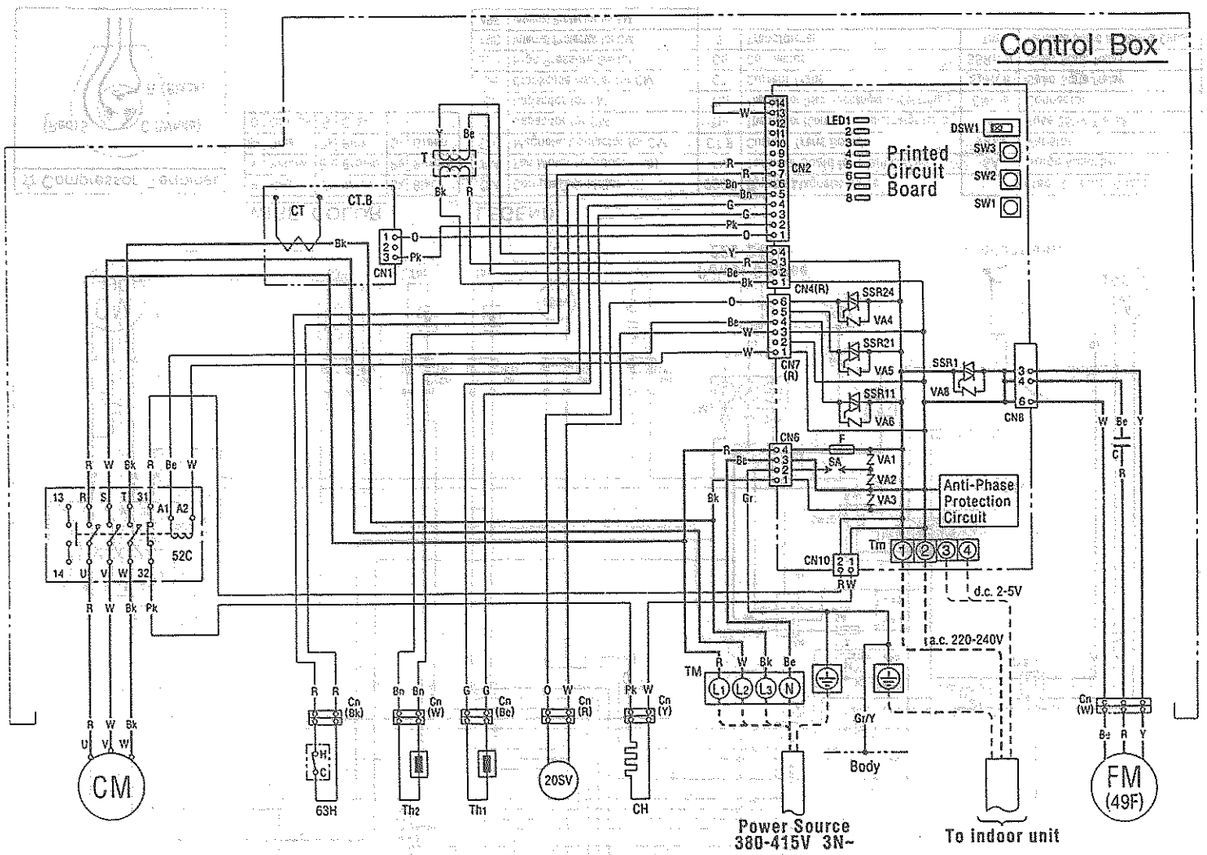


WIRE COLOR

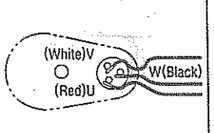
R	Red	W	White	Bk	Black
Y	Yellow	Bn	Brown	Pe	Purple
Be	Blue	Pk	Pink	Gr	Green
O	Orange	G	Gray		

LEGEND

CM	Compressor Motor	20SV	Bypass Magnetic Valve	Printed Circuit Board	
FM	Fan Motor (Ourdoor Unit)	TM	Terminal Board for Main Circuit	SA	Surge Absorber
52C	Magnetic Contactor for CM	CT.B	Current Trans Board	VA1~8	Varistor
C1	Capacitor for CM	Th1	Thermistor (Compressor discharge temp.)	F	Fuse 250V T 6.3A
C2	Capacitor for FM	Th2	Thermistor (Heat exchanger outlet temp.)	CN1~10	Connector
CH	Crankcase Heater for CM	CT	Current Trans	SSR1,11	Solid State Relay
63H	High Pressure Switch	Cn	Connector	SSR21,24	Solid State Relay
49C	Internal Protector for CM	T	Transformer	Tm	Terminal Board for Control Circuit
49F	Internal Protector for FM				



☆ Compressor Terminal

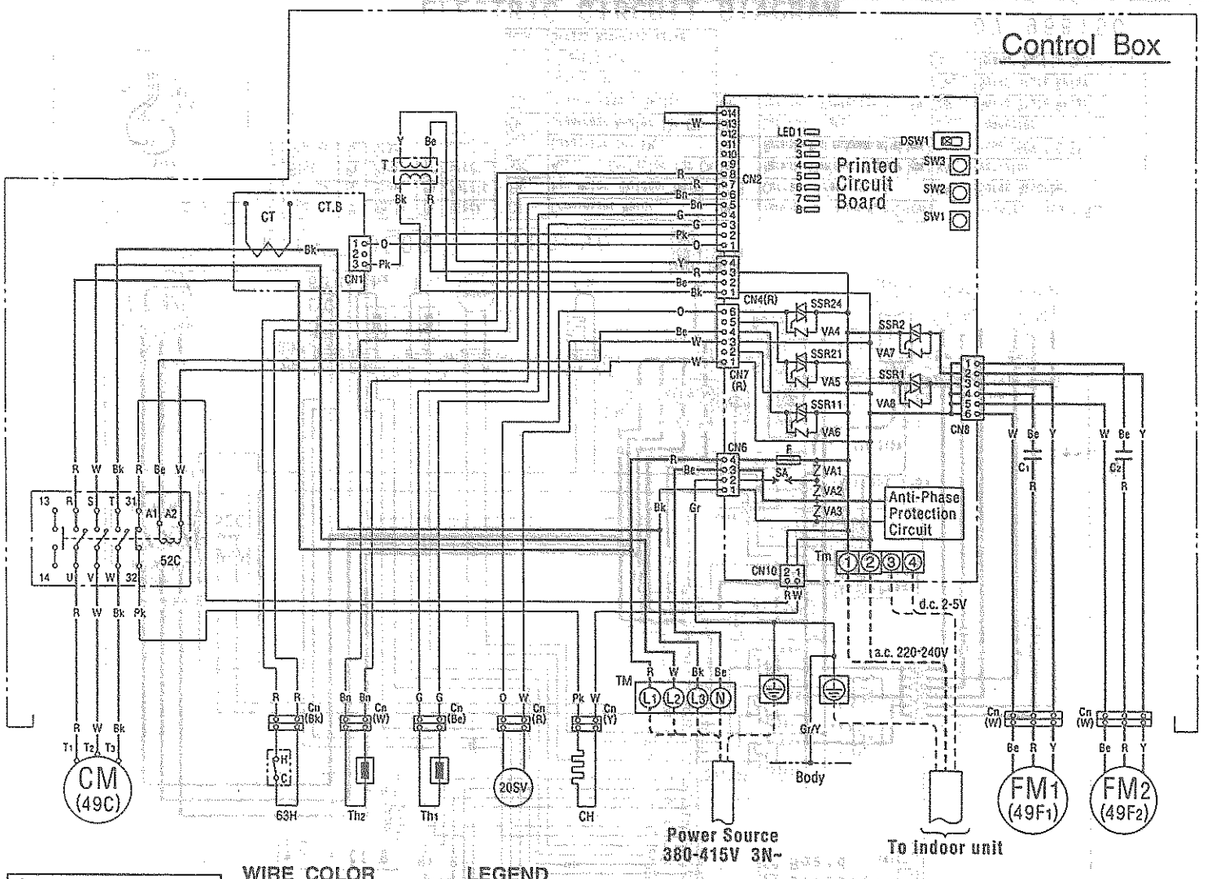


WIRE COLOR

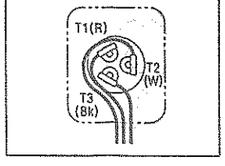
R	Red	W	White	Bk	Black
Y	Yellow	Bn	Brown	Pe	Purple
Be	Blue	Pk	Pink	Gr	Green
O	Orange	G	Gray		

LEGEND

CM	Compressor Motor	20SV	Bypass Magnetic Valve	Printed Circuit Board	
FM	Fan Motor (Ourdoor Unit)	TM	Terminal Board for Main Circuit	SA	Surge Absorber
52C	Magnetic Contactor for CM	CT.B	Current Trans Board	VA_{1-8}	Varistor
C	Capacitor for FM	Th_1	Thermistor (Compressor discharge temp.)	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th_2	Thermistor (Heat exchanger outlet temp.)	CN_{1-10}	Connector
63H	High Pressure Switch	CT	Current Trans	$SSR_{1,11}$	Solid State Relay
Cn	Connector	T	Transformer	$SSR_{21,24}$	Solid State Relay
49F	Internal Protector for FM			Tm	Terminal Board for Control Circuit



☆ Compressor Terminal



WIRE COLOR

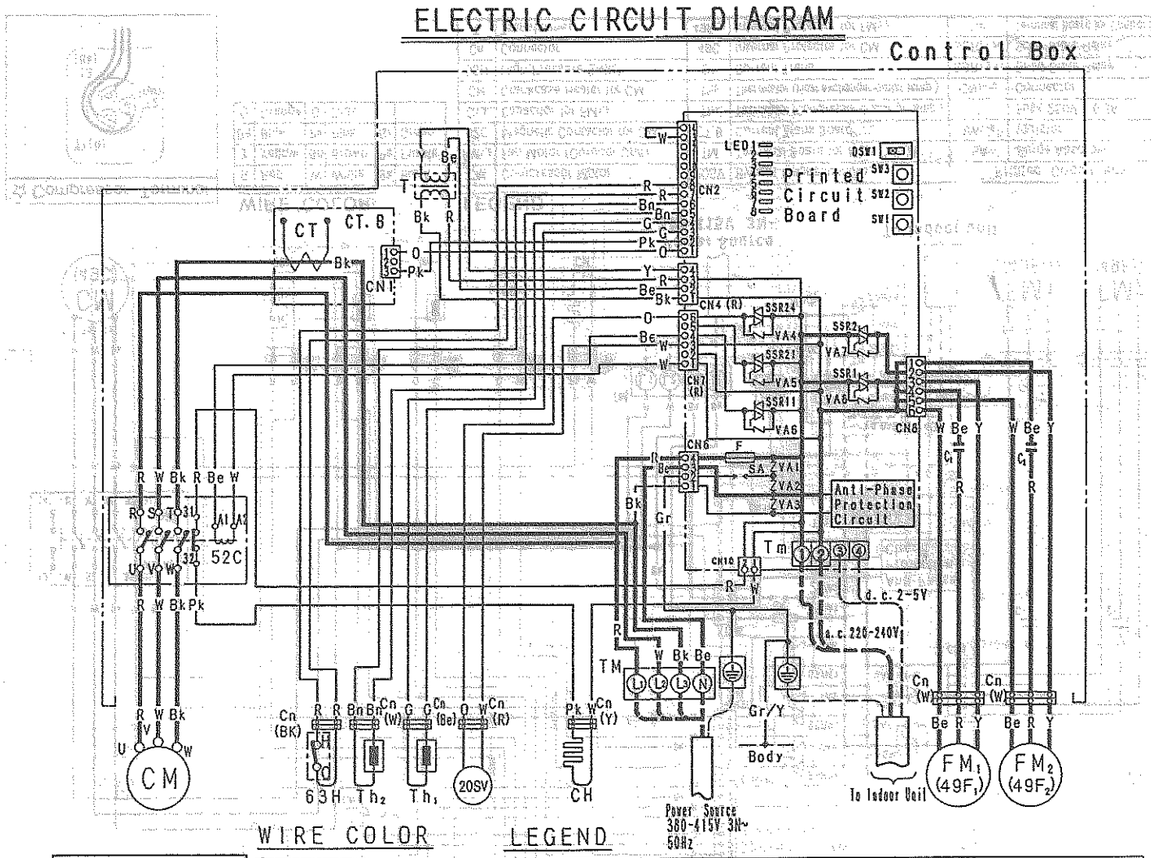
R	Red	W	White	Bk	Black
Y	Yellow	Bn	Brown	Pe	Purple
Be	Blue	Pk	Pink	Gr	Green
O	Orange	G	Gray		

LEGEND

CM	Compressor Motor	20SV	Bypass Magnetic Valve	Printed Circuit Board	
$FM_{1,2}$	Fan Motor (Ourdoor Unit)	TM	Terminal Board for Main Circuit	SA	Surge Absorber
52C	Magnetic Contactor for CM	CT.B	Current Trans Board	VA_{1-8}	Varistor
$C_{1,2}$	Capacitor for $FM_{1,2}$	Th_1	Thermistor (Compressor discharge temp.)	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th_2	Thermistor (Heat exchanger outlet temp.)	CN_{1-10}	Connector
63H	High Pressure Switch	CT	Current Trans	$SSR_{1,2,11}$	Solid State Relay
Cn	Connector	49C	Internal Protector for CM	$SSR_{21,24}$	Solid State Relay
T	Transformer	$49F_{1,2}$	Internal Protector for $FM_{1,2}$	Tm	Terminal Board for Control Circuit

CU-140C03XP

ELECTRIC CIRCUIT DIAGRAM



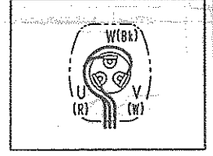
WIRE COLOR

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

LEGEND

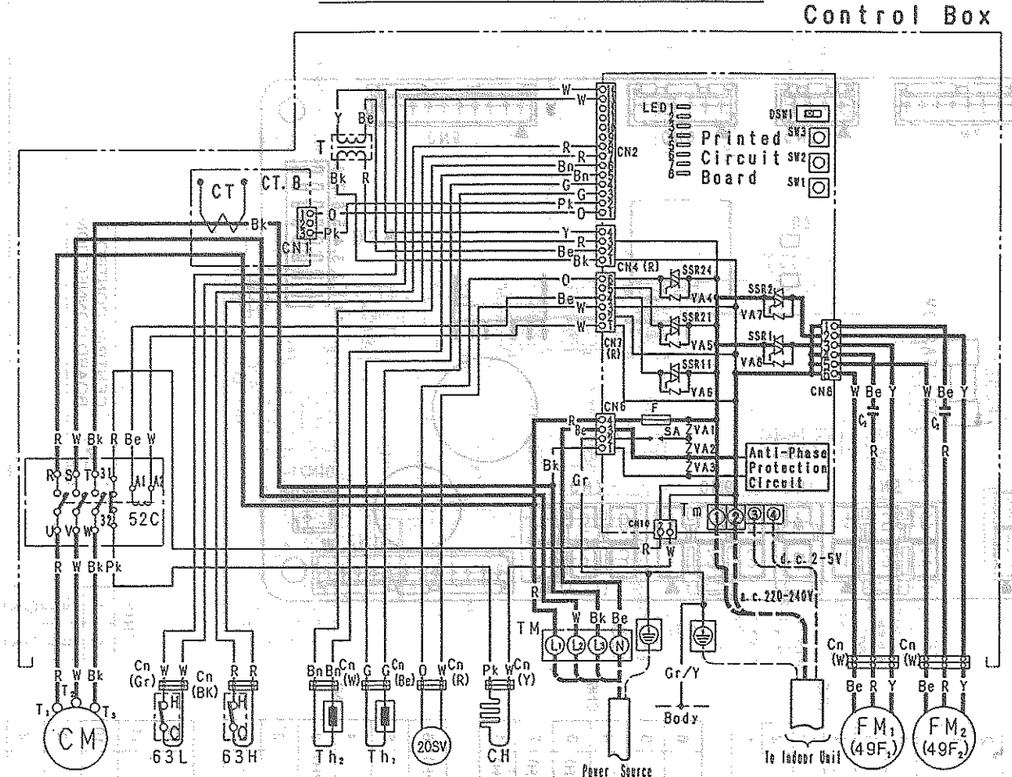
CM	Compressor Motor	TM	Terminal Board for Main Circuit		Printed Circuit Board
$FM_{1,2}$	Fan Motor (Outdoor Unit)	CT. B	Current Trans. Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	$VA_{1\sim8}$	Varistor
$C_{1,2}$	Capacitor for $FM_{1,2}$	Th_2	Thermistor (Heat exchanger outlet temp.)	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	CT	Current Trans	$CN_{1\sim10}$	Connector
63H	High Pressure Switch	$49F_{1,2}$	Internal Protector for FM	$SSR_{1,11}$	Solid State Relay
Cn	Connector			$SSR_{21,24}$	Solid State Relay
T	Transformer			Tm	Terminal Board for Control Circuit
20SV	Bypass Magnetic Valve				

☆Compressor Terminal



CU-160C03XP

ELECTRIC CIRCUIT DIAGRAM



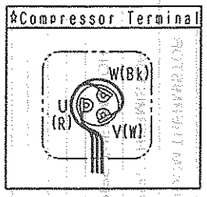
WIRE COLOR

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

LEGEND

CM	Compressor Motor	20SV	Bypass Magnetic Valve		Printed Circuit Board
$FM_{1,2}$	Fan Motor (Outdoor Unit)	TM	Terminal Board for Main Circuit	SA	Surge Absorber
52C	Magnetic Contactor for CM	CT. B	Current Trans. Board	$VA_{1\sim8}$	Varistor
$C_{1,2}$	Capacitor for $FM_{1,2}$	Th_1	Thermistor (Compressor discharge temp.)	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th_2	Thermistor (Heat exchanger outlet temp.)	$CN_{1\sim10}$	Connector
63H	High Pressure Switch	CT	Current Trans	$SSR_{1,11}$	Solid State Relay
63L	Low Pressure Switch	$49F_{1,2}$	Internal Protector for FM	$SSR_{21,24}$	Solid State Relay
Cn	Connector			Tm	Terminal Board for Control Circuit
T	Transformer				

☆Compressor Terminal



■APPLICABLE MODEL
ALL MODEL

●INDOOR UNIT
PRINTED CIRCUIT BOARD

CN4

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

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

CN5

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

CN6

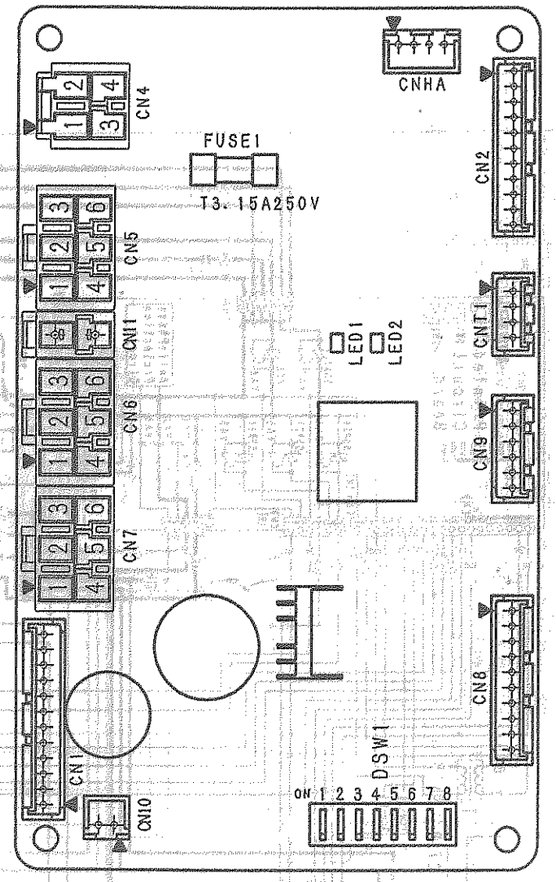
LOUVER MOTOR		6
HEATER		5
DRAIN PUMP		4
COM	(S PH)	3
COM	(S PH)	2
COM	(S PH)	1

CN7

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

CN1

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



CN10

2	FLOAT SW	
1	FLOAT SW	

CN8	CENTRAL CONTROL BOARD CONNECTION

CN2	OPTIONAL BOARD CONNECTION

CNTI

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

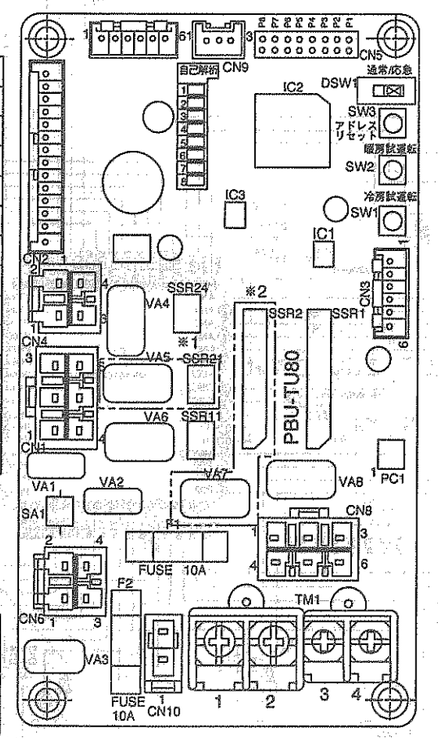
■APPLICABLE MODEL
ALL MODEL

●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

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



TM1

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

CN8

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

CN4

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

CN10

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

CN7

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

CN6

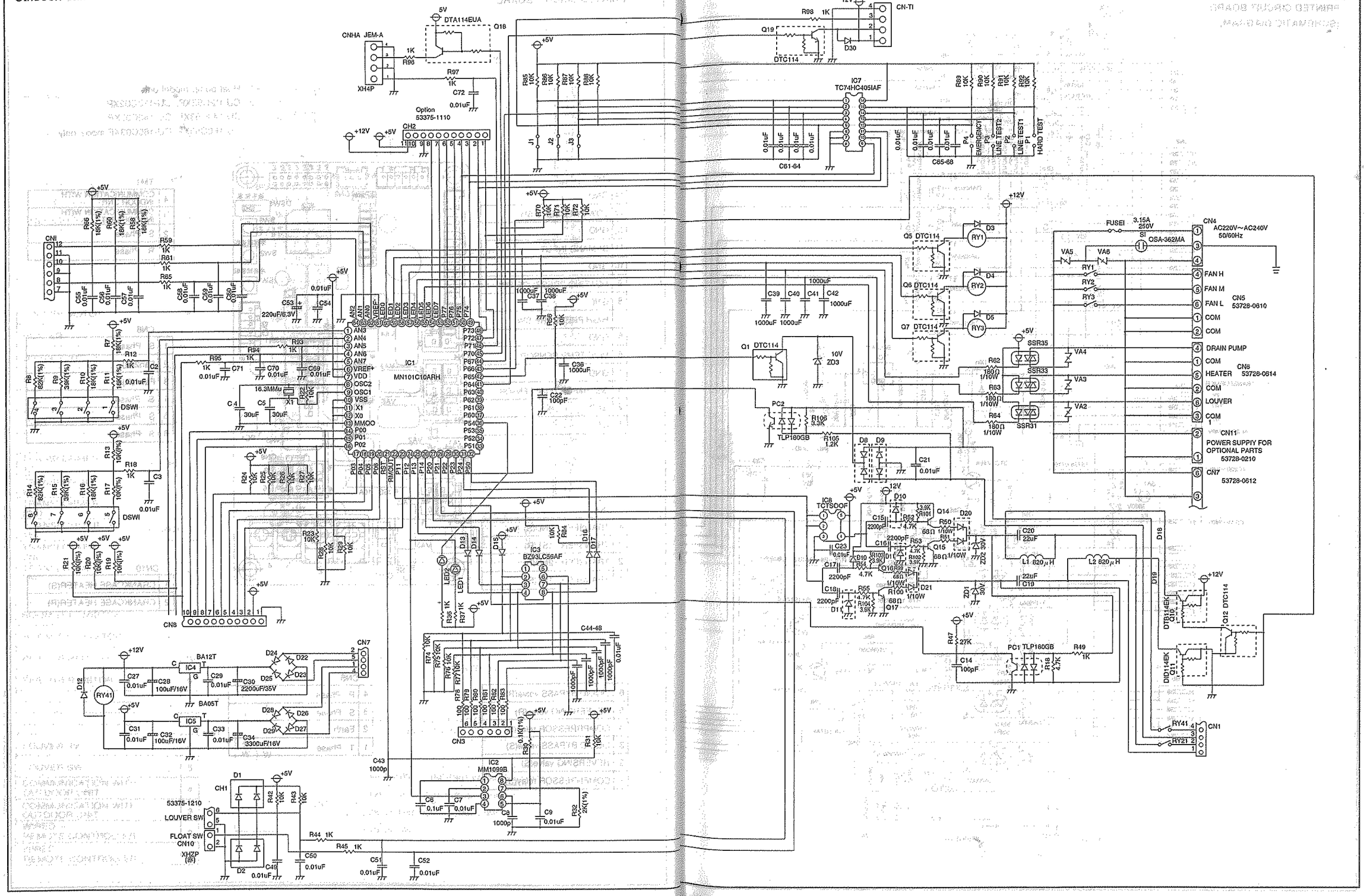
4	R Phase
3	S Phase
2	Earth
1	T Phase

5.CIRCUIT DIAGRAM

APPLICABLE MODEL

ALL MODEL

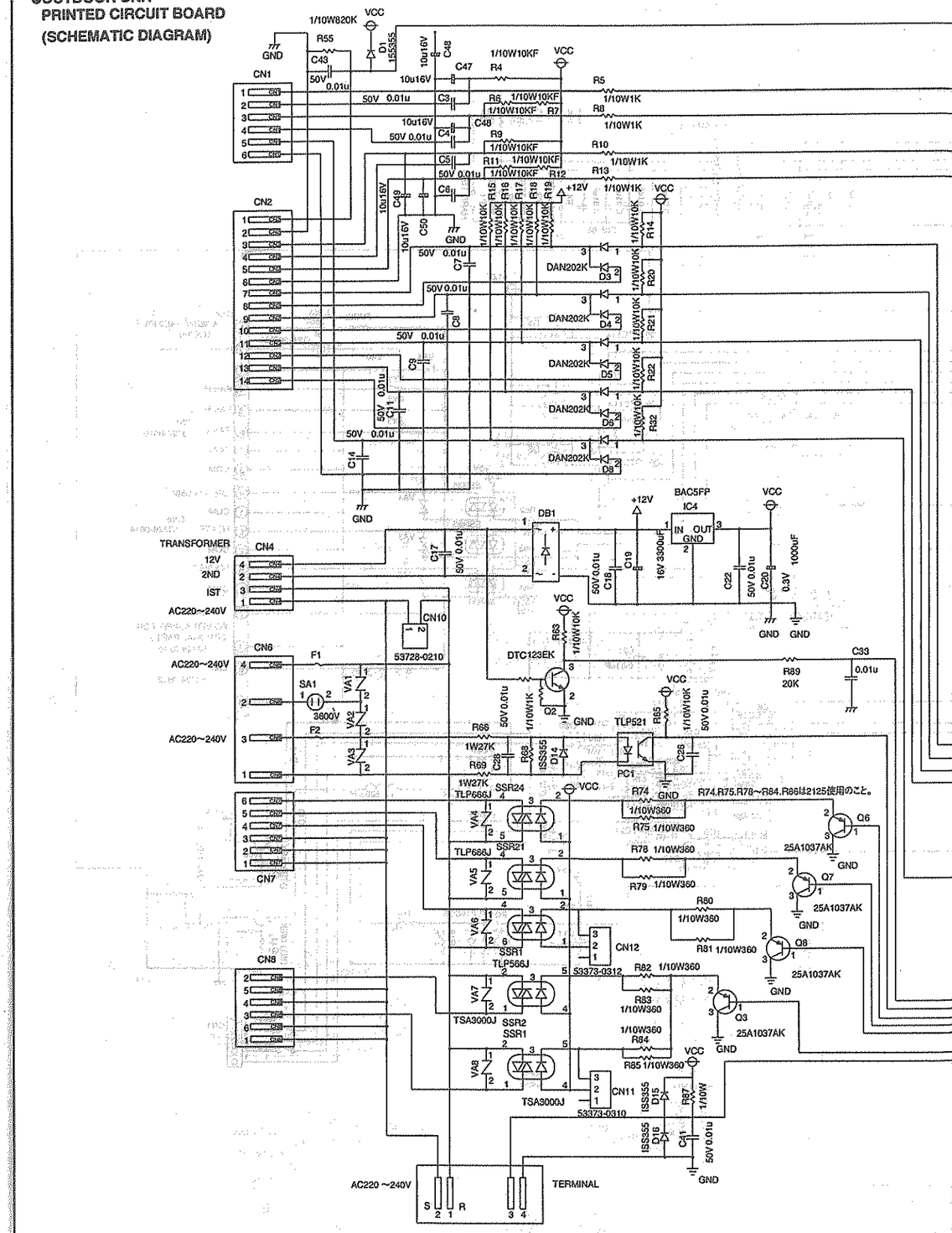
INDOOR UNIT

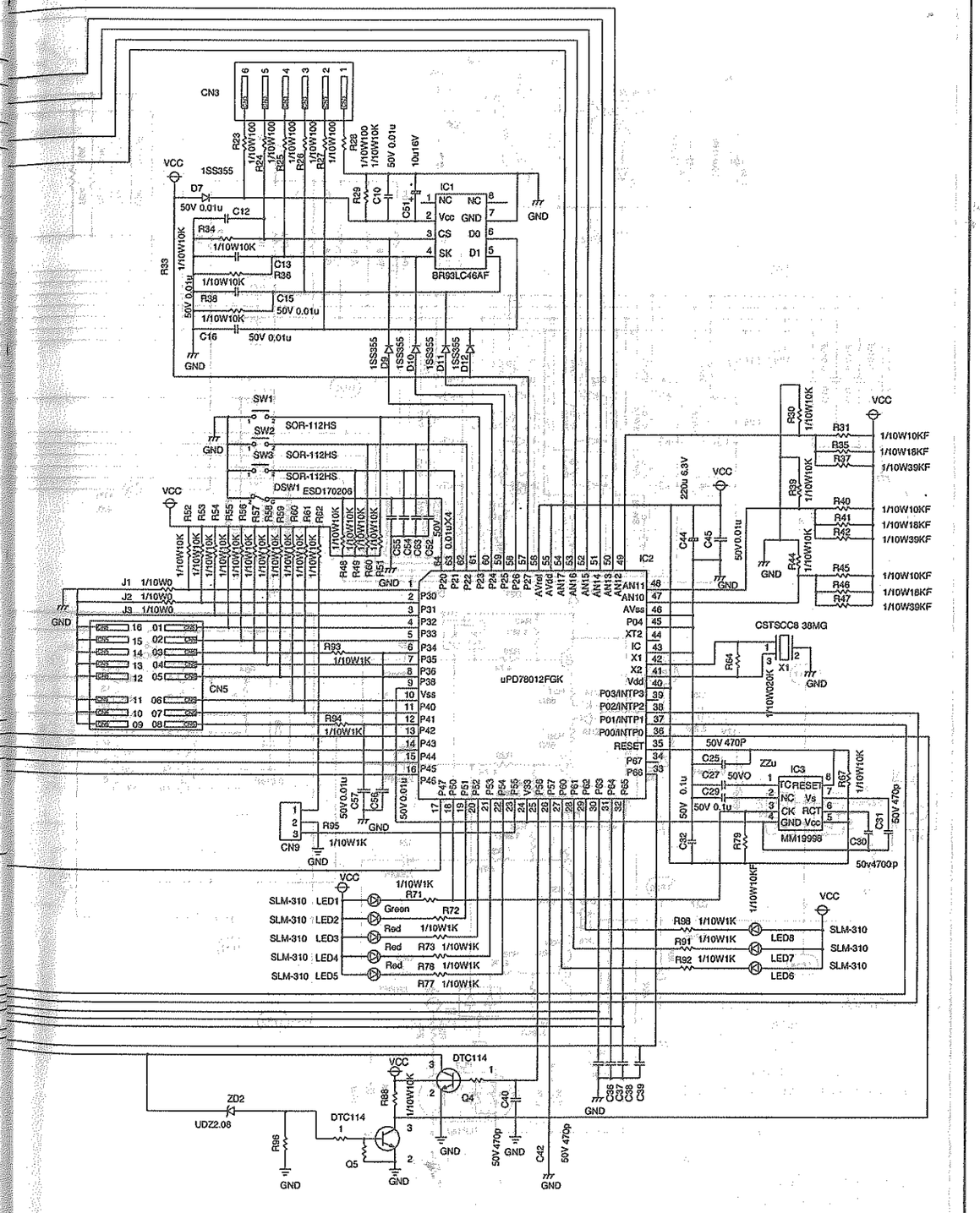


APPLICABLE MODEL

ALL MODEL

●OUTDOOR UNIT PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)



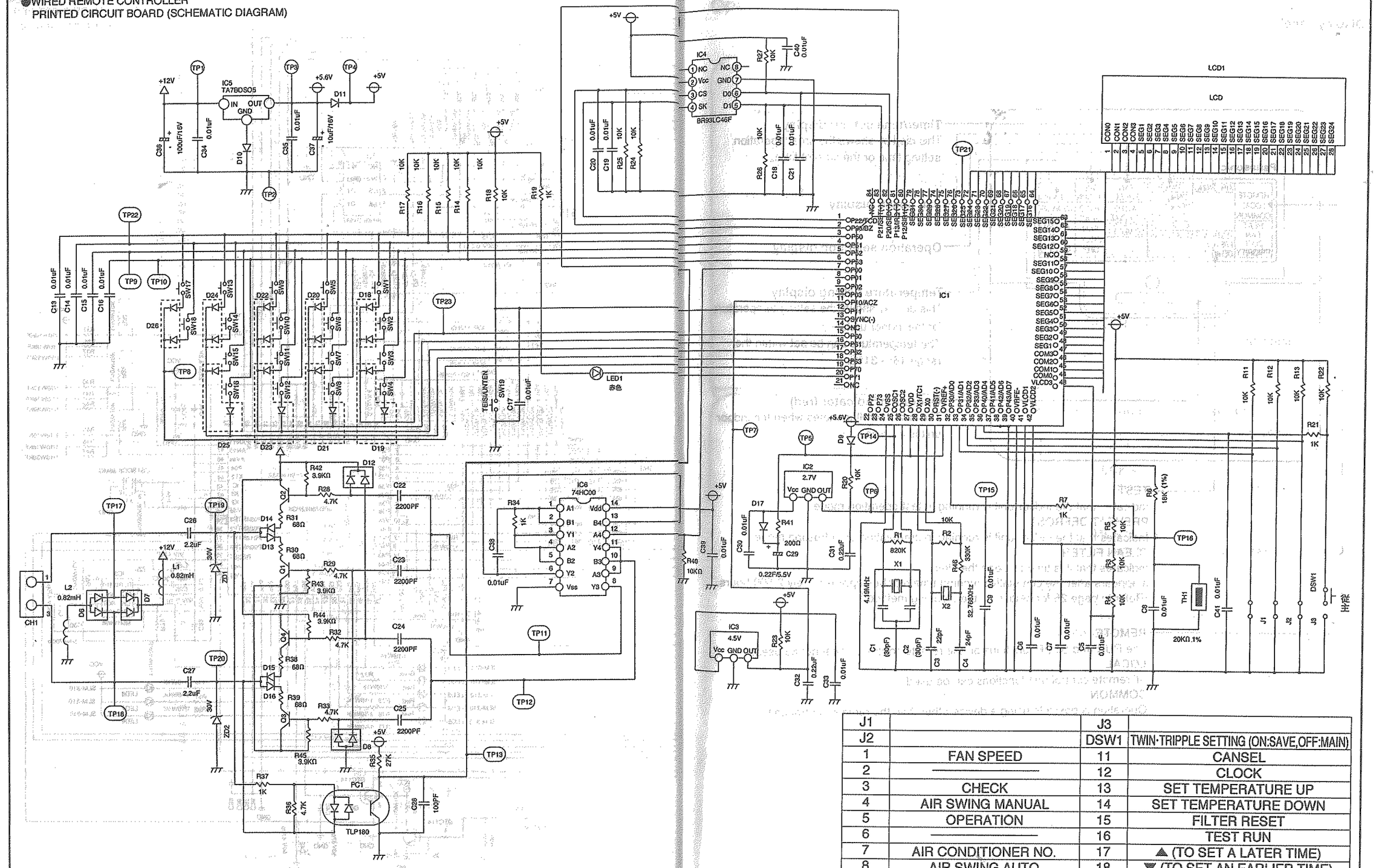


5. CIRCUIT DIAGRAM

APPLICABLE MODEL

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

WIRED REMOTE CONTROLLER PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)

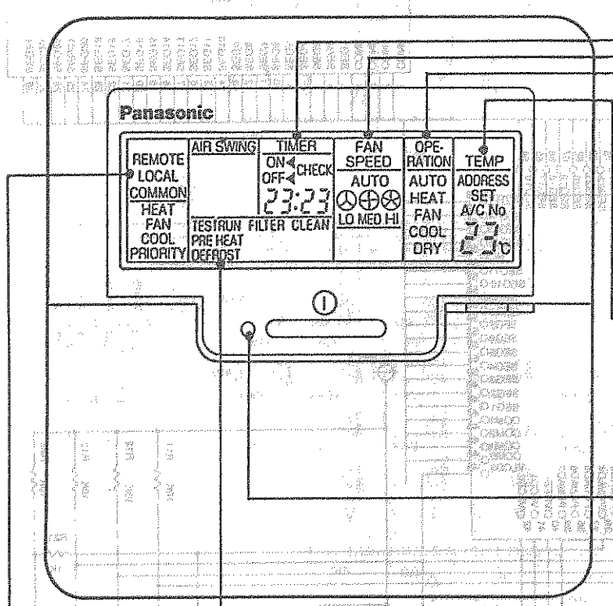


J1		J3	
J2		DSW1	TWIN·TRIPPLE SETTING (ON:SAVE,OFF:MAIN)
1	FAN SPEED	11	CANSEL
2	———	12	CLOCK
3	CHECK	13	SET TEMPERATURE UP
4	AIR SWING MANUAL	14	SET TEMPERATURE DOWN
5	OPERATION	15	FILTER RESET
6	———	16	TEST RUN
7	AIR CONDITIONER NO.	17	▲ (TO SET A LATER TIME)
8	AIR SWING AUTO	18	▼ (TO SET AN EARLIER TIME)
9	TIMER SET (ON/OFF)	19	RUN SWITCH (ON/OFF)
10	RESERVE	20	———

■Wired Remote Controller

Name and function of each part

Display panel



Timer/time setting display
This display shows the timer operation setting time or the current time.

Fan speed display

Operation selection display

Temperature setting display
This display shows the setting temperature for the indoor unit.
The temperature can be set within the range 16° - 31°C.

Operation indicator (red)
This indicator illuminates when the indoor unit is running.

TEST
Indicates that the indoor unit is running in test operation mode.

PREHEAT DEFROST
Indicates that the indoor unit is running in pre-heating or defrosting mode.

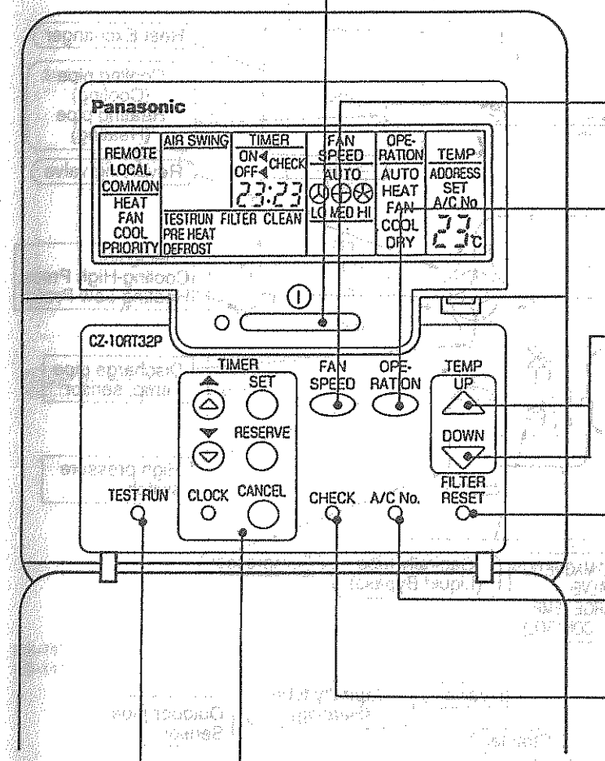
CLEAN FILTER
Indicates that it is time to clean the filter.
It appears after the cumulative running time reaches approximately 2,500 hours.
(Refer to page 26 for details on the cleaning method.)

REMOTE
The RUN and STOP functions on the remote control unit cannot be used.

LOCAL
All remote control unit functions can be used.

COMMON
Operation is possible using a device other than the remote control unit.

Operating panel



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

FAN SPEED switch

OPERATION MODE switch

TEMPERATURE SETTING switch

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

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

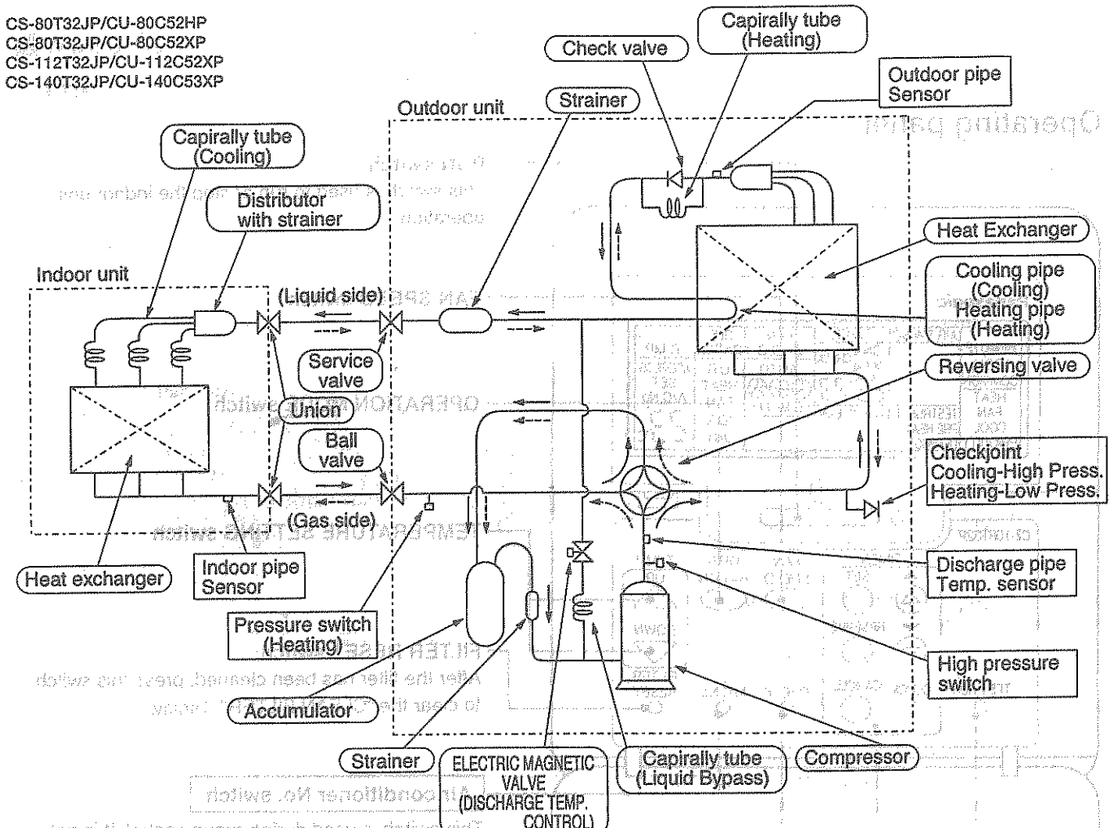
CHECK switch
Press this switch if the check display is flashing.

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

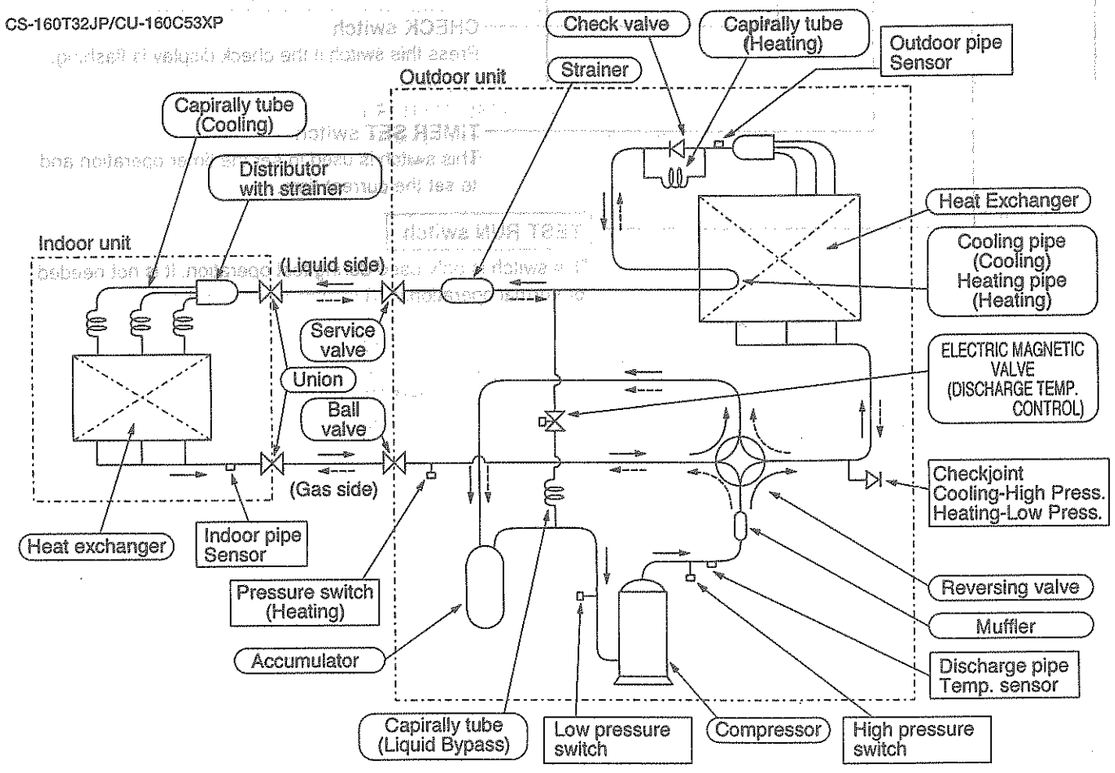
TEST RUN switch
This switch is only used during test operation. It is not needed for normal operation.

7. REFRIGERATION CYCLE(HEAT PUMP TYPE)

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

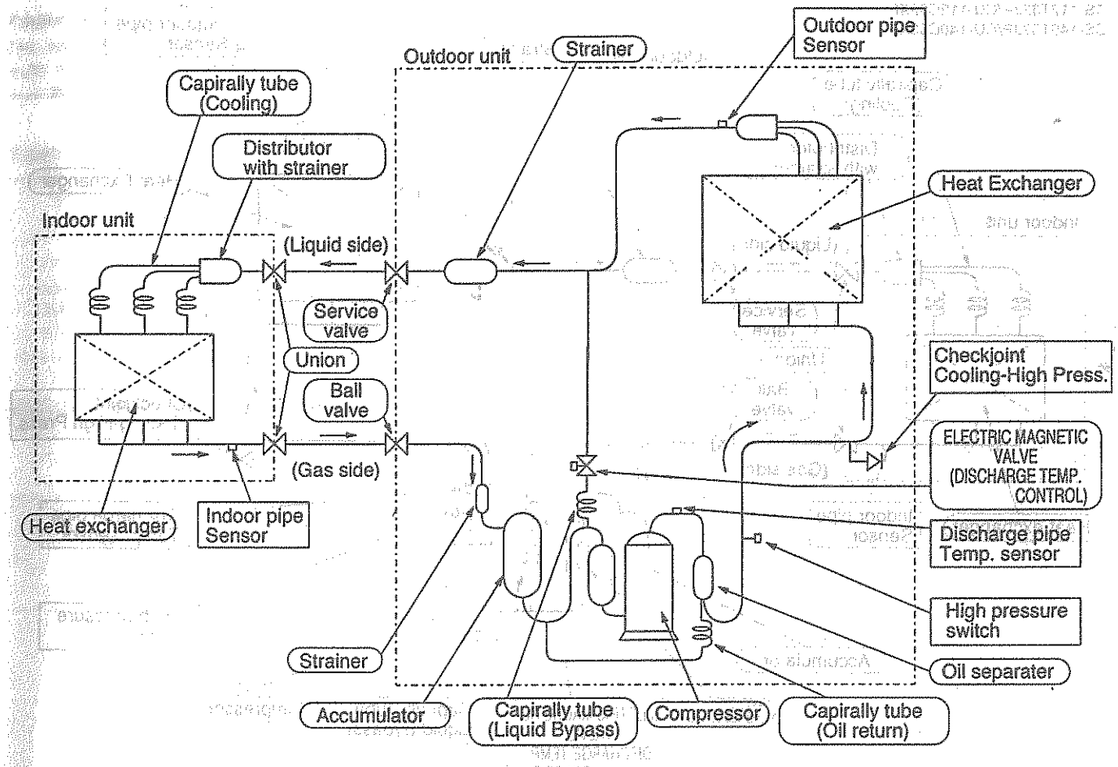


CS-160T32JP/CU-160C53XP

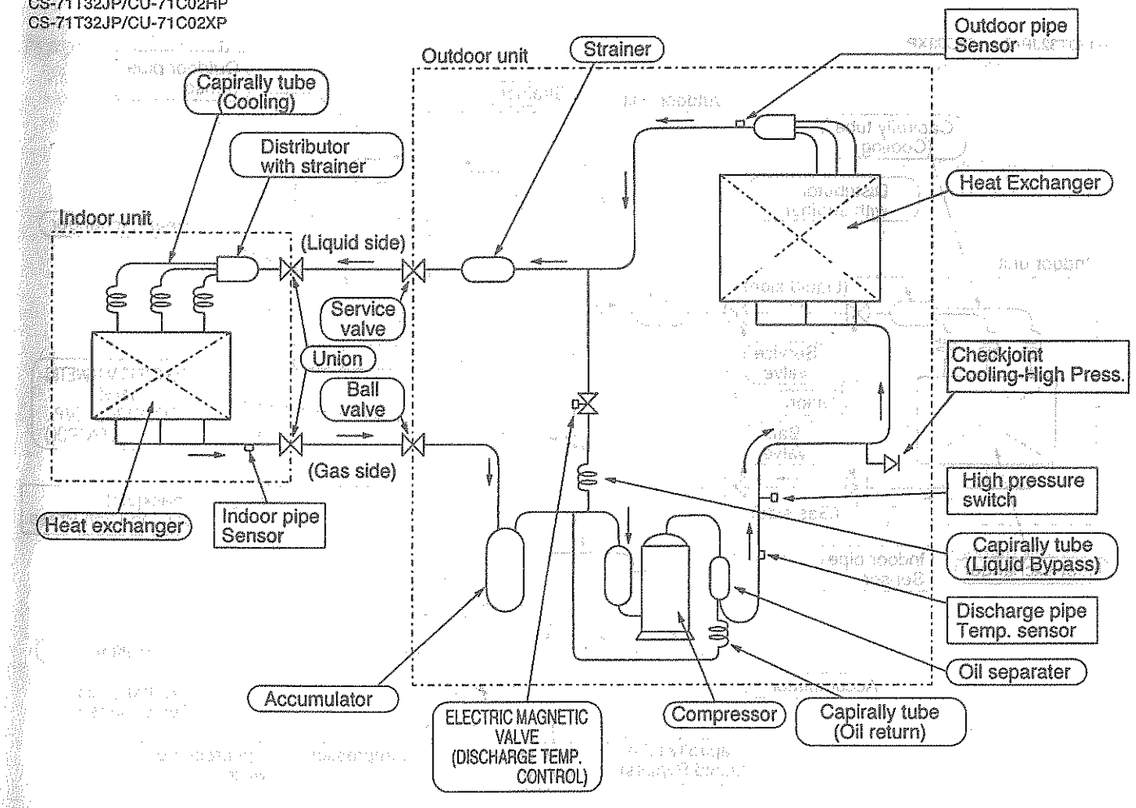


7. REFRIGERATION CYCLE(COOLING ONLY TYPE)

CS-50T32JP/CU-50C02HP

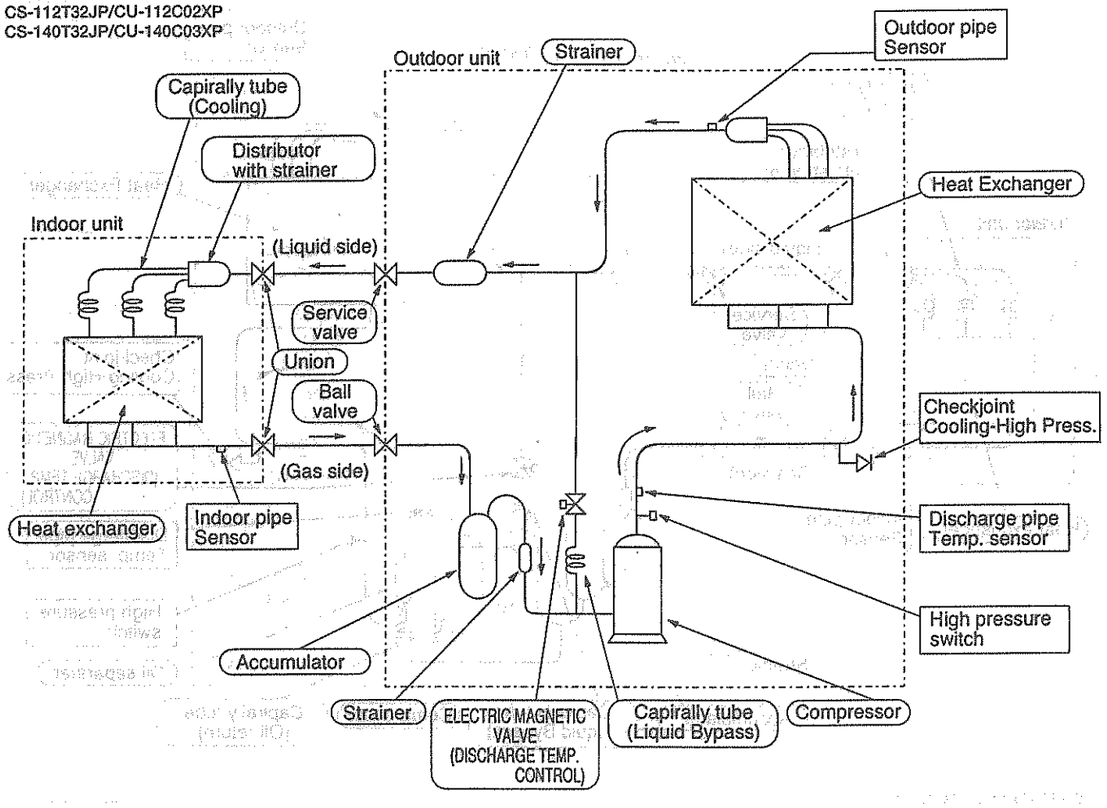


CS-71T32JP/CU-71C02HP
CS-71T32JP/CU-71C02XP

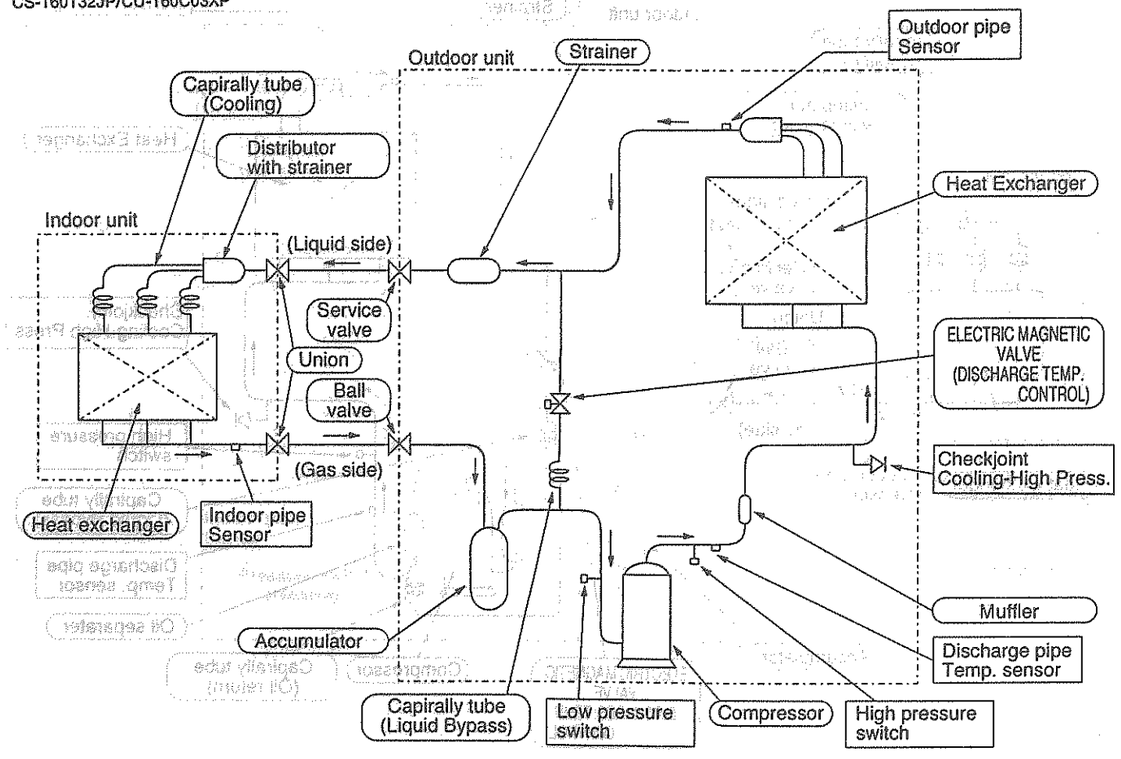


7. REFRIGERATION CYCLE (COOLING ONLY TYPE)

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



CS-160T32JP/CU-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.

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	3N~380	50	418	342
50C02HP	1~230	50	253	207		3N~400	50	440	360
71C02HP	1~240	50	254	216	71C02XP 80C02XP 112C02XP 140C03XP 160C03XP	3N~415	50	440	374
80C02HP									

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 exlsting piping

CU-C52, CU-C02 series changes the liquld pipe size of the previous series. It is possible to use the exlsting 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 (φmm)	Gas piping (φmm)	Gas charge-less length (m)	Additional gas volume (g/m)	Liquid piping (φmm)	Gas piping (φmm)	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.

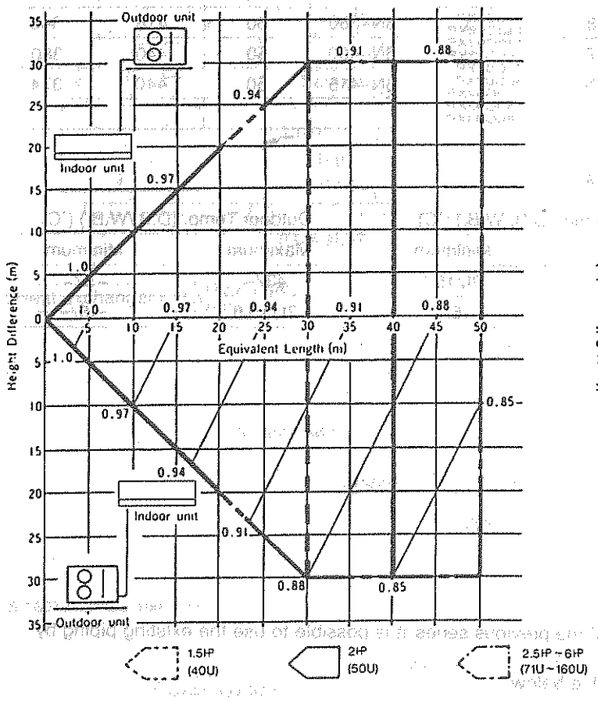
■ CORRECTION OF COOLING AND HEATING CAPACITIES

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

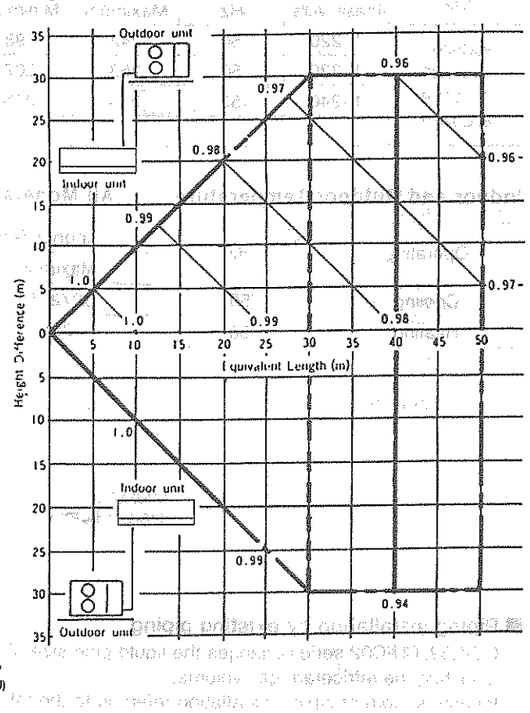
The data of cooling capacities (marked on the name plate) are based on 5 meters connecting pipe and horizontal installation.

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

(Cooling)



(Heating)



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.

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

■ 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.

Model	Ref. Charge
1.5~2.5HP	20g per 1m
3~6HP	50g per 1m

Example: CS-71U32JP

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

CS-140U32JP

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

	Model	Main Power Source		Compressor Motor			Evaporator Fan Motor		Condenser Fan Motor	
		Voltage	Frequency	S.C.	R.C.(A)	IPT(kW)	R.C.	IPT	R.C.	IPT
		(V)	(Hz)	(A)	COOL/HEAT	COOL/HEAT	(A)	(kW)	(A)	(kW)
HEAT PUMP MODEL	CS-80T32JP CS-80C52HP	220	50	56.0	10.81/11.1	2.48/2.24	0.69	0.14	0.50	0.11
		230	50	56.0	10.61/10.8	2.48/2.24	0.69	0.14	0.50	0.11
		240	50	56.0	10.47/10.57	2.48/2.24	0.63	0.14	0.50	0.11
	CS-80T32JP CS-80C52XP	380	50	26.0	4.20/4.10	2.48/2.24	0.69	0.14	0.50	0.11
		400	50	26.0	4.10/4.00	2.48/2.24	0.69	0.14	0.50	0.11
		415	50	26.0	4.02/3.92	2.48/2.24	0.63	0.14	0.50	0.11
	CS-112T32JP CS-112C52XP	380	50	48.0	4.96/5.06	2.75/2.77	0.91	0.18	1.01	0.22
		400	50	48.0	4.77/4.87	2.75/2.77	0.87	0.18	1.01	0.22
		415	50	48.0	4.69/4.79	2.75/2.77	0.83	0.18	1.01	0.22
	CS-140T32JP CS-140C53XP	380	50	62.0	7.62/7.52	4.21/4.02	0.77	0.16	0.96	0.22
		400	50	62.0	7.53/7.43	4.21/4.02	0.75	0.16	0.96	0.22
		415	50	62.0	7.44/7.34	4.21/4.02	0.71	0.16	0.96	0.22
	CS-160T32JP CS-160C53XP	380	50	61.0	7.65/7.45	4.29/4.16	0.87	0.18	1.08	0.24
		400	50	61.0	7.46/7.26	4.29/4.16	0.83	0.18	1.08	0.24
		415	50	61.0	7.37/7.17	4.29/4.16	0.82	0.18	1.08	0.24
COOLING ONLY MODEL	CS-50T32JP CS-50C02HP	220	50	33.7	8.12	1.69	0.66	0.13	0.32	0.07
		230	50	33.7	7.82	1.69	0.66	0.13	0.32	0.07
		240	50	33.7	7.55	1.69	0.63	0.13	0.32	0.07
	CS-71T32JP CS-71C02HP	220	50	60.0	10.71	2.25	0.69	0.14	0.5	0.11
		230	50	60.0	10.51	2.25	0.69	0.14	0.5	0.11
		240	50	60.0	10.37	2.25	0.63	0.14	0.5	0.11
	CS-80T32JP CS-80C02HP	220	50	56.0	10.81	2.48	0.69	0.14	0.5	0.11
		230	50	56.0	10.61	2.48	0.69	0.14	0.5	0.11
		240	50	56.0	10.47	2.48	0.63	0.14	0.5	0.11
	CS-71T32JP CS-71C02XP	380	50	27.0	4.10	2.25	0.69	0.14	0.5	0.11
		400	50	27.0	4.00	2.25	0.69	0.14	0.5	0.11
		415	50	27.0	3.92	2.25	0.63	0.14	0.5	0.11
	CS-80T32JP CS-80C02XP	380	50	26.0	4.20	2.48	0.69	0.14	0.5	0.11
		400	50	26.0	4.10	2.48	0.69	0.14	0.5	0.11
		415	50	26.0	4.02	2.48	0.63	0.14	0.5	0.11
	CS-112T32JP CS-112C02XP	380	50	48.0	4.96	2.75	0.91	0.18	1.01	0.22
		400	50	48.0	4.77	2.75	0.87	0.18	1.01	0.22
		415	50	48.0	4.69	2.75	0.83	0.18	1.01	0.22
	CS-140T32JP CS-140C03XP	380	50	62.0	7.62	4.21	0.77	0.16	0.96	0.22
		400	50	62.0	7.53	4.21	0.75	0.16	0.96	0.22
		415	50	62.0	7.44	4.21	0.71	0.16	0.96	0.22
	CS-160T32JP CS-160C03XP	380	50	61.0	7.65	4.29	0.87	0.18	1.08	0.24
		400	50	61.0	7.46	4.29	0.83	0.18	1.08	0.24
		415	50	61.0	7.37	4.29	0.82	0.18	1.08	0.24

Legend : S.C. : Starting Current
R.C. : RUnning Current
IPT : Power Consumption

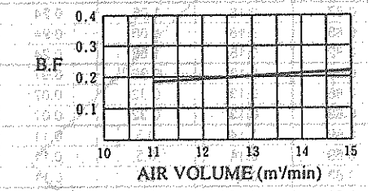
• FAN PERFORMANCE

●CS-50T32JP

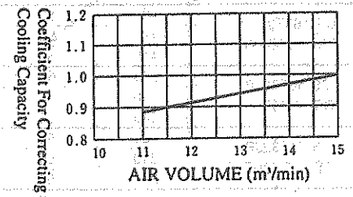
ITEM \ Model		Indoor-Unit			Outdoor Unit
		CS-50T32JP			CU-40C52HP, CU-50C52HP
Mode		Hi	Me	Lo	Hi
Air Volume	m^3/min	15	13	11	32
Running Current	A	0.66	—	—	0.32
Power Consumption	kW	0.13	0.11	0.08	0.07
Fan Speed	r/min	1,400	1,230	970	900

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

Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity

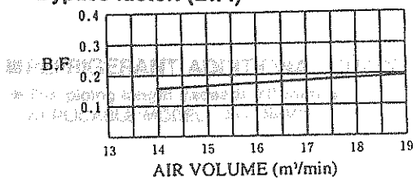


●CS-71T32JP

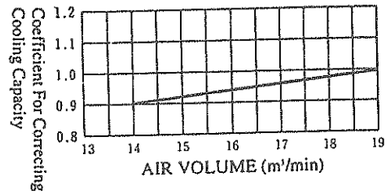
ITEM \ Model		Indoor Unit			Outdoor Unit
		CS-71T32JP			CU-71C52HP, CU-71C52XP
Mode		Hi	Me	Lo	Hi
Air Volume	m^3/min	19	17	14	50
Running Current	A	0.69	—	—	0.50
Power Consumption	kW	0.14	0.11	0.10	0.11
Fan Speed	r/min	1,660	1,530	1,360	900

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

Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity



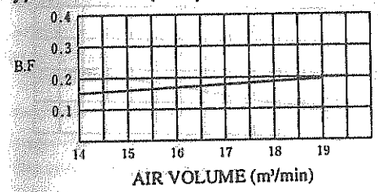
• FAN PERFORMANCE

●CS-80T32JP

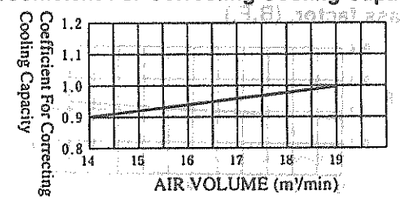
ITEM \ Model		Indoor Unit			Outdoor Unit
		CS-80T32JP			CU-80C52HP, CU-80C52XP
Mode		Hi	Me	Lo	Hi
Air Volume	m^3/min	19	17	14	50
Running Current	A	0.69	—	—	0.50
Power Consumption	kW	0.14	0.11	0.10	0.11
Fan Speed	r/min	1,660	1,530	1,360	900

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

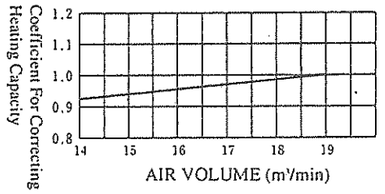
Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity

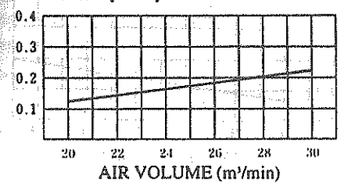


●CS-112T32JP

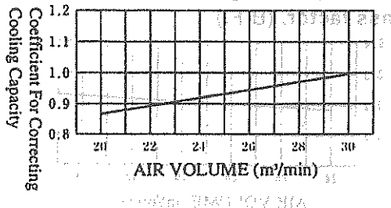
ITEM \ Model		Indoor Unit			Outdoor Unit
		CS-112T32JP			CU-112C52XP
Mode		Hi	Me	Lo	Hi
Air Volume	m^3/min	30	25	20	75
Running Current	A	0.87	—	—	1.01
Power Consumption	kW	0.18	0.16	0.12	0.22
Fan Speed	r/min	1,450	1,250	1,050	800

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

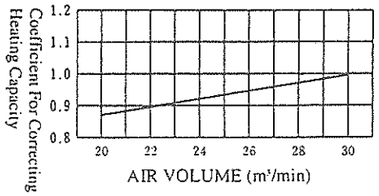
Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity



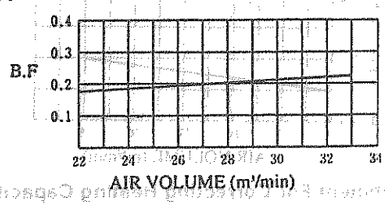
• FAN PERFORMANCE

●CS-140T32JP

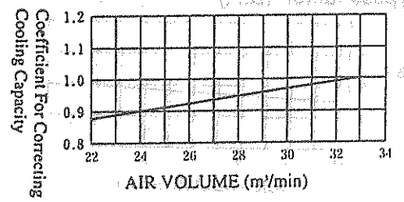
ITEM \ Model		Indoor Unit			Outdoor Unit
		CS-140T32JP			CU-140C53XP
Mode		Hi	Me	Lo	Hi
Air Volume	m^3/min	33	28	22	80
Power Consumption	kW	0.16	0.16	0.11	0.22
Fan Speed	r/min	1,420	1,250	1,050	810
Running Current	A	0.75	—	—	0.96

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

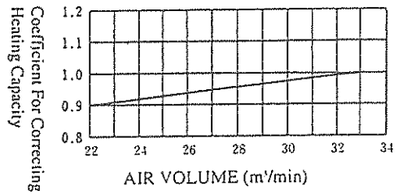
Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity

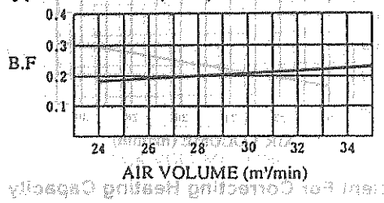


●CS-160T32JP

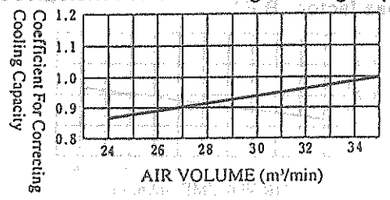
ITEM \ Model		Indoor Unit			Outdoor Unit
		CS-160T32JP			CU-160C53XP
Mode		Hi	Me	Lo	Hi
Air Volume	m^3/min	35	30	24	95
Power Consumption	kW	0.18	0.16	0.11	0.24
Fan Speed	r/min	1,400	1,200	960	880
Running Current	A	0.83	—	—	1.08

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

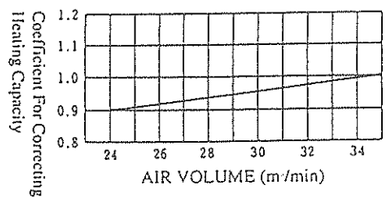
Bypass factor. (B.F.)



Coefficient For Correcting Cooling Capacity



Coefficient For Correcting Heating Capacity



● 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	℃	135	135	135	135	135	135	135	135
	ON	℃	86	86	86	86	86	86	86	86
For control protection										
Fuse	CUT	A	3	3	3	3	3	3	3	3

● OUTDOOR UNIT

Outdoor unit: Heat pump model							CU-80C52XP	CU-112C52XP	CU-140C53XP	CU-160C53XP
Outdoor unit: Cooling only 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 protecter(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)	Cmpressor OFF	℃	115	115	115	115	115	120	120	120
Discharge temp. control										
Discharge temperature thermistor(Th1)	Magntic valve ON	℃	100	100	100	100	100	100	100	100
	Magntic valve OFF	℃	70	70	70	70	70	70	70	70
Liquid compress protection										
Crankcase heater	—	W	25	37	37	37	37	37	41	41
Internal protection										
wind temperature	OFF	℃	160	170	———	165	———	135	120	120
	ON	℃	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	℃	135	135	135	135	135	135	135	135
	ON	℃	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	2.35	2.35	2.35	2.35
	ON	※MPa	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96
Cooling control										
Heat exchanger outlet temp thermistor(Th2)	Control method		Th≧30℃ ——— High speed Th<30℃ ——— 5 speed step control							
For control protection										
Fuse	CUT	A	10	10	10	10	10	10	10	10

※1MPa=10.2kg/cm²

COMPONENT SPECIFICATION

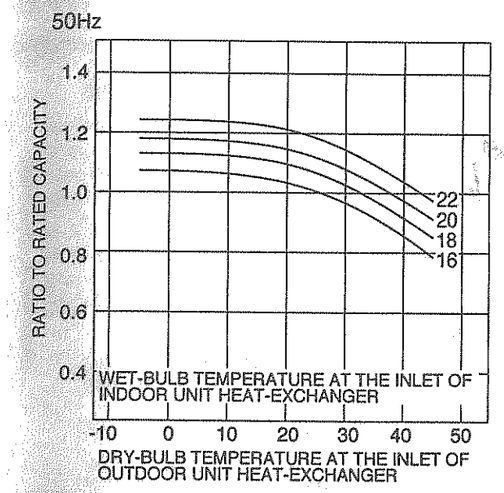
Unit Model (Heat pump model)			CS-50T32JP	CS-71T32JP	CS-71T32JP	CS-80T32JP	CS-80T32JP	CS-112T32JP	CS-140T32JP	CS-160T32JP
Unit Model (Cooling only model)			CS-50C02HP	CS-71C02HP	CS-71C02XP	CS-80C02HP	CS-80C02XP	CS-112C02XP	CS-140C03XP	CS-160C03XP
Compressor Model			2K32C225A1B	NH-41VND	NH-41YDA	NH-44VND	NH-44YDA	ZR-45KC-TFD	NM-S0502HU5	JT170BC-YE
Compressor Type			ROTARY					SCROLL		
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	2,900
Piston Displacement	50Hz	m³/h	5.37	7.27	7.27	7.73	7.73	10.73	14.0	15.3
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
Insulation Class			E	E	E	E	E	E	E	E
Oil Type		*	DIAMOND M.S32 (N-1)					SONTEX 200LT	SUNISO 4GDI-HT	SUNISO 4GSDID-K
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		Copper tube							
Outer Diameter	mm	9.53	9.53	9.53	9.53	9.53	9.53	9.53	9.5
Thicness	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		Aluminium							
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	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		Direct On-Line Starting							
Rated Output	kW	0.04	0.06	0.06	0.08	0.08	0.08	0.11	0.12
Poles		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
Condenser									

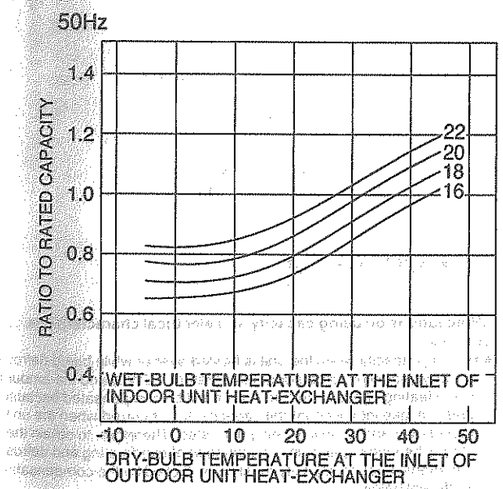
Models (Heat pump model)						CU-80C52HP	CU-80C52XP	CU-112C52XP	CU-140C53XP	CU-160C53XP
Models (Cooling only model)		CU-50C02HP	CU-71C02HP	CU-71C02XP	CU-80C02HP	CU-80C02XP	CU-112C02XP	CU-140C03XP	CU-160C03XP	
Tube Material		Copper tube								
Outer Diameter	mm	9.5	9.52	9.52	9.52	9.52	9.52	9.52	9.52	
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		Aluminium								
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	AX-Louver fin	AX-Louver fin	AX-Louver fin	AX-Louver fin	AX-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		Direct On-Line Starting								
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	
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	

COOLING CAPACITY CURVE, COOLING POWER CONSUMPTION CURVE

• COOLING CAPACITY CURVE



• COOLING POWER COMSUMPTION 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-71C02HP	6.50	2.50
CS-71T32JP/CU-71C02XP	6.50	2.50
CS-80T32JP/CU-80C02HP	7.30	2.73
CS-80T32JP/CU-80C02XP	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

● 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

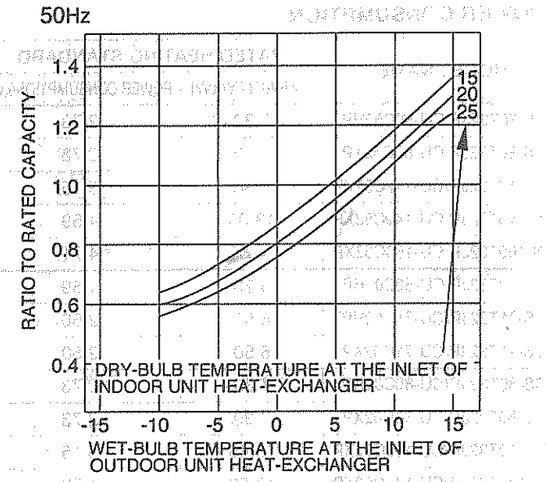
= 0.90 × 7.30 = 6.57(kW)

Actual cooling power consumption = cooling power consumption ratio × rated power consumption

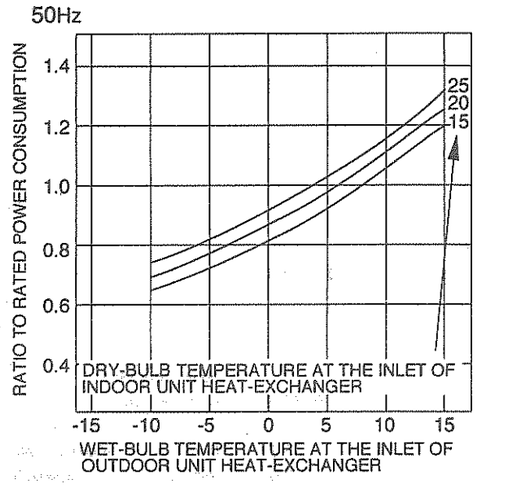
= 1.04 × 2.73 = 2.84(kW)

■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

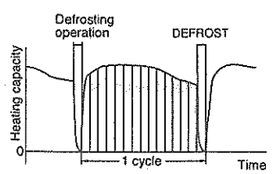
<Precautions on using capacity and electrical characteristics curves>

• 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>



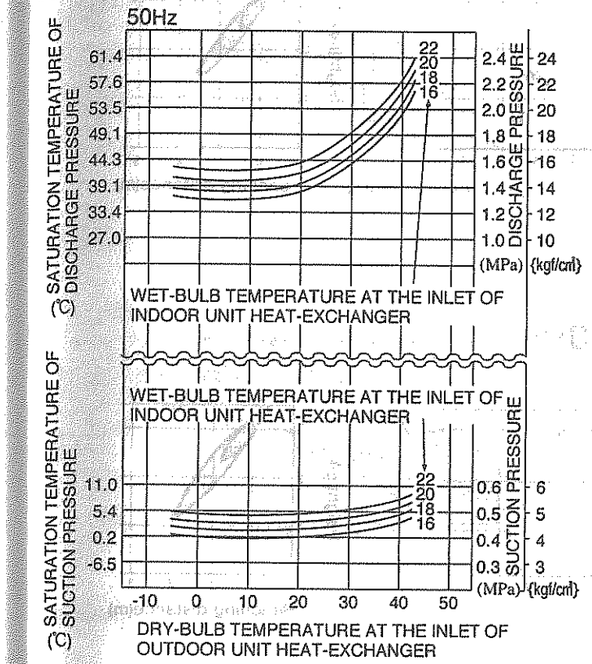
※1
Integral heating capacity is obtained by integrating the capacity consumed in 1 defrost cycle into the normal heating capacity, and calculating this value as an hourly figure. One defrost cycle is determined as the time from when a defrost operation stops (heating starts) until the next heating operation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

■SATURATION TEMPERATURE OF DISCHARGE AND SUCTION PRESSURE

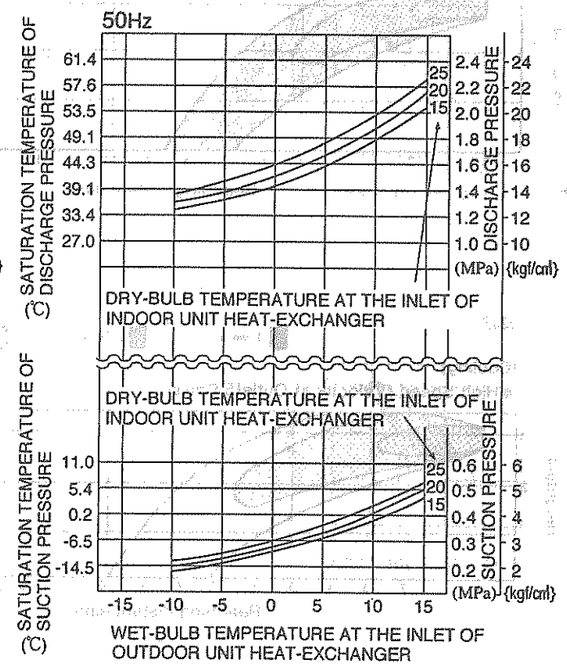
• Commonness TO THE ALL MODEL

• SATURATION TEMPERATURE OF DISCHARGE AND SUCTION PRESSURE

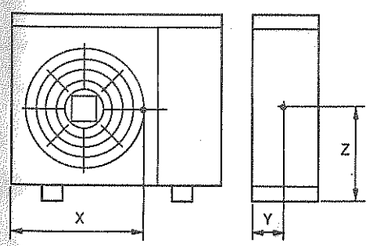
COOLING



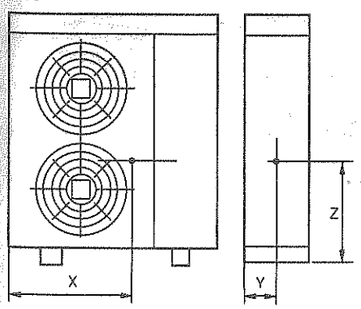
HEATING (Heat pump model only)



50C~80C



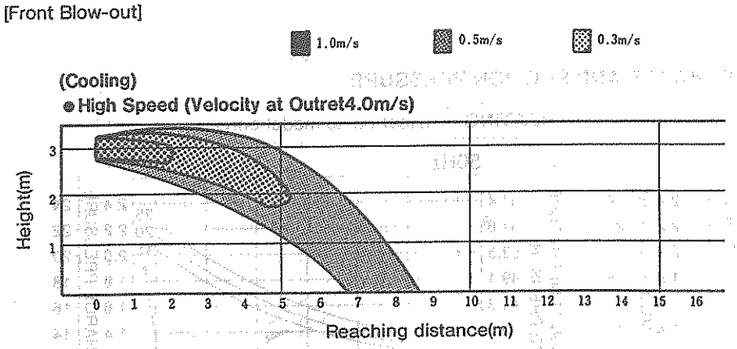
112C~160C



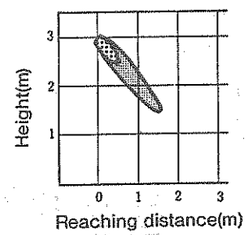
MODEL NAME	OUTSIDE DIMENSIONS			NET WEIGHT	CENTER OF GRAVITY		
	WIDTH	DEPTH	HEIGHT	kg	X	Y	Z
CU-80C52HP	900	320	900	73	580	160	340
CU-80C52XP	900	320	900	73	580	160	340
CU-112C52XP	900	320	1220	98	590	160	460
CU-140C53XP	1100	320	1220	113	720	160	460
CU-160C53XP	1100	320	1220	118	720	160	460
CU-50C02HP	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

CS-50T32JP

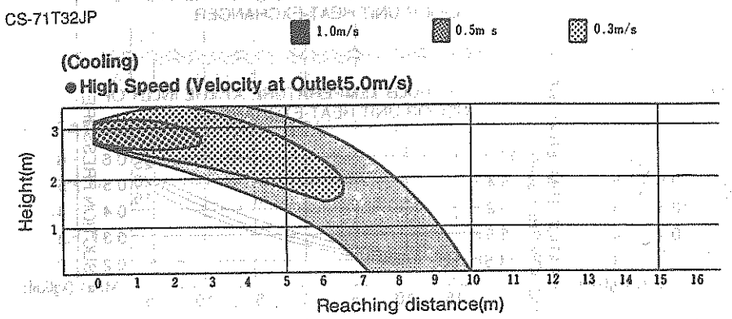
[Front Blow-out]

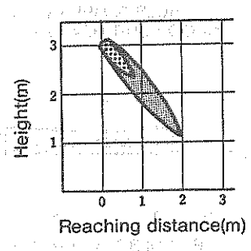


[Side Blow-out]



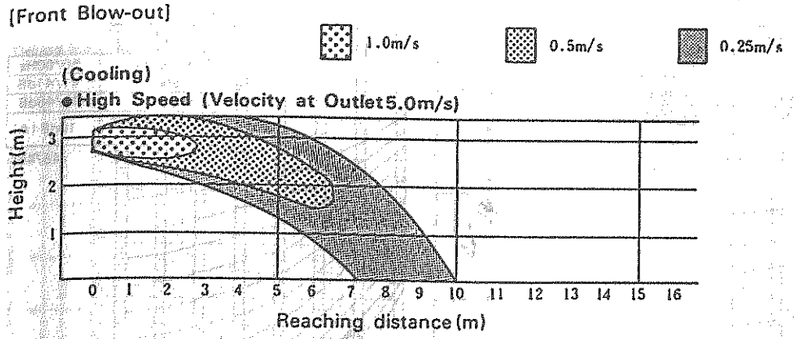
CS-71T32JP



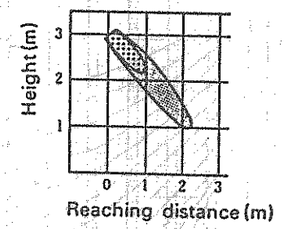


CS-80T32JP

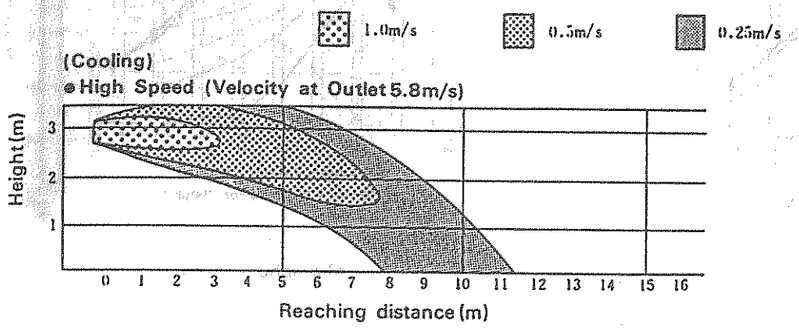
[Front Blow-out]

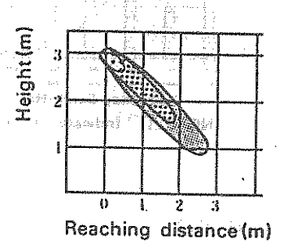


[Side Blow-out]

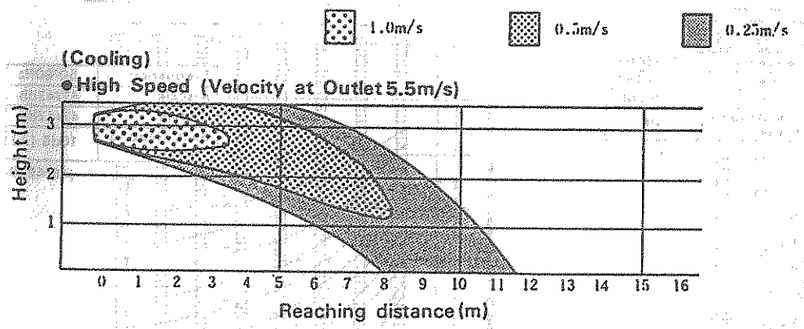


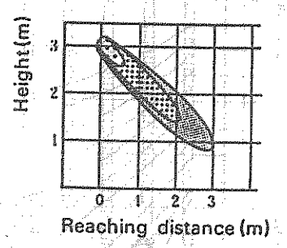
CS-112T32JP



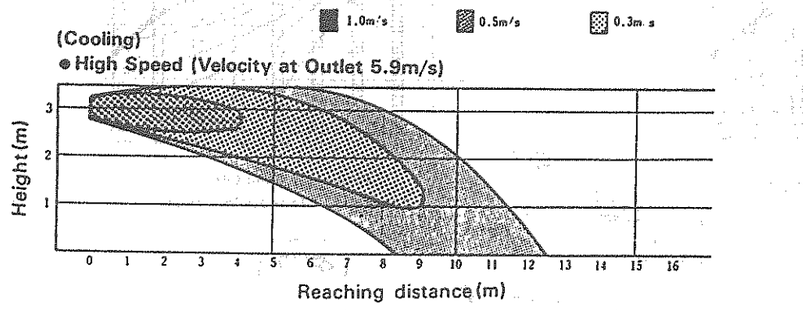


CS-140T32JP

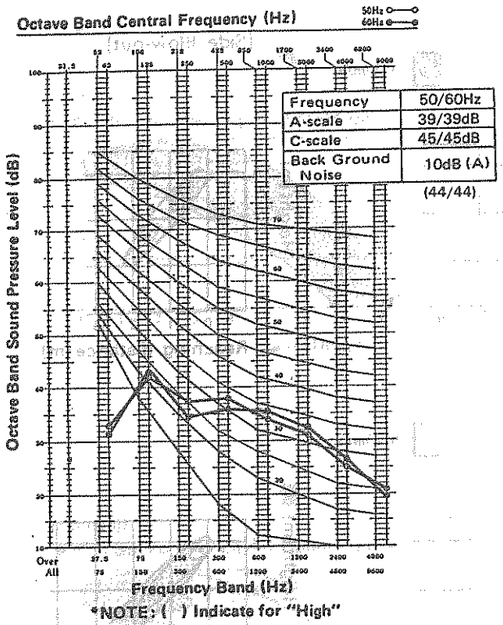




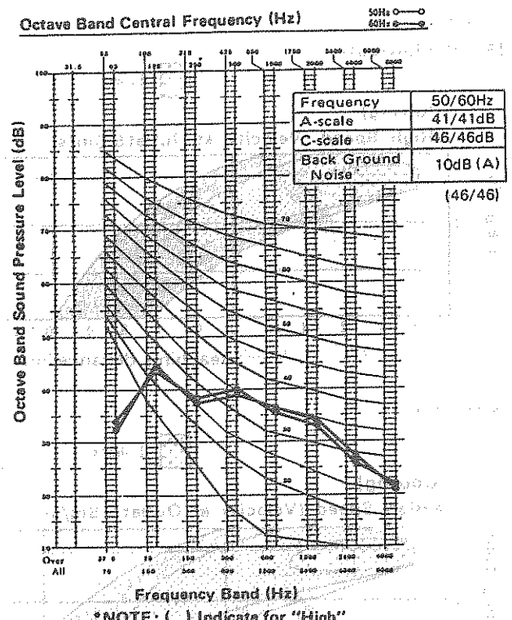
CS-160T32JP



CS-50T32JP



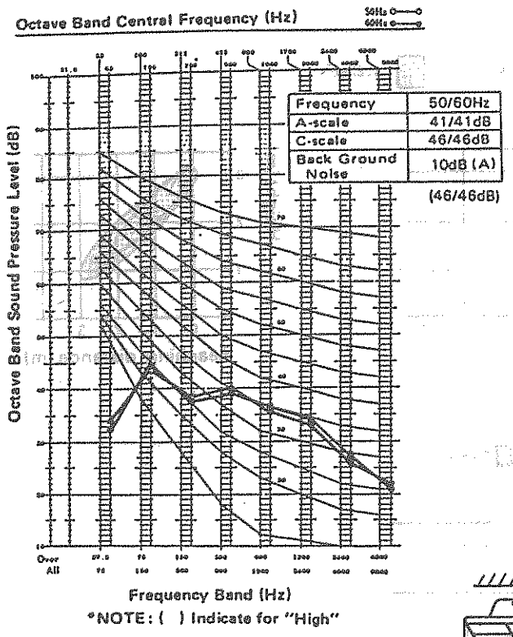
CS-71T32JP



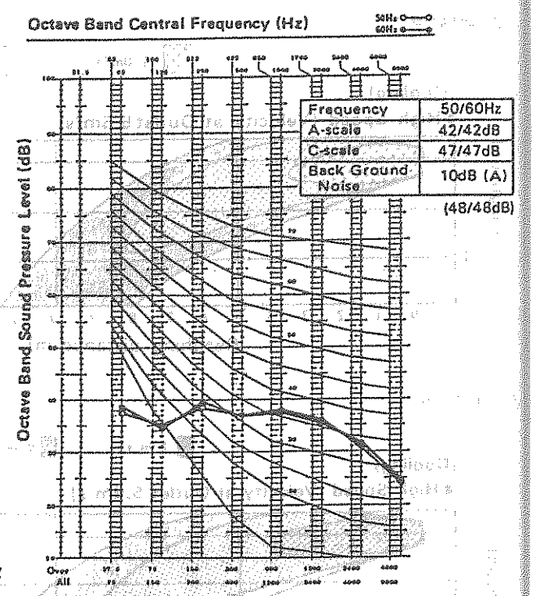
NOTE:

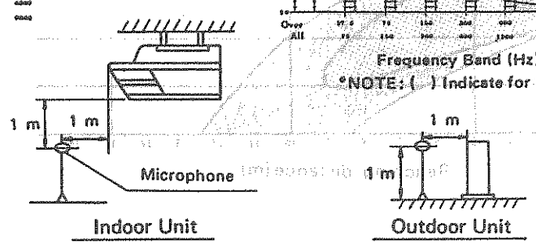
Microphone position

CS-80T32JP

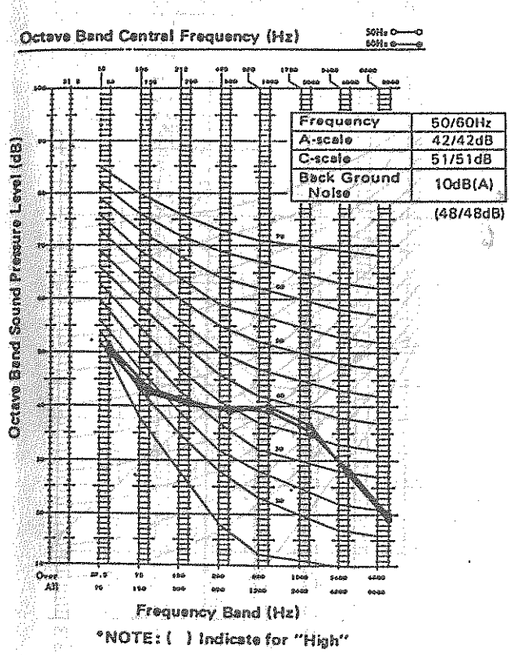


CS-112T32JP

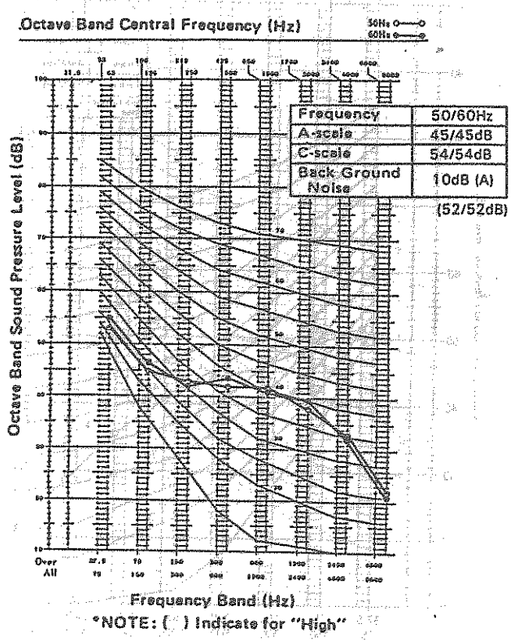




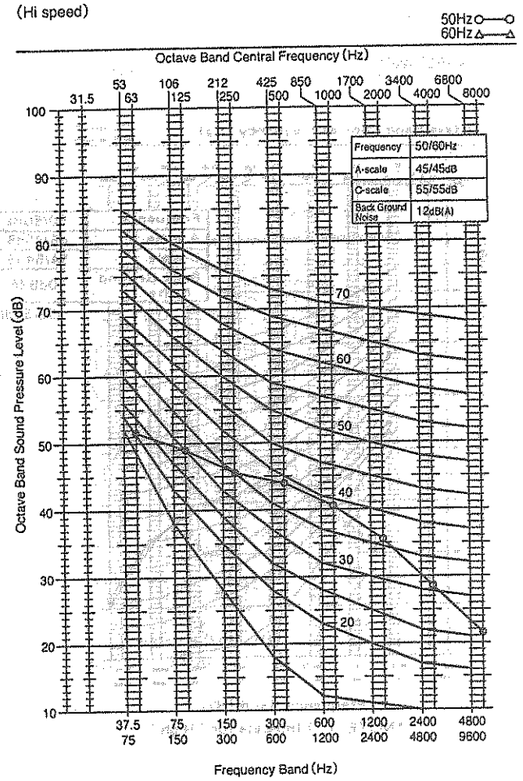
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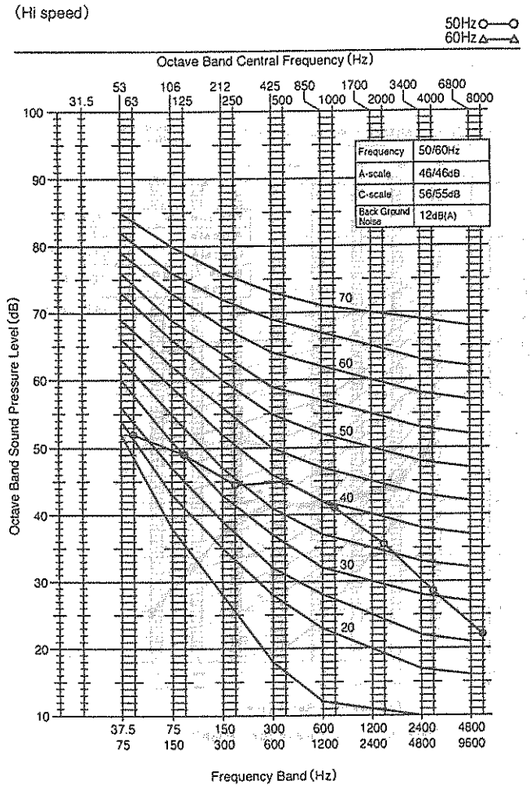
CS-160T32JP



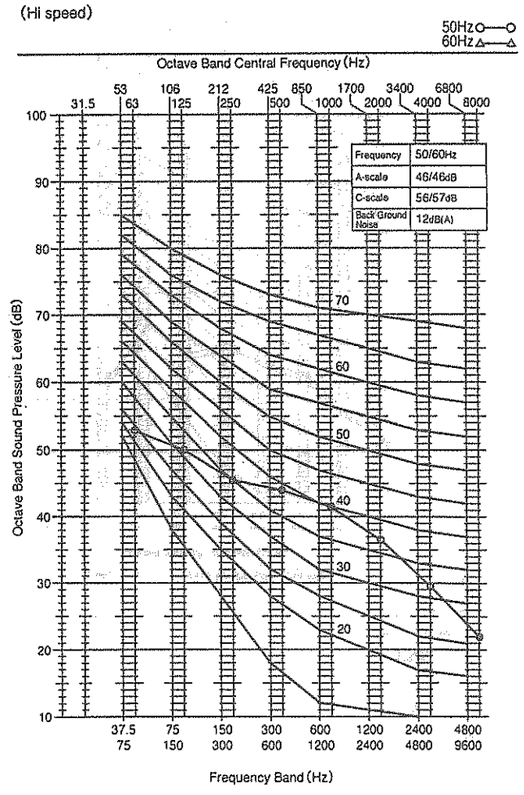
CU-50C02HP
(Hi speed)



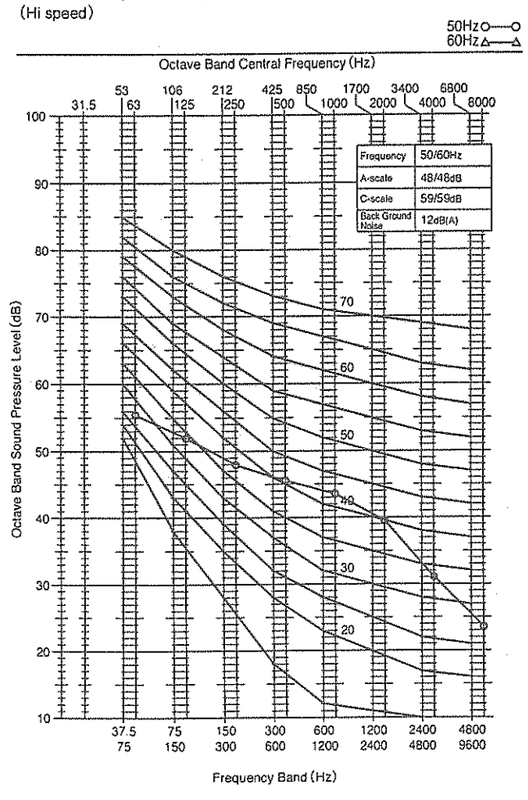
CU-71C02HP, CU-71C02XP
(Hi speed)



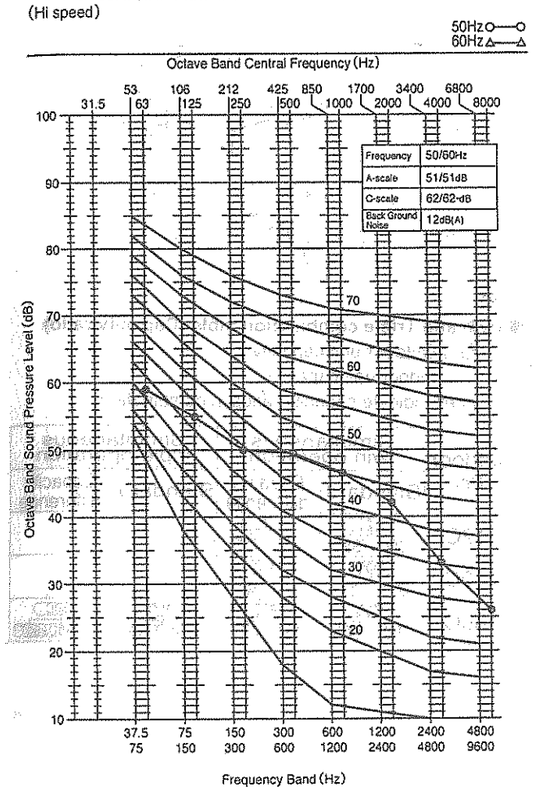
CU-80C52HP, CU-80C52XP, CU-80C02HP, CU-80C02XP
(Hi speed)



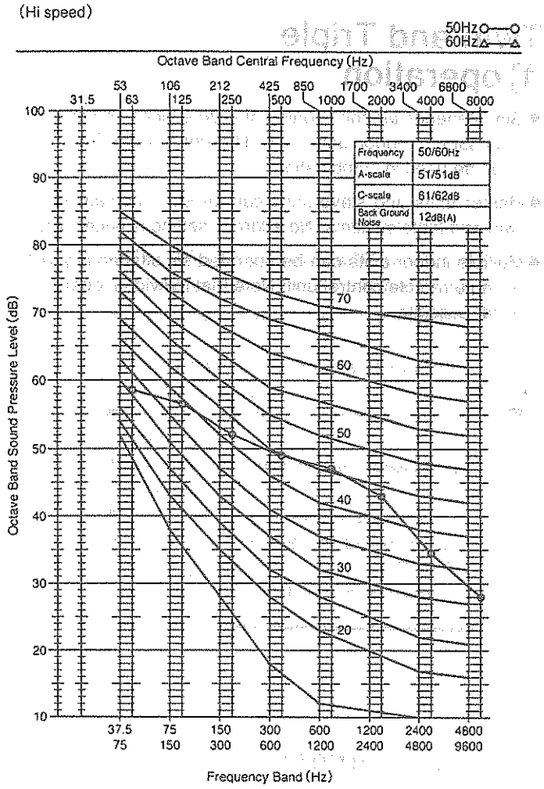
CU-112C52XP, CU-112C02XP
(Hi speed)



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



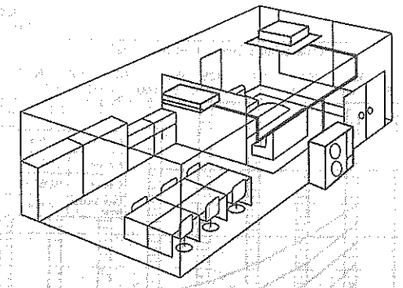
CU-160C53XP,CU-160C03XP
(Hi speed)



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.)

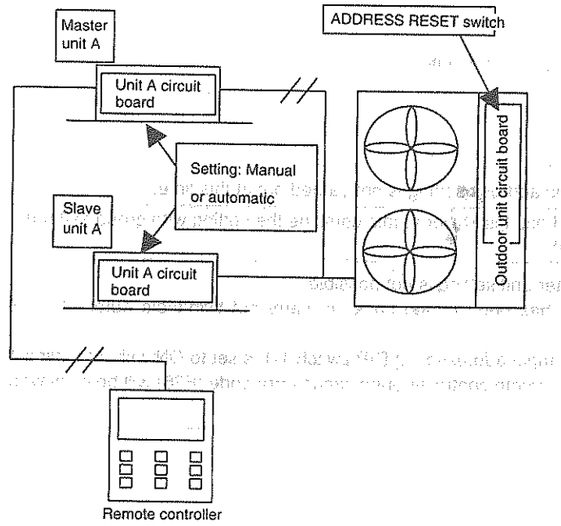
Outdoor unit	Simultaneous twin operation		Simultaneous triple operation	
	Standard	Capacity difference	Standard	Capacity difference
112C	112C (50U)(50U)	112C (40U)(71T)		
140C	140C (71T)(71T)	140C (50T)(80T)		
160C	160C (80T)(80T)	160C (50T)(112T)	160C (50T)(50T)(50T)	160C (40U)(40U)(80T)

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

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





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.)
- 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

Procedure: Turn on the power supply for the indoor and outdoor units.

Operation: Automatic address setting will start 10 to 30 seconds after the power supply is turned on, and will be completed after about 1 minute.

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

If the order of turning on the power supply is incorrect, the master unit setting may overlap. In such a case, turn on the power supplies for all units in the correct order as given above, or carry out a twin/triple automatic address reset (press dip switch 3 on the outdoor unit continuously for 4 seconds or longer).

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

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

DIP switch settings for twin/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.)
Turn on the power supply.

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

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

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

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	
112C	Indoor unit capacity		50T	50T	40U	71T
Liquid side: φ9.52	Branch pipe diameter	Liquid side	φ6.35	φ6.35	φ6.35	φ6.35
Gas side: φ19.05		Gas side	φ12.7	φ12.7	φ12.7	φ15.88
140C	Indoor unit capacity		71T	71T	50T	80T
Liquid side: φ9.52	Branch pipe diameter	Liquid side	φ6.35	φ6.35	φ6.35	φ9.52
Gas side: φ19.05		Gas side	φ15.88	φ15.88	φ12.7	φ15.88
160C	Indoor unit capacity		80T	80T	50T	112T
Liquid side: φ9.52	Branch pipe diameter	Liquid side	φ9.52	φ9.52	φ6.35	φ9.52
Gas side: φ19.05		Gas side	φ15.88	φ15.88	φ12.7	φ19.05

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

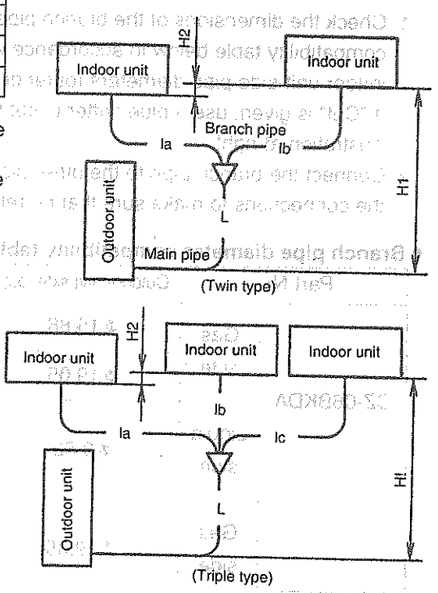
Outdoor unit main pipe diameter (mm)			Indoor unit combinations					
			Standard			Horsepower difference		
160C	Indoor unit capacity		50T	50T	50T	40U	40U	80T
Liquid side: φ9.52	Branch pipe diameter	Liquid side	φ6.35	φ6.35	φ6.35	φ6.35	φ6.35	φ9.52
Gas side: φ19.05		Gas side	φ12.7	φ12.7	φ12.7	φ12.7	φ12.7	φ15.88

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

Equivalent length	L + la + lb + (lc)				Within 50 m
Branch pipe diameter	la, lb, (lc)				Within 15 m
Branch pipe difference	la - lb, lb - (lc), la - (lc)				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 + la, L + lb, L + lc), and 15 or less overall.
3. Branch pipes should be positioned horizontally.

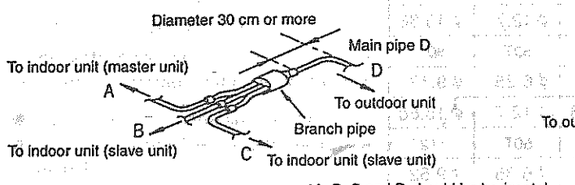


※The branch pipe should be horizontal to or perpendicular to the indoor unit.

NOTE:

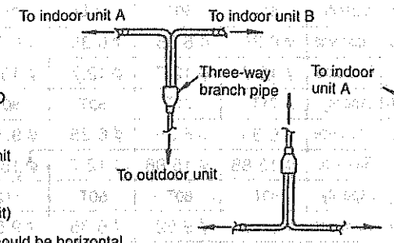
1. Use the main pipe to gain any rise or fall required for the pipes.
2. The number of bends should be 8 or less in a single system (L + la, L + lb, L + lc), and 15 or less overall.
3. Branch pipes should be positioned horizontally.

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

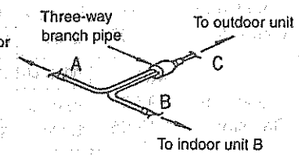


*A, B, C and D should be horizontal.

Horizontal connection



Vertical installation



*A, B and C should be horizontal.

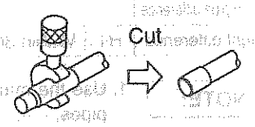
Horizontal installation

• Installing branch pipes

• Table of parts (option)

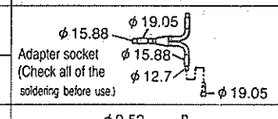
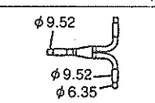
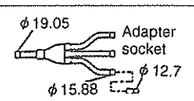
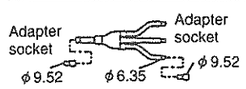
Kit name	Gas-side branch pipe	Liquid-side branch pipe	Insulator (gas side)	Insulator (liquid side)
CZ-06BKDA Twin type (80-160 models)	Adapter socket x 1		Ivory x 1 (Polyethylene foam)	White x 1 (Styrene foam)
CZ-06BKTA Triple type (160 model)	Adapter socket ×3	Adapter socket 2types×1each	Ivory x 1 (Polyethylene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

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.



• Cut using a pipe cutter.

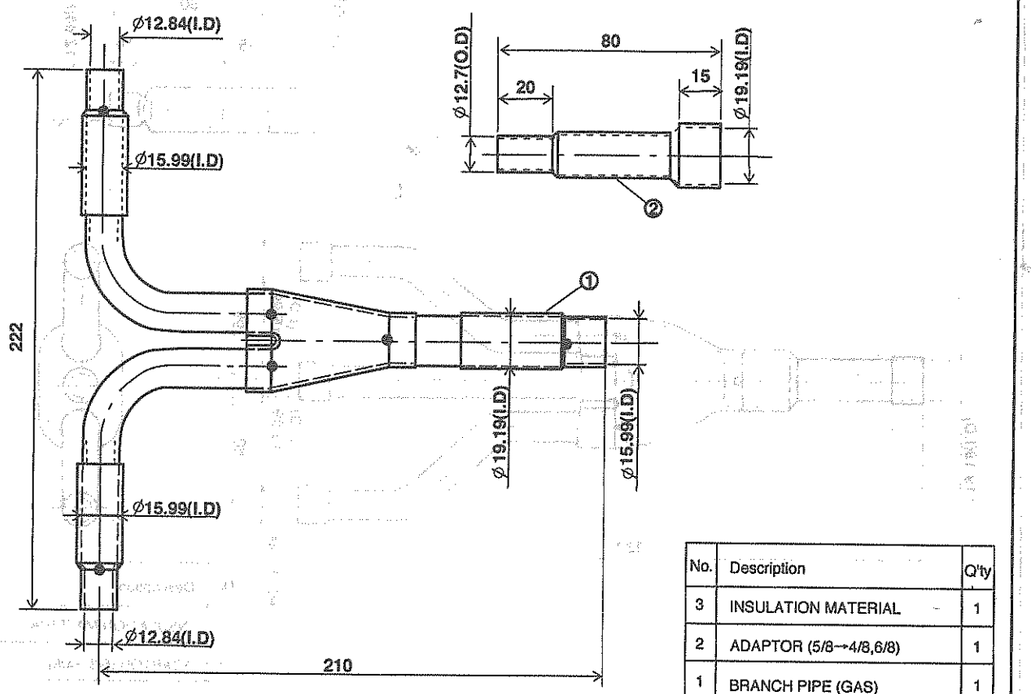
• Branch pipe diameter compatibility table

Part No.		Outdoor unit side (outer diameter)		Branch pipe (inner diameter)	Indoor unit side (outer diameter)	
CZ-06BKDA	Gas side	ϕ15.88	———		ϕ12.7	———
		ϕ19.05	Cut		ϕ15.88	Cut
					ϕ19.05	Adapter socket
	Liquid side	ϕ9.52	———		ϕ6.35	———
					ϕ9.52	Cut
CZ-06BKTA	Gas side	ϕ19.05	———		ϕ12.7	Adapter socket
					ϕ15.88	———
	Liquid side	ϕ9.52	Adapter socket		ϕ6.35	———
					ϕ9.52	Adapter socket

• BRANCH PIPE KIT FOR TWIN TYPE CZ-06BKDA

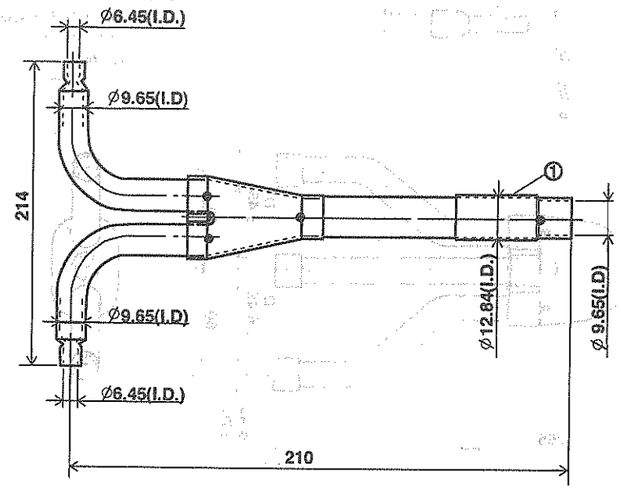
APPLICABLE MODEL · · · CU-112C52XP,CU-140C53XP,CU-160C53XP

■ GAS PIPE



No.	Description	Q'ty
3	INSULATION MATERIAL	1
2	ADAPTOR (5/8→4/8,6/8)	1
1	BRANCH PIPE (GAS)	1

■ Liquid pipe

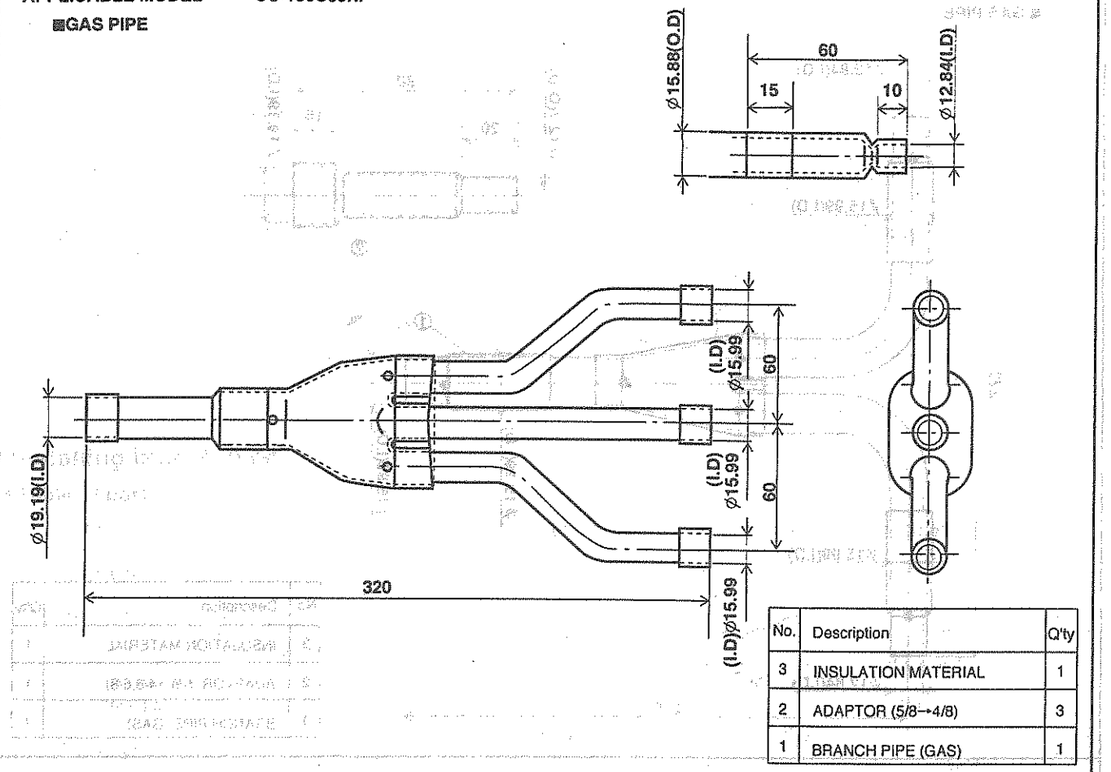


No.	Description	Q'ty
2	INSULATION MATERIAL	1
1	BRANCH PIPE (LIQUID)	1

●BRANCH PIPE KIT FOR TRIPPLE TYPE CZ-06BKTA

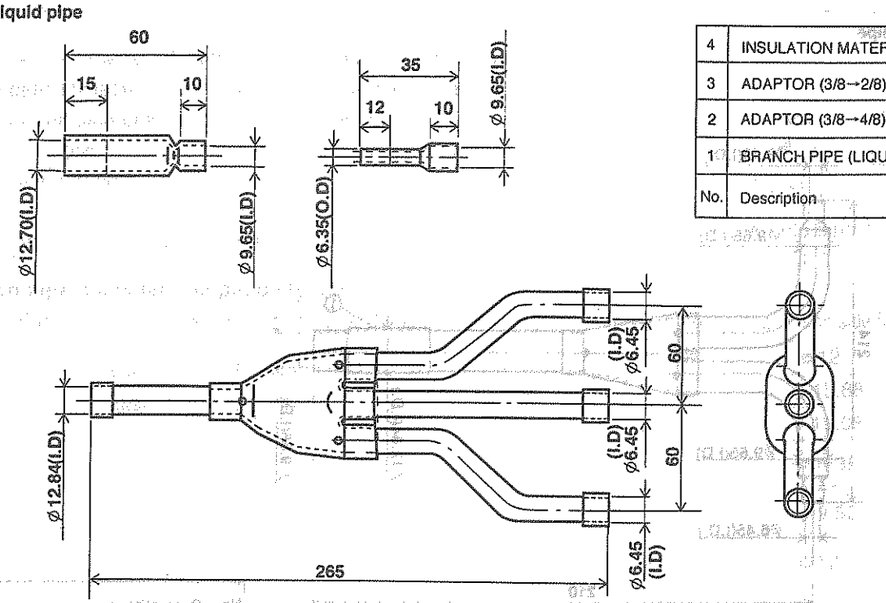
APPLICABLE MODEL · · · CU-160C53XP

■GAS PIPE



No.	Description	Q'ty
3	INSULATION MATERIAL	1
2	ADAPTOR (5/8→4/8)	3
1	BRANCH PIPE (GAS)	1

■Liquid pipe



No.	Description	Q'ty
4	INSULATION MATERIAL	1
3	ADAPTOR (3/8→2/8)	1
2	ADAPTOR (3/8→4/8)	1
1	BRANCH PIPE (LIQUID)	1

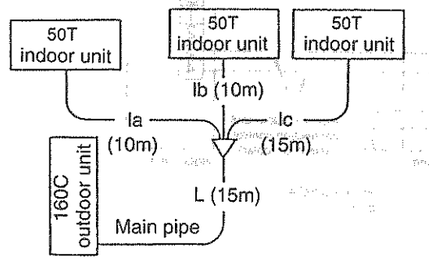
3 Refrigerant charging

● 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	ϕ6.35	ϕ9.52
Additional charging amount (kg/m)	0.02	0.05

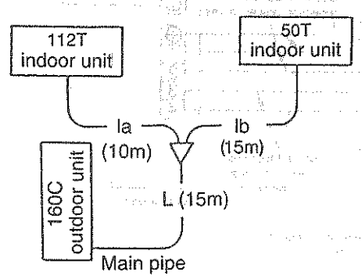
Example 1: For 160C outdoor unit with an equivalent pipe length of 50 m



(Triple type)

		Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe (kg)
Main pipe (L)		ϕ9.52	15m	Not needed if within 30 m
Main pipe	(la)	ϕ6.35	10m	Not needed if within 30 m
	(lb)	ϕ6.35	10m	If exceeds 30 m, 5 m × 0.02 = 0.1
	(lc)	ϕ6.35	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

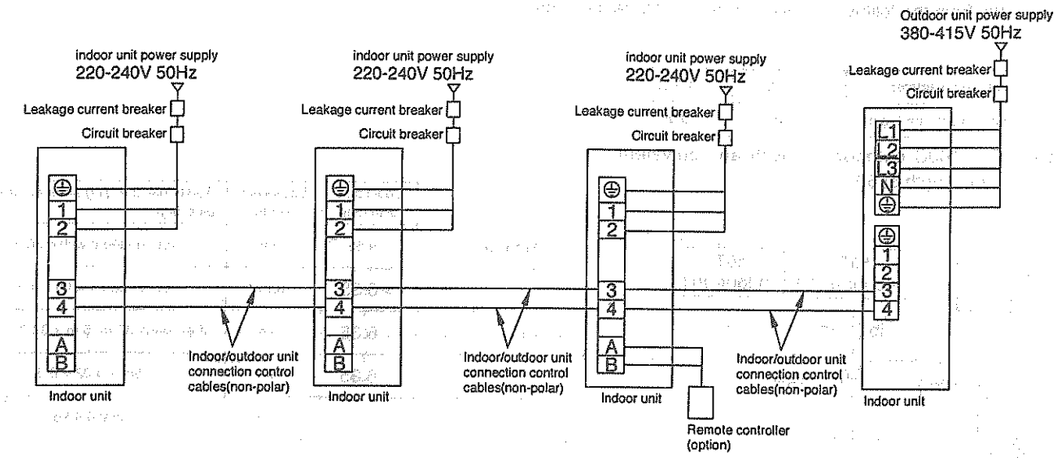


(Twin type)

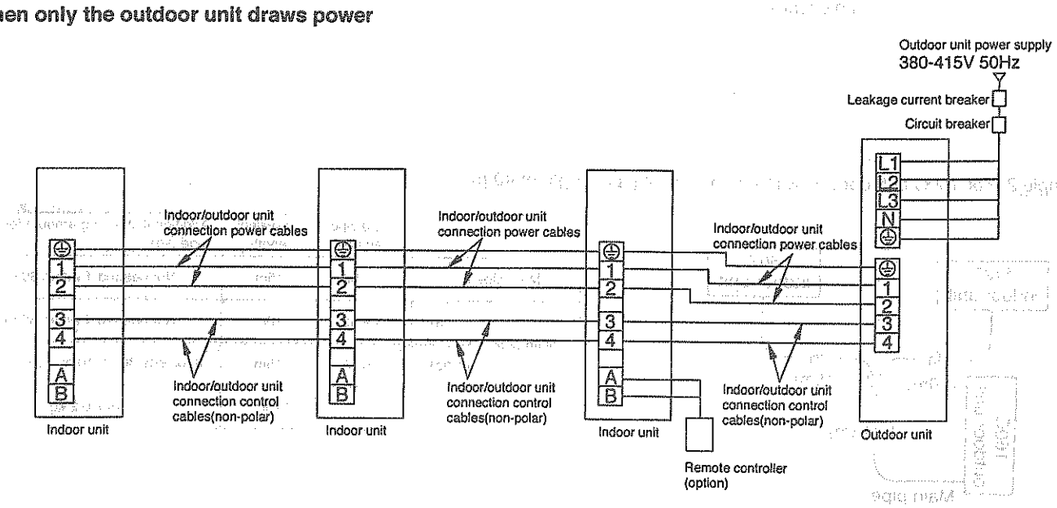
		Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe (kg)
Main pipe (L)		ϕ9.52	15m	Not needed if within 30 m
Main pipe	(la)	ϕ9.52	10m	Not needed if within 30 m
	(lb)	ϕ6.35	15m	If exeeds 30 m, 10 m × 0.02 = 0.2
——			40m	Total 0.2 kg

4 Wiring

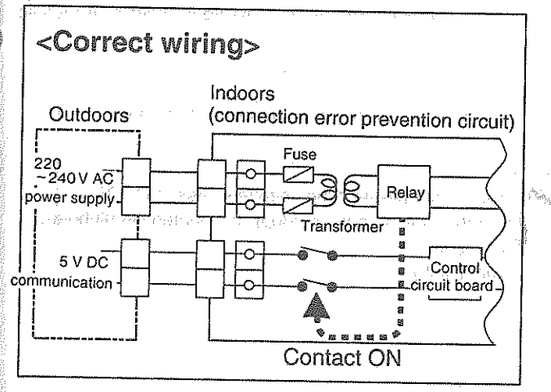
When both indoor and outdoor unit draw power
(Example: 3 Phase power supply model)

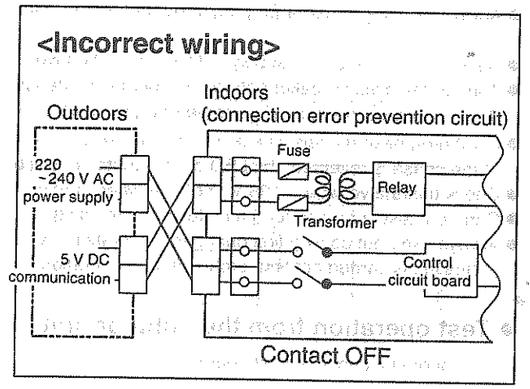


When only the outdoor unit draws power



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



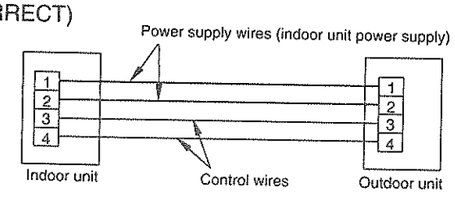


Connection errors with the control wires and the power supply wires will not only contribute to burning-out of the control circuit board, but can also cause large-scale working losses and affect reliability. If a circuit board with an "Connection error prevention" circuit is used, the relay will not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

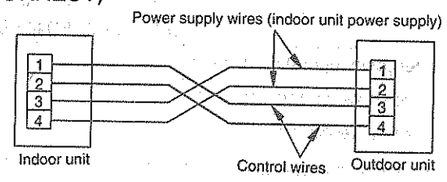
Prevention of connecting errors

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

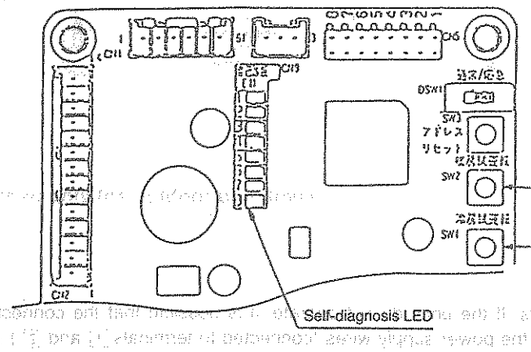
Test operation and self-diagnosis

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 metalic 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.

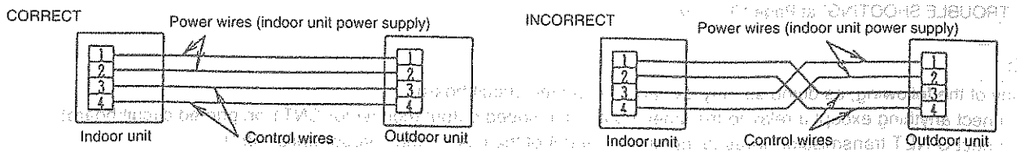
<Cooling operation>
- Press the COOL test operation switch for 1 second.
  The LEDs on the printed circuit board will flash as indicated in the table below.

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					-☼-	-☼-	-☼-

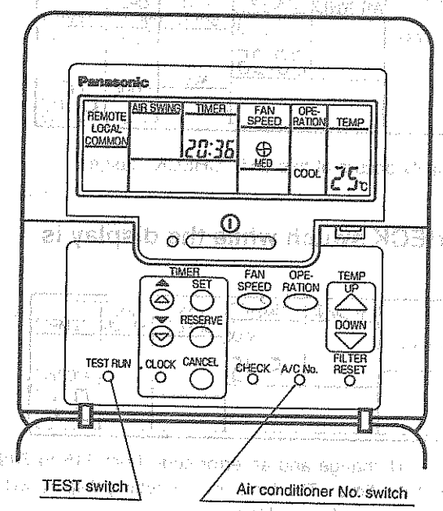
To cancel test operation, press the TEST or RUN switch once more while test operation is being carried out.
(Test operation will stop automatically after 30 minutes have passed.)

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.



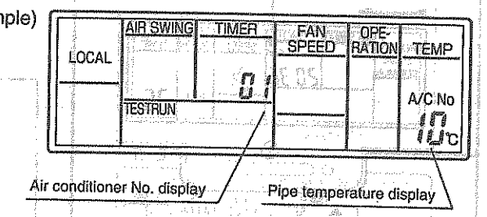
NOTE:2 Do not short the remote control unit wires to each other. (The protection circuit will be activated and the units will not operate.)
Once the cause of the short is eliminated, normal operation will then be possible.

● Test operation using the wired remote controller



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

(Example)



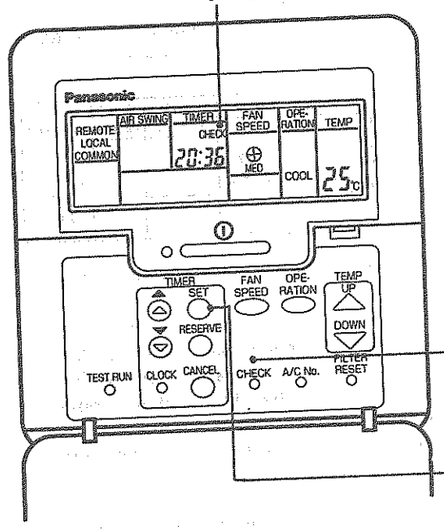
- During group control, the number appearing in the timer display will change each time the air conditioner No. switch is pressed, and the pipe temperature for the indoor unit corresponding to the number displayed will appear in the temperature setting display.

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

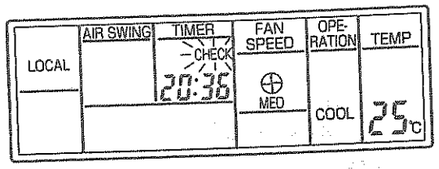
Self-diagnosis function

- 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



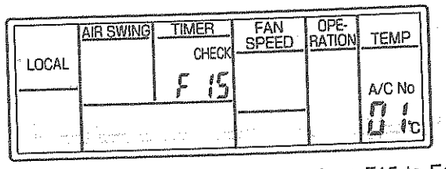
(Example)



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

Press the CHECK switch while the display is flashing.

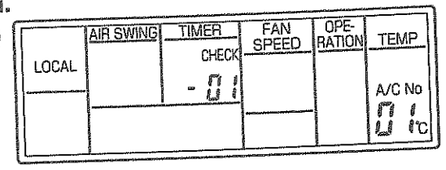
(Example)



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

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

(Example)



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

<Air conditioner No.>

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

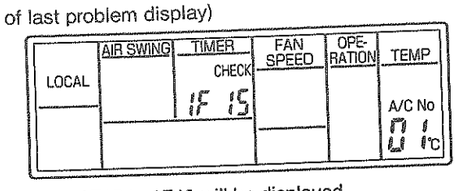
- After checking the error display and the detail display, refer to the self-diagnosis error code table on the following page and check the location of the problem.
- If the problem is repaired and operation returns to normal, the CHECK display on the remote controller will put out, but the self-diagnosis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

How to display the past errer 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)

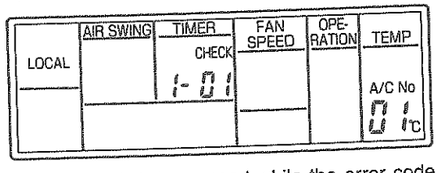
Press the CHECK button once more to return to the normal display.

(Example of last problem display)



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

(Example)



If the TIMER ON/OFF switch is pressed while the error code from 1F15 to 1F49 is being displayed, the display screen will change to show the details of the last problem display.
(If 2F15 to 2F49 is being displayed, the details of the second-last problem display will appear.)

Self-diagnosis error code table

☼: Flashing ○: Illuminated Blank: Off

Remote controller display			Printed circuit board self-diagnosis LED (red)								Error display
Wired		Wireless	Indoor unit	Outdoor unit							(Check location)
Error display	Detail display	Run LED	LED2	LED2	LED3	LED4	LED5	LED6	LED7	LED8	
F15	–01	☼	☼	☼				☼	(※2)	(※2)	Drain level float switch problem Drain pump and drain pipe, indoor unit connectors CN6 & CN10, or relay connector
F16	–01	☼	☼		☼			☼	(※2)	(※2)	Louver switch problem Louver motor, veneer panel connection terminal, or indoor unit connectors CN1& CN6
F17	–01	☼	☼	☼	☼			☼	(※2)	(※2)	Option problem Option connection terminals
F20	–01	☼	☼	☼			☼		(※2)	(※2)	Indoor temperature thermistor problem Indoor temperature thermistor lead wire or indoor unit connector CN1
	–02	☼	☼	☼		☼	☼		(※2)	(※2)	Remote control thermistor problem Remote control thermistor
F21	–01	☼	☼		☼		☼		(※2)	(※2)	Pipe temperature thermistor problem (indoor unit side) Pipe temperature thermistor lead wire or indoor unit connector CN1
F25	–01	☼	☼			☼			(※2)	(※2)	Centralised control address overlap problem Check settings for optional centralised control circuit board address switch
F26	–01	☼	☼		☼				(※2)	(※2)	Remote control transmission wire open circuit problem Remote control unit cable and connection terminals
	–02	☼	☼	☼					(※2)	(※2)	Remote control transmission problem Check the transmission wave pattern
F27	–01	☼	☼		☼				☼		Indoor/outdoor unit transmission wire open circuit problem Indoor/outdoor unit connection cable and connection terminals, or indoor unit and outdoor unit power supplies
	–02	☼	☼	☼					☼		Indoor/outdoor unit transmission problem Check the transmission wave pattern.
F29	–01	☼	☼		☼		☼	☼	(※2)	(※2)	Indoor unit setting problem Abnormal setting of the indoor p.c. board.
	–02	☼	☼	☼			☼	☼	(※2)	(※2)	Indoor unit setting problem Abnomal setting of the indoor p.c.board.
	–12	☼	☼	☼		☼	☼	☼	(※2)	(※2)	Remote control unit setting problem Abnomal setting of the remote controller.
F30	–02	☼	☼	☼		☼		☼	☼		Negative or open phase power supply Check the main power supply terminal board connections, and switch the main power supply phase.
	–06	☼	☼		☼	☼		☼	☼		Poor power supply connection, or distorted voltage wave pattern Check the main power supply terminal board connections, and check the power supply wave patttern.
	–07	☼	☼	☼	☼	☼		☼	☼		Poor power supply connection Check the main power supply terminal board connections.
F31	–02	☼	☼		☼			☼	☼		High-pressure cut-off Refrigeration system, Obstructing of the heat radiation from outdoor unit
F33	–01	☼	☼	☼				☼	☼		Compressor overcurrent protection Open phase or lock in compressor, or blown main power supply fuse
	–02	☼	☼	☼	☼			☼	☼		Compressor discharge temperature protection Insufficient gas
F40	–41	☼	☼	☼			☼		☼		Compressor discharge temperature thermistor problem Discharge temperature thermistor lead wire, outdoor unit connector CN2, or relay connector
	–61	☼	☼		☼		☼		☼		Heat exchanger outlet temperature thermistor problem (Outdoor unit) Heat exchanger outlet temperature thermistor lead wire, outdoor unit connector CN2, or relay connector
F41	–02	☼	☼	☼		☼	☼		☼		High-pressure switch open circuit problem High-pressure switch lead wire, outdoor unit connector CN2, or relay connector
	–03	☼	☼		☼	☼	☼		☼		Heating pressure switch open circuit problem Heating pressure switch lead wire, outdoor unit connector CN2, or relay connector
F42	–01	☼	☼	☼	☼		☼		☼		Current detector open circuit or compressor current problem Outdoor unit connector CN2, compressor internal protection system activated, or blown main power supply fuse
F49	–01	☼	☼		☼		☼	☼	☼		Outdoor unit setting problem Abnormal setting of the outdoor p.c.board
	–02	☼	☼	☼			☼	☼	☼		Outdoor unit setting problem Abnormal setting of the outdoor p.c.board

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

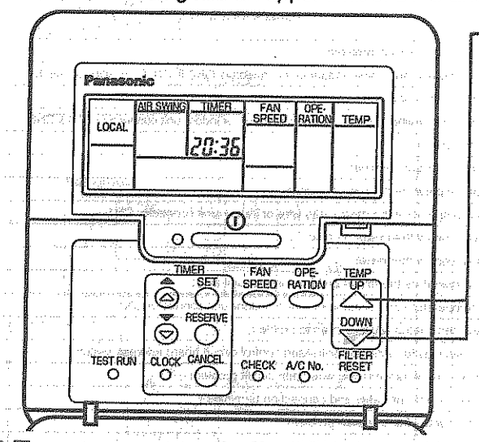
(※2)

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

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

● 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.)

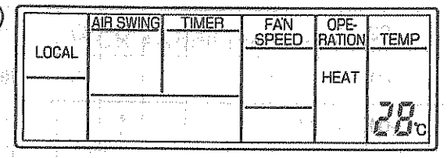


1 While operation is stopped, press the UP and DOWN switches simultaneously.

⇩

The display will change.

(Example)



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.

3 To set a lower limit

Press the OPERATION MODE switch until COOL is displayed.

⇩

Press the UP or DOWN switch to set the temperature.

⇩

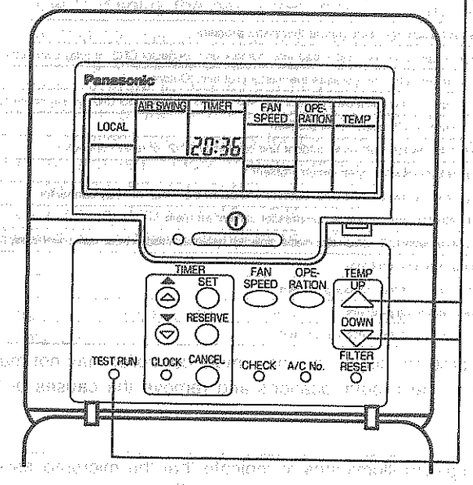
Press the RESERVE switch to complete the lower limit setting.

Example:If the cooling display is set to 22°C, setting the temperature to lower than 22°C will not be possible.

•Press the CLEAR switch to cancel the setting

● 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.)

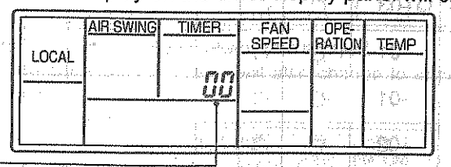


1 While operation is stopped, press and hold the TEST RUN switch, UP switch and DOWN switches simultaneously.

⇩

The time display on the timer display panel will change.

(Example)



"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)

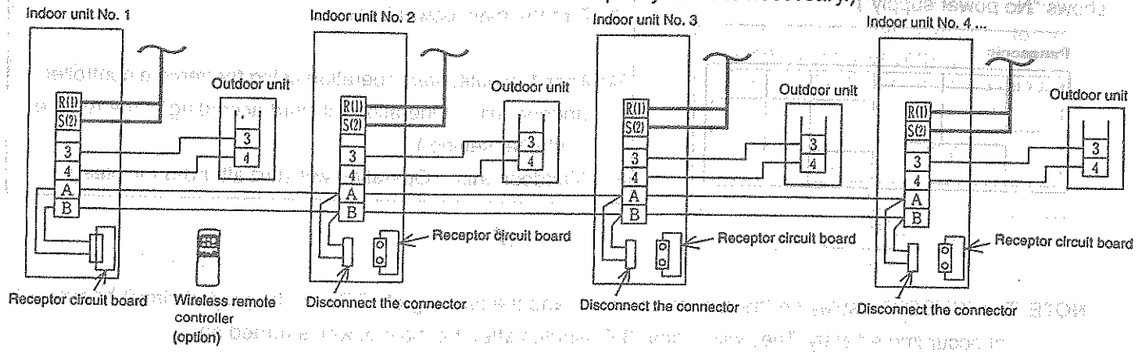
	Indoor unit No.	1	2	3	4	5	6	7	8
Manual setting	DIP switch (DSW1) setting on indoor unit printed circuit board Air conditioner No. setting	No operation necessary	1 is ON	2 is ON	1 and 2 are ON	3 is ON	1 and 3 are ON	2 and 3 are ON	1, 2 and 3 are ON
	Indoor unit No.	9	10	11	12	13	14	15	16
	DIP switch (DSW1)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

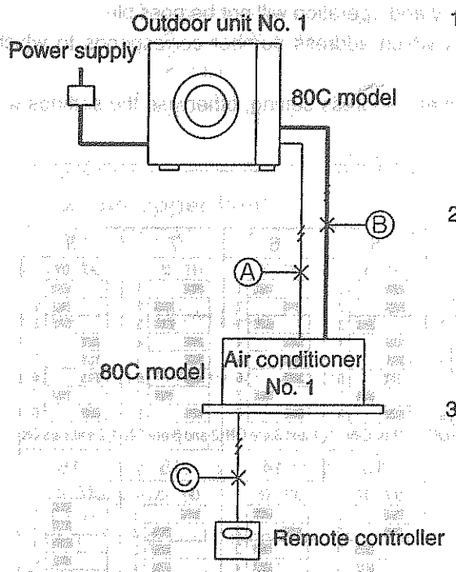


If test operation does not proceed correctly

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.

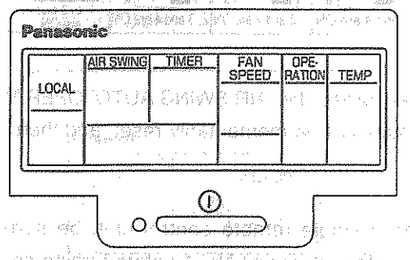
If the following symptoms occur after turning on the power, check the wiring connections once more.

●For standard installation
(System example)

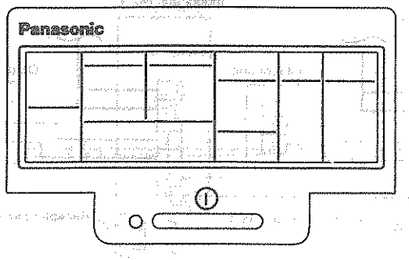


1. The main power is turned on while the indoor-outdoor transmission wires are not connected (open circuit at section A)
   Symptom: Remote control unit . . . . "CHECK" flashes
   NOTE: Indoor unit . . . . LED2 on printed circuit board flashes
   Outdoor unit . . . LED 3 and LED 7 on printed circuit board flash
2. The main power is turned on while the indoor-outdoor power supply wires are not connected (open circuit at section B)
   Symptom: Remote control unit ... Display of "No power supply"
   NOTE: Indoor unit . . . . No display
   Outdoor unit . . . LED 3 and LED 7 on printed circuit board flash
3. The main power is turned on while the remote control unit connection cord is not connected (open circuit at section C)
   Symptom: Remote control unit ... Display of "No power supply"
   NOTE: Indoor unit . . . . LED1 on printed circuit board stays illuminated
   Outdoor unit . . . LED1 on printed circuit board stays illuminated

(When remote controller display shows "Power supply")



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

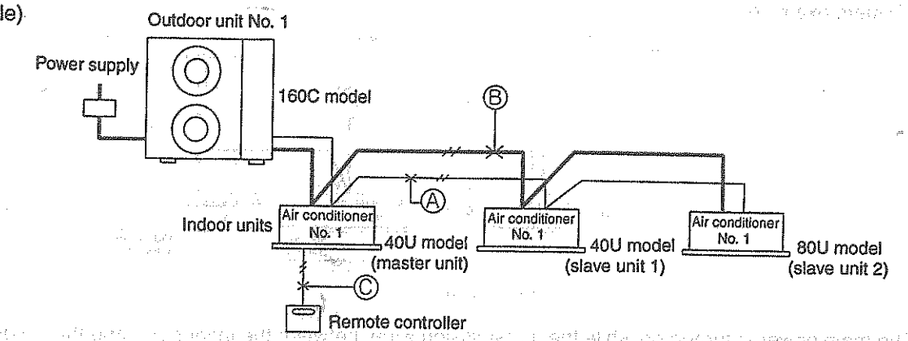


Remedy

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.)

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.

●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 the160C 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

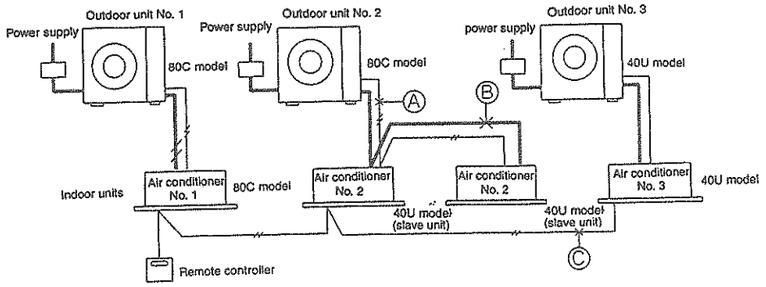
1. Turn off the main power.
   ⇩
2. Connect the disconnected wires correctly.
   ⇩
3. Turn the main power back on.
   ⇩
4. After 1 minute, start operation using the remote controller.
   (Indoor units Operation will start according to the remote controller setting.)
   (Outdoor unit...Operation will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

●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.

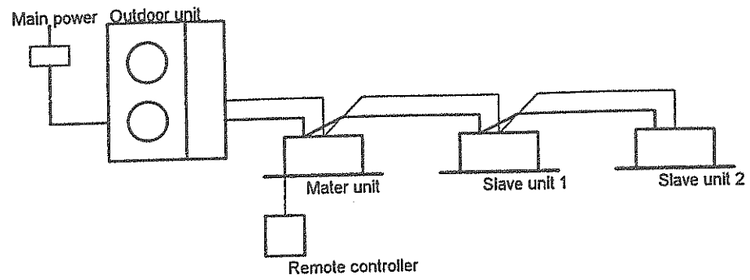
The above procedure cannot be used to carry out automatic address resetting of twin/triple control.

(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.

ADDRESS SETTING FOR TWIN/TRIPLE SYSTEM

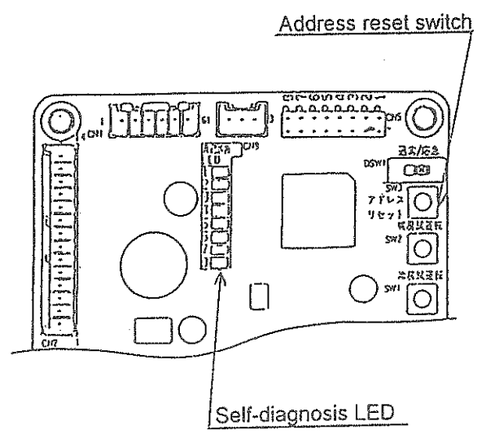
(Example)



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.

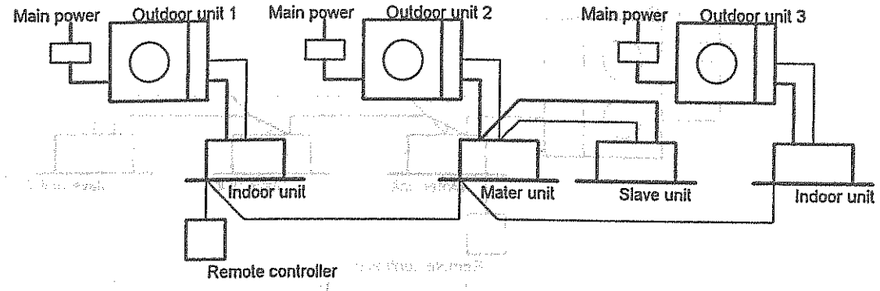
Manual address setting (by dip-switch DSW1)

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 The address for the master unit will be set in the unit with RC	DSW1 ON OFF 1 2 3 4 5 6 7 8 **No. 8 ON, The others no change**	DSW1 ON OFF 1 2 3 4 5 6 7 8 **No. 1 and 8 ON, The others no change**

ADDRESS SETTING FOR GROUP CONTROL SYSTEM

(Example)

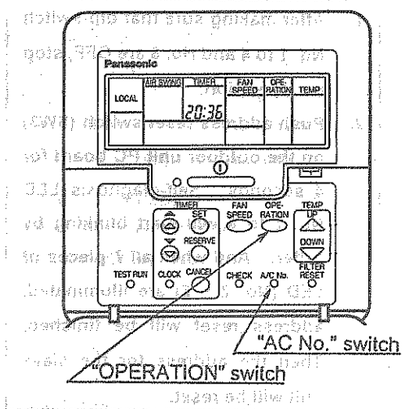


1. Automatic address setting (no need to have dip-switch set)

If the wiring connected properly as above example, the AC numbers are set automatically by the main power supply. 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 The address for the master unit will be set in the unit with RC	DSW1 ON/OFF 1 2 3 4 5 6 7 8 No. 8 ON, The others no change	DSW1 ON/OFF 1 2 3 4 5 6 7 8 No. 1 and 8 ON, The others no change

Manual address setting (by dip-switch DSW1)

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

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

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.

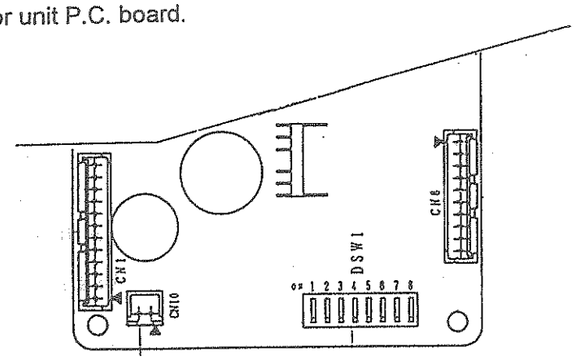
4.Set the 'off' position for No.1 ,No.2, No.3 and No.4 pin of dip switch(DSW1).

(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.

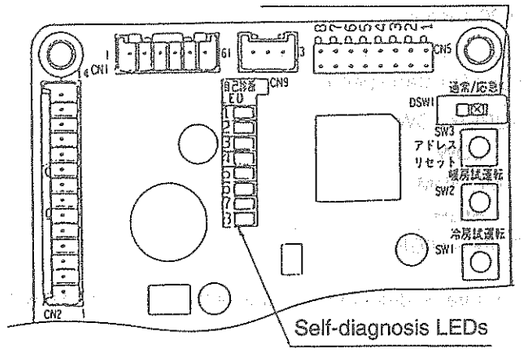
<Thermistor resistance table>

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>

EMERGENCY DIP switch



•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.

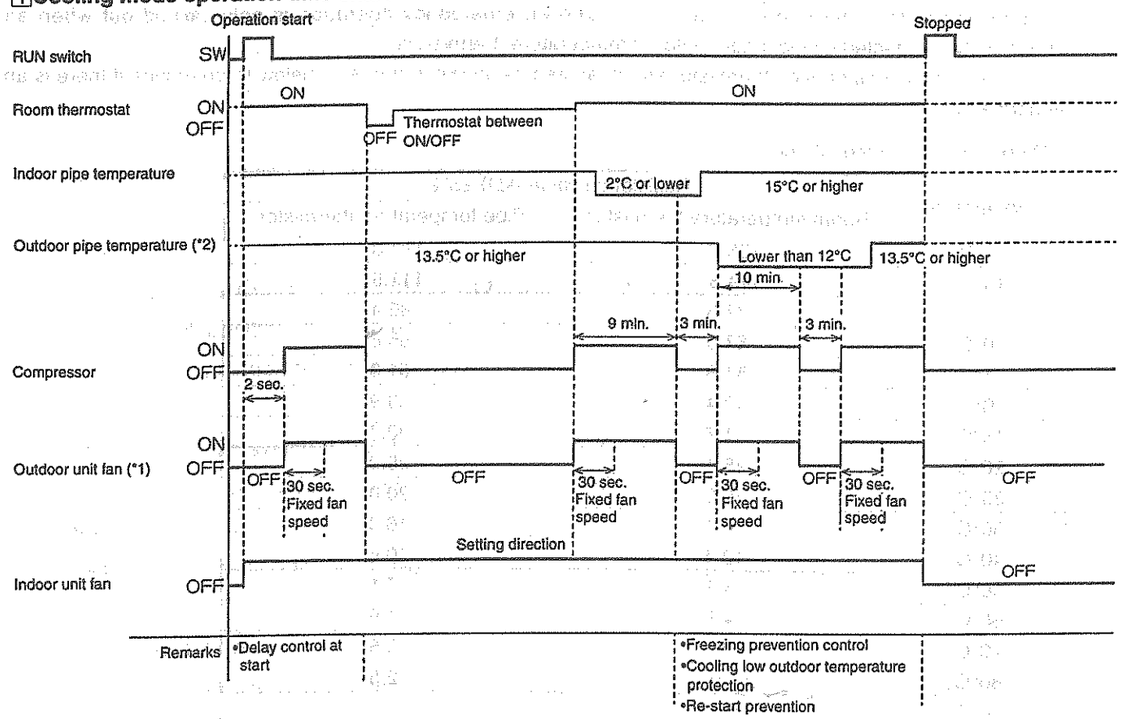
NOTE: •Any abnormalities detected by the temperature thermistors are ignored during emergency operation, so that long-term operation in this mode should be avoided.

•After emergency mode operation has been competed 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



(*1)

Outdoor unit fan start control during cooling

At the start of cooling mode and drying mode operation, the outdoor unit heat exchanger outlet temperature is detected in order to set the fan speed.

Operation is carried out at the fan speed detected for 30 seconds.

Heat exchanger outlet temperature detected (T)	Outdoor unit fan start speed
T < 0°C	SUPER LOW
0°C ≦ T < 10°C	LOW
10°C ≦ T < 20°C	MEDIUM
20°C ≦ T < 25°C	HIGH
25°C ≦ T	SUPER HIGH

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

(*2)

Cooling low outdoor temperature protection

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

This is 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

①Operation

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.

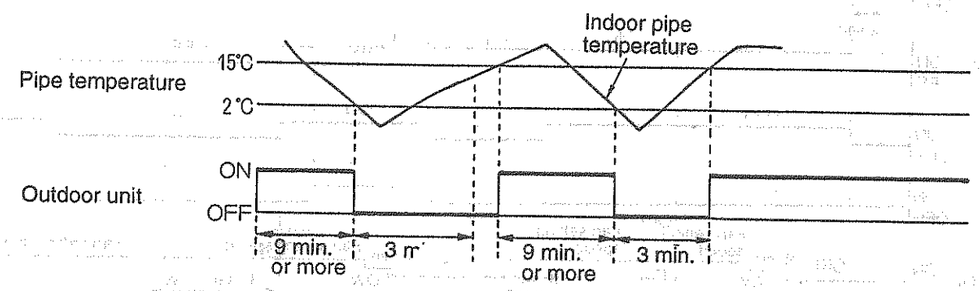
The indoor unit continues operating at the fan speed set by the remote control unit. (The remote control unit display does not change.)

③Canceling

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

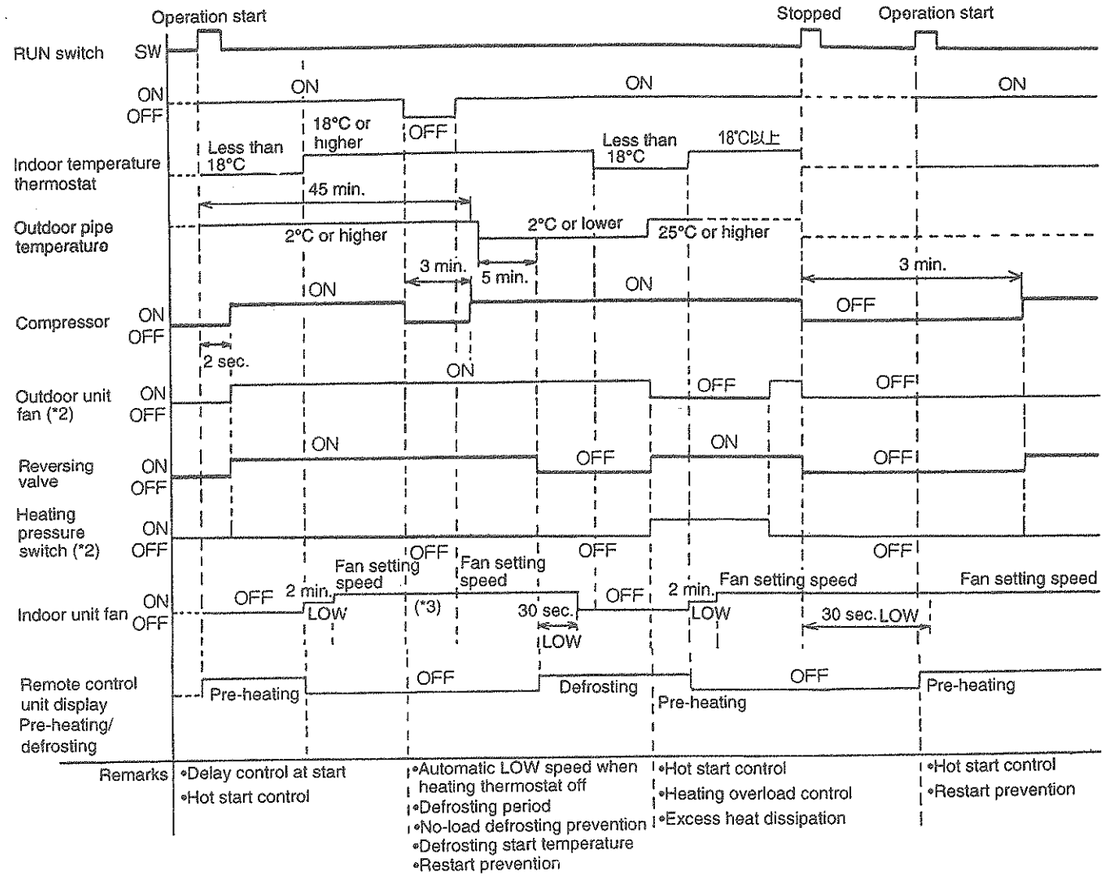
(If the outdoor unit stops even though the temperature is 15°C or higher, restart prevention control will activated and the outdoor unit will not start again for 3 minutes.)

(The 9-minute countdown is cleared while the compressor is stopped.)



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

4 Heating mode operation time chart



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

(*4) Refer to "9 Indoor thermostat characteristics

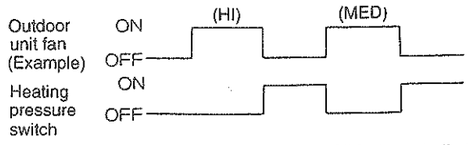
(*2)

Outdoor unit fan control during heating mode operation

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

(At the start of heating mode operation, the fan operates at HI speed.)

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



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

5 Hot starting

1. When heating mode operation starts

①Start

Hot start control commences when heating mode operation starts.

②Operation

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

At the indoor unit, the indoor unit fan stops.

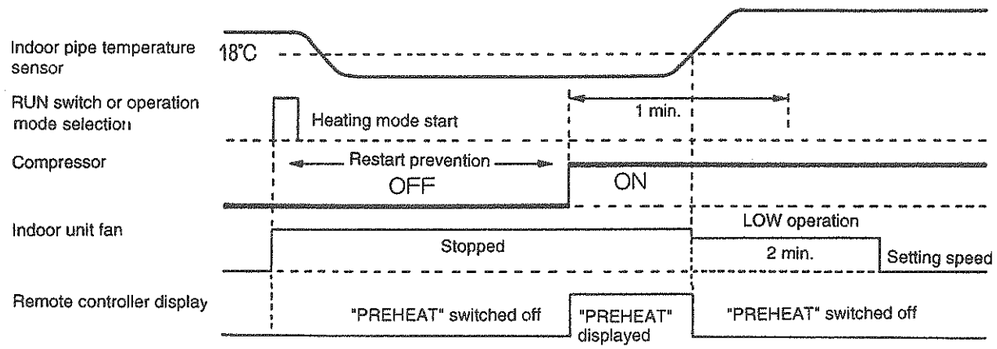
③Canceling

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.

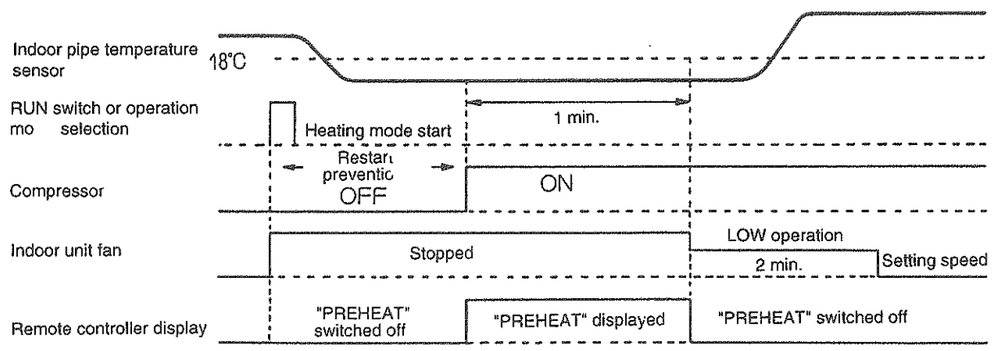
After cancellation, the "PREHEAT" display on the remote controller disappears and the louver operation returns to the previous setting.

(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

①Start

Hot start control commences when defrosting is complete.

②Operation

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

At the indoor unit, the indoor unit fan stops.

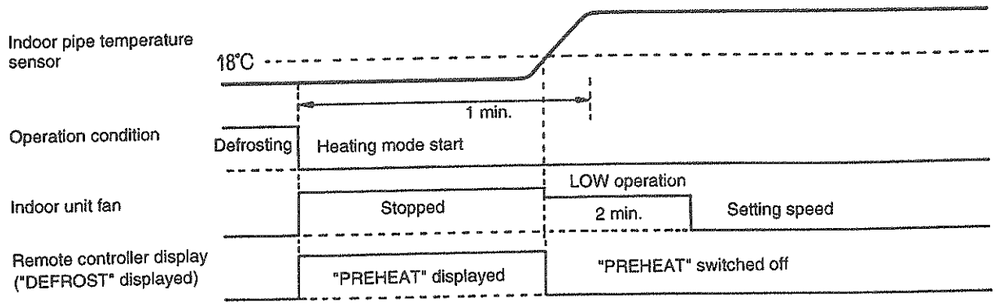
③Canceling

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.

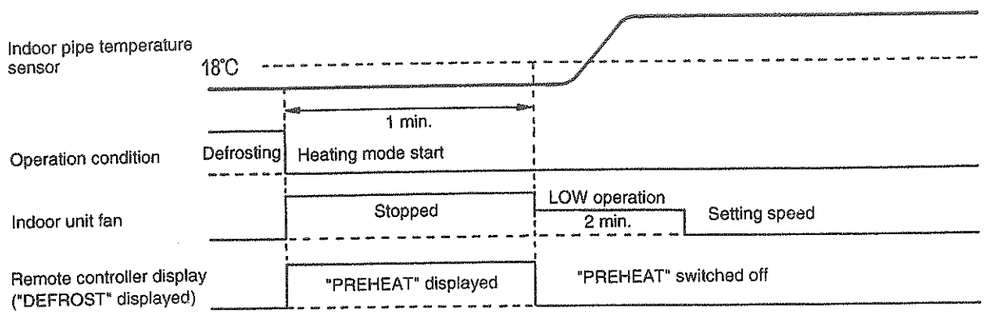
After cancellation, the "PREHEAT" display on the remote controller disappears and the louver operation returns to the previous setting.

(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>



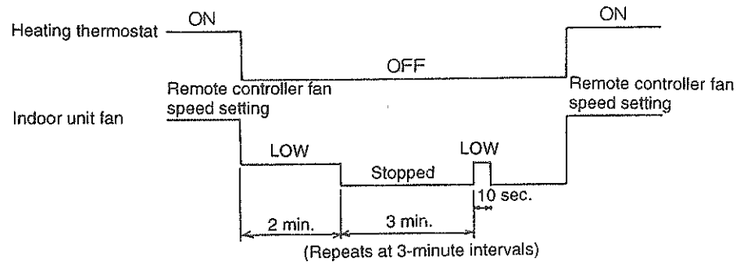
<When hot start operation is canceled by time>



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.

①When heating mode operation has stopped

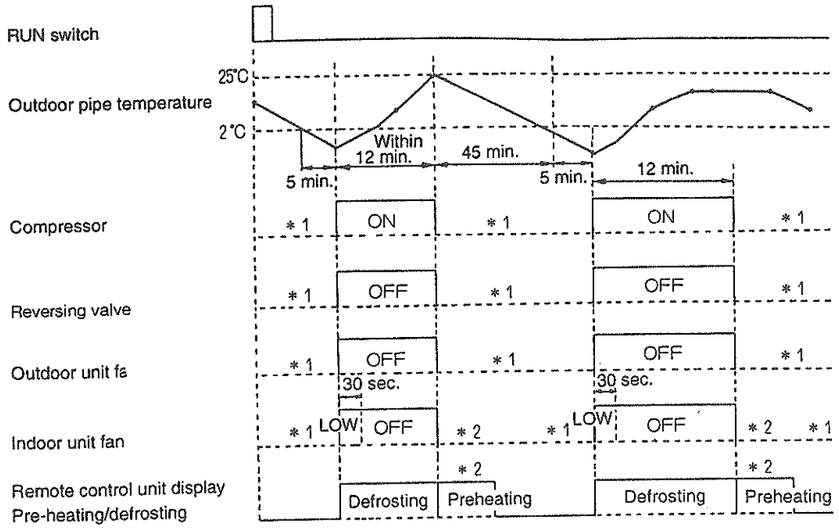
(LOW operation for 30 seconds)

②When operation is set to a mode other than heating by means of the OPERATION MODE switch

③If 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

①Start

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.

②Completion

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.

③Forced 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

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

②The indoor unit fan operates at LOW for 30 seconds after defrosting starts. After this, the indoor unit fan turns off until defrosting is complete.

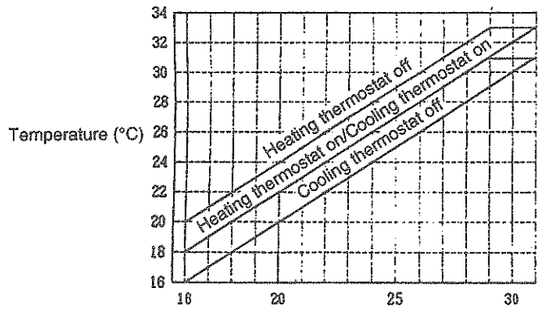
9 Indoor thermostat characteristics

1. Thermostat characteristics during cooling and heating modes

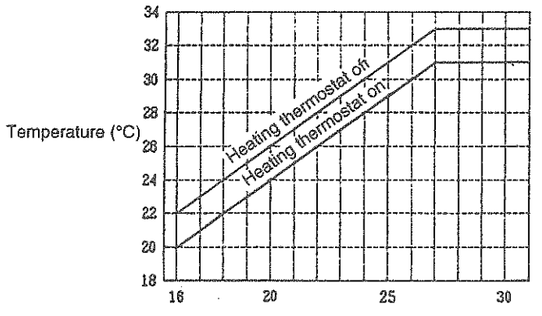
Operation mode	Setting temperature (To)	Room temperature (°C) Operation	Differential 2.0K	Differential 4.0K
Cooling	16	O N	18.0	———
		O F F	16.0	———
	31	O N	33.0	———
		O F F	31.0	———
Heating *1	16	O N	18.0	20.0
		O F F	20.0	22.0
	29~31 *1(27~31)	O N	31.0	31.0
		O F F	33.0	33.0

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

Thermostat characteristics during cooling and heating modes



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



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

2.Thermostat characteristics during dry mode

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

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

①Settings at the start of automatic changeover operation

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

Indoor temperature (T) °C	Initial setting
T < remote controller display temperature - 2 (°C)	Heating mode operation, thermostat on
Remote controller display temperature ≧ T	Heating mode operation, thermostat off (fan mode operation)
Remote controller display temperature ≦ T	Cooling mode operation, thermostat off (fan mode operation)
Remote controller display temperature + 2 (°C) < T	Cooling mode operation, thermostat on

2 (°C): Thermostat differential

②Thermostat characteristics when switching between cooling and heating mode operation

Switching between cooling mode and heating mode operation is carried out as shown in the table below.
However, during automatic operation, the operation does not change again until 10 minutes after the thermostat has switched off in either cooling mode or heating mode.
(The 10-minute timer is canceled when operation is changed to another mode or when operation stops and the thermostat turns on.)

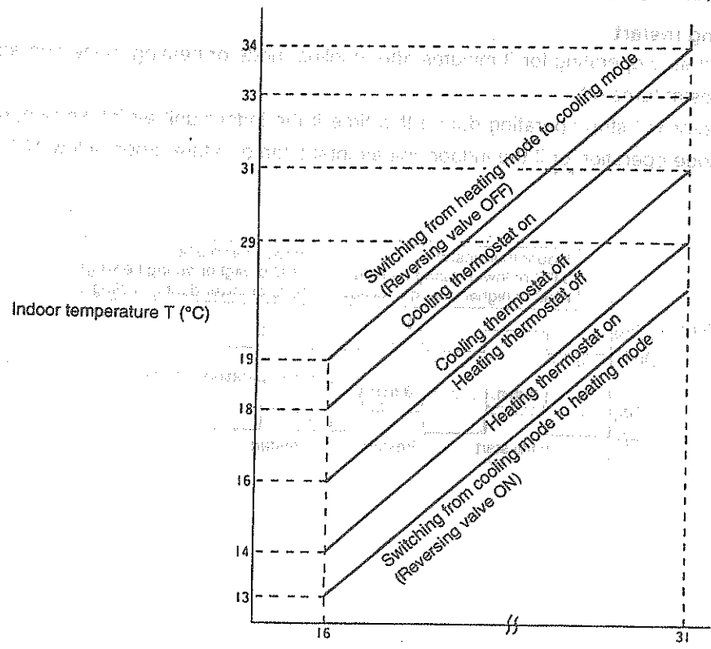
Indoor temperature (T) °C	Operation switching
T ≧ Remote controller display temperature + 3 (°C)	Heating mode → Cooling mode
T ≦ Remote controller display temperature - 3 (°C)	Cooling mode → Heating mode

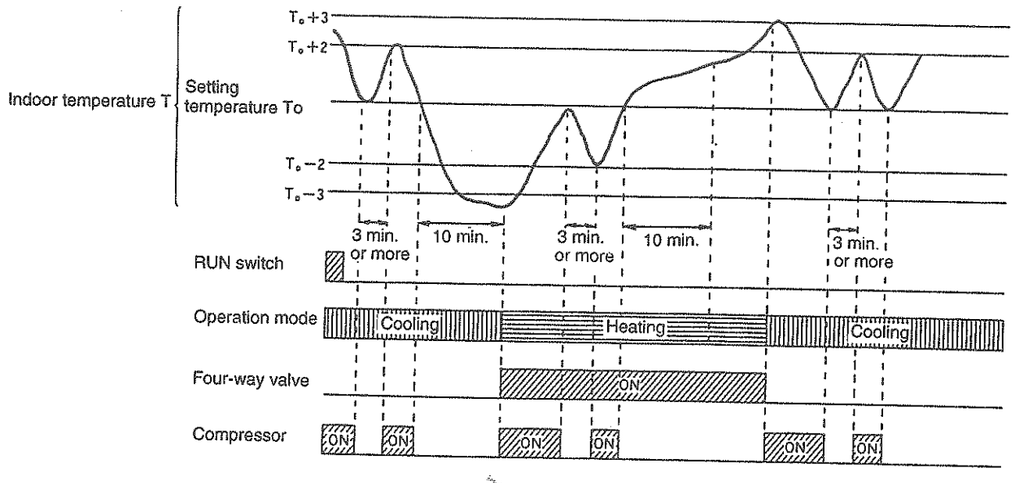
③Thermostat characteristics during cooling mode and heating mode operation

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

Indoor temperature thermostat characteristics during automatic changeover operation





Automatic cooling/heating mode operation time chart

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.

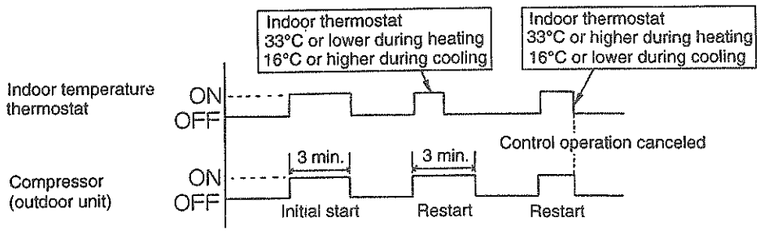
(Indoor temperature)– (Setting temperature) (Units: K)

	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

①Start

Carried out when the compressor switches from on to off (when the remote control unit is used to stop operation)

②Operation

The outdoor unit fan runs at SUPER HI speed for approximately 60 seconds and then stops.

14 Discharge temperature control

①Operation

When the discharge temperature sensor detects a temperature of 100°C or higher during cooling mode operation, the liquid bypass valve is turned on.

②Canceling

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.

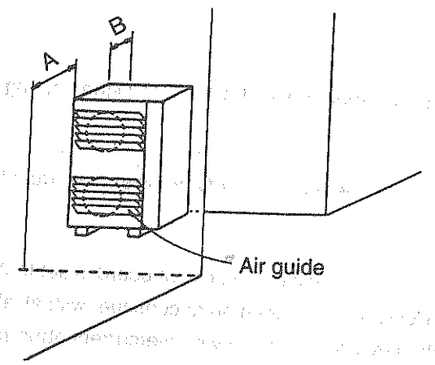
16 DIP switch settings

● Indoor unit printed circuit board (DSW1)

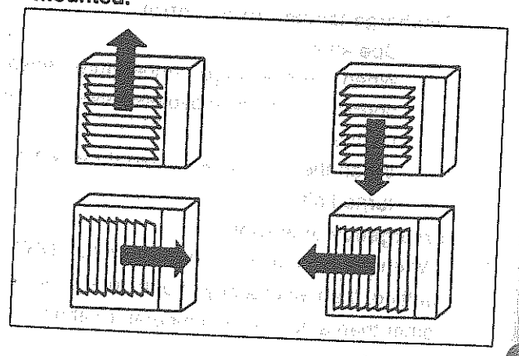
No.	Setting type	Factory shipment	Remarks
1	Group address setting (twin/triple address setting)	OFF	When group operation is being carried out using the remote controller, this address is set in order to control the order of starting for the indoor units. (If No. 8 is ON, twin/triple address setting is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



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



Air guider for outdoor units

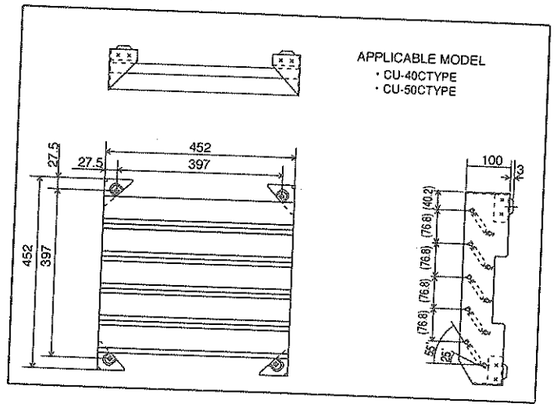
MODEL NAME		PART NUMBER	A dimension	B dimension
CU-50C02HP		CZ-02AGA	50cm	10cm
CU-71C02HP CU-71C02XP CU-80C52HP CU-80C52XP	CU-80C02HP CU-80C02XP	CZ-03AGA	50cm	10cm
CU-112C52XP CU-140C53XP CU-160C53XP	CU-112C02XP CU-140C03XP CU-160C03XP	CZ-06AGA	100cm	20cm

NOTE When installing the air guider

1) If directing the air upward, there should be no obstacles above the outdoor unit.
2) If directing the air to the left or right, there should be no obstacles at the left or right of the outdoor unit.
3) Never use the air guider in locations which are subject to snowfall. If snow get inside the air guider, it could cause the fan to freeze up.
4) If connecting outdoor units in series, direct the air flow upward.

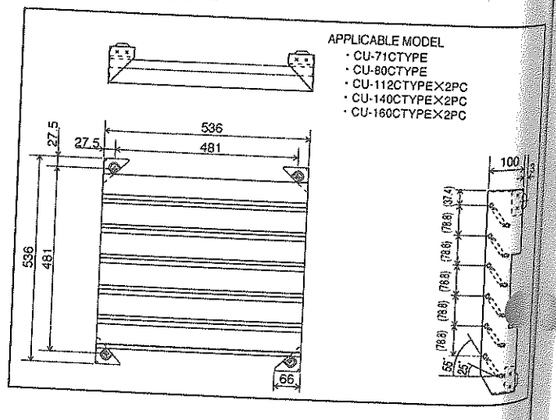
CZ-02AGA

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

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

- As to installation, request the distributor or vendor to perform it. Imperfection in installation caused by that having been carried out by the customer himself leads to water leakage, electric shock, fire, etc.
- Carry out the installation work with reliability according to this manual for installation work. Imperfection in installation leads to water leakage, electric shock, fire, etc.
- Carry out the installation with reliability on the place that bears the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.
- Carry out predetermined installation work in preparation for strong wind such as typhoon, earthquake. Imperfection in installation work may lead to accident arisen from overturn, etc.
- Electric work shall be carried out by the 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.
- Wiring shall be connected securely using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section. Imperfect connection and fixing leads to fire, etc.
- If installing inside a small room, measures should be taken to prevent refrigerant levels from building up to critical concentrations in the event of a refrigerant leak occurring. Please discuss with the place of purchase for advice on what measures may be necessary to prevent critical concentrations being exceeded. If the refrigerant leaks and reaches critical concentration levels, there is the danger that death from suffocation may result.
- Securely attach the protective covers for the outdoor unit connection 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.

⚠ Warnings

- If refrigerant gas escapes during installation, ventilate the affected area. If the refrigerant gas comes into contact with sparks or naked flames, it will cause toxic gases to be generated.
- Once installation work is complete, check that there are no refrigerant gas 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.

⚠ Cautions

- 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.
- Do not install the unit at the place where the possibility of inflammable gas leakage exists. If such gas leakage should arise and the gas builds up around the unit, such situation may lead to ignition.
- Mounting of the earth leakage breaker is required.
  Omission in mounting of the earth leakage breaker may lead to electric shock.
- Drain piping should be made to ensure secure drainage according to the manual for installation work and carry out the thermal insulation to prevent the occurrence of condensation. Imperfection in piping work leads to water leakage and may cause the house and property, etc. to become wet.
- Position the indoor 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.)

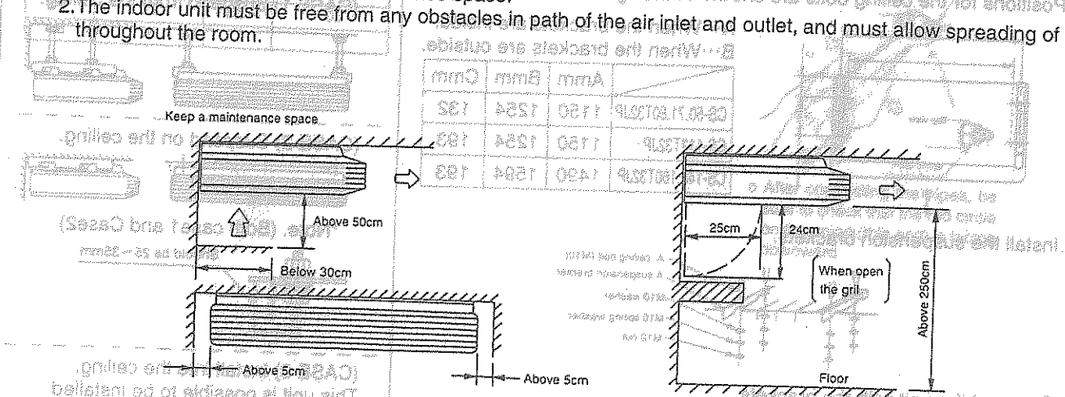
1.ACCESSORIES PACKED IN THE INDOOR UNIT CONTAINER

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

2.SELECTING THE LOCATION OF THE INDOOR UNIT

Provide a check port on the piping side celling for repair and maintenance.

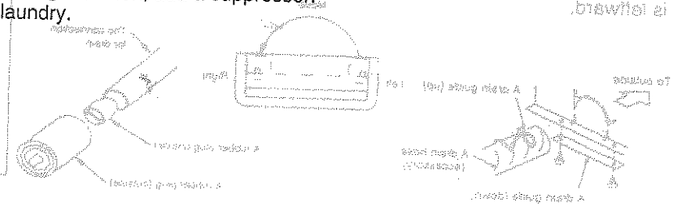
- Install the indoor unit the following conditions are satisfied, after receiving customer approval.
  1.The indoor unit must keep a maintenance space.
  2.The indoor unit must be free from any obstacles in path of the air inlet and outlet, and must allow spreading of air throughout the room.



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

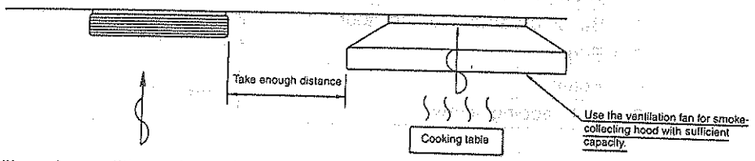
⚠Warning
3.The installation position must be able to support a load four times the indoor unit weight.

4.The indoor unit must be away from heat and steam sources, but avoid installing it near an entrance.
5.Prepare a power outlet for the indoor unit nearby.
6.The indoor unit must allow easy draining.
7.The indoor unit must allow easy connection to the outdoor unit.
8.Place assuring the height in the ceiling shown in the upper figure or more.
9.The indoor unit must be at least 3m away from any noise-generating equipment.
The electrical wiring must be shielded with a steal conduit.
10.If the power supply is subject to noise generation, add a suppressor.
11.Do not install the indoor unit in a laundry.
(Electric shocks may result.)



NOTE ● Throughly study the follwing installation locations:

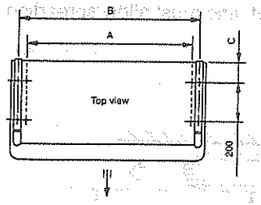
1.In such places as restaurants and kitchens, considerable amount of oil steam and flour adhere to the turbo fan, the fin of the heatexchanger and the drain pump, resulting in heat exchange reduction, spraying, dispersing of water drops, drain pump malfunction, etc.
In these cases, take the following 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

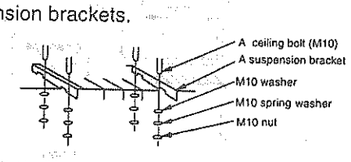
1.Positions for the ceiling bolts are shown in the figure below.



A···When the brackets are inside.
B···When the brackets are outside.

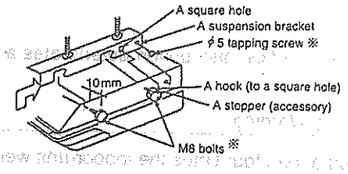
	Amm	Bmm	Cmm
CS-50.71.80T32JP	1150	1254	132
CS-112T32JP	1150	1254	193
CS-140.160T32JP	1490	1594	193

2.Install the suspension brackets.

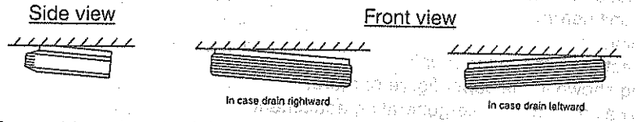


3.Suspend the unit with the brackets.

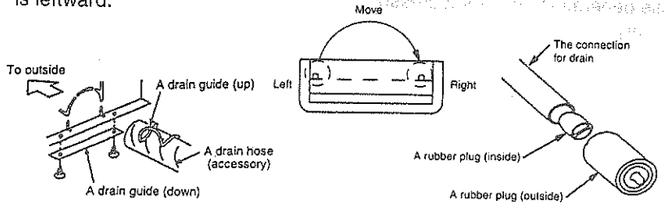
※Note.
Tighten these (※) of both sides at last.



4.Pay special attention to facilitate draining.

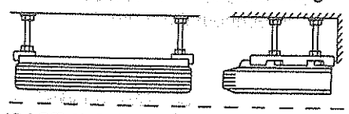


5.Move rubber plugs to right and drain guides to left when drain is leftward.



How to suspend the Air Conditioner

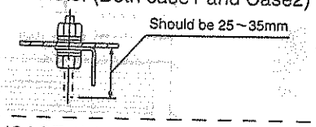
(CASE 1) Suspend from the ceiling.



(CASE 2) Suspend on the ceiling.

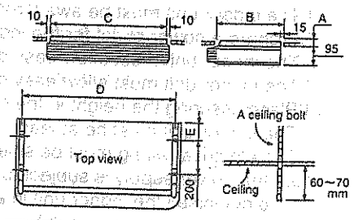


*Note. (Both case1 and Case2)



(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

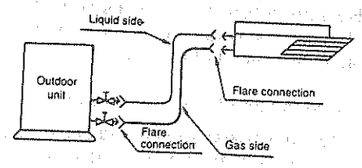
4. PIPING CONNECTION

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.

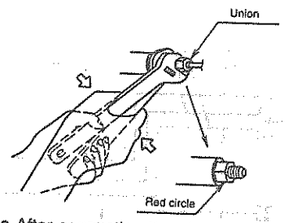
Model name	Liquid side piping	Gas side piping
CS-50T32JP	ϕ6.35mm	ϕ12.70mm
CS-71T32JP	ϕ6.35mm	ϕ15.88mm
CS-80T32JP	ϕ9.52mm	ϕ15.88mm
CS-112T32JP CS-140T32JP CS-160T32JP	ϕ9.52mm	ϕ19.05mm



CAUTION

Use two wrenches and tighten with regular torque.

TIGHT TORQUE FOR FLARE NUT (N · m)			
2/8"	18	5/8"	65
3/8"	42	6/8"	100
4/8"	55		



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

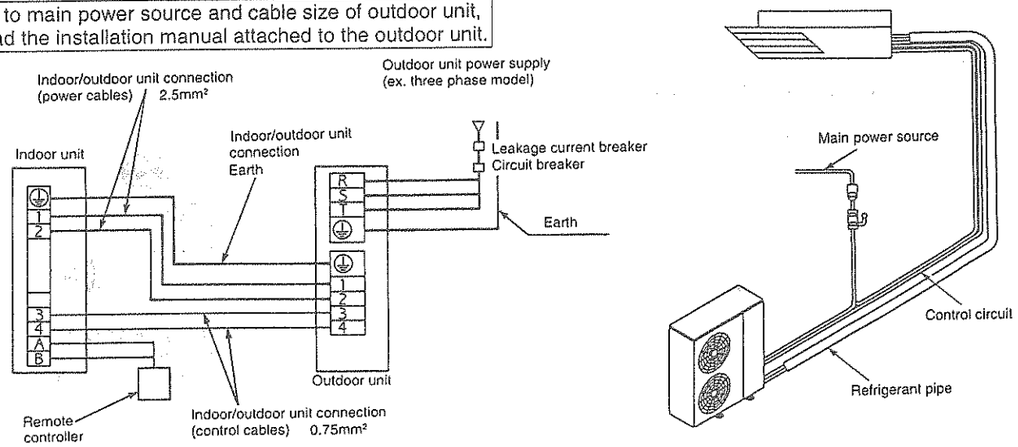
5.ELECTRICAL WIRING

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 counduit 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 insuffucient 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.

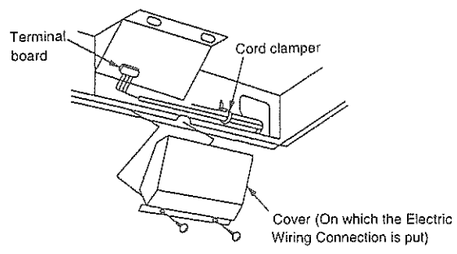
⚠Caution	Be sure to connect the unit to secure earth connection. (with a earth resistance of 100Ω or less) If the earthing work is not carried out properly, electric shocks may result.

⚠Caution	Wiring shall be connected securely using specified cabls 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.

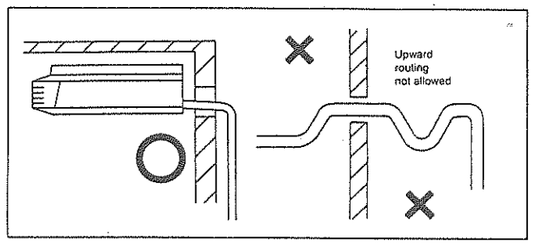


6. DRAIN PIPING WORK

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

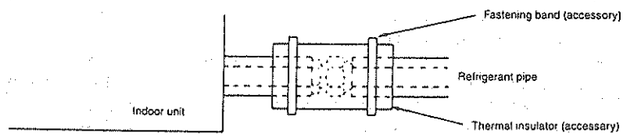


- Be sure to execute heat insulation on the drain piping.

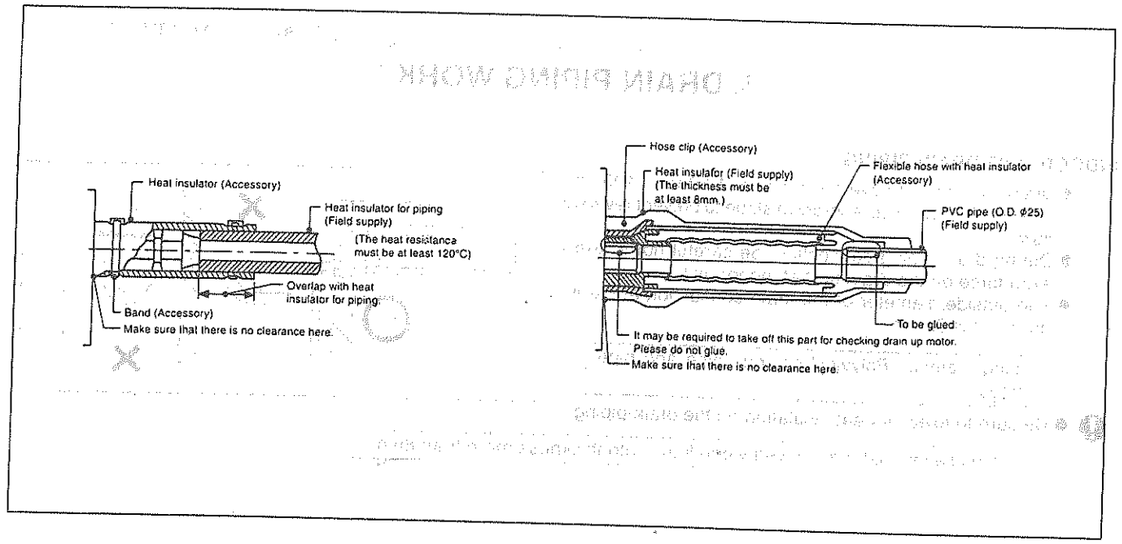
Heat insulation material: Polyethylene foam with thickness more than 8mm

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.



8. SELF-DIAGNOSES FUNCTION

SELF-DIAGNOSIS FUNCTION

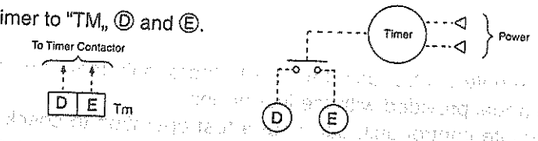
- The LED1 (green) illuminates to indicate that the microprocessor on the microprocessor circuit board is operating normally. If the LED is switched off or is flashing irregularly, check the power supply, and turn it off and then back on again.

- 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 2	Outdoor unit circuit board LED	Location of problem	Check location
Abnormal display	Detail display					
F15	- 01	○ Flashing	○	For further details, refer to the section on outdoor unit self-diagnosis.	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, veneer 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
	- 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	○	○		Centralized control address overlap problem	Check settings for optional centralized control circuit board address switch
F26	- 01	○	○		Remote control transmission wire open circuit problem	Remote control unit cable and connection terminals
	- 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
	- 02	○	○		Indoor/outdoor unit transmission problem	Check the transmission wave pattern
F29	- ○○	○	○		Setting problem	Contact the place of purchase.
F30~F49	- ○○	○	○		Outdoor unit problem	Refer to the section on outdoor unit self-diagnosis.

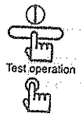
9. USE OF TIMER (LOCAL ARRANGEMENTS)

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



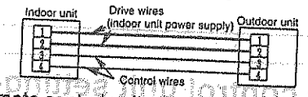
10. TEST OPERATION

- 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)
☐ Is there any leakage of refrigerant?
☐ Is remote controller switch operated?
☐ Are there any faulty wiring?
☐ Are not terminal screws loosened?
☐ Tightening torque (N • cm {kgf • cm})
M4...118 {12}, M5...196 {20}
M6...245 {25}, M8...588 {61}

12. DELIVERY TO OUR CUSTOMERS

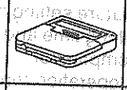
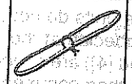
- Teach the customer the operation and maintenance procedures, using the operation manual (air filter cleaning, temperature control, etc.)

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

Wired Remote Control Unit Installation Manual

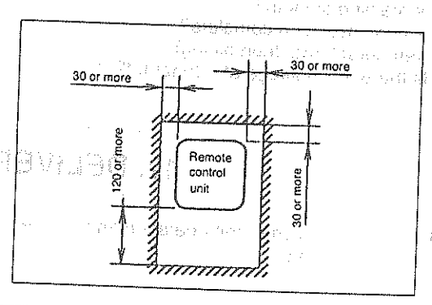
- Before installing the wired remote control unit, be sure to thoroughly read the "Notes with regard to safety" section of the Installation manual provided with the indoor unit.
- After installing the wired remote control unit, carry out a test operation to check that the remote control unit functions 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
				M4 screw	3		Installing the remote control unit to an outlet box
Remote control cord	1		Connecting the indoor unit and remote control unit (cord length 10 m)	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.

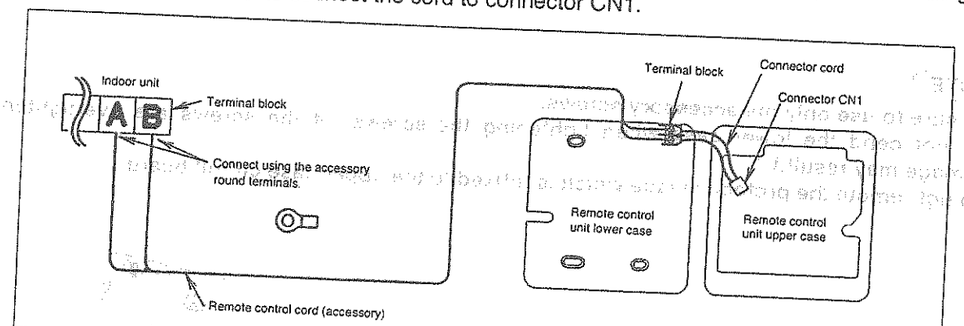


3.Remote control unit installation

- 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.

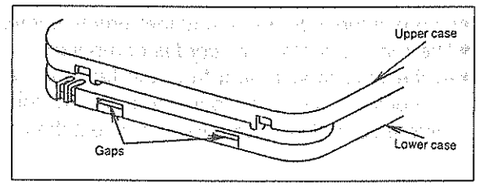


NOTE

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

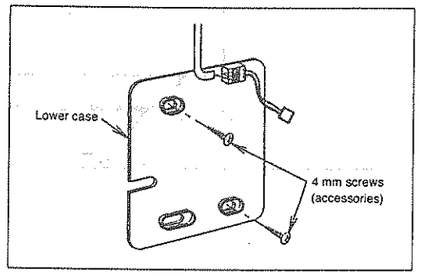
Remote control unit installation procedure

- 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.)



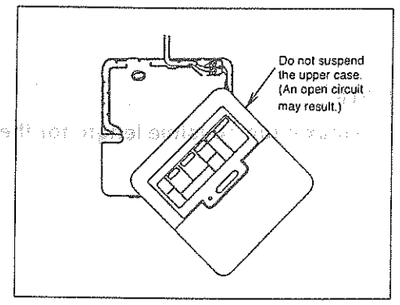
NOTE

★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 remote the protective tape which is affixed to the upper case circuit board.



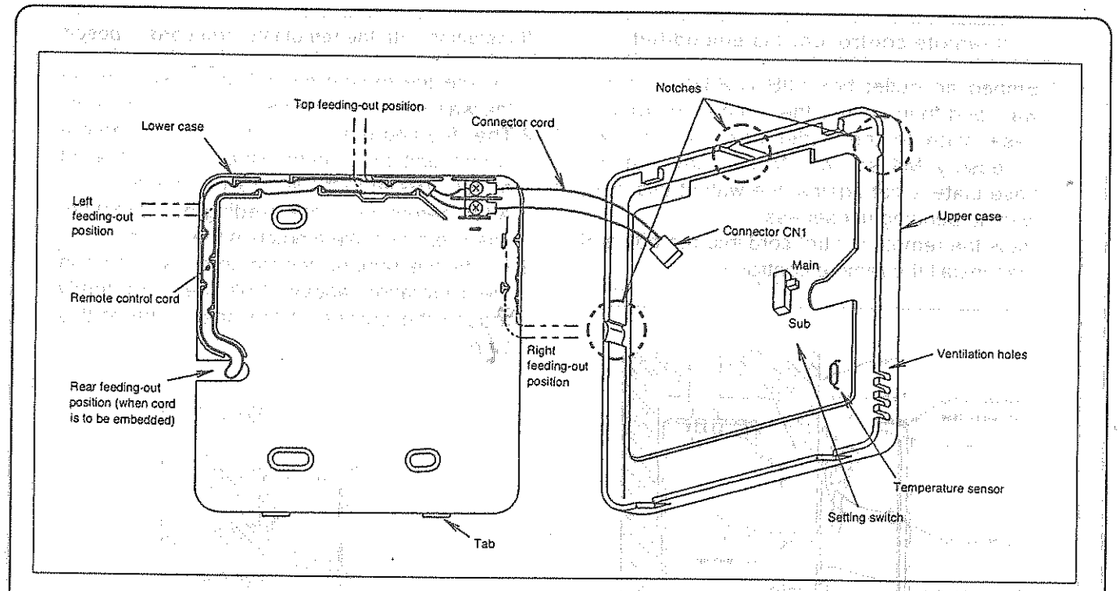
- If installing the remote control unit with the remote control unit cord exposed, use pliers to cut a notch into the upper case. (The feeding-out direction can be either up or to the left or right.)

- 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.)

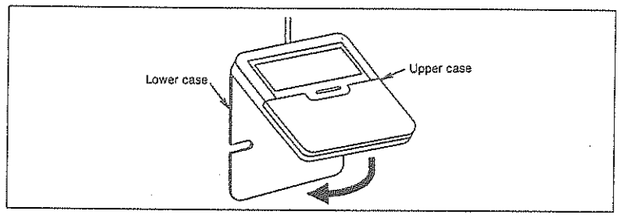


NOTE

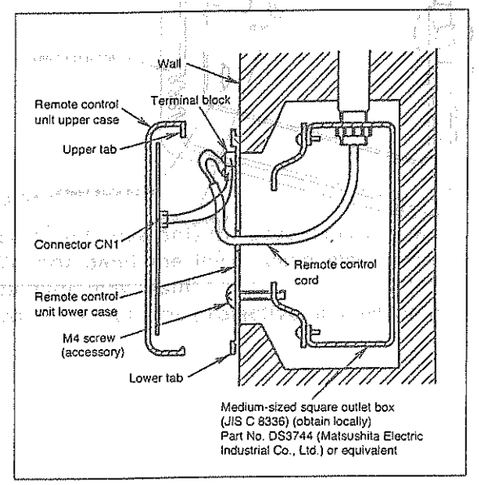
★After connecting the connector, do not suspend the upper case by its own weight, otherwise the connector cord may break.

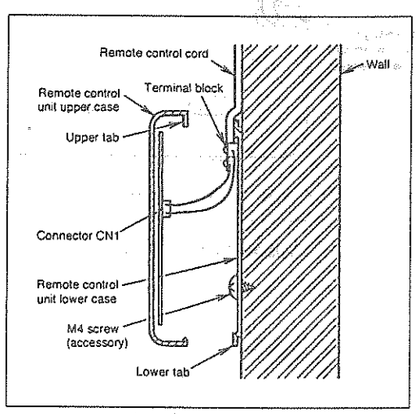


- If controlling using two remote control units, refer to "Control using two remote control units" in "4. Settings".
- Secure the upper case to the lower case.
  (Hook the upper tab of the upper case into the lower case, and then push the upper case until it snaps shut onto the lower case tab, while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



If remote control cord is embedded	If installing with the remote control cord exposed
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.	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.



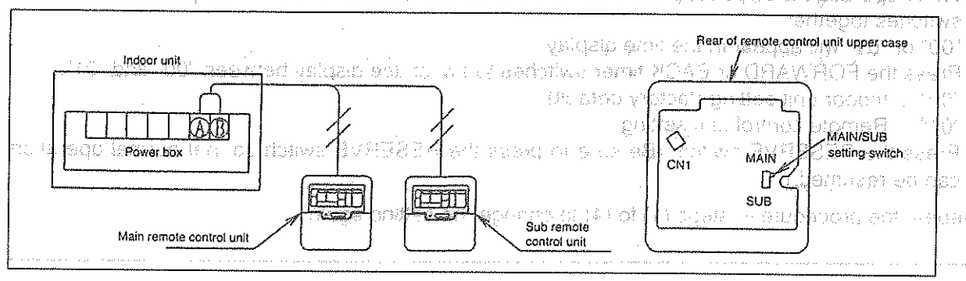


4. Settings

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.

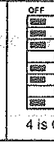
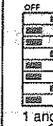
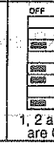
(1) Decide which is to be the main and which is to be the sub remote control unit.
The main or sub status of the remote control unit is set automatically. The MAIN/SUB setting switch can also be used to make the setting manually, however if a manual setting is made, that manual setting has priority. 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								
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								
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.

(1) While operation is stopped, press and hold the STOP/RUN switch, and then press the UP and DOWN switches together.
(2) "00" or "01" will appear in the time display.
(3) Press the FORWARD or BACK timer switches to switch the display between "00" and "01".
"00" ... Indoor unit setting (factory default)
"01" ... Remote control unit setting
(4) Press the RESERVE switch. (Be sure to press the RESERVE switch so that normal operation mode can be resumed.)

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

Energy save setting

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

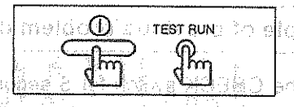
(1) While operation is stopped, press the UP and DOWN switches simultaneously.
(2) To set an upper limit (Setting a temperature above the energy save temperature will not be possible.)
Press the OPERATION MODE switch until HEAT is displayed.
Press the UP or DOWN switch to set the temperature.
Press the RESERVE switch.
Example:If the heating display is set to 28°C, setting the temperature to higher than 28°C will not be possible.
(3) To set a lower limit (Setting a temperature below the energy save temperature will not be possible.)
Press the OPERATION MODE switch until COOL is displayed.
Press the UP or DOWN switch to set the temperature.
Press the RESERVE switch.
Example:If the cooling display is set to 22°C, setting the temperature to lower than 22°C will not be possible.
(4) If the CLEAR switch is pressed during steps (2) or (3) above, the energy save setting will be cleared.

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

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.

Problem display →

Timer	Fan speed	Operation	Temperature setting
CHECK F26			Air conditioner No. 01

Detai display →

Timer	Fan speed	Operation	Temperature setting
CHECK -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 more . ⟶ Continue pressing the TIMER ON/OFF switch while the problem details are being displayed.

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

	Timer	Fan speed	Operation	Temperature setting
Detai display ⟶	CHECK 1-01			Air conditioner No. 01

Example of abnormality display before previous display

- While the previous display still appears, press the FORWARD timer switch. ⟶ Continue pressing the TIMER ON/OFF switch while the problem details are being displayed.

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

	Timer	Fan speed	Operation	Temperature setting
Detai display ⟶	CHECK 2-01			Air conditioner No. 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

▲ As to installation, request the distributor or vendor to perform it. Imperfection in installation caused by that having been carried out by the customer himself leads to water leakage, electric shock, fire, etc.

▲ Carry out the installation work with reliability according to this manual for installation work. Imperfection in installation leads to water leakage, electric shock, fire, etc.

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

▲ Carry out predetermined installation work in preparation for strong wind such as typhoon, earthquake. Imperfection in installation work may lead to accident arisen from overturn, etc.

▲ Electric work shall be carried out by the 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.

▲ 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.

▲ 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.

▲ 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.

⚠ Warnings

▲ If refrigerant gas escapes during installation, ventilate the affected area. If the refrigerant gas comes into contact with sparks or naked flames, it will cause toxic gases to be generated.

▲ Once installation work is complete, check that 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.

⚠ Cautions

▲ 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.



▲ Do not install the unit at the place where the possibility of inflammable gas leakage exists. If such gas leakage should arise and the gas builds up around the unit, such situation may lead to ignition.



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

▲ Drain piping should be made to ensure secure drainage according to the manual for installation work and carry out the thermal insulation to prevent the occurrence of condensation. Imperfection in piping work leads to water leakage and may cause the house and property, etc. to become wet.

▲ Position the indoor 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 supplied with outdoor unit

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

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

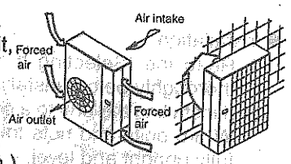
Heat pump-types only

Part name	Qty.	Diagram	Application
Drain elbow (with Ring seat)	1		For connecting the drain pipe

2. Selecting the outdoor unit installation location

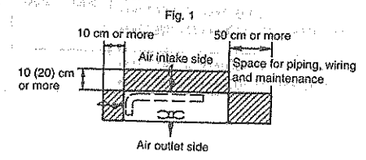
- Select a location which satisfies the following condition, and then confirm with the customer that such a place is satisfactory before installing the outdoor unit.

1. There should be sufficient ventilation.
2. The outdoor unit should be sheltered as much as possible from rain and direct sunlight, and the air should be able to move around so that hot and cold air do not build up.
3. There should be no animals or plants near the air outlet which could be adversely affected by hot or cold air coming out of the unit.
4. The outlet air and operating noise should not be a nuisance to other occupants nearby.
5. The location should be able to withstand the full weight and vibration of the outdoor unit, and it should also be level and safe for the unit to be installed.
6. The intake and outlet should not be covered.
7. There should be no danger of flammable gas or corrosive gas leaks.
8. There should be as little back-ventilation (air blowing directly onto the fan) as possible.
   (If strong wind blows directly onto the fan, it may cause problems with normal operation.)
   - If you know which direction the prevailing wind comes from during the operating season, set the outdoor unit at a right-angle to this wind direction, or so that the air outlet faces toward a wall or fence.
   - If the re are no obstructions near the outdoor unit and the wind direction is not constant, install an optional air guider.
9. Do not allow any obstacles near the outdoor unit which will interfere with air flow around the air intake and air outlet.
10. If installing in a location which is prone to snowfall, place the installation base as high as possible, and be sure to install a roof or enclosure which does not allow snow to accumulate.
11. Avoid installing the unit in places where petroleum products (such as machine oil), salinity, sulfurous gases or high-frequency noise are present.
12. Be sure to leave enough space around the outdoor unit to maintain proper performance and to allow access for routine maintenance.
    - Allow enough space from any obstacles as shown in Fig. 1.2 below in order to prevent short-circuits from occurring. (If installing more than one outdoor unit, make the necessary space available as outlined in 14.)
      However, there should be at least 1 meter of free space above the unit.
    - The height of any obstacles at the air intake and outlet sides should not be greater than the height of the outdoor unit.



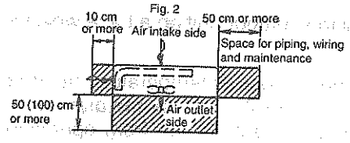
- When facing the air intake side toward a wall

Fig. 1



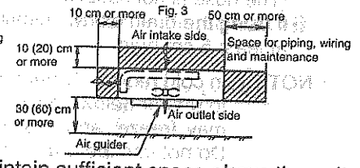
- When facing the air outlet side toward a wall

Fig. 2



- When using an optional air guider for outdoor units

Fig. 3



※Maintain sufficient space above the unit.

13. If 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

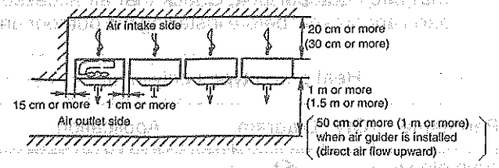
1) If directing the air upward, there should be no obstacles above the outdoor unit.
2) If directing the air to the left or right, there should be no obstacles at the left or right of the outdoor unit.
3) Never use the air guider in locations which are subject to snowfall. If snow gets inside the air guider, it could cause the fan to freeze up.
4) If connecting outdoor units in series, direct the air flow upward.

Air guider for outdoor units

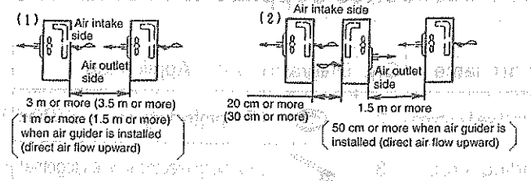
MODEL NAME	PART NUMBER
CU-40C5*** CU-40C0*** CU-50C5*** CU-50C0*** CU-50CT0***	CZ-02AGA
CU-71C5*** CU-71C0*** CU-71CT0*** CU-80C5*** CU-80C0*** CU-80CT0***	CZ-03AGA
CU-100C0*** CU-100CT0*** CU-112C5*** CU-112C0*** CU-112CT0*** CU-140C5*** CU-140C0*** CU-140CT0*** CU-160C5*** CU-160C0*** CU-160CT0***	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



● When installing units facing each other



※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

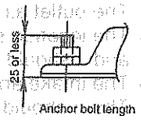
● Transporting

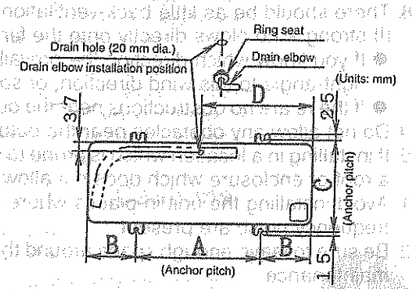
1. The outdoor unit should be transported in its original packaging as close to the installation location as possible.
2. If suspending the outdoor unit, use a rope or belt, and use cloth or wood as padding in order to avoid damaging the unit.
3. Use the handles at left and right to transport the unit, 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.





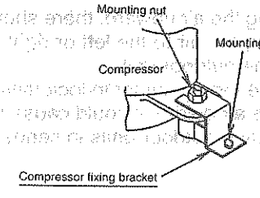
Anchor bolt positions

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

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

CAUTION

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



4. Connecting the pipes

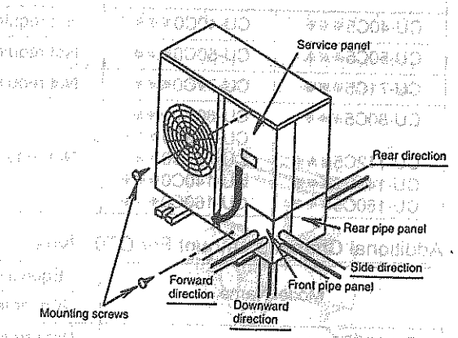
● The refrigerant pipes are of particular importance. The installation work for refrigeration cycles in separate-type air conditioners must be carried out perfectly.

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)
	Liquid-side pipes	Gas-side pipes		
CU-40C5✱✱✱ CU-40C0✱✱✱	φ6.35	φ12.7	30	30
CU-50C5✱✱✱ CU-50C0✱✱✱ CU-50CT0✱✱✱	φ6.35	φ12.7	40	30
CU-71C5✱✱✱ CU-71C0✱✱✱ CU-71CT0✱✱✱	φ6.35	φ15.88	50	30
CU-80C5✱✱✱ CU-80C0✱✱✱ CU-80CT0✱✱✱ CU-100C0✱✱✱ CU-100CT0✱✱✱	φ9.52	φ15.88	50	30
CU-112C5✱✱✱ CU-112C0✱✱✱ CU-112CT0✱✱✱ CU-140C5✱✱✱ CU-140C0✱✱✱ CU-140CT0✱✱✱ CU-160C5✱✱✱ CU-160C0✱✱✱ CU-160CT0✱✱✱	φ9.52	φ19.05	50	30

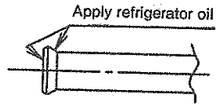
2. Local pipes can project in any of four directions.
   - Make holes in the pipe panels for the pipes to pass through.
   - Be sure to install the pipe panels to prevent rain from getting inside the outdoor unit.

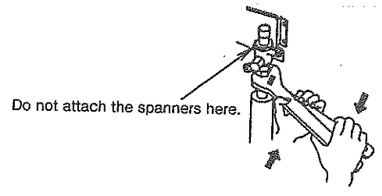
   [Removing the service panel]
   (1) Remove the two mounting screws.
   (2) Slide the service panel downward to release the pawls. After this, pull the service panel toward you to remove it.



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}
φ6.35mm	18 {180}	φ15.88mm	65 {650}
φ9.52mm	42 {420}	φ19.05mm	100 {1000}
φ12.7mm	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.

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

5. Heat insulation

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

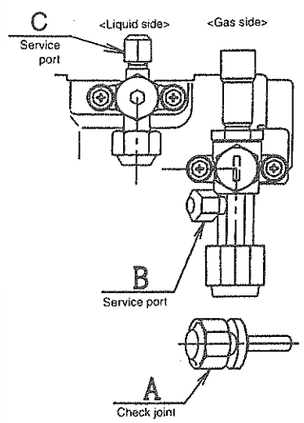
Liquid-side pipes	Material that can withstand 120°C or higher
Gas-side pipes	

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	0.02kg/m	40m
CU-71C5※※※	CU-71C0※※※	Not required	0.02kg/m	50m
CU-80C5※※※ CU-112C5※※※ CU-140C5※※※ CU-160C5※※※	CU-80C0※※※ CU-100C0※※※ CU-112C0※※※ CU-140C0※※※ CU-160C0※※※	Not required	0.05kg/m	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※※※	Not required	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

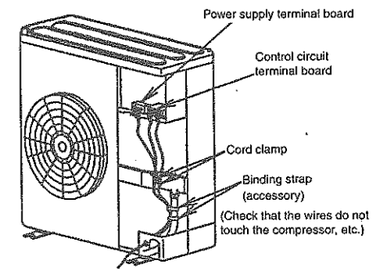
⚠ WARNING	All electrical work must be carried out only by a qualified technician according to proper technical standards for electrical work and according to instructions given in the installation manual, and only the proper specified circuits must be used. If circuits with insufficient capacity are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

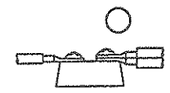
⚠ Caution	Be sure to install a leakage current breaker or circuit breaker to the main power supply, otherwise electric shocks may result.

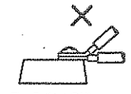
⚠ Caution	Be sure to connect the unit to a secure earth connection. Use the special earthing screw to connect the unit to earth (with a earth resistance of 100 Ω or less) with a earthing wire as specified in the table below. If the earthing work is not carried out properly, electric shocks may result.

◎ 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 - 415 V, or 220 V (or single-phase 220 - 240 V) 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).




Fig. A (OK)


Fig. B (Not OK)

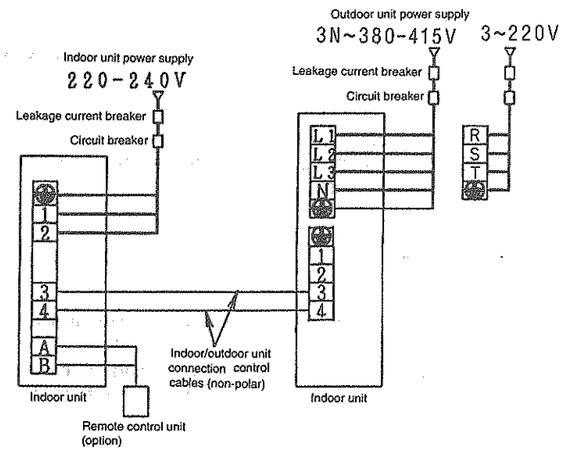
⚠ WARNING	Use only the specified cables for wiring connections. Connect the cables securely, and secure them properly so that no undue force will be applied to the terminal connections. If the terminals are loose or if the wires are not connected securely, fire may result.

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}

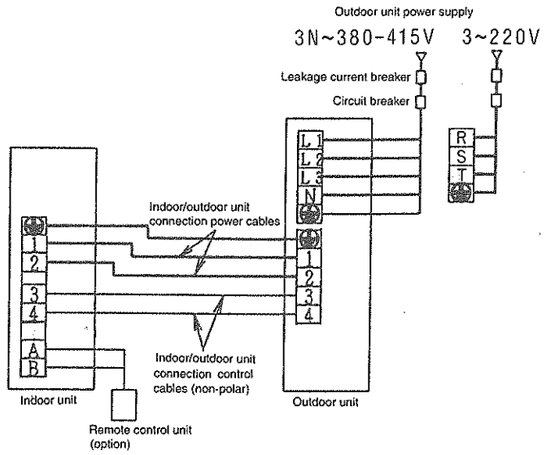
Refer to the following diagrams for details on how to connect the power supply cables and indoor/outdoor unit connection cables.

Outdoor unit/3-phase model

(When both indoor and outdoor unit draw power)

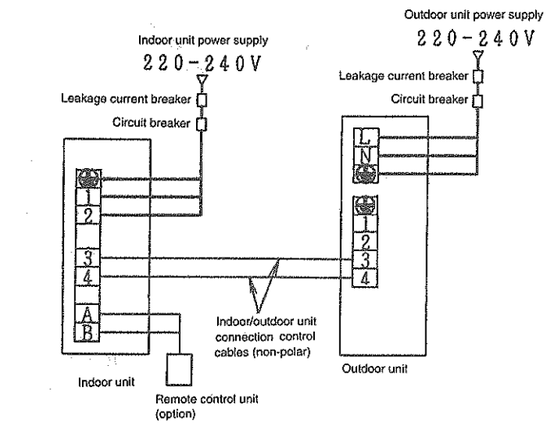


(When only the outdoor unit draws power)

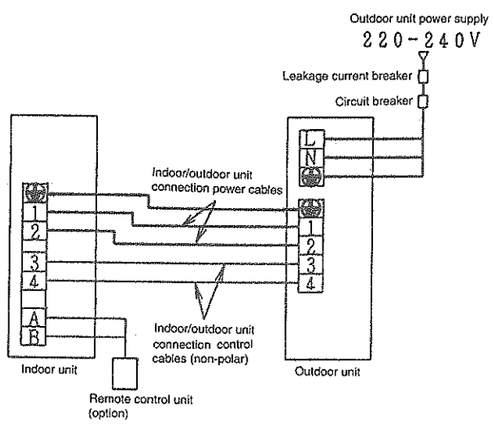


Outdoor unit/single-phase model

(When both indoor and outdoor unit draw power)



(When only the outdoor unit draws power)



◎ Power supply specifications

Model			Leakage breaker (A)	Circuit breaker Switch(A)	Circuit breaker Fuse(A)	Minimum power source cable size ※1 (mm)	Minimum power source cable size ※1 (mm^2)	Earthing cable size	Indoor/outdoor unit connection power cables terminals (1)-(2)	Indoor/outdoor unit connection power cables terminals (3)-(4)
40C(1.5HP)	Single phase	220~240V	30	30	20	2.0	3.5	2.0mm² (φ1.6mm) or more	2.0mm² (φ1.6mm) or more	0.5~2.0 mm²×2
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	3.5mm² (φ2.0mm) or more		
		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.

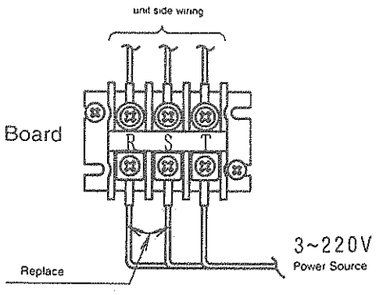
Note

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 lightening 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.

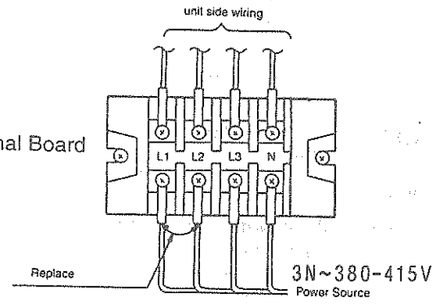
Connecting power supply cables

- 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.

Terminal Board



Terminal Board



Caution

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

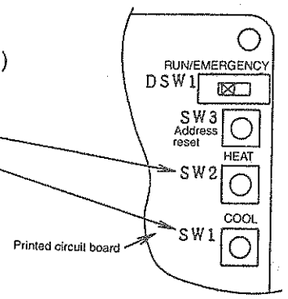
8. Precautions with regard to test operation

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.)

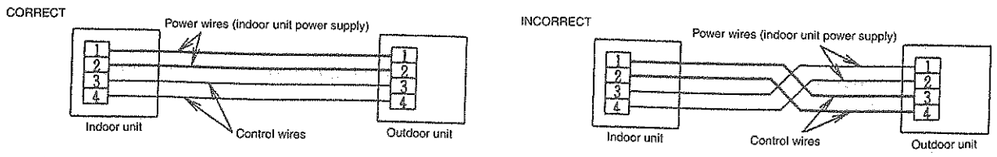
※ The compressor will stop momentarily when the operation mode is changed.

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 boart. 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℃	
	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	Detail 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
	-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
	-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
	-02	○					○		Indoor/outdoor unit transmission problem	Check the transmission wave pattern.
F29	-01		○		○	○			Indoor unit setting problem	Contact the place of purchase.
	-02	○			○	○			Indoor unit setting problem	Contact the place of purchase.
	-12	○		○	○	○			Remote control unit setting problem	Contact the place of purchase.
F30	-02	○		○		○	○		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.
	-06		○	○		○	○		Poor power supply connection, or distorted voltage wave pattern	Check the main power supply terminal board connections, and check the power supply wave pattern.
	-07	○	○	○		○	○		Poor power supply connection	Check the main power supply terminal board connections.
F31	-01			○		○	○		Intake pressure protection	Insufficient gas
	-02		○			○	○		High-pressure cut-off	Refrigeration system
F33	-01	○				○	○		Compressor overcurrent protection	Open phase or lock in compressor, or blown main power supply fuse
	-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
	-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
	-03		○	○	○		○		Heating pressure switch open circuit problem	Heating pressure switch lead wire, outdoor unit connector CN2, or relay connector
	-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.
	-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 temperatures, wind velocity, wind volume, voltage, current, presence of abnormal vibration, operating pressure, piping temperature, compressive pressure, airtight pressure as items to be measured.
- As to the structure and appearance, check following items.

☐ Short circuit of the blowout air.
☐ Smooth flow of the drain
☐ Reliable thermal insulation
☐ Leakage of refrigerant
☐ Mistake in wiring
☐ Reliable connection of the grand 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 guider for outdoor unit and parts to be sold separately for indoor unit, etc., however, as to details of mounting method, etc., observe respective instruction manual.