Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

CE

No.OC317

TECHNICAL & SERVICE MANUAL

R410A

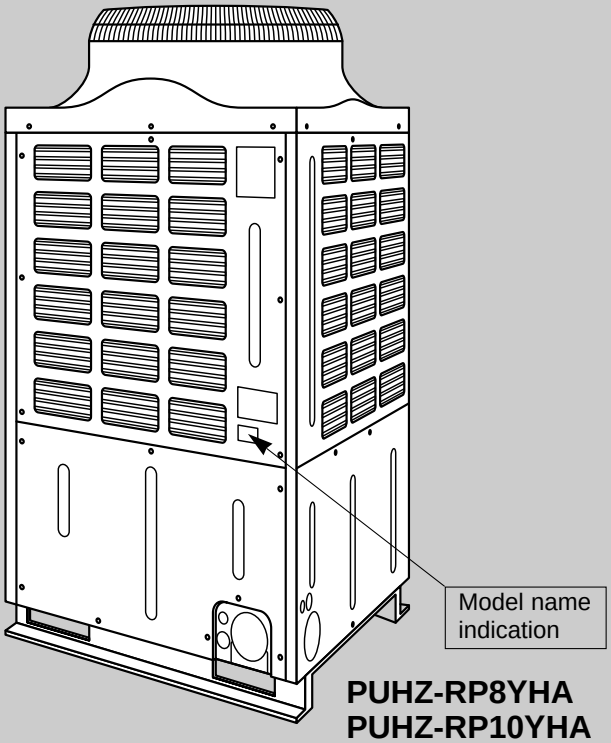
Outdoor unit
[model names]

PUHZ-RP8YHA

PUHZ-RP10YHA

[Service Ref.]

PUHZ-RP8YHA
PUHZ-RP10YHA



PUHZ-RP8YHA
PUHZ-RP10YHA

CONTENTS

Mr.SLIM™

1 SAFETY PRECAUTION

1-1. CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R410A

Use new refrigerant pipes.

In case of using the existing pipes for R22, be careful with the followings.
· Change flare nut to the one provided with this product. Use a newly flared pipe.
· Avoid using thin pipes.

Make sure that the inside and outside of refrigerant piping is clean and it has no contamination such as sulfur hazardous for use, oxides, dirt, shaving particles, etc.
In addition, use pipes with specified thickness.

Contamination inside refrigerant piping can cause deterioration of refrigerant oil etc.

Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing. (Leave elbow joints, etc. in their packaging.)

If dirt, dust or moisture enter into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Use ester oil, ether oil or alkylbenzene oil (small amount) as the refrigerant oil applied to flares and flange connections.

If large amount of mineral oil enter, that can cause deterioration of refrigerant oil etc.

Charge refrigerant from liquid phase of gas cylinder.

If the refrigerant is charged from gas phase, composition change may occur in refrigerant and the efficiency will be lowered.

Do not use refrigerant other than R410A.

If other refrigerant (R22 etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil etc.

Use a vacuum pump with a reverse flow check valve.

Vacuum pump oil may flow back into refrigerant cycle and that can cause deterioration of refrigerant oil etc.

Use the following tools specifically designed for use with R410A refrigerant.

The following tools are necessary to use R410A refrigerant.

Tools for R410A	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

Keep the tools with care.

If dirt, dust or moisture enter into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of refrigerant will change and the efficiency will be lowered.

Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.

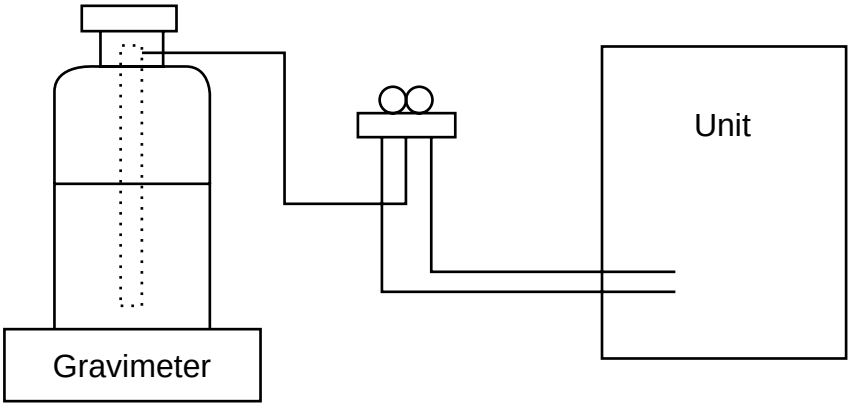
[1] Cautions for service

(1) Perform service after collecting the refrigerant left in unit completely.
(2) Do not release refrigerant in the air.
(3) After completing service, charge the cycle with specified amount of refrigerant.
(4) When performing service, install a filter drier simultaneously.
Be sure to use a filter drier for new refrigerant.

[2] Additional refrigerant charge

When charging directly from cylinder

· Check that cylinder for R410A on the market is syphon type.
· Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



[3] Service tools

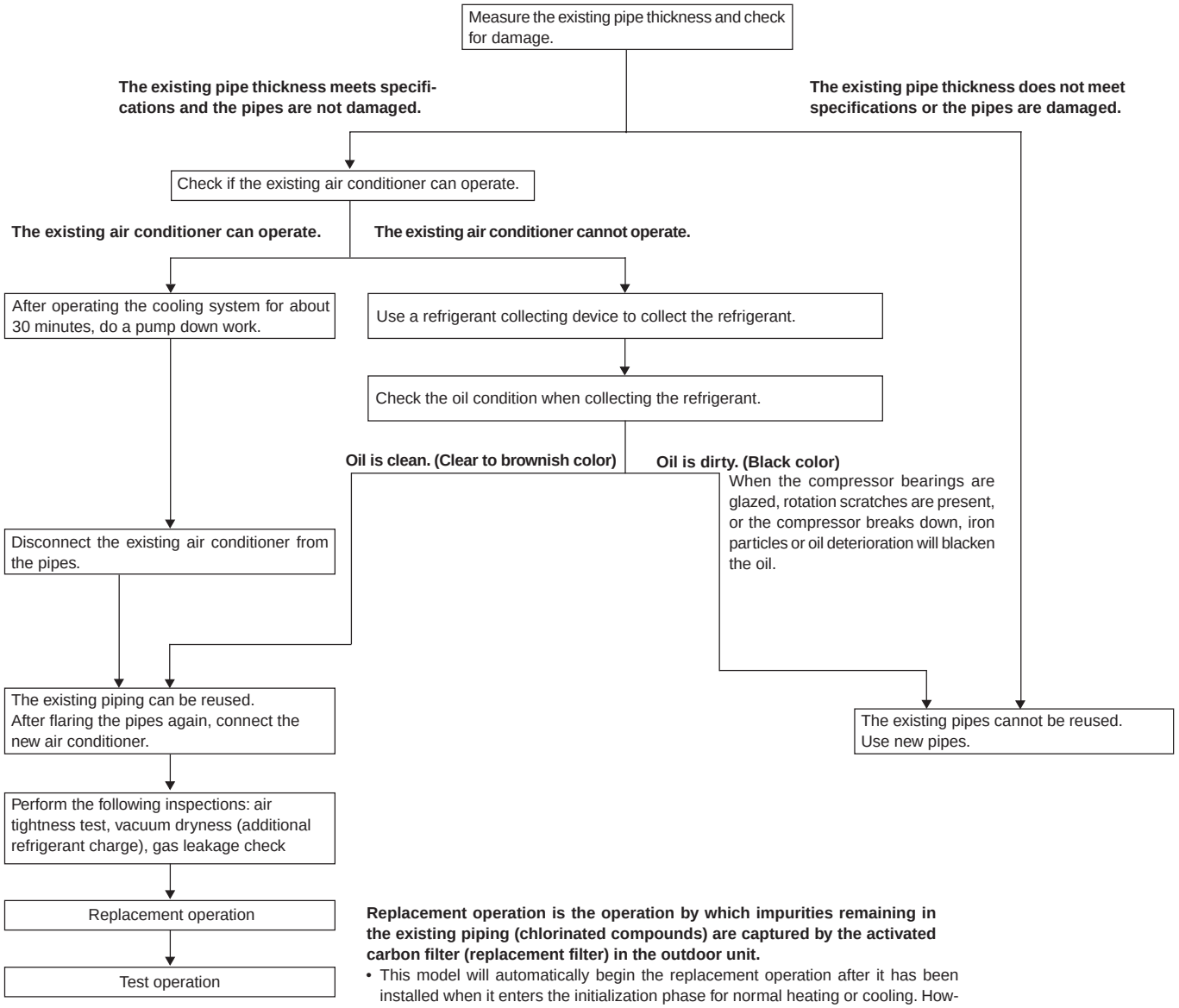
Use the below service tools as exclusive tools for R410A refrigerant.

No.		Specifications
①	Gauge manifold	·Only for R410A
		·Use the existing fitting specifications. (UNF1/2)
		·Use high-tension side pressure of 5.3MPa·G or over.
②	Charge hose	·Only for R410A
		·Use pressure performance of 5.09MPa·G or over.
③	Electronic scale	——
④	Gas leak detector	·Use the detector for R134a, R407C or R410A.
⑤	Adaptor for reverse flow check	·Attach on vacuum pump.
⑥	Refrigerant charge base	——
⑦	Refrigerant cylinder	·Only for R410A Top of cylinder (Pink) Cylinder with syphon
⑧	Refrigerant recovery equipment	——

1-2. CHANGED POINT

• Precautions when reusing existing R22 refrigerant pipes

(1) Flowchart



Replacement operation is the operation by which impurities remaining in the existing piping (chlorinated compounds) are captured by the activated carbon filter (replacement filter) in the outdoor unit.

- This model will automatically begin the replacement operation after it has been installed when it enters the initialization phase for normal heating or cooling. However, the unit will not automatically perform the replacement operation if it is moved to a new location where it will be used with existing R22 refrigerant piping. Under such conditions, always use the SW8-2 operations to perform the replacement operation before beginning the test operation.

Connecting a new air conditioner to existing R22 refrigerant pipes

① Flare the pipe for the use with R410A refrigerant.
Use the flare nut attached to indoor and outdoor unit of the new air conditioner only.

② When reusing existing R22 refrigerant pipes of which gas pipe is ϕ28.58mm and, in addition, when the outdoor unit is installed to lower position than the indoor unit, be sure to change the setting of the DIP SW8-1 on the controller circuit board of the outdoor unit to ON.

✻ This is to increase the speed of refrigerant passing in the gas pipe so that refrigerant oil can smoothly flow in the system.

- Use a different-diameter joint or brazing for the connection.

③ When reusing standard-size existing R22 refrigerant pipes.
The pipes can be reused with pipe length restriction described on 12-1.

(2) Cautions for refrigerant piping work

New refrigerant R410A is adopted for replacement inverter series. Although the refrigerant piping work for R410A is same as for R22, exclusive tools are necessary so as not to mix with different kind of refrigerant. Furthermore as the working pressure of R410A is 1.6 time higher than that of R22, their sizes of flared sections and flare nuts are different.

①Thickness of pipes

Because the working pressure of R410A is higher compared to R22, be sure to use refrigerant piping with thickness shown below. (Never use pipes of 0.7mm or below.)

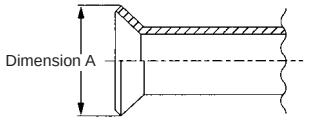
Diagram below: Piping diameter and thickness

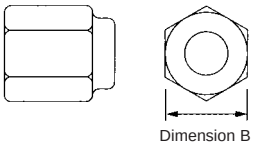
Nominal dimensions	Outside diameter (mm)	Thickness (mm)	
		R410A	R22
1/4”	6.35	0.8	0.8
3/8”	9.52	0.8	0.8
1/2”	12.70	0.8	0.8
5/8”	15.88	1.0	1.0
3/4”	19.05	—	1.0
7/8”	22.20	—	1.0
1”	25.40	—	1.0
1”-1/8”	28.58	—	1.0

②Dimensions of flare cutting and flare nut

The component molecules in HFC refrigerant are smaller compared to conventional refrigerants. In addition to that, R410A is a refrigerant, which has higher risk of leakage because of its working pressure higher than that of other refrigerants. Therefore, to enhance airtightness and intensity, flare cutting dimension of copper pipe for R410A have been specified separately from the dimensions for other refrigerants as shown below. The dimension B of flare nut for R410A also have partly been changed to increase intensity as shown below. Set copper pipe correctly referring to copper pipe flaring dimensions for R410A below. For 1/2” and 5/8”, the dimension B changes.

Use torque wrench corresponding to each dimension.





Flare cutting dimensions (mm)

Nominal dimensions	Outside diameter	Dimension A ($^{+0}_{-0.4}$)	
		R410A	R22
1/4”	6.35	9.1	9.0
3/8”	9.52	13.2	13.0
1/2”	12.70	16.6	16.2
5/8”	15.88	19.7	19.4
3/4”	19.05	—	23.3

Flare nut dimensions (mm)

Nominal dimensions	Outside diameter	Dimension B	
		R410A	R22
1/4”	6.35	17.0	17.0
3/8”	9.52	22.0	22.0
1/2”	12.70	26.0	24.0
5/8”	15.88	29.0 ※	27.0
3/4”	19.05	—	36.0

※36.0mm for indoor unit of RP4, 5 and 6

③Tools for R410A (The following table shows whether conventional tools can be used or not.)

Tools and materials	Use	R410A tools	Can R22 tools be used?	Can R407C tools be used?
Gauge manifold	Air purge and refrigerant charge	Tool exclusive for R410A	×	×
Charge hose	Operation check and the two above	Tool exclusive for R410A	×	×
Gas leak detector	Gas leak check	Tool for HFC refrigerant	×	○
Refrigerant recovery equipment	Collection of refrigerant	Tool exclusive for R410A	×	×
Refrigerant cylinder	Refrigerant charge	Tool exclusive for R410A	×	×
Applied oil	Apply to flared section	Ester oil and alkylbenzene oil (minimum amount)	×	Ester oil: ○ Alkylbenzene oil: minimum amount
Safety charger	Prevent compressor malfunction when charging refrigerant by spraying liquid refrigerant	Tool exclusive for R410A	×	×
Charge valve	Prevent gas from blowing out when detaching charge hose	Tool exclusive for R410A	×	×
Vacuum pump	Vacuum drying and air purge	Tools for other refrigerants can be used if equipped with adopter for reverse flow check	△ (Usable if equipped with adopter for reverse flow)	△ (Usable if equipped with adopter for reverse flow)
Flare tool	Flaring work of piping	Tools for other refrigerants can be used by adjusting flaring dimension	△ (Usable by adjusting flaring dimension)	△ (Usable by adjusting flaring dimension)
Bender	Bend the pipes	Tools for other refrigerants can be used	○	○
Pipe cutter	Cut the pipes	Tools for other refrigerants can be used	○	○
Welder and nitrogen gas cylinder	Weld the pipes	Tools for other refrigerants can be used	○	○
Refrigerant charging scale	Charge refrigerant	Tools for other refrigerants can be used	○	○
Vacuum gauge or thermistor vacuum gauge and vacuum valve	Check the degree of vacuum. (Vacuum valve prevents back flow of oil and refrigerant to thermistor vacuum gauge)	Tools for other refrigerants can be used	○	○
Charging cylinder	Charge refrigerant	Tool exclusive for R410A	×	—

× : Prepare a new tool. (Use the new tool as the tool exclusive for R410A.)

△ : Tools for other refrigerants can be used under certain conditions.

○ : Tools for other refrigerants can be used.

2 COMBINATION OF INDOOR AND OUTDOOR UNITS

2-1. 1:1 SYSTEM

Indoor unit	Outdoor unit	
	PUHZ-RP·YHA	
	8	10
PEH-RP·MYA	○	○

2-2. SYNCHRONIZED TWIN, TRIPLE AND QUADRUPLE SYSTEM

(1) Synchronized twin (50:50)

Indoor unit	Outdoor unit	
	PUHZ-RP·YHA	
	8	10
PLA-RP4AA × 2	○	
PLA-RP5AA × 2		○
PEAD-RP4EA × 2	○	
PEAD-RP5EA × 2		○
PEAD-RP4GA × 2	○	
PKA-RP4FAL × 2	○	
PCA-RP4GA × 2	○	
PCA-RP5GA × 2		○

(2) Synchronized triple (33:33:33)

Indoor unit	Outdoor unit	
	PUHZ-RP·YHA	
	8	10
PLA-RP2.5AA × 3	○	
PLA-RP3AA × 3		○
PEAD-RP2.5EA × 3	○	
PEAD-RP3EA × 3		○
PEAD-RP2.5GA × 3	○	
PEAD-RP3GA × 3		○
PKA-RP2.5FAL × 3	○	
PKA-RP3FAL × 3		○
PCA-RP2.5GA × 3	○	
PCA-RP3GA × 3		○

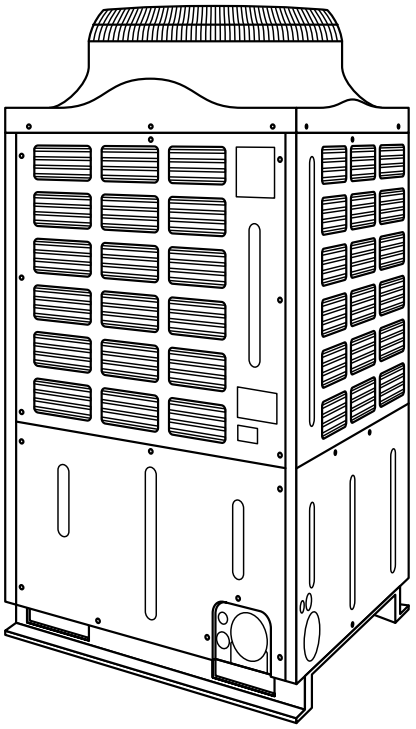
(3) Synchronized quadruple (25:25:25:25)

Indoor unit	Outdoor unit	
	PUHZ-RP·YHA	
	8	10
PLA-RP2AA × 4	○	
PLA-RP2.5AA × 4		○
PEAD-RP2EA × 4	○	
PEAD-RP2.5EA × 4		○
PEAD-RP2.5GA × 4		○
PKA-RP2GAL × 4	○	
PKA-RP2.5FAL × 4		○
PCA-RP2GA × 4	○	
PCA-RP2.5GA × 4		○

2-3. MULTI DISTRIBUTION PIPE (OPTION)

	Ratio of distributing	Part No.
Synchronized twin	50:50	MSDD-50WR-E
Synchronized triple	33:33:33	MSDT-111R-E
Synchronized quadruple	25:25:25:25	MSDF-1111R-E

3 FEATURES



PUHZ-RP8YHA
PUHZ-RP10YHA

CHARGELESS SYSTEM
PRE-CHARGED REFRIGERANT IS SUPPLIED FOR PIPING LENGTH AT SHIPMENT. (Max.30m)

The refrigerant circuit with LEV(Linear Expansion Valve) and accumulator always control the optimal refrigerant level regardless of the length (30m max. and 5m min.) of piping. The additional refrigerant charging work during installation often causes problems. Heretofore it is completely eliminated. This unique system improves the quality and reliability of the work done.It also helps to speed up the installation time.

4 SPECIFICATIONS

Service Ref.				PUHZ-RP8YHA		PUHZ-RP10YHA	
Function				Cooling	Heating	Cooling	Heating
Capacity			Btu/h	64,800	76,400	75,000	92,100
			kW	19.0(10.0~22.4)	22.4(10.0~25.0)	22.0(12.5~28.0)	27.0(15.7~31.5)
Total input			kW	6.76	6.98	7.83	8.41
OUTDOOR UNIT	Power supply (phase, cycle, voltage)			3-ph, 50Hz, 380-400-415V (4wires)			
		Running current	A	10.0	10.4	11.5	12.4
	External finish			Munsell 3Y 7.8/1.1			
	Refrigerant control			Linear Expansion Valve			
	Compressor			Hermetic			
		Model		ANV47FFBMT			
		Motor output	kW	4.5		5.5	
		Starter type		Line start			
		Protection devices		HP switch, LP switch, Discharge thermo			
	Crankcase heater		W	—			
	Heat exchanger			Plate fin coil			
	Fan	Fan(drive) × No.		Propeller fan × 1			
		Fan motor output	kW	0.635			
		Airflow	m³/min(CFM)	150(5,300)			
	Defrost method			Reverse cycle			
	Noise level	Cooling	dB	55		58	
		Heating	dB	56		58	
	Dimensions	W	mm(in.)	900(35-7/16)			
		D	mm(in.)	750(29-17/32)			
		H	mm(in.)	1,798(70-25/32)			
	Weight		kg(lbs)	198(436)			
	Refrigerant			R410A			
		Charge	kg(lbs)	10.5(23.1)			
		Oil (Model)	L	2.30(MEL56)			
REFRIGERANT PIPING	Pipe size O.D.	Liquid	mm(in.)	9.52(3/8)		12.7(1/2)	
		Gas	mm(in.)	25.4(1)		28.58(1-1/8)	
	Connection method	Indoor side		Flared			
		Outdoor side		Flared & Brazing			
	Between the indoor & outdoor unit	Height difference		Max. 40m			
		Piping length		Max. 80m			

Notes1. Rating Conditions (ISO T1)
Cooling : Indoor : D.B. 27˚C(80˚F), W.B. 19˚C(66˚F) Outdoor : D.B. 35˚C(95˚F), W.B. 24˚C(75˚F)
Heating : Indoor : D.B. 20˚C(68˚F) Outdoor : D.B. 7˚C(45˚F), W.B. 6˚C(43˚F)
Refrigerant piping length (one way) : 5m (16ft)

2. Guaranteed operating range

		Indoor	Outdoor
Cooling	Upper limit	D.B. 35˚C, W.B. 22.5˚C	D.B. 46˚C
	Lower limit	D.B. 19˚C, W.B. 15˚C	D.B. -5˚C
Heating	Upper limit	D.B. 28˚C	D.B. 21˚C, W.B. 15˚C
	Lower limit	D.B. 17˚C	D.B. -20˚C, W.B. -20˚C

3. Guaranteed voltage
342~457V, 50Hz

4. Above data based on indicated voltage
Indoor Unit 1 phase 230V 50Hz
Outdoor Unit 3 phase 400V 50Hz

5. Refer to the service manual of indoor unit for the indoor unit's specifications.

6. The total input is of twin combination of 4-way cassette.

5 DATA

5-1. ELECTRICAL PARTS SPECIFICATIONS

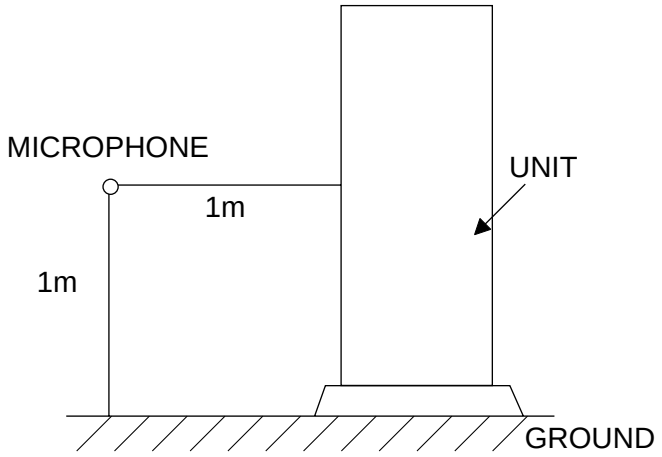
Outdoor unit / Parts name	PUHZ-RP8YHA	PUHZ-RP10YHA
FUSE (FUSE1,2)	250V 15A	
FUSE (FUSE3,4)	250V 6.3A	
Solenoid Valve (Four-way Valve)	VT60100	
Solenoid Valve Coil (Four-way Valve) 21S4	LB64 (DM50G461)	
Linear Expansion Valve (LEV-A)	HAM-BD32 (0~480 Pulse)	
Linear Expansion Valve Coil (LEV-A)	DC12V	
Solenoid Valve <Bypass Valve>	VF20100	
Solenoid Valve Coil <Bypass Valve> (SV)	LD2	
Reactor (DCL)	2.7mH 25A	
High Pressure Switch (63H)	OFF 3.60+0.2MPa ON 2.80±0.15MPa	
Low Pressure Switch (63L)	OFF -0.03±0.03MPa ON 0.05±0.04MPa	
Fan Motor (MF)	6P 635W ×1 PA6Y635-T	
Thermistor (Outdoor Pipe) (TH3, TH32)	0℃/15kΩ 10℃/9.6kΩ 20℃/6.3kΩ 25℃/5.4kΩ 30℃/4.3kΩ 40℃/3.0kΩ	
Thermistor (Discharge) (TH4)	20℃/250kΩ 30℃/160kΩ 40℃/104kΩ 50℃/70kΩ 60℃/48kΩ 70℃/34kΩ 80℃/24kΩ 90℃/15kΩ 100℃/13kΩ	
Thermistor (Outdoor2-PhasePipe) (TH6)	0℃/15kΩ 10℃/9.6kΩ 20℃/6.3kΩ 25℃/5.4kΩ 30℃/4.3kΩ 40℃/3.0kΩ	
Thermistor (Outdoor) (TH7)	0℃/15kΩ 10℃/9.6kΩ 20℃/6.3kΩ 25℃/5.4kΩ 30℃/4.3kΩ 40℃/3.0kΩ	
Terminal Block (Power Supply) (TB1)	5P (L1, L2, L3, N, ⏚)	
Terminal Block (Indoor / Outdoor) (TB2)	3P (S1, S2, S3)	
Main Smoothing Capacitor (CB1, CB2)	2200μF 400V	
Rush Current Protect Resister (RS)	16Ω 30W	
Motor Compressor (MC)	ANV47FFBMT	

5-2. COMPRESSOR TECHNICAL DATA

(at 20°C)

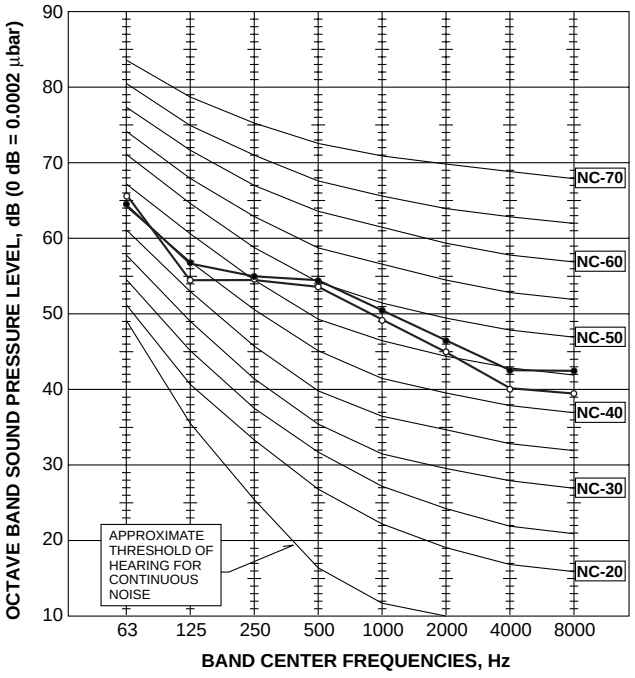
Unit		PUHZ-RP8, 10YHA
Compressor model		ANV47FFBMT
Winding Resistance (Ω)	U-V	0.72
	U-W	0.72
	W-V	0.72

5-3. NOISE CRITERION CURVES



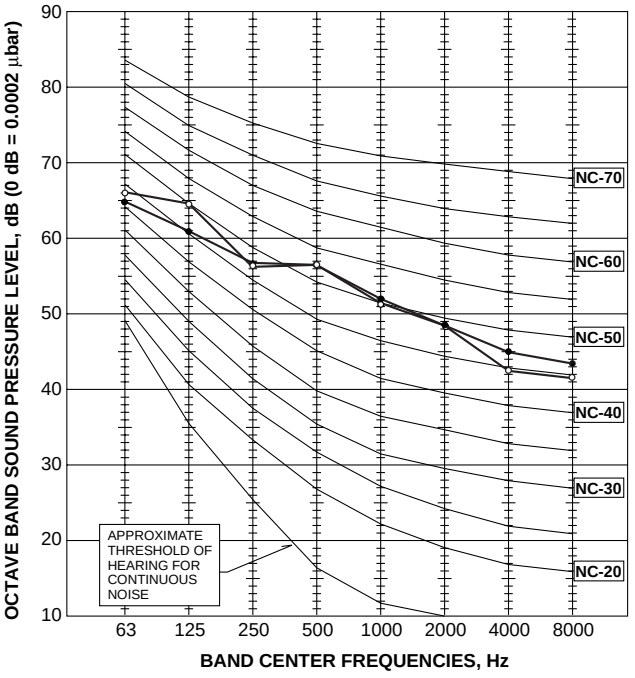
PUHZ-RP8YHA

MODE	SPL(dB)	LINE
COOLING	55.0	○—○
HEATING	56.0	●—●



PUHZ-RP10YHA

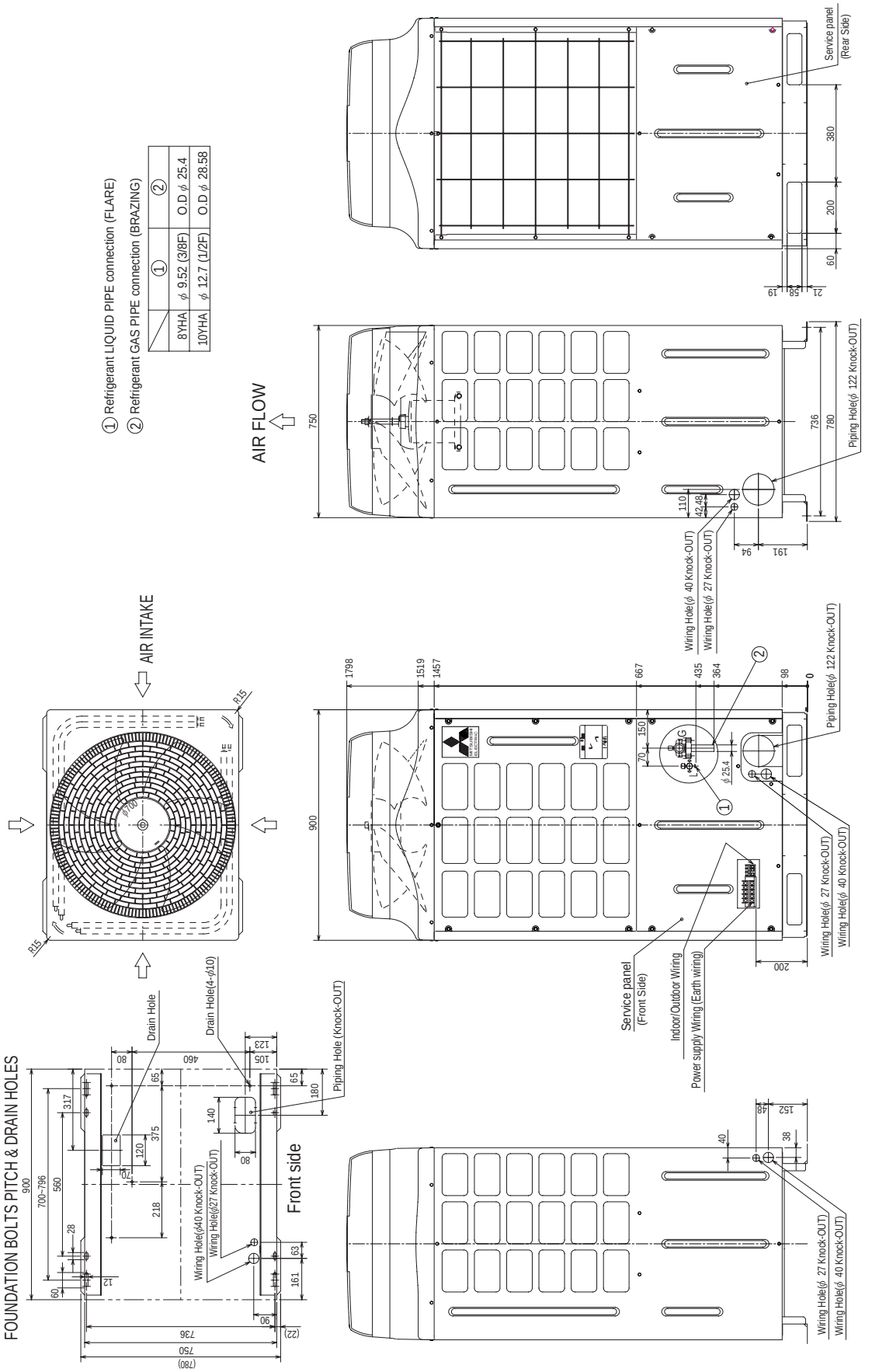
MODE	SPL(dB)	LINE
COOLING	58.0	○—○
HEATING	58.0	●—●



6 OUTLINES AND DIMENSIONS

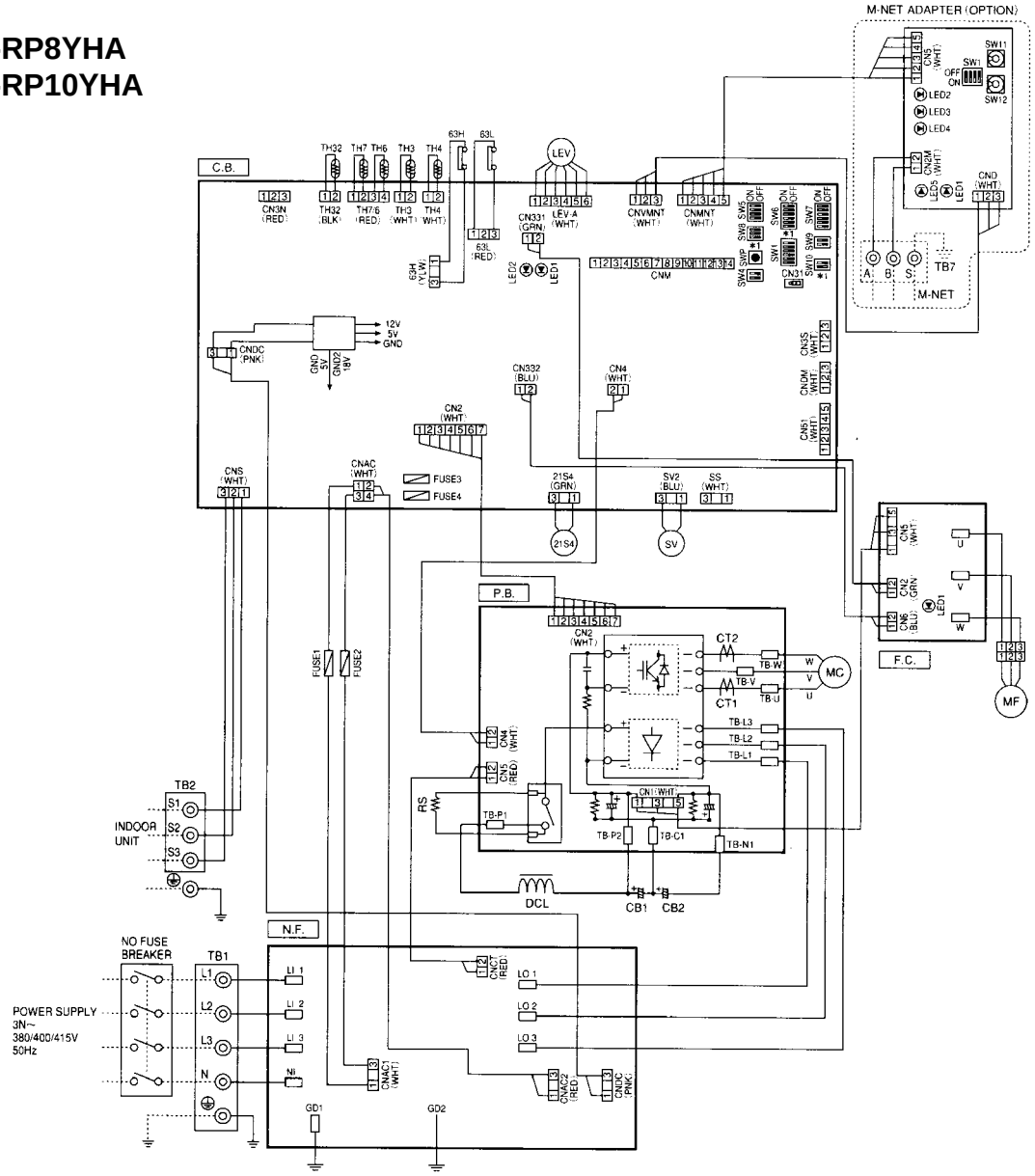
PUHZ-RP8YHA
PUHZ-RP10YHA

Unit : mm



7 WIRING DIAGRAM

PUHZ-RP8YHA
PUHZ-RP10YHA



SYMBOL	NAME
TB1	Terminal Block (Power Supply)
TB2	Terminal Block (Indoor/Outdoor)
MC	Motor Compressor
MF	Fan Motor
21S4	Solenoid Valve (Four-Way Valve)
SV	Solenoid Valve (Bypass Valve)
63H	High Pressure Switch
63L	Low Pressure Switch
TH3	Thermistor (Outdoor Pipe)
TH32	Thermistor (Outdoor Pipe)
TH4	Thermistor (Discharge)
TH6	Thermistor (Outdoor 2-Phase Pipe)
TH7	Thermistor (Outdoor)
LEV	Linear Expansion Valve
DCL	Reactor
CB1,CB2	Main Smoothing Capacitor
RS	Rush Current Protect Resistor
FUSE1,FUSE2	FUSE (15 A)
P.B.	Power Circuit Board
TB-U/V/W	Connection Terminal (U/V/W-Phase)
TB-L1/L2/L3	Connection Terminal (L1/L2/L3 Power Supply)
TB-P1	Connection Terminal
TB-P2	Connection Terminal
TB-C1	Connection Terminal
TB-N1	Connection Terminal
CT1,CT2	Current Trans
CN1	Connector
CN2	Connector
CN4	Connector
CN5	Connector
N.F.	Noise Filter Circuit Board
LI1/L2/L3/NI	Connection Terminal (L1/L2/L3/N-Power Supply)
LO1/LO2/LO3/NO	Connection Terminal (L1/L2/L3/N-Power Supply)
CNAC1	Connector
CNAC2	Connector
CNCT	Connector
CNDC	Connector
F.C.	Fan Controller Circuit Board
U/V/W	Connection Terminal (U/V/W-Phase)
CN2	Connector
CN5	Connector
CN6	Connector
LED1	LED (MF Operation Status Indicators)

SYMBOL	NAME
C.B.	Controller Circuit Board
FUSE3,FUSE4	FUSE (6.3 A)
SW1	Switch (Forced Defrost, Defect History Record Reset, Refrigerant Address)
SW4	Switch (Test Operation)
SW5	Switch (Function Switch)
SW6	Switch (Model Select)
SW7	Switch (Function Switch)
SW8	Switch (Function Switch)
SW9	Switch (Function Switch)
SW10	Switch (Function Switch)
SWP	Switch (Pump Down)
CN31	Connector (Emergency Operation)
CNAC	Connector
CNS	Connector
CNDC	Connector
21S4	Connector
SV2	Connector
SS	Connector (Connection for Option)
CN2	Connector
CN4	Connector
CN331	Connector
CN332	Connector
LEV-A	Connector
63H	Connector
63L	Connector
TH3	Connector
TH4	Connector
TH7/6	Connector
TH32	Connector
CNM	Connector (A Control Service Inspection Kit)
CNVMNT	Connector (Connect to Optional M-NET Adapter Board)
CNMNT	Connector (Connect to Optional M-NET Adapter Board)
CN3S	Connector (Connection for Option)
CNDM	Connector (Connection for Option)
CN51	Connector (Connection for Option)
LED1,LED2	LED (Operation Inspection Indicators)

*1 MODEL SELECT

MODEL	SW6	SW8	SW10
RP8Y	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3	ON OFF 1 2
RP10Y	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3	ON OFF 1 2

M-NET ADAPTER

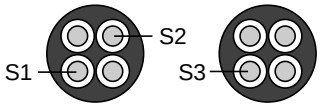
SYMBOL	NAME
TB7	Terminal Block (M-NET connection)
CN5	Connector (Transmission)
CND	Connector (Power Supply)
CN2M	Connector (M-NET communication)
SW1	Switch (Status of communication)
SW11	Switch (Address setting:1st digit)
SW12	Switch (Address setting:2nd digit)
LED1	LED (Power Supply:DC5V)
LED2	LED (Connection to Outdoor Unit)
LED3	LED (Transmission:Sending)
LED4	LED (Transmission:Receiving)
LED5	LED (Power Supply:DC12V)

8 WIRING SPECIFICATIONS

WIRING SPECIFICATIONS FOR 220V-240V 50Hz (INDOOR - OUTDOOR CONNECTING CABLE)

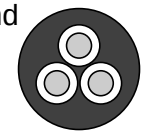
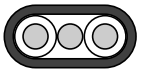
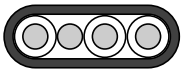
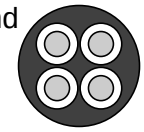
The cable shall not be lighter than design 245 IEC or 227 IEC.

When cable length is 30m or more.
Use one cable for S1 and S2 and another for S3 as shown in the picture.



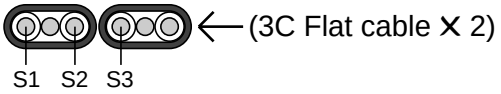
wire size :
cable length 50m : 4mm^2
cable length 80m : 6mm^2

The cable length may vary depending on the condition of installation, humidity or materials, etc.

Cross section of cable	Wire size (mm^2)	Number of wires	Polarity	L(m) ✻5
Round 	2.5	3	Clockwise : S1-S2-S3	(30) ✻1
Flat 	2.5	3	Not applicable (Because center wire has no cover finish)	Not applicable ✻2
Flat 	1.5	4	From left to right : S1-Open-S2-S3	(18) ✻3
Round 	2.5	4	Clockwise : S1-S2-S3-Open Connect S1 and S3 to the opposite angle	30 ✻4

✻1 : In case that cable with stripe of yellow and green is available.

✻2 : In the flat cables are connected as this picture, they can be used up to 30m.



✻3 : In case of regular polarity connection (S1-S2-S3), wire size is 1.5mm^2.

✻4 : In case of regular polarity connection (S1-S2-S3).

✻5 : Mentioned cable length is just a reference value.
It may be different depending on the condition of installation, humidity or materials, etc.

Be sure to connect the indoor-outdoor connecting cables directly to the units (no intermediate connections).
Intermediate connections can lead to communication errors if water enters the cables and causes insufficient insulation to ground or a poor electrical contact at the intermediate connection point.
(If an intermediate connection is necessary, be sure to take measures to prevent water from entering the cables.)

9 SPECIFICATIONS FOR ELECTRICAL WORK

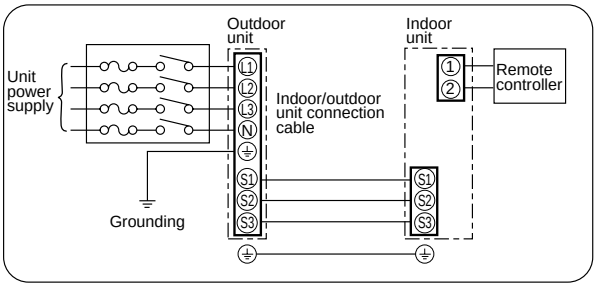
9-1. FIELD ELECTRICAL WIRING (POWER WIRING SPECIFICATIONS) PUHZ-RP•YHA

Models (Outdoor unit)		RP8	RP10
Outdoor unit Power supply	Phase	3N~(3ph 4wires)	
	Frequency & Voltage	50Hz, 380-400-415V	
Input capacity Main switch/Breaker	Outdoor unit (A)	32	32
Wiring: Outdoor unit Power supply	Wire No.	4	4
Wiring: Indoor unit/Outdoor unit connecting Wire No. × size (mm²)		Cable length 50 m : 3 × 4 (Polar) Cable length 80 m : 3 × 6 (Polar)	
Wiring: Remote controller-indoor unit connecting Wire No. × size (mm²)		Cable 2C × 0.69 This wire is accessory of remote controller (Wire length: 10m, Non-polar)	
Control circuit rating		Indoor unit-Outdoor unit: S1-S2 AC220V-230V-240V S2-S3 DC24V Remote controller-Indoor unit: DC14V	

Check items

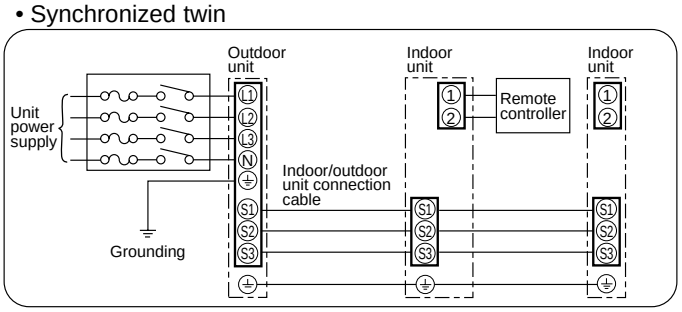
1. Wiring size must comply with the applicable local and national code.
2. Be careful about choosing the installation location for the earth leakage breaker and how it is installed as the initial electric current may cause it to malfunction.
3. Power supply cords and indoor unit / Outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (design 254 IEC 57)

1:1 system

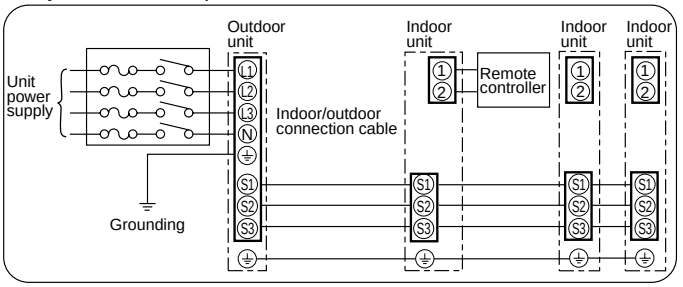


Synchronized twin, triple and quadruple system Electrical wiring

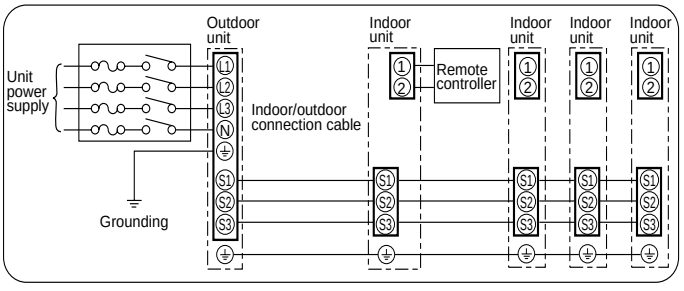
• Synchronized twin



• Synchronized triple



• Synchronized quadruple



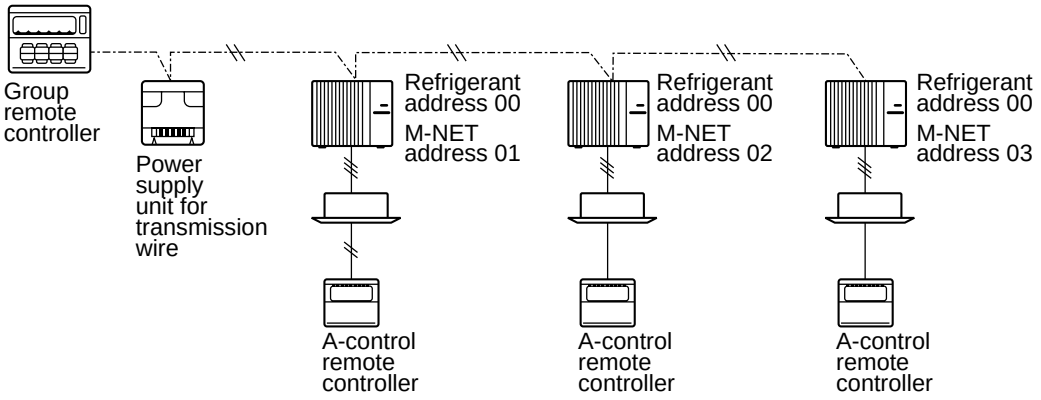
9-2. M-NET WIRING METHOD

(Points to notice)

(1) Outside the unit, transmission wires should stay away from electric wires in order to prevent electromagnetic noise from making an influence on the signal communication. Place them at intervals of more than 5cm. Do not put them in the same conduit tube.

(2) Terminal block (TB7) for transmission wires should never be connected to 220~240V power supply. If it is connected, electronic parts on M-NET p.c. board may be burn out.

(3) Use 2-core x 1.25mm^2 shield wire (CVVS, CPEVS) for the transmission wire. Transmission signals may not be sent or received normally if different types of transmission wires are put together in the same multi-conductor cable. Never do this because this may cause a malfunction.

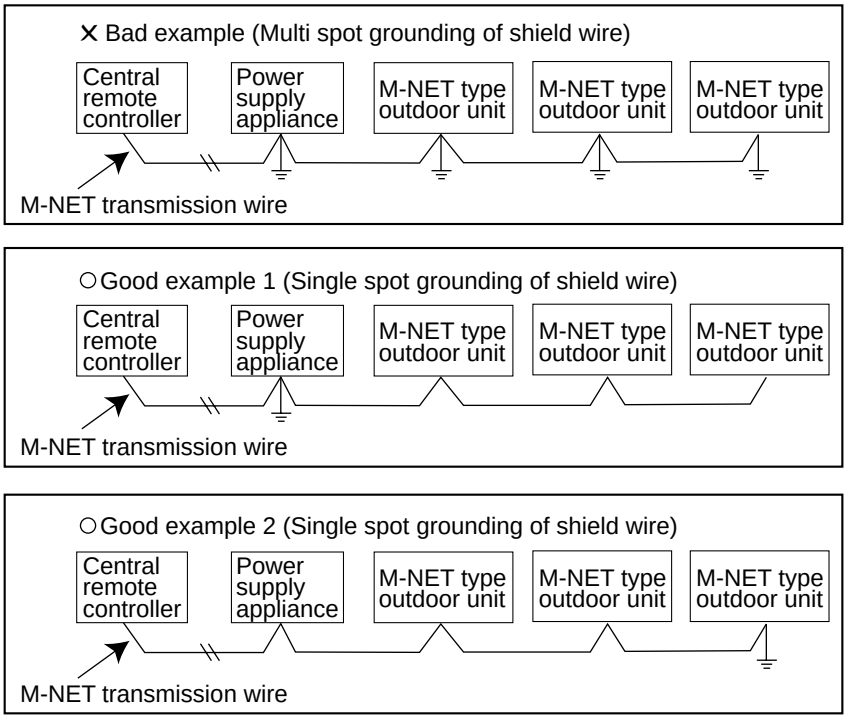


It would be ok if M-NET wire (non-polar, 2-cores) is arranged in addition to the wiring for A-control.

(4) Ground only one of any appliances through M-NET transmission wire (shield wire). Communication error may occur due to the influence of electromagnetic noise.

"Ed" error will appear on the LED display of outdoor unit.

"0403" error will appear on the central-control remote controller.

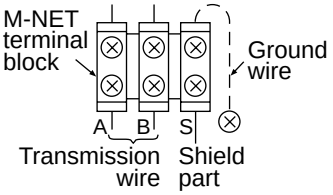


If there are more than two grounding spots on the shield wire, noise may enter into the shield wire because the ground wire and shield wire form one circuit and the electric potential difference occurs due to the impedance difference among grounding spots. In case of single spot grounding, noise does not enter into the shield wire because the ground wire and shield wire do not form one circuit.

To avoid communication errors caused by noise, make sure to observe the single spot grounding method described in the installation manual.

● **M-NET wiring**

(1) Use 2-core x 1.25mm^2 shield wire for electric wires.
(Excluding the case connecting to system controller.)
(2) Connect the wire to the M-NET terminal block.Connect one core of the transmission wire (non-polar) to A terminal and the other to B. Peel the shield wire, twist the shield part to a string and connect it to S terminal.
(3) In the system which several outdoor units are being connected, the terminal (A, B, S) on M-NET terminal block should be individually wired to the other outdoor unit's terminal, i.e. A to A, B to B and S to S.In this case, choose one of those outdoor units and drive a screw to fix an ground wire on the plate as shown on the right figure.



9-2-1. M-NET address setting

In A-control models, M-NET address and refrigerant address should be set only for the outdoor unit. Similar to Free Combo system, there is no need to set the address of outdoor unit and remote controller. To construct a central control system, the setting of M-NET address should be conducted only upon the outdoor unit. The setting range should be 1 to 50 (the same as that of the indoor unit in Free Combo system), and the address number should be consecutively set in a same group.

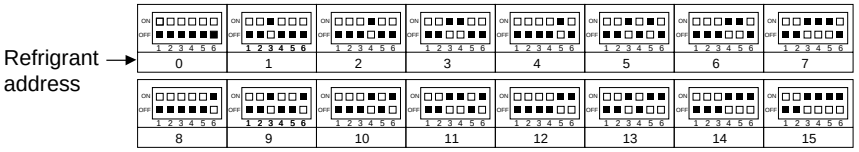
Address number can be set by using rotary switches (SW11 for ones digit and SW12 for tens digit), which is located on the M-NET p.c. board of outdoor unit. (Factory setting: all addresses are set to "0".)

<Setting example>

M-NET Address No.		1	2	~	50
Switng setting	SW11 ones digit				
	SW12 tens digit				

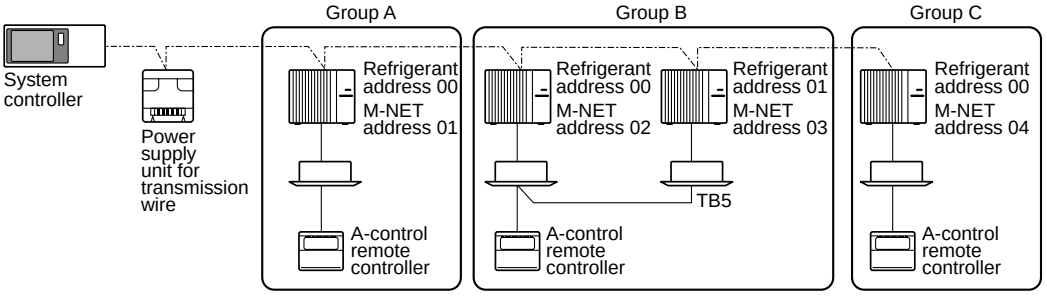
9-2-2. Refrigerant address setting

In case of multiple grouping system (multiple refrigerant circuits in one group), indoor units should be connected by remote controller wiring (TB5) and the refrigerant address needs to be set. Leave the refrigerant addresses to "00" if the group setting is not conducted. Set the refrigerant address by using DIP SW1-3 to -6 on the outdoor controller circuit board. [Factory setting: all switches are OFF. (All refrigerant addresses are "00".)]

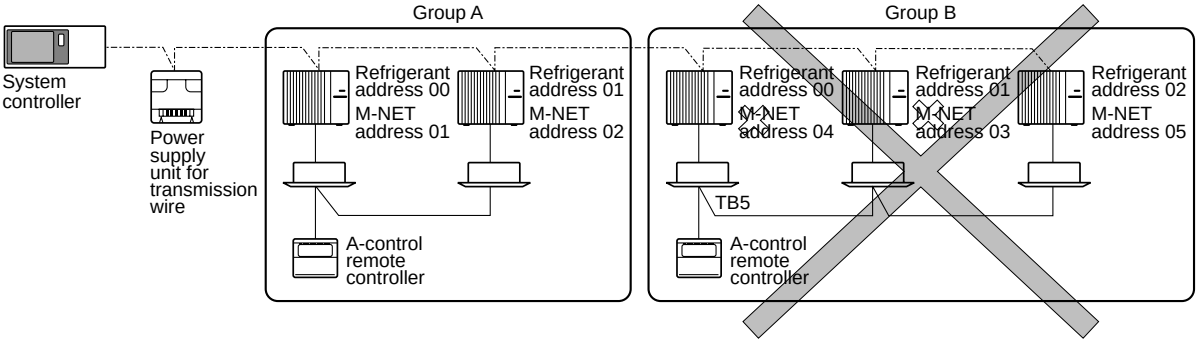


9-2-3. Regulations in address settings

In case of multiple grouping system, M-NET and refrigerant address settings should be done as explained in the above section. Set the lowest number in the group for the outdoor unit whose refrigerant address is "00" as its M-NET address.



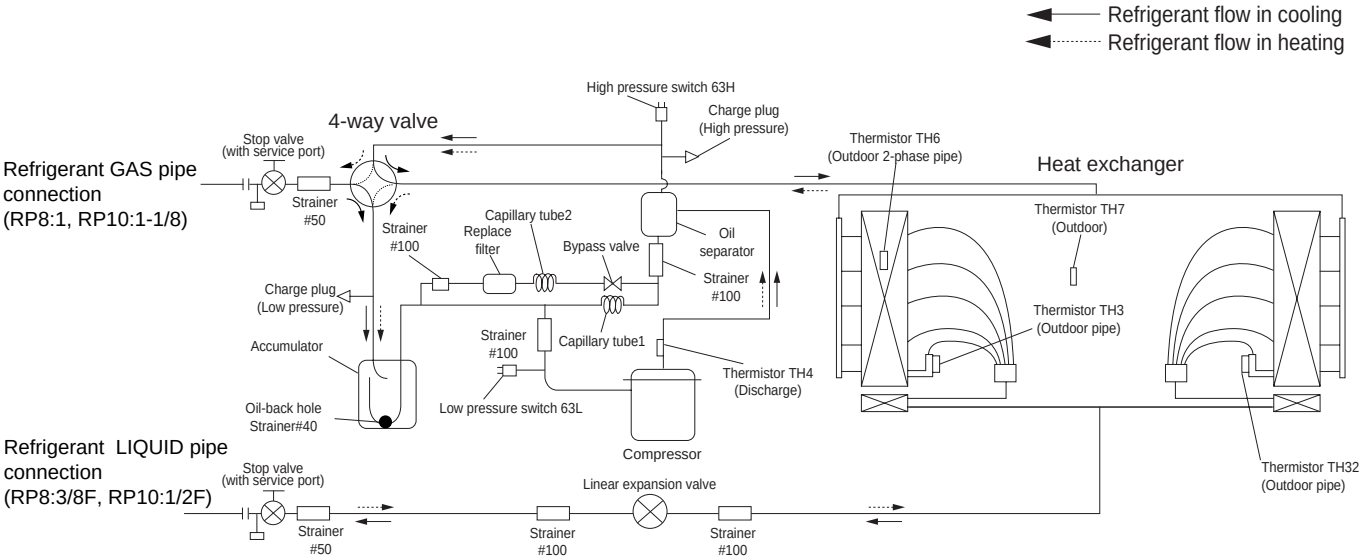
※ Refrigerant addresses can be overlapped if they are in the different group.



※ In group B, M-NET address of the outdoor unit whose refrigerant address is "00" is not set to the minimum in the group. As "3" is right for this situation, the setting is wrong. Taking group A as a good sample, set the minimum M-NET address in the group for the outdoor unit whose refrigerant address is "00".

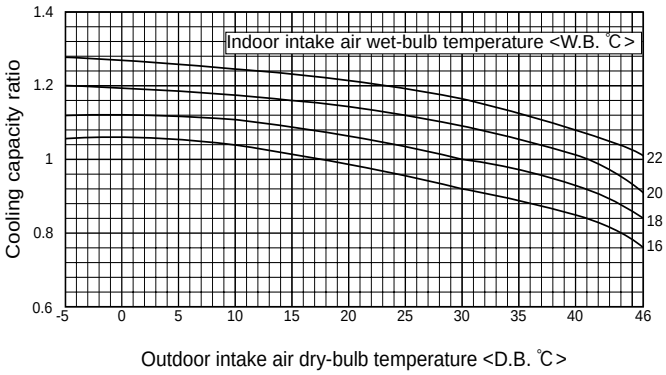
10 REFRIGERANT SYSTEM DIAGRAM

PUHZ-RP8YHA
PUHZ-RP10YHA



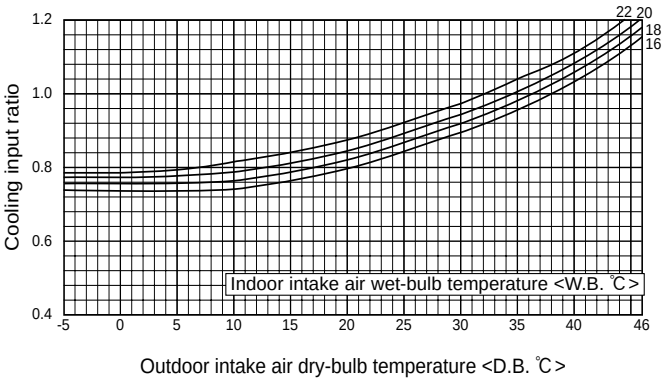
11 CAPACITY CURVES

Cooling capacity



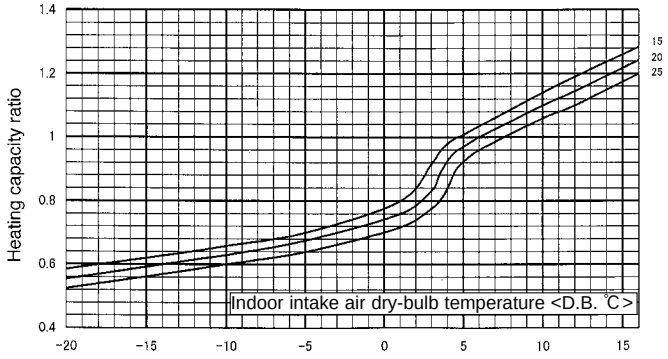
Outdoor intake air dry-bulb temperature <D.B. ℃>

Cooling input



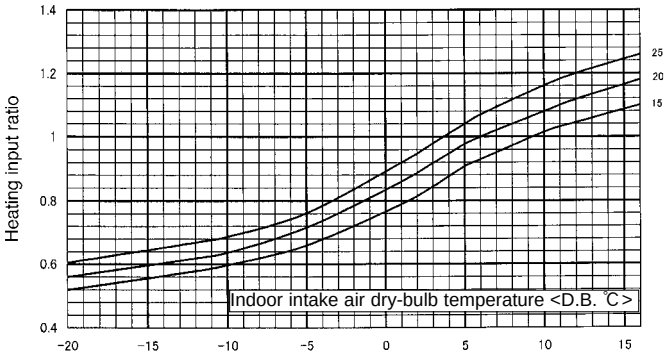
Outdoor intake air dry-bulb temperature <D.B. ℃>

Heating capacity



Outdoor intake air wet-bulb temperature <W.B. ℃>

Heating input



Outdoor intake air wet-bulb temperature <W.B. ℃>

Note : These diagrams show the case where the operation frequency of a compressor is fixed.

12 APPLICABLE EXTENSION PIPE FOR EACH MODEL

12-1. 1:1 SYSTEM

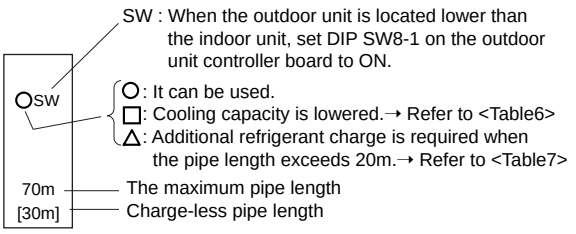
(1) Pipe length

<Table 1> Maximum pipe length (RP8·RP10)

Liquid pipe (mm)	OD	ϕ9.52				ϕ12.7				ϕ15.88			
	Thick-ness	t0.8				t0.8				t1.0			
gas pipe (mm)	OD	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
	Thick-ness	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0	t1.0
RP8		□ 20m [20m]	□ 50m [30m]	Normal piping 70m※1 [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2 △SW 50m [20m]
RP10		□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	Normal piping 70m※1 [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2 △ 50m [20m]

Note : The maximum pipe length is 80m in case of new piping.
※1 Be sure to use hard (tempered) one for pipe over ϕ22.2.(Do not use soft (annealed) one.)
※2 When using ϕ31.75 pipe, the outdoor temperature range (dry-bub temperature) for heating operation is -11 to +21℃.

<Marks in the table above>



(2) Adjusting the amount of refrigerant

Check additional refrigerant charging amount referring to table 7 when the liquid pipe diameter is larger than the standard size, and table 2 when the pipe of the standard diameter is used.

<Table 2>

Outdoor unit	permitted pipe length	At time of shipping (kg)	Amount of additional refrigerant charge (kg)					
			30 m and less	31-40 m and less	41-50 m and less	51-60 m and less	61-70 m and less	71-80 m and less
RP8	80m or less	10.5	No additional charge necessary	0.9 kg	1.8 kg	2.7 kg	3.6 kg	The additional charge amount is obtained by the following formula.
RP10		10.5		1.2 kg	2.4 kg	3.6 kg	4.8 kg	

Calculate the additional charge amount based on the following procedure.
If the calculation results in an amount that is smaller than the "Additional charge amount for 70m," perform the additional charge using the amount shown in "Additional charge amount for 70m."

Amount of additional charge [kg]	=	Main piping: Liquid line size ϕ12.7 over all length [m] × 0.12 [kg/m]	+	Main piping: Liquid line size ϕ9.52 overall length [m] × 0.09 [kg/m]	+	Branch piping: Liquid line size ϕ9.52 overall length [m] × 0.06 [kg/m]	+	Branch piping: Liquid line size ϕ6.35 overall length [m] × 0.02 [kg/m]	−	3.6 (kg)

Additional charge amount for 70 m	RP8	3.6 kg
	RP10	4.8 kg

(3) Capacity correction

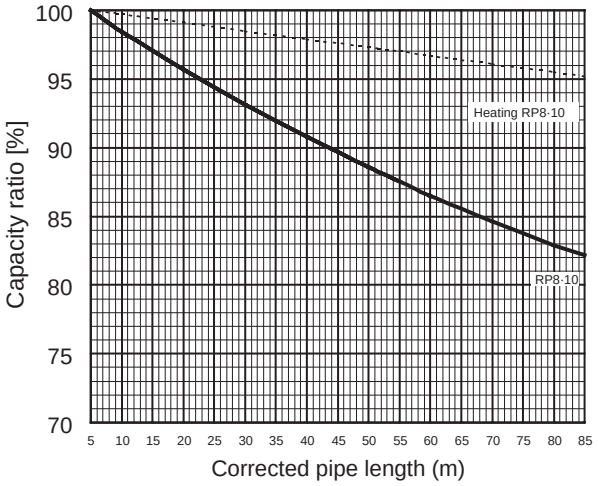
Cooling and heating capacity is lowered according to the piping length. Capacity can be obtained by referring to the following capacity curves.

When the diameter of the gas pipe is smaller than the standard size, cooling capacity is lowered comparing to the operation using the standard diameter pipe.

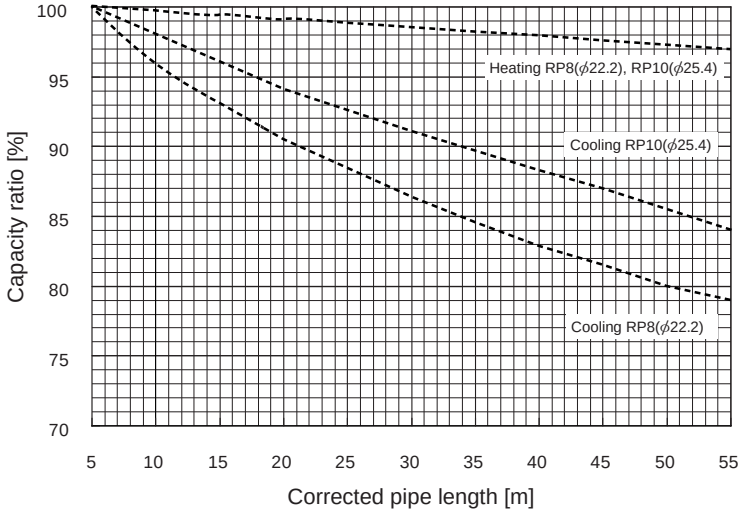
The lowered capacity can be obtained by referring to the capacity curves for gas pipe which is one or two size smaller than standard size.

Corrected pipe length (m) = actual pipe length (m) + number of bends × 0.3 (m)

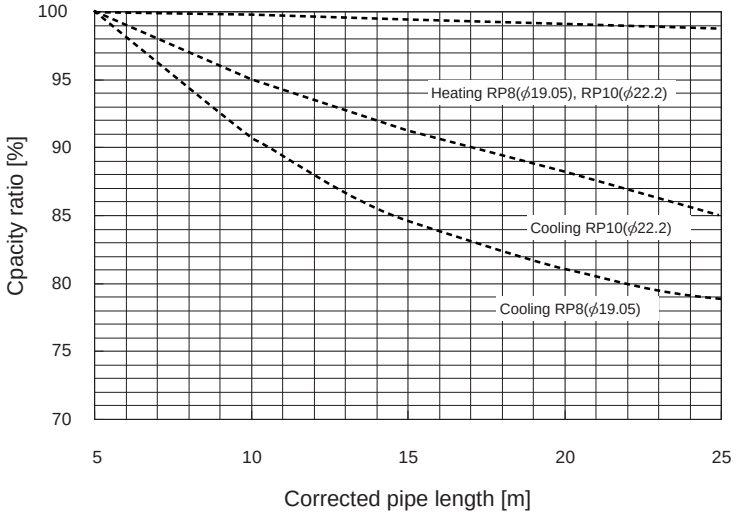
1. Capacity curves 1 <Standard size>



2. Capacity curves 2 <When the gas pipe's diameter is one-size-smaller than the standard



3. Capacity curves 3 <When the gas pipe's diameter is two-size-smaller than the standard



12-2. SYNCHRONIZED TWIN, TRIPLE AND QUADRUPLE SYSTEM

(1) Synchronized twin

Maximum pipe length (Main pipe[A]+Branch pipe diameter [B and C])

			RP8 twin (RP4X2)												RP10 twin (RP5X2)											
Main pipe	Liquid pipe		ϕ9.52				ϕ12.7				ϕ15.88				ϕ9.52				ϕ12.7				ϕ15.88			
(mm)[A]	Gas pipe		ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
Branch pipe [mm] [B, C]	Liquid pipe	ϕ6.35																								
	Gas pipe	ϕ12.7																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	Normal piping 70m※1 [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	Normal piping 70m※1 [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ15.88																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								
	Liquid pipe	ϕ12.7	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								

※1 The maximum pipe length is 80m in case of new pipping.
※2 When using ϕ31.75 pipe, the outdoor temperature range (dry-bulb temperature) for heating operation is -11 to +21℃.

(2) Synchronized triple

Maximum pipe length (Main pipe [A] + Branch pipe [B, C and D])

			RP8 triple (RP2.5X3)												RP10 triple (RP3X3)											
Main pipe	Liquid pipe		ϕ9.52				ϕ12.7				ϕ15.88				ϕ9.52				ϕ12.7				ϕ15.88			
(mm)[A]	Gas pipe		ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
Branch pipe [mm] [B, C, D]	Liquid pipe	ϕ6.35																								
	Gas pipe	ϕ12.7																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	Normal piping 70m※1 [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	Normal piping 70m※1 [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ15.88																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								
	Liquid pipe	ϕ12.7	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								

※1 The maximum pipe length is 80m in case of new pipping.
※2 When using ϕ31.75 pipe, the outdoor temperature range (dry-bulb temperature) for heating operation is -11 to +21℃.

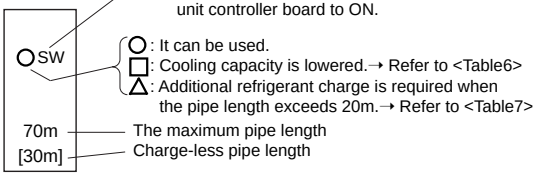
(3) Synchronized quadruple

Maximum pipe length (Main pipe[A]+Branch pipe [B, C, D and E])

			RP8 quadruple (RP2X4)												RP10 quadruple (RP2.5X4)											
Main pipe	Liquid pipe		ϕ9.52				ϕ12.7				ϕ15.88				ϕ9.52				ϕ12.7				ϕ15.88			
(mm)[A]	Gas pipe		ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
Branch pipe [mm] [B, C, D, E]	Liquid pipe	ϕ6.35	□ 20m [20m]	□ 50m [30m]	Normal piping 70m※1 [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2△SW 50m [20m]												
	Gas pipe	ϕ12.7																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	Normal piping 70m※1 [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ15.88																								
	Liquid pipe	ϕ9.52	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○SW 70m [30m]	△ 50m [20m]	△ 50m [20m]	△SW 50m [20m]	※2△SW 50m [20m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								
	Liquid pipe	ϕ12.7													□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	□ 20m [20m]	□ 50m [30m]	○ 70m [30m]	○ 70m [30m]	△ 50m [20m]	△ 50m [20m]	△ 50m [20m]	※2△ 50m [20m]
	Gas pipe	ϕ19.05																								

※1 The maximum pipe length is 80m in case of new pipping.
※2 When using ϕ31.75 pipe, the outdoor temperature range (dry-bulb temperature) for heating operation is -11 to +21℃.

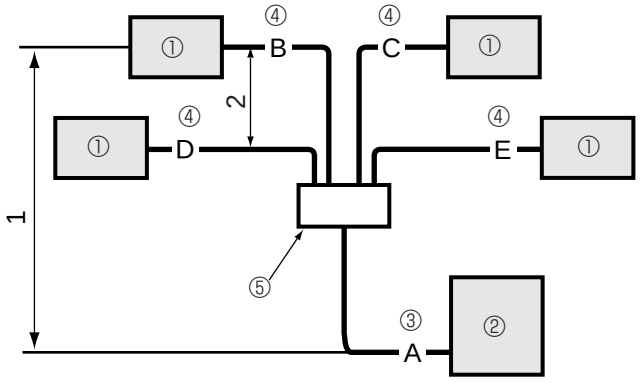
<Marks in the table above>



Pipe diameter and thickness

OD (mm)	ϕ6.35	ϕ9.52	ϕ12.7	ϕ15.88	ϕ19.05	ϕ22.2	ϕ25.4	ϕ28.58	ϕ31.75
Thickness (mm)	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.1

Be sure to use hard (tempered) one for pipe over ϕ22.2.(Do not use soft (annealed) one.)



① Indoor unit
② Outdoor unit
③ Main piping
④ Branch piping
⑤ Multi disttibution pipe (option)

1 Height difference (Indoor unit-Outdoor unit) Max. 40 m

2 Height difference (Indoor unit-Indoor unit) Max. 1 m

3 Distance between indoor and indoor units pipe length.

|B—C| |B—D| |B—E|
|C—D| |C—E| |D—E|

4 Number of pipe bends
Within 15
points8 points between main pipe A and each branch pipe (B, C, D, E).

<Table 6> Lowered cooling capacity by the smaller gas pipe diameter

Pipe length	RP8 Cooling capacity ratio		RP10 Cooling capacity ratio	
	gas pipe ϕ22.2	gas pipe ϕ19.05	gas pipe ϕ25.4	gas pipe ϕ22.2
5m and less	100%	100%	100%	100%
6~10m	100~96%	100~91%	100~98%	100~95%
11~20m	96~91%	91~81%	98~94%	95~88%
21~30m	91~86%	—	94~91%	—
31~40m	86~83%	—	91~88%	—
41~50m	83~80%	—	88~86%	—

<Table 7> Additional refrigerant amount when the liquid pipe of the larger diameter is used.
(Single /Simultaneous Twin / Simultaneous Triple / Simultaneous Quadruple)

Capacity	When the extension pipe length (main piping + branch piping) exceeds 20m
RP8, RP10	Additional refrigerant amount△W(g)=(180×L_1)+(120×L_2) (90×L_3)+(30×L_4)-3000

L_1 : ϕ15.88 liquid pipe (m) L_2 : ϕ12.7 liquid pipe (m)
L_3 : ϕ9.52 liquid pipe (m) L_4 : ϕ6.35 liquid pipe (m)

If the calculation produces a negative number (i.e. a "minus" charge), additional charging is not necessary.
(△W ≦ 0)

<Table 8>

Outdoor unit	Permissible total piping length A+B+C+D+E	A+B or A+C or A+D or A+E	Charge-less piping length A+B+C+D+E
RP8 PR10	80 m and less	80 m and less	30 m and less

<Table 9>

Outdoor unit	| B-C | or | B-D | or | B-E |or | C-D | or | C-E | or | D-E |	Number of pipe bends
RP8 RP10	8 m and less	Within 15

<Table 10>

Outdoor unit	permitted pipe length	At time of shipping (kg)	A+B+C+D Amount of additional refrigerant charge (kg)					
			30 m and less	31-40 m and less	41-50 m and less	51-60 m and less	61-70 m and less	71-80 m and less
RP8	80m or less	10.5	No additional charge necessary	0.9 kg	1.8 kg	2.7 kg	3.6 kg	The additional charge amount is obtained by the following formula.
RP10		10.5		1.2 kg	2.4 kg	3.6 kg	4.8 kg	

When length exceeds 70 m

When the total length of the piping exceeds 70 m, calculate the amount of additional charge based on the following requirements.
Note: If the calculation produces a negative number (i.e. a “minus” charge), of if calculation results in an amount that is less than the “Additional charge amount for 70 m,”perform the additional charge using the amount shown in “Additional charge amount for 70 m.”

Amount of additional charge	=	Main piping: Liquid line size ϕ12.7 overall length 0.12	+	Main piping: Liquid line size ϕ9.52 overall length 0.09 (Gas line:ϕ28.58)	+	Branch piping: Liquid line size ϕ9.52 overall length 0.06 (Gas line: ϕ15.88)	+	Branch piping: Liquid line size ϕ6.35 overall length 0.02 (Gas line: ϕ15.88)	–	3.6 (kg)

Additional charge amount for 70 m	RP8	3.6 kg
	RP10	4.8 kg

1. Perform refrigerant piping connections for the indoor / outdoor unit while the outdoor unit's stopvalve is completely closed (factory setting), and then vacuumize the refrigerant lines through the service port of the outdoor unit.
2. Open the stop valves of the outdoor unit completely.
   This will completely connects the refrigerant lines of the indoor and outdoor units.
   Handling of the stop valve is shown on the outdoor unit.

Note :

- Apply refrigerating machine oil over the flare seat surface. Do not apply to the threaded portion. (It will cause the flare nut to loosen.)
- Use two wrenches to tighten piping connection.
- Use leak detector or soapy water to check for gas leaks after connections are completed.
- For the insulation of the connection at the indoor side, make sure to use the attached insulation materials and thoroughly follow the instruction shown in the manual.
- Always use a non-oxidizing brazing material when brazing the pipes.

Adjusting the amount of refrigerant

Check additional refrigerant charging amount referring to the procedure ② below when the liquid pipe diameter of the main piping A is larger than the standard size.

① When the standard diameter pipe is used for the main piping A, calculate the additional refrigerant amount by referring to <Table 2> as well as the 1:1 system.

② When the liquid pipe diameter of the main piping A is one size larger than the standard size:

- When the extension pipe length (main piping + branch piping) does not exceeds 20m, adjustment of the refrigerant is not necessary (charge-less).
- When the extension pipe length (main piping + branch piping) exceeds 20m, charge the amount of refrigerant that is obtained by the formula shown in <Table 7>.

If the calculation produces a negative number (i.e. a "minus" charge), additional charging is not necessary.
Note: Apply 0 to L1 to L3 corresponding to the piping that are not used.

Correcting the capacity value

When calculating the lowered capacity by the extension pipe length, use the longest length between the indoor and the outdoor units.

Refrigerant collecting (pump down)

Perform the following procedures to collect the refrigerant when moving the indoor unit or the outdoor unit.

① Before collecting the refrigerant, first make sure that the all of the SW5 DIP switches for function changes on the control board of the outdoor unit are set to OFF. If all of the SW5 switches are not set to OFF, record the settings and then set all of the switches to OFF. Start collecting the refrigerant. After moving the unit to a new location and completing the test run, set the SW5 switches to the previously recorded settings.

② Supply power (circuit breaker).

* When power is supplied, make sure that "CENTRALLY CONTROLLED" is not displayed on the remote controller. If "CENTRALLY CONTROLLED" is displayed, the refrigerant collecting (pump down) cannot be completed normally.

③ After the liquid stop valve is closed, set the SWP switch on the control board of the outdoor unit to ON. The compressor (outdoor unit) and ventilators (indoor and outdoor units) start operating and refrigerant collecting operation begins. LED1 and LED2 on the control board of the outdoor unit are lit.

* Set the SWP switch (push-button type) to ON in order to perform refrigerant collecting operation only when the unit is stopped.
However, refrigerant collecting operation cannot be performed until compressor stops even if the unit is stopped.
Wait three minutes until compressor is completely stopped and set the SWP switch to ON again.

④ As the unit automatically stops after two or three minutes of refrigerant collecting operation (LED1 if not lit and LED2 is lit), be sure to quickly close the gas stop valve.
If the unit stops while both LED1 and LED2 are lit, open the liquid valve completely, wait three minutes, then repeat the step ③.

* If the refrigerant collecting operation has been completed normally (LED1 and LED2 are lit), the unit will remain stopped until the power supply is turned off.

⑤ Turn off the power supply (circuit breaker).

* Note that when the length of the extension piping is long, it may not be possible to perform a pump-down operation.When performing the pump-down operation, make sure that the low pressure is lowered to near 0 MPa (gauge).

Unit replacement operation

· This model will automatically begin the replacement operation after it has been installed when it enters the initialization phase for normal heating or cooling. However, the unit will not automatically perform the replacement operation if it is moved to a new location where it will be used with existing R22 refrigerant piping. Under such conditions, always use the SW8-2 operations to perform the replacement operation before beginning the test operation.
Some models can perform the replacement operation only by SW8-2 operation.
Refer to the outdoor unit's Installation Manual for detail.

Replacement operation procedures (When moving the unit and connecting it to existing R22 piping.)

① Supply power.

② Set DIP switch SW8-2 on the control board of the outdoor unit to ON to start replacement operation.

* The replacement operation is performed using the cooling system. Cool air will flow from the indoor unit during the replacement operation.

* During the replacement operation, TEST RUN is displayed on the remote controller and LED1 and LED2 on the control board of the outdoor unit flash together.

③ The duration of the replacement operation is determined by the length of the piping. Always perform the replacement operation for longer than the stipulated time.

* Always perform one of the following operations at the completion of the replacement operation. The replacement operation will end and the unit will automatically stop.

(1) Set SW8-2 from ON to OFF. (When ending a replacement operation of less than 2 hours.)

· Each time SW8-2 is set from OFF to ON, the replacement operation can be started. Always perform the replacement operation for longer than the stipulated time.
Required replacement operation times

Piping Length	Replacement Operation Time
0 to 20 meters	30 minutes or more
21 to 30 meters	45 minutes or more
31 to 70 meters	60 minutes or more

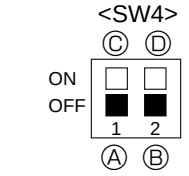
(2) The replacement operation will automatically stop after 2 hours. (It will end with SW8-2 still in the ON position.)

· When the replacement operation has ended automatically after 2 hours of operation, there is no need to set SW8-2 from ON to OFF; normal air conditioning operations can bestarted with the SW8-2 being set to ON.However, to repeat the replacement operation, SW8-2 will have to be returned to OFF and then set to ON.

* If the indoor temperature is below 15℃, the compressor will operate intermittently but the unit is not faulty.

Start and finish of test run

- Operation from the indoor unit
  Execute the test run using the installation manual for the indoor unit.
- Operation from the outdoor unit
  By using the DIP switch SW4 on the control board of the outdoor unit, test run can be started and finished, and its operation mode (cooling/heating) can be set up.
  ①Set the operation mode (cooling/heating) using SW4-2.
  ②Turn on SW4-1 to start test run with the operation mode set by SW4-2.
  ③Turn off SW4-1 to finish the test run.
- There may be a faint knocking sound around the machine room after power is supplied, but this is no problem with product because the linear expansion pipe is just moving to adjust opening pulse.
- There may be a knocking sound around the machine room for several seconds after compressor starts operating, but this is no problem with product because the check valve, itself, generates the sound because pressure difference is small in the refrigerant circuit.



Ⓐ Stop Ⓒ operation
Ⓑ Cooling Ⓓ Heating

Note:
The operation mode cannot be changed by SW4-2 during test run. (To change test run mode, stop the unit by SW4-1, change the operation mode and restart the test run by SW4-1.)

13 TROUBLESHOOTING

13-1. TROUBLESHOOTING

<Error code display by self-diagnosis and actions to be taken for service (summary)>
Present and past error codes are logged and displayed on the wired remote controller and control board of outdoor unit. Actions to be taken for service, which depends on whether or not the inferior phenomenon is reoccurring at service, are summarized in the table below. Check the contents below before investigating details.

Unit conditions at service	Error code	Actions to be taken for service (summary)
The inferior phenomenon is reoccurring.	Displayed	Judge what is wrong and take a corrective action according to “13-4. SELF-DIAGNOSIS ACTION TABLE”.
	Not displayed	Conduct trouble shooting and ascertain the cause of the inferior phenomenon according to “13-5. TROUBLE-SHOOTING BY INFERIOR PHENOMENA”.
The inferior phenomenon is not reoccurring.	Logged	①Consider the temporary defects such as the work of protection devices in the refrigerant circuit including compressor, poor connection of wiring, noise and etc. Re-check the symptom, and check the installation environment, refrigerant amount, weather when the inferior phenomenon occurred, matters related to wiring and etc. ②Reset error code logs and restart the unit after finishing service. ③There is no abnormality concerning of parts such as electrical component, controller board, remote controller and etc.
	Not logged	①Re-check the abnormal symptom. ②Conduct trouble shooting and ascertain the cause of the inferior phenomenon according to “13-5. TROUBLE-SHOOTING BY INFERIOR PHENOMENA”. ③Continue to operate unit for the time being if the cause is not ascertained. ④There is no abnormality concerning of parts such as electrical component, controller circuit board, remote controller and etc.

13-2. CHECK POINT UNDER TEST RUN (MA remote controller)

(1) Before test run

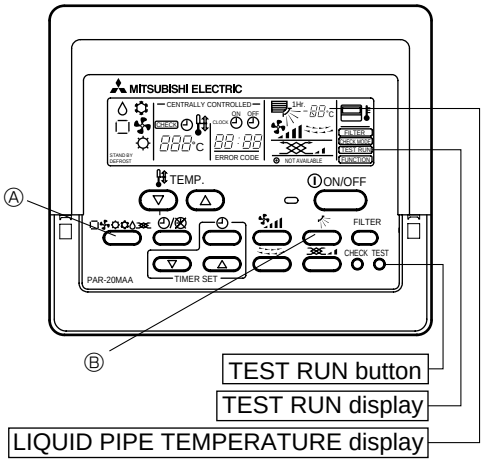
- After installation of indoor and outdoor units, piping work and electric wiring work, re-check that there is no refrigerant leakage, loosened connections and incorrect polarity.
- Measure impedance between the ground and the power supply terminal block(L, N) on the outdoor unit by 500V Merger and check that it is 1.0MΩ or over.

※Don't use 500V Merger to indoor/outdoor connecting wire terminal block(S1, S2, S3) and remote controller terminal block (1, 2). This may cause malfunction.

- Make sure that test run switch (SW4) is set to OFF before turning on power supply.
- Make sure that all of the SW5 switches for function changes on the control board of the outdoor unit are set to OFF. If all of the SW5 switches are not set to OFF, record the settings and then set all of the switches to OFF. And perform emergency operation. After finishing emergency operation, set the SW5 switches to the recorded settings.
- Turn on power supply twelve hours before test run in order to protect compressor.
- For specific models which requires higher ceiling settings or auto-recovery feature from power failure, make proper changes of settings referring to the description of "Selection of Functions through Remote Controller".

Make sure to read operation manual before test run. (Especially items to secure safety.)

13-2-1. Test run by remote controller



Operating procedures	
1. Turn on the main power supply.	While the room temperature display on the remote controller is "H0", the remote controller is disabled. Wait until "H0" disappears before using remote controller. "H0" appears for about 2 minutes after power supply is turned on. ※1
2. Press TEST button twice.	The TEST appears on the screen.
3. Press OPERATION SWITCH Ⓐ button.	Cooling mode: Check if cool air blows and water is drained. Heating mode: Check if warm air blows. (It takes a little while until warm air blows.)
4. Press AIR DIRECTION Ⓑ button.	Check for correct motion of auto-vanes.
5. Check the outdoor unit fan for correct running.	The outdoor unit features automatic capacity control to provide optimum fan speeds. Therefore, the fan keeps running at a low speed to meet the current outside air condition unless it exceeds its available maximum power. Then, in actuality, the fan may stop or run in the reverse direction depending on the outside air, but this does not mean malfunction.
6. Press the ON/OFF button to reset the test run in progress.	
7. Turn off the main power supply.	

- In case of test run, the OFF timer will be activated, and the test run will automatically stop after two hours.
- The room temperature display section shows the pipe temperature of indoor units during the test run.
- Check that all the indoor units are running properly in case of simultaneous twin and triple operation. Malfunctions may not be displayed regardless of incorrect wiring.

※1 After turning on the power supply, the system will go into startup mode, "H0" will blink on the display section of the room temperature, and lamp(red) of the remote controller will flash.
As to INDOOR BOARD LED, LED1 and LED2 will be lit up in case the address is 0, or turned off in case the address is not 0. LED3 will blink.
As to OUTDOOR BOARD LED, LED1(green) and LED2(red) will light up. (After the startup mode of the system finishes, LED2(red) will be turned off.)
In case OUTDOOR BOARD LED is digital display, □— and —□ will be displayed alternately every second.

- If one of the above operations doesn't function correctly, the causes written below should be considered. Find causes from the symptoms.
  The below symptoms are under test run mode. "startup" in the table means the display status of ※1 written above.

Symptoms in test run mode		Cause
Remote Controller Display	**OUTDOOR BOARD LED Display** < > indicates digital display.	
Remote controller displays "H0", and cannot be operated.	After "startup" is displayed, only green lights up. <00>	• After power is turned on, "H0" is displayed for 2 minutes during system startup. (Normal)
After power is turned on, "H0" is displayed for 3 minutes, then error code is displayed.	After "startup" is displayed, green(once) and red(once) blink alternately. <F1>	• Incorrect connection of outdoor terminal block (L, N and S1, S2, S3.)
	After "startup" is displayed, green(once) and red(twice) blink alternately. <F3, F4, F9>	• Outdoor unit's safeguard installation connector is open.
No display appears even when remote controller operation switch is turned on. (Operation lamp does not light up.)	After "startup" is displayed, green(twice) and red(once) blink alternately. <EA. Eb>	• Incorrect wiring between the indoor and outdoor unit (Polarity is wrong for S1, S2, S3.) • Remote controller transmission wire short.
	After "startup" is displayed, only green lights up. <00>	• There is no outdoor unit of address 0. (Address is other than 0.) • Remote controller transmission wire burnout.
Display appears but soon disappears even when remote controller is operated.	After "startup" is displayed, only green lights up. <00>	• After canceling function selection, operation is not possible for about 30 seconds. (Normal)

※Press the remote controller's (CHECK) button twice to perform self-diagnosis. See the table below for the contents of LCD display.

LCD	Contents of inferior phenomena	LCD	Contents of inferior phenomena
P1	Abnormality of room temperature thermistor	U1~UP	Malfunction outdoor unit
P2	Abnormality of pipe temperature thermistor/Liquid	F3~F9	Malfunction outdoor unit
P4	Abnormality of drain sensor	E0~E5	Remote controller transmitting error
P5	Drain overflow protection is working.	E6~EF	Indoor/outdoor unit communication error
P6	Freezing/overheating protection is working.	----	No error history
P8	Abnormality of pipe temperature	FFFF	No applied unit
P9	Abnormality of pipe temperature thermistor/Cond./Eva		

See the table below for details of the LED display (LED 1, 2, 3) on the indoor controller circuit board.

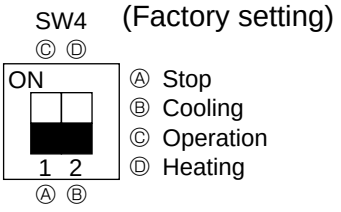
LED1 (microcomputer power supply)	Lits when power is supplied.
LED2 (remote controller)	Remote controller The indoor unit should be connected to the outdoor unit with address "0" setting.
LED3 (indoor/outdoor communication)	Flash when indoor and outdoor unit are communicating.

13-2-2. Test run by outdoor unit SW4

The setting of test run (ON/OFF) and its operation mode (cooling/heating) can be set by SW4 on the controller circuit board of outdoor unit. Check that SW5-1 is set to OFF before performing test run. If SW5-1 is set to ON, turn it OFF and then perform test run. After finishing test run, set SW5-1 back to ON.

①Set operation mode(cooling or heating) by SW4-2.
②Start test run by setting SW4-1 to ON (⤒) with the indicated operation mode of SW4-2.
③Finish test run by setting SW4-1 to OFF (⤓).

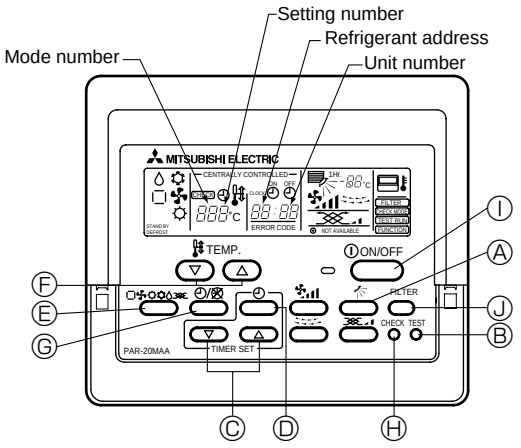
- Operation mode cannot be changed by SW4-2 during test run.
  Stop test run to change operation mode by SW4-1, and restart test run by SW4-1 after the mode is changed.
- Test run automatically stops 2 hours later by 2-hour OFF timer function.
- Test run can be performed by the remote controller.
- The remote controller display of test run by outdoor unit is the same as that of test run by remote controller.



13-3. MALFUNCTION-DIAGNOSIS METHOD BY REMOTE CONTROLLER

13-3-1. Error history of unit

(1) Wired remote controller



<In case of trouble during operation>

If there is a trouble on air conditioner, both indoor unit and outdoor unit will stop and digital display shows what was wrong.

① "CHECK" and refrigerant address are displayed at set temperature display. Error code and unit number are displayed at clock display alternately.
(If outdoor unit is malfunctioning, unit number is 00.)

② The refrigerant address and error code initially sent from the unit are displayed in case of group control system which one remote controller controls plural refrigerant systems.

③ Press the "ON/OFF" button to cancel error code.
In case of central control by the controller of MELANS, cancel the error code by the controller of the MELANS, and in case of distant-handy combined operation, cancel the error code by cancelling distant operation.

<Malfunction-diagnosis method at maintenance service>

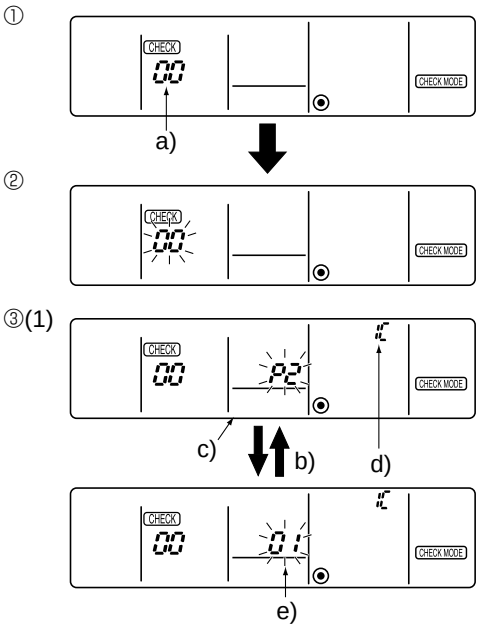
Digital control has memory function that memorizes latest error code even if it is cancelled by remote controller or power is shut off, so error histories can be searched by following the procedure below.

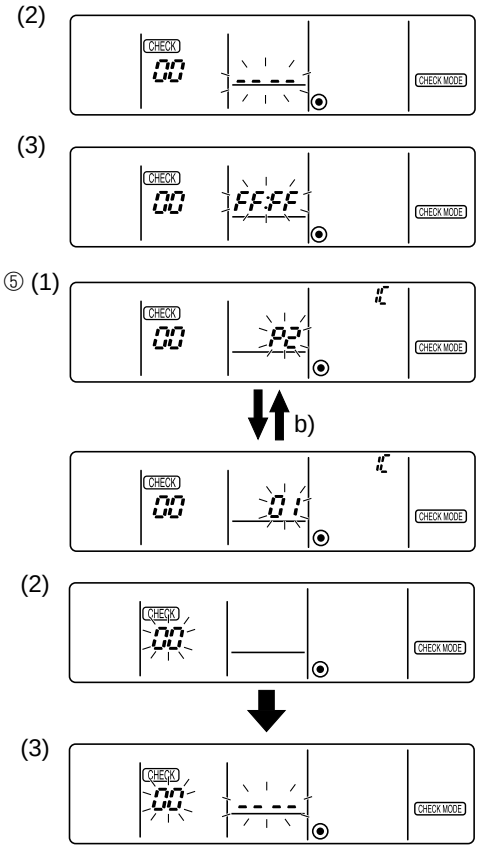
Search error histories of each unit by remote controller.

① Turn to self-diagnosis mode.
Press the Ⓗ "CHECK" button twice within three seconds, and following display appears.
a) Refrigerant address for self-diagnosis

② Set refrigerant address number that you want to diagnose.
Press the Ⓕ ▽△ (temp.) button to set refrigerant address to be diagnosed.
Refrigerant address has number from 00 to 15.
Three seconds after setting, lighted self-diagnosed refrigerant address begins blinking and self-diagnosis process begins.

③ Self-diagnosis result display
(1) When there is an error history.
(Refer to 13-4. for details of error code contents.)
b) Alternating display
c) Error code
d) Attribute of error search
e) Unit number
(2) When there is no error history.
(3) When the address does not exist.





④ To cancel self-diagnosis

There are following two methods to cancel self-diagnosis:

Press the Ⓗ "CHECK" button twice within three seconds.

➜Self-diagnosis is cancelled and the display screen will return to the status before self-diagnosis.

Press the ⓘ "ON/OFF" button.

➜Self-diagnosis is cancelled and indoor unit will stop.

This operation is ineffectual when the operation of remote controller is prohibited.

During self-diagnosis at maintenance service, all the indoor units start performing fan operation except for the indoor unit indicating the latest error. Then outdoor units of the same refrigerant system also start performing fan operation intermittently for 3 minutes. (The fan is on for 3 seconds and then off for 5 seconds.)

The unit with error can be inspected by using this. In case unit other than indoor unit, such as outdoor unit and controller of MELANS, has an error, all the indoor units of the same refrigerant system stop fan operation and outdoor units operate intermittently for 3 minutes.

⑤ To delete error code

When something is wrong with air conditioner, error code (P1 etc.) is memorized, but error code can be deleted after termination of service.

<To delete error cord with remote controller>

(1) Display the error cord at the self-diagnosis result display screen.
b) Alternating display

(2) The address for self-diagnosis will blink when the Ⓓ ◴ button is pressed twice within three seconds.

(3) The display (3) shown on the left will be appeared when the error cord has been reset. Note that the error content will be redisplayed if error cord resetting is unsuccessful.

<To delete error cord with switch of outdoor unit>

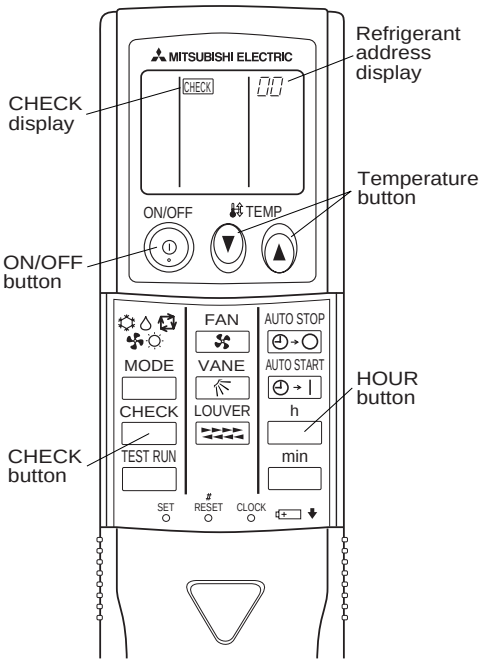
Refer to "**13-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS"**.

(2) Digital wireless remote controller

<In case of trouble during operation>

When a malfunction occurs to air conditioner, both indoor unit and outdoor unit will stop and operation lamp blinks to inform unusual stop.

<Malfunction-diagnosis method at maintenance service>



[Procedure]

1. Press the CHECK button twice.
   - "CHECK" lights, and refrigerant address "00" flashes.
   - Check that the remote controller's display has stopped before continuing.
2. Press the temperature ▼▲ buttons.
   - Select the refrigerant address of the indoor unit for the self-diagnosis.

   Note: Set refrigerant address using the outdoor unit's DIP switch (SW1). (For more information, see the outdoor unit installation manual.)
3. Point the remote controller at the sensor on the indoor unit and press the HOUR button.
   - If an air conditioner error occurs, the indoor unit's sensor emits an intermittent buzzer sound, the operation light flashes, and the error code is output. (It takes 3 seconds at most for error code to appear.)
4. Point the remote controller at the sensor on the indoor unit and press the ON/OFF button.
   - The check mode is cancelled.

✻ Malfunction diagnosis can be performed only for refrigerant system controlling wireless units.

Inspected unit	Error code	Beep output	Operation LED	Inspected unit	Check code	Beep output	Operation LED
Indoor unit	P1	beep × 1 time	1 sec. × 1 time	Outdoor unit	F1–F9	beep beep × 1 time	(0.4sec+0.4sec) × 1 time
	P2	beep × 2 times	1 sec.× 2 times		U0–UP		
	P4	beep × 4 times	1 sec.× 4 times		E6–EE	Other than above	Other than above
	P5	beep × 5 times	1 sec.× 5 times	—	No check code (normal)	No output	Lights off
	P6	beep × 6 times	1 sec.× 6 times		No check code (mistake of matching with refrigerant address)	beep beep beep	Lights off
	P8	beep × 8 times	1 sec.× 8 times				
	P9	beep × 2 times	1 sec.× 2 times				
	E4, E5	Other than above	Other than above				

13-3-2. Wired Remote controller Diagnosis

If operation can not be carried out from remote controller, try remote controller diagnosis with following process.

① First, check the electricity current marker.
When correct voltage (DC12V) is not supplied to remote controller, the electricity current marker is put out.
If the electricity current marker is not lighted, check the remote controller wiring and the indoor units.
a) Electric current marker

② Transfer to remote controller diagnosis mode
Hold down the Ⓗ "CHECK" button for five seconds or more, and following display appears.
Press the Ⓐ "FILTER" button, and remote controller diagnosis will begin.

③ Remote controller diagnosis result
(1) When the remote controller is functioning correctly
Check other possible causes, as there is no problem with remote controller.
Consider the unit is normal when remote controller transmits the result of diagnosis to indoor or outdoor unit and receives the same data back.
(2) When remote controller has malfunction
The remote controller must be replaced.
If the transmitting-receiving circuit is defective, ['NG'] blinks.
"NG" will be displayed when remote controller transmits the result of diagnosis to indoor or outdoor unit, and receives no response.

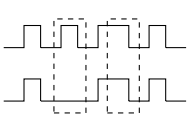
When there might be other problems than diagnosed remote controller,

(3) There might be noise on transmission path or damage of other remote controllers or indoor units. Check the transmission path and other controllers.
If the transmission is not possible, [E3] blinks.
"E3" will be displayed when remote controller transmits the result of diagnosis to indoor or outdoor unit and receives different data back.
(4) The number of data errors means the difference between the number of bits sent from remote controller and the actual number of bits sent to transmission path.
If the data error is displayed, noise and etc. are interfering with the transmission data. Check the transmission path.
If the data error has occurred, [ERC] and number of data errors are displayed.
b) Number of generated data errors (maximum 66 errors)

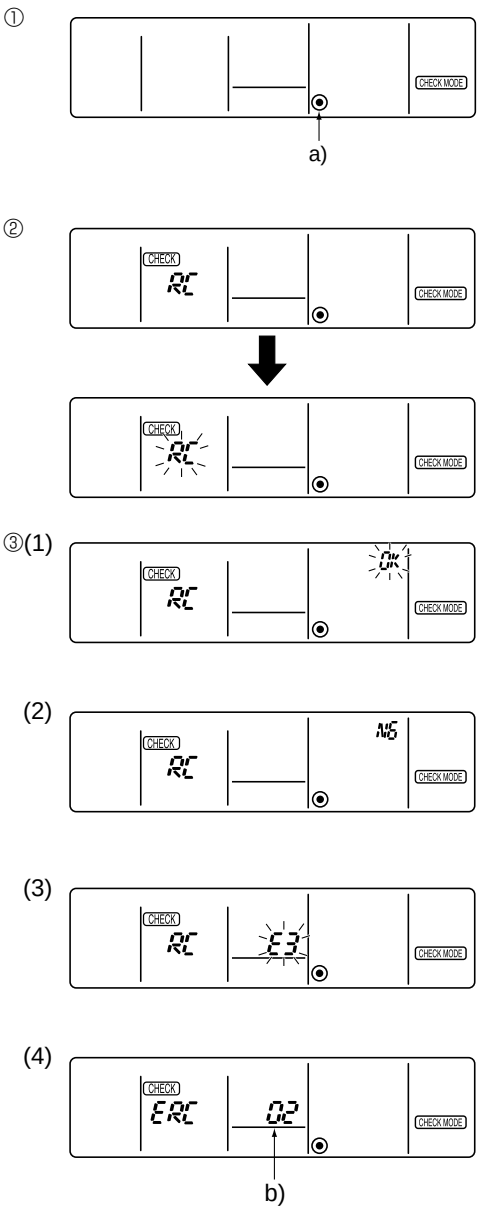
When the number of data errors is 02.

Transmission data from remote controller

Transmission data on transmission path



④ Cancel the remote controller diagnosis
Hold down the Ⓗ "CHECK" button for five seconds or more to cancel remote controller diagnosis, then [H0] operation lamp will blink and the display screen will return to the status before remote controller diagnosis in about 30 seconds.



13-4. SELF-DIAGNOSIS ACTION TABLE

<Abnormalities detected when the power is put on> (Note 1) Refer to indoor unit section for code P and code E.

Error Code	Meaning of error code and detection method	Case	Judgment and action
None	—	① No voltage is supplied to terminal block(TB1) of outdoor unit. a) Power supply breaker is put off. b) Contact failure or disconnection of power supply terminal. c) Open phase (L2 or N phase) ② Electric power is not supplied to outdoor controller circuit board. a) Disconnection of connector (CNDC) ③ Disconnection of outdoor noise filter circuit board or parts failure in outdoor noise filter circuit board. ④ Defective outdoor controller circuit board.	① Check following items. a) Power supply breaker b) Connection of power supply terminal block. (TB1) c) Connection of power supply terminal block. (TB1) ② Check connection of the connector (CNDC) on the outdoor controller circuit board. Check connection of the connector, (CNDC) the outdoor noise filter circuit board. Refer to 13-9. ③ a) Check connection of outdoor noise filter circuit board. b) Replace outdoor noise filter circuit board. Refer to 13-9. ④ Replace controller board (When items above are checked but the units can not be repaired.)
F3 (5202)	**63L connector open** Abnormal if 63L connector circuit is open for three minutes continuously after power supply. 63L: Low-pressure switch	① Disconnection or contact failure of 63L connector on outdoor controller circuit board. ② Disconnection or contact failure of 63L. ③ 63L is working due to refrigerant leakage or defective parts. ④ Defective outdoor controller circuit board.	① Check connection of 63L connector on outdoor controller circuit board. Refer to 13-9. ② Check the 63L side of connecting wire. ③ Check refrigerant pressure. Charge additional refrigerant. Check continuity by tester. Replace the parts if the parts are defective. ④ Replace outdoor controller circuit board.
F5 (5201)	**63H connector open** Abnormal if 63H connector circuit is open for three minutes continuously after power supply. 63H: High-pressure switch	① Disconnection or contact failure of 63H connector on outdoor controller circuit board. ② Disconnection or contact failure of 63H. ③ 63H is working due to defective parts. ④ Defective outdoor controller circuit board.	① Check connection of 63H connector on outdoor controller circuit board. Refer to 13-9. ② Check the 63H side of connecting wire. ③ Check continuity by tester. Replace the parts if the parts are defective. ④ Replace outdoor controller circuit board.
F9 (4119)	**2 connector open** Abnormal if both 63H and 63L connector circuits are open for three minutes continuously after power supply. 63H: High-pressure switch 63L: Low-pressure switch	① Disconnection or contact failure of connector (63H,63L) on outdoor controller circuit board. ② Disconnection or contact failure of 63H, 63L. ③ 63H and 63L are working due to defective parts. ④ Defective outdoor controller circuit board.	① Check connection of connector(63H,63L) on outdoor controller circuit board. Refer to 13-9. ② Check the 63H and 63L side of connecting wire. ③ Check continuity by tester. Replace the parts if the parts are defective. ④ Replace outdoor controller circuit board.

Error Code	Meaning of error code and detection method	Case	Judgment and action
EA (6844)	**Indoor/outdoor unit connector mis-wiring, excessive number of units (4 units or more)** 1. Outdoor controller circuit board can automatically check the number of connected indoor units. Abnormal if the number cannot be checked automatically due to mis-wiring of indoor/outdoor unit connecting wire and etc. after power is turned on for 4 minutes. 2. Abnormal if outdoor controller circuit board recognizes the number of connected indoor units as “5 units or more”.	① Contact failure or mis-wiring of indoor/outdoor unit connecting wire. ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ③ 5 or more indoor units are connected to one outdoor unit. ④ Defective transmitting receiving circuit of outdoor controller circuit board. ⑤ Defective transmitting receiving circuit of indoor controller circuit board. ⑥ Defective indoor power circuit board. ⑦ Two or more outdoor units have refrigerant address “0” . (In case of group control) ⑧ Noise has entered into power supply or indoor / outdoor unit connecting wire.	① Check disconnection or looseness or polarity of indoor/outdoor unit connecting wire of indoor and outdoor units. ② Check diameter and length of indoor/outdoor unit connecting wire. Total wiring length: 80m (including wiring connecting each indoor unit and between indoor and outdoor unit) Also check if the connection order of flat cable is S1, S2, S3. ③ Check the number of indoor units that are connected to one outdoor unit. (If EA is detected) ④~⑥ Put the power off once, and on again to check. Replace outdoor controller circuit board, indoor controller circuit board or indoor power board if abnormality occurs again. ⑦ Check if refrigerant addresses (SW1-3 to SW1-6 on outdoor controller circuit board) are overlapping in case of group control system. ⑧ Check transmission path, and remove the cause. ※ The descriptions above, ①-⑧, are for EA, Eb and EC.
Eb (6845)	**Mis-wiring of indoor/outdoor unit connecting wire (converse wiring or disconnection)** Outdoor controller circuit board can automatically set the unit number of indoor units. Abnormal if the indoor unit number can not be set within four minutes after power on because of mis-wiring (converse wiring or disconnection) of indoor/outdoor unit connecting wire.	① Contact failure or mis-wiring of indoor/outdoor unit connecting wire. ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ④ Defective transmitting receiving circuit of outdoor controller circuit board. ⑤ Defective transmitting receiving circuit of indoor controller circuit board. ⑥ Defective indoor power circuit board. ⑦ Two or more outdoor units have refrigerant address “0” . (In case of group control) ⑧ Noise has entered into power supply or indoor/outdoor unit connecting wire.	
EC (6846)	**Start-up time over** The unit can not finish start-up process within four minutes after power on.	① Contact failure of indoor/outdoor unit connecting wire. ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ⑦ Two or more outdoor units have refrigerant address “0” . (In case of group control) ⑧ Noise has entered into power supply or indoor/outdoor unit connecting wire.	

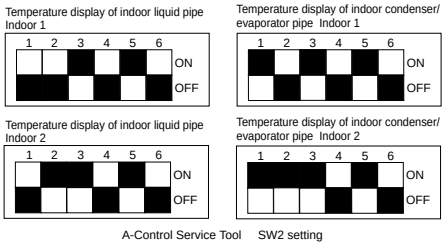
<Abnormalities detected while unit is operating>

Error Code	Meaning of error code and detection method	Case	Judgment and action
U1 (1302)	**Abnormal high pressure (High-pressure switch 63H worked)** Abnormal if high-pressure switch 63H worked (3.6MPa) during compressor operation. 63H: High-pressure switch	① Short cycle of indoor unit. ② Clogged filter of indoor unit. ③ Decreased airflow caused by dirt of indoor fan. ④ Dirt of indoor heat exchanger. ⑤ Locked indoor fan motor. ⑥ Malfunction of indoor fan motor. ⑦ Defective operation of stop valve (Not full open). ⑧ Clogged or broken pipe. ⑨ Locked outdoor fan motor. ⑩ Malfunction of outdoor fan motor. ⑪ Short cycle of outdoor unit. ⑫ Dirt of outdoor heat exchanger. ⑬ Decreased airflow caused by defective inspection of outside temperature thermistor (It detects lower temperature than actual temperature.) ⑭ Disconnection or contact failure of connector (63H) on outdoor controller circuit board. ⑮ Disconnection or contact failure of 63H connection. ⑯ Defective outdoor controller circuit board. ⑰ Defective action of linear expansion valve. ⑱ Malfunction of fan driving circuit.	①~⑥Check indoor unit and repair defectives. ⑦ Check if stop valve is full open. ⑧ Check piping and repair defectives. ⑨~⑫ Check outdoor unit and repair defectives. ⑬ Check the inspected temperature of outside temperature thermistor on LED display. (SW2 on A-Control Service Tool : Refer to page 57.) ⑭~⑯Put the power off and check F5 is displayed when the power is put again. When F5 is displayed, refer to “Judgment and action” for F5. ⑰ Check linear expansion valve. Refer to 13-6. ⑱ Replace outdoor controller circuit board or FAN controller circuit board.
U2 (1102)	**Abnormal high discharging temperature** (1) Abnormal if discharge temperature thermistor (TH4) exceeds 125℃ or 110℃ continuously for 5 minutes. Abnormal if condenser/evaporator temperature thermistor (TH5) exceeds 40℃ during defrosting and discharge temperature thermistor (TH4) exceeds 110℃. (2) Abnormal if discharge super heat (Cooling: TH4 – TH5 / Heating: TH4 – TH6) increases. All the conditions in A or B are detected simultaneously for 10 minutes continuously after 6 minutes past from compressor start-up (including the thermostat indication or recovery from defrosting). <Condition A> • Heating mode • When discharge super heat is less than 70 deg. • When the TH6 temp is more than the value obtained by TH7 – 5 deg. • When the condensing temp of TH5 is less than 35℃. <Condition B> • During comp operation (Cooling and Heating) • When discharge super heat is less than 80 deg in Cooling. • When discharge super heat is less than 90 deg in Heating. • When condensing temp of TH6 is more than –40℃. (In Cooling only.)	① Over-heated compressor operation caused by shortage of refrigerant. ② Defective operation of stop valve. ③ Defective thermistor. ④ Defective outdoor controller circuit board. ⑤ Defective action of linear expansion valve.	① Check intake super heat. Check leakage of refrigerant. Charge additional refrigerant. ② Check if stop valve is full open. ③④ Put the power off and check if U3 is displayed when the power is put again. When U3 is displayed, refer to “Judgement and action” for U3. ⑤ Check linear expansion valve. Refer to 13-6.

<table>
<tr><th>Error Code</th><th>Meaning of error code and detection method</th><th>Case</th><th>Judgment and action</th></tr>
<tr><td>U3
(5104)</td><td>Open/short circuit of discharge temperature thermistor (TH4)
Abnormal if open (3℃ or less) or short (217℃ or more) is detected during compressor operation.
(Detection is inoperative for 10 minutes of compressor starting process and for 10 minutes after and during defrosting.)</td><td>① Disconnection or contact failure of connector (TH4) on the outdoor controller circuit board.
② Defective thermistor.
③ Defective outdoor controller circuit board.</td><td>① Check connection of connector (TH4) on the outdoor controller circuit board.
Check breaking of the lead wire for thermistor (TH4). Refer to 13-9.
② Check resistance value of thermistor (TH4) or temperature by microcomputer.
(Thermistor/TH4: Refer to 13-6.)
(SW2 on A-Control Service Tool: Refer to page 57.)
③ Replace outdoor controller circuit board.</td></tr>
<tr><td>U4
(TH3, TH32 :5105)
(TH6:5107)
(TH7:5106)
(TH8:5110)</td><td>Open/short of outdoor unit thermistors (TH3, TH32, TH6, TH7, and TH8)
Abnormal if open or short is detected during compressor operation.
Open detection of thermistors TH3 and TH6 is inoperative for 10 seconds to 10 minutes after compressor starting and 10 minutes after and during defrosting.
※Check which unit has abnormality in its thermistor by switching the mode of SW2.
(Refer to page 62.)
<table><tr><th colspan="2" rowspan="2">Thermistors</th><th rowspan="2">Open detection</th><th rowspan="2">Short detection</th></tr><tr><th>Symbol</th><th>Name</th></tr><tr><td>TH3, TH32</td><td>Thermistor <Outdoor pipe></td><td>– 40℃ or below</td><td>90℃ or above</td></tr><tr><td>TH6</td><td>Thermistor <Outdoor 2-phase pipe></td><td>– 40℃ or below</td><td>90℃ or above</td></tr><tr><td>TH7</td><td>Thermistor <Outdoor></td><td>– 40℃ or below</td><td>90℃ or above</td></tr><tr><td>TH8</td><td>Internal thermistor</td><td>– 35℃ or below</td><td>170℃ or above</td></tr></table></td><td>① Disconnection or contact failure of connectors.
(Outdoor controller circuit board: TH3, TH32, TH6/TH7
Outdoor power circuit board: CN3)
② Defective thermistor.
③ Defective outdoor controller circuit board.</td><td>① Check connection of connector (TH3, TH32, TH6/TH7) on the outdoor controller circuit board.
Check connection of connector (CN3) on the outdoor power circuit board.
Check breaking of the lead wire for thermistor (TH3, TH32, TH6,TH7,TH8). Refer to 13-9.
② Check resistance value of thermistor (TH3, TH32, TH6,TH7,TH8) or check temperature by microcomputer.
(Thermistor/TH3,TH32,TH6,TH7,TH8: Refer to13-6.)
(SW2 on A-Control Service Tool: Refer to page 57.)
③ Replace outdoor controller circuit board.
※Emergency operation is available in case of abnormalities of TH3, TH32, TH6 and TH7. Refer to 13-8.</td></tr>
<tr><td rowspan="2">U5
(4230)</td><td>Abnormal temperature of heat sink
Abnormal if heat sink thermistor TH8, which is built in the power module, detects temperature indicated below.
RP8YHA·····95℃
RP10YHA····95℃</td><td>① The outdoor fan motor is locked.
② Failure of outdoor fan motor.
③ Air flow path is clogged.
④ Rise of ambient temperature.
⑤ Defective thermistor.
⑥ Defective input circuit of outdoor power circuit board.
⑦ Failure of outdoor fan drive circuit.</td><td>①② Check the resistance of outdoor fan motor wiring.
Refer to “13-6 HOW TO CHECK THE PART”.
③ Check air flow path for cooling.
④ Check if there is something which causes temperature rise around outdoor unit.
(Upper limit of ambient temperature is 46℃.)
Turn off power, and on again to check if U5 is displayed within 30 minutes.
If U4 is displayed instead of U5, follow the action to be taken for U4.
⑤ Check TH8 temperature by microcomputer.
(SW2 on A-Control Service Tool: Refer to page 57.)
⑥ Replace outdoor power circuit board.
⑦ Replace outdoor controller circuit board.</td></tr>
<tr><td>Compressor overcurrent interruption (When compressor locked)
Abnormal if overcurrent of DC bus or compressor is detected within 30 seconds after compressor starts operating.</td><td>① Stop valve is closed.
② Decrease of power supply voltage.
③ Looseness, disconnection or converse of compressor wiring connection.
④ Defective compressor.
⑤ Defective outdoor power circuit board.</td><td>① Open stop valve.
② Check facility of power supply.
③ Correct the wiring (U•V•W phase) to compressor.
Refer to page 52 and 53.
④ Check compressor.
Refer to 13-6.
⑤ Replace outdoor power circuit board.</td></tr>
<tr><td>U6
(4250)</td><td>Abnormality of power module
Check abnormality by driving power module in case overcurrent is detected.</td><td>① Outdoor stop valve is closed.
② Decrease of power supply voltage
③ Looseness, disconnection or converse of compressor wiring connection.
④ Defective compressor.
⑤ Defective outdoor power circuit board.</td><td>① Open stop valve.
② Check facility of power supply.
③ Correct the wiring (U•V•W phase) to compressor. Refer to 13-9.
④ Check compressor referring to 13-6.
⑤ Replace outdoor power circuit board.</td></tr>
</table>

Error Code	Meaning of error code and detection method	Case	Judgment and action
U9 (4220)	**Abnormality such as overvoltage or voltage shortage and abnormal synchronous signal to main circuit** Abnormal if any of followings are detected during compressor operation; • Instantaneous decrease of DC bus voltage to 400V. • Increase of DC bus voltage to 760V. • Decrease of input current of outdoor unit to 0.5A only if operation frequency is more than or equal to 40Hz or compressor current is more than or equal to 5A.	① Decrease of power supply voltage. ② Defective 52C drive circuit of outdoor power circuit board. ③ Disconnection or loose connection of CN5 on the outdoor power circuit board or outdoor noise filter circuit board. ④ Defective ACCT of outdoor noise filter circuit board. ⑤ Disconnection or loose connection of CN2 on the outdoor power circuit board.	① Check the facility of power supply. ② Replace outdoor power circuit board. ③ Check CN5 wiring on the outdoor power circuit board or outdoor noise filter circuit board. Refer to 13-9. ④ Replace outdoor noise filter circuit board. ⑤ Check CN2 wiring on the outdoor power circuit board. Refer to 13-9.
UF (4100)	**Compressor overcurrent interruption (When compressor locked)** Abnormal if overcurrent of DC bus or compressor is detected within 30 seconds after compressor starts operating.	① Stop valve is closed. ② Decrease of power supply voltage. ③ Looseness, disconnection or converse of compressor wiring connection. ④ Defective compressor. ⑤ Defective outdoor power circuit board.	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U•V•W phase) to compressor. Refer to page 13-9. ④ Check compressor. Refer to 13-6. ⑤ Replace outdoor power circuit board.
UH (5300)	**Current sensor error** Abnormal if current sensor detects –1.5A to 1.5A during compressor operation. (This error is ignored in case of test run mode.)	① Disconnection of compressor wiring. ② Defective circuit of current sensor on outdoor power circuit board.	① Correct the wiring (U•V•W phase) to compressor. Refer to 13-9. ② Replace outdoor power circuit board.
UL (1300)	**Abnormal low pressure (63L worked)** Abnormal if 63L is worked (under-0.03MPa) during compressor operation. 63L: Low-pressure switch	① Stop valve of outdoor unit is closed during operation. ② Disconnection or loose connection of connector (63L) on outdoor controller circuit board. ③ Disconnection or loose connection of 63L. ④ Defective outdoor controller circuit board. ⑤ Leakage or shortage of refrigerant. ⑥ Malfunction of linear expansion valve.	① Check stop valve. ②~④ Put the power off and on again to check if F3 is displayed on restarting. If F3 is displayed, follow the F3 processing direction. ⑤ Correct to proper amount of refrigerant. ⑥ Check linear expansion valve. Refer to 13-6.
UP (4210)	**Compressor overcurrent interruption** Abnormal if overcurrent DC dc bus or compressor is detected after compressor starts operating for 30 seconds.	① Stop valve of outdoor unit is closed. ② Decrease of power supply voltage. ③ Looseness, disconnection or converse of compressor wiring connection. ④ Defective fan of indoor/outdoor units. ⑤ Short cycle of indoor/outdoor units. ⑥ Defective input circuit of outdoor controller circuit board. ⑦ Defective compressor. ⑧ Defective outdoor power circuit board.	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U•V•W phase) to compressor. Refer to 13-9. ④ Check indoor/outdoor fan. ⑤ Solve short cycle. ⑥ Replace outdoor controller circuit board. ⑦ Check compressor. Refer to 13-6. ※ Before the replacement of the outdoor controller circuit board, disconnect the wiring to compressor from the outdoor power circuit board and check the output voltage among phases, U, V, W, during test run. No defect on board if voltage among phases (U-V, V-W and W-U) is same. Make sure to perform the voltage check with same performing frequency. ⑧ Replace outdoor power circuit board.

Error Code	Meaning of error code and detection method	Case	Judgment and action
E0 (No display)	**Remote controller communication error (Signal receiving error)** (1) Abnormal if any signal from IC of refrigerant address “0” could not be normally received for three minutes. (2) Abnormal if sub remote controller could not receive any signal for two minutes.	① Defective communication circuit of remote controller. ② Defective communication circuit of indoor controller circuit board of refrigerant address “0”. ③ Noise has entered into transmission line of remote controller. ④ All remote controllers are set as “sub” remote controller. In this case, E4 is displayed at outdoor LED, and E0 is displayed at remote controller.	①~③ Diagnose remote controller. Take actions as follows according to diagnosis result. a) When “RC OK” is displayed, remote controllers have no problem. Put the power off, and on again to check. If, “H0” is displayed for four minutes or more, replace indoor controller circuit board. b) When “RC NG” is displayed, replace remote controller. c) When “RC E3” or “ERC 00-66” is displayed, noise may be causing abnormality. ④ Set a remote controller to main, and the other to sub. ※ The descriptions above, ①-③, are for E0 and E3.
E3 (No display)	**Remote controller communication error (Transmitting error)** (1) Abnormal if sub remote controller could not find blank of transmission path for six seconds. (2) Abnormal if remote controller could not finish transmitting 30 times continuously.	① Defective communication circuit of remote controller. ② Noise has entered into transmission line of remote controller. ③ Two remote controllers are set as "main." (In case of 2 remote controllers).	
E8 (6840)	**Indoor/outdoor unit communication error (Signal receiving error) (Outdoor unit)** (1) Abnormal if outdoor controller circuit board could not receive anything normally for three minutes.	① Contact failure of indoor/outdoor unit connecting wire. ② Defective communication circuit of outdoor controller circuit board. ③ Defective communication circuit of indoor controller circuit board. ④ Noise has entered into indoor/ outdoor unit connecting wire.	① Check disconnection or looseness of indoor/ outdoor unit connecting wire of indoor or outdoor units. ②~④ Put the power off, and on again to check. Replace indoor controller circuit board or outdoor controller circuit board if abnormality is displayed again.
E9 (6841)	**Indoor/outdoor unit communication error (Transmitting error) (Outdoor unit)** (1) Abnormal if “0” receiving is detected 30 times continuously though outdoor controller circuit board has transmitted “1”. (2) Abnormal if outdoor controller circuit board could not find blank of transmission path for three minutes.	① Indoor/ outdoor unit connecting wire has contact failure. ② Defective communication circuit of outdoor controller circuit board. ③ Noise has entered power supply. ④ Noise has entered indoor/ outdoor unit connecting wire.	① Check disconnection or looseness of indoor/outdoor unit connecting wire. ②~④ Put the power off, and on again to check. Replace outdoor controller circuit board if abnormality is displayed again.
EF (6607 or 6608)	**Non defined error code** This code is displayed when non defined error code is received.	① Noise has entered transmission wire of remote controller. ② Noise has entered indoor/ outdoor unit connecting wire. ③ Outdoor unit is not a series of power-inverter. ④ Model name of remote controller is PAR-S25A.	①② Put the power off, and on again to check. Replace indoor controller circuit board or outdoor controller circuit board if abnormality is displayed again. ③ Replace outdoor unit with power-inverter type outdoor unit. ④ Replace remote controller with MA remote controller.
Ed (0403)	**Serial communication error** 1.Abnormal if serial communication between outdoor controller circuit board and outdoor power circuit board is defective.	① Breaking of wire or contact failure of connector CN2 between the outdoor controller circuit board and the outdoor power circuit board. ② Breaking of wire or contact failure of connector CN4 between the outdoor controller circuit board and the outdoor power circuit board. ③ Defective communication circuit of outdoor power circuit board ④ Defective communication circuit of outdoor controller circuit board for outdoor power circuit board	①② Check connection of each connector CN2 and CN4 between the outdoor controller circuit board and the outdoor power circuit board. ③ Replace outdoor power circuit board. ④ Replace outdoor controller circuit board.
	2. Abnormal if communication between outdoor controller circuit board and M-NET board is not available.	① Breaking of wire or contact failure of connector between outdoor controller circuit board and M-NET board ② Contact failure of M-NET board power supply line ③ Noise has entered into M-NET transmission wire.	① Check disconnection, looseness, or breaking of connection wire between outdoor controller circuit board (CNMNT) and M-NET board (CN5). ② Check disconnection, looseness, or breaking of connection wire between outdoor controller circuit board(CNMNT) and M-NET board (CND). ③ Refer to (4) in “ 2-2. M-NET Wiring method ” on Service Technical Guide for OCT04.

Error Code	Meaning of error code and detection method	Case	Judgment and action
P8	**Abnormality of pipe temperature** <Cooling mode> Detected as abnormal when the pipe temperature is not in the cooling range 3 minutes later of compressor start and 6 minutes later of the liquid or condenser/evaporator pipe is out of cooling range. Note 1) It takes at least 9 min. to detect. Note 2) Abnormality P8 is not detected in drying mode. Cooling range : Indoor pipe temperature (TH2 or TH5) – intake temperature (TH1) ≦ -3 deg TH: Lower temperature between: liquid pipe temperature and condenser/ evaporator temperature <Heating mode> When 10 seconds have passed after the compressor starts operation and the hot adjustment mode has finished, the unit is detected as abnormal when condenser/evaporator pipe temperature is not in heating range within 20 minutes. Note 3) It takes at least 27 minutes to detect abnormality. Note 4) It excludes the period of defrosting (Detection restarts when defrosting mode is over) Heating range : 3 deg ≦ (Condenser/ Evaporator temperature(TH5) – intake temperature(TH1))	① Slight temperature difference between indoor room temperature and pipe <liquid or condenser / evaporator> temperature thermistor. • Shortage of refrigerant • Disconnected holder of pipe <liquid or condenser / evaporator> thermistor • Defective refrigerant circuit ② Converse connection of extension pipe (on plural units connection). ③ Converse wiring of indoor/ outdoor unit connecting wire (on plural units connection). ④ Defective detection of indoor room temperature and pipe <condenser / evaporator> temperature thermistor. ⑤ Stop valve is not opened completely.	①~④ Check pipe <liquid or condenser / evaporator> temperature with room temperature display on remote controller and outdoor controller circuit board. Pipe <liquid or condenser / evaporator> temperature display is indicated by setting SW2 of outdoor controller circuit board as follows. (Conduct temperature check with outdoor controller circuit board after connecting 'A-Control Service Tool(PAC-SK52ST)'.)  ②③Check converse connection of extension pipe or converse wiring of indoor/outdoor unit connecting wire.

<M-NET communication error>

(Note) "Indoor unit" in the text indicates M-NET board in outdoor unit.

Error Code	Meaning of error code and detection method	Case	Judgment and action
A0 (6600)	**Address duplicate definition** This error is displayed when transmission from the units of same address is detected. Note) The address and attribute displayed at remote controller indicate the controller that detected abnormality.	① There are two or more same address of controller of outdoor unit, indoor unit, FRESH MASTER, or LOSSNAY. ② Noise has entered into transmission signal and signal was transformed.	Search the unit with same address as abnormality occurred. If the same address is found, shut of the power supply of outdoor unit and indoor unit and FRESH MASTER or LOSSNAY at the same time for two minutes or more after the address is corrected, and put the power on again. Check transmission wave form or noise on transmission wire.
A2 (6602)	**Hard ware error of transmission processor** Transmission processor intended to transmit "0", but "1" appeared on transmission wire. Note) The address and attribute display at remote controller indicate the controller that detected abnormality.	① Error is detected if wave form is transformed when wiring works of transmission wire of outdoor unit, indoor unit, FRESH MASTER or LOSSNAY are done, or polarity is changed with the power on and transmission data collide each other. ② Defective transmitting receiving circuit of transmission processor. ③ Transmission data is changed by the noise on transmission.	① If the works of transmission wire is done with the power on, shut off the power supply of outdoor unit and indoor unit and FRESH MASTER or LOSSNAY at the same time for two minutes or more, and put the power on again. ② Check transmission wave form or noise on transmission wire.
A3 (6603)	**BUS BUSY** 1. Over error by collision damage Abnormal if transmitting is not possible for 8-10 minutes continuously because of collision of transmission. 2. Data could not reach transmission wire for 8-10 minutes continuously because of noise or etc. Note) The address and attribute displayed at remote controller indicate the controller that detected abnormality.	① Transmission processor could not transmit because short cycle voltage of noise and the like have entered into transmission wire continuously. ② Transmission quantity has increased and transmission is not possible because there was wiring mistake of terminal block for transmission wire (TB3) and terminal block for central control (TB7) in outdoor unit. ③ Transmission are mixed with others and occupation rate on transmission wire rose because of defective repeater (a function to connector or disconnect transmission of control and central control system) of outdoor unit, then abnormality is detected.	① Check if transmission wire of indoor unit, FRESH MASTER, LOSSNAY, or remote controller is not connected to terminal block for central control (TB7) of outdoor unit. ② Check if transmission wore of indoor unit, FRESH MASTER or LOSSNAY is not connected to terminal block for transmission wire of outdoor unit. ③ Check if terminal block for transmission wire (TB3) and terminal block for central control (TB7) is not connected. ④ Check transmission wave form or noise on transmission wire.

Error Code	Meaning of error code and detection method	Case	Judgment and action
A6 (6606)	**Communication error with communication processor** Defective communication between unit processor and transmission processor Note) The address and attribute display at remote controller indicate the controller that detected abnormality.	① Data of transmission processor or unit processor is not transmitted normally because of accidental trouble such as noise or thunder surge. ② Address forwarding from unit processor is not transmitted normally because of defective transmission processor hardware.	Shut of the power supply of outdoor unit and indoor unit and FRESH MASTER or LOSSNAY at the same time for two minutes or more, and put the power on again. System returns normally if abnormality was accidental malfunction. If the same abnormality generates again, abnormality-generated controller may be defective.
A7 (6607)	**NO ACK signal** 1. Transmitting side controller detects abnormal if a massage was transmitted but there is no reply (ACK) that a massage was received. Transmitting side detects abnormality every 30 seconds, six times continuously. Note) The address and attribute displayed at remote controller is indicate the controller that did not reply (ACK).	Common factor that has no relation with abnormality source. ① The unit of former address does not exist as address switch has changed while the unit was energized. ② Extinction of transmission wire voltage and signal is caused by over-range transmission wire. • Maximum distance ·····200m • Remote controller line ··(12m) ③ Extinction of transmission wire voltage and signal is caused by type-unmatched transmission wire. Type ····· With shield wire- CVVS, CPEVS With normal wire (no shield)- VCTF, VCTFK, CVV CVS, VVR, VVF, VCT Diameter····1.25mm² or more ④ Extinction of transmission wire voltage and signal is caused by over-numbered units. ⑤ Accidental malfunction of abnormality-detected controller (noise, thunder surge). ⑥ Defective of abnormality-generated controller.	**Always try the followings when the error "A7" occurs.** ① Shut off the power supply of outdoor unit and indoor unit and FRESH MASTER or LOSSNAY at the same time for two minutes or more, and put the power on again. If malfunction was accidental, the unit returns to normal. ② Check address switch of abnormality-generated address. ③ Check disconnection or looseness of abnormality-generated or abnormality-detected transmission wire (terminal block and connector) ④ Check if tolerance range of transmission wire is not exceeded. ⑤ Check if type of transmission wire is correct or not. If there were some trouble of ①-⑤ above, repair the defective, then shut off the power supply of outdoor unit and indoor unit and FRESH MASTER or LOSSNAY at the same time for two minutes or more, and put the power on again. • If there was no trouble with ①-⑤ above in single refrigerant system (one outdoor unit), controller of displayed address or attribute is defective. • If there was no trouble with ①-⑤ above in different refrigerant system (two or more outdoor units), judge with ⑥. ⑥ If address of abnormality source is the address that should not exist, there is the unit that memorizes nonexistent address information. Delete useless address information with manual setting function of remote controller. Only the system FRESH MASTER or LOSSNAY are connected to, or the system that is equipped with group setting of different refrigerant system. If there was no trouble with ①-⑥ above, replace the controller board of displayed address or attribute. If the unit does not return normally, multi-controller board of outdoor unit may be defective (repeater circuit). Replace multi-controller board one by one to check if the unit returns normally.
	2. If displayed address or attribute is outdoor unit, Indoor unit detects abnormality when indoor unit transmitted to outdoor unit and there was no reply (ACK).	① Contact failure of transmission wire of outdoor unit or indoor unit. ② Disconnection of transmission connector (CN2M) of outdoor unit. ③ Defective transmitting receiving circuit of outdoor unit or indoor unit.	
	3. If displayed address or attribute is indoor unit, Remote controller detects abnormality when remote controller transmitted to indoor unit and there was no reply (ACK).	① During group operation with indoor unit of multi- refrigerant system, if remote controller transmit to indoor unit while outdoor unit power supply of one refrigerant system is put off or within two minutes of restart, abnormality is detected. ② Contact failure of transmission wire of remote controller or indoor unit. ③ Disconnection of transmission connector (CN2M) of indoor unit. ④ Defective transmitting receiving circuit of indoor unit or remote controller.	

Continued to the next page.

From the previous page.

Error Code	Meaning of error code and detection method	Case	Judgment and action
A7 (6607)	4. If displayed address or attribute is remote controller, Indoor unit detects abnormality when indoor unit transmitted to remote controller and there was no reply (ACK).	① During group operation with indoor unit of multi- refrigerant system, if indoor unit transmit to remote controller while outdoor unit power supply of one refrigerant system is put off or within two minutes of restart, abnormality is detected. ② Contact failure of transmission wire of remote controller or indoor unit. ③ Disconnection of transmission connector (CN2M) of indoor unit. ④ Defective transmitting receiving circuit of indoor unit or remote controller.	**Same as mentioned in "A7" of the previous page.**
	5. If displayed address or attribute is FRESH MASTER, Indoor unit detects abnormality when indoor unit transmitted to FRESH MASTER and there was no reply (ACK).	① During sequential operation of indoor unit and FRESH MASTER of other refrigerant system, if indoor unit transmits to FRESH MASTER while outdoor unit power supply of same refrigerant system with FRESH MASTER is put off or within two minutes of restart, abnormality is detected. ② Contact failure of transmission wire of indoor unit or FRESH MASTER. ③ Disconnection of transmission connector (CN2M) of indoor unit or FRESH MASTER. ④ Defective transmitting receiving circuit of indoor unit or FRESH MASTER.	
	6. If displayed address or attribute is LOSSNAY, Indoor unit detects abnormality when indoor unit transmitted to LOSSNAY and there was no reply (ACK).	① If the power supply of LOSSNAY is off, indoor unit detects abnormality when it transmits to LOSSNAY. ② During sequential operation of indoor unit and LOSSNAY of other refrigerant system, if indoor unit transmits to LOSSNAY while outdoor unit power supply of same refrigerant system with LOSSNAY is put off or within two minutes of restart, abnormality is detected. ③ Contact failure of transmission wire of indoor unit of LOSSNAY. ④ Disconnection of transmission connector (CN2M) of indoor unit. ⑤ Defective transmitting receiving circuit of indoor unit or LOSSNAY.	
	7. If displayed address or attribute is nonexistent,	① The unit of former address does not exist as address switch has changed while the unit was energized. ② Abnormality is detected when indoor unit transmitted because the address of FRESH MASTER and LOSSNAY are changed after sequential operation of FRESH MASTER and LOSSNAY by remote controller.	

Error Code	Meaning of error code and detection method	Case	Judgment and action
A8 (6608)	**M-NET•NO RESPONSE** Abnormal if a massage was transmitted and there were reply (ACK) that massage was received, but response command does not return. Transmitting side detects abnormality every 30 seconds, six times continuously. Note) The address and attribute displayed at remote controller is indicate the controller that did not reply (ACK).	① Transmitting condition is repeated fault because of noise and the like. ② Extension of transmission wire voltage and signal is caused by over-range transmission wire. • Maximum distance ·····200m • Remote controller line ··(12m) ③ Extension of transmission wire voltage and signal is caused by type-unmatched transmission wire. Type ····· With shield wire- CVVS, CPEVS With normal wire (no shield)- VCTF, VCTFK, CVV CVS, VVR, VVF, VCT Diameter····1.25mm² or more ④ Accidental malfunction of abnormality-generated controller.	① Check transmission wave form or noise on transmission wire. ② Shut off the power supply of outdoor unit and indoor unit and FRESH MASTER or LOSSNAY at the same time for two minutes or more, and put the power on again. If malfunction was accidental, the unit returns to normal. If the same abnormality generates again, controller of displayed address and attribute may be defective.

13-5. TROUBLESHOOTING BY INFERIOR PHENOMENA

Phenomena	Factor	Countermeasure
1. Remote controller display does not work.	①DC12V is not supplied to remote controller. (Power supply display ◉ is not indicated on LCD.) ②DC12~15V is supplied to remote controller, however, no display is indicated. • "H0" is not displayed. • "H0" is displayed.	①Check LED2 on indoor controller circuit board. (1) When LED2 is lit. Check the remote controller wiring for breaking or contact failure. (2) When LED2 is blinking. Check short circuit of remote controller wiring. (3) When LED2 is not lit. Refer to No.3 below. ②Check the following. • Failure of remote controller if "H0" is not displayed • Refer to No.2 below if "H0" is displayed.
2. "H0" display is remained on the remote controller.	①At longest 2 minutes after the power supply "H0" is displayed to start up. ②Communication error between the remote controller and indoor unit. ③Communication error between the indoor and outdoor unit. ④Outdoor unit protection device connector is open.	①Normal operation ②Self-diagnosis of remote controller ③"H0" is displayed for 6 minutes at most. in case of indoor/outdoor unit communication error. Check LED3 on indoor controller board. (1)When LED3 is not blinking. Check indoor/outdoor connecting wire for mis-wiring. (Converse wiring of S1 and S2, or break of S3 wiring.) (2)When LED3 is blinking. Indoor/outdoor connecting wire is normal. ④Check LED display on outdoor controller circuit board. Refer to page 55 and 56. Check protection device connector (63L and 63H) for contact failure. Refer to 13-9.
3. When pressing the remote controller operation switch the OPERATION display is appeared but it will be turned off soon.	①After cancelling to select function from the remote controller, the remote controller operation switch will be not accepted for approx. 30 seconds.	①Normal operation
4. Even controlling by the wireless remote controller no beep is heard and the unit does not start operating. Operation display is indicated on wireless remote controller.	①The pair number settings of the wireless remote controller and indoor controller circuit board are mismatched.	①Check the pair number settings.

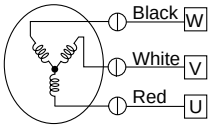
Phenomena	Factor	Countermeasure
5. When operating by the wireless remote controller, beep sound is heard, however, unit does not start operating.	①No operation for 2 minutes at most after the power supply ON. ②Hand-held remote controller operation is prohibited. • Remote controlling adaptor is connected to CN32 on the indoor controller circuit board. • Hand-held remote controller operation is prohibited by centralised controller etc. since it is connected to MELANS. ③Factor of No.2 above.	①Normal operation. ②Normal operation. ③Check the details of No.2 above.
6. Remote controller display works normally and the unit performs cooling operation, however, the capacity cannot be fully obtained. (The air does not cool well.)	①Refrigerant shortage. ②Filter clogging. ③Heat exchanger clogging. ④Air duct short cycle.	①• If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening. • Check pipe connections for gas leakage. ②Open suction grill and check the filter. Clean the filter by removing dirt or dust on it. ③• If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. • Clean the heat exchanger. ④Remove the shield.
7. Remote controller display works normally and the unit performs heating operation, however, the capacity cannot be fully obtained.	①Linear expansion valve fault. Opening cannot be adjusted well due to linear expansion valve fault. ②Refrigerant shortage. ③Lack of insulation for refrigerant piping. ④Filter clogging. ⑤Heat exchanger clogging. ⑥Air duct short cycle . ⑦Bypass circuit of outdoor unit fault.	①• Discharging temperature and indoor heat exchanger temperature does not rise. Inspect the failure by checking discharging pressure. • Replace linear expansion valve. ②• If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening. • Check pipe connections for gas leakage. ③Check the insulation. ④Open suction grill and check the filter. Clean the filter by removing dirt or dust on it. ⑤• If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. • Clean the heat exchanger. ⑥Remove the shield. ⑦Check refrigerant system during operation.
8. ①For 3 minutes after temperature adjuster turns off, the compressor will not start operating even if temperature adjuster is turned on. ②For 3 minutes after temperature adjuster turns on, the compressor will not stop operating even if temperature adjuster is turned off. (Compressor stops operating immediately when turning off by the remote controller.)	①②Normal operation. (For protection of compressor)	①②Normal operation
9. Defective fan of outdoor units. (Not rotate)	①Defective fan motor (Winding open or shoot). ②Disconnection or loose connection of connector on outdoor Fan controller circuit board. ③Defective Outdoor fan controller circuit board.	①Check the winding resistance. Refer to 13-6. However, make sure to check the resistance after it gets cold enough (≦87±15℃), as there is a possibility that the temperature protector housed in the fan motor is working. ②Check CN2, CN5, CN6, TAB-U, TAB-V, TAB-W, TAB-W wiring. ③Replace outdoor fan controller circuit board.

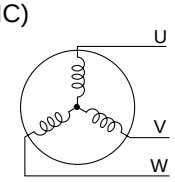
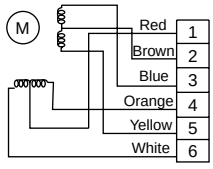
13-6. HOW TO CHECK THE PARTS
PUHZ-RP8YHA
PUHZ-RP10YHA

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Thermistor (TH3, TH32)
<Outdoor pipe>

Thermistor (TH4)
<Discharge>

Thermistor (TH6)
<Outdoor 2-phase pipe>

Thermistor (TH7)
<Outdoor></td><td>Disconnect the connector then measure the resistance using a tester.
(Surrounding temperature 10℃~30℃)
<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>TH4</td><td>160kΩ~410kΩ</td><td rowspan="2">Open or short</td></tr><tr><td>TH3, TH32
TH6
TH7</td><td>4.3kΩ~9.6kΩ</td></tr></table></td></tr>
<tr><td>Fan motor(MF1,MF2)
 

Pin number of relay connector is different from that motor connector</td><td>Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)
<table><tr><th>Relay connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Red — Black</td><td rowspan="3">15.3±0.5Ω</td><td rowspan="3">Open or short</td></tr><tr><td>Black — White</td></tr><tr><td>White — Red</td></tr></table></td></tr>
<tr><td>Solenoid valve coil
<Four-way valve>
(21S4)</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 20℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>1370±100Ω</td><td>Open or short</td></tr></table></td></tr>
<tr><td>Motor for compressor
(MC)
 
</td><td>Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>0.72Ω</td><td>Open or short</td></tr></table></td></tr>
<tr><td>Linear expansion valve
(LEV(A))
 
</td><td>Disconnect the connector then measure the resistance using a tester.
(Winding temperature 20℃)
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>Red - White</td><td>Red - Orange</td><td>Brown - Yellow</td><td>Brown - Blue</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">46±4Ω</td></tr></table></td></tr>
<tr><td>Solenoid valve coil
<Bypass valve>
(SV)</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 20℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>1197±10Ω</td><td>Open or short</td></tr></table></td></tr>
</table>

13-7. HOW TO CHECK THE COMPONENTS

<Thermistor feature chart>

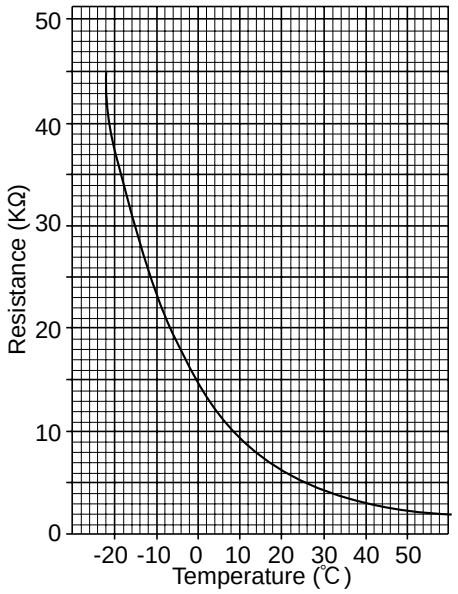
Low temperature thermistors

- Thermistor <Outdoor pipe> (TH3, TH32)
- Thermistor <Outdoor 2-phase pipe> (TH6)
- Thermistor <Outdoor> (TH7)

Thermistor R0 = 15kΩ ± 3%
B constant = 3480K ± 2%

$$R_t = 15\exp\{3480(\frac{1}{273+t} - \frac{1}{273})\}$$

0℃	15kΩ	30℃	4.3kΩ
10℃	9.6kΩ	40℃	3.0kΩ
20℃	6.3kΩ		
25℃	5.2kΩ		



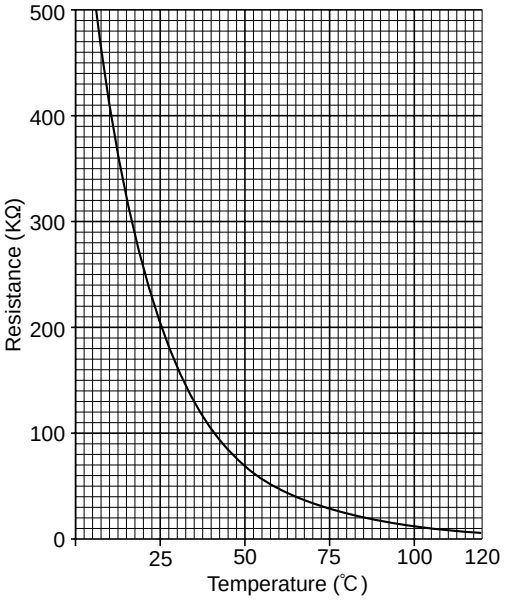
High temperature thermistor

- Thermistor <Discharge> (TH4)

Thermistor R120 = 7.465kΩ ± 2%
B constant = 4057K ± 2%

$$R_t = 7.465\exp\{4057(\frac{1}{273+t} - \frac{1}{393})\}$$

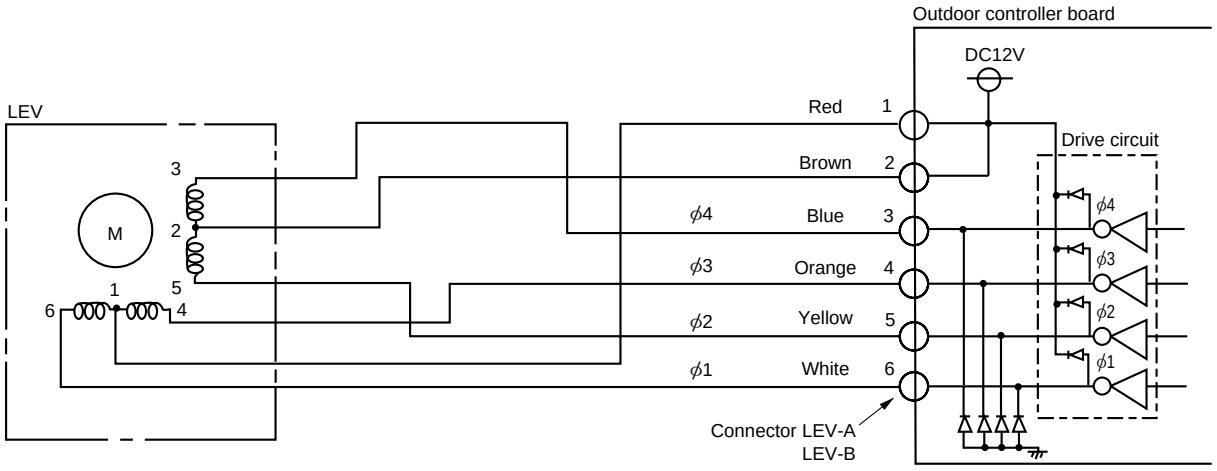
20℃	250kΩ	70℃	34kΩ
30℃	160kΩ	80℃	24kΩ
40℃	104kΩ	90℃	17.5kΩ
50℃	70kΩ	100℃	13.0kΩ
60℃	48kΩ	110℃	9.8kΩ



Linear expansion valve

(1) Operation summary of the linear expansion valve.

• Linear expansion valve open/close through stepping motor after receiving the pulse signal from the outdoor controller circuit board.
• Valve position can be changed in proportion to the number of pulse signal.
<Connection between the indoor controller circuit board and the linear expansion valve>



<Output pulse signal and the valve operation>

Output (Phase)	Output							
	1	2	3	4	5	6	7	8
ϕ1	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
ϕ2	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
ϕ3	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
ϕ4	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

Opening a valve : 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1 → 8
Closing a valve : 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 1

The output pulse shifts in above order.

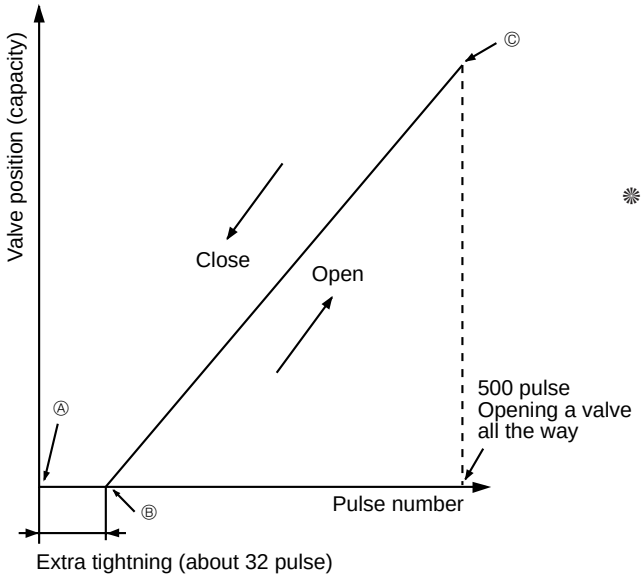
✵ 1. When linear expansion valve operation stops, all output phase become OFF.

✵ When the switch is turned on, 700 pulse closing valve signal will be sent till it goes to Ⓐ point in order to define the valve position. (The pulse signal is being sent for about 20 seconds.)

When the valve moves smoothly, there is no noise or vibration occurring from the linear expansion valve : however, when the pulse number moves from Ⓑ to Ⓐ or when the valve is locked, more noise can be heard than normal situation.
No noise is heard when the pulse number moves from Ⓑ to Ⓐ in case coil is burn out or motor is locked by open-phase.

✵ Noise can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

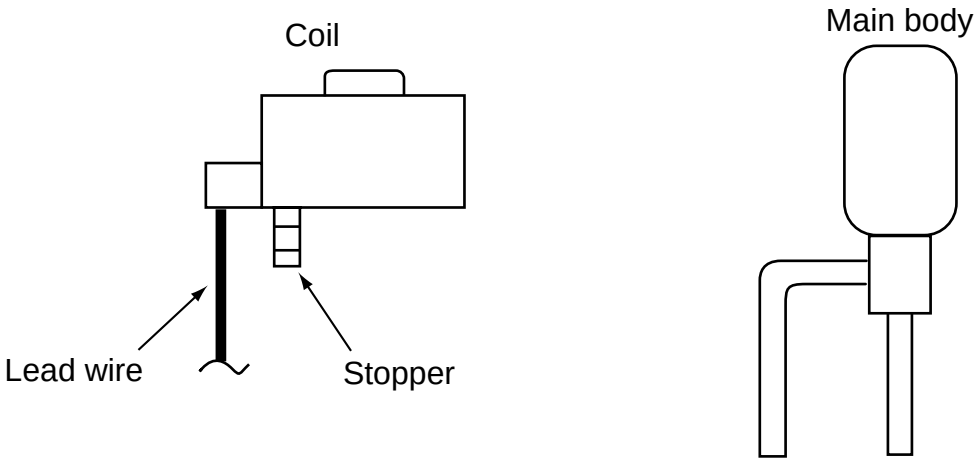
(2) Linear expansion valve operation



(3) How to attach and detach the coil of linear expansion valve

<Composition>

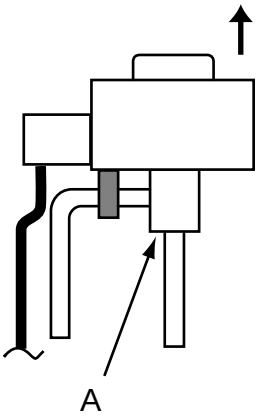
Linear expansion valve is separable into the main body and the coil as shown in the diagram below.



<How to detach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and detach the coil by pulling it upward.

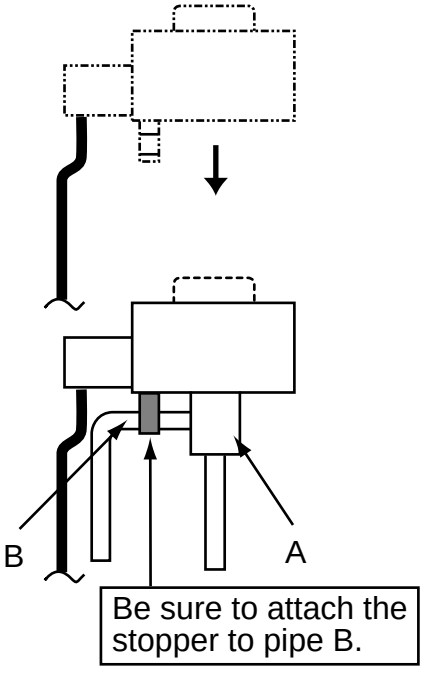
Be sure to detach the coil holding main body firmly. Otherwise pipes can bend due to pressure.



<How to attach the coil>

Hold the lower part of the main body (shown as A) firmly so that the main body does not move and attach the coil by inserting it downward into the main body. Then securely attach the coil stopper to pipe B. (At this time, be careful that stress is not added to lead wire and main body is not wound by lead wire.) If the stopper is not firmly attached to pipe B, coil may be detached from the main body and that can cause defective operation of linear expansion valve.

To prevent piping stress, be sure to attach the coil holding the main body of linear expansion valve firmly. Otherwise pipe may break.



13-8. EMERGENCY OPERATION

(1) When the error codes shown below are displayed on outdoor unit or microcomputer for wired remote controller or indoor unit has a failure, but no other problems are found, emergency operation will be available by setting the emergency operation switch (SWE) to ON and short-circuiting the connector (CN31) on outdoor controller circuit board.

●When following abnormalities occur, emergency operation will be available.

Error code	Inspected content
U4	Open/short of pipe thermistor (TH3, TH32/TH6)
E8	Indoor/outdoor unit communication error •Signal receiving error (Outdoor unit)
E9	Indoor/outdoor unit communication error •Transmitting error (Indoor unit)
E0 ~ E7	Communication error other than outdoor unit
Ed	Communication error between outdoor controller board and M-NET board (Serial communication error)

(2) Check the following items and cautions for emergency operation

①Make sure that there is no abnormality in outdoor unit other than the above abnormalities. (Emergency operation will not be available when error code other than the above are indicated.)

②For emergency operation, it is necessary to set the emergency operation switch (SWE) on indoor controller circuit board. Refer to the electrical wiring diagram of indoor unit for how to set the indoor unit.)

③During emergency operation, the air-conditioner will continuously be operated by supplying power and stopping it: It can not be turned on or off by remote control, and temperature control is not possible.

④Do not perform emergency heating operation for an extended period of time: If the outdoor unit starts defrosting during this period, cold air will blow out from the indoor unit.

⑤Do not perform emergency cooling operation for more than 10 hours: Neglecting this could result in freezing the heat exchanger in indoor unit.

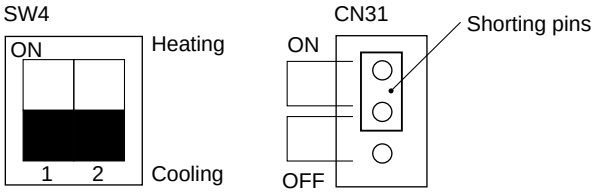
(3) Emergency operation procedure

①Turn the main power supply off.

②Turn on the emergency operation switch (SWE) on indoor controller circuit board.

③Set the shorting pins of emergency operation connector (CN31) on outdoor controller circuit board to ON.

④Use SW4-2 on outdoor controller circuit board to set the operation mode (cooling or heating). (SW4-1 is not used.)



⑤Turning the main power supply on will start the emergency operation.

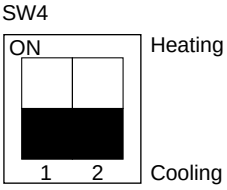
(4) Releasing emergency operation

①Turn the main power supply off.

②Set the emergency operation switch (SWE) on indoor controller circuit board to OFF.

③Set the shorting pins of emergency operation connector (CN31) on outdoor controller circuit board to OFF.

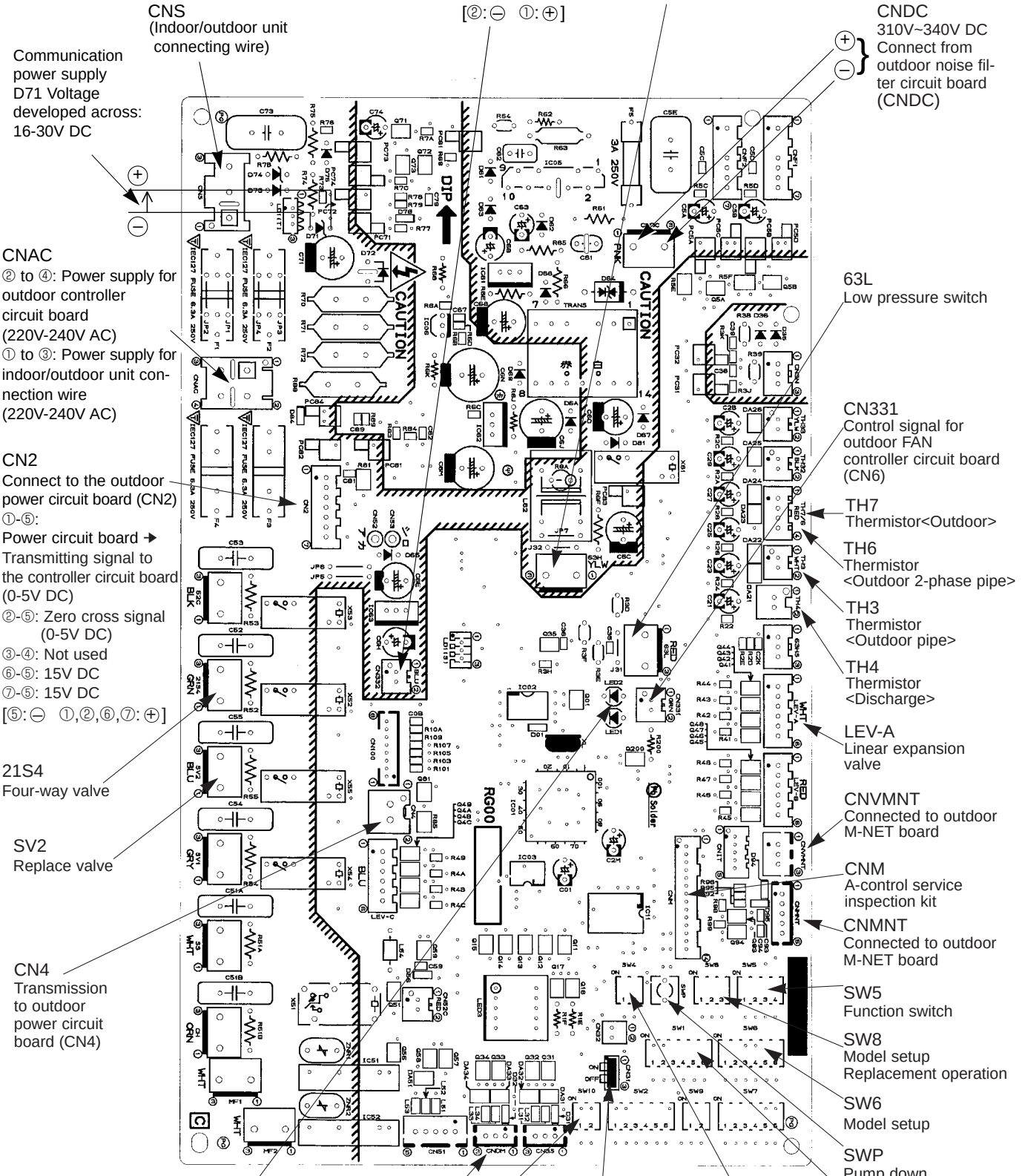
④Set SW4-2 on outdoor controller circuit board as shown in the right.



※If shorting pins are not set on emergency operation connector (CN31), the setting remains OFF.

13-9. TEST POINT DIAGRAM

Outdoor controller circuit board
PUHZ-RP8YHA
PUHZ-RP10YHA



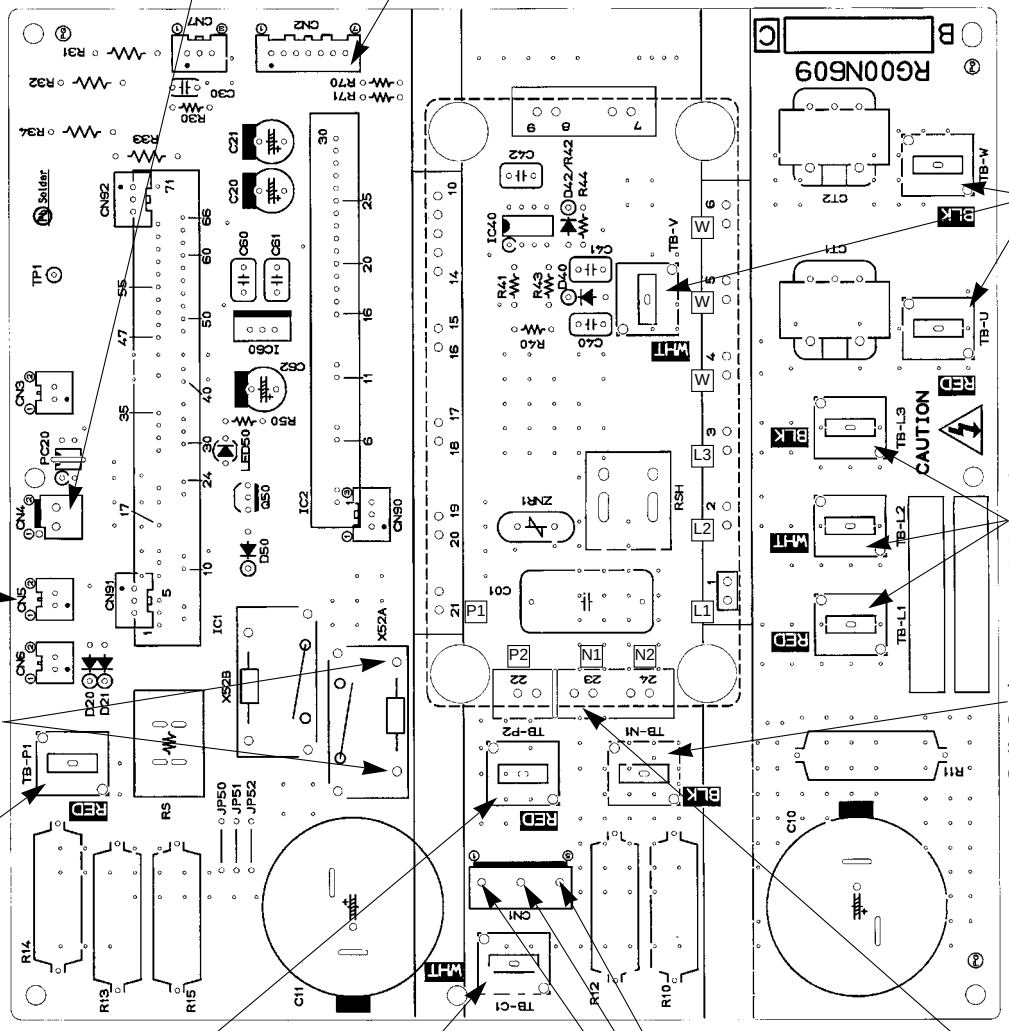
Outdoor Power circuit board
PUHZ-RP8YHA
PUHZ-RP10YHA

Brief Check of POWER MODULE
※ Usually, they are in a state of being short-circuited if they are broken.
Measure the resistance in the following points (connectors, etc.).
If they are short-circuited, it means that they are broken.
1. Check of POWER MODULE
①.Check of DIODE circuit
L1 - P1, L2 - P1, L3 - P1, L1 - N1 , L2 - N1 , L3 - N1
②.Check of IGBT circuit
P2 - U , P2 - V , P2 - W , N2 - U , N2 - V , N2 - W
Note:The marks, L1 , L2, L3 , N1 ,N2, P1, P2 ,U , V and W shown in the diagram above are not actually printed on the board.

CN5
Detection of primary current (Connect to the outdoor noise filter circuit board (CN5))

CN4
Connect to the outdoor controller circuit board (CN4)

CN2
Connect to the outdoor controller circuit board (CN2)
①-⑤: Power circuit board → Transmitting signal to the controller board (0-5V DC)
②-⑤: Zero cross signal (0-5V DC)
③-④: Not used
⑥-⑤: 15V DC
⑦-⑤: 15V DC
[⑤ :⊖ ①, ②, ⑥, ⑦ :⊕]



TB-U, TB-V, TB-W
Connect to the compressor (MC)
Voltage among phases:
10V-400V AC

TB-L1, TB-L2, TB-L3
Connect to the outdoor noise filter circuit board (LO1, LO2, LO3)
380V-415V AC

TAB connecter on X52A
Connect to the RS resistor

TB-N1
Connect to the smoothing capacitor CB2⊖

TB-P1
Connect to the DCL

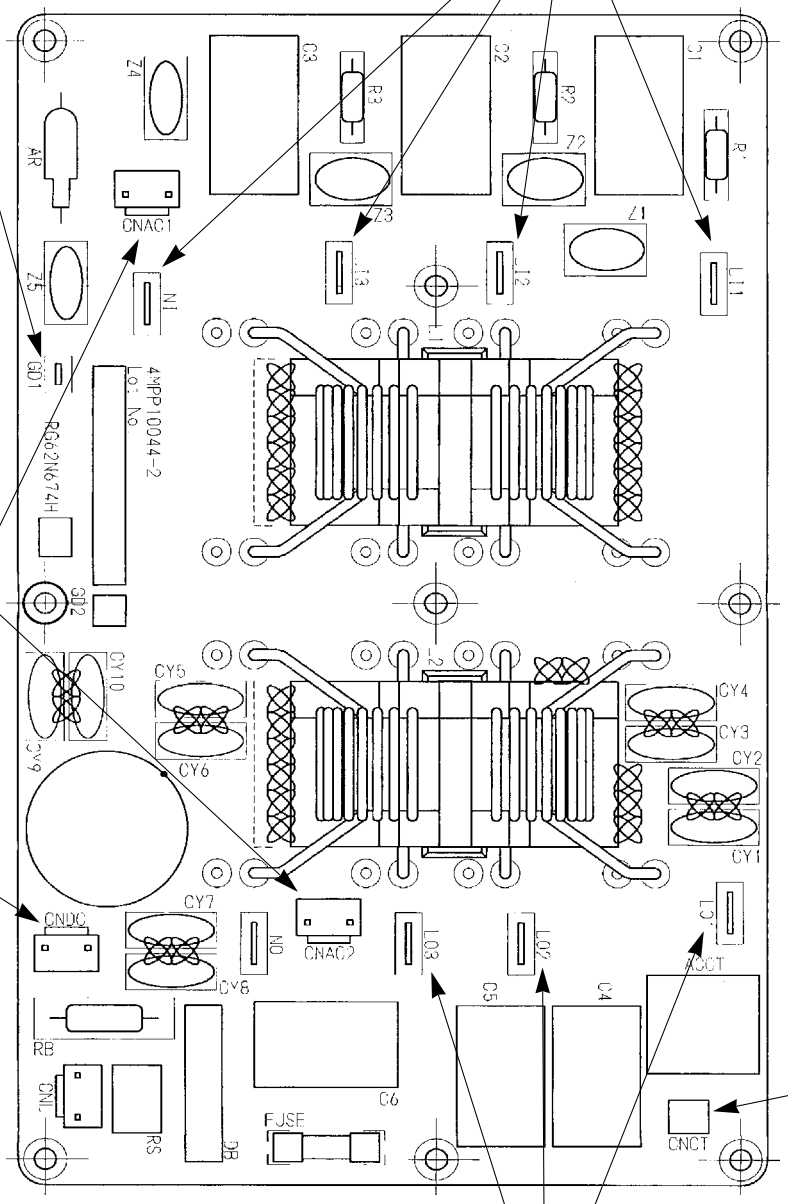
TB-P2
Connect to the DCL and the smoothing capacitor CB1⊕

TB-C1
Connect to the smoothing capacitor CB1⊖, CB2⊕

POWER MODULE

CN1
⊖ } 282V DC
⊕ } 282V DC } 565V DC
Connect to the outdoor FAN controller circuit board (CN5)

Outdoor Noise filter circuit board
PUHZ-RP8YHA
PUHZ-RP10YHA



LI1, LI2, LI3, NI
POWER SUPPLY
LI1-LI2/LI-LI3/LI3-LI1 : AC380/400/415V input
LI1-NI/LI2-NI/LI3-NI : AC220/230/240V input
(Connect to the terminal block (TB1))

GD1
Connect to the earth

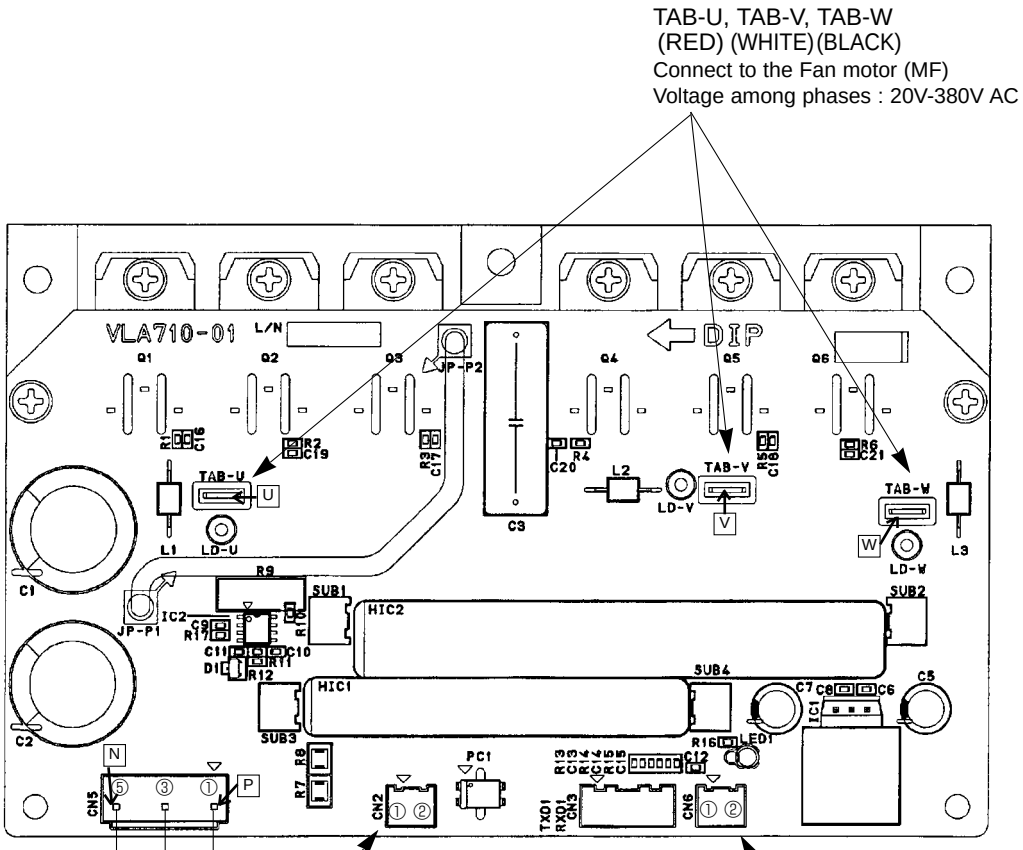
CNAC1, CNAC2
AC220/230/240V
(Connect to the outdoor controller circuit board (CNAC))

CNDC
(Connect to the outdoor power circuit board (CNDC))

CNCT
Primary current
(Connect to the outdoor power circuit board (CN5))

LO1, LO2, LO3
POWER SUPPLY
LO1-LO2/LO2-LO3/LO3-LO1 : AC380/400/415V OUTPUT
(Connect to the outdoor power circuit board (TB-L1, L2, L3))

Outdoor Fan controller circuit board
PUHZ-RP8YHA
PUHZ-RP10YHA



CN2
Power supply from outdoor controller circuit board (CN332)

①-②: 18V DC
[②: ⊖ , ①: ⊕]

CN6
Control signal from outdoor controller circuit board (CN331)

CN5

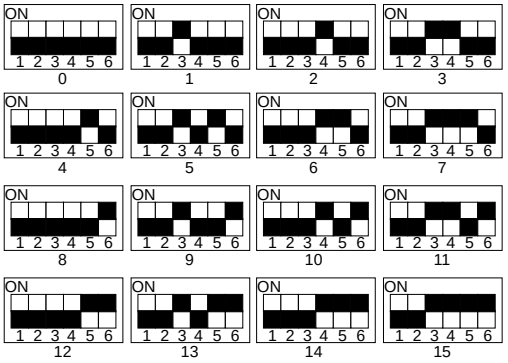
⊕ 282V DC
⊕ 282V DC
⊖ 282V DC
} 565V DC

Connect to the outdoor Power circuit board (CN1)

Brief Check of IGBT
※ Usually, they are in a state of being short-circuited if they are broken.
Measure the resistance in the following points (connectors, etc.).
If they are short-circuited, it means that they are broken.
Check of POWER MODULE
Check of IGBT circuit
[P]-[U], [P]-[V], [P]-[W], [N]-[U], [N]-[V], [N]-[W]
Note:The marks, [U], [V] and [W]
shown in the diagram above are not actually printed on the board.

13-10. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS

(1) Function of switches

Type of switch	Switch	No.	Function	Action by the switch operation		Effective timing
				ON	OFF	
Dip switch	SW1	1	Compulsory defrosting	Start	Normal	When compressor is working in heating operation. ※
		2	Abnormal history clear	Clear	Normal	off or operating
		3	Refrigerant address setting			When power supply ON
		4				
		5				
		6				
	SW4	1	Test run	Operating	OFF	Under suspension
		2	Test run mode setting	Heating	Cooling	

Compulsory defrosting should be done as follows.

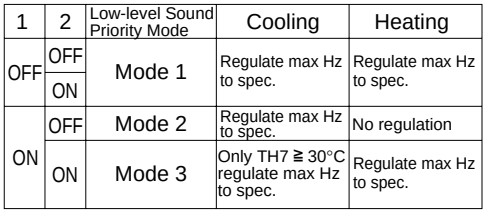
①Change the DIP SW1-1 on the outdoor controller circuit board from OFF to ON.

②Compulsory defrosting will start by the above operation ① if these conditions written below are satisfied.

- Heat mode setting
- 10 minutes have passed since compressor started operating or previous compulsory defrosting finished.
- Pipe temperature is less than or equal to 8℃.

③Compulsory defrosting will finish if certain conditions are satisfied.

※Compulsory defrosting can be done if above conditions are satisfied when DIP SW1-1 is changed from OFF to ON. After DIP SW1-1 is changed from OFF to ON, there is no problem if DIP SW1-1 is left ON or changed to OFF again. This depends on the service conditions.

Type of Switch	Switch	No.	Function	Action by the switch operation		Effective timing
				ON	OFF	
Dip switch	SW5	1	No function	—	—	—
		2	Power failure automatic recovery ※1	Auto recovery	No auto recovery	When power supply ON
		3	No function	—	—	—
		4	No function	—	—	—
	SW7	1	Switch to “Low-level Sound Priority Mode” ※2			Always
		2				
		3	No function	—	—	—
		4	No function	—	—	—
		5	No function	—	—	—
		6	No function	—	—	—
	SW8	1	Use of existing pipe	Used or RP10Y※3	Not used	Always
		2	Replacement operation	Start	Normal	Under suspension
		3	No function	—	—	—
Push switch	SWP		Pump down	Start	Normal	Under suspension

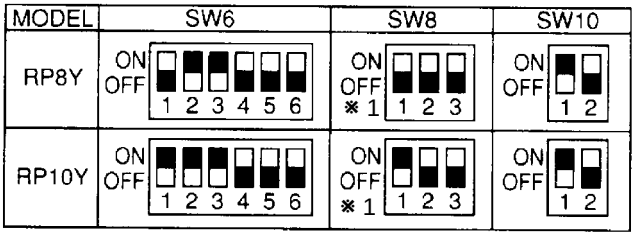
1	2	Low-level Sound Priority Mode	Cooling	Heating
OFF	OFF	Mode 1	Regulate max Hz to spec.	Regulate max Hz to spec.
	ON			
ON	OFF	Mode 2	Regulate max Hz to spec.	No regulation
	ON	Mode 3	Only TH7 ≧ 30°C regulate max Hz to spec.	Regulate max Hz to spec.

※1 Power failure automatic recovery’ can be set by either remote controller or this DIP SW. If one of them is set to ON, ‘Auto recovery’ activates. Please set “Auto recovery” basically by remote controller because all units have not DIP SW. Please refer to mode 01 in the table on 13-11.

※2 SW7-1,2 to “Low-level Sound Priority Mode” available in “Low-level Sound Priority Mode” mode only.

※3 RP10YHA is always ON.

(2) Function of connectors

Types	Connector	Function	Action by the switch operation		Effective timing
			Short	Open	
Connector	CN31	Emergency operation	Start	Normal	When power supply ON
SW6	SW6-1	Model select			
	SW6-2				
	SW6-3				
	SW6-4				
	SW6-5				
	SW6-6				
SW8	SW8-1				
SW10	SW10-1				
	SW10-2				

※ 1 As for SW8, see also 13-10 (1) Function of switches, as SW8 sets the replacement operation as well.

Special function

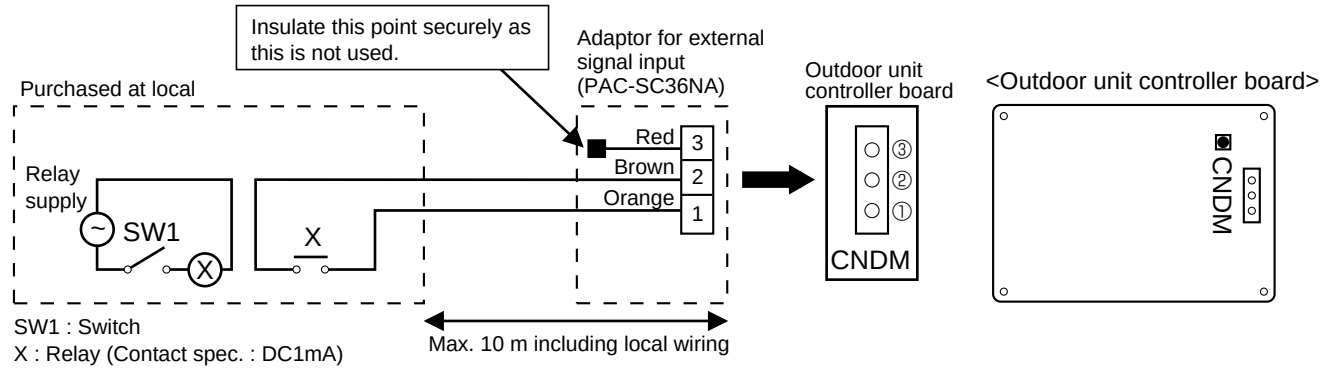
(a) Low-level sound priority mode (Local wiring)

Unit enters into Low-level sound priority mode by SW7-1, 2 and external signal input setting.
Inputting external signals to the outdoor unit decreases the outdoor unit operation sound 3 to 4 dB lower than that of usual.
Adding a commercial timer or on-off switch contactor setting to the CNDM connector which is optional contactor for Demand input located on the outdoor controller circuit board enables to control compressor operation frequency. In Low-level sound priority mode, the maximum outdoor fan steps is regulated to 8 and the maximum operation frequency of the compressor is regulated to specified range in cool mode. In heating mode, the maximum compressor operation frequency is regulated to specified range.

※ The performance is depends on the load of conditioned air of the room.

How to wiring

<Low-level sound priority mode circuit>



1) Make the circuit as shown above with Adaptor for external signal input(PAC-SC36NA).
2) Turn SW1 to on for Low-level sound priority mode.
   Turn SW1 to off to release Low-level sound priority mode and normal operation.

(b) On demand control (Local wiring)

Demand control is available by external input. In this mode, the outdoor unit stops and indoor unit operates with fan mode.

※ The setting of SW-7 is not required for the demand control.

How to wiring

Basically, the wiring is the same.

Connect an SW 1 which is procured at field to the between Orange and Red(1 and 3) of the Adaptor for external signal input(PAC-SC36NA), and insulate the tip of the brown lead wire.

<Display function of inspection for outdoor unit>

The blinking patterns of both LED1(green) and LED2(red) indicate the types of abnormality when it occurs. Types of abnormality can be indicated in details by connecting an optional part 'A-Control Service Tool (PAC-SK52ST)' to connector CNM on outdoor controller circuit board.

[Display]

(1)Normal condition

Unit condition	Outdoor controller circuit board		A-Control Service Tool	
	LED1 (Green)	LED2 (Red)	Error code	Indication of the display
When the power is turned on	Lighted	Lighted	—⇔—	Alternately blinking display
When unit stops	Lighted	Not lighted	00, etc.	Operation mode
When compressor is warming up	Lighted	Not lighted	08, etc.	
When unit operates	Lighted	Lighted	C5, H7 etc.	

(2)Abnormal condition

Indication		Error			
Outdoor controller circuit board		Contents	Error code ※1	Inspection method	Detailed reference page
LED1 (Green)	LED2 (Red)				
1 blinking	2 blinking	Connector(63L) is open.	F3	①Check if connector (63L or 63H) on the outdoor controller board is not disconnected. ②Check continuity of pressure switch (63L or 63H) by tester.	P.32
		Connector(63H) is open.	F5		P.32
		2 connectors are open.	F9		P.32
2 blinking	1 blinking	Mis-wiring of indoor/outdoor unit connecting wire, excessive number of indoor units (5 units or more)	—	①Check if indoor/outdoor connecting wire is connected correctly. ②Check if 5 or more indoor units are connected to outdoor unit.	P.33
		Mis-wiring of indoor/outdoor unit connecting wire (converse wiring or disconnection)	—	③Check if noise entered into indoor/outdoor connecting wire or power supply. ④Re-check error by turning off power, and on again.	P.33
		Startup time over	—		P.33
	2 blinking	Indoor/outdoor unit communication error (signal receiving error) is detected by indoor unit.	E6	①Check if indoor/outdoor connecting wire is connected correctly. ②Check if noise entered into indoor/outdoor connecting wire or power supply. ③Check if noise entered into indoor/outdoor controller circuit board. ④Re-check error by turning off power, and on again.	※2
		Indoor/outdoor unit communication error (transmitting error) is detected by indoor unit.	E7		※2
		Indoor/outdoor unit communication error (signal receiving error) is detected by outdoor unit.	—		P.37
		Indoor/outdoor unit communication error (transmitting error) is detected by outdoor unit.	—		P.37
	3 blinking	Remote controller signal receiving error is detected by remote controller.	E0	①Check if connecting wire of indoor unit or remote controller is connected correctly. ②Check if noise entered into transmission wire of remote controller. ③Re-check error by turning off power, and on again.	P.37
		Remote controller transmitting error is detected by remote controller.	E3		P.37
		Remote controller signal receiving error is detected by indoor unit.	E4		※2
		Remote controller transmitting error is detected by indoor unit.	E5		※2
	4 blinking	Error code is not defined.	EF	①Check if remote controller is MA remote controller(PAR-20MAA). ②Check if noise entered into transmission wire of remote controller. ③Check if noise entered into indoor/outdoor connecting wire. ④Re-check error by turning off power, and on again.	P.37
	5 blinking	Serial communication error <Communication between outdoor controller board and outdoor power board> <Communication between outdoor controller board and M-NET p.c. board>	Ed	①Check if connector (CN4) on outdoor controller circuit board and outdoor power circuit board is not disconnected. ②Check if there is poor connection of connector on outdoor controller circuit board(CNMNT and CNVMNT). ③Check M-NET communication signal.	P.37
		Communication error of high prior signal(M-NET)	A0~A8		P.38~P.41

※1.Remote controller displays error code.

※2.Refer to service manual for indoor unit.

Indication		Error			
Outdoor controller circuit board		Contents	Error code ※1	Inspection method	Detailed reference page
LED1 (Green)	LED2 (Red)				
3 blinking	1 blinking	Abnormality of shell thermostat and discharging temperature (TH4)	U2	①Check if stop valves are open. ②Check if connectors (TH4, LEV-A) on outdoor controller circuit board are not disconnected. ③Check if unit fills with specified amount of refrigerant. ④Measure resistance values among terminals on indoor valve and outdoor linear expansion valve using a tester.	P.34
	2 blinking	Abnormal high pressure (High pressure switch 63H worked.)	U1	①Check if indoor/outdoor units have a short cycle on their air ducts. ②Check if connector (63H) on outdoor controller circuit board is not disconnected. ③Check if heat exchanger and filter is not dirty. ④Measure resistance values among terminals on linear expansion valve using a tester.	P.34
	4 blinking	Compressor over current breaking (Start-up locked)	UF	①Check if stop valves are open. ②Check looseness, disconnection, and converse connection of compressor wiring. ③Measure resistance values among terminals on compressor using a tester. ④Check if outdoor unit has a short cycle on its air duct.	P.36
		Compressor over current breaking	UP		P.36
		Abnormality of current sensor (P.B.)	UH		P.36
		Abnormality of power module	U6		P.35
	5 blinking	Open/short of discharge thermistor (TH4)	U3	①Check if connectors (TH3, TH32, TH4, TH6 and TH7) on outdoor controller circuit board and connector (CN3) on outdoor power circuit board are not disconnected. ②Measure resistance value of outdoor thermistors.	P.35
		Open/short of outdoor thermistors (TH3, TH32, TH6, TH7 and TH8)	U4		P.35
		Open/short of outdoor thermistor (TH8)			
	6 blinking	Abnormality of heat sink temperature	U5	①Check if indoor/outdoor units have a short cycle on their air ducts. ②Measure resistance value of outdoor thermistor(TH8).	P.35
	7 blinking	Abnormality of voltage	U9	①Check looseness, disconnection, and converse connection of compressor wiring. ②Measure resistance value among terminals on compressor using a tester. ③Check if power supply voltage decreases. ④Check CN5 wiring on the outdoor power circuit board or noise filter circuit board.	P.36
4 blinking	1 blinking	Abnormality of room temperature thermistor (TH1)	P1	①Check if connectors (CN20, CN21 and CN29) on indoor controller circuit board are not disconnected. ②Measure resistance value of indoor thermistors.	※2
		Abnormality of pipe temperature thermistor /Liquid (TH2)	P2		※2
		Abnormality of pipe temperature thermistor/Condenser-Evaporator	P9		※2
	2 blinking	Abnormality of drain sensor (DS)	P4	①Check if connector (CN31) on indoor controller circuit board is not disconnected. ②Measure resistance value of indoor thermistors. ③Measure resistance value among terminals on drain-up machine using a tester. ④Check if drain-up machine works. ⑤Check drain function.	※2
		Indoor drain overflow protection	P5		
	3 blinking	Freezing (cooling)/overheating (heating) protection	P6	①Check if indoor unit has a short cycle on its air duct. ②Check if heat exchanger and filter is not dirty. ③Measure resistance value on indoor and outdoor fan motors. ④Check if the inside of refrigerant piping is not clogged.	※2
	4 blinking	Abnormality of pipe temperature	P8	①Check if indoor thermistors (TH2 and TH5) are not disconnected from holder. ②Check if stop valve is open. ③Check converse connection of extension pipe. (on plural units connection) ④Check if indoor/outdoor connecting wire is connected correctly. (on plural units connection)	※2

※1 Error code displayed on remote controller
※2 Refer to service manual for indoor unit.

LED indications of fan operating condition (LED1 on outdoor Fan controller circuit board)

Operation	LED1 (Red)	Contents
Normal (Stop)	Lighted	Fan stops.
Normal (Operating)		Controller board is outputting waveform for fan driving.

Operation	LED1 (Red)	Importance	Meaning of error code and detection method	Remark
Abnormal is detected	2 blinks	1	**Abnormality of bus voltage**: Abnormal if voltage is less than 200V or more than 760V.	This LED is not used for service.
	6 blinks	2	**Abnormality of overcurrent**: Abnormal if current value of DC bus in over the cut-off point.	

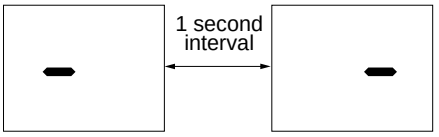
<Outdoor unit operation monitor function>
[When option part 'A-Control Service Tool(PAC-SK52ST)' is connected to outdoor controller circuit board(CNM)]
Digital indicator LED1 displays 2 digit number or code to inform operation condition and the meaning of error code by controlling DIP SW2 on 'A-Control Service Tool'.

Operation indicator SW2 : Indicator change of self diagnosis

SW2 setting	Display detail	Explanation for display	Unit
ON 1 2 3 4 5 6			

<Digital indicator LED1 working details>
(Be sure the 1 to 6 in the SW2 are set to OFF.)

(1) Display when the power supply ON.
When the power supply ON, blinking displays by turns.
Wait for 4 minutes at the longest.
(2) When the display lights. (Normal operation)
①Operation mode display.



LED1 (Lighting)

SW2 ON 1 2 3 4 5 6 (Initial setting)

The tens digit : Operation mode

Display	Operation Model
O	OFF / FAN
C	COOLING / DRY ※
H	HEATING
d	DEFROSTING

The ones digit : Relay output

Display	Warming-up Compressor	Compressor	4-way valve	Solenoid valve
0	—	—	—	—
1	—	—	—	ON
2	—	—	ON	—
3	—	—	ON	ON
4	—	ON	—	—
5	—	ON	—	ON
6	—	ON	ON	—
7	—	ON	ON	ON
8	ON	—	—	—
A	ON	—	ON	—

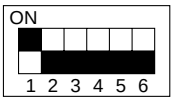
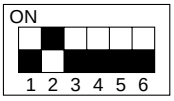
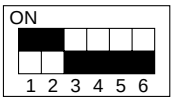
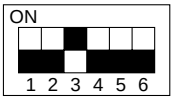
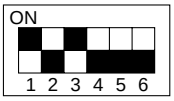
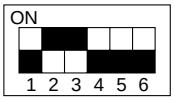
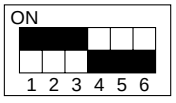
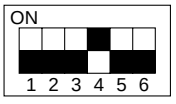
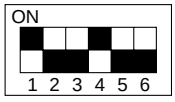
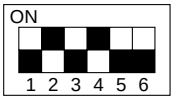
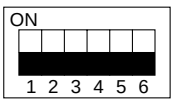
②Display during error postponement
Postponement code is displayed when compressor stops due to the work of protection device.
Postponement code is displayed while error is being postponed.

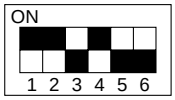
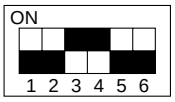
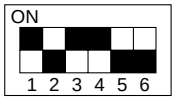
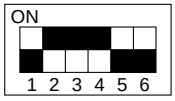
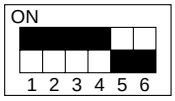
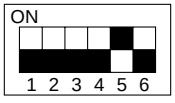
(3) When the display blinks
Inspection code is displayed when compressor stops due to the work of protection devices.

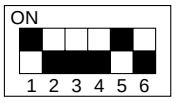
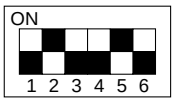
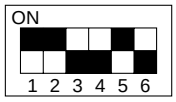
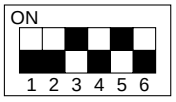
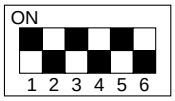
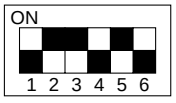
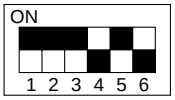
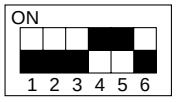
Display	Inspection unit
0	Outdoor unit
1	Indoor unit 1
2	Indoor unit 2
3	Indoor unit 3
4	Indoor unit 4

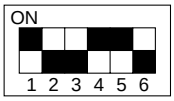
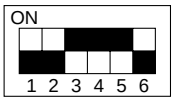
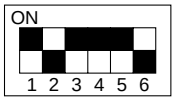
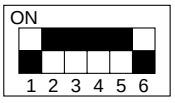
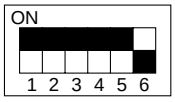
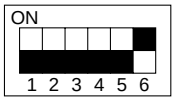
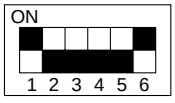
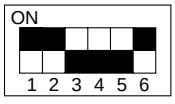
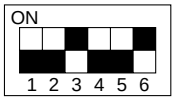
Display	Contents to be inspected (During operation)
U1	Abnormal high pressure (63H worked)
U2	Abnormal high discharging temperature, shortage of refrigerant
U3	Open/short circuit of discharging thermistor(TH4)
U4	Open/short of outdoor unit thermistors(TH3, TH32, TH6, TH7 and TH8)
U5	Abnormal temperature of heat sink Compressor overcurrent interruption (When Comp. locked)
U6	Abnormality of power module
U7	Abnormality of super heat due to low discharge temperature
UF	Compressor overcurrent interruption (When Comp. locked)
UH	Current sensor error
UL	Abnormal low pressure (63L worked)
UP	Compressor overcurrent interruption
P1~P8	Abnormality of indoor units
A0~A7	Communication error of high-prior signal (M-NET)

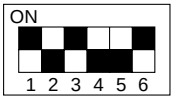
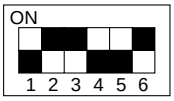
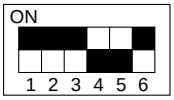
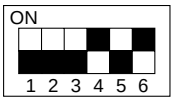
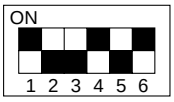
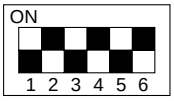
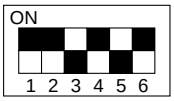
Display	Contents to be inspected (When power is turned on)
F3	63L connector(red) is open.
F5	63H connector(yellow) is open.
F9	2 connectors (63H/63L) are open.
E8	Indoor/outdoor communication error (Signal receiving error) (Outdoor unit)
E9	Indoor/outdoor communication error (Transmitting error) (Outdoor unit)
EA	Mis-wiring of indoor/outdoor unit connecting wire, excessive number of indoor units (5 units or more)
Eb	Mis-wiring of indoor/outdoor unit connecting wire(converse wiring or disconnection)
Ec	Startup time over
E0~E7	Communication error except for outdoor unit

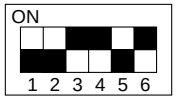
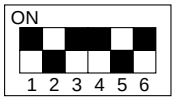
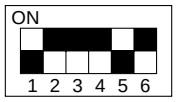
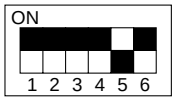
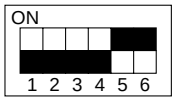
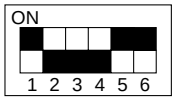
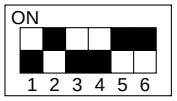
SW2 setting	Display detail	Explanation for display	Unit
	Pipe temperature / Liquid(TH3) – 40~90	– 40~90 (When the coil thermistor detects 0℃ or below, "–" and temperature are displayed by turns.) (Example) When –10℃; 0.5 secs. 0.5 secs. 2 secs. -□ →10 →□□	℃
	Discharge temperature (TH4) 3~217	3~217 (When the discharge thermistor detects 100℃ or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105℃; 0.5 secs. 0.5 secs. 2 secs. □1 →05 →□□	℃
	Output step of outdoor FAN 0~10	0~10	Step
	The number of ON / OFF times of compressor 0~9999	0~9999 (When the number of times is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 42500 times (425 ×100 times); 0.5 secs. 0.5 secs. 2 secs. □4 →25 →□□	100 times
	Compressor integrating operation times 0~9999	0~9999 (When it is 100 hours or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 2450 hours (245 ×10 hours); 0.5 secs. 0.5 secs. 2 secs. □2 →45 →□□	10 hours
	Compressor operating current. 0~50	0~50 ※Omit the figures after the decimal fractions.	A
	Compressor operating frequency 0~225	0~255 (When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns. (Example) When 125Hz; 0.5 secs. 0.5 secs. 2 secs. □1 →25 →□□	Hz
	LEV-A opening pulse 0~480	0~480 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns. (Example) When 150 pulse; 0.5 secs. 0.5 secs. 2 secs. □1 →50 →□□	Pulse
	Error postponement code history (1) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement "00" is displayed in case of no postponement.	Code display
	Operation mode on error occurring	Operation mode of when operation stops due to error is displayed by setting SW2 like below. (SW2) 	Code display

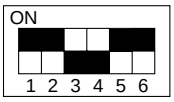
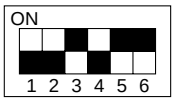
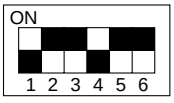
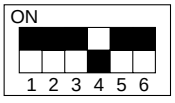
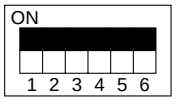
SW2 setting	Display detail	Explanation for display	Unit
	Pipe temperature / Liquid(TH3) on error occurring – 40~90	– 40~90 (When the coil thermistor detects 0℃ or below, "–" and temperature are displayed by turns.) (Example) When –15℃; 0.5 secs. 0.5 secs. 2 secs. -□ →15 →□□	℃
	Compressor temperature (TH4) or discharge temperature (TH4) on error occurring 3~217	3~217 (When the temperature is 100℃ or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 130℃; 0.5 secs. 0.5 secs. 2 secs. □1 →30 →□□	℃
	Compressor operating current on error occurring 0~20	0~20	A
	Error code history (1) (latest) Alternate display of abnormal unit number and code	When no error history, " 0 " and "– –" are displayed by turns.	Code display
	Error code history (2) Alternate display of error unit number and code	When no error history, " 0 " and "– –" are displayed by turns.	Code display
	Thermostat ON time 0~999	0~999 (When it is 100 minutes or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 245 minutes; 0.5 secs. 0.5 secs. 2 secs. □2 →45 →□□	Minute
	Test run elapsed time 0~120	0~120 (When it is 100 minutes or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105 minutes; 0.5 secs. 0.5 secs. 2 secs. □1 →05 →□□	Minute

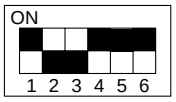
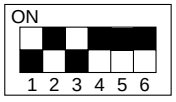
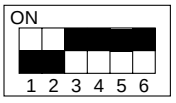
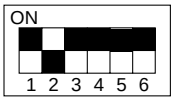
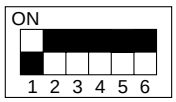
<table>
<tr><th>SW2 setting</th><th>Display detail</th><th>Explanation for display</th><th>Unit</th></tr>
<tr><td>  </td><td>The number of connected indoor units</td><td>0~4
(The number of connected indoor units are displayed.)</td><td>Unit</td></tr>
<tr><td>  </td><td>Capacity setting display</td><td>Displayed as an outdoor capacity code.<table><tr><th>Capacity</th><th>Code</th></tr><tr><td>RP8Y</td><td>40</td></tr><tr><td>RP10Y</td><td>50</td></tr></table></td><td>Code display</td></tr>
<tr><td>  </td><td>Outdoor unit setting information</td><td>• The tens digit (Total display for applied setting)<table><tr><th>Setting details</th><th>Display details</th></tr><tr><td>H·P / Cooling only</td><td>0 : H·P 1 : Cooling only</td></tr><tr><td>Single phase / Three phase</td><td>0 : Single phase 2 : Three phase</td></tr></table>• The ones digit<table><tr><th>Setting details</th><th>Display details</th></tr><tr><td>Defrosting switch</td><td>0 : Normal 1 : For high humidity</td></tr></table>(Example) When heat pump,three phase and defrosting (normal) are set up, “20” is displayed.</td><td>Code display</td></tr>
<tr><td>  </td><td>Indoor pipe temperature / Liquid (TH2(1))
Indoor 1
– 39~88</td><td>– 39~88
(When the temperature is 0℃ or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor pipe temperature / Cond. / Eva. (TH5(1))
Indoor 1
– 39~88</td><td>– 39~88
(When the temperature is 0℃ or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor pipe temperature / Liquid (TH2(2))
Indoor 2
– 39~88</td><td>– 39~88
(When the temperature is 0℃ or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor pipe temperature / Cond. / Eva. (TH5(2))
Indoor 2
– 39~88</td><td>– 39~88
(When the temperature is 0℃ or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor room temperature (TH1)
8~39</td><td>8~39</td><td>℃</td></tr>
</table>

SW2 setting	Display detail	Explanation for display	Unit
	Indoor setting temperature 17~30	17~30	℃
	Outdoor pipe temperature / Cond./ Eva. (TH6) – 39~88	– 39~88 (When the temperature is 0℃ or less, "–" and temperature are displayed by turns.)	℃
	Outdoor outside temperature (TH7) – 39~88	– 39~88 (When the temperature is 0℃ or less, "–" and temperature are displayed by turns.)	℃
	Outdoor internal heat sink temperature (TH8) – 40~200	– 40~200 (When the temperature is 0℃ or less, "–" and temperature are displayed by turns.) (When the thermistor detects 100℃ or more, hundreds digit, tens digit and ones digit are displayed by turns.)	℃
	Discharge super heat. SHd 0~255 [Cooling = TH4-TH6 Heating = TH4-TH5]	0~255 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C
	Sub cool. SC 0~130 [Cooling = TH6-TH3 Heating = TH5-TH4]	0~130 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C
	Input current of outdoor unit	0~500 (When it is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.)	0.1 A
	Targeted operation frequency 0~255	0~255 (When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.)	Hz
	DC bus voltage 360~760	360~760 (When it is 100V or more, hundreds digit, tens digit and ones digit are displayed by turns.)	V

SW2 setting	Display detail	Explanation for display	Unit
	Capacity save 0~255 When air conditioner is connected to M-NET and capacity save mode is demanded, “0”~”100” is displayed. [When there is no setting of capacity save “100” is displayed.]	0~100 (When the capacity is 100% hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 100%; 0.5 secs. □1 → 0.5 secs. 00 → 2 secs. □□	%
	Error postponement code history (2) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement “00” is displayed in case of no postponement.	Code display
	Error postponement code history (3) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement “00” is displayed in case of no postponement.	Code display
	Error code history (3) (Oldest) Alternate display of abnormal unit number and code.	When no error history, “0” and “– –“ are displayed by turns.	Code display
	Error thermistor display [When there is no error thermistor, “–“ is displayed.]	3: Outdoor pipe temperature /Liquid (TH3, TH32) 6: Outdoor pipe temperature /Cond./Eva. (TH6) 7: Outdoor outside temperature (TH7) 8: Outdoor heat sink (TH8)	Code display
	Operation frequency on error occurring 0~255	0~255 (When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 125Hz; 0.5 secs. □1 → 0.5 secs. 25 → 2 secs. □□	Hz
	Fan step on error occurring 0~10	0~10	Step

SW2 setting	Display detail	Explanation for display	Unit
	LEV-A opening pulse on error occurring 0~480	0~480 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 130 pulse; 0.5 secs. □1 → 0.5 secs. 30 → 2 secs. □□	Pulse
	Indoor room temperature (TH1) on error occurring 8~39	8~39	℃
	Indoor pipe temperature / Liquid (TH2) on error occurring – 39~88	– 39~88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.) (Example) When -15°C; 0.5 secs. –□ → 0.5 secs. 15 → 2 secs. □□	℃
	Indoor pipe temperature / Cond./ Eva. (TH5) on error occurring – 39~88	– 39~88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.) (Example) When -15°C; 0.5 secs. –□ → 0.5 secs. 15 → 2 secs. □□	℃
	Outdoor pipe temperature / Cond./ Eva. (TH6) on error occurring – 39~88	– 39~88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.) (Example) When -15°C; 0.5 secs. –□ → 0.5 secs. 15 → 2 secs. □□	℃
	Outdoor outside temperature (TH7) on error occurring – 39~88	– 39~88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.) (Example) When -15°C; 0.5 secs. –□ → 0.5 secs. 15 → 2 secs. □□	℃
	Outdoor heat sink temperature (TH8) on error occurring – 40~200	– 40~200 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.) (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	℃

SW2 setting	Display detail	Explanation for display	Unit
	Discharge super heat on error occurring SHd 0~255 [Cooling = TH4-TH6 Heating = TH4-Th5]	0~255 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 150°C; 0.5 secs. □1 → 0.5 secs. 50 → 2 secs. → □□	℃
	Sub cool on error occurring. SC 0~130 Cooling = TH6-TH3 [Heating = TH5-TH2]	0~130 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 115°C; 0.5 secs. □1 → 0.5 secs. 15 → 2 secs. → □□	℃
	Thermostat-on time until error stops 0~999	0~999 (When it is 100 minutes or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 415 minutes; 0.5 secs. □4 → 0.5 secs. 15 → 2 secs. → □□	Minute
	Indoor pipe temperature / Liquid (TH2 (3)) Indoor 3 – 39~88	– 39~88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.)	℃
	Indoor pipe temperature / Cond./ Eva. (TH5 (3)) Indoor 3 – 39~88	– 39~88 (When the temperature is 0°C or less, "–" and temperature are displayed by turns.) When there is no indoor unit, "00" is displayed.	℃
	Suspensive U9 error detail	(1) Display timing ① During the error suspensive period, the latest suspensive error is displayed according to the table below. ② When U9 error is determined, the latest error status is displayed according to the table below, and the display is cleared (=00) by the error clearing condition. (2) Error display Description / Display Normal / 00 Overvoltage error / 01 Undervoltage error / 02 T phase interruption error / 04 Abnormal power synchronous signal / 08 ※ Display examples for multiple errors: Overvoltage (01) + Undervoltage (02) =03 Undervoltage (02) + Power-sync signal error (08) = 0A	–

<table>
<tr><th>SW2 setting</th><th>Display detail</th><th>Explanation for display</th><th>Unit</th></tr>
<tr>
<td> 
</td>
<td>Controlling status of compressor operating frequency</td>
<td>The following code will be a help to know the operating status of unit.
•The tens digit
<table>
<tr><th>Display</th><th>Compressor operating frequency control</th></tr>
<tr><td>1</td><td>Primary current control</td></tr>
<tr><td>2</td><td>Secondary current control</td></tr>
</table>
•The ones digit (In this digit, the total number of activated control is displayed.)
<table>
<tr><th>Display</th><th>Compressor operating frequency control</th></tr>
<tr><td>1</td><td>Preventive control for excessive temperature rise of discharge temperature</td></tr>
<tr><td>2</td><td>Preventive control for excessive temperature rise of condensing temperature</td></tr>
<tr><td>4</td><td>Frosting preventing control</td></tr>
<tr><td>8</td><td>Preventive control for excessive temperature rise of radiator panel</td></tr>
</table>
(Example)
The following controls are activated.
• Primary current control
• Preventive control for excessive temperature rise of condensing temperature
• Preventive control for excessive temperature rise of radiator panel
LED  </td>
<td>Code display</td>
</tr>
<tr>
<td> 
</td>
<td>Liquid pipe temperature (TH32)
– 40~90</td>
<td>– 40~90
(When the temperature is 0°C or less, “–” and temperature are displayed by turns.)
(Example)
When –10°C; 0.5 secs. 0.5 secs. 2 secs.
-□ →10 →□□</td>
<td>℃</td>
</tr>
<tr>
<td> 
</td>
<td>Indoor pipe temperature / Liquid (TH2(4))
Indoor 4
– 39~88</td>
<td>– 39~88
(When the temperature is 0°C or less, “–” and temperature are displayed by turns.)</td>
<td>℃</td>
</tr>
<tr>
<td> 
</td>
<td>Indoor pipe temperature / (Cond./Eva.) (TH5(4))
Indoor 4
– 39~88</td>
<td>– 39~88
(When the temperature is 0°C or less, “–” and temperature are displayed by turns.)</td>
<td>℃</td>
</tr>
<tr>
<td> 
</td>
<td>Indication for performing status of unit replacement operation
•The ones digit
Every time the unit replacement operation is performed by using SW8-2 for 2 hours, the number "1" is displayed. However, the operation less than 2 hours is not counted, and the number "0" is displayed.
•The tens digit
When specified time of unit replacement operation has been performed by using outdoor unit, the number "1" is displayed. (The number gets back to "0" when performing replacement operation by using SW8-2.)</td>
<td>•The ones digit
1: Performed
0: Not performed
•The tens digit
1: Specified time of replacement operation completed
0: Now performing replacement operation</td>
<td>—</td>
</tr>
</table>

13-11. SELECTING FUNCTIONS USING THE REMOTE CONTROLLER

Each function can be set according to necessity using the remote controller. The setting of function for each unit can only be done by the remote controller. Select function available from the table 1.

<Table 1> Function selections

(1) Functions available when setting the unit number to 00 (Select 00 referring to ④ setting the indoor unit number on 13-11-1.)

※1 The functions below are available only when the wired remote controller is used.The functions are not available for floor standing models.

Function	Settings	Mode No.	Setting No.	Initial setting (when sent from the factory)	Remarks
Power failure automatic recovery	OFF	01	1	●	The setting is applied to all the units in the same refrigerant system.
	ON		2		
Indoor temperature detecting	Operating indoor units (The average is considered as indoor temperature.)	02	1	●	
	Indoor unit with remote controller		2		
	Remote controller's internal sensor		3		
LOSSNAY connectivity	Not supported	03	1	●	
	Supported (indoor unit not equipped with outdoor air intake)		2		
	Supported (indoor unit equipped with outdoor air intake)		3		
Power supply voltage	240V	04	1		
	220V,230V		2	●	
Auto operating mode	Auto energy-saving operation ON	05	1	●	
	Auto energy-saving operation OFF		2		
Frost prevention temperature	2℃ (Normal)	15	1	●	
	3℃		2		
Humidifier control	When the compressor operates, the humidifier also operates.	16	1	●	
	When the fan operates, the humidifier also operates.		2		
Change of defrosting control	Standard	17	1	●	
	For high humidity		2		

(2) Functions available when setting the unit number to 01-03 or AL (07 in case of wireless remote controller)

- When setting functions for an indoor unit in an independent system, set the unit number to 01 referring to ④ setting the indoor unit number on 13-11-1.
- When setting functions for a simultaneous- Twin Triple indoor unit system, set the unit number to 01 to 03 for each indoor unit in case of selecting different functions for each unit referring to ④ setting the indoor unit number on 13-11-1.
- When setting the same functions for an entire simultaneous Twin Triple-indoor unit system, set refrigerant address to AL (07 in case of wireless remote controller) referring to ④ setting the indoor unit number on 13-11-1.

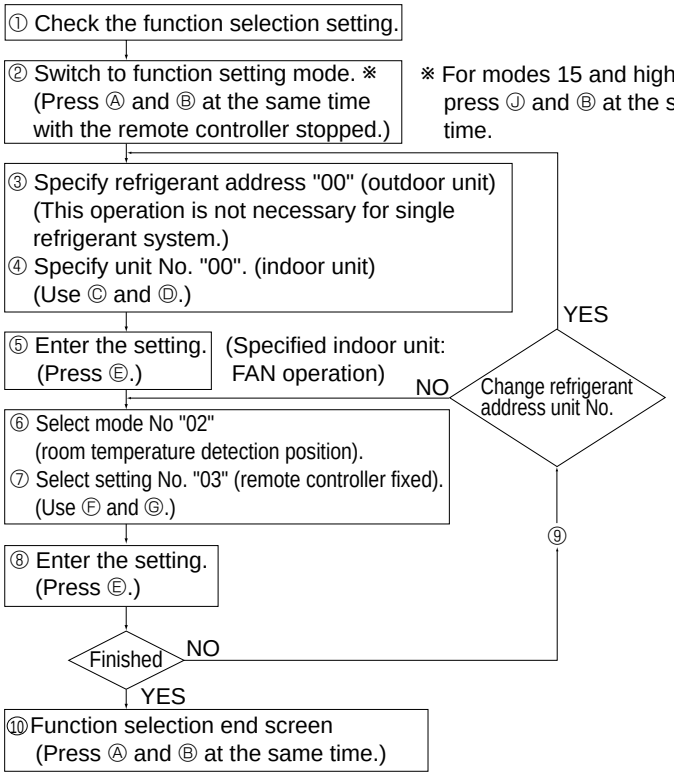
Function	Settings	Mode No.	Setting No.	Initial setting(when sent from the factory) Ceiling concealed –: Not available							Remarks
				4-way Cassette		Ceiling Concealed	Ceiling Concealed	Ceiling Suspended	Wall Mounted		
				PLA-AA (power-cassette)	PLA-AA.UK (power-cassette)	PEH-MYA	PEAD-EA PEAD-GA	PCA-GA	PKA-FAL	PKA-GAL	
Filter sign	100Hr	07	1						●	●	
	2500Hr		2	●	●			●			
	No filter sign indicator		3			●	●				
Fan speed	standard	08	1	●	●	—	—		—	—	
	High ceiling ①		2			—	—	●	—	—	
	High ceiling ②		3			—	—		—	—	
No. of air outlets	4 directions	09	1	●	●	—	—	—	—	—	
	3 directions		2			—	—	—	—	—	
	2 directions		3			—	—	—	—	—	
Installed options (high-performance filter)	Not supported	10	1	●	●	—	—	●	—	—	
	Supported		2			—	—		—	—	
Horizontal vane setting	No vanes	11	1			—	—		—	—	
	Equipped with vane (No.1 setting)		2	●		—	—	●	—	—	
	Equipped with vane (No.2 setting)		3		●	—	—		—	—	
Energy saving air flow (Heating mode)	Disabled	12	1	●	●	—	—	●	—	—	
	Enabled		2			—	—		—	—	
Direct add-on type humidifier (Only for power-cassette)	Not supported	13	1	●	●	—	—	—	—	—	
	Supported		2			—	—	—	—	—	
Swing	Not available	23	1			—	—				
	Available		2	●	●	—	—	●	●	●	
Set temperature in heating mode 4deg-up	Available	24	1	●	●	●	●	●	●	●	
	Not available		2								
Fan speed when the heating thermostat is OFF	Extra low	25	1	●	●	—		●	●	●	
	Low (4-speed model) Low (2-speed model)		2			—	●				
	Set fan speed		3			—					
Quiet operation mode of power cassette	Normal	26	1	●	●	—	—	—	—	—	
	Quiet		2			—	—	—	—	—	
Fan speed when the cooling thermostat is OFF	Set fan speed	27	1	●	●	●	●	●	●	●	
	Stop		2								
Detection of abnormality of the pipe temperature (P8)	Available	28	1	●	●	●	●	●	●	●	
	Not available		2								

13-11-1. Selecting functions using the wired remote controller

[Flow of function selection procedure]

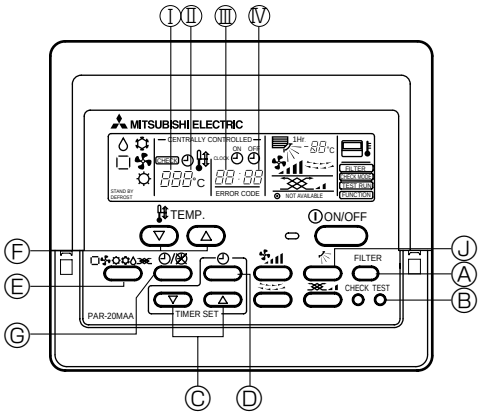
The flow of function selection procedure is shown below. The flow is described in case of setting indoor temperature detecting shown in table 1 on the preceding page. Refer to procedure ① to ⑩ when actually setting functions.

Selecting functions using the wired remote controller



Wired type

Ⓘ Mode number
Ⓘ Setting number
Ⓘ Refrigerant address
Ⓘ Unit number



For mode 01 to 13, press A and B at the same time and for mode 15 to 28, press B and J to go to function select mode.

[Operating instructions]

① Checking the function settings

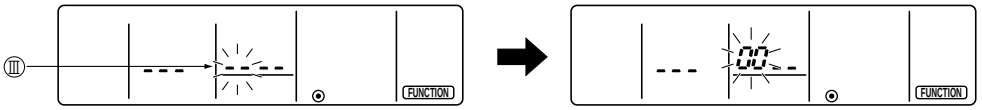
If you change the setting in the function setting procedure, the contents of setting will be changed for the designated mode. Change the setting after recording all the previous setting into the checklist of table 1 by following steps ② to ⑦. In addition, read the installation manual packed with indoor units to be informed of initial setting.

② Turning off the remote controller

Press the Ⓐ FILTER and Ⓑ TEST RUN buttons simultaneously and hold them for at least 2 seconds.
(For modes 15 and higher, press Ⓙ and Ⓑ simultaneously for at least 2 seconds.) FUNCTION will start to flash. After a while, the refrigerant address display will start to flash .

③ Setting the refrigerant address No. of outdoor unit

Press Ⓒ (△) (▽) TIMER SET button to select the refrigerant address from No.00 to No.15. (Set the refrigerant address to No.00 in case of single refrigerant grouping system.)



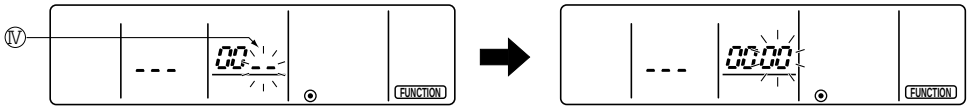
※ If the unit stops two seconds after the FUNCTION display starts to flash or [88] starts to flash in the room temperature display, a transmission problem may have occurred. Check to see if there are some sources of transmission interference (noise) nearby.

If you make a mistake during any points of this procedure, you can quit the function setting by pressing ⑩ then return to step ②.

④ Setting the indoor unit number

Press Ⓓ(CLOCK ON OFF) and [--] will start to flash in the unit number display (Ⅳ) .

Press Ⓒ ▲ ▼ (TIMER SET) button to select the unit number from 00, 01, 02, 03, 04, and AL.

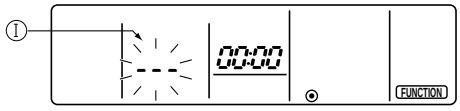


- Set the unit number to 00 if the mode such as power failure automatic recovery, indoor temperature detecting or LOSSNAY connectivity is desired to be selected.
- Select the unit number from 01 to 04 if the function setting is desired to be done for each of them individually.
- Set the unit number to AL if the function setting is desired to be done for all of units simultaneously.

⑤ Confirming the refrigerant address and indoor unit number

Press Ⓔ MODE button to confirm the refrigerant address and unit number.

After a while, [--] will flash in the mode number display (I).

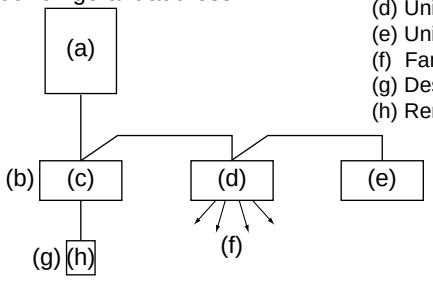


※If [88] appears in the room temperature display section, the selected refrigerant address does not exist in the system. Also, if [F] appears in the unit number display section, the selected unit number does not exist. Enter the correct refrigerant address and unit number at steps ② and ③.

Designated indoor unit starts fan draft operation by pressing Ⓔ MODE button. Check which indoor unit is designated for function setting by doing this. In addition, all the units of the selected refrigerant address start fan draft operation if the unit number is set to 00 or AL.

Example) When the refrigerant address is set to 00 and the unit number is 02;

Ⅲ 00 refrigerant address

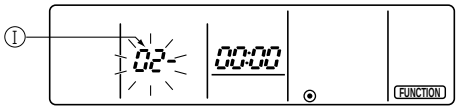


(a) Outdoor unit
(b) Indoor unit
(c) Unit number 01
(d) Unit number 02
(e) Unit number 03
(f) Fan draft
(g) Designation
(h) Remote controller

※If any undesignated indoor units start fan draft operation under multiple refrigerant grouping system, refrigerant addresses may be overlapped. Reassign refrigerant addresses at the DIP switch of the outdoor unit.

⑥ Selecting the mode number

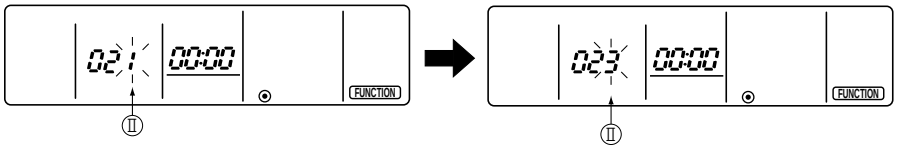
Press Ⓕ ▲ ▼ (TEMP) buttons to set the desired mode number. (It is possible to set the number of available mode only.)



⑦ Selecting the setting of designated mode

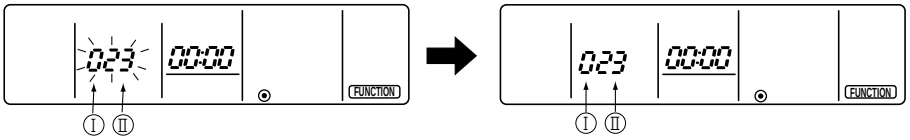
Press Ⓖ button, and the setting number will start to flash. Check the current status of the setting by doing this.

Press Ⓕ ▲ ▼ (TEMP) button to select the setting number.



⑧ Registering the settings from steps ③ to ⑦ into memory

The mode and setting numbers (Ⅰ)(Ⅱ) will start to flash when the MODE button Ⓔ is pressed and registration will begin. The numbers are set when the flashing stays lit.



※If [---] appears in the room temperature display as the mode/setting number, or if a flashing [88] display appears, a transmission problem may have occurred. Check to see if there are some sources of transmission interference (noise) nearby.

---

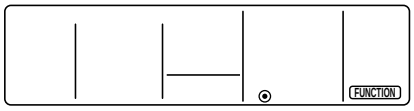
⑨ Registering other settings simultaneously

Repeat steps ③ to ⑧ to make other function settings.

---

⑩ Completing the function settings

Press Ⓐ FILTER and Ⓑ TEST RUN buttons simultaneously for at least two seconds. (For modes 15 and higher, press Ⓙ and Ⓑ simultaneously for at least 2 seconds.) After a while, the function selection screen will disappear and air conditioner OFF display will appear.

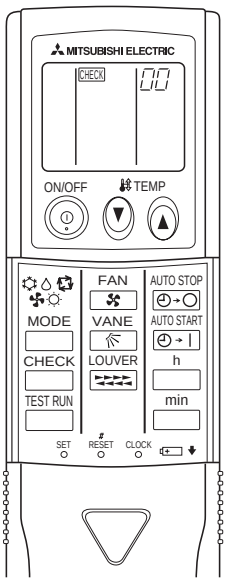


※Do not use the remote controller for 30 seconds after completing the function setting. (Any requests will be rejected.)

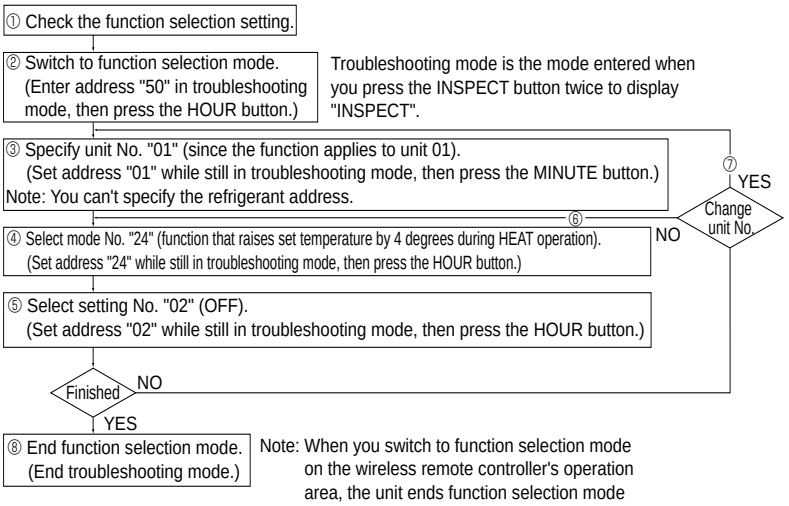
13-11-2. Selecting functions using the wireless remote controller (Type C)

Functions can be selected with the wireless remote controller. Function selection using wireless remote controller is available only for refrigerant system with wireless function. Refrigerant address cannot be specified by the wireless remote controller.

[Flow of function selection procedure]



The flow of the function selection procedure is shown below. This example shows how to turn off the function that raises the set temperature by 4 degrees during HEAT operation .
The procedure is given after the flow chart.



[Operating instructions]

① Check the function settings.

② Press the CHECK button twice continuously. → CHECK is lit and “00” blinks.
Press the temp button once to set “50”. Direct the wireless remote controller toward the receiver of the indoor unit and press the h button.

③ Set the unit number.
Press the temp button to set the unit number. (Press “01” to specify the indoor unit whose unit number is 01.)
Direct the wireless remote controller toward the receiver of the indoor unit and press the min button.
(By setting unit number with the min button, specified indoor unit starts performing fan operation.
Detect which unit is assigned to which number using this function. If unit number is set to AL, all the indoor units in same refrigerant system start performing fan operation simultaneously.)

* If a unit number that cannot be recognized by the unit is entered, 3 beeps of 0.4 seconds will be heard. Reenter the unit number setting.
* If the signal was not received by the sensor, you will not hear a beep or a “double beep” may be heard. Reenter the unit number setting.

④ Select a mode.
Press the temp button to set a mode. Press “24” to turn on the function that raises the set temperature by 4 degree during heat operation. Direct the wireless remote controller toward the sensor of the indoor unit and press the h button.
→ The sensor-operation indicator will flash and beeps will be heard to indicate the current setting number.
Current setting number: 1 = 1 beep (one second)
2 = 2 beeps (one second each)
3 = 3 beeps (one second each)

* If a mode number that cannot be recognized by the unit is entered, 3 beeps of 0.4 seconds will be heard. Reenter the mode number.
* If the signal was not received by the sensor, you will not hear a beep or a “double beep” may be heard. Reenter the mode number.

⑤ Select the setting number.
Press the temp button to select the setting number. (02: Not available)
Direct the wireless remote controller toward the receiver of the indoor unit and press the h button.
→ The sensor-operation indicator will flash and beeps will be heard to indicate the the setting number.
Setting number: 1 = 2 beeps (0.4 seconds each)
2 = 2 beeps (0.4 seconds each, repeated twice)
3 = 2 beeps (0.4 seconds each, repeated three times)

* If a setting number that cannot be recognized by the unit is entered, the setting will turn back to the original setting.
* If the signal was not received by the sensor, you will not hear a beep or a “double beep” may be heard. Reenter the setting number.

⑥ Repeat steps ④ and ⑤ to make an additional setting without changing unit number.

⑦ Repeat steps ③ to ⑤ to change unit number and make function settings on it.

⑧ Complete the function settings
Press ON / OFF button.

* Do not use the wireless remote controller for 30 seconds after completing the function setting.

14 DISASSEMBLY PROCEDURE

※ When servicing, pay careful attention in removing heavy parts.
※ Collect the refrigerant before you service the refrigerant system.
※ When brazing, make sure to apply the non-oxidizing braze.

PUHZ-RP8YHA PUHZ-RP10YHA

OPERATING PROCEDURE

1. Removing the service panel
(1) Remove 8 service panel fixing screws (5×10) (see photo 1) .
(2) Remove the service panel by sliding it towards you.

※ It is the panel to remove when you maintain the refrigerant circuit, electrical parts, and compressor.

2. Removing the rear panel
(1) Remove 7 rear panel fixing screws (5×10) (see photo 2).
(2) Remove the rear panel by sliding it towards you.

※ It is the panel to remove when you maintain the machine room from the rear side.

3. Removing the front panel
(1) Remove 7 front panel fixing screws (5×10) (see photo 1).
(2) Remove the front panel by sliding it towards you, then upward.

※ It is the panel to remove when you maintain the thermistor and the fan motor.

PHOTOS

Photo 1 (front)

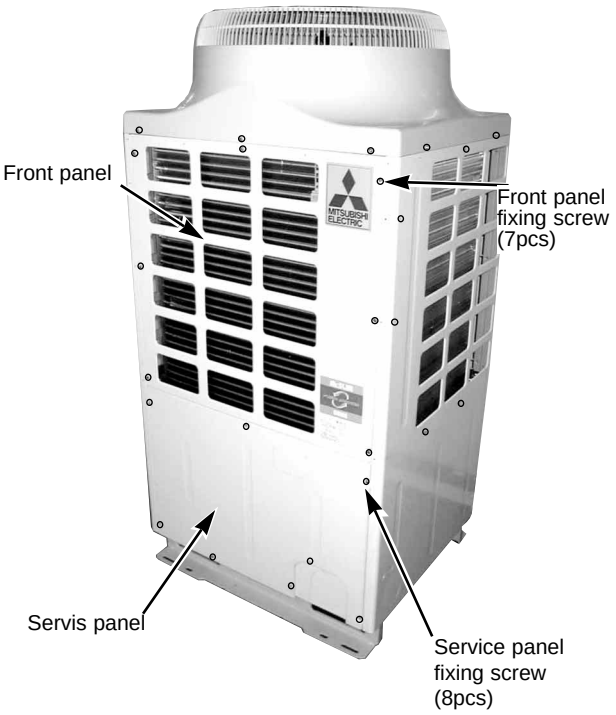
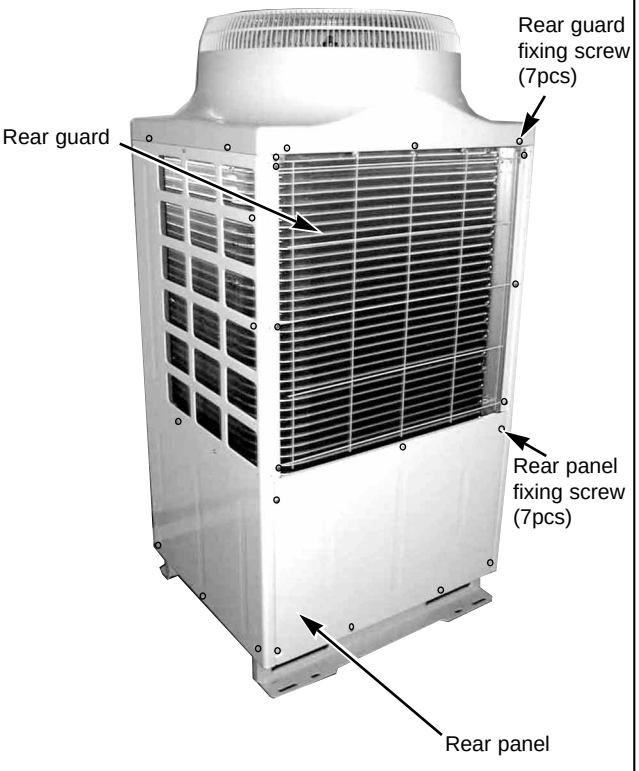
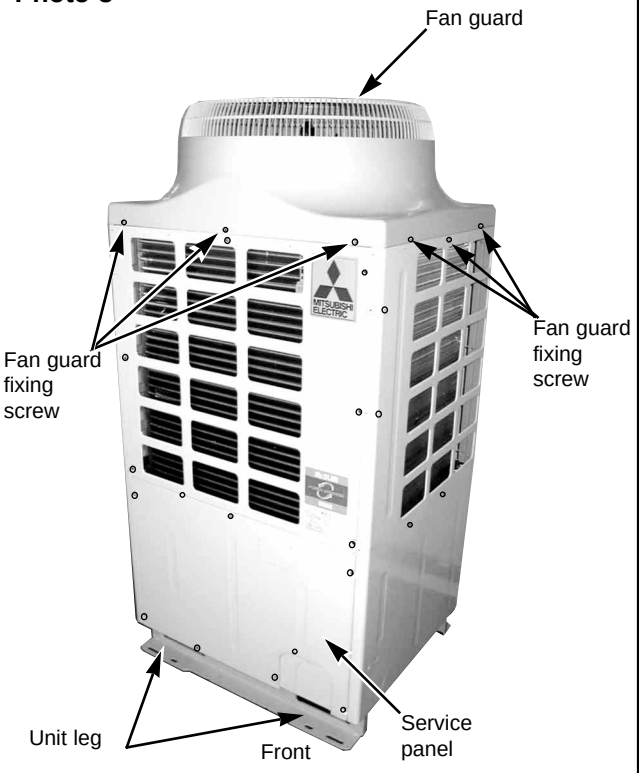
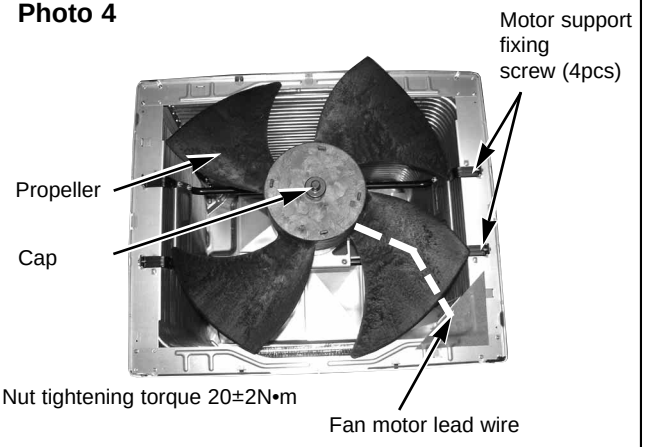
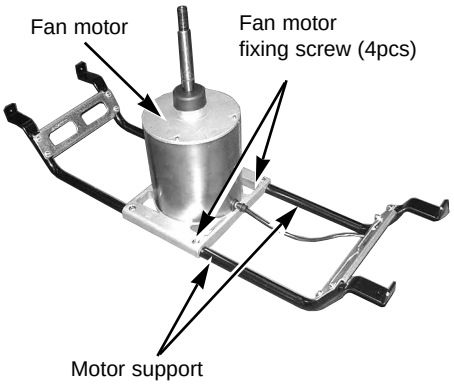
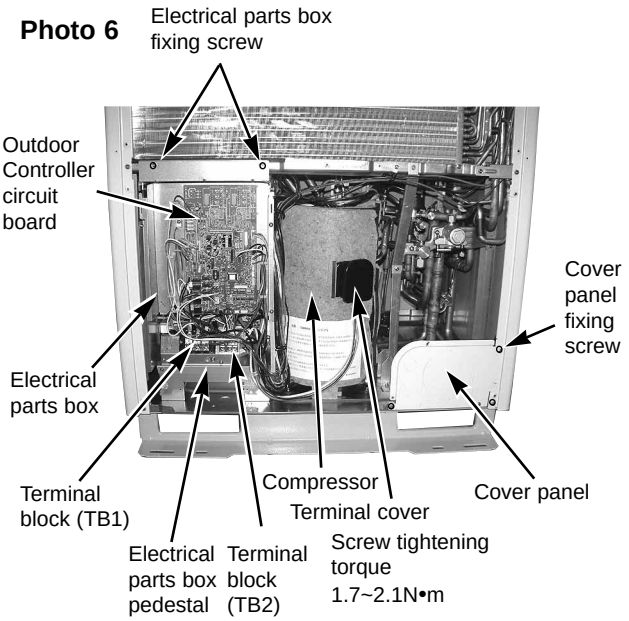
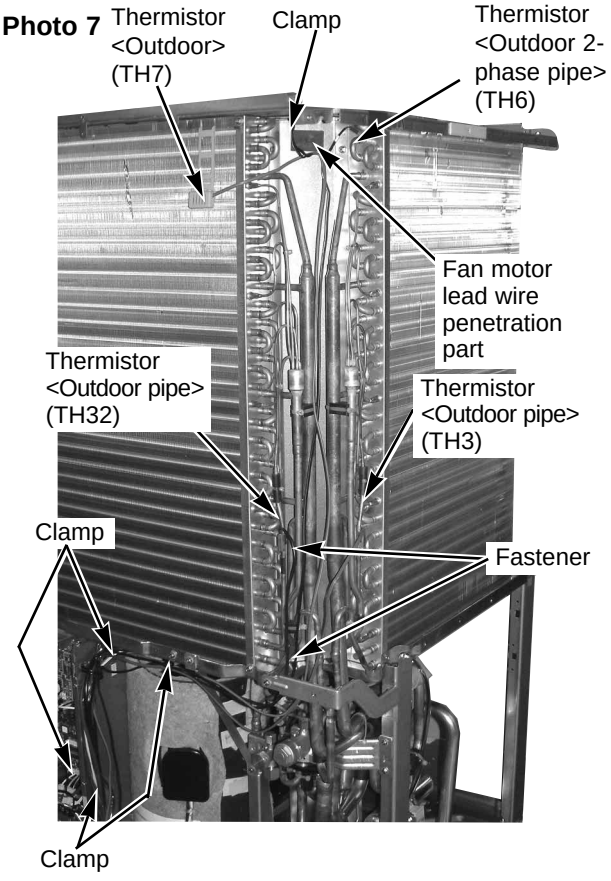
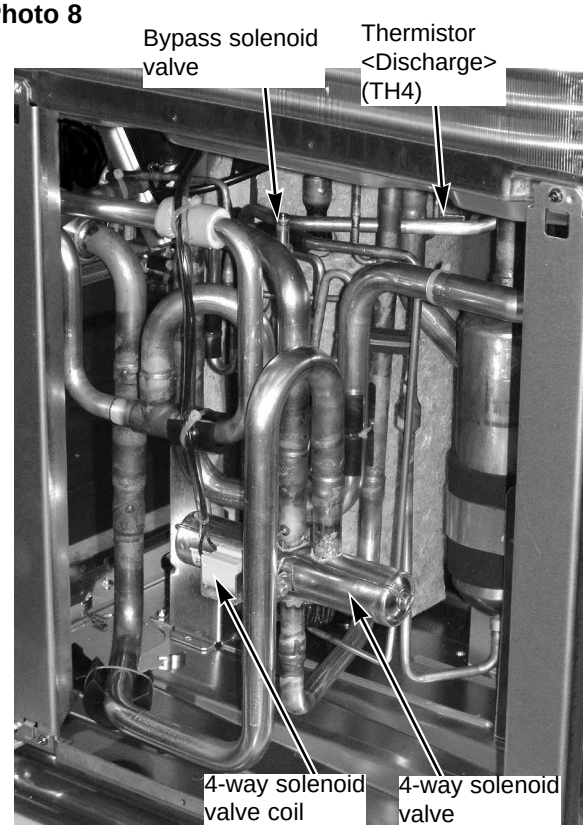
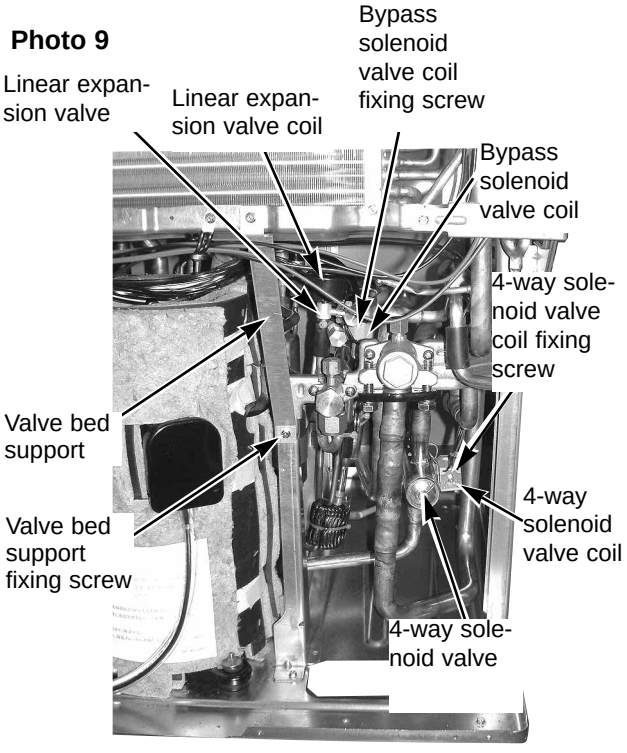


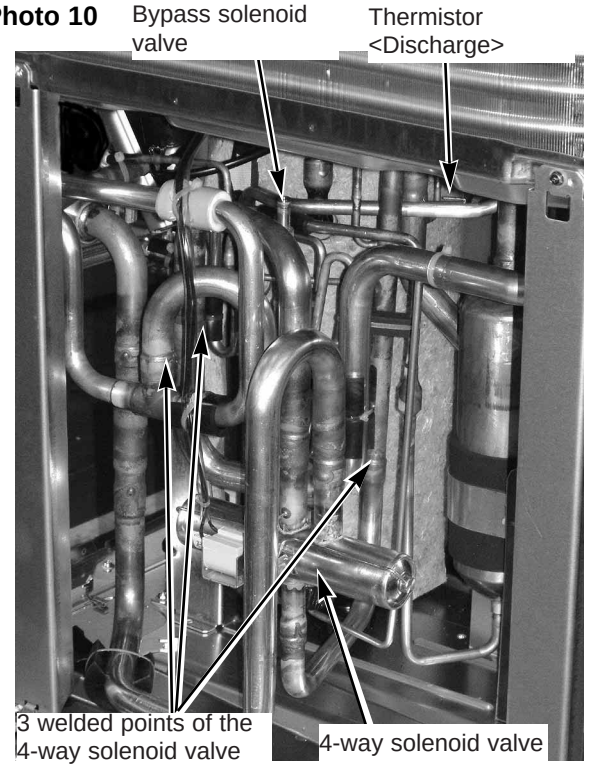
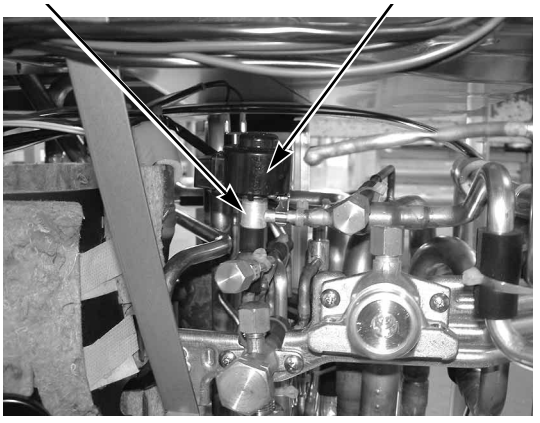
Photo 2 (rear)

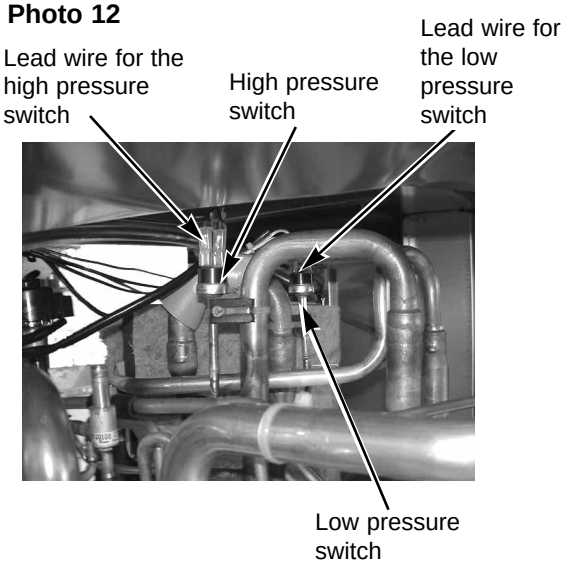


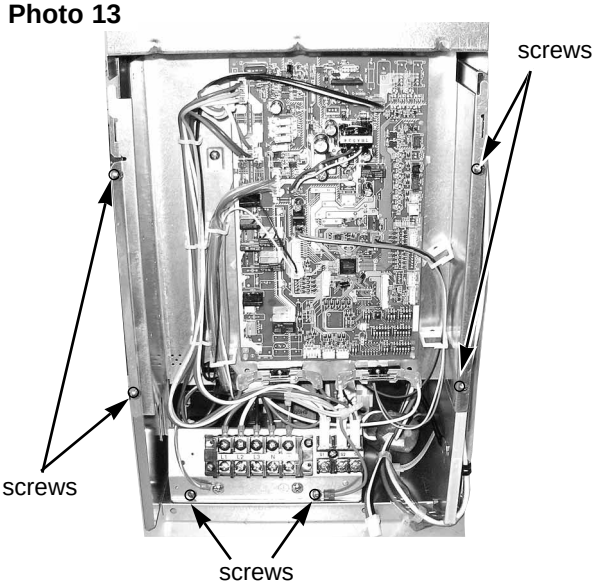
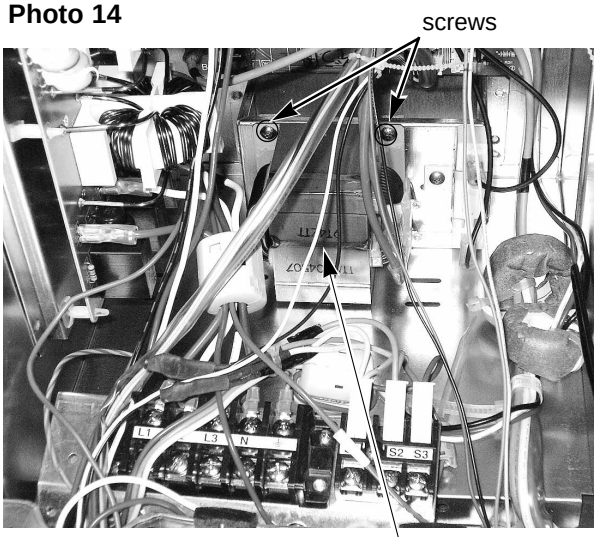
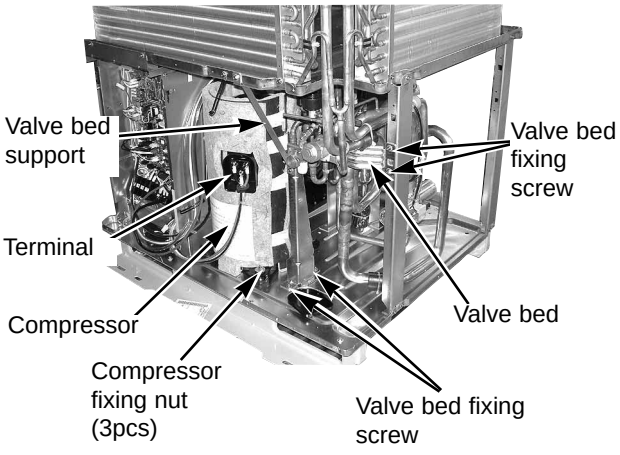
OPERATING PROCEDURE	PHOTOS
4. Removing the fan motor (1) Remove • 10 fan guard fixing screws (5×15) (see photo 3). • Fan guard by sliding it upward. • Cap by pulling it upward (see photo 4). • Propeller fixing nut (M16, left screw). • Washer (ϕ32) and the propeller from the fan motor shaft (see photo 4). • Propeller holding washer (ϕ40) from the fan motor shaft. **Note 1: Be careful not to drop any of the cap, nuts, and washers inside the unit.** (2) Remove the service panel and the front panel. (3) Disconnect the relay connector of the fan motor lead wire in the electrical parts box. (4) Loosen all the clamps for the fan motor lead wire, and pull out the wire from the penetration part. (5) Remove • 4 motor support fixing screws (5×15). • Motor support together with the fan motor (see photo 4). **Note 2: The motor support and the fan motor should be held by two people.** (6) Remove • 4 fan motor fixing screws (M6×16). • Fan motor (see photo 5).	**Photo 3**  **Photo 4**  **Photo 5** 

OPERATING PROCEDURE	PHOTOS
5. Removing the electrical parts box (1) Remove • Service panel. • Waterproof sheet for the electrical parts. (2) Disconnect • Power wire from TB1, and the indoor / outdoor connecting wire from TB2 (see photo 6). • Fan motor relay connector. • Lead wires in the compressor terminal cover (see photo 6). (3) Disconnect all the following connectors from the controller circuit board. • LEV-A (Linear expansion valve / 6P, white) • TH3 (Thermistor <Outdoor pipe> / 3P, white) • TH32 (Thermistor <Outdoor pipe> / 3P, black) • TH4 (Thermistor <Discharge> / 3P, white) • TH6/7 (Thermistor <Outdoor 2-phase pipe>, <Outdoor> / 4P, red) • 63H (High pressure switch / 3P, yellow) • 63L (Low pressure switch / 3P, red) • 21S4 (4-way solenoid valve / 3P, green) • SV2 (Bypass solenoid valve / 3P, blue) (4) Remove • 4 electrical parts box fixing screws (5×10). • Electrical parts box by sliding it towards you (see photo6).	**Photo 6** 
6. Removing the thermistor <Outdoor 2-phase pipe> (TH6) and thermistor <Outdoor> (TH7) ※ TH6 and TH7 are replaced together, since they are combined together at the connector to the controller circuit board. (1) Remove the service panel and the front panel. (2) Disconnect the connector TH6/7 (4P, red) from the controller circuit board. (3) Loosen all the clamps for the lead wire and cut 2 fasteners (see photo 7). (4) Pull out • Thermistor <Outdoor 2-phase pipe> (TH6) from the sensor holder mounted on the heat exchanger. • Thermistor <Outdoor pipe> (TH7) from the sensor holder (see photo 7). **7. Removing the thermistor <Outdoor pipe>** (1) Remove the service panel and the front panel. (2) Disconnect the connector TH3 (3P, white) or TH32 (3P, black) from the controller circuit board. (3) Loosen all the clamps for the lead wire and cut 2 fasteners (see photo 7). (4) Pull out the thermistor (TH3 or TH32) from the sensor holder mounted on the heat exchanger (see photo 7). ※ When there is difficulty in pulling out TH3 from the heat exchanger, open the side panel (right) by removing 2 side panel fixing screws (5×10).	**Photo 7** 

OPERATING PROCEDURE	PHOTOS
8. Removing the thermistor <Discharge> (1) Remove the service panel. (2) Disconnect the connector TH4 (3P, white) from the controller circuit board. (3) Loosen all the clamps for the lead wire (see photo 7). (4) Pull out the thermistor (TH4) from the sensor holder mounted on the compressor discharging pipe (see photo 8).	**Photo 8**  <Side panel (right) is removed>
9. Removing the 4-way solenoid valve coil, the linear expansion valve coil, and the bypass solenoid valve coil (1) Remove the service panel. <4-way solenoid valve coil> (2) Disconnect the connector 21S4 (3P, green) from the controller circuit board. (3) Loosen all the clamps for the lead wire and cut 2 fasteners (see photo 7). (4) Remove the 4-way solenoid valve coil fixing screw (M4×6) (see photo 9). (5) Remove the 4-way solenoid valve coil by sliding it towards you (see photo 8, 9). <Bypass solenoid valve coil> (2) Disconnect the connector SV2 (3P, blue) from the controller circuit board. (3) Loosen all the clamps for the lead wire and cut 2 fasteners (see photo 7). (4) Remove the bypass solenoid valve coil fixing screw (M4×6) (see photo 9). (5) Remove the bypass solenoid valve coil by sliding it upward. <Linear expansion valve coil> 2. Disconnect the connector LEV-A (6P, white) from the controller circuit board. 3. Loosen all the clamps for the lead wire and cut 2 fasteners (see photo 7). 4. Remove the linear expansion valve coil by sliding it upward (see photo 9). **Note) When attaching the coil, make sure to tie the lead wires with the fasteners that are equivalent to the ones you just cut.**	**Photo 9** 

OPERATING PROCEDURE	PHOTOS
10. Removing the 4-way solenoid valve (1) Remove • Service panel. • 3 cover panel fixing screws (5×10). • Cover panel (see photo 6). • 4-way solenoid valve coil (see photo 8, 9). • 2 valve bed support fixing screws (5×10), then valve bedsupport (see photo 9). • 4 valve bed fixing screws (5×10), 4 stop valve fixing screws (5×16), then valve bed (see photo 15). (2) Collect the refrigerant. (3) Remove 4-way solenoid valve together with the pipes from 3 welded points shown in the photo 10. (4) Separate 4 welded pipes from the 4-way solenoid valve. **Note 1: Collect the refrigerant without releasing it in the air.** **Note 2: The welded points can be accessed easily by removing the right side panel.** **Note 3: When installing the 4-way solenoid valve, cover it with a wet cloth to prevent it from heating (120℃ or more), then braze the pipe (non-oxidizing braze).**	**Photo 10**  <Side panel (right) is removed>
11. Removing the linear expansion valve (1) Remove • Service panel. • 3 cover panel fixing screws (5×10). • Cover panel (see photo 6). • Linear expansion valve coil (see photo 11). • 2 valve bed support fixing screws (5×10), then valve bed support (see photo 9). • 4 valve bed fixing screws (5×10), 4 stop valve fixing screws (5×16), then valve bed (see photo 15). (2) Collect the refrigerant. (3) Remove the linear expansion valve from 2 welded points. **Note 1: Collect the refrigerant without releasing it in the air.** **Note 2: The welded points can be accessed easily by removing the right side panel.** **Note 3: When installing the linear expansion valve, cover it with a wet cloth to prevent it from heating (120℃ or more), then braze the pipe (non-oxidizing braze).**	**Photo 11** 

OPERATING PROCEDURE	PHOTOS & ILLUSTRATION
12. Removing the bypass solenoid valve (1) Remove • Service panel • 3 cover panel fixing screws (5×10). • Cover panel (see photo 6). • Bypass solenoid valve coil (see photo 9). • 2 valve bed support fixing screws (5×10), then valve bed support (see photo 9). • 4 valve bed fixing screws (5×10), 4 stop valve fixing screws (5×16), then valve bed (see photo 15). (2) Collect the refrigerant. (3) Remove the bypass solenoid valve from 2 welded points. **Note 1: Collect the refrigerant without releasing it in the air.** **Note 2: The welded points can be accessed easily by removing the right side panel.**	
13. Removing the low pressure switch and the high pressure switch (1) Remove • Service panel (see photo 1). • 3 cover panel fixing screws (5×10). • Cover panel (see photo 6). • 2 valve bed support fixing screws (5×10), then valve bed support (see photo 9). • 4 valve bed fixing screws (5×10), 4 stop valve fixing screws (5×16), then valve bed (see photo 15). (3) Disconnect the lead wire for the low pressure switch or the high pressure switch (see photo 12). (4) Collect the refrigerant (5) Remove the low pressure switch or the high pressure switch from the welded part. **Note 1: Collect the refrigerant without releasing it in the air.** **Note 2: The welded points can be accessed easily by removing the right side panel.** **Note 3: When installing the low / high pressure switch, cover it with a wet cloth to prevent it from heating (100℃ or more), then braze the pipe (non-oxidizing braze).**	**Photo 12** 

OPERATING PROCEDURE	PHOTOS & ILLUSTRATION
14. Removing the reactor (1) Remove • Service panel • 2 screws (4×8) that hold the terminal block fixing metal plate in front of the electrical parts box, then slightly pull the plate towards you. • 4 screws (4×8) that hold the controller circuit board fixing metal plate in front of the electrical parts box, then tilt the plate towards you (see photo 6). • 3 reactor fixing screws (4×8). • Remove the reactor by sliding it upward (see photo 14).	**Photo 13**  **Photo 14** 
15. Removing the compressor (1) Remove • Service panel (see photo 2). • 3 cover panel fixing screws (5×10). • Cover panel (see photo 6). • 2 valve bed support fixing screws (5×10), then valve bed support (see photo 9). • 4 valve bed fixing screws (5×10), 4 stop valve fixing screws (5×16), then valve bed (see photo 15). • Terminal cover. • 3 lead wire fixing screws (M5×10), then disconnect the lead wire (see photo 15). (2) Collect the refrigerant. (3) Remove the sound insulation. (4) Disengage the welded points of the compressor inlet and dis charge pipes. (5) Remove 3 compressor fixing nuts by using a spanner or a monkey wrench. **Note: Collect the refrigerant without releasing it in the air.**	**photo 15** 

OPERATING PROCEDURE

16. Removing the accumulator

(1) Remove
- Service panel (see photo 1).
- Electrical parts box (see photo 6).
- 2 electrical parts box leg fixing screws (5×10), then electrical parts box legs (see photo 6).
- 2 lower fixing screws (5×10) of the heat sink duct.
- 2 screws (4×10) which hold the metal plate above the heat sink, then remove the plate.
- Fan guard.
- 3 upper fixing screws (5×10) of the heat sink duct located below the fan motor, then remove the hear sink duct (see photo 15).

(2) Collect the refrigerant.

(3) Disengage 2 welded points of the accumulator inlet and outlet (see photo 17).

(4) Remove 4 accumulator fixing screws (5×10), then take out the accumulator.

Note 1: Collect the refrigerant without releasing in the air.

Note 2: The welded points can be accessed easily by removing the rear panel. When servicing from the rear side, remove the rear panel first, then follow the procedure from number 2 (collecting the refrigerant) **mentioned above** (see photo 16).

PHOTOS

Photo 16

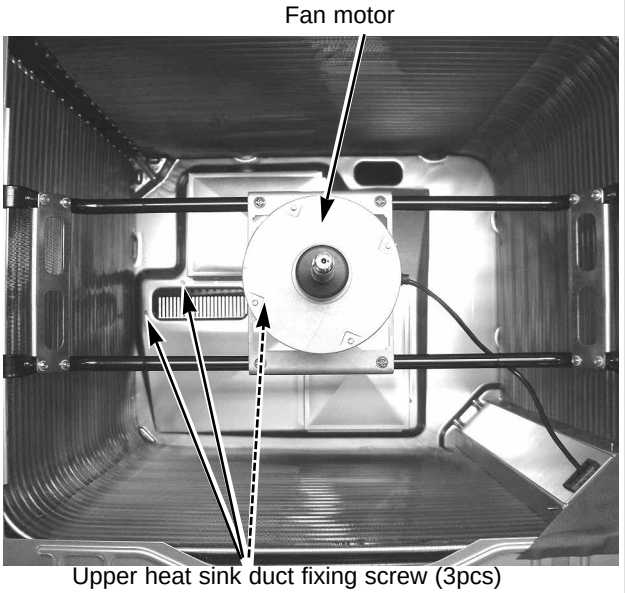
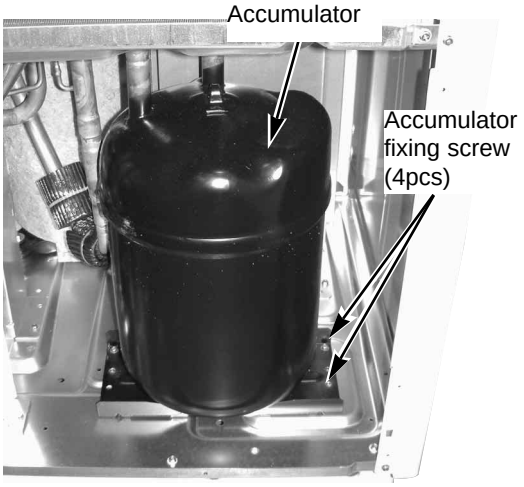


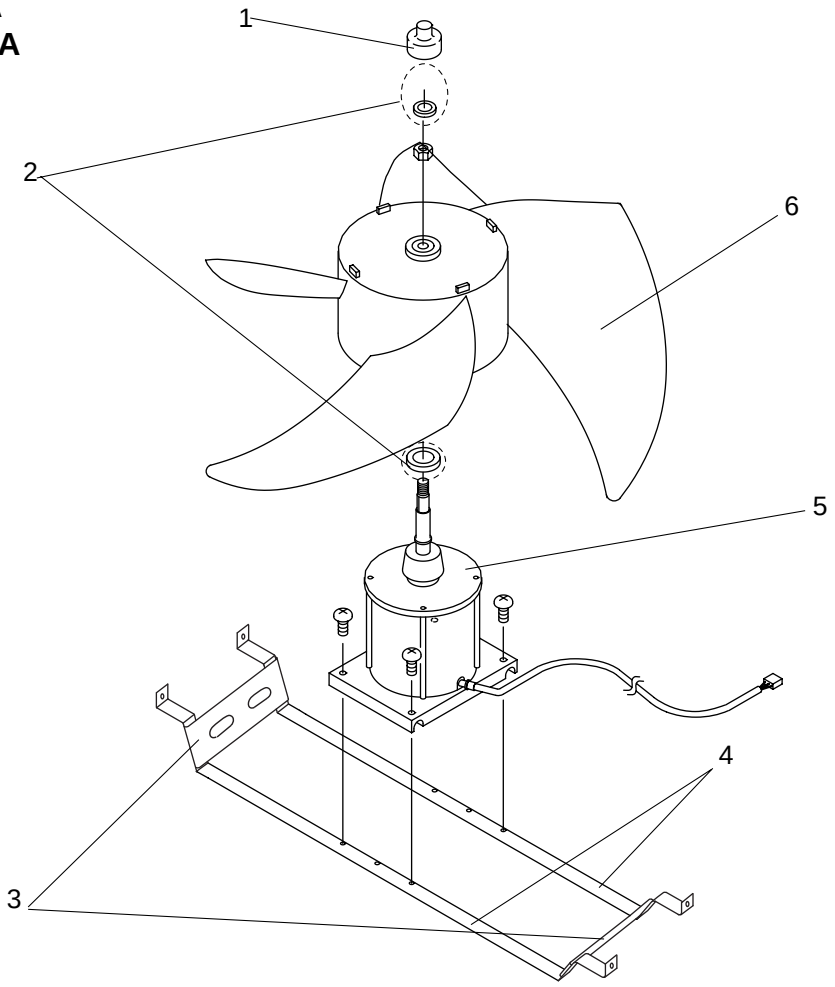
Photo 17



<Viewed from rear side>

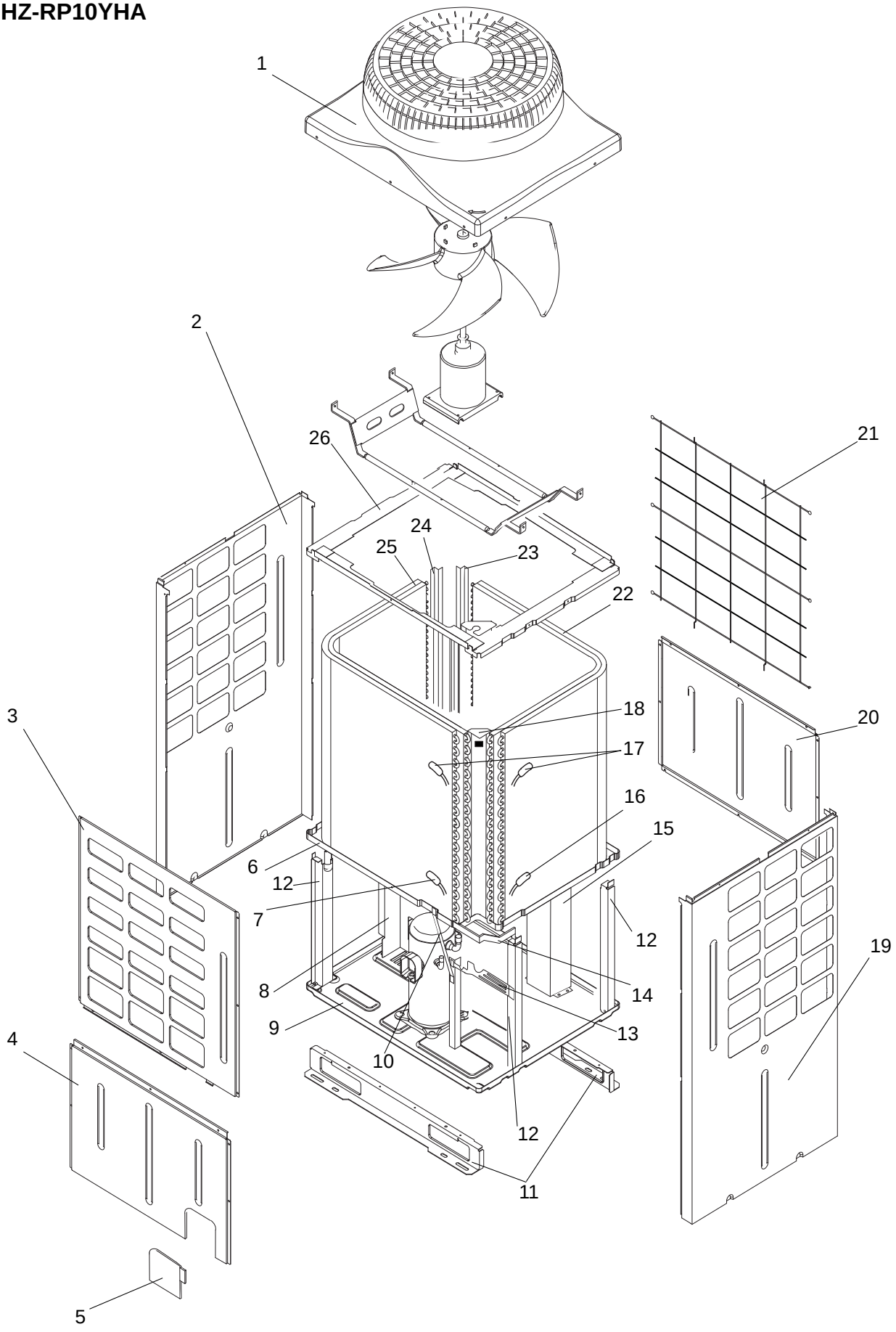
15 PARTS LIST

FAN PARTS
PUHZ-RP8YHA
PUHZ-RP10YHA



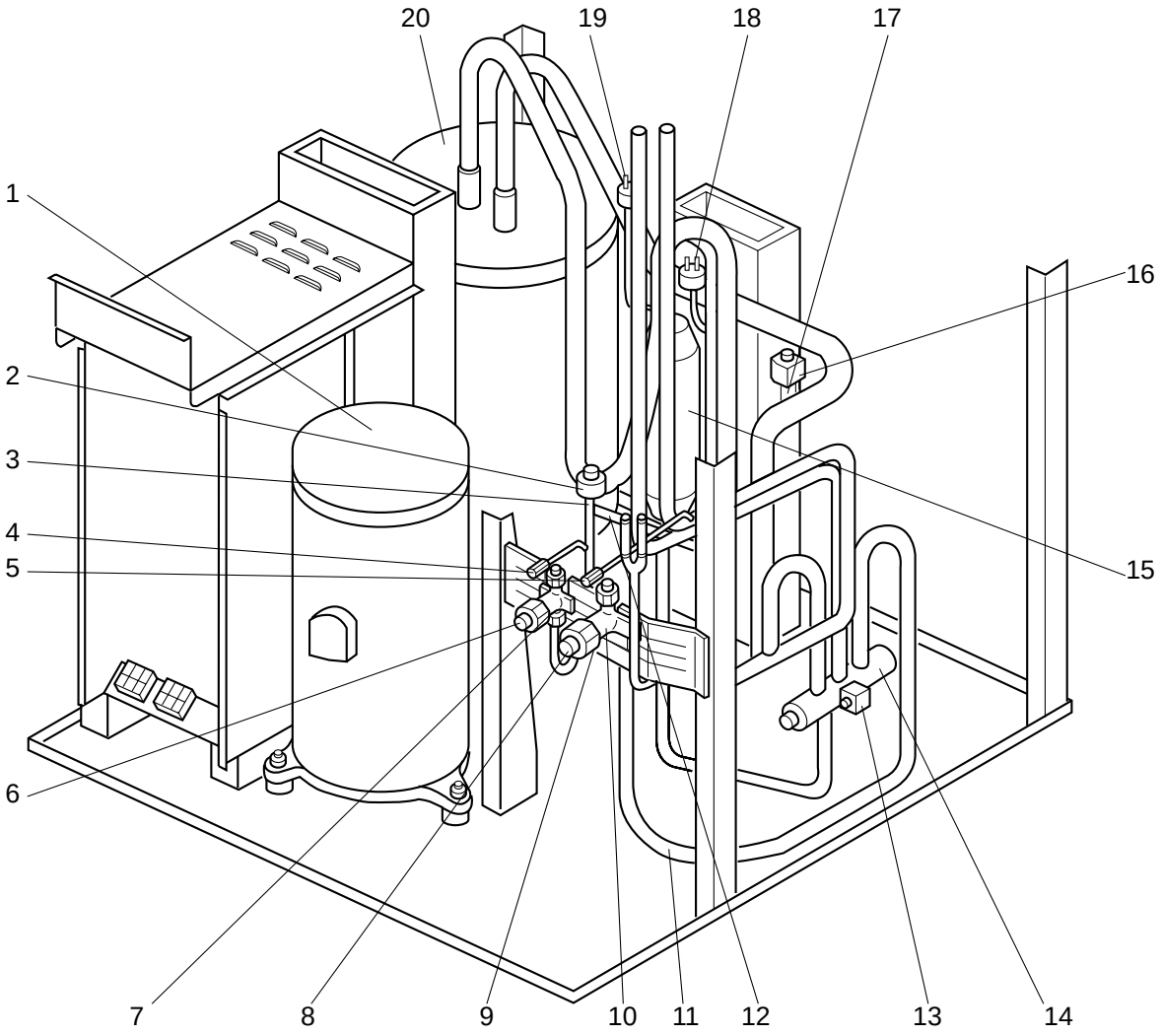
No.	Part No.	Part Name	Specification	Q'ty/set PUHZ RP8 YHA	Q'ty/set PUHZ RP10 YHA	Remarks (Drawing No.)	Wining Diagram Symbol	Recommended Q'ty	Price Unit	Price Amount
1	R01 E01 122	MOTOR CAP		1	1					
2	R01 E05 097	NUT M16		1	1					
3	—	SUPPORT		2	2	BG02U187H03				
4	R01 E20 130	MOTOR SUPPORT		2	2					
5	T7W E26 763	FAN MOTOR		1	1		MF			
6	R01 E03 115	PROPELLER		1	1					

STRUCTURAL PARTS
PUHZ-RP8YHA
PUHZ-RP10YHA



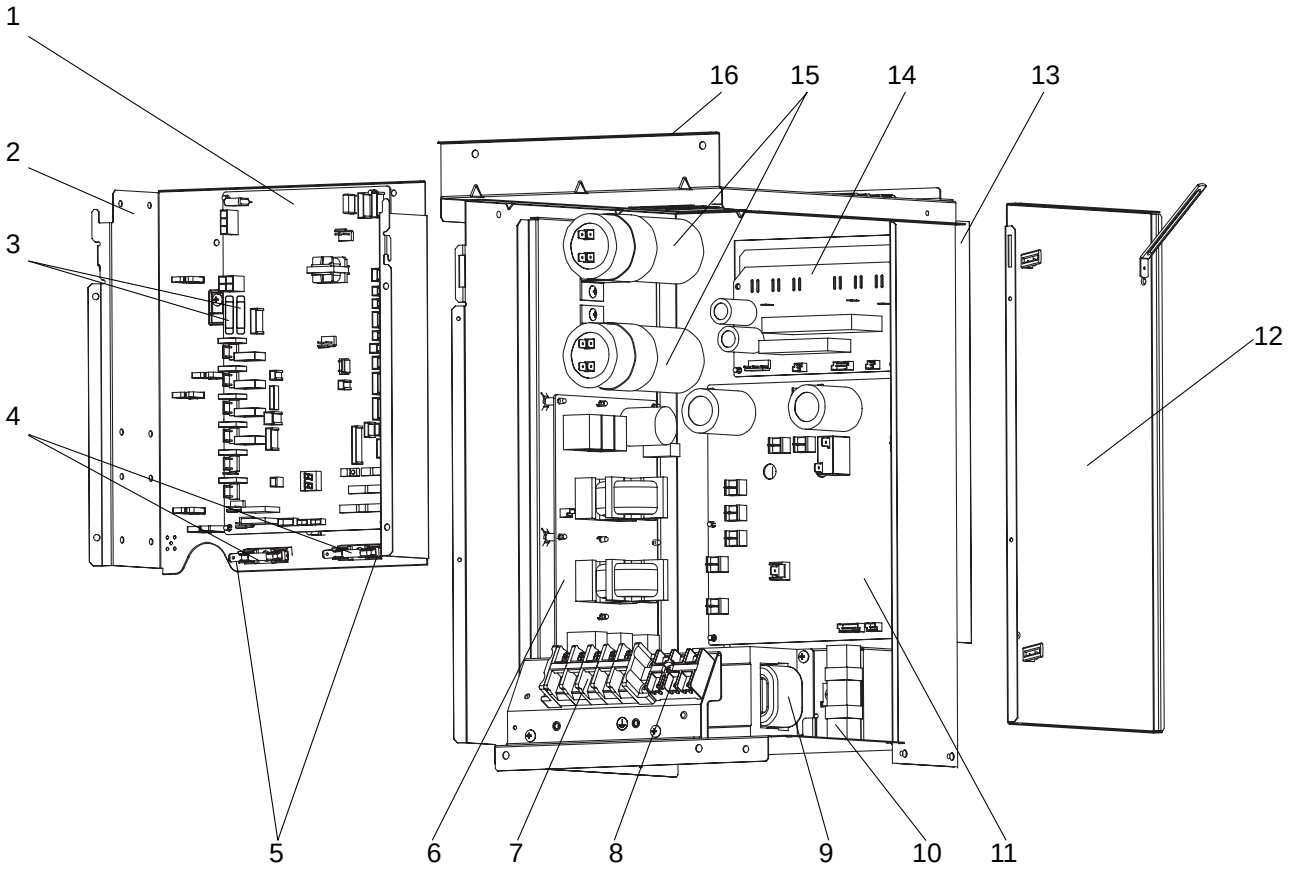
No.	Part No.	Part Name	Specification	Q'ty/set PUHZ RP8 YHA	Q'ty/set PUHZ RP10 YHA	Remarks (Drawing No.)	Wining Diagram Symbol	Recom-mended Q'ty	Price Unit	Price Amount
1	R01 E01 675	FAN GUARD		1	1					
2	R01 E05 662	SIDE PANEL (L)		1	1					
3	R01 E06 668	FRONT PANEL		1	1					
4	R01 E05 667	SERVICE PANEL		1	1					
5	R01 E06 658	COVER PANEL		1	1					
6	—	SEPARATOR		1	1	RG00N510G03				
7	R01 H75 202	THERMISTOR (OUTDOOR PIPE)		1	1		TH32			
8	—	HEAT SINK DUCT		1	1	RG00T950G05				
9	—	BASE		1	1	BG02Q044G08				
10	—	VALVE BED SUPPORT		1	1	BH02C038H01				
11	R01 E00 808	LEG		2	2					
12	—	SUPPORT		4	4	RG02N341H03				
13	—	VALVE BED		1	1	RG02N340G05				
14	—	SEPARATOR SUPPORT		1	1	RG02T894H03				
15	—	DRAIN DUCT		1	1	RG00T951G03				
16	R01 E74 202	THERMISTOR (OUTDOOR PIPE)		1	1		TH3			
17	R01 H76 202	THERMISTOR (OUTDOOR)		1	1		TH6,TH7			
18	—	HEAT EXCHANGER JOINT		1	1	RG02N346G10				
19	R01 E10 661	SIDE PANEL (R)		1	1					
20	R01 E07 667	REAR PANEL		1	1					
21	R01 E03 698	REAR GUARD		1	1					
22	R01 E66 408	HEAT EXCHANGER (1)		1	1					
23	—	COIL PLATE (1)		1	1	RG02N397H05				
24	—	COIL PLATE (2)		1	1	RG02N397K05				
25	R01 E39 409	HEAT EXCHANGER (2)		1	1					
26	—	TOP FRAME		1	1	RG00N473G09				
㉗	—	LABEL (MITSUBISHI)		1	1	DG79R130H01				
㉘	—	LABEL (INVERTER)		1	1	BK79C208G02				
㉙	—	ELECTRICAL PARTS BOX PEDESTAL		1	1	RG02T748H04				
㉚	—	SENSOR HOLDER		1	1	BG25V080H03				
㉛	—	SEPARATOR CAP		2	2	RG02T749H04				

FUNCTIONAL PARTS
PUHZ-RP8YHA
PUHZ-RP10YHA



No.	Part No.	Part Name	Specification	Q'ty/set PUHZ RP8	Q'ty/set PUHZ RP10	Remarks (Drawing No.)	Wining Diagram Symbol	Recommended Q'ty	Price Unit	Price Amount
				YHA	YHA					
1	T97 410 741	MOTOR FOR COMPRESSOR	ANV47FFBMT	1	1		MC			
2	R01 E20 242	LINEAR EXPANSION VALVE COIL		1	1					
3	R01 E59 401	LINEAR EXPANSION VALVE		1	1		LEV			
4	R01 E06 413	CHARGE PLUG		1	1					
5	R01 E05 413	CHARGE PLUG		1	1					
6	R01 E09 410	STOP VALVE	3/8F	1						
	R01 E08 410	STOP VALVE	1/2F		1					
7	R01 E00 450	STRAINER		1						
	R01 30L 450	STRAINER			1					
8	R01 E07 410	STOP VALVE	1F	1	1					
9	R01 E00 570	GASKET		1	1					
10	R01 E00 417	FRANG ASSY		1						
	T7W E01 417	FRANG ASSY			1					
11	R01 E01 450	STRAINER		1	1					
12	R01 E02 450	STRAINER		2	2					
13	T7W E07 242	SOLENOID COIL (FOUR-WAY VALVE)		1	1		21S4			
14	R01 E11 403	SOLENOID VALVE (FOUR-WAY VALVE)		1	1					
15	R01 E02 490	OIL SEPARATOR		1	1					
16	T7W E06 242	SOLENOID COIL (BYPASS VALVE)		1	1					
17	R01 E03 428	SOLENOID VALVE (BYPASS VALVE)		1	1		SV			
18	T7W E03 208	HIGH PRESSURE SWITCH		1	1		63H			
19	R01 25T 209	LOW PRESSURE SWITCH		1	1		63L			
20	T7W E13 440	ACCUMULATOR		1	1					
㉑	R01 E00 201	THERMISTOR (DISCHARGE)		1	1		TH4			
㉒	—	SOUND INSULATION		1	1	RG33N368G03				
㉓	R01 E19 425	CAPILLARY TUBE	3.0×1.0×1000	1	1					
㉔	R01 E20 425	CAPILLARY TUBE	3.0×1.0×300	1	1					

ELECTRICAL PARTS
PUHZ-RP8YHA
PUHZ-RP10YHA



No.	Part No.	Part Name	Specification	Q'ty/set		Remarks (Drawing No.)	Wining Diagram Symbol	Recom-mended Q'ty	Price	
				PUHZ					Unit	Amount
				RP8	RP10					
				YHA						
1	T7W E23 315	CONTROLLER CIRCUIT BOARD		1	1		C.B.			
2	—	CIRCUIT BOARD SUPPORT PLATE		1	1	RG02N450G10				
3	R01 E02 239	FUSE	250V 6.3A	2	2		FUSE3,4			
4	R01 E03 239	FUSE	250V 15A	2	2		FUSE1,2			
5	R01 30L 241	FUSE HOLDER		2	2					
6	T7W E06 346	NOISE FILTER CIRCUIT BOARD		1	1		N.F.			
7	T7W E06 716	TERMINAL BLOCK (POWER SUPPLY)	5P(L1,L2,L3,N,⏚)	1	1		TB1			
8	T7W E22 716	TERMINAL BLOCK (INDOOR / OUTDOOR)	3P(S1,S2,S3)	1	1		TB2			
9	T7W E05 259	REACTOR	2.7mH 25A	1	1		DCL			
10	R01 E08 233	RUSH CURRENT PROTECT RESISTOR		1	1		RS			
11	T7W E11 313	POWER CIRCUIT BOARD		1	1		P.B.			
12	—	ELECTRICAL PARTS BOX RIGHT SIDE PLATE		1	1	RG02N349G06				
13	—	HEAT SINK		1	1	RG11N336G05				
14	T7W E38 310	FAN CONTROLLER CIRCUIT BOARD		1	1		F.C.			
15	T7W E03 254	MAIN SMOOTHING CAPACITOR		2	2		CB1, 2			
16	—	ELECTRICAL PARTS BOX		1	1	RG00N768G02				
⑰	—	WATERPROOF SHEET FOR THE ELECTRICAL PARTS		1	1	BH00C028G10				

16 OPTIONAL PARTS

Parts name		RP8·RP10 Parts No.
Distribution pipe	Twin	MSDD-50WR-E
	Triple	MSDT-111R-E
	Quadruple	MSDF-1111R-E
Joint pipe		PAC-SG73RJ-E (ϕ9.52 → ϕ12.7)
Centralized drain kit		PAC-SG92DS-E
Air guide	Front, Rear	PAC-SG86AG-E
	Left, Right	PAC-SG87AG-E
Filter dryer	ϕ9.52	PAC-SG82DR-E
	ϕ12.7	PAC-SG85DR-E
A-control interface board	Main	PAC-SK73MI-E
	Sub	PAC-SK80SI-E
M-NET adapter		PAC-SF60MA-E

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Distributed in Nov. 2004 No.OC317 PDF 9
Made in Japan.

New publication, effective Nov. 2004
Specifications subject to change without notice.