Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

No. OCT04
REVISED EDITION-A

# SERVICE TECHNICAL GUIDE R410A

**<Indoor unit>**
**[Model names]** **[Service Ref.]**

| [Model names] | [Service Ref.] |
|---|---|
| PLA-RP·AA | PLA-RP·AA |
| | PLA-RP·AA$_1$ |
| | PLA-RP·AA.UK |
| | PLA-RP·AA$_1$.UK |
| PKA-RP·GAL | PKA-RP·GAL |
| PKA-RP·FAL | PKA-RP·FAL |
| PCA-RP·GA | PCA-RP·GA |
| PEA-RP·EA | PEA-RP·EA.TH-A |
| PEAD-RP·EA | PEAD-RP·EA.UK |
| | PEAD-RP·EA$_1$.UK |
| PEAD-RP·GA | PEAD-RP·GA.UK |

**<Outdoor unit>**
**[Model names]** **[Service Ref.]**

| [Model names] | [Service Ref.] |
|---|---|
| PUHZ-RP·VHA | PUHZ-RP·VHA |
| | PUHZ-RP·VHA$_1$ |
| | PUHZ-RP·VHA-A |
| | PUHZ-RP·VHA$_1$-A |

**Revision:**
- PKA-RP•GAL, PKA-RP•FAL, PCA-RP•GA, PEAD-RP•GA, PUHZ-RP•VHA$_1$ and PUHZ-RP•VHA$_1$-A are added in REVISED EDITION-A.
- Please void OCT04.

## CONTENTS



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# 1 PAIRING TABLE OF THE INDOOR AND OUTDOOR UNITS

| | Indoor unit | | Outdoor unit | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Heat pump type | | | | | | |
| | | | PUHZ-RP | | | | | | |
| | Service Ref. | Service Manual No. | 1.6 | 2 | 2.5 | 3 | 4 | 5 | 6 |
| | | | VHA | VHA | VHA | VHA | VHA<br>VHA$_1$ | VHA<br>VHA$_1$ | VHA<br>VHA$_1$ |
| Heat pump without electric heater | PEAD-RP▪EA.UK<br>PEAD-RP▪EA$_1$.UK | — | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | PEAD-RP▪GA.UK | — | — | — | ○ | ○ | ○ | — | — |
| | PLA-RP▪AA<br>PLA-RP▪AA$_1$ | OC293<br>REVISED EDITION-B | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | PLA-RP▪AA.UK<br>PLA-RP▪AA$_1$.UK | OC297<br>REVISED EDITION-C | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | PKA-RP▪FAL | OC301<br>REVISED EDITION-A | — | — | ○ | ○ | ○ | — | — |
| | PKA-RP▪GAL | OC305 | ○ | ○ | — | — | — | — | — |
| | PCA-RP▪GA | OC311 | — | ○ | ○ | ○ | ○ | ○ | ○ |

| | Indoor unit | | Outdoor unit | | | |
|---|---|---|---|---|---|---|
| | | | Heat pump type | | | |
| | | | PUHZ-RP | | | |
| | Service Ref. | Service Manual No. | 3 | 4 | 5 | 6 |
| | | | VHA-A | VHA-A<br>VHA$_1$-A | VHA-A<br>VHA$_1$-A | VHA-A<br>VHA$_1$-A |
| Heat pump without electric heater | PLA-RP▪AA<br>PLA-RP▪AA$_1$ | OC293<br>REVISED EDITION-B | ○ | ○ | ○ | ○ |
| | PEA-RP▪EA.TH-A | OC299<br>REVISED EDITION-A | ○ | ○ | ○ | ○ |
| | PKA-RP▪FAL | OC301<br>REVISED EDITION-A | ○ | ○ | — | — |
| | PCA-RP▪GA | OC311 | ○ | ○ | ○ | ○ |

# 2 SPECIFICATIONS FOR ELECTRICAL WORK

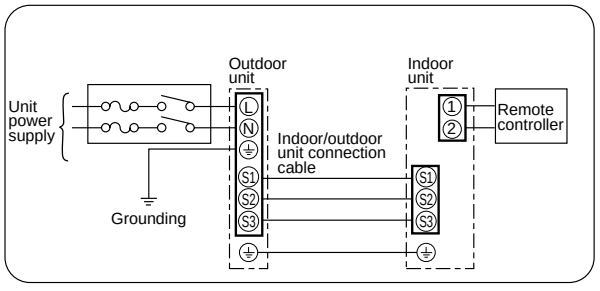
## 2-1. Field electrical wiring(power wiring specifications)
## PUHZ-RP•VHA
## PUHZ-RP•VHA-A

| Indoor unit model | | RP1.6, 2V | RP2.5, 3V | RP4, 5V | RP6V |
|---|---|---|---|---|---|
| Outdoor unit power supply | | ~ / N (Single) 50Hz, 220-230-240V | | | |
| Outdoor unit input capacity *1<br>Main switch (Breaker) | | 16A | 25A | 32A | 40A |
| Wiring Wire No. × size ($mm^2$) | Outdoor unit power supply | 2 × Min. 1.5 | 2 × Min. 2.5 | 2 × Min. 4 | 2 × Min. 6 |
| | Outdoor unit power supply earth | 1 × Min. 1.5 | 1 × Min. 2.5 | 1 × Min. 4 | 1 × Min. 6 |
| | Indoor unit - Outdoor unit *2 | 3 × 2.5 (polar) | | | |
| | Indoor unit - Outdoor unit earth | 1 × Min. 2.5 | 1 × Min. 2.5 | 1 × Min. 2.5 | 1 × Min. 2.5 |
| | Remote controller - Indoor unit *3 | 2 × 0.69 (Non-polar) | | | |
| Circuit rating | Outdoor unit L-N *4 | AC 220-230-240V | | | |
| | Indoor unit-Outdoor unit S1-S2 *4 | AC220-230-240V | | | |
| | Indoor unit-Outdoor unit S2-S3 *4 | DC24V | | | |
| | Remote controller - Indoor unit *4 | DC14V | | | |

*1 A breaker with at least 3mm contact separation in each poles shall be provided.
Use non-fuse breaker (NF) or earth leakage breaker (NV).
*2 Max. 50m Total Max, including all indoor/ indoor connection is 80m.
*3 10m wire is attached in the remote controller accessory.
*4 The figures are NOT always against the ground.
S3 terminal has DC24V against S2 terminal. However, between S3 and S1, these terminals are NOT electrically insulated by the transformer or other device.

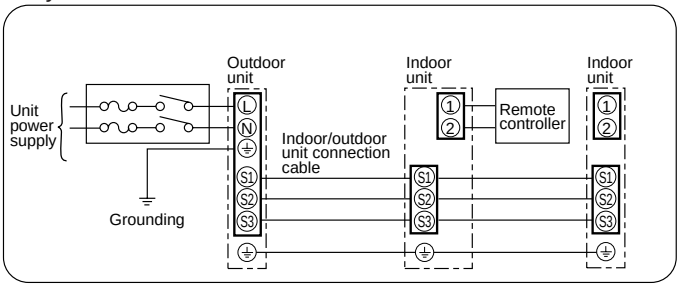
**Notes:** 1. Wiring size must comply with the applicable local and national code.
2. Power supply cords and indoor/ Outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (design 254 IEC 57)
3. Install an earth longer and thicker than other cables.

**1:1 system**

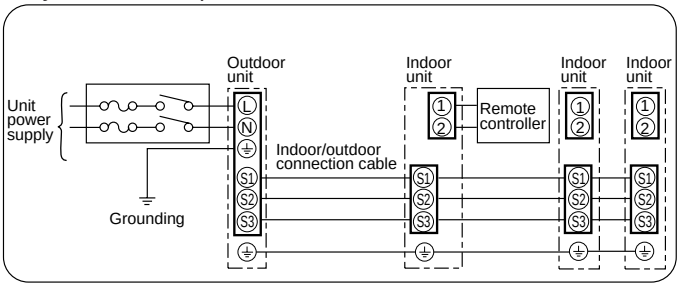



**Synchronized twin and triple system Electrical wiring**

• Synchronized twin




• Synchronized triple



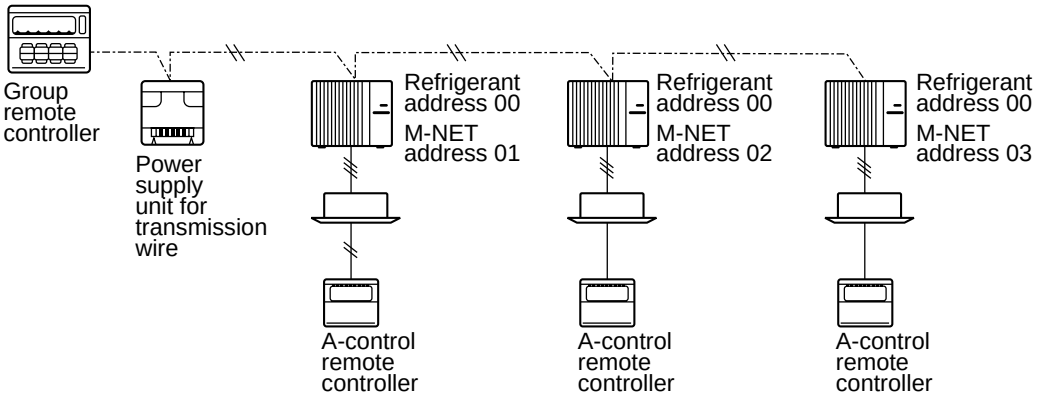
## 2-2. M-NET wiring method

(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.

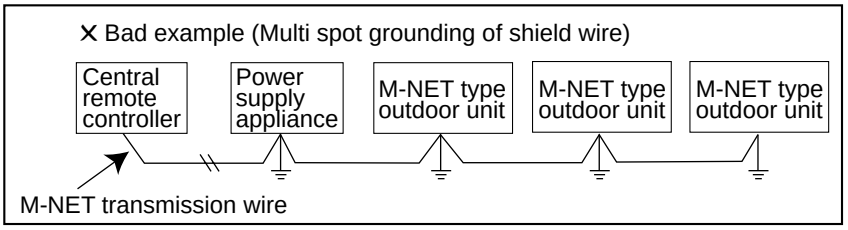


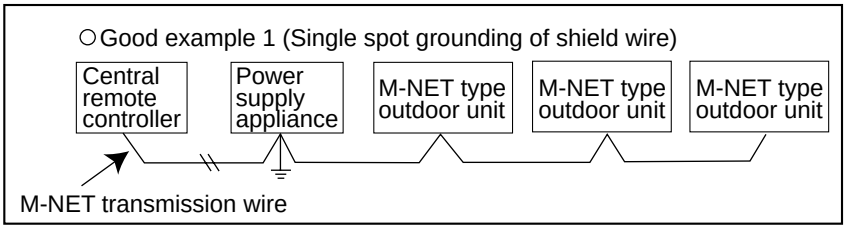

It would be ok if M-NET wire (non-polar, 2-cores) is arranged in addition to the wiring for A-control.

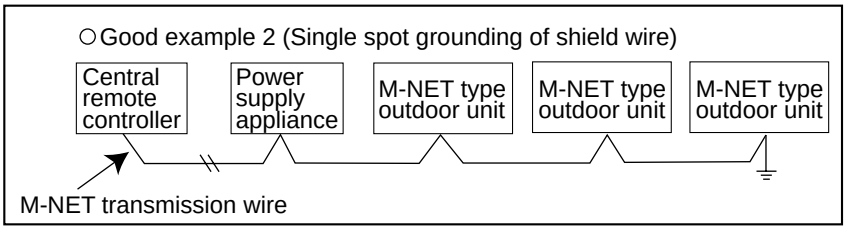
(4) Ground only one of any appliances through M-NET transmission wire (shield wire). Communication error may occur due to the influence of electromagnetic noise.

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

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



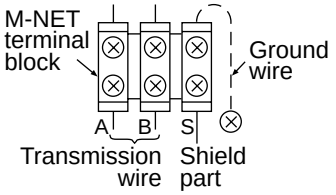




If there are more than two grounding spots on the shield wire, noise may enter into the shield wire because the ground wire and shield wire form one circuit and the electric potential difference occurs due to the impedance difference among grounding spots. In case of single spot grounding, noise does 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.




### 2-2-1. 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.

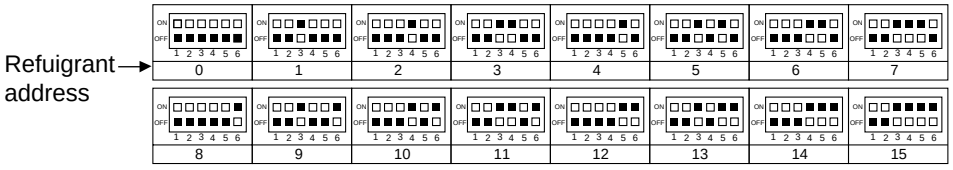
Address number can be set by using rotary switches (SW11 for ones digit and SW12 for tens digit), which is located on the M-NET board of outdoor unit.
(Factory setting: all addresses are set to "0".)

<Setting example>

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

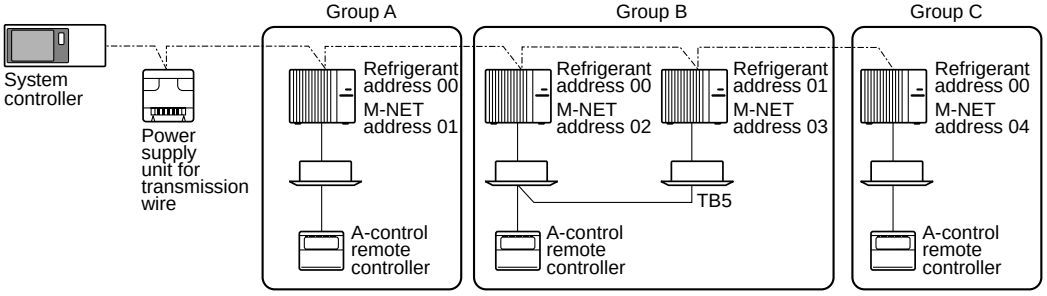
### 2-2-2. Refrigerant address setting

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 board. [Factory setting: all switches are OFF. (All refrigerant addresses are "00".)]

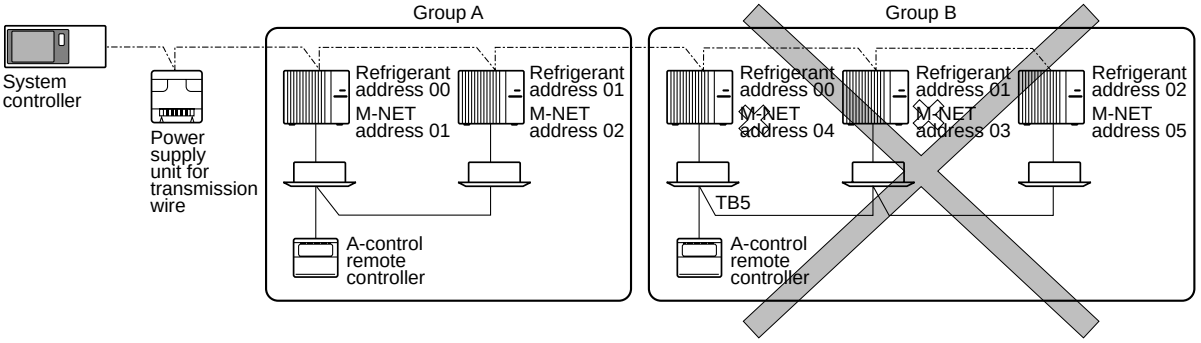



### 2-2-3. Regulations in address settings

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.



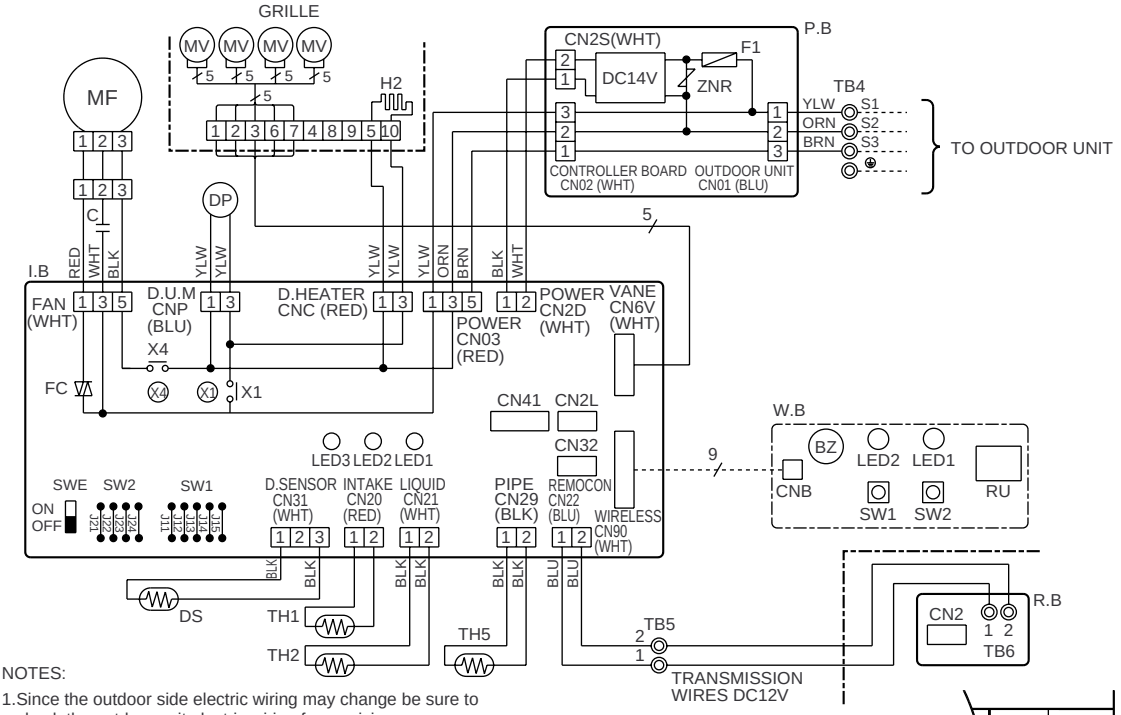

※ In group B, M-NET address of the outdoor unit whose refrigerant address is "00" is not set to the minimum in the group. As "3" is right for this situation, the setting is wrong. Taking group A as a good sample, set the minimum M-NET address in the group for the outdoor unit whose refrigerant address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

# 3 WIRING DIAGRAM

**PLA-RP1.6AA** **PLA-RP2AA** **PLA-RP2.5AA**
**PLA-RP1.6AA.UK** **PLA-RP2AA.UK** **PLA-RP2.5AA.UK**
**PLA-RP3AA** **PLA-RP4AA** **PLA-RP5AA** **PLA-RP6AA**
**PLA-RP3AA$_1$** **PLA-RP4AA$_1$** **PLA-RP5AA$_1$** **PLA-RP6AA$_1$**
**PLA-RP3AA.UK** **PLA-RP4AA.UK** **PLA-RP5AA.UK** **PLA-RP6AA.UK**
**PLA-RP3AA$_1$.UK** **PLA-RP4AA$_1$.UK** **PLA-RP5AA$_1$.UK** **PLA-RP6AA$_1$.UK**

[LEGEND]

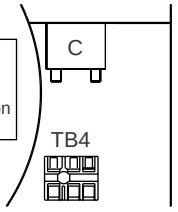
| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| P.B | INDOOR POWER BOARD | MV | VANE MOTOR | W.B | WIRELESS REMOTE CONTROLLER BOARD |
| F1 | FUSE (4A) | DP | DRAIN PUMP | RU | RECEIVING UNIT |
| ZNR | VARISTOR | DS | DRAIN SENSOR | BZ | BUZZER |
| I.B | INDOOR CONTROLLER BOARD | H2 | DEW PREVENTION HEATER | LED1 | LED (RUN INDICATOR) |
| CN2L | CONNECTOR (LOSSNAY) | TB4 | TERMINAL BLOCK (INDOOR/OUTDOOR CONNECTING LINE) | LED2 | LED (HOT ADJUST) |
| CN32 | CONNECTOR (REMOTE SWITCH) | TB5 | TERMINAL BLOCK (REMOTE CONTROLLER TRANSMISSION LINE) | SW1 | SWITCH (HEATING ON/OFF) |
| CN41 | CONNECTOR (HA TERMINAL-A) | | | SW2 | SWITCH (COOLING ON/OFF) |
| SW1 | JUMPER WIRE (MODEL SELECTION) | TH1 | ROOM TEMPERATURE THERMISTOR (0℃/15kΩ, 25℃/5.4kΩ DETECT) | | |
| SW2 | JUMPER WIRE (CAPACITY CORD) | | | | |
| SWE | SWITCH (EMERGENCY OPERATION) | TH2 | PIPE TEMPERATURE THERMISTOR/LIQUID (0℃/15kΩ, 25℃/5.4kΩ DETECT) | | |
| X1 | RELAY (DRAIN PUMP) | | | | |
| X4 | RELAY (FAN MOTOR) | TH5 | COND./EVA. TEMPERATURE THERMISTOR (0℃/15kΩ, 25℃/5.4kΩ DETECT) | | |
| FC | FAN PHASE CONTROL | | | | |
| LED1 | POWER SUPPLY (I.B) | R.B | REMOTE CONTROLLER BOARD | | |
| LED2 | POWER SUPPLY (I.B) | CN2 | CONNECTOR (PROGRAM TIMER) | | |
| LED3 | TRANSMISSION (INDOOR-OUTDOOR) | TB6 | TERMINAL BLOCK (REMOTE CONTROLLER TRANSMISSION LINE) | | |
| C | CAPACITOR (FAN MOTOR) | | | | |
| MF | FAN MOTOR | | | | |




NOTES:

1. Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2. Indoor and outdoor connecting wires are made with polarities, make wiring matching terminal numbers (S1,S2,S3).
3. Symbols used in wiring diagram above are, ☐☐☐ :Connector, ◎:Terminal (block).

Please set the voltage using the remote controller.
For the setting method, please refer to the indoor unit Installation Manual.



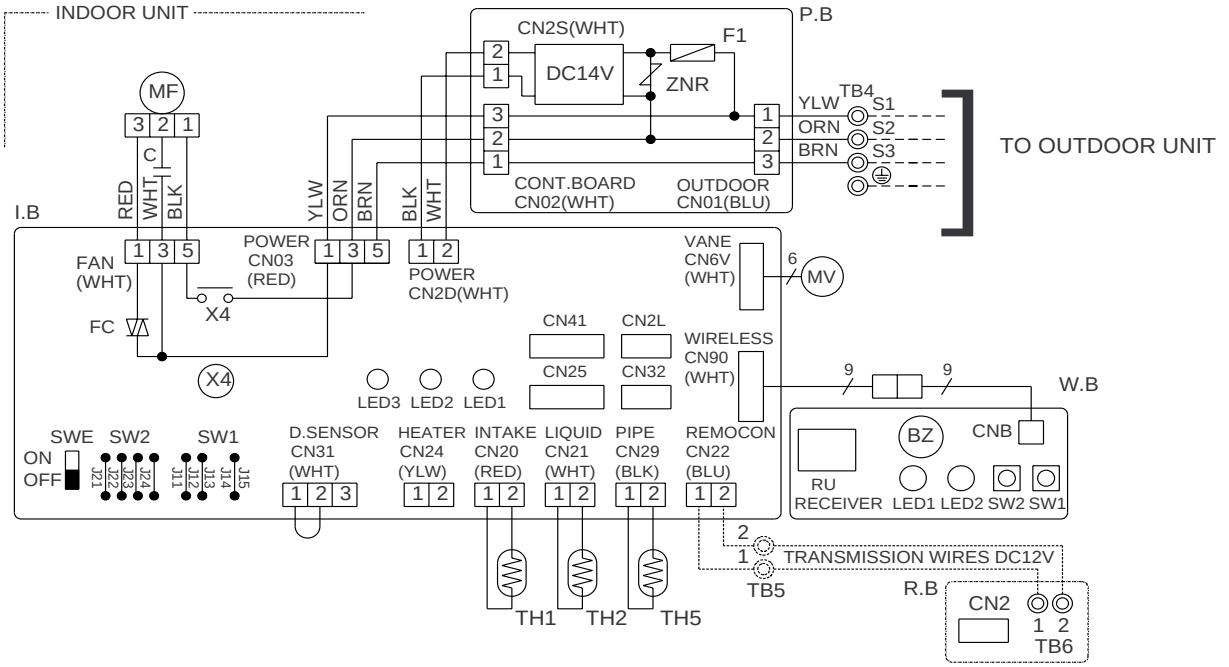

[Servicing]

Fasten terminal of the terminal board "TB4" equips lock system.
To remove the fastened terminal, pull it while pressing the protruding portion (locking lever) of the terminal. The fastened terminal protruding portion should face upward.

| SW1 | | |
|---|---|---|
| MODELS | Manufacture | Service board |
| PLA-RP1.6,2,2.5AA<br>PLA-RP3,4,5,6AA<br>PLA-RP3,4,5,6AA$_1$ | J11J12J13J14J15 | 1 2 3 4 5 ON OFF |

| SW2 | | | | | |
|---|---|---|---|---|---|
| MODELS | Manufacture | Service board | MODELS | Manufacture | Service board |
| PLA-RP1.6AA | J21J22J23J24 | 1 2 3 4 ON OFF | PLA-RP4AA<br>PLA-RP4AA$_1$ | J21J22J23J24 | 1 2 3 4 ON OFF |
| PLA-RP2AA | J21J22J23J24 | 1 2 3 4 ON OFF | PLA-RP5AA | J21J22J23J24 | 1 2 3 4 ON OFF |
| PLA-RP2.5AA | J21J22J23J24 | 1 2 3 4 ON OFF | PLA-RP5AA$_1$<br>PLA-RP6AA<br>PLA-RP6AA$_1$ | J21J22J23J24 | 1 2 3 4 ON OFF |
| PLA-RP3AA<br>PLA-RP3AA$_1$ | J21J22J23J24 | 1 2 3 4 ON OFF | | | |

## PKA-RP1.6GAL PKA-RP2GAL




Please set the voltage using the remote controller.
For the setting method,please refer to the indoor unit Installation Manual.

| SW1 | | SW2 | | | | | |
|---|---|---|---|---|---|---|---|
| Manufacture | Service board | MODELS | Manufacture | Service board | MODELS | Manufacture | Service board |
| J11 J12 J13 J14 J15 | 1 2 3 4 5 ON OFF | 1.6GAL | J21 J22 J23 J24 | 1 2 3 4 ON OFF | 2GAL | J21 J22 J23 J24 | 1 2 3 4 ON OFF |

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| P.B | INDOOR POWER BOARD | C | CAPACITOR(FAN MOTOR) | W.B | WIRELESS REMOTE CONTROLLER BOARD |
| F1 | FUSE(4A) | MF | FAN MOTOR | RU | RECEIVING UNIT |
| ZNR | VARISTOR | MV | VANE MOTOR | BZ | BUZZER |
| I.B | INDOOR CONTROLLER BOARD | TB4 | TERMINAL BLOCK(INDOOR/OUTDOOR CONNECTING LINE) | LED1 | LED(RUN INDICATOR) |
| CN2L | CONNECTOR(LOSSNAY) | | | LED2 | LED(HOT ADJUST) |
| CN32 | CONNECTOR(REMOTE SWITCH) | TB5 | TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)(OPTION) | SW1 | SWITCH(HEATING ON/OFF) |
| CN41 | CONNECTOR(HA TERMINAL-A) | | | SW2 | SWITCH(COOLING ON/OFF) |
| SW1 | JUMPER WIRE(MODEL SELECTION) | TH1 | ROOM TEMP.THERMISTOR (0°C/15kΩ,25°C/5.4kΩ DETECT) | R.B | REMOTE CONTROLLER BOARD(OPTION) |
| SW2 | JUMPER WIRE(CAPACITY CORD) | | | CN2 | CONNECTOR(PROGRAM TIMER) |
| SWE | SWITCH(EMERGENCY OPERATION) | TH2 | PIPE TEMP.THERMISTOR/LIQUID (0°C/15kΩ,25°C/5.4kΩ DETECT) | TB6 | TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE) |
| X4 | RELAY(FAN MOTOR) | | | | |
| FC | FAN PHASE CONTROL | TH5 | COND./EVA.TEMP.THERMISTOR (0°C/15kΩ,25°C/5.4kΩ DETECT) | | |
| LED1 | POWER SUPPLY(I.B) | | | | |
| LED2 | POWER SUPPLY(R.B) | | | | |
| LED3 | TRANSMISSION(INDOOR-OUTDOOR) | | | | |

NOTES:
1.Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2.Indoor and outdoor connecting wires are made with polarities,make wiring matching terminal numbers(S1,S2,S3).
3.Make sure that the main power supply of the booster heater is independent.
4.Symbols used in wiring diagram above are, □□□ :Connector, ◎ :Terminal (block).

[Self-diagnosis]

An explanation of the wireless remote controller self checking operations,check codes,buzzer sounds and LED signals are given below. For check codes and symptom see the table below please.

1.Press the CHECK button twice continuously.
- CHECK begins to light and refrigerant address display "00" begins to blink.
- Start this operation from the status of remote controller display turned off.

2.Press the TEMP ▼,▲ buttons.
- Set the refrigerant address of the indoor unit that is to be self-diagnosed.
- Set the refrigerant address of outdoor unit by outdoor unit dip switch "SW1". (Refer to installation manual of outdoor unit for the detail.)

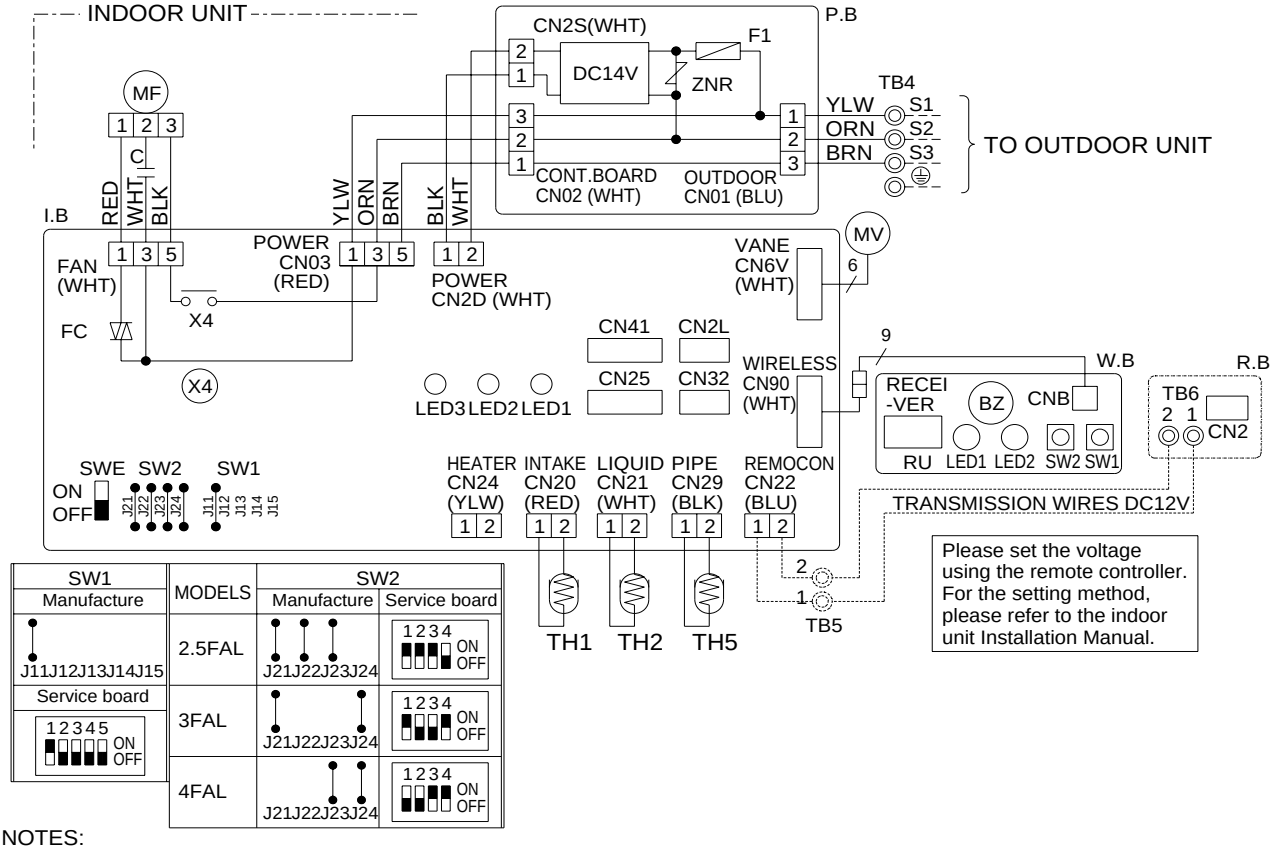
3.While pointing the remote controller toward the unit's receiver, press the h button.
- The check code will be indicated by the number of times that the buzzer sounds from the receiver section and the number of blinks of the operation lamp.

4.While pointing the remote controller toward the unit's receiver, press the ON/OFF ⏻ button.
- Self-check mode is canceled.

| Check code | Operation lamp | Buzzer sound | Symptom |
|---|---|---|---|
| P1 | 1SEC.FLASH×1 | Single beep×1 | Abnormality of room temperature thermistor(TH1). |
| P2 | 1SEC.FLASH×2 | Single beep×2 | Abnormality of pipe temperature thermistor/Liquid(TH2). |
| P6 | 1SEC.FLASH×6 | Single beep×6 | Freezing /overheating protection is working. |
| P8 | 1SEC.FLASH×8 | Single beep×8 | Abnormality of pipe temperature. |
| P9 | 1SEC.FLASH×2 | Single beep×2 | Abnormality of pipe temperature thermistor/ Cond./Eva.(TH5). |
| U0~UL F1~F9 | (0.4+0.4)SEC.FLASH×1 | Double beep×1 | Abnormality in outdoor unit. Refer to outdoor unit wiring diagram. |
| E6~EF | DIFFERENT FROM ABOVE | Sounds other than above | Abnormality of signal transmission between indoor unit and outdoor unit ("EE" indicates abnormality of combination). |
| ---- | OFF | No sound | No trouble generated in the past. |
| FFFF | OFF | Triple beep | No corresponding unit. |

## PKA-RP2.5FAL PKA-RP3FAL PKA-RP4FAL

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| P.B | INDOOR POWER BOARD | C | CAPACITOR(FAN MOTOR) | W.B | WIRELESS REMOTE CONTROLLER BOARD |
| F1 | FUSE(4A) | MF | FAN MOTOR | RU | RECEIVING UNIT |
| ZNR | VARISTOR | MV | VANE MOTOR | BZ | BUZZER |
| I.B | INDOOR CONTROLLER BOARD | TB4 | TERMINAL BLOCK(INDOOR/OUTDOOR CONNECTING LINE) | LED1 | LED(RUN INDICATOR) |
| CN2L | CONNECTOR(LOSSNAY) | | | LED2 | LED(HOT ADJUST) |
| CN32 | CONNECTOR(REMOTE SWITCH) | TB5 | TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)(OPTION) | SW1 | SWITCH(HEATING ON/OFF) |
| CN41 | CONNECTOR(HA TERMINAL-A) | | | SW2 | SWITCH(COOLING ON/OFF) |
| SW1 | JUMPER WIRE(MODEL SELECTION) | TH1 | ROOM TEMPERATURE THERMISTOR (0°C/15kΩ, 25°C/5.4kΩ DETECT) | R.B | REMOTE CONTROLLER BOARD(OPTION) |
| SW2 | JUMPER WIRE(CAPACITY CODE) | | | CN2 | CONNECTOR(SCHEDULE TIMER) |
| SWE | SWITCH(EMERGENCY OPERATION) | TH2 | PIPE TEMPERATURE THERMISTOR/LIQUID (0°C/15kΩ, 25°C/5.4kΩ DETECT) | TB6 | TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE) |
| X4 | RELAY(FAN MOTOR) | | | | |
| FC | FAN PHASE CONTROL | TH5 | CONDENSER / EVAPORATOR TEMPERATURE THERMISTOR (0°C/15kΩ, 25°C/5.4kΩ DETECT) | | |
| LED1 | POWER SUPPLY(I.B) | | | | |
| LED2 | POWER SUPPLY(R.B) | | | | |
| LED3 | TRANSMISSION(INDOOR-OUTDOOR) | | | | |




| SW1 | MODELS | SW2 | |
|---|---|---|---|
| Manufacture | | Manufacture | Service board |
| J11J12J13J14J15 | 2.5FAL | J21J22J23J24 | 1234 ON OFF |
| Service board | 3FAL | J21J22J23J24 | 1234 ON OFF |
| 12345 ON OFF | 4FAL | J21J22J23J24 | 1234 ON OFF |

NOTES:

1.Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2.Indoor and outdoor connecting wires are made with polarities, make wiring matching terminal numbers(S1, S2, S3).
3.Symbols used in wiring diagram above are, □□□ :Connector, ◎:Terminal (block).

[Self-diagnosis]

An explanation of the wireless remote controller self checking operations, check codes, buzzer sounds and LED signals are given below. For check codes and symptom see the table below please.

1.Press the CHECK button twice continuously.
- CHECK begins to light and refrigerant address display "00" begins to blink.
- Start this operation from the status of remote controller display turned off.

2.Press the TEMP ▼ , ▲ buttons.
- Set the refrigerant address of the indoor unit that is to be self-diagnosed.
- Set the refrigerant address of outdoor unit by outdoor unit dip switch "SW1". (Refer to installation manual of outdoor unit for the detail.)

3.While pointing the remote controller toward the unit's receiver, press the h button.
- The check code will be indicated by the number of times that the buzzer sounds from the receiver section and the number of blinks of the operation lamp.

4.While pointing the remote controller toward the unit's receiver, press the ON/OFF ⏻ button.
- Self-check mode is canceled.

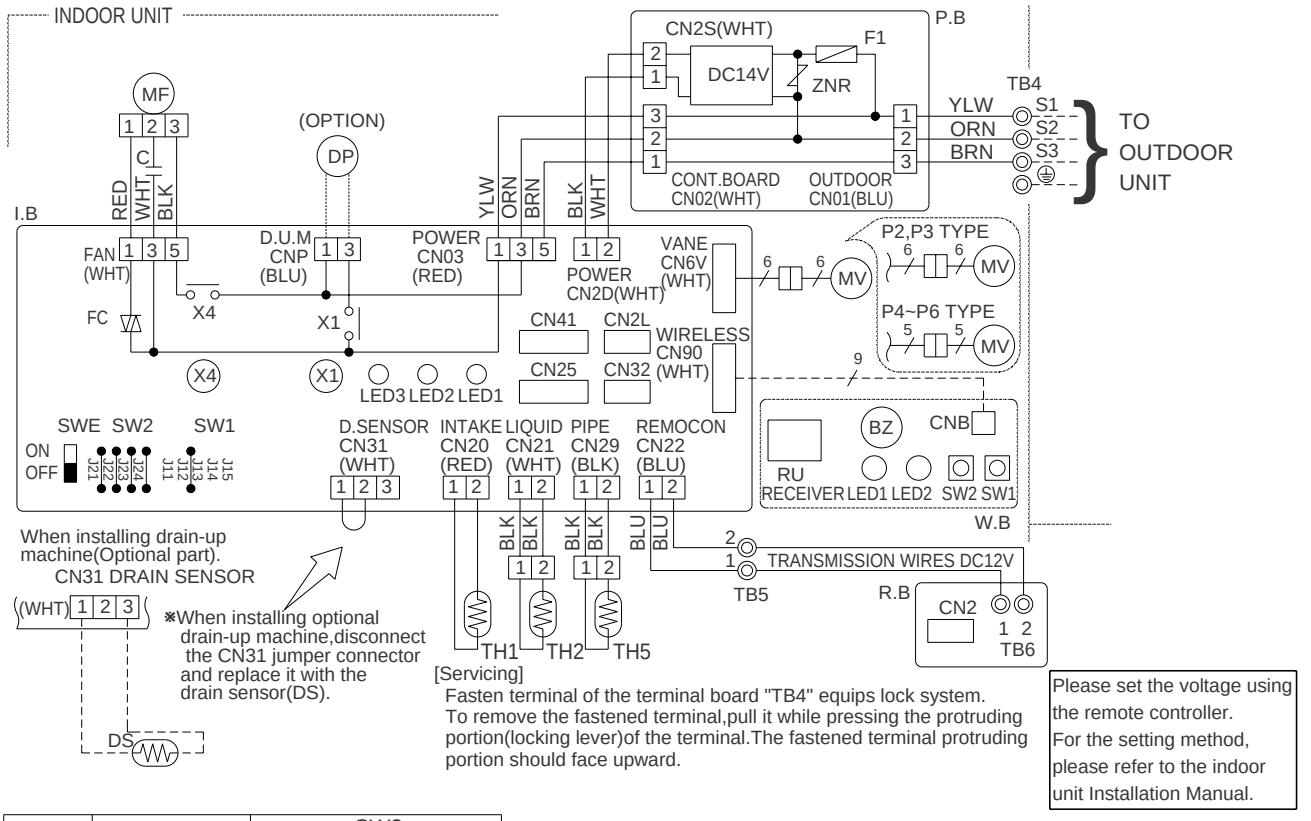
| Check code | Operation lamp | Buzzer sound | Symptom |
|---|---|---|---|
| P1 | 1SEC.FLASH X 1 | Single beep X 1 | Abnormality of room temperature thermistor(TH1). |
| P2 | 1SEC.FLASH X 2 | Single beep X 2 | Abnormality of pipe temperature thermistor/Liquid(TH2). |
| P4 | 1SEC.FLASH X 4 | Single beep X 4 | Abnormality of drain sensor(DS). |
| P5 | 1SEC.FLASH X 5 | Single beep X 5 | Malfunction of drain-up machine. |
| P6 | 1SEC.FLASH X 6 | Single beep X 6 | Freezing /overheating protection is working. |
| P8 | 1SEC.FLASH X 8 | Single beep X 8 | Abnormality of pipe temperature. |
| P9 | 1SEC.FLASH X 2 | Single beep X 2 | Abnormality of pipe temperature thermistor/ Condenser/Evaporator(TH5). |
| U0~UL | (0.4+0.4)SEC.FLASH X 1 | Double beep X 1 | Abnormality in outdoor unit. Refer to outdoor unit wiring diagram. |
| F1~F9 | | | |
| E6~EF | DIFFERENT FROM ABOVE | Sounds other than above | Abnormality of signal transmission between indoor unit and outdoor unit ("EE" indicates abnormality of combination). |
| ---- | OFF | No sound | No trouble generated in the past. |
| FFFF | OFF | Triple beep | No corresponding unit. |

## PCA-RP2GA PCA-RP2.5GA PCA-RP3GA
## PCA-RP4GA PCA-RP5GA PCA-RP6GA

| SYMBOL | | NAME |
|---|---|---|
| P.B | | INDOOR POWER BOARD |
| | F1 | FUSE(4A) |
| | ZNR | VARISTOR |
| I.B | | INDOOR CONTROLLER BOARD |
| | CN2L | CONNECTOR(LOSSNAY) |
| | CN32 | CONNECTOR(REMOTE SWITCH) |
| | CN41 | CONNECTOR(HA TERMINAL-A) |
| | SW1 | JUMPER WIRE(MODEL SELECTION) |
| | SW2 | JUMPER WIRE(CAPACITY CORD) |
| | SWE | SWITCH(EMERGENCY OPERATION) |
| | X1 | RELAY(DRAIN PUMP) |
| | X4 | RELAY(FAN MOTOR) |
| | FC | FAN PHASE CONTROL |
| | LED1 | POWER SUPPLY(I.B) |
| | LED2 | POWER SUPPLY(R.B) |
| | LED3 | TRANSMISSION(INDOOR-OUTDOOR) |
| C | | CAPACITOR(FAN MOTOR) |
| MF | | FAN MOTOR |

| SYMBOL | | NAME |
|---|---|---|
| MV | | VANE MOTOR |
| DP | | DRAIN-UP MACHINE(OPTION) |
| DS | | DRAIN SENSOR(OPTION) |
| TB4 | | TERMINAL BLOCK(INDOOR/OUTDOOR CONNECTING LINE) |
| TB5 | | TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE) |
| TH1 | | ROOM TEMP.THERMISTOR (0℃/15kΩ,25℃/5.4kΩ DETECT) |
| TH2 | | PIPE TEMP.THERMISTOR/LIQUID (0℃/15kΩ,25℃/5.4kΩ DETECT) |
| TH5 | | COND./EVA.TEMP.THERMISTOR (0℃/15kΩ,25℃/5.4kΩ DETECT) |
| R.B | | REMOTE CONTROLLER BOARD |
| | CN2 | CONNECTOR(SCHEDULE TIMER) |
| | TB6 | TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE) |
| TB2 | | TERMINAL BLOCK(HEATER) |

| SYMBOL | | NAME |
|---|---|---|
| W.B | | WIRELESS REMOTE CONTROLLER BOARD(OPTION) |
| | RU | RECEIVING UNIT |
| | BZ | BUZZER |
| | LED1 | LED(RUN INDICATOR) |
| | LED2 | LED(HOT ADJUST) |
| | SW1 | SWITCH(HEATING ON/OFF) |
| | SW2 | SWITCH(COOLING ON/OFF) |




[Servicing]
Fasten terminal of the terminal board "TB4" equips lock system.
To remove the fastened terminal,pull it while pressing the protruding portion(locking lever)of the terminal.The fastened terminal protruding portion should face upward.

Please set the voltage using the remote controller.
For the setting method, please refer to the indoor unit Installation Manual.

| MODELS | SW1 | SW2 Manufacture | SW2 Service board |
|---|---|---|---|
| 2GA | <For manufacture> J11 J12 J13 J14 J15 | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 2.5GA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 3GA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 4GA | <For service board> 1 2 3 4 5 ON OFF | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 5GA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 6GA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |

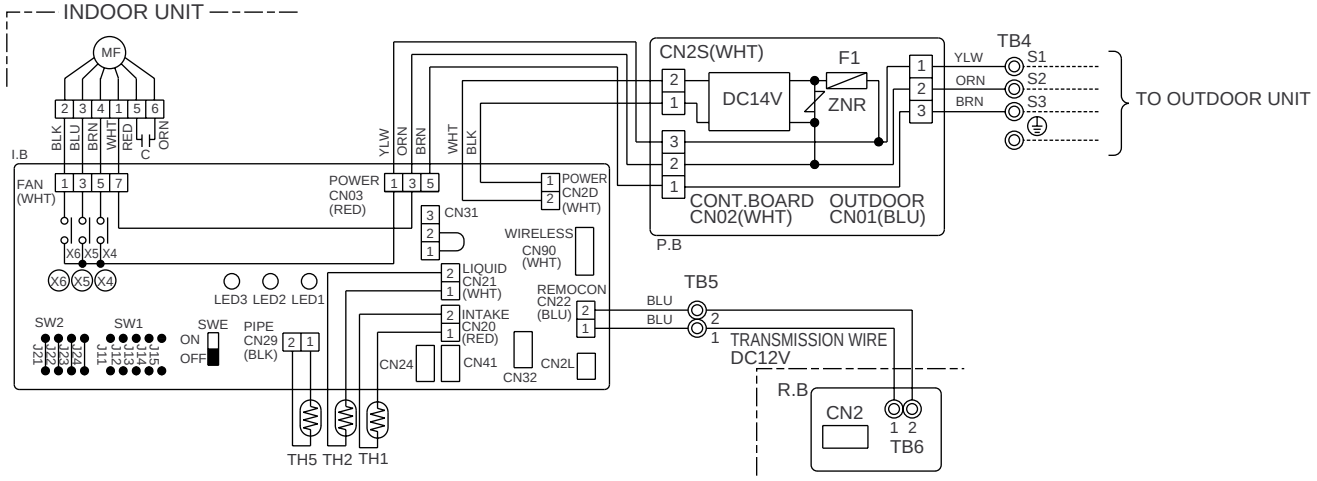
[Self-diagnosis]
1.For details on how to operate self-diagnosis with the wireless remote control,refer to the technical manuals etc.

NOTES:
1.Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2.Indoor and outdoor connecting wires are made with polarities,make wiring matching terminal numbers(S1,S2,S3).
3.Make sure that the main power supply of the booster heater is independent.
4.Symbols used in wiring diagram above are,
□□□ :Connector, ◎ : Terminal (block).

[Emergency operation procedure]
1.When the wired remote control or the indoor unit microcomputer has failed,but all other components work properly, if you set the switch(SWE) on the indoor control panel ON,the indoor unit will begin Emergency Operation.
When Emergency Operation is activated, the indoor unit operates as follows:
(1)Indoor fan is running at high speed.
(2)Drain-up machine(optional) is working.

## PEA-RP3EA.TH-A PEA-RP5EA.TH-A
## PEA-RP4EA.TH-A PEA-RP6EA.TH-A

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| I.B | INDOOR CONTROLLER BOARD | P.B | INDOOR POWER BOARD | C | CAPACITOR(FAN MOTOR) |
| CN2L | CONNECTOR(LOSSNAY) | F1 | FUSE(4A) | MF | FAN MOTOR |
| CN32 | CONNECTOR(REMOTE SWITCH)) | ZNR | VARISTOR | TB4 | TERMINAL BLOCK (INDOOR/OUTDOOR CONNECTING LINE) |
| CN41 | CONNECTOR(HA TERMINAL-A) | R.B | REMOTE CONTROLLER BOARD | | |
| LED1 | POWER SUPPLY(I.B) | CN2 | CONNECTOR(PROGRAM TIMER) | | |
| LED2 | POWER SUPPLY(R.B) | TB6 | TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSON LINE) | | |
| LED3 | TRANSMISSOION(INDOOR • OUTDOOR) | | | | |
| SW1 | JUMPER WIRE(MODEL SELECTION) | TH1 | ROOM TEMPERATURE THERMISTOR (0˚C/15kΩ, 25˚C/5.4kΩ DETECT) | | |
| SW2 | JUMPER WIRE(CAPACITY CORD) | | | | |
| SWE | SWITCH(EMERGENCY OPERATION) | TH2 | PIPE TEMPERATURE THERMISTOR/LIQUID (0˚C/15kΩ, 25˚C/5.4kΩ DETECT) | | |
| X4 | RELAY(FAN MOTOR) | | | | |
| X5 | RELAY(FAN MOTOR) | TH5 | COND./EVA. TEMPERATURE THERMISTOR (0˚C/15kΩ, 25˚C/5.4kΩ DETECT) | | |
| X6 | RELAY(FAN MOTOR) | | | | |




| MODELS | SW1 | SW2 | |
|---|---|---|---|
| | | Manufacture | Service board |
| 3EA | <For manufacture> | J21J22J23J24 | 1 2 3 4 ON OFF |
| 4EA | J11J12J13J14J15 | J21J22J23J24 | 1 2 3 4 ON OFF |
| 5EA | <For service board> | J21J22J23J24 | 1 2 3 4 ON OFF |
| 6EA | 1 2 3 4 5 ON OFF | J21J22J23J24 | 1 2 3 4 ON OFF |

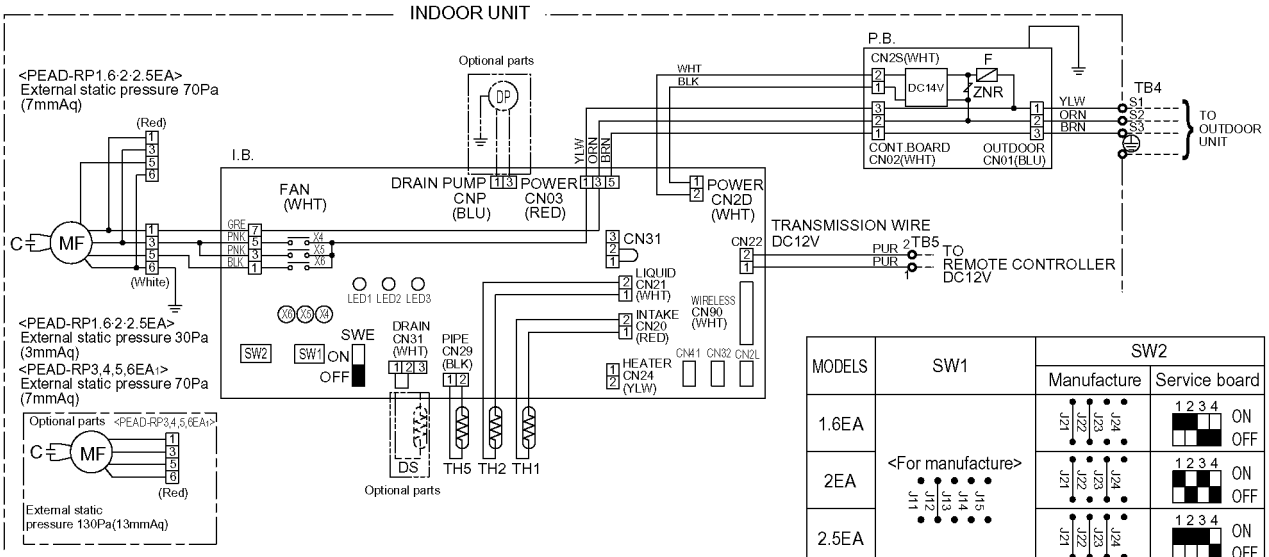
[NOTES]

1. Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2. Indoor and outdoor connecting wires are made with polarities,make wiring matching terminal numbers(S1,S2,S3).
3. Symbols used in wiring diagram above are, □□□:Connector, ◎:Terminal (block).

[Self diagnosis]

1. When pressing the CHECK switch twice on the remote controller,the unit changes to the self-diagnosis mode and will display the check code by LED(light Emitting Diode)
   Refer to the right table for the check codes and abnormarities.

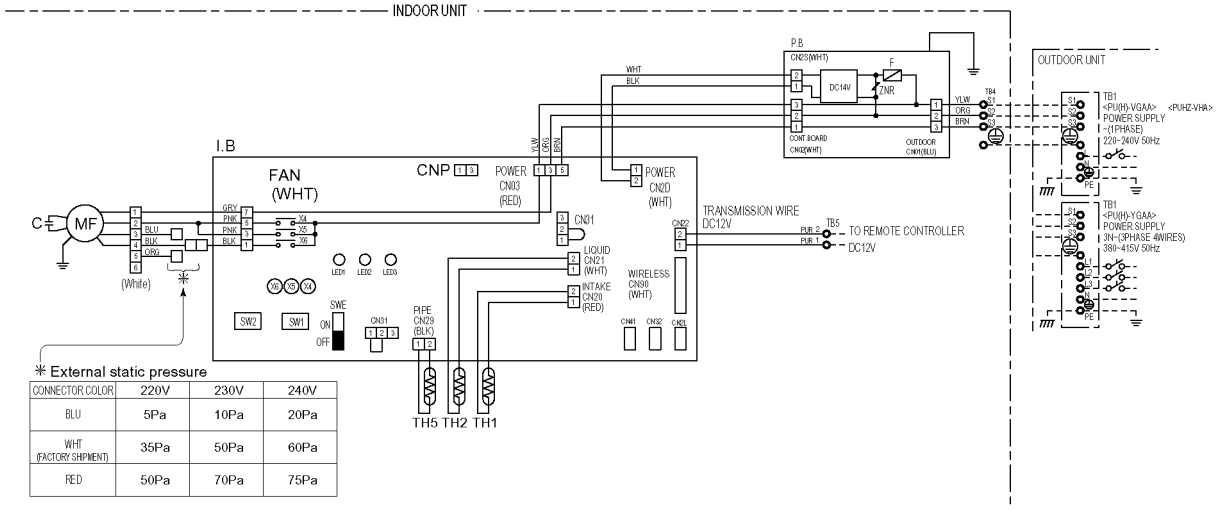
**PEAD-RP1.6EA.UK PEAD-RP2EA.UK PEAD-RP2.5EA.UK**
**PEAD-RP3EA.UK PEAD-RP4EA.UK PEAD-RP5EA.UK PEAD-RP6EA.UK**
**PEAD-RP3EA$_1$.UK PEAD-RP4EA$_1$.UK PEAD-RP5EA$_1$.UK PEAD-RP6EA$_1$.UK**




| MODELS | SW1 | SW2 | |
|---|---|---|---|
| | | Manufacture | Service board |
| 1.6EA | <For manufacture> J11 J12 J13 J14 J15 <For service board> 1 2 3 4 5 ON OFF | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 2EA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 2.5EA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 3EA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 4EA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 5EA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |
| 6EA | | J21 J22 J23 J24 | 1 2 3 4 ON OFF |

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| I.B. | INDOOR CONTROLLER BOARD | P.B. | INDOOR POWER BOARD | C | CAPACITOR(FAN MOTOR) |
| CN2L | CONNECTOR(LOSSNAY) | F1 | FUSE(4A) | MF | FAN MOTOR |
| CN32 | CONNECTOR(REMOTE SWITCH) | ZNR | VARISTOR | TB5 | TERMINAL BLOCK(REMOTE CONTROLLER) |
| CN41 | CONNECTOR(HA TERMINAL-A) | | | TB4 | TERMINAL BLOCK (INDOOR/OUTDOOR CONNECTING LINE) |
| LED1 | POWER SUPPLY(I.B.) | DRAIN PUMP | (OPTIONAL PARTS) | | |
| LED2 | POWER SUPPLY(REMOTE CONTROLLER) | DP | DRAIN PUMP | TH1 | ROOM TEMPERATURE THERMISTOR (0°C/15KΩ, 25°C/5.4KΩ DETECT) |
| LED3 | TRANSMISSION(INDOOR·OUTDOOR) | DS | DRAIN SENSOR | | |
| SW1 | JUMPER WIRE(MODEL SELECTION) | | | TH2 | PIPE TEMPERATURE THERMISTOR/LIQUID (0°C/15KΩ, 25°C/5.4KΩ DETECT) |
| SW2 | JUMPER WIRE(CAPACITY CORD) | | | | |
| SWE | SWITCH(EMERGENCY OPERATION) | | | TH5 | COND./EVA. TEMPERATURE THERMISTOR (0°C/15KΩ, 25°C/5.4KΩ DETECT) |
| X4 | RELAY(FAN MOTOR) | | | | |
| X5 | RELAY(FAN MOTOR) | | | | |
| X6 | RELAY(FAN MOTOR) | | | | |

**PEAD-RP2.5GA**
**PEAD-RP3GA**
**PEAD-RP4GA**

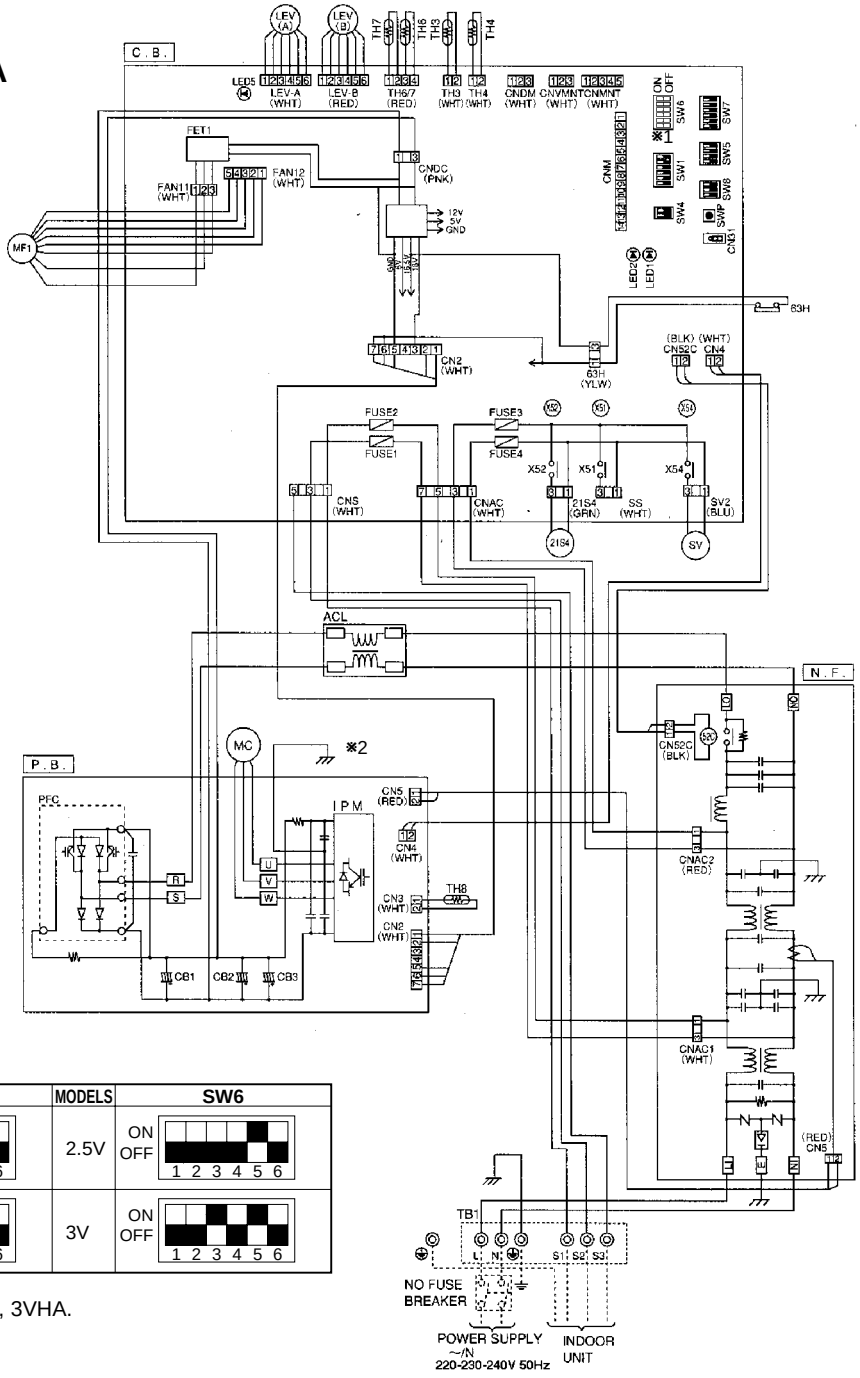



| CONNECTOR COLOR | 220V | 230V | 240V |
|---|---|---|---|
| BLU | 5Pa | 10Pa | 20Pa |
| WHT (FACTORY SHIPMENT) | 35Pa | 50Pa | 60Pa |
| RED | 50Pa | 70Pa | 75Pa |

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| I.B | INDOOR CONTROLLER BOARD | P.B | INDOOR POWER BOARD | C | CAPACITOR(FAN MOTOR) |
| CN2L | CONNECTOR(LOSSNAY) | F1 | FUSE(4A) | MF | FAN MOTOR |
| CN32 | CONNECTOR(REMOTE SWITCH) | ZNR | VARISTOR | TB5 | TERMINAL BLOCK(REMOTE CONTROLLER) |
| CN41 | CONNECTOR(HA TERMINAL-A) | | | TB4 | TERMINAL BLOCK (INDOOR/OUTDOOR CONNECTING LINE) |
| LED1 | POWER SUPPLY(I.B) | | | | |
| LED2 | POWER SUPPLY(REMOTE CONTROLLER) | | | TH1 | ROOM TEMPERATURE THERMISTOR (0°C/15KΩ,25°C/5.4KΩ DETECT) |
| LED3 | TRANSMISSION(INDOOR-OUTDOOR) | | | | |
| SW1 | JUMPER WIRE(MODEL SELECTION) | | | TH2 | PIPE TEMPERATURE THERMISTOR/LIQUID (0°C/15KΩ,25°C/5.4KΩ DETECT) |
| SW2 | JUMPER WIRE(CAPACITY CORD) | | | | |
| SWE | SWITCH(EMERGENCY OPERATION) | | | TH5 | COND./EVA. TEMPERATURE THERMISTOR (0°C/15KΩ,25°C/5.4KΩ DETECT) |
| X4 | RELAY(FAN MOTOR) | | | | |
| X5 | RELAY(FAN MOTOR) | | | | |
| X6 | RELAY(FAN MOTOR) | | | | |

| MODELS | SW1 | SW2 | |
|---|---|---|---|
| | | Manufacture | Service board |
| 2.5GA | <For manufacture> 1P1 1P2 1P3 1P4 1P5 <For service board> 1 2 3 4 5 ON OFF | 1P1 1P2 1P3 1P4 | 1 2 3 4 ON OFF |
| 3GA | | 1P1 1P2 1P3 1P4 | 1 2 3 4 ON OFF |
| 4GA | | 1P1 1P2 1P3 1P4 | 1 2 3 4 ON OFF |

**PUHZ-RP1.6VHA**
**PUHZ-RP2VHA**
**PUHZ-RP2.5VHA**
**PUHZ-RP3VHA**
**PUHZ-RP3VHA-A**




**※1 MODEL SELECT**

| MODELS | SW6 | MODELS | SW6 |
|---|---|---|---|
| 1.6V | ON / OFF 1 2 3 4 5 6 | 2.5V | ON / OFF 1 2 3 4 5 6 |
| 2V | ON / OFF 1 2 3 4 5 6 | 3V | ON / OFF 1 2 3 4 5 6 |

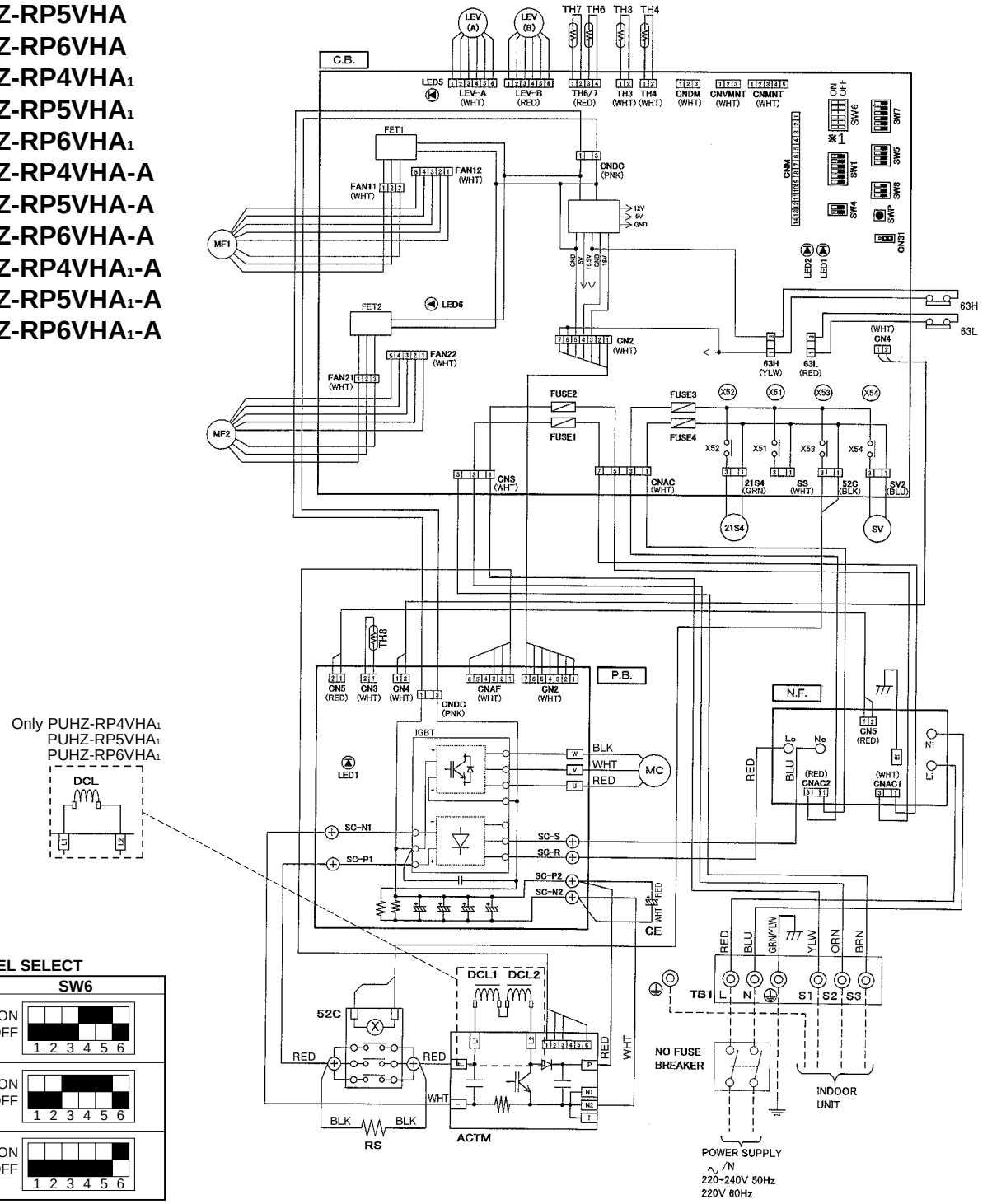
※2 Only PUHZ-RP2.5, 3VHA.

| SYMBOL | NAME |
|---|---|
| TB1 | Terminal Block (Power Supply, Indoor/Outdoor) |
| MC | Motor for Compressor |
| MF1 | Fan Motors |
| 21S4 | Solenoid Valve (Four-Way Valve) |
| 63H | High Pressure Switch |
| SV | Solenoid Valve (Bypass Valve) |
| TH3 | Thermistor (Outdoor Pipe) |
| TH4 | Thermistor (Discharge) |
| TH6 | Thermistor (Outdoor 2-Phase Pipe) |
| TH7 | Thermistor (Outdoor) |
| TH8 | Thermistor (Heat sink) |
| LEV(A),LEV(B) | Linear Expansion Valve |
| ACL | Reactors |
| P.B. | Power Circuit Board |
| R/S | Connection Terminal (L/N-Phase) |
| U/V/W | Connection Terminal (U/V/W-Phase) |
| CN2~5 | Connector |
| PFC | Converter |
| IPM | Inverter |
| CB1~CB3 | Main Smoothing Capacitor |

| SYMBOL | NAME |
|---|---|
| N.F. | Noise Filter Circuit Board |
| L1/L0 | Connection Terminal (L-Phase) |
| N1/N0 | Connection Terminal (N-Phase) |
| E | Connection Terminal (Ground) |
| CNAC1/2 | Connector |
| CN5 | Connector |
| CN52C | Connector |
| 52C | 52C Relay |
| C.B. | Controller Circuit Board |
| 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 Setup) |
| SW8 | Switch |
| LED1,LED2 | Light Emitting Diodes (Operation Inspection Indicators) |
| LED5 | Light Emitting Diodes (MF1 Operation Status Indicators) |

| SYMBOL | NAME |
|---|---|
| FUSE1~4 | Fuse (6.3 A) |
| SWP | Switch (Pump Down) |
| CN31 | Connector (Emergency Operation) |
| CNAC | Connector |
| CNDC | Connector |
| CNS | Connector |
| FAN11 | Connector |
| FAN12 | Connector |
| SS | Connector (Connection for Option) |
| SV2 | Connector |
| CNM | Connector (A-Control Service Inspection Kit) |
| CNMNT | Connector (Connected to Optional M-NET Adapter Board) |
| CNVMNT | Connector (Connected to Optional M-NET Adapter Board) |
| CNDM | Connector (Connected for Option (Contact Input)) |
| X51,X52,X54 | Reray |
| FET1 | MF1 Drive Element |

**PUHZ-RP4VHA**
**PUHZ-RP5VHA**
**PUHZ-RP6VHA**
**PUHZ-RP4VHA$_1$**
**PUHZ-RP5VHA$_1$**
**PUHZ-RP6VHA$_1$**
**PUHZ-RP4VHA-A**
**PUHZ-RP5VHA-A**
**PUHZ-RP6VHA-A**
**PUHZ-RP4VHA$_1$-A**
**PUHZ-RP5VHA$_1$-A**
**PUHZ-RP6VHA$_1$-A**




Only PUHZ-RP4VHA$_1$
PUHZ-RP5VHA$_1$
PUHZ-RP6VHA$_1$




**※1 MODEL SELECT**

| MODELS | SW6 |
|---|---|
| 4V | ON / OFF 1 2 3 4 5 6 |
| 5V | ON / OFF 1 2 3 4 5 6 |
| 6V | ON / OFF 1 2 3 4 5 6 |

| SYMBOL | NAME |
|---|---|
| TB1 | Terminal Block (Power Supply, Indoor/Outdoor) |
| MC | Motor for Compressor |
| MF1,MF2 | Fan Motors |
| 21S4 | Solenoid Valve (Four-Way Valve) |
| SV | Solenoid Valve (Bypass Valve) |
| 63H | High Pressure Switch |
| 63L | Low Pressure Switch |
| TH3 | Thermistor (Outdoor Pipe) |
| TH4 | Thermistor (Discharge) |
| TH6 | Thermistor (Outdoor 2-Phase Pipe) |
| TH7 | Thermistor (Outdoor) |
| TH8 | Thermistor (Heat sink) |
| LEV(A),LEV(B) | Linear Expansion Valve |
| DCL1, DCL2 | Reactors (RP4-6VHA) |
| DCL | Reactor (RP4-6VHA$_1$) |
| 52C | 52C Relay |
| RS | Rush Current Protect Resistor |
| ACTM | Active Filter Module |
| CE | Main Smoothing Capacitor |
| P.B. | Power Circuit Board |
| U/V/W | Connection Terminal (U/V/W-Phase) |

| SYMBOL | NAME |
|---|---|
| SC-R/S | Screw Type Terminal (L/N-Phase) |
| SC-P1, P2 | Screw Type Terminal (DC Voltage) |
| SC-N1, N2 | Screw Type Terminal (DC Voltage) |
| CN2~5 | Connector |
| CNDC | Connector |
| CNAF | Connector |
| IGBT | Converter, Inverter |
| LED1 | Light Emitting Diodes (Inverter Control Status) |
| N.F. | Noise Filter Circuit Board |
| LI/LO | Connection Lead (L-Phase) |
| NI/NO | Connection Lead (N-Phase) |
| EI | Connection Terminal (Ground) |
| CNAC1/2 | Connector |
| CN5 | Connector |
| C.B. | Controller Circuit Board |
| FUSE1~4 | 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) |

| SYMBOL | NAME |
|---|---|
| SW7 | Switch (Function Setup) |
| SW8 | Switch |
| SWP | Switch (Pump Down) |
| CN31 | Connector (Emergency Operation) |
| LED1,LED2 | Light Emitting Diodes (Operation Inspection Indicators) |
| LED5/6 | Light Emitting Diodes (MF1/MF2 Operation Status Indicators) |
| CNAC | Connector |
| CNDC | Connector |
| CNS | Connector |
| FAN11 | Connector |
| FAN12 | Connector |
| FAN21 | Connector |
| FAN22 | Connector |
| SS | Connector (Connection for Option) |
| SV2 | Connector |
| CNM | Connector (A-Control Service Inspection Kit) |
| CNMNT | Connector (Connected to Optional M-NET Adapter Board) |
| CNVMNT | Connector (Connected to Optional M-NET Adapter Board) |
| CNDM | Connector (Connected for Option (Contact Input)) |

# 4 REFRIGERANT SYSTEM DIAGRAM

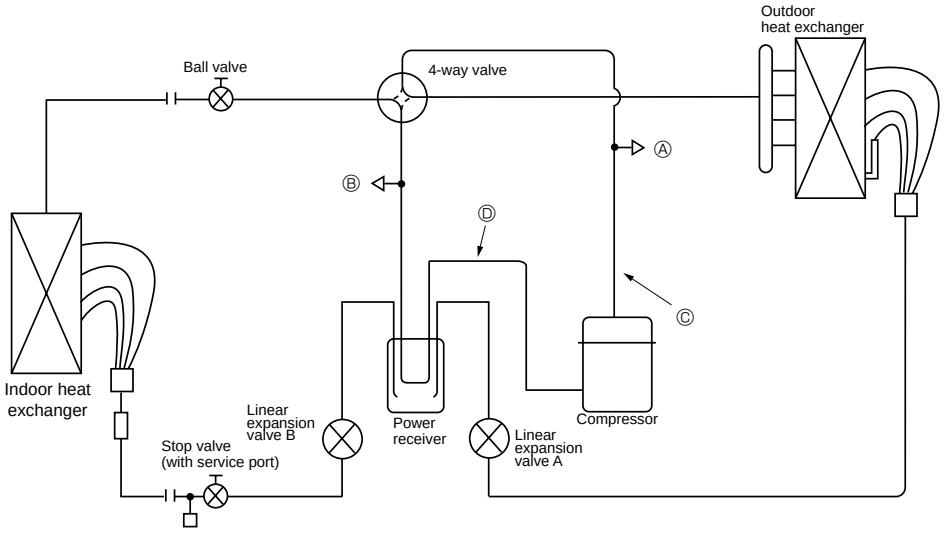
## 4-1. Checking operation statuses PUHZ-RP • HA

### 4-1-1. Measurement points and items

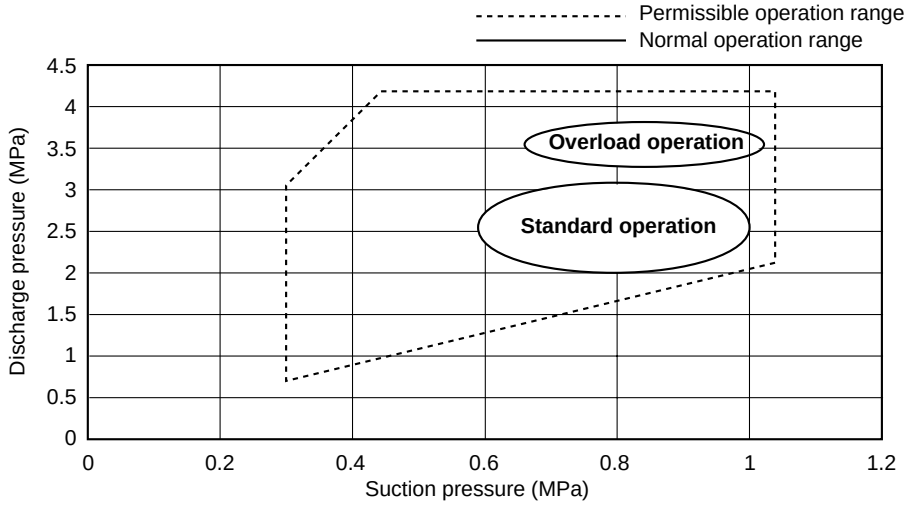
•The table and diagrams below show the measurement item for each measurement point, and the pressure and temperature near the ISO T1 standard operating conditions.
•Measure the temperature and pressure of each part by following the descriptions in the table.
•Measurement time: Be sure to wait until the refrigerant circuit has stabilized (30 minutes to 1 hour) before taking measurements.

| | Measurement item | Pressure/temperature near JIS standard operating conditions | Measurement method, remarks |
|---|---|---|---|
| Ⓐ | High pressure (MPa) | COOL: 2.3 ~ 3.0 HEAT: 2.0 ~ 3.2 | Connect the pressure gauge to the high-pressure check valve. |
| Ⓑ | Low pressure (MPa) | 0.55 ~ 1.0 | Connect the pressure gauge to the low-pressure check valve. |
| Ⓒ | Discharge pipe temperature (℃) | 50 ~ 100 | Measured with piping surface thermometer. |
| Ⓓ | Suction pipe temperature (℃) | -2 ~ +18 | Measured with piping surface thermometer. |
| Ⓔ | Indoor intake temperature (℃) | COOL: 27℃ HEAT: 20℃ | Can be displayed on remote controller. |
| Ⓕ | Indoor outlet temperature (℃) | COOL: 8 ~ 20<br>HEAT: 30 ~ 50 | |
| Ⓖ | Outdoor intake temperature (℃) | COOL: 35 HEAT: 7 | Measured with piping surface thermometer. |
| Ⓗ | Outdoor outlet temperature (℃) | COOL: 40 ~ 50 HEAT: 0 ~ 5 | Measured with piping surface thermometer. |

Notes : The operation statuses vary depending on the compressor's operating frequency because units are inverter-type.

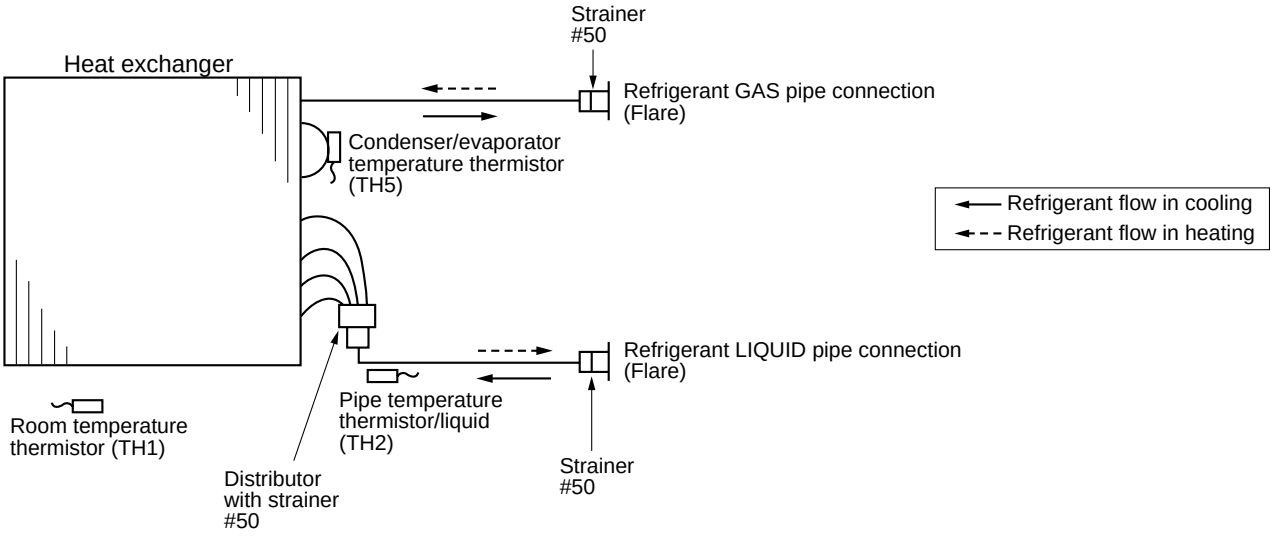



### 4-1-2. Operation pressure ranges

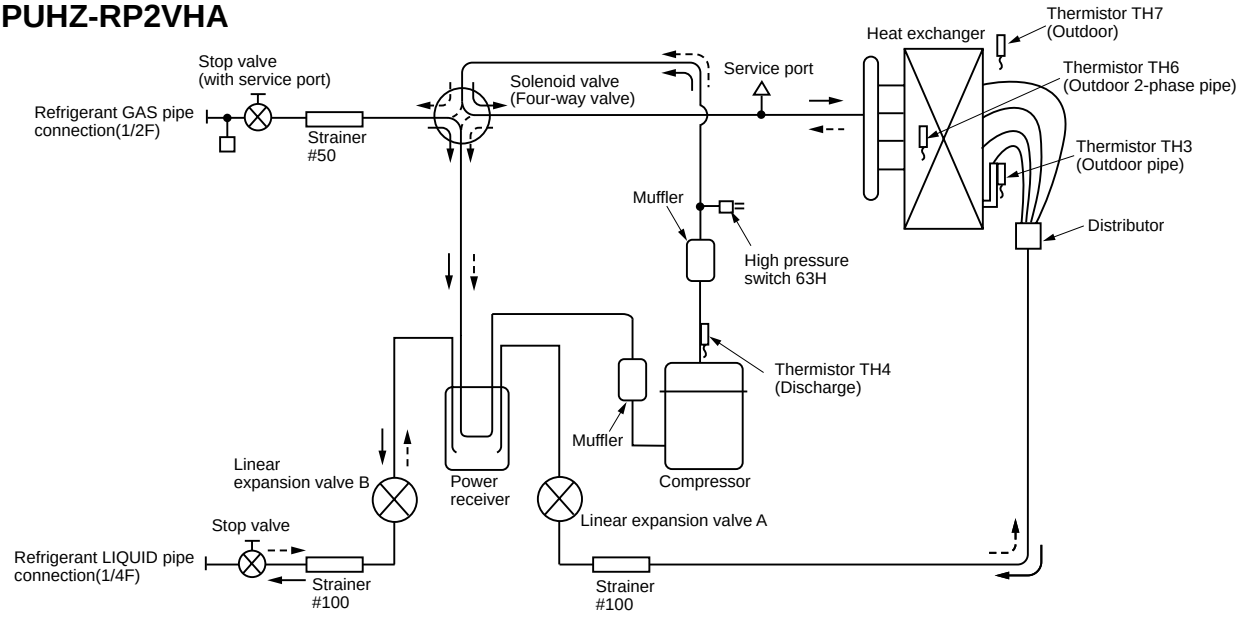


## 4-2. Refrigerant System Diagram

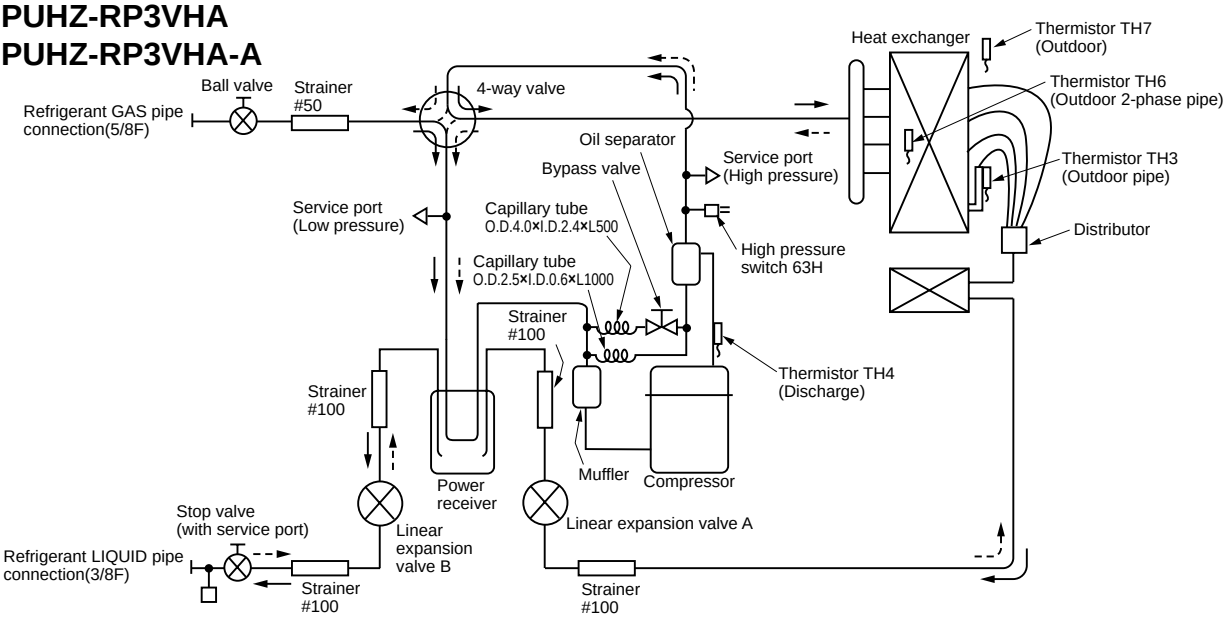
| | | | |
|---|---|---|---|
| **PLA-RP1.6AA** | **PLA-RP2AA** | **PLA-RP2.5AA** | |
| **PLA-RP1.6AA.UK** | **PLA-RP2AA.UK** | **PLA-RP2.5AA.UK** | |
| **PLA-RP3AA** | **PLA-RP4AA** | **PLA-RP5AA** | **PLA-RP6AA** |
| **PLA-RP3AA.UK** | **PLA-RP4AA.UK** | **PLA-RP5AA.UK** | **PLA-RP6AA.UK** |
| **PLA-RP3AA$_1$** | **PLA-RP4AA$_1$** | **PLA-RP5AA$_1$** | **PLA-RP6AA$_1$** |
| **PLA-RP3AA$_1$.UK** | **PLA-RP4AA$_1$.UK** | **PLA-RP5AA$_1$.UK** | **PLA-RP6AA$_1$.UK** |
| **PKA-RP1.6GAL** | **PKA-RP2GAL** | | |
| **PKA-RP2.5FAL** | **PKA-RP3FAL** | **PKA-RP4FAL** | |
| **PCA-RP2GA** | **PCA-RP2.5GA** | | |
| **PCA-RP3GA** | **PCA-RP4GA** | **PCA-RP5GA** | **PCA-RP6GA** |
| **PEA-RP3EA.TH-A** | **PEA-RP4EA.TH-A** | **PEA-RP5EA.TH-A** | **PEA-RP6EA.TH-A** |
| **PEAD-RP1.6EA.UK** | **PEAD-RP2EA.UK** | **PEAD-RP2.5EA.UK** | |
| **PEAD-RP3EA.UK** | **PEAD-RP4EA.UK** | **PEAD-RP5EA.UK** | **PEAD-RP6EA.UK** |
| **PEAD-RP3EA$_1$.UK** | **PEAD-RP4EA$_1$.UK** | **PEAD-RP5EA$_1$.UK** | **PEAD-RP6EA$_1$.UK** |
| **PEAD-RP2.5GA.UK** | **PEAD-RP3GA.UK** | **PEAD-RP4GA.UK** | |



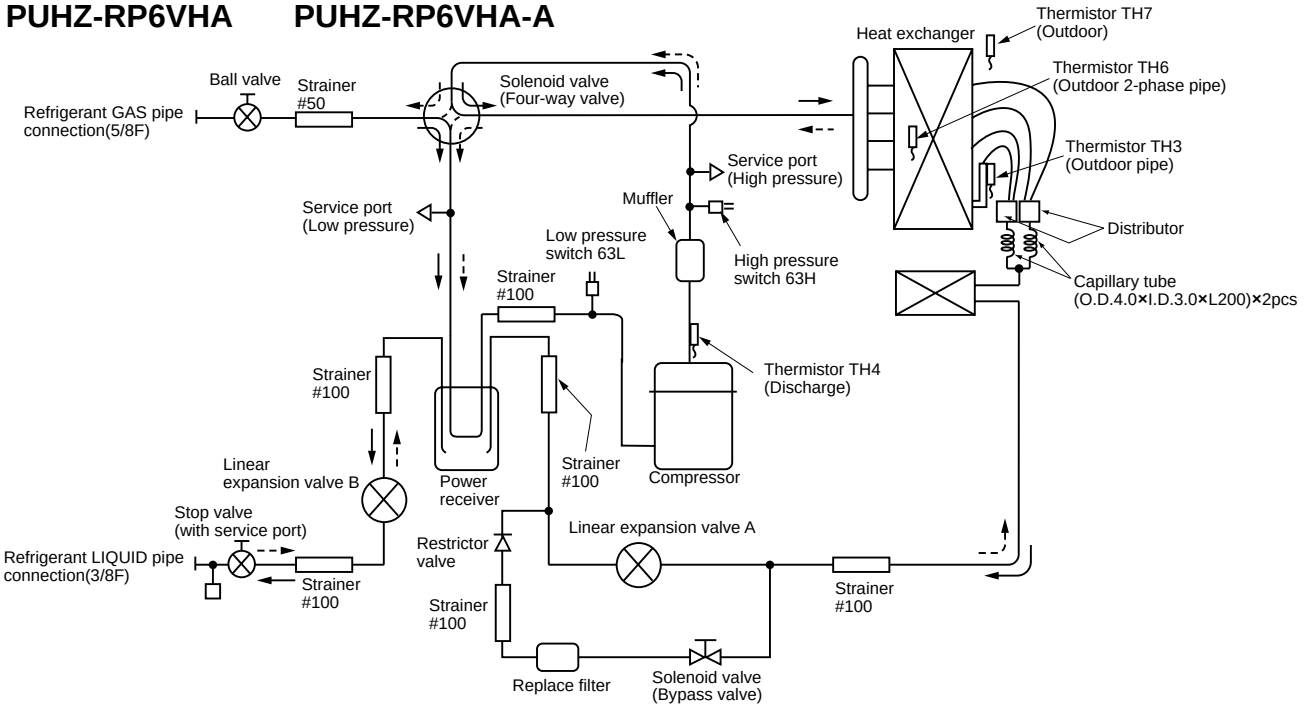
## PUHZ-RP1.6VHA
## PUHZ-RP2VHA



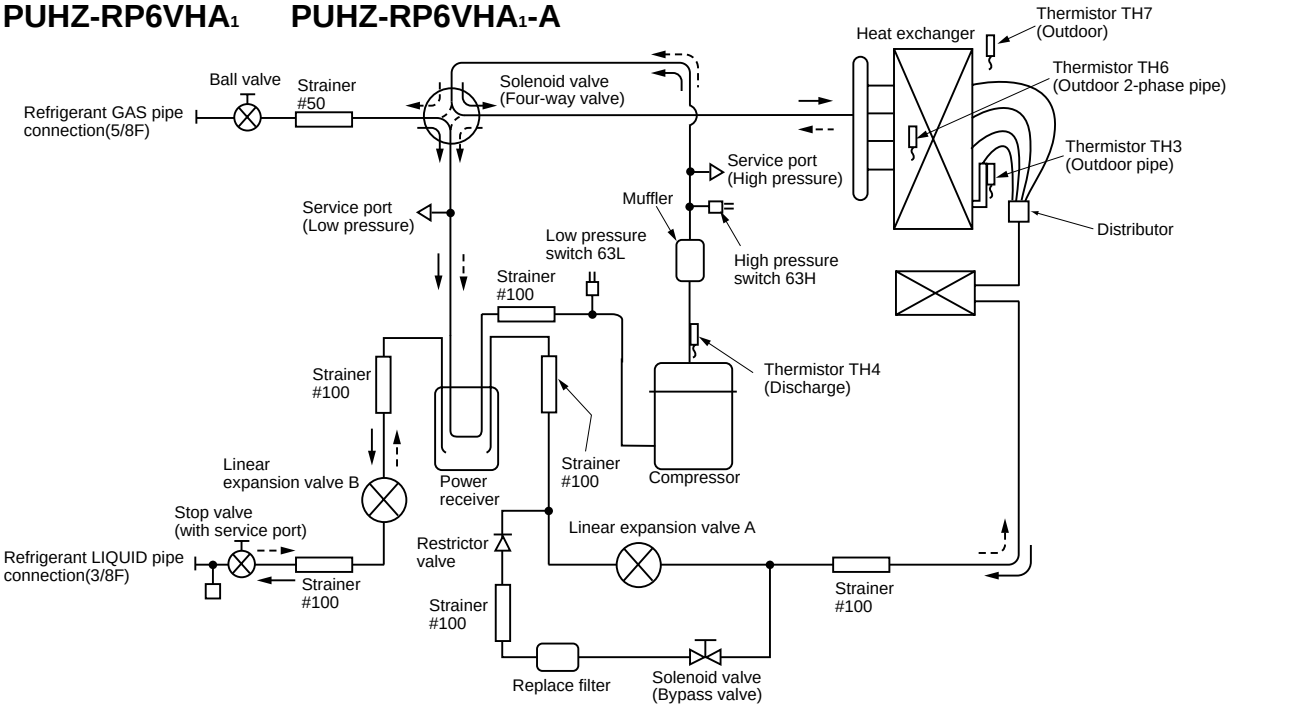

## PUHZ-RP2.5VHA
## PUHZ-RP3VHA
## PUHZ-RP3VHA-A



**PUHZ-RP4VHA PUHZ-RP4VHA-A**
**PUHZ-RP5VHA PUHZ-RP5VHA-A**
**PUHZ-RP6VHA PUHZ-RP6VHA-A**




**PUHZ-RP4VHA$_1$ PUHZ-RP4VHA$_1$-A**
**PUHZ-RP5VHA$_1$ PUHZ-RP5VHA$_1$-A**
**PUHZ-RP6VHA$_1$ PUHZ-RP6VHA$_1$-A**



## 4-3. Applicable extension pipe for each model

### 4-3-1. 1:1 system

**(a) Pipe length**

<Table 1> Pipe length for 1:1 system

| Liquid pipe (mm) | OD | ϕ6.35 | | | ϕ9.52 | | | ϕ12.7 | |
|---|---|---|---|---|---|---|---|---|---|
| | Thick-ness | t0.8 | | | t0.8 | | | t0.8 | |
| Gas pipe (mm) | OD | ϕ9.52 | ϕ12.7 | ϕ15.88 | ϕ12.7 | ϕ15.88 | ϕ19.05 | ϕ15.88 | ϕ19.05 |
| | Thick-ness | t0.8 | t0.8 | t1.0 | t0.8 | t1.0 | t1.0 | t1.0 | t1.0 |
| RP1.6 | | □30m | ◎50m | ○30m | △30m | △30m (*1) | × | × | × |
| RP2 | | □10m | ◎50m | ○30m | △30m | △30m (*1) | × | × | × |
| RP2.5 | | × | □10m | ○10m | □30m | ◎50m | × | △30m | × |
| RP3 | | × | □10m | ○10m | □30m | ◎50m | × | △30m | × |
| RP4 | | × | × | × | × | ◎75m (*2) | ○50m (*1) | △50m | △50m (*1) |
| RP5 | | × | × | × | × | ◎75m (*2) | ○50m (*1) | △50m | △50m (*1) |
| RP6 | | × | × | × | × | ◎75m (*2) | ○50m (*1) | △50m | △50m (*1) |

*1: Set DIP SW8-1 on outdoor unit controller board to ON.
*2: The maximum length is 50 m in case of using existing pipes.
*3: The height difference between indoor and outdoor unit should be kept within 30 m for all models.

[Marks in the table above]

◎ : Normal piping
△ : It can be used, however, additional refrigerant charge is required when the pipe length exceeds 20m. ➡ Refer to <table 4>.
× : It cannot be used.
○ : It can be used.
□ : It can be used, however, the capacity is lowered. ➡ Refer to (c) **Capacity correction.**

**(b) Adjusting the amount of refrigerant**

- Additional refrigerant charge is not necessary for the pipe length up to 30 m. When the pipe length exceeds 30 m or service (refrigerant replacement) is performed, charge proper amount of refrigerant for each pipe length referring to table below. Use refrigerant R410A. Use charge hose exclusive for R410A.
- When charging additional refrigerant, charge the refrigerant from low-pressure side of the port valve using a safety charger.
- Make sure that air purge for this unit at refrigerant replacement is performed from both high-pressure check valve and service port. (If air purge is performed only from one of them, air in not purged enough.)
- When replacing refrigerant, charge the refrigerant from service port. When charged refrigerant is less than specified amount, charge the refrigerant again from low pressure side of the port valve using a safety charger.
- Tighten the service port cap (nut) of stop valve firmly. The tightening torque is 12 to 16 N·m. (For the prevention of slow-leak)
- Check additional refrigerant charging amount referring to table 4 when liquid pipe is one size larger than standard diameter, and table 2 when the pipe is standard diameter.

<Table 2> Additional refrigerant charging amount for pipe of standard diameter

| Outdoor unit | Permitted pipe length | Additional refrigerant charging amount for pipe length exceeding 30 m (kg) | | | | Number of bends | Height difference |
|---|---|---|---|---|---|---|---|
| | | 31 — 40m | 41 — 50m | 51 — 60m | 61 — 75m | | |
| PUHZ-RP1.6, 2V | 50m or less | 0.2kg | 0.4kg | — | — | 15 | 30m or above |
| PUHZ-RP2.5, 3V | 50m or less | 0.6Kg | 1.2Kg | — | — | | |
| PUHZ-RP4-6V, RP4-6V1 | 75m or less | 0.6kg | 1.2kg | 1.8kg | 2.4kg | | |

<Table 3>

| Outdoor unit | Permitted pipe length | Additional refrigerant charging amount for recharging (above) and pipe length exceeding 30m (below) (kg) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 10m or below | 11 — 20m | 21 — 30m | 31 — 40m | 41 — 50m | 51 — 60m | 61 — 75m |
| PUHZ-RP1.6, 2V | 50m or less | 2.1 | 2.3 | 2.5 | 2.7<br>0.2 | 2.9<br>0.4 | —<br>— | —<br>— |
| PUHZ-RP2.5, 3V | 50m or less | 3.1 | 3.3 | 3.5 | 4.1<br>0.6 | 4.7<br>1.2 | —<br>— | —<br>— |
| PUHZ-RP4-6V | 75m or less | 5.1 | 5.3 | 5.5 | 6.1<br>0.6 | 6.7<br>1.2 | 7.3<br>1.8 | 7.9<br>2.4 |
| PUHZ-RP4-6V1 | 75m or less | 4.6 | 4.8 | 5.0 | 5.6<br>0.6 | 6.2<br>1.2 | 6.8<br>1.8 | 7.4<br>2.4 |

<Table 4> Additional refrigerant charging amount for liquid pipe which is one size larger than standard diameter

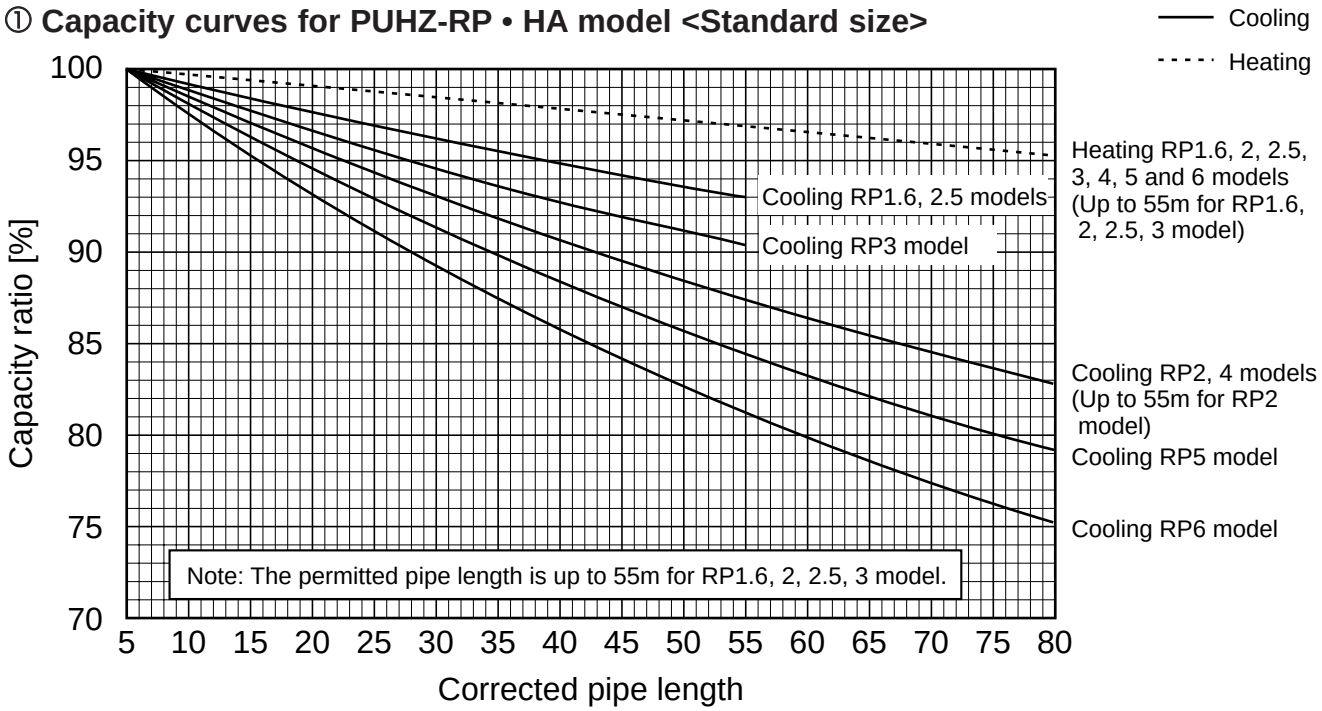
| | Liquid pipe dia | Chargeless | Max. pipe length | Additional refrigerant charging amount |
|---|---|---|---|---|
| RP1.6, 2 | ϕ9.52 | 20m | 30m | 60 g addition per 1 m when pipe length exceeds 20 m |
| RP2.5, 3 | ϕ12.7 | 20m | 30m | 100 g addition per 1 m when pipe length exceeds 20 m |
| RP4-6 | ϕ12.7 | 20m | 50m | 100 g addition per 1 m when pipe length exceeds 20 m |

**(c) Capacity correction**

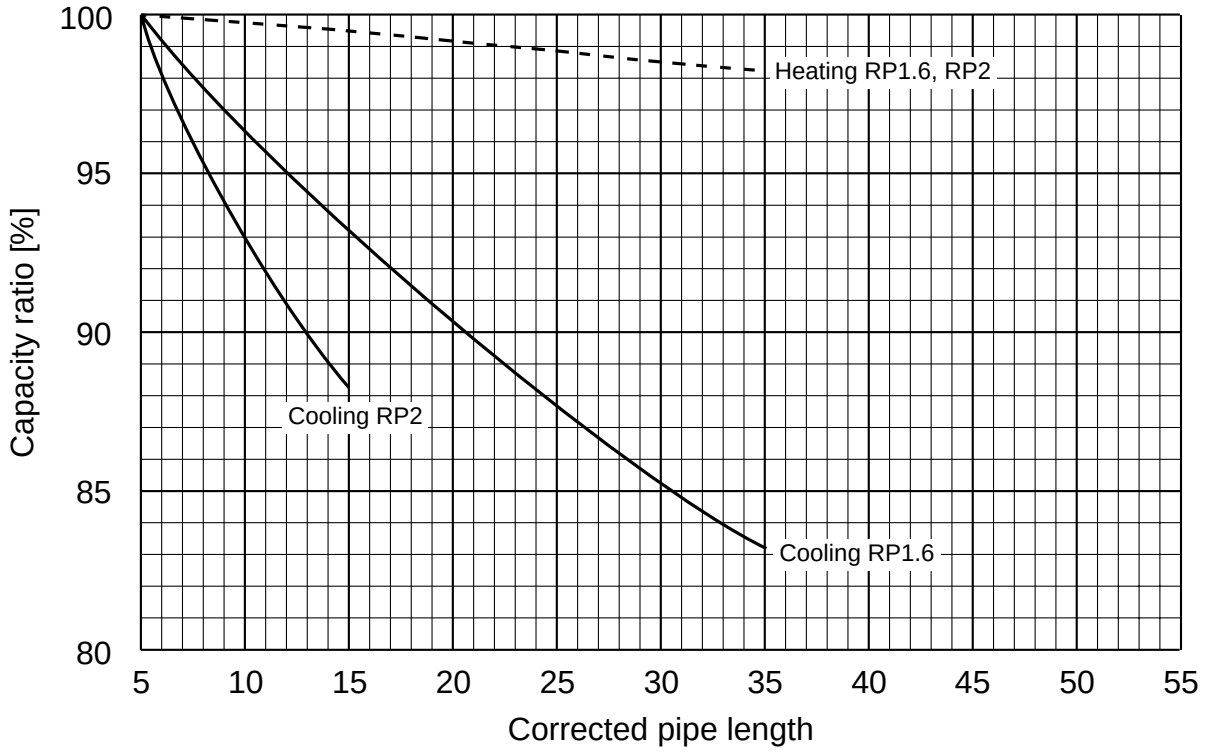
Cooling and heating capacity is lowered according to pipe length. Capacity can be obtained by referring to the capacity curves below. When the diameter of gas pipe is one size smaller than standard diameter, cooling capacity is lowered comparing to the standard diameter. The lowered capacity can be obtained by referring to capacity curves for gas pipe which is one size smaller than standard size.

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

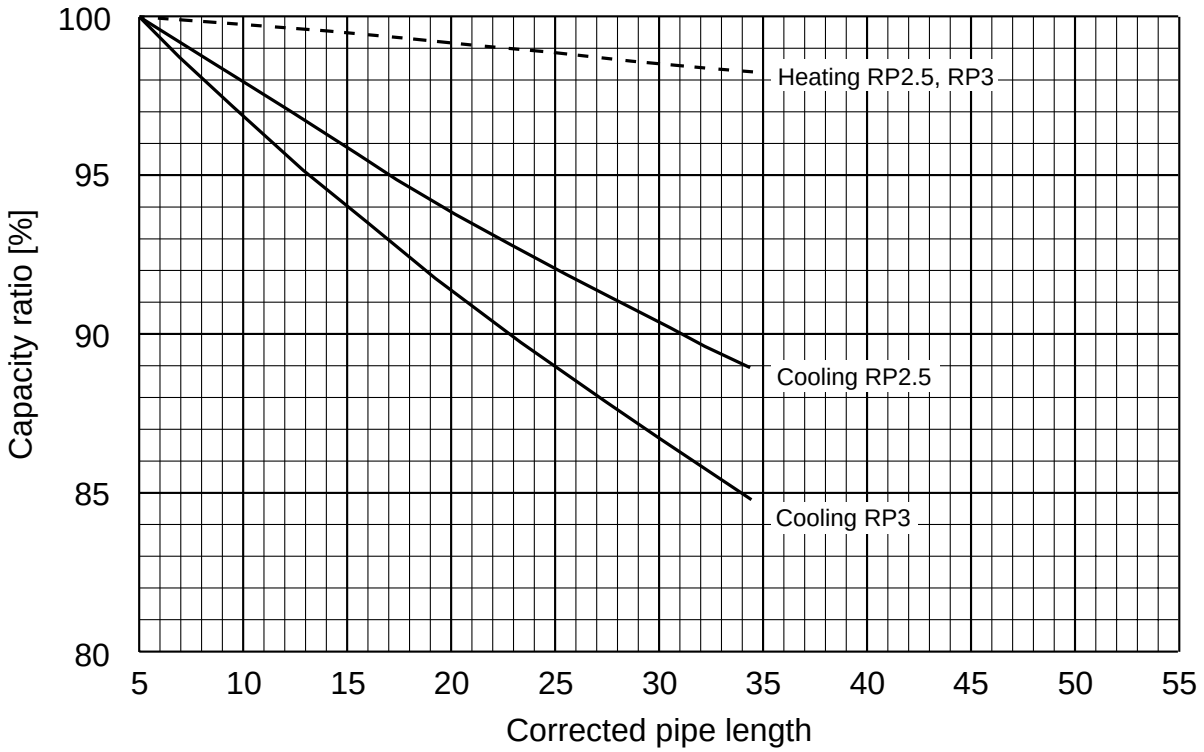
### ① Capacity curves for PUHZ-RP • HA model <Standard size>




### ② Capacity curve for PUHZ-RP1.6, 2 models <When gas pipe is one size smaller than standard size>



**③ Capacity curve for PUHZ-RP2.5, 3 models**
**<When gas pipe is one size smaller than standard size>**




**④ When gas pipe is one size larger than standard size for PUHZ-RP4, 5 and 6.**

① Capacity can be obtained by referring to capacity curves of standard size.

### 4-3-2. Synchronized twin and triple

**(a) Pipe length**

Please note that refrigerant piping length, bend number and height difference of indoor units are specified for each unit combination.

Note: Be sure to use our Multi-distributor for distributing pipe to use existing piping.

<Table 5>

| Synchronized twin | | Permitted total piping length A + B + C | Chargeless piping length A + B + C | Indoor unit's height difference [B and C] | Bend number ※ 2 |
|---|---|---|---|---|---|
| Outdoor unit | PUHZ-RP3VHA<br>PUHZ-RP3VHA-A | 50 m or less | 30 m or less | 8 m or less | 15 at most |
| | PUHZ-RP4-6VHA<br>PUHZ-RP4-6VHA-A | 75 m or less | | | |

<Table 6>

| Synchronized twin | | Permitted total piping length A + B + C + D | Charge-less piping length A + B + C + D | Indoor unit's height difference [B and C] [C and D] [B and D] | Bend number ※ 2 |
|---|---|---|---|---|---|
| Outdoor unit | PUHZ-RP6VHA<br>PUHZ-RP6VHA-A | 70 m or less | 30 m or less | 8 m or less | 15 at most |

Note 1: If total piping length exceeds charge-less piping length of 30 m, charge additional refrigerant according to the table 7.

<Table 7>

| Outdoor unit | A + B + C (+D) Additional refrigerant to be charged (kg) | | | | |
|---|---|---|---|---|---|
| | 30 m or less | 31 - 40 m | 41 - 50 m | 51 - 60 m | 61 - 75 m |
| PUHZ-RP3VHA<br>PUHZ-RP3VHA-A | Not required | 0.6 | 1.2 | | |
| PUHZ-RP4-6VHA<br>PUHZ-RP4-6VHA-A | | | | 1.8 | 2.4 |

※ Charge additional refrigerant from the check valve connected to the pipe of low-pressure side in indoor unit.

Note 2: Bends number (※ 2) should be within 8 for each combination, A + B, A +C and A + D, and 15 in all.

Note 3: Height difference between indoor and outdoor unit is referred to no matter which unit is located higher or lower.

<Table 8> Pipe length for twin of RP 3 - 6 (Piping length: A + B + C)

| | | RP3 Twin (RP1.6×2) | | RP4 Twin (RP2×2) | | RP5 Twin (RP2.5×2) | | RP6 Twin (RP3×2) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Main pipe diameter [A] | | | | | | | |
| | | Liquid $\phi$6.35 Gas $\phi$12.7 | Liquid $\phi$9.52 Gas $\phi$15.88 | Liquid $\phi$9.52 Gas $\phi$15.88 | Liquid $\phi$12.7 Gas $\phi$19.05 | Liquid $\phi$9.52 Gas $\phi$15.88 | Liquid $\phi$12.7 Gas $\phi$19.05 | Liquid $\phi$9.52 Gas $\phi$15.88 | Liquid $\phi$12.7 Gas $\phi$19.05 |
| Branch pipe diameter [B and C] | Liquid $\phi$6.35 Gas $\phi$12.7 | × | ○ 50 m | ○75 m(✻2) | △50 m(✻1) | × | × | × | × |
| | Liquid $\phi$9.52 Gas $\phi$15.88 | × | △ 50 m | △ 50 m | △50 m(✻1) | ○75 m(✻2) | △50 m(✻1) | ○75 m(✻2) | △50 m(✻1) |
| | Liquid $\phi$12.7 Gas $\phi$19.05 | × | × | × | × | × | × | × | × |

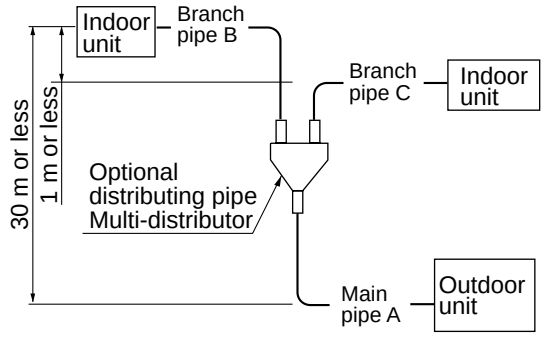
<Table 9> Pipe length for triple of RP6 (Piping length: A + B + C + D)

| | | Main pipe diameter [A] | |
|---|---|---|---|
| | | Liquid $\phi$9.52 Gas $\phi$15.88 | Liquid $\phi$12.7 Gas $\phi$19.05 |
| Branch pipe diameter [B,C and D] | Liquid $\phi$6.35 Gas $\phi$12.7 | ○75 m(✻2) | △50 m(✻1) |
| | Liquid $\phi$9.52 Gas $\phi$15.88 | △ 50 m | △50 m(✻1) |
| | Liquid $\phi$12.7 Gas $\phi$19.05 | × | × |

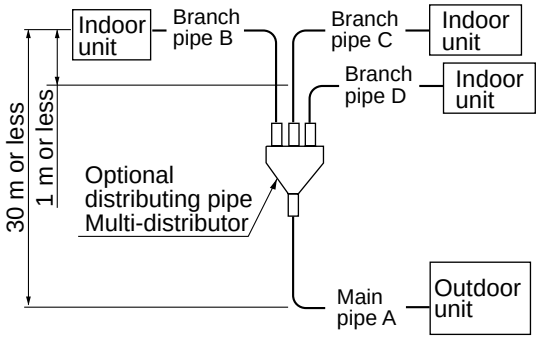
✻1 … Set DIP SW8-1 on outdoor unit control circuit board to ON.
✻2 … When using existing piping, pipe length should be 50 m at most.
✻3 … Height difference between indoor and outdoor unit should be kept within 30 m in every case.

[Marks in table]
○ … Normal piping
△ … It can be used with some changes of piping length and the amount of refrigerant to be charged.
× … It cannot be used.

**Synchronized twin**




**Synchronized triple**




1. Keep Stop valve in outdoor unit fully closed (as it is shipped), and after completing refrigerant piping connection, conduct air purge from service port of stop valve at outdoor unit.
2. After air purging, make the valve rod of stop valve at outdoor unit fully open.
   Now refrigerating cycle is complete between indoor and outdoor unit.
   Handle stop valve following the indication on outdoor unit.

Caution:
- Be sure to apply refrigerating oil to flare sheet face. Never apply it to screws. (As it causes flare nut loosening.)
- Use double spanner for piping connection.
- Be sure to check gas leak by using leak detector or soapy water.
- Use attached parts for refrigerant piping to provide correct insulation to the connection of indoor unit side in accordance with attached explanation sheet.
- Be sure to provide anoxidized brazing.

**(b) Adjusting the amount of refrigerant**

(i) In case of RP 3 twin
Check the additional refrigerant to be charged referring to table 2 when using pipe of size referred in table 8.

(ii) In case of RP4 - 6 twin or RP6 triple
When using liquid pipe one size larger than standard diameter for main pipe A, calculate the amount of additional refrigerant referring to ② below.

① When using piping of standard diameter or gas pipe one size larger than standard diameter for main pipe A.
Check the additional refrigerant to be charged referring to table 2 like 1:1 system.

② When using liquid pipe one size larger than standard diameter for main pipe A.
[In case of RP4-6 using liquid pipe of $\phi$12.7]
- When total length of extension pipe (main pipe and branch pipe) is less than 20 m.
  No adjustment is required for refrigerant. (Chargeless)
- When total length of extension pipe (main pipe and branch pipe) is more than 20 m.
  Calculate the amount of additional refrigerant, referred to as △W (g) in the following, using the equation below and add proper amount of refrigerant. If △W is less than or equal to 0, no additional charge is required. (Chargeless)

**[Additional refrigerant] △ W (g) = {100(g) × L1} + {60(g) × L2} + {30(g) × L3} - 2000(g)**

Note: Put "0" in L1-3 if it is not used.

L1: Liquid pipe length of $\phi$12.7 (m)
L2: Liquid pipe length of $\phi$9.52 (m)
L3: Liquid pipe length of $\phi$6.35 (m)

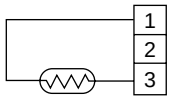
**(c) Capacity correction**

Apply pipe length between indoor and outdoor unit which is the longest of all for the calculation of capacity lowering according to each pipe length.

# 5 HOW TO CHECK THE PARTS

## 5-1. INDOOR UNIT

### • Common parts

| Parts name | Check points |
|---|---|
| Room temperature thermistor (TH1)<br>Pipe temperature thermistor/ liguid (TH2)<br>Condenser/evaporator temperature thermistor (TH5) | Disconnect the connector then measure the resistance using a tester.<br>(Surrounding temperature 10℃~30℃)<br>Normal: 4.3kΩ~9.6kΩ / Abnormal: Open or short<br>(Refer to below for a detail.) |
| Drain sensor<br>  | Measure the resistance between the terminals using a tester.<br>Measure the resistance after 3 minutes have passed since the power supply was intercepted.<br>(Surrounding temperature 0℃~60℃)<br>Normal: 0.6kΩ~6.0kΩ / Abnormal: Open or short<br>(Refer to below for a detail.) |

<Thermistor Characteristic graph>

**Thermistor for lower temperature**

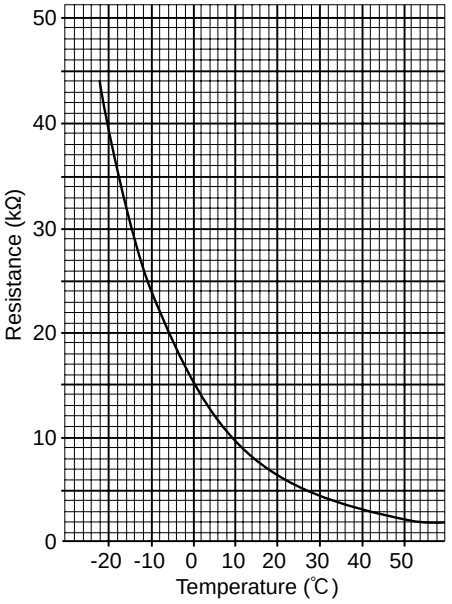
Room temperature thermistor(TH1)
Pipe temperature thermistor(TH2)
Condenser/evaporator temperature thermistor(TH5)

Thermistor $R_0$=15kΩ ± 3%
Fixed number of B=3480K ± 2%

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

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

< Thermistor for lower temperature >



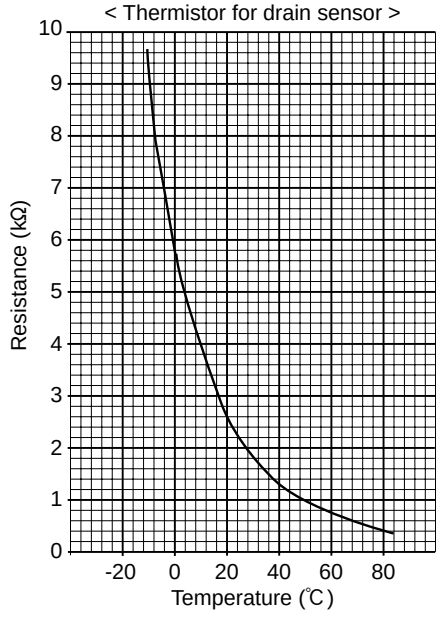

**Drain sensor**

Thermistor $R_0$=6.0kΩ ±5%
Fixed number of B=3390K ±2%

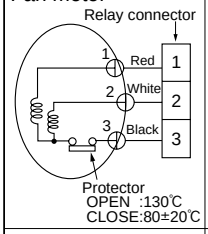
$$Rt=6\exp\{3390(\frac{1}{273+t}-\frac{1}{273})\}$$

| | |
|---|---|
| 0℃ | 6.0kΩ |
| 10℃ | 3.9kΩ |
| 20℃ | 2.6kΩ |
| 25℃ | 2.2kΩ |
| 30℃ | 1.8kΩ |
| 40℃ | 1.3kΩ |
| 60℃ | 0.6kΩ |

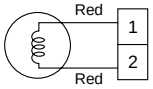
< Thermistor for drain sensor >



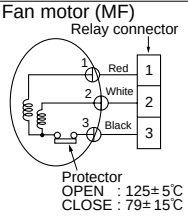
**PLA-RP1.6AA** **PLA-RP2AA** **PLA-RP2.5AA**
**PLA-RP1.6AA.UK** **PLA-RP2AA.UK** **PLA-RP2.5AA.UK**
**PLA-RP3AA** **PLA-RP4AA** **PLA-RP5AA** **PLA-RP6AA**
**PLA-RP3AA$_1$** **PLA-RP4AA$_1$** **PLA-RP5AA$_1$** **PLA-RP6AA$_1$**
**PLA-RP3AA.UK** **PLA-RP4AA.UK** **PLA-RP5AA.UK** **PLA-RP6AA.UK**
**PLA-RP3AA$_1$.UK** **PLA-RP4AA$_1$.UK** **PLA-RP5AA$_1$.UK** **PLA-RP6AA$_1$.UK**

| Parts name | Check points |
|---|---|
| Vane motor | Measure the resistance between the terminals using a tester.<br>(Surrounding temperature20℃)<br>Normal: 15kΩ / Abnormal: Open or short |
| Fan motor<br>  | Measure the resistance between the terminals using a tester.<br>(Winding temperature 20℃) |

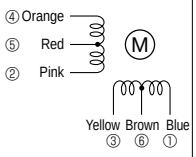
| Motor terminal or Relay connector | Normal | | Abnormal |
|---|---|---|---|
| | PLA-RP1.6, 2, 2.5, 3AA<br>PLA-RP1.6, 2, 2.5, 3AA.UK<br>PLA-RP3AA$_1$<br>PLA-RP3AA$_1$.UK | PLA-RP4, 5, 6AA<br>PLA-RP4, 5, 6AA.UK<br>PLA-RP4, 5, 6AA$_1$<br>PLA-RP4, 5, 6AA$_1$.UK | |
| Red-Black | 87.2Ω | 28.7Ω | Open or short |
| White-Black | 104.1Ω | 41.6Ω | |

| Parts name | Check points |
|---|---|
| Drain pump<br>  | Measure the resistance between the terminals using a tester.<br>(Winding temperature 20℃)<br>Normal: 290Ω / Abnormal: Open or short |

## PKA-RP1.6GAL PKA-RP2GAL

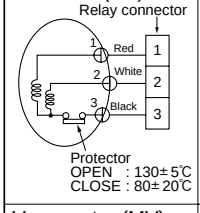
| Parts name | Check points |
|---|---|
| Fan motor (MF)<br>  | Measure the resistance between the terminals using a tester.<br>(Winding temperature 20℃) |

| Motor terminal or Relay connector | Normal | Abnormal |
|---|---|---|
| | RP1.6 , RP2 | |
| Red – Black | 120.5Ω | Open or short |
| White – Black | 111.3Ω | |

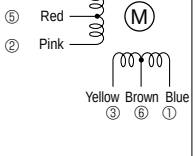
| Vane motor (MV)<br>  | Measure the resistance between the terminals using a tester.<br>(Surrounding temperature 20℃~30℃) |
|---|---|

| Connector | Normal | Abnormal |
|---|---|---|
| Brown – Yellow | 186~214Ω | Open or short |
| Brown – Blue | | |
| Red – Orange | | |
| Red – Pink | | |

## PKA-RP2.5FAL PKA-RP3FAL PKA-RP4FAL

| Parts name | Check points |
|---|---|
| Fan motor (MF)<br>  | Measure the resistance between the terminals using a tester.<br>(Winding temperature 20℃) |

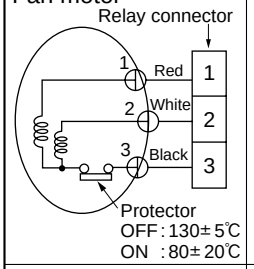
| Motor terminal or Relay connector | Normal | | Abnormal |
|---|---|---|---|
| | RP2.5<br>RP3 | RP4 | |
| Red – Black | 99.5Ω | 62.6Ω | Open or short |
| White – Black | 103.9Ω | 74.0Ω | |

| Vane motor (MV)<br>  | Measure the resistance between the terminals using a tester.<br>(Surrounding temperature 20℃~30℃) |
|---|---|

| Connector | Normal | Abnormal |
|---|---|---|
| | RP2.5, RP3, RP4 | |
| Brown –Y ellow | 186~214Ω | Open or short |
| Brown – Blue | | |
| Red – Orange | | |
| Red – Pink | | |

## PCA-RP2GA PCA-RP2.5GA PCA-RP3GA
## PCA-RP4GA PCA-RP5GA PCA-RP6GA

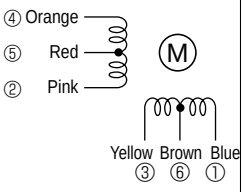
### Fan motor



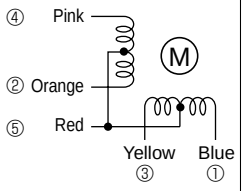

Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)

| Motor terminal or Relay connector | Normal | | | | Abnormal |
|---|---|---|---|---|---|
| | RP2 | RP2.5, RP3 | RP4 | RP5, RP6 | |
| Red – Black | 70.6Ω | 45.0Ω | 43.7Ω | 20.4Ω | Open or short |
| White – Black | 69.6Ω | 44.8Ω | 55.3Ω | 20.7Ω | |

### Vane motor

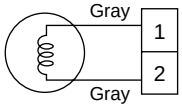



| Connector | Normal | | Abnormal |
|---|---|---|---|
| | RP2 | RP2.5, RP3 | |
| Brown – Yellow | 186~214Ω | 140~160Ω | Open or short |
| Brown – Blue | | | |
| Red – Orange | | | |
| Red – Pink | | | |




| Connector | Normal | Abnormal |
|---|---|---|
| | RP4, RP5, RP6 | |
| Brown – Yellow | 140~160Ω | Open or short |
| Brown – Blue | | |
| Red – Orange | | |
| Red – Pink | | |

### Drain-up mechanism (Option)

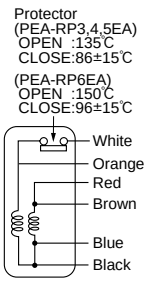



Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)

| Normal | Abnormal |
|---|---|
| 195Ω | Open or short |

## PEA-RP3EA.TH-A PEA-RP4EA.TH-A PEA-RP5EA.TH-A PEA-RP6EA.TH-A

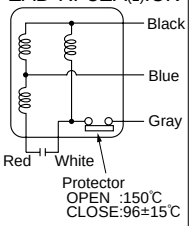
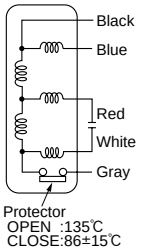
### Fan motor (MF)




Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)

| Motor terminal or Relay connector | Normal PEA- | | | | Abnormal |
|---|---|---|---|---|---|
| | RP3EA.TH-A | RP4EA.TH-A | RP5EA.TH-A | RP6EA.TH-A | |
| White – Black | 28.6Ω | 20.6Ω | 15.3Ω | 10.2Ω | Open or short |
| Black – Blue | 12.5Ω | 8.1Ω | 5.1Ω | 5.2Ω | |
| Blue – Brown | 4.3Ω | 3.2Ω | 2.7Ω | 3.1Ω | |
| Brown – Red | 23.6Ω | 16.0Ω | 14.5Ω | 12.1Ω | |

## PEAD-RP1.6EA.UK PEAD-RP2EA.UK PEAD-RP2.5EA.UK
## PEAD-RP3EA.UK PEAD-RP4EA.UK PEAD-RP5EA.UK PEAD-RP6EA.UK
## PEAD-RP3EA$_1$.UK PEAD-RP4EA$_1$.UK PEAD-RP5EA$_1$.UK PEAD-RP6EA$_1$.UK

| Parts name | Check points |
|---|---|
| Fan motor (MF)<br>PEAD-RP3EA$_{(1)}$.UK<br>  <br><br>PEAD-RP4,5,6EA$_{(1)}$.UK<br>  <br> | Measure the resistance between the terminals using a tester.<br>(Winding temperature 20℃)<br><br>**PEAD-RP3EA$_{(1)}$.UK**<br><br>Motor terminal or Relay connector / Normal: PEAD-RP1.6, 2, 2.5EA.UK, PEAD-RP3EA$_{(1)}$.UK / Abnormal<br>Gray – Black (White or Red open): 43.5Ω<br>Black – Blue (White or Red open): 14.74Ω<br>Blue – Red (White or Red open): 57.5Ω<br>Abnormal: Open or short<br><br>**PEAD-RP4,5,6EA$_{(1)}$.UK**<br><br>Motor terminal or Relay connector / Normal: PEAD- / Abnormal<br>PEAD- RP4EA$_{(1)}$.UK / RP5EA$_{(1)}$.UK RP6EA$_{(1)}$.UK<br>Gray-Black (White or Red open): 24.76Ω / 10.27Ω<br>Blue – Black: 4.78Ω / 2.11Ω<br>Black – Red (White or Red open): 18.99Ω / 20.75Ω<br>Gray – Red (White or Red open): 36.63Ω / 25.44Ω<br>Abnormal: Open or short |

## PEAD-RP2.5GA
## PEAD-RP3GA
## PEAD-RP4GA

| Parts name | Check points |
|---|---|
| Fan motor (MF)<br><br>Protector / RP2.5, 3 / RP4<br>OPEN / 145±5°C / 135±5°C<br>CLOSE / 94±15°C / 86±15°C | Measure the resistance between the terminals using a tester (winding temp. 20°C).<br><br>Motor terminal / Normal: RP2.5, 3 / RP4 / Abnormal<br>Orange-Gray: 35.0Ω / 35.2Ω<br>Orange-Black: 10.3Ω / 2.63Ω<br>Black-Blue: 5.87Ω / 3.00Ω<br>Blue-Yellow: 6.97Ω / 7.01Ω<br>Yellow-Red: 21.4Ω / —<br>Orange-Red: — / 50.7Ω<br>Abnormal: Open or short |

## 5-2. OUTDOOR UNIT

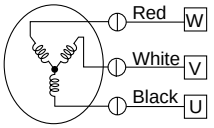
**PUHZ-RP1.6HA PUHZ-RP2VHA PUHZ-RP2.5VHA PUHZ-RP3VHA**
**PUHZ-RP4VHA PUHZ-RP5VHA PUHZ-RP6VHA**
**PUHZ-RP4VHA$_1$ PUHZ-RP5VHA$_1$ PUHZ-RP6VHA$_1$**
**PUHZ-RP4VHA-A PUHZ-RP5VHA-A PUHZ-RP6VHA-A**
**PUHZ-RP4VHA$_1$-A PUHZ-RP5VHA$_1$-A PUHZ-RP6VHA$_1$-A**

### Thermistor (TH3) <Outdoor pipe> / Thermistor (TH4) <Discharge> / Thermistor (TH6) <Outdoor 2-phase pipe> / Thermistor (TH7) <Outdoor> / Thermistor (TH8) <Heat sink>

Disconnect the connector then measure the resistance using a tester.
(Surrounding temperature 10℃~30℃)

| | Normal | Abnormal |
|---|---|---|
| TH4 | 160kΩ~410kΩ | Open or short |
| TH3<br>TH6<br>TH7 | 4.3kΩ~9.6kΩ | |
| TH8 | 39kΩ~105kΩ | |

### Fan motor(MF1,MF2)




Pin number of relay connector is different from that motor connector

Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)

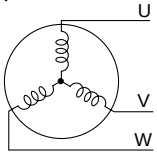
| Relay connector | Normal | | Abnormal |
|---|---|---|---|
| | RP1.6V, 2V | RP2.5-6V | |
| Red — Black | 66.5±3.3Ω | 15.1±0.5Ω | Open or short |
| Black — White | | | |
| White — Red | | | |

### Solenoid valve coil <Four-way valve> (21S4)

Measure the resistance between the terminals using a tester.
(Surrounding temperature 20℃)

| Normal | | Abnormal |
|---|---|---|
| RP1.6-3V | RP4-6V | Open or short |
| 2350±170Ω | 1370±100Ω | |

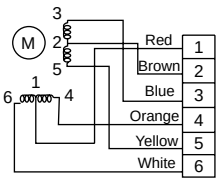
### Motor for compressor (MC)




Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)

| Normal | | | Abnormal |
|---|---|---|---|
| RP1.6V, 2V | RP2.5V, 3V | RP4-6V | Open or short |
| 0.300Ω~0.340Ω | 0.865Ω~0.895Ω | 0.266Ω | |

### Linear expansion valve ( LEV(A),LEV(B) )




Disconnect the connector then measure the resistance using a tester.
(Winding temperature 20℃)

| Normal | | | | Abnormal |
|---|---|---|---|---|
| (1) - (6)<br>Red - White | (1) - (4)<br>Red - Orange | (2) - (5)<br>Brown - Yellow | (2) - (3)<br>Brown - Blue | Open or short |
| 46±4Ω | | | | |

### Solenoid valve coil <Bypass valve> (SV) RP2.5-6VHA only

Measure the resistance between the terminals using a tester.
(Surrounding temperature 20℃)

| Normal | Abnormal |
|---|---|
| 1197±10Ω | Open or short |

## 5-3. COMPRESSOR TECHNICAL DATA

(at 20°C)

| Unit | | PUHZ-RP1.6,2VHA | PUHZ-RP2.5,3VHA | PUHZ-RP4,5,6VHA |
|---|---|---|---|---|
| Compressor model | | SNB130FLBH | TNB220FMBH | ANV33FDAMT |
| Winding Resistance ( Ω ) | U-V | 0.300 ~ 0.340 | 0.865 ~ 0.895 | 0.266 |
| | U-W | 0.300 ~ 0.340 | 0.865 ~ 0.895 | 0.266 |
| | W-V | 0.300 ~ 0.340 | 0.865 ~ 0.895 | 0.266 |

## HOW TO CHECK THE COMPONENTS

**<Thermistor feature chart>**

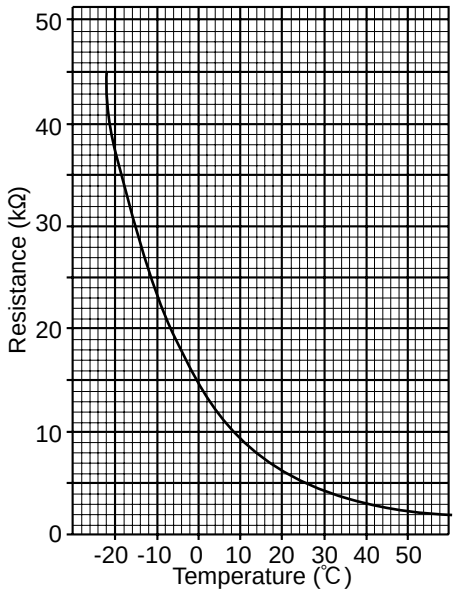
**Low temperature thermistors**

- Thermistor <Outdoor pipe> (TH3)
- 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 | | |



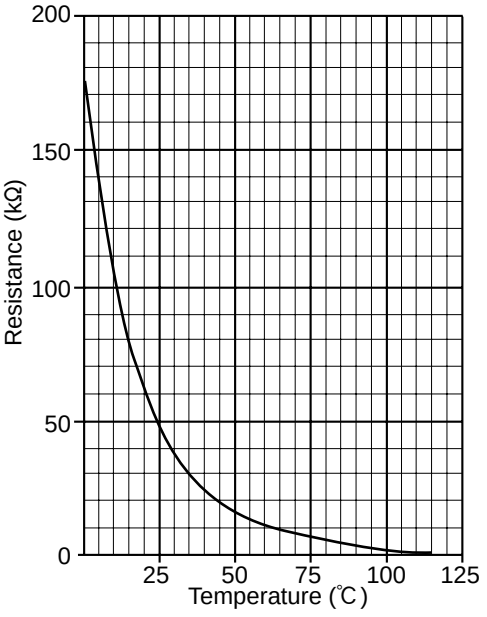

**Medium temperature thermistor**

- Thermistor <Heat sink> (TH8)

Thermistor R50 = 17kΩ ± 2%
B constant = 4150K ± 3%

$$R_t = 17\exp\{4150(\frac{1}{273+t} - \frac{1}{323})\}$$

| | |
|---|---|
| 0℃ | 180kΩ |
| 25℃ | 50kΩ |
| 50℃ | 17kΩ |
| 70℃ | 8kΩ |
| 90℃ | 4kΩ |



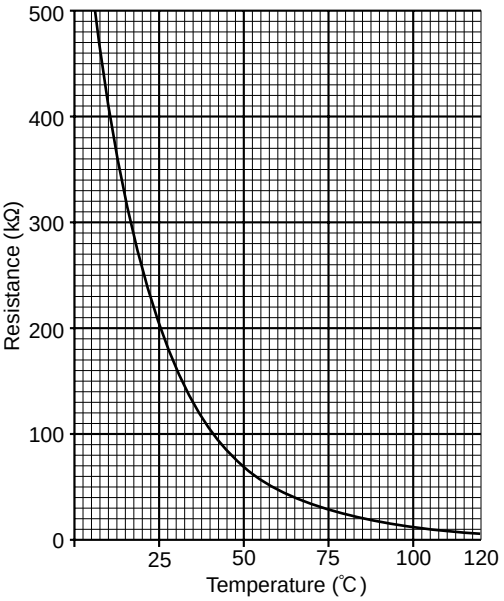

**High temperature thermistor**

- Thermistor <Discharge> (TH4)

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

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

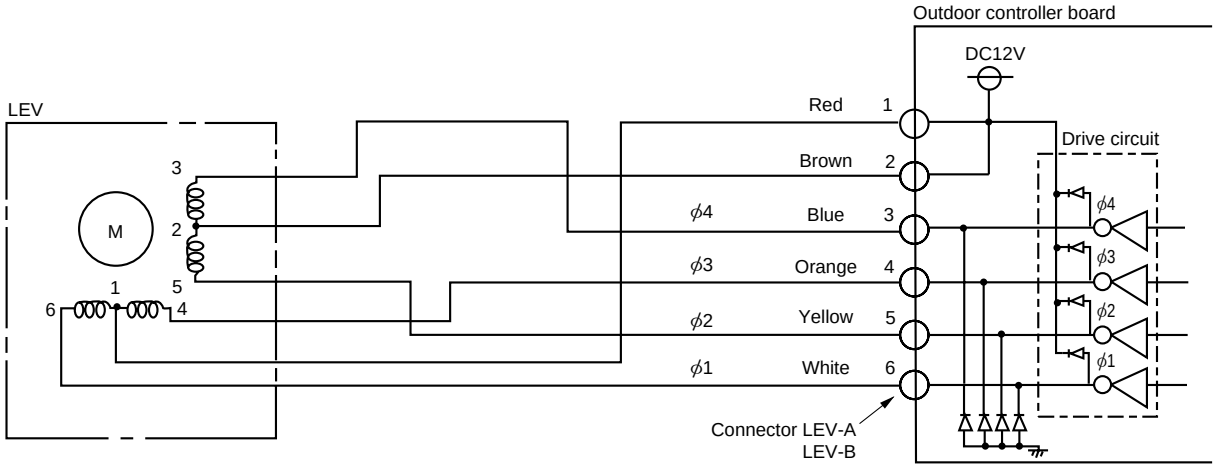
| | | | |
|---|---|---|---|
| 20℃ | 250kΩ | 70℃ | 34kΩ |
| 30℃ | 160kΩ | 80℃ | 24kΩ |
| 40℃ | 104kΩ | 90℃ | 17.5kΩ |
| 50℃ | 70kΩ | 100℃ | 13.0kΩ |
| 60℃ | 48kΩ | 110℃ | 9.8kΩ |



## 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 board.
• Valve position can be changed in proportion to the number of pulse signal.
<Connection between the outdoor controller 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.

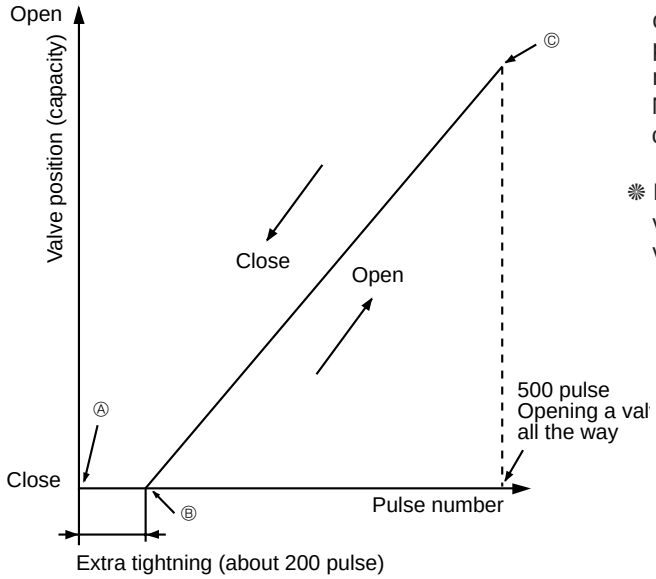
✵ 1. When linear expansion valve operation stops, all output phase become OFF.

✵ 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.

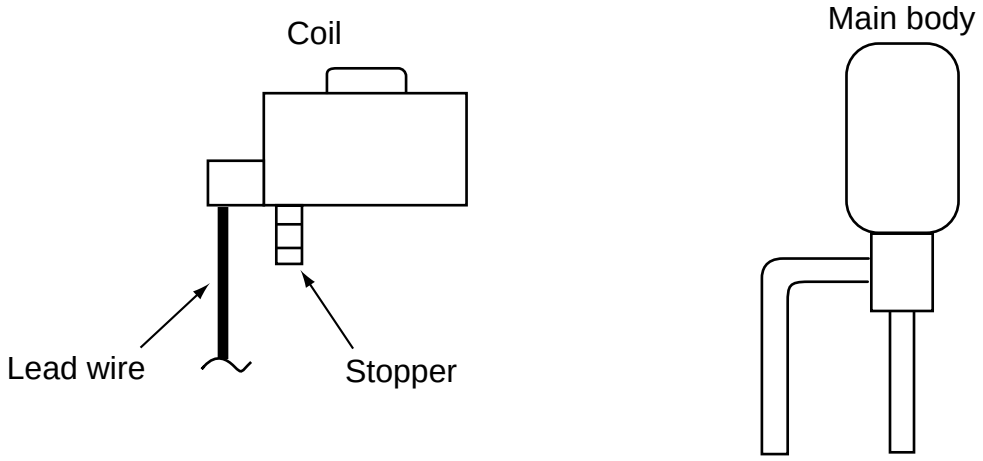
**(2) Linear expansion valve operation**



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

<Composition>

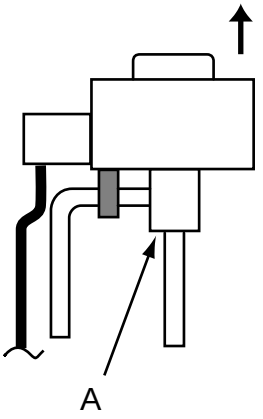
Linear expansion valve is separable into the main body and the coil as shown in the diagram below.




**<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.

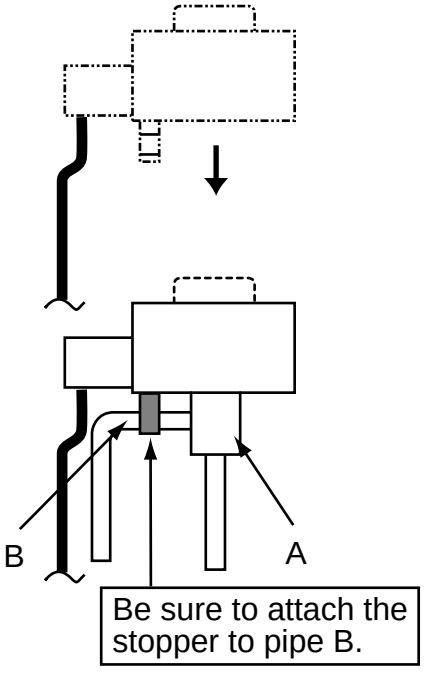
Be sure to detach the coil holding main body firmly. Otherwise pipes can bend due to pressure.




**<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.

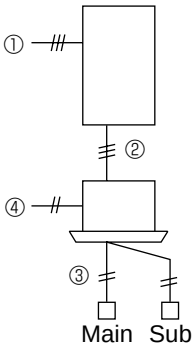


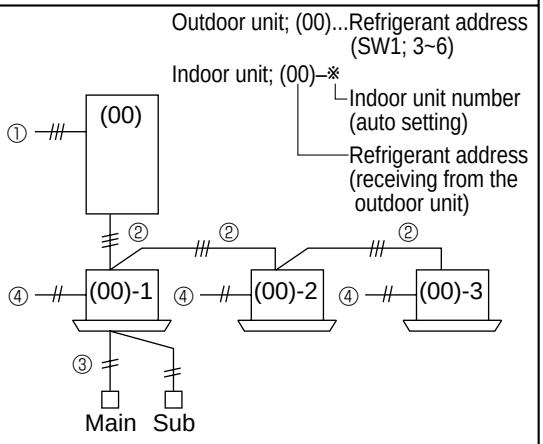
# 6 MICROPROCESSOR CONTROL

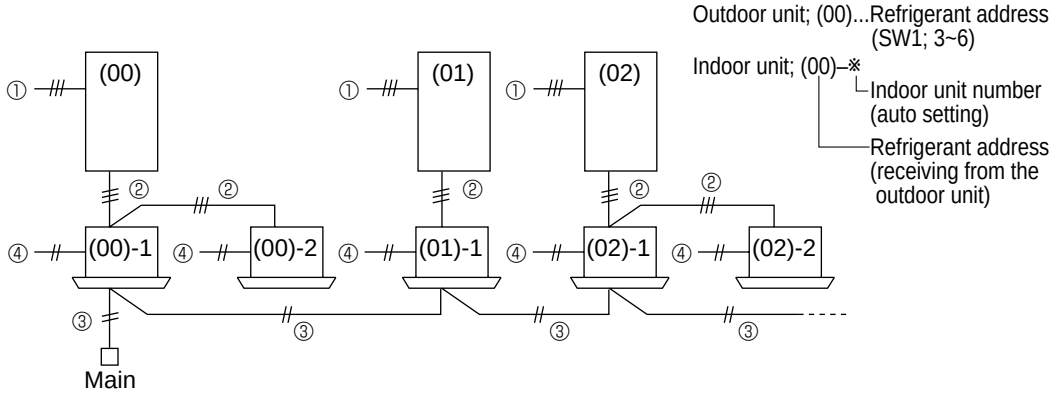
## 6-1. System construction

(1) System construction

A-control model which just wires the connecting line between the indoor and outdoor unit and supply the power is applicable to any models of standard (1:1), twin and triple. (Refer to 2 Start-up system.)

<table>
<tr><td colspan="2"></td><td>Standard 1:1</td><td>Synchronized twin. Triple</td></tr>
<tr><td colspan="2">System construction</td><td> 

①Unit (indoor/outdoor) power supply L/N<br>②Connecting line between the indoor and outdoor; S1/S2/S3, Polarized 3-wire<br>③Remote controller transmission line; Non polarized 2-wire<br>④Auxiliary heater exclusive power supply; L/N</td><td> 

①Unit (indoor/outdoor) power supply L/N<br>②Connecting line between the indoor and outdoor; S1/S2/S3, Polarized 3-wire<br>③Remote controller transmission line; Non polarized 2-wire<br>④Auxiliary heater exclusive power supply; L/N</td></tr>
<tr><td rowspan="3">Various setting</td><td>Remote controller</td><td>Remote control main/sub setting necessity<br>(In case of 2 remote controllers)</td><td>Remote control main/sub setting necessity<br>(In case of 2 remote controllers)</td></tr>
<tr><td>Indoor unit</td><td>No setting</td><td>No setting (initial setting)</td></tr>
<tr><td>Outdoor unit</td><td>No setting</td><td>No setting (initial setting)</td></tr>
<tr><td colspan="2">Remarks</td><td></td><td>(1) Indoor unit number is set automatically</td></tr>
<tr><td colspan="2"></td><td colspan="2">Group control</td></tr>
<tr><td colspan="2">System construction</td><td colspan="2"> 

①Unit (indoor/outdoor) power supply L/N<br>②Connecting line between the indoor and outdoor; S1/S2/S3, Polarized 3-wire<br>③Remote controller transmission line; Non polarized 2-wire<br>④Auxiliary heater exclusive power supply; L/N</td></tr>
<tr><td rowspan="3">Various setting</td><td>Remote controller</td><td colspan="2">Remote control main/sub setting necessity<br>(In case of 2 remote controllers)</td></tr>
<tr><td>Indoor unit</td><td colspan="2">No setting (initial setting)</td></tr>
<tr><td>Outdoor unit</td><td colspan="2">Refrigerant address setting; SW1; 3~6</td></tr>
<tr><td colspan="2">Remarks</td><td colspan="2">(1) Indoor unit number is set automatically<br>(2) When the refrigerant address of the unit is "00", Remote controller is supplied.</td></tr>
</table>

(2) The transmitting specification for “A” control

①Wiring regulations

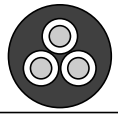
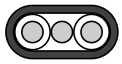
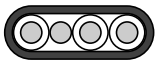
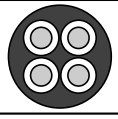
| Section | Communications from remote controllers | Communications between indoor and outdoor units |
|---|---|---|
| The maximum length of total wiring | 500m | 80m (Including the wiring among indoor units in addition to the wiring between indoor and outdoor units) |
| The maximum numbers for connection | One remote controller can connect and operate up to 16 indoor units by grouping them.*1<br>One group can connect up to two remote controllers.<br>✻1 Remote controller considers multiplex units as a single group. | One outdoor unit can connect up to three indoor units. |
| The cables applicable | 0.3mm$^2$ to 1.25mm$^2$ | Use either flat-type cable (3 cores: ϕ1.6mm or more) or wires in the table below.<br>✻2 The diameter of the cables depends on each unit. |
| Others | The wirings as follows are not allowed:<br>• The wiring that the indoor units of the same refrigerant system are connected through TB5.<br>• The wiring which directly connects the terminals for remote controllers. | The core wire connected to terminal S2 shall be placed at the center of flat-type cable. |

②Transmitting specification

| Section | Communications from remote controllers | Communications between indoor and outdoor units |
|---|---|---|
| Transmitting speed | 83.3 bit/sec. (1 bit = 12ms) | 83.3 bit/sec. (1 bit = 12ms) |
| Normal transmission | The terminal for remote controller transmits signals every 7.5 seconds; the indoor unit whose refrigerant address is “0” responds them. | Outdoor unit transmits signals every 3 seconds; all the connected indoor units respond them. |
| Modulation | The waveform modulates at 50kHz. | There is no modulation. |
| Detection of abnormal communication | When transmitting error is detected for three consecutive minutes. | When transmitting error is detected for three consecutive minute. |

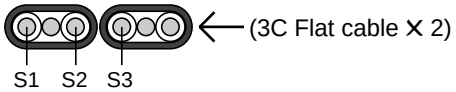
## For 220-240V 50Hz

The cable shall not be lighter than design 245 IEC or 227 IEC.
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) |
|---|---|---|---|---|
| Round  | 2.5 | 3 | Clockwise : S1-S2-S3 | (50)<br>✻1 |
| Flat  | 2.5 | 3 | Not applicable<br>(Because center wire has no cover finish) | Not applicable<br>✻2 |
| Flat  | 1.5 | 4 | From left to right : S1-Open-S2-S3 | (45)<br>✻3 |
| Round  | 2.5 | 4 | Clockwise : S1-S2-S3-Open<br>Connect S1 and S3 to the opposite angle | 60<br>✻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 80m.

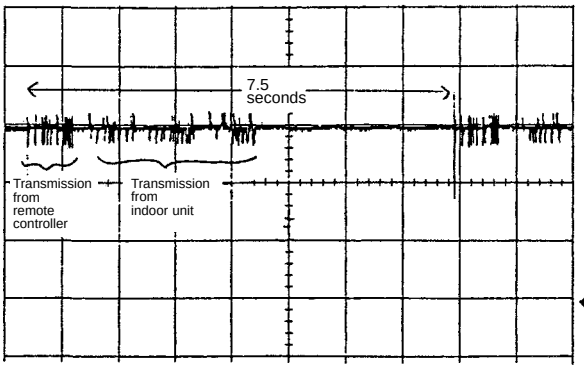



✻3 : In case of regular polarity connection (S1-S2-S3), wire size is 1.5mm$^2$.

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

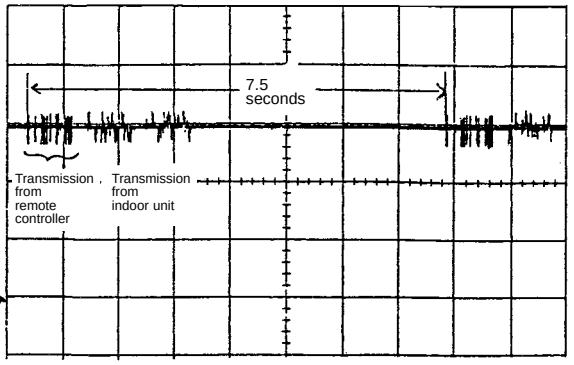
(3) The waveforms of from remote controller communications
The following graphs are the examples for measuring waveforms on the wirings of remote controlled transmission at the terminal block for remote controller.

a) A measuring example in the sequence of startup



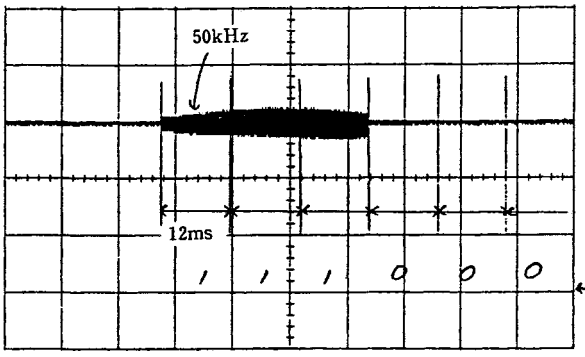

5V/div, 1sec/div:

b) A measuring example during normal stop



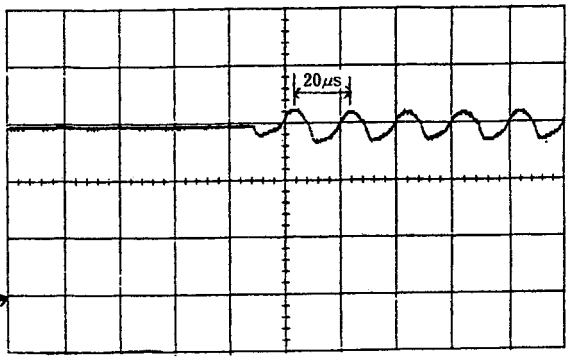

5V/div, 1sec/div:

c) Expanded waveform 1 (signal 111000....)




5V/div, 10msec/div:

d) Expanded waveform 2 (50Hz carrier)

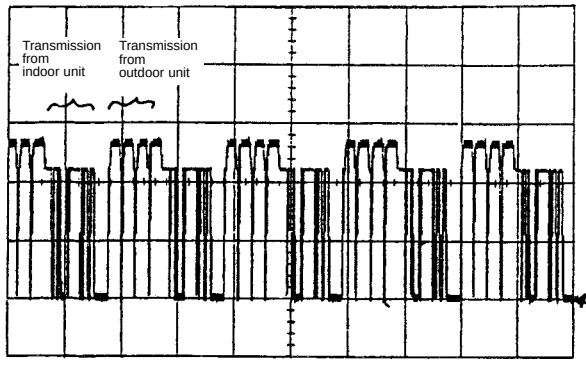



5V/div, 2μsec/div:

• During normal operation, the remote controller interactively exchanges signals with the indoor unit of refrigerant address “0”. When the remote controller cannot receive signals from the indoor unit of refrigerant address “0” for 3 minutes, it is considered as abnormal. E0 is displayed on the remote controller as an error.

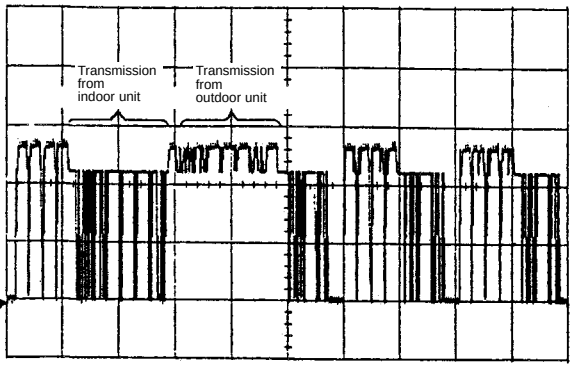
(4) The waveforms of communications between indoor and outdoor units
The following graphs are the examples for measuring waveforms on the wirings of connecting indoor and outdoor units at between S2 and S3 of the outdoor terminal block TB1.

a) A measuring example the sequence of startup: 1



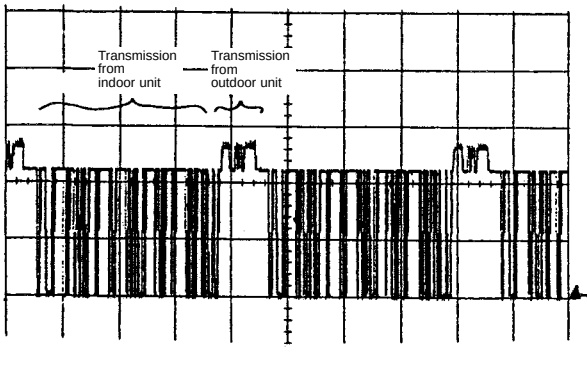

10V/div, 500msec/div:

b) A measuring example in the sequence of startup: 2



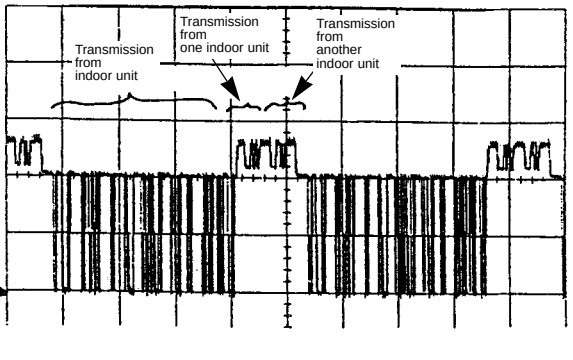

10V/div, 500msec/div:

c) A measuring example during normal stop
(When one outdoor unit connects one indoor unit)



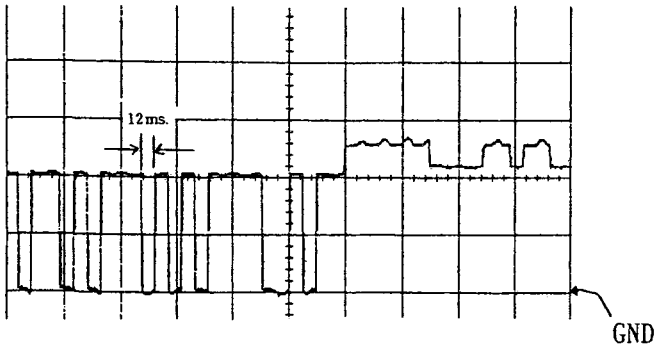

10V/div, 500msec/div:

d) A measuring example during normal stop
(When one outdoor unit connects two indoor units)




10V/div, 500msec/div:

c) Expanded waveform




10V/div, 50msec/div:

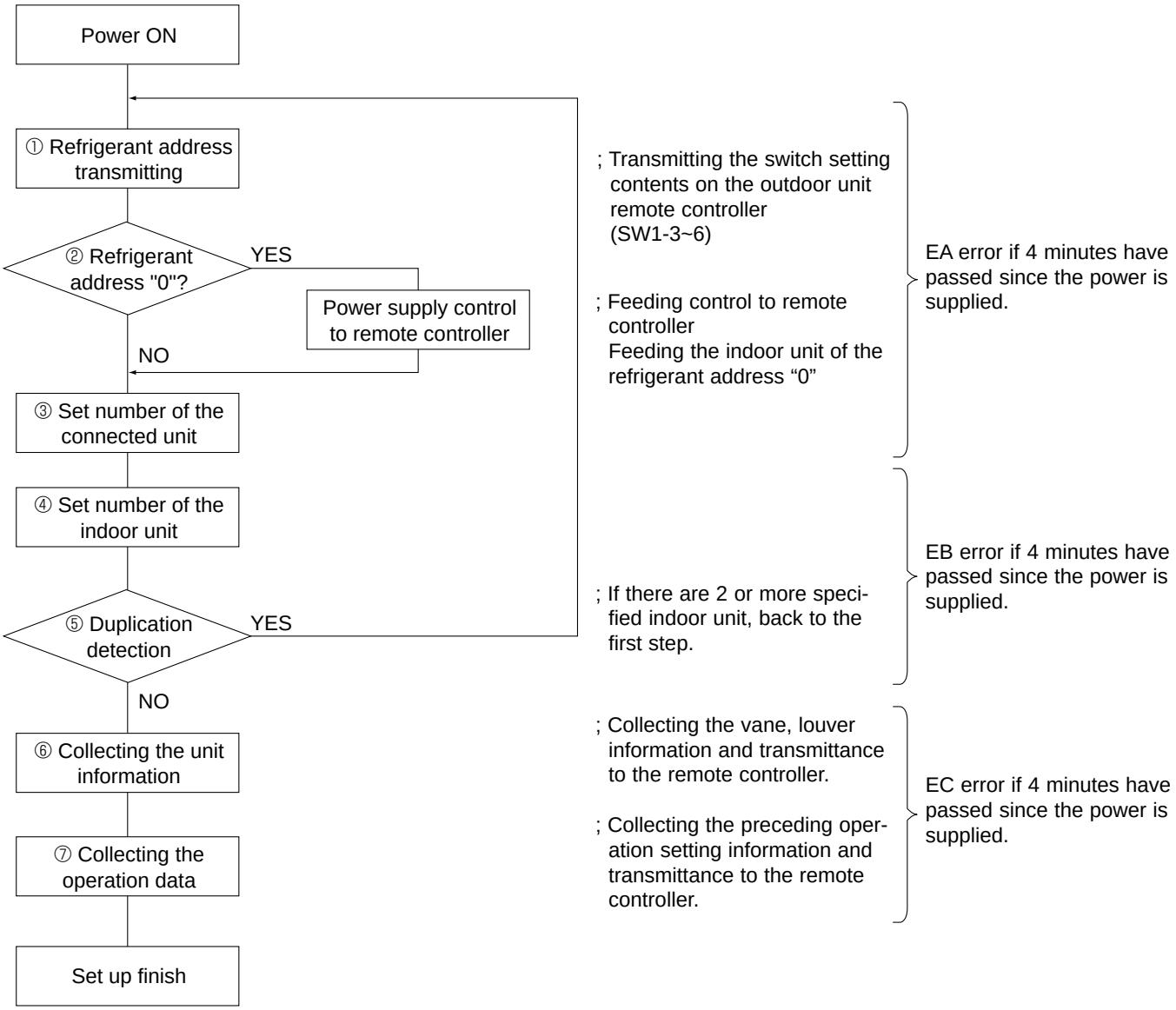
- During normal operation, outdoor unit interactively exchanges signals with all the connected indoor units.
- When outdoor unit cannot receive signals for three minutes from an indoor unit due to any trouble like cable disconnection, it is considered as abnormal and the outdoor unit stops. E8 is displayed on the remote controller. This is to avoid independent operation of indoor units.

(5) Start-up system

A control unit is applicable to any models of standard (1:1), twin and triple without switch setting according to carrying out the below process automatically when the power is supplied.

When the power is supplied, following processes of ① Refrigerant address transmitting, ② Power supply control to remote controller, ③ Set number of the connected unit, ④ Set number of the indoor unit, ⑤ Duplication detection, ⑥ Collecting the unit information and ⑦ Collecting the operation data are carried out as shown on the figure.

Also when detecting the duplicated setting in the step ⑤, back to the first step and reset it.




<<Feature>>

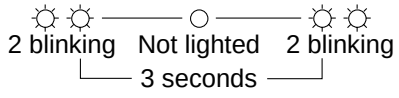
A. Start-up time from the second time will be shorter since setting of the number of connected units is memorized once set.
Start-up time can be estimated as following;
- •When installing ... 1~2 minutes (Depending the number of connecting units)
- •Since the second time .... 20 seconds ~ 1 minute (Depending the number of connecting units)

※ When the above processing does not finish, even if 4 minutes have passed, consider the processing an error and Ea, Eb or Ec will be displayed.
However if power is not supplied to the indoor unit due to miss-wiring or looseness of the connecting lines between the indoor and outdoor unit, there will be no display on the remote controller. Also when the data can not be received from the outdoor unit, E6 is displayed on the remote controller after 6 minutes.

B. When replacing the p.c.board, only the unit number which has had it`s p.c.board replaced is reset.
Even if the power supply is reset, the unit number which has not had it`s replaced does not change.

C. Automatic set unit is possible to confirm by blinking the frequency of LED3 in the indoor controller board.
At intervals of approx. 3 seconds, the number of the unit-number blinks.(Example:The unit(unit number:2) blinks twice at 3-second intervals.

Example



## Function/control specifications

| | Item | | 4-way ceiling cassette | Ceiling concealed | | |
|---|---|---|---|---|---|---|
| | | | PLA-RP•AA | PEA-RP•EA | PEAD-RP•EA | PEAD-RP•GA |
| Function / specification | Fan | Number of fan speed | 4 | 2 | 2 | 2 |
| | | Drive method | Pulsation (AC motor) | Tap-changing (AC motor) | Tap-changing (AC motor) | Tap-changing (AC motor) |
| | Up/down auto vane | Provided | ○ | — | — | — |
| | | Swing function | ○ | — | — | — |
| | | Shutter mechanism | ○ | — | — | — |
| | | Motor type | Stepping (12V DC) | — | — | — |
| | Left/right swing louver | Provided | — | — | — | — |
| | | Motor type | — | — | — | — |
| | Drain pump | | ○ | — | △ | △ |

Note: The parts marked △ are optional.

| | Item | | Ceiling suspended | Wall mounted | |
|---|---|---|---|---|---|
| | | | PCA-RP•GA | PKA-RP•GAL | PKA-RP•FAL |
| Function / specification | Fan | Number of fan speed | 4 | 4 | 2 |
| | | Drive method | Phase control (AC motor) | Phase control (AC motor) | Phase control (AC motor) |
| | Up/down auto vane | Provided | ○ | ○ | ○ |
| | | Swing function | ○ | ○ | ○ |
| | | Shutter mechanism | ○ | ○ | ○ |
| | | Motor type | Stepping (12V DC) | Stepping (12V DC) | Stepping (12V DC) |
| | Left/right swing louver | Provided | — | — | — |
| | | Motor type | — | — | — |
| | Drain pump | | △ | — | △ |

Note: The parts marked △ are optional.

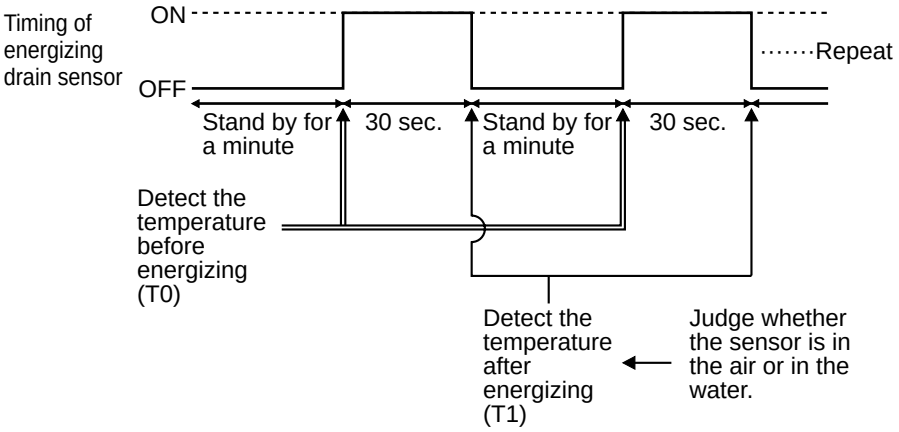
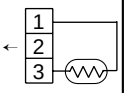
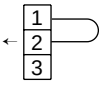
# 7 INDOOR UNIT CONTROL

## 7-1. COOL operation

| Control modes | Control details | Remarks |
|---|---|---|
| 1. Compressor | 1-1. Thermoregulating function (Function to prevent restarting for 3 minutes)<br>• Room temperature ≧ desired temperature +1℃ ···Compressor ON<br>• Room temperature ≦ desired temperature ···Compressor OFF<br>Crankcase heater: OFF when compressor operates<br>ON when compressor stopped (including when thermostat is OFF)<br>■Crankcase heater switches ON when 220-240V AC current is applied between connectors CH ① and ② on the outdoor control board. | ※1 The thermoregulating function is provided in the outdoor unit.<br>The indoor unit transmits the indoor room temperature and set temperature data to outdoor unit, then the outdoor unit controls thermoregulation. |
| | 1-2. Anti-freezing control<br>Detected condition : When the liquid pipe temperature (TH2 ) or Condenser/ Evaporator temperature (TH5 ) (※3) is 2℃ or less (※4) in 16 minutes from compressors start up, anti-freezing control starts and the compressor will be suspended.<br>Released condition : The timer which prevents reactivating is set for 3 minutes, and anti- freezing control is cancelled when any one of the following conditions is satisfied.<br>① Liquid pipe temperature (TH2) and Condenser / Evaporator temperature (TH5) turn 10℃ or above.<br>② The condition of the compressor stop has become complete by thermoregulating, etc.<br>③ The operation modes became mode other than COOL.<br>④ The operation stopped. | Refer to ※2.<br>Refer to ※3. |
| | 1-3. Frozen protection<br>Detected condition : ① When the indoor pipe temperature (TH2 ) or Condenser/ Evaporator temperature (TH5 ) continues -15℃ for 3 minutes since 3 minutes has passed after the compressor start, the compressor stops and then the mode changes to prevent restarting for 6 minutes. After restarting of 6 minutes, when the indoor pipe temp. (TH2) or Condenser / Evaporator temperature (TH5) continues -15 or less for three minutes again by the time 16 minutes have passed, the frozen protection operates. (P6)<br>Detected condition : ② In case the indoor unit continues to be under the anti-freezing control for 9 minutes or more, the unit will be in a state of the suspensive abnormality. Restart the compressor after releasing the anti-freezing control. The suspensive abnormality will be cancelled if the compressor keeps operating for 20 minutes. However, the suspensive abnormality will turn into the abnormality if the anti-freezing control works again for 9 minutes during that period. On the other hand, the suspensive abnormality will be cancelled if the anti-freezing control works for less than 9 minutes<br>Released condition : When the operation stops by the remote controller operation. | |
| 2. Fan | By the remote controller setting (switch of 4 speeds or 2 speeds)<br>When determining the abnormality of the pipe temp. low speed fan is fixed. | |

| Type | Fan speed notch | |
|---|---|---|
| 4 speeds type | [Low] [Medium2] [Medium1] [High] | |
| 2 speeds type | [Low] | [High] |

※2 Compare liquid pipe temperature to Condenser/ Evaporator temperature, and the lower one is applied to anti-freezing control.
• Liquid pipe temperature ≦ Condenser/ Evaporator temperature····· Liquid pipe
• Liquid pipe temperature > Condenser/ Evaporator temperature····· Condenser/ Evaporator pipe
※3 The function of remote controller can change the temperature to start anti-freezing control.

| Control modes | Control details | Remarks |
|---|---|---|
| 3. Drain pump | 3-1. Drain pump control<br>•Always drain pump ON during the COOL and DRY mode operation. (Regardless of the compressor ON/ OFF)<br>•When the operation mode has changed from the COOL or DRY to the others (including Stop), OFF the control after the drain pump ON for 3 minutes. | |
| | **Drain sensor function**<br>• Energize drain sensor at a fixed voltage for a fixed duration. After energizing, compare the drain sensor's temperature to the one before energizing, and judge whether the sensor is in the air or in the water.<br><br>**Basic control system**<br>• While drain pump is turned on, repeat the following control system and judge whether the sensor is in the air or in the water.<br>  <br><br>•Drain sensor temperature rise (Δt)<br>•Temperature of drain sensor before current is applied ($T_0$)<br>•Temperature of drain sensor after current is applied ($T_1$)<br><br>[ $\Delta t = T_1 - T_0$ ] | ⁎1 Drain sensor<br>Indoor controller board<br>CN31<br>  <br><br>⁎2 If the unit is without the drain sensor, install the jumper connector.<br>Indoor controller board<br>CN31<br>  <br><br>When installing the jumper connector, determine to detect compulsorily in the air. |
| 4. Vane<br>(up/ down vane change) | (1) Initial setting : Start at COOL mode and horizontal vane.<br>(2) Vane position : Horizontal →Downward A →Downward B →Downward C→Swing<br><br>(3) Restriction of the downward vane setting<br>When setting the downward vane A, B and C in [Medium2] or [Low] of the fan speed notch, the vane changes to horizontal position after 1 hour have passed. | ⁎1 Whether the unit has a swing function is listed in the function/ control specifications.<br>⁎2 See the function/control specifications for the vane motor type.<br>⁎3 "1Hr" appears on the wired remote controller. |

## 7-2. DRY operation

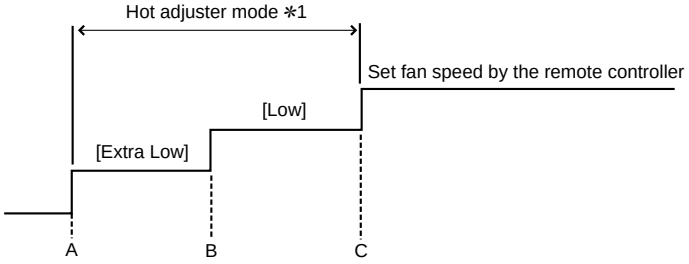
<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>1-1. Thermoregulating function (Function to prevent restarting for 3 minutes)<br>Setting the compressor operation time by the thermoregulating signal and the room temperature (TH1).<br>Thermoregulating signal ON Room temperature ≧ desired temperature +1℃<br>Thermoregulating signal OFF Room temperature ≦ desired temperature
<table>
<tr><th>Room temp.</th><th>Thermoregulating signal</th><th>Operating time (min)</th><th>OFF time (min)</th></tr>
<tr><td rowspan="2">Over 18℃</td><td>ON</td><td>9</td><td>3</td></tr>
<tr><td>OFF</td><td>3</td><td>10</td></tr>
<tr><td>Less than 18℃</td><td colspan="3">Compressor operation stop</td></tr>
</table></td><td>*1<br>The thermoregulating function is provided in the outdoor unit.<br><br>The indoor unit transmits the indoor room temperature and set temperature data to outdoor unit, then the outdoor unit controls thermoregulation.</td></tr>
<tr><td></td><td>1-2. Frozen prevention control<br>No control function</td><td></td></tr>
<tr><td></td><td>1-3. Frozen protection<br>Same control as COOL operation</td><td></td></tr>
<tr><td>2. Fan</td><td>Indoor fan operation controlled depends on the compressor conditions.
<table>
<tr><th>Compressor</th><th>Fan speed</th></tr>
<tr><td>ON</td><td>[Low]</td></tr>
<tr><td>OFF</td><td>Stop (*1)</td></tr>
</table>
Note: Remote controller setting is not acceptable.</td><td>*1 Note that even when the compressor is OFF, the unit starts operating in [LOW] if the start condition below is met.<br>Start condition: The piping temperature (fluid piping or 2-phase piping) has fallen to 1℃ or less.<br>Release condition: The piping temperature (fluid piping or 2-phase piping) has returned to at least 10℃.</td></tr>
<tr><td>3. Drain pump</td><td>Same control as COOL operation</td><td></td></tr>
<tr><td>4. Vane<br>(up/ down vane change)</td><td>Same control as COOL operation</td><td></td></tr>
<tr><td>5. Louver<br>(Left/ right change)</td><td>Remote controller setting</td><td>*1 Model which is installed louver function.</td></tr>
</table>

## 7-3. FAN operation

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>None (always stopped)</td><td></td></tr>
<tr><td>2. Fan</td><td>Set by remote controller.
<table>
<tr><th>Number of fan speeds</th><th>Fan speed notches</th></tr>
<tr><td>4</td><td>[Low], [Medium2], [Medium1], [High]</td></tr>
<tr><td>2</td><td>[Low] [High]</td></tr>
</table></td><td></td></tr>
<tr><td>3. Drain pump</td><td>3.1 Drain pump control<br>The drain pump turns ON for the specified amount of time when any of the following conditions is met:<br>① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (FAN).<br>② ON for 6 minutes after the drain sensor is determined to be submerged using the liquid level detection method given below.<br>③ ON for 6 minutes after indoor piping (liquid piping) temperature - indoor intake temperature ≦ -10℃, AND the drain sensor input is at the short or open level.<br>(If condition ② or ③ is still being met after the drain pump has been turned ON for 6 minutes, the drain pump is kept ON for a further 6 minutes.)</td><td></td></tr>
<tr><td></td><td>3.2 Liquid level detection method<br>The liquid level is detected by determining whether or not the drain sensor is submerged, based on the amount the temperature rises after self-heating the sensor. This process is performed if any of the following conditions is met:<br>① Drain pump is ON.<br>② Indoor piping (liquid piping) temperature - indoor intake temperature ≦ -10℃<br>③ Indoor piping (liquid piping) temperature or indoor intake temperature is at the short or open level temperature.<br>④ Every hour after the drain pump has been switched from ON to OFF.</td><td></td></tr>
<tr><td>4. Vane<br>(up/ down vane change)</td><td>Same as the control performed during the COOL operation, but with no restriction on the vane's downward blow setting.</td><td></td></tr>
</table>

## 7-4. HEAT operation

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>1-1. Thermoregulating function (Function to prevent restarting for 3 minutes)<br>• Room temperature ≦ desired temperature-1℃ ⋯Compressor ON<br>• Room temperature ≧ desired temperature ⋯Compressor OFF</td><td>∗1<br>The thermoregulating function is provided in the outdoor unit.<br><br>The indoor unit transmits the indoor room temperature and set temperature data to outdoor unit, then the outdoor unit controls thermoregulation.</td></tr>
<tr><td></td><td>1-2. Over- rise protection control<br>Detected control : When Condenser/ Evaporator temp. turns 74℃ or more, less than 90℃ after starting compressor, stop the compressor, then the mode changes to restarting compressor, stop the compressor, then the mode changes to restarting protection mode after 6 minutes.<br>After restarting after 6 minutes when the Condenser/ Evaporator temperature became 74℃ or more, less than 90℃ by the time 10 minutes pass, the mode changes to over-rise protection control.<br>Release control : When the operation stops by the remote controller.</td><td></td></tr>
<tr><td>2. Auxiliary heater</td><td>2-1. Thermoregulating function<br>When the mode is not Hot adjust or Defrosting mode during HEAT compressor operation, the controller changes to auxiliary heater ON.<br>Thermoregulating function follows the below table with according to desired temp. and room temp.<br><table><tr><th>Temperature difference</th><th>Auxiliary heater</th></tr><tr><td>z < 0</td><td>OFF</td></tr><tr><td>0 ≦ z < 3</td><td>Keeping condition</td></tr><tr><td>3 ≦ z</td><td>ON</td></tr></table>temperature difference Z=Desired temperature - Room temperature<br>2-2. Over-rise prevention control<br>During the HEAT compressor operation, when the Condenser/ Evaporator temperature becames 63℃ or more, over-rise prevention control operates and the auxiliary heater prohibits for ON operation. When the indoor Condenser/Evaporator temperature is being 58℃ or less for 3minutes during over-rise prevention, over-rise prevention control will be released and auxiliary heater ON will be allowed.<br>(However, in case the Condenser/Evaporator temperature becomes 66℃ or more during over-rise prevention, 40℃ or less will be the requirement to release over-rise prevention control and allow auxiliary heater to be ON.)</td><td>∗1 Models without auxiliary heater also control the units in the same way as shown in the left.<br><br>∗2 During the over-rise prevention control, "Airflow increasing" in the indoor fan is controlled.<br>( Only the model of fan 4-speed)</td></tr>
</table>

| Control modes | Control details | Remarks |
|---|---|---|
| 3. Fan | Controlled by the remote controller (4-speed or 2-speed)<br>Give priority to under-mentioned controlled mode<br>3-1. Hot adjuster mode<br>3-2. Preheating exclusion mode<br>3-3. Thermostat OFF mode (When the compressor off by the thermoregulating)<br>3-4. Cool air prevention mode (Defrosting mode)<br>3-5. Capacity increasing mode | ∗1<br>Fan speed change notch<br>Refer to the model function table |
| | 3-1. Hot adjuster mode<br>The fan controller becomes the stand by (hot adjuster) mode for the following conditions.<br>① When starting the HEAT operation<br>② When starting the compressor by the thermoregulating<br>③ When release the HEAT defrosting operation<br>  <br><br>A: Stand by (hot adjuster) mode start<br>B: 5 min have passed since the condition A or the indoor Condenser/ Evaporator temperature turned 35℃ or more<br>C: 2 min have passed since the condition A (Terminating the stand by (hot adjuster) mode) | ∗1 "STAND BY" will be displayed during the stand by (hot adjuster) mode. |
| | 3-2. Preheating exclusion mode<br>When the condition changes the auxiliary heater ON to OFF (thermoregulating or operation stop, etc), the indoor fan operates in [Low] mode for 1 minute. | ∗1 This control is same for the model without auxiliary heater. |
| | 3-3. Thermostat OFF mode<br>When the compressor stops by the thermoregulating, etc., the indoor fan operates in [Extra low]. | ∗1 Fan's airflow volume, when thermostat is OFF, can be changed by selecting the function of remote controller. |
| | 3-4. Cool air prevention mode (Heat defrosting mode)<br>After "not adjustment" mode is finished, the indoor fan will stop if ① or ② mentioned below is detected.<br>When receiving "DEFROST" from the outdoor unit, the mode changes to defrosting mode.<br>Pipe temp. (Condenser/ Evaporator) - Room temp. ≦ -5deg …①<br>-5deg < pipe temp. (Condenser/ Evaporator) - Room temp. ≦ 5deg …②<br>5deg < pipe temp. (Condenser/ Evaporator) - Room temp. …③ | ∗1 "DEFROST "will be displayed on the remote controller during the defrost operation. |
| | 3-5. Fan speed up mode<br>•When the control changes to over-rise prevention.<br>The condition of over-rise prevention (Prohibit for auxiliary heater ON) continues for 10 seconds or more and the set fan speed is [Low] or [Medium2], the fan speed changes to [Medium1].<br>•When the control changes to over-rise prevention during the heater OFF, the mode changes to capacity increasing mode immediately.<br>The capacity increasing mode is canceled by canceling the over-rise prevention mode. | ∗1 This control is applied for only 4-speed model. |

| Control modes | Control details | Remarks |
|---|---|---|
| 4. Drain pump | 4-1. Drain pump control<br><br>The drain pump turns ON for the specified amount of time when any of the following conditions is met (regardless of whether the compressor is ON or OFF).<br>① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (HEAT mode).<br>② ON for 6 minutes after the drain sensor is determined to be submerged using the liquid level detection method given below.<br>③ ON for 6 minutes after indoor liquid pipe temperature - indoor intake temperature becomes -10deg or less AND the drain sensor input is at the short or open level.<br>(If condition ② or ③ is still being met after the drain pump has been turned ON for 6 minutes, the drain pump is kept ON for a further 6 minutes.) | |
| | 4-2. Liquid level detection method<br><br>The liquid level is detected by determining whether or not the drain sensor is submerged, based on the amount of the temperature rise after the sensor is self-heated. This process is performed if any of the following conditions is met.<br>① Drain pump is ON.<br>② Indoor liquid pipe temperature - indoor intake temperature ≦ -10deg (except during defrosting)<br>③ Indoor liquid pipe temperature or indoor intake temperature is at the short or open level temperature.<br>④ Every hour after the drain pump has been switched from ON to OFF. | ※ Refer to “7-1. COOL opration” for liquid level detection method. |
| 5. Vane control (Up/ down vane change) | (1) Initial setting : OFF → HEAT⋯[last setting]<br>When changing the mode from exception of HEAT to HEAT operation. ⋯[Downward C]<br>(2) Air flow direction<br>[Horizontal]→[Downward A]→Downward B]→Downward C]→[Swing]<br>(3) Determining position (When the timing motor of AC 200-240V)<br>Control each air outlet angle considering the starting OFF → ON of limit switch to be a standard position (Horizontal or shutter).<br>When the standard position can not be determined for 10 minutes, the vane stops at the arbitrary position.<br>(Vane swing motion for 10 minutes)<br>(4) Restriction of vane position<br>The vane is horizontally fixed for the following modes.<br>(The control by the remote controller is temporally invalidated and control by the unit.)<br>•Compressor OFF mode (Thermoregulating, etc.)<br>•Stand by (hot adjuster) [Extra low] mode<br>•Cool prevention mode (Determining except for Heat area)<br>•Heat defrost mode<br>•Piping (Condenser/ Evaporator) temperature is 37℃ or less. | ⁎1 Whether the unit has a swing function is listed in the function/control specifications.<br><br>⁎ See the function/control specifications for the vane motor type. |

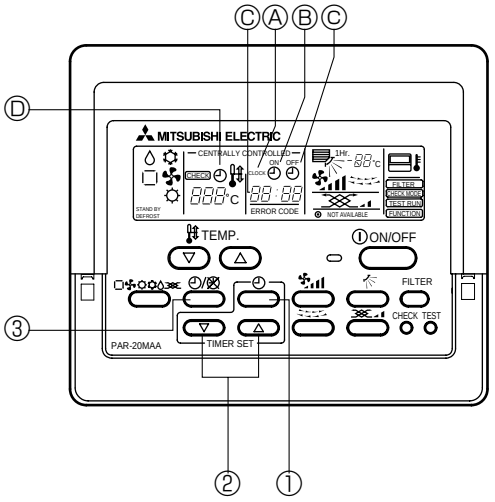
## 7-5. AUTO operation

| Control modes | Control details | Remarks |
|---|---|---|
| 1. Initial value of operation mode | HEAT mode for room temperature < Desired temperature<br>COOL mode for room temperature ≧ Desired temperature | ✻This mode is provide in the outdoor unit. The indoor unit follows the instruction from the outdoor unit. |
| 2. Mode change | (1) HEAT mode → COOL mode<br>Room temperature ≧ Desired temperature + 2deg. or 15 min. has passed<br>(2) COOL mode → HEAT mode<br>Room temperature ≦ Desired temperature - 2deg. or 15 min. has passed | ✻This mode is provide in the outdoor unit. The indoor unit follows the instruction from the outdoor unit. |
| 3. COOL mode | Same control as cool operation | |
| 4. HEAT mode | Same control as heat operation | |

## 7-6. When unit is stopped Control mode

| Control modes | Control details | Remarks |
|---|---|---|
| 1. Drain pump | 1.1 Drain pump control<br>The drain pump turns ON for the specified amount of time when any of the following conditions is met (regardless of whether the compressor is ON or OFF)<br>① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (HEAT mode).<br>② ON for 6 minutes after the drain sensor is determined to be submerged using the liquid level detection method given below.<br>③ ON for 6 minutes after indoor piping (liquid piping) temperature - indoor intake temperature ≦ -10deg, AND the drain sensor input is at the short or open level.<br>(If condition ② or ③ is still being met after the drain pump has been turned ON for 6 minutes, the drain pump is kept ON for a further 6 minutes.) | |
| | 1.2 Liquid level detection method<br>The liquid level is detected by determining whether or not the drain sensor is submerged, based on the amount the temperature rises after self-heating the sensor. This process is performed if any of the following conditions is met:<br>① Drain pump is ON.<br>② Indoor piping (liquid piping) temperature - indoor intake temperature ≦ -10deg (except during defrosting)<br>③ Indoor piping (liquid piping) temperature or indoor intake temperature is at the short or open level temperature.<br>④ Every hour after the drain pump has been switched from ON to OFF. | |

## 7-7. TIMER operation




**▶ Available Timer-Interlocked Operation Modes**

1. AUTO START/STOP:Allows both start and shutdown to be interlocked with the timer.
2. AUTO START: Allows automatic start in response to the timer setting and shutdown to be proceeded by manually pressing the ON/OFF button.
3. AUTO STOP: Allows the start of the operation to be manually invoked by pressing the ON/OFF button and automatic shutdown based on the timer setting.

**▶ Timer-interlocked operation is available only once for both start and shutdown in 24 hours.**

**While Ⓓ ◴ is displayed, setting and changing of time for timer-interlocked operation is disabled.**

**In this case, press ③ button once to turn off the Ⓓ ◴ display on the remote controller. This is referred to as TIMER OFF operation.**

**1) Set the current time**

1-1) Press the ① button and “CLOCK” Ⓐ will be displayed.
1-2) Press the ② button once to advance the current time by one.
Press the ② button once to set back the current time by one.
- Press and hold down either button to fast-forward (-reverse) the time setting.
- The display will disappear from about 10 seconds after the setting has been entered.

**2) Set the time to start the unit as follows**

2-1) Press the ① button and ON ◴ Ⓑ will be displayed.
2-2) Press the ② button to set the current time.
2-3) The --:-- field Ⓒ will be displayed.
The --:-- field Ⓒ will display a range of time between 23:50 and 00:00.
2-4) Press the ③ button and ◴ Ⓓ will be displayed.

**3) Set time to stop the unit as follows**

3-1) Press the ① button and OFF ◴ Ⓒ will be displayed.
3-2) Press the ② button to set the current time.
3-3) Set the automatic shutdown timer in the --:-- Ⓑ display.
3-4) Press the ③ button and ◴ Ⓓ will be displayed.

**4) Changing the set times**

- Enter a start time/shutdown time.
- Press the ③ button and ◴ Ⓓ will be displayed.

**5) Cancelling the set times**

- Press the ③ button to clear the remote controller`s display.

**Note:**

**When the air conditioner is operated or is turned off after the timer setting has finished, the unit will automatically run without interruption the next time it is operated.**

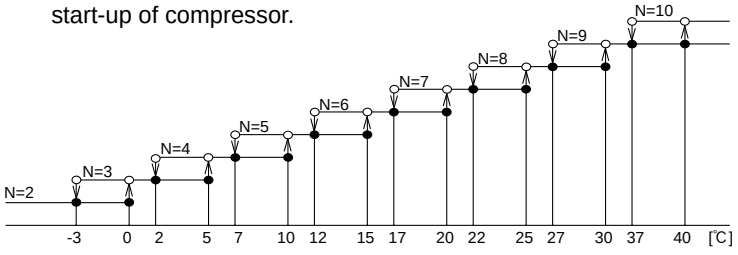
# 8 OUTDOOR UNIT CONTROL

## 8-1. COOL operation

| Control modes | Control details | Remarks |
|---|---|---|
| 1. Compressor | 1-1. Thermoregulating function<br>The outdoor unit receives information of set temperature and intake temperature from the indoor unit through transmission and judges the necessity of thermoregulating from their temperature difference.<br>(Refer to "INDOOR UNIT CONTROL" for detailed detecting method.) | |
| | 1-2. Normal control<br>Compressor operating frequency is controlled according to the difference between intake temperature and set temperature in order to let the intake temperature be the same as the set temperature<br>• Control timing: Once per minute after 3 minutes have passed since the compressor started.<br>• Frequency changing range: -12Hz to +20Hz<br>※: However, in the following cases, the frequency changing amount, which is different from the normal one, will be applied to control the operating frequency.<br>(1) Frequency is fixed to the minimum just before the compressor is stopped by the thermoregulating function.<br>Intake temperature ≦ Set temperature +0.5℃ ⋯ Fixed to the minimum frequency.<br>Intake temperature ≦ Set temperature +1.0℃ ⋯ Fixation is released. (Returned to normal control.)<br>(2) Correction of the frequency changing amount according to the estimated discharge temperature If the estimated discharge temperature is more than 113℃, the frequency changing amount will be corrected.<br>• Correction amount: 0Hz to -6Hz | Refer to "8-7. Inverter control" for "Inverter control basic control frequency setting". |
| | 1-3. Start-up control<br>Controls, which are conducted in 3 minutes after the compressor gets started, are categorized as below.<br>(1) In case of start-up (first time)<br>a. 0 min. to 1 min. after start-up: Fixed to 48Hz.<br>b. 1 min. to 3 min. after start-up: Fixed to the Hz which has been regulated according to the temp. difference between intake temp. and set temperature<br>• Fixed frequency: minimum Hz to 48Hz.<br>(2) In case of restart<br>a. 0 min. to 1 min. after start-up: Fixed to minimum Hz.<br>b. 1 min. to 3 min. after start-up: Fixed to the Hz which has been regulated according to the temperature difference between intake temp. and set temperature<br>• Fixed frequency: minimum Hz or 42Hz.<br>Maximum Hz will be controlled to 70Hz for 10 minutes after the start-up of compressor. | |
| | 1-4. Indoor anti-freezing control<br>When the outdoor unit receives the signal of anti-freezing control mode, the compressor stops. The compressor will restart when the indoor anti-freezing control is released. | Refer to "INDOOR UNIT CONTROL" for the indoor anti-freezing control. |
| | 1-5. Indoor frozen prevention control<br>Frequency controls such as Hz-down and no more Hz-up will be conducted according to the indoor liquid pipe temp. (TH2) or indoor cond./eva. temp. (TH5).<br>Temp. restriction: No more Hz-up ⋯ When TH2 or TH5 detects 4.5℃ or less<br>Hz-down ⋯ When TH2 or TH5 detects 3.5℃ or less ※<br>※ Hz-down amount: -5Hz per minute | |

Continued to the next page.

From the previous page.

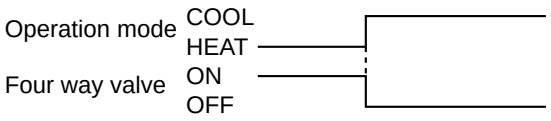
<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>1-6. Discharge temperature over-rise prevention control<br>Frequency controls such as Hz-down and no more Hz-up will be conducted according to the discharge temperature (TH4).<br>Temperature restriction: No more Hz-up … When TH4 detects 105℃ or more<br>Hz-down ….-6Hz per min. when TH4 detects 110℃ or more<br>….-10Hz per min. when TH4 detects 118℃ or more</td><td></td></tr>
<tr><td></td><td>1-7. Condensing temperature over-rise prevention control<br>Frequency controls such as Hz-down and no more Hz-up will be conducted according to the outdoor condenser/evaporator temperature (TH6).<br>Temperature restriction: No more Hz-up … When TH6 detects 58℃ or more<br>Hz-down ….-5Hz per min. when TH6 detects 60℃ or more<br>….-10Hz per min. when TH6 detects 63℃ or more</td><td></td></tr>
<tr><td></td><td>1-8. Heat sink temperature over-rise prevention control<br>Frequency controls such as Hz-down and no more Hz-up will be conducted according to the heat sink temperature (TH8).<br>Temperature restriction:
<table>
<tr><th>Models</th><th>No more Hz-up</th><th>Hz-down</th></tr>
<tr><td>PUHZ-RP1.6VHA</td><td>78℃</td><td>81℃</td></tr>
<tr><td>PUHZ-RP2VHA</td><td>78℃</td><td>81℃</td></tr>
<tr><td>PUHZ-RP2.5VHA</td><td>71℃</td><td>74℃</td></tr>
<tr><td>PUHZ-RP3VHA</td><td>71℃</td><td>74℃</td></tr>
<tr><td>PUHZ-RP4VHA</td><td>78℃</td><td>81℃</td></tr>
<tr><td>PUHZ-RP5VHA</td><td>78℃</td><td>81℃</td></tr>
<tr><td>PUHZ-RP6VHA</td><td>78℃</td><td>81℃</td></tr>
</table>
※ Hz-down amount: -5Hz per minute</td><td></td></tr>
<tr><td>2. Fan</td><td>2-1. Normal control<br>Fan rotation times (rpm) will be controlled according to the outdoor outside temperature (TH7).<br>• Control method: Inverter control<br>• Rotation times: Fan step (N) = 0 and 2 to 10<br>• Compressor start-up: Fan step is fixed to 9 for 30 seconds after the start-up of compressor.<br> 

Outside temperature (TH7)</td><td>Step (N)—Rotation times(rpm)
<table>
<tr><th rowspan="2">Step (N)</th><th colspan="3">Rotation times(rpm)</th></tr>
<tr><th>RP1.6, 2</th><th>RP2.5, 3</th><th>RP4-6</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>105</td><td>95</td><td>125</td></tr>
<tr><td>2</td><td>135</td><td>115</td><td>155</td></tr>
<tr><td>3</td><td>165</td><td>135</td><td>175</td></tr>
<tr><td>4</td><td>205</td><td>165</td><td>200</td></tr>
<tr><td>5</td><td>265</td><td>200</td><td>240</td></tr>
<tr><td>6</td><td>340</td><td>245</td><td>285</td></tr>
<tr><td>7</td><td>430</td><td>305</td><td>360</td></tr>
<tr><td>8</td><td>530</td><td>450</td><td>465</td></tr>
<tr><td>9</td><td>680</td><td>700</td><td>700</td></tr>
<tr><td>10</td><td>700</td><td>720</td><td>720</td></tr>
</table></td></tr>
<tr><td></td><td>2-2. Correction of fan step according to the outdoor cond./eva. temperature<br>Fan step will be corrected according to the outdoor cond./eva. temp.(TH6).<br>• Correction range of condensing temperature : 19℃ to 62℃<br>• Correction range of fan step: -1 to +3</td><td></td></tr>
<tr><td></td><td>2-3. Correction of fan step according to the heat sink temperature<br>Fan step will be corrected according to the heat sink temperature (TH8).<br>• Correction range of heat sink temperature: 68℃ to 78℃<br>• Correction range of fan step: 0 to +2</td><td></td></tr>
<tr><td></td><td>2-4. Other<br>(1) Fan also stops when the compressor is being stopped. (Fan step = 0)<br>However, fan step will be set to 10 while the compressor is being stopped due to the abnormal heat sink temperature (Error code = U5).<br>At this time, the compressor is just waiting for 3 minutes to restart.</td><td></td></tr>
</table>

| Control modes | Control details | Remarks |
|---|---|---|
| 3. LEV(A) | 3-1. Normal control<br>Opening pulse will vary among steps (1 to 3) according to air conditioner's operating status.<br>• Control timing: Once every 5 minutes after 3 or 7 minutes have passed since the compressor started.<br>• LEV opening pulse for each step:<br>• Requirement for step-up<br>LEV opening pulse will step up when any of following conditions is satisfied.<br>(1) The discharge temperature (TH4) is 100℃ or more<br>(2) The outdoor condenser/evaporetor temperature (TH6) is 57℃ or more<br>(3) The discharge super heat temperature is 50℃ or more Super heat temperature = Discharge temperature (TH4) - Outdoor condenser/evaporetor temperature (TH6)<br>(4) The sub cool temperature is 12℃ or more<br>Sub cool temperature = Outdoor condenser/evaporetor temperature (TH6) - Outdoor liquid pipe temperature (TH3)<br>• Requirement for step-down<br>LEV opening pulse will step down when any of following conditions is satisfied and any of step-up conditions are NOT satisfied.<br>(1) The discharge temperature (TH4) is 90℃ or less.<br>(2) The outdoor condenser/evaporetor temperature (TH6) is 52℃ or less.<br>(3) The discharge super heat temp. is 40℃ or less.<br>Super heat temperature = Discharge temperature (TH4) - Outdoor condenser/evaporetor temperature(TH6)<br>(4) The sub cool temperature is 3℃ or less.<br>Super heat temperature = Outdoor condenser/evaporetor temperature (TH6) - Outdoor liquid pipe temperature (TH3)<br>• The step does not change if neither step-up conditions nor step-down conditions are satisfied. | |

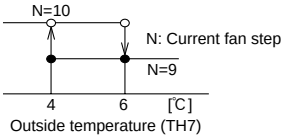
| Step | RP1.6VHA | RP2VHA | RP2.5VHA | RP3VHA | RP4VHA | RP5VHA | RP6VHA | RP4VHA$_1$ | RP5VHA$_1$ | RP6VHA$_1$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 195 | 200 | 150 | 200 | 220 | 220 | 220 | 220 | 220 | 220 |
| 2 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 260 | 260 | 260 |
| 3 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 |

| | | |
|---|---|---|
| | 3-2. Compulsory step-up<br>When any of the following conditions is satisfied, the step will be forced to 3.<br>(1) The discharge temperature (TH4) is 110℃ or more.<br>(2) The condenser/evaporetor temperature (TH6) is 62℃ or more. | |
| | 3-3. Stop control<br>When the LEV is being stopped, the step will be set to 3. | |

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>4. LEV(B)</td><td>4-1. Normal control<br>LEV opening pulse will be controlled according to the change of compressor operating frequency and regulated every minute to adjust the discharge temperature to let the intake super heat temperature be 0℃ to 5℃.<br>• Control timing: Once per minute after 3 or 7 minutes have passed since the compressor started.<br>• Opening pulse range: The following range is specified according to the compressor operating frequency.<br><table><tr><td rowspan="2">Compressor frequency</td><td colspan="3">Opening pulse range (Lower limit to upper limit)</td></tr><tr><td>PUHZ-RP1.6, 2VHA</td><td>PUHZ-RP2.5, 3VHA</td><td>PUHZ-RP4,5,6VHA</td></tr><tr><td>49Hz or less</td><td>65 ~ 250</td><td>70 ~ 250</td><td>80 ~ 300</td></tr><tr><td>50Hz to 75Hz</td><td>95 ~ 350</td><td>105 ~ 350</td><td>90 ~ 350</td></tr><tr><td>76Hz to 90Hz</td><td>120 ~ 400</td><td>160 ~ 400</td><td>100 ~ 400</td></tr><tr><td>91Hz to more</td><td>140 ~ 480</td><td>160 ~ 480</td><td>120 ~ 480</td></tr></table>• Opening pulse range corresponding to the change of compressor operating frequency<br>Opening pulse range = Present opening pulse × (Target frequency / Operating frequency -1) × 0.8<br>• Compressor start-up<br>Opening pulse will be adjusted according to only the change of frequency during 3 or 7 minute start-up. The start-up control time will be changed according to the discharge temperature (TH4).<br>Discharge temperature (TH4) ≧ 30℃: 3 minute start-up<br>Discharge temperature (TH4) < 30℃: 7 minute start-up</td><td></td></tr>
<tr><td></td><td>4-2. Evaporation protection control<br>The targeted opening pulse should be made large in the condition written below.<br>Indoor cond./eva. temperature (TH5) - Indoor liquid pipe temperature (TH2) ≧ 6℃<br>Set the targeted value of the discharge temperature about 5 to 15℃ lower.<br>※ This control does not work for 3 or 7 minutes after the compressor gets started.</td><td></td></tr>
<tr><td></td><td>4-3. Low discharge super heat temperature protection control<br>Set a small value for the targeted opening pulse according to the discharge super heat temperature.<br>• Correction range of the discharge super heat temp. : 10℃ or less<br>※ This control does not work for 3 or 7 minutes after the compressor gets started.</td><td>Discharge super heat temp. is calculated from discharge temp. (TH4) and outdoor cond./eva. temp. (TH6).</td></tr>
<tr><td></td><td>4-4. Others<br>① LEV opening pulse is set to 400 while the compressor is being stopped.<br>② After LEV opening pulse is initialized to 0 by making 700 pulse down from the present pulse, set the pulse to 400.<br>③ 20 pulses are added to the present pulse if the following conditions are satisfied within 14 minutes after the compressor gets started.<br>COOL: Indoor cond./eva. temperature (TH5) - Indoor liquid pipe temperature (TH2) ≧ 25℃<br>HEAT: Outdoor cond./eva. temperature (TH6) - Outdoor liquid pipe temperature (TH3) ≧ 25℃</td><td></td></tr>
<tr><td>5. Four way valve</td><td>5-1. Normal control<br>Always OFF during normal operation.</td><td></td></tr>
<tr><td></td><td>5-2. Change of Operation mode<br>When the mode changes from HEAT to COOL:<br> 
</td><td></td></tr>
</table>

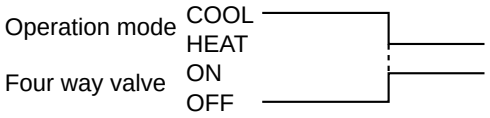
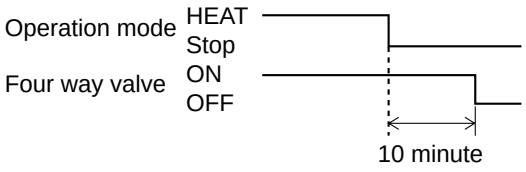
## 8-2. HEAT operation

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Compressor</td><td>1-1. Thermoregulating function<br>The outdoor unit receives information of set temperature and intake temperature from the indoor unit through transmission and judges the compressor ON/OFF controlled by thermoregulating from their temperature difference. However, the compressor does not stop when the indoor unit is in the hot adjuster mode even though the information tells the need to turn off the compressor.</td><td>Refer to “INDOOR UNIT CONTROL” for the detailed detection method.</td></tr>
<tr><td></td><td>1-2. Normal control<br>• Control timing: Once per minute after 3 minutes have passed since the compressor started.<br>• Frequency changing range: -12Hz to +20Hz ※1<br>※1. However, in the following cases, the frequency changing amount, which is different from the normal one, will be applied to control the operating frequency.<br>(1) Frequency is fixed to the minimum just before the compressor is stopped by the thermoregulating function.<br>Intake temperature ≧ Set temperature - 0.5℃ … Fixed to the minimum frequency.<br>Intake temperature ≦ Set temperature - 1.0℃ … Fixation is released. (Returned to normal control.)<br>(2) Correction of the frequency changing amount according to the estimated discharge temp.<br>If the estimated discharge temperature is more than 113℃, the frequency changing amount will be corrected.<br>• Correction amount: 0Hz to -6Hz<br>(3) Frequency control after the defrosting operation<br>After the defrosting operation is finished, the compressor will be stopped for 1 minute and then get restarted.</td><td></td></tr>
<tr><td></td><td>1-3. Start-up control<br>Controls, which are conducted in 3 minutes after the compressor gets started, are categorized according to the outside temperature(TH7) as shown below.
<table>
<tr><th rowspan="2">Outside temp.</th><th colspan="2">Start-up pattern</th><th rowspan="2">Defrosting restore start-up</th></tr>
<tr><th>Initial start-up</th><th>Restart</th></tr>
<tr><td>TH7 < 0℃</td><td>(A), (D)</td><td>(B), (D)</td><td>(A), (D)</td></tr>
<tr><td>0℃ ≦ TH7 < 12℃</td><td>(A)</td><td>(B)</td><td>(A)</td></tr>
<tr><td>TH7 ≧ 12℃</td><td>(C)</td><td>(C)</td><td>(A)</td></tr>
</table>
(1) In case of pattern (A)<br>a. 0 min. to 1 min. after start-up: Fixed to 48Hz.<br>b. 1 min. to 3 min. after start-up: Fixed to the Hz which has been regulated according to the temp. difference between intake temp. and set temp.<br>• Fixed frequency: minimum Hz to 48Hz.<br>(2) In case of pattern (B)<br>a. 0 min. to 1 min. after start-up: Fixed to the minimum Hz.<br>b. 1 min. to 3 min. after start-up: Fixed to the Hz which has been regulated according to the temp. difference between intake temp. and set temp.<br>• Fixed frequency: minimum Hz or 42Hz.<br>(3) In case of pattern (C)<br>a. 0 min. to 3 min. after start-up: Fixed to the minimum Hz.<br>(4) In case of pattern (D)<br>a. 0 min. to 1 min. after start-up: Fixed to 70Hz.<br>b. 1 min. to 3 min. after start-up: Fixed to the 63 or 70 Hz which has been regulated according to the temp. difference between intake temp. and set temp.<br>Maximum Hz will be limited to 70Hz for 10 minutes after the start-up of compressor.</td><td>Start-up pattern when TH7 < 0℃<br>RP1.6, 2····(A)<br>RP4-6·····(A)<br>RP2.5, 3····(D)</td></tr>
<tr><td></td><td>1-4. Discharge temperature over-rise prevention control<br>The same control as that of COOL operation.</td><td></td></tr>
<tr><td></td><td>1-5. Condensing temperature over-rise prevention control<br>Frequency controls such as Hz-down and no more Hz-up will be conducted according to the indoor cond./eva. temperature (TH5).<br>• Temperature restriction: No more Hz-up … When TH5 detects 53℃ or more<br>Hz-down … -5Hz per min. when TH5 detects 58℃ or more<br>-10Hz per min. when TH5 detects 63℃ or more</td><td></td></tr>
</table>

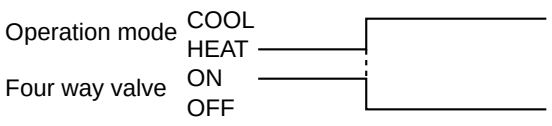
<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>2. Fan</td><td>2-1. Normal control<br>Fan rotation times (rpm) will be controlled according to the outdoor outside temperature (TH7).<br>• Control method: Inverter control<br>• Rotation times: Fan step (N) = 0, 9 and 10<br> 
</td><td>Step (N)—Rotation times(rpm)
<table>
<tr><th rowspan="2">Step (N)</th><th colspan="3">Rotation times(rpm)</th></tr>
<tr><th>RP1.6, 2</th><th>RP2.5, 3</th><th>RP4-6</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>105</td><td>95</td><td>125</td></tr>
<tr><td>2</td><td>135</td><td>115</td><td>155</td></tr>
<tr><td>3</td><td>165</td><td>135</td><td>175</td></tr>
<tr><td>4</td><td>205</td><td>165</td><td>200</td></tr>
<tr><td>5</td><td>265</td><td>200</td><td>240</td></tr>
<tr><td>6</td><td>340</td><td>245</td><td>285</td></tr>
<tr><td>7</td><td>430</td><td>305</td><td>360</td></tr>
<tr><td>8</td><td>530</td><td>450</td><td>465</td></tr>
<tr><td>9</td><td>680</td><td>700</td><td>700</td></tr>
<tr><td>10</td><td>700</td><td>720</td><td>720</td></tr>
</table></td></tr>
<tr><td></td><td>2-2. Start-up control in HEAT operation at low outside temperature (RP3 only)<br>[Requirement] All of following conditions should be satisfied.<br>a. The first start-up after the power has been reset, or the start-up in HEAT mode after 30 minutes have passed since the compressor stopped.<br>b. Outside temperature (TH7) ≦ 0℃<br>[Control details]<br>Fan step will be set to 0 (N = 0) for 2 minutes after the start-up of compressor.<br>Start-up control will turn into the normal control after the 2-minute operation of compressor.</td><td></td></tr>
<tr><td></td><td>2-3. Others<br>(1) Fan also stops when the compressor is being stopped. (Fan step = 0) However, fan step will be set to 10 while the compressor is being stopped due to the abnormal heat sink temperature (Error code = U5). At that time, the compressor is just waiting for 3 minutes to restart.<br>(2) In case of RP3, fan is being stopped for 2 minutes after the start-up of compressor in HEAT mode at low outside tempereture (Fan step = 0)</td><td></td></tr>
<tr><td>3. Bypass valve control (RP3 only)</td><td>3-1. Normal control<br>Start-up control in HEAT operation<br>[Bypass valve ON/OFF]<br>ON for 3 minutes after the compressor gets started operating.</td><td></td></tr>
</table>

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>4. LEV(A)</td><td>4-1. Normal control<br>LEV opening pulse will be controlled every minute to adjust the discharge temperature in order to let the intake super heat temperature be 0℃ to 5℃.<br>• Control timing: Once per minute after 3 or 7 minutes have passed since the compressor started.<br>• Opening pulse range: The following range is specified according to the compressor operating frequency.
<table>
<tr><th rowspan="2">Compressor frequency</th><th colspan="3">Opening pulse range (Lower limit to upper limit)</th></tr>
<tr><th>PUHZ-RP1.6, 2VHA</th><th>PUHZ-RP2.5, 3VHA</th><th>PUHZ-RP4,5,6VHA</th></tr>
<tr><td>49Hz or less</td><td>55 ~ 250</td><td>80 ~ 250</td><td>70 ~ 300</td></tr>
<tr><td>50Hz to 75Hz</td><td>85 ~ 350</td><td>95 ~ 350</td><td>90 ~ 350</td></tr>
<tr><td>76Hz to 90Hz</td><td>100 ~ 400</td><td>130 ~ 400</td><td>100 ~ 400</td></tr>
<tr><td>91Hz to more</td><td>125 ~ 480</td><td>130 ~ 480</td><td>120 ~ 480</td></tr>
</table>
• Opening pulse range corresponding to the change of compressor operating frequency<br>Opening pulse range = Present opening pulse × (Target frequency / Operating frequency -1) × 0.8<br>• Compressor start-up<br>Opening pulse will be adjusted according to only the change of frequency during 3 or 7 minute start-up.<br>The start-up control time will be changed according to the discharge temperature (TH4).<br>Discharge temperature (TH4) ≧ 30℃: 3 minute start-up<br>Discharge temperature (TH4) < 30℃: 7 minute start-up</td><td></td></tr>
<tr><td></td><td>4-2. Low discharge super heat temperature protection control<br>Set a small value for the targeted opening pulse according to the discharge super heat temperature.<br>• Correction range of the discharge super heat temperature : 10℃ or less<br>• This control does not work for 3 or 7 minutes after the compressor gets started.</td><td>Discharge super heat temp. is calculated from discharge temp. (TH4) and outdoor cond./eva. temp. (TH6).</td></tr>
<tr><td></td><td>4-3. Evaporation protection control<br>20 pulse will be added to the present opening pulse in the condition written below.<br>Outdoor condenser/evaporator temperature (TH6) - Outdoor liquid pipe temperature (TH3) ≧ 6℃<br>※ This control does not work for 3 or 7 minutes after the compressor gets started.</td><td></td></tr>
<tr><td></td><td>4-4. Others<br>① LEV opening pulse is set to 400 while the compressor is being stopped.<br>② After LEV opening pulse is initialized to 400 by making 700 pulse down from the present pulse, set the pulse to 400.</td><td></td></tr>
</table>

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>5. LEV(B)</td><td>
5-1. Normal control<br>
Opening pulse will vary among steps (1 to 3) according to air conditioner's operating status.<br>
• Control timing: Once every 5 minutes after 3 or 7 minutes have passed since the compressor started.<br>
• LEV opening pulse for each step:
<table>
<tr><th>Step</th><th>RP1.6VHA</th><th>RP2VHA</th><th>RP2.5VHA</th><th>RP3VHA</th><th>RP4VHA</th><th>RP5VHA</th><th>RP6VHA</th><th>RP4VHA1</th><th>RP5VHA1</th><th>RP6VHA1</th></tr>
<tr><td>1</td><td>150</td><td>170</td><td>150</td><td>200</td><td>180</td><td>180</td><td>185</td><td>180</td><td>180</td><td>185</td></tr>
<tr><td>2</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td><td>240</td><td>240</td><td>240</td></tr>
<tr><td>3</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td><td>480</td></tr>
</table>
• Start-up step<br>
The step is set to 2 when the compressor starts up.<br>
• Requirement for step-up<br>
LEV opening pulse will step up when any of following conditions is satisfied.<br>
(1) The discharge temp. (TH4) is 100℃ or more<br>
(2) The outdoor condenser/evaporator temperature (TH6) is 57℃ or more<br>
(3) The discharge super heat temperature is 50℃ or more<br>
Super heat temperature = Discharge temperature (TH4) - Outdoor condenser/evaporator temperature (TH6)<br>
(4) The sub cool temperature is 12℃ or more<br>
Sub cool temperature = Outdoor condenser/evaporator temperature (TH6) - Outdoor liquid pipe temperature (TH3)<br>
• Requirement for step-down<br>
LEV opening pulse will step down when any of following conditions are satisfied and above step-up conditions are not satisfied.<br>
(1) The discharge temperature (TH4) is 90℃ or less<br>
(2) The outdoor condenser/evaporator temperature (TH6) is 52℃ or less<br>
(3) The discharge super heat temperature is 40℃ or less<br>
Super heat temperature = Discharge temperature (TH4) - Outdoor condenser/evaporator temperature (TH6)<br>
(4) the sub cool temperature is 3℃ or less<br>
Sub cool temperature = Outdoor condenser/evaporator temperature (TH6) - Outdoor liquid pipe temperature (TH3)<br>
• The step does not change if neither step-up conditions nor step-down conditions are satisfied.
</td><td></td></tr>
<tr><td></td><td>
5-2. Compulsory step-up<br>
When any of the following conditions are satisfied, the step will be forced to 3.<br>
(1) The discharge temperature (TH4) is 110℃ or more.<br>
(2) The condenser/evaporator temperature (TH6) is 62℃ or more.
</td><td></td></tr>
<tr><td></td><td>
5-3. Stop control<br>
When the LEV is being stopped, the step will be set to 3.
</td><td></td></tr>
</table>

| Control modes | Control details | Remarks |
|---|---|---|
| 6. Four way valve | 6-1. Normal control<br>Always OFF during normal operation. | |
| | 6-2. Change of Operation mode<br>• When the mode changes from HEAT to COOL:<br>  <br><br>• When the operation stops in HEAT mode:<br>  <br> | |
| | 6-3. Start-up control in HEAT operation at low outside temperature (RP3 only)<br>[Requirement] Same as the explanation in fan control.<br>[Control details] OFF for 2 minutes after the start-up of compressor, but ON if 2 minutes pass. | |
| | 6-4. In the defrosting operation<br>Always OFF during the defrosting operation | |

## 8-3. DRY operation

| Control modes | Control details | Remarks |
|---|---|---|
| 1. Compressor | 1-1. Thermoregulating function<br>The outdoor unit receives information of set temp. and intake temp. from the indoor unit through transmission and judges the compressor ON/OFF with thermoregulating function from their temperature difference. | Refer to "INDOOR UNIT CONTROL" for ON/OFF judgment method |
| | 1-2. Normal control<br>Same control as that of COOL operation. | |
| | 1-3. Start-up control<br>Same control as that of COOL operation. | |
| | 1-4. Indoor anti-freezing control<br>Not available | |
| | 1-5. Outdoor frozen prevention control<br>Same control as that of COOL operation | |
| | 1-6. Discharge temperature over-rise prevention control<br>Same control as that of COOL operation | |
| | 1-7. Condensing temperature over-rise prevention control<br>Same control as that of COOL operation | |
| | 1-8. Heat sink temperature over-rise prevention control<br>Same control as that of COOL operation. | |
| | 1-9. Others<br>Same control as that of COOL operation. | |
| 2. Fan | 2-1. Normal control<br>Fan rotation times (rpm) will be controlled according to the outdoor outside temp. (TH7).<br>• Control method: Inverter control<br>• Rotation times: Fan step (N) = 0 and 2 to 10<br>• Comp. Start-up: Fan step is fixed to 9 for 30 seconds after the start-up of compressor. | |
| | 2-2. Correction of fan step according to the outdoor cond./eva. temperature<br>Fan step will be corrected according to the outdoor cond./eva. temperature (TH6).<br>• Correction range of condensing temperature : 19℃ to 62℃<br>• Correction range of fan step: -1 to +3 | |
| | 2-3. Correction of fan step according to the heat sink temperature<br>Fan step will be corrected according to the heat sink temperature (TH8)<br>• Correction range of heat sink temperature: 68℃ to 78℃<br>• Correction range of fan step: 0 to +2 | |
| | 2-4. Others<br>Fan also stops when the compressor is being stopped. (Fan step = 0.)<br>However, fan step will be set to 10 while the compressor is being stopped due to the abnormal heat sink temperature (Error code = U5). At this time, the compressor is just waiting 3 minutes to restart. | |
| 3. LEV | Same control as that of COOL operation. | |
| 4. Four way valve | 4-1. During normal operation<br>Always OFF during normal operation. | |
| | 4-2. Operation mode change<br>When the mode changes from HEAT to COOL;<br>  | |

## 8-4. FAN operation

| Control modes | Control details | Remarks |
|---|---|---|
| 1. Compressor | Always OFF | |
| 2. Fan | Always OFF | |
| 3. Four way valve | Always OFF | |

## 8-5. Defrosting operation

| Control modes | Control details | Remarks |
|---|---|---|
| 1. Start | 1-1. Requirements for starting<br>Defrosting starts when either of below conditions is satisfied.<br>(Conditions)<br>a. In HEAT operation and when the outdoor liquid pipe temp.(TH3) continues to be -2℃ or less for 7 minutes after the compressor integrating operation time fulfils defrosting prohibition time (T1 ※).<br>b. In HEAT operation and when the outdoor liquid pipe temp.(TH3) continues to be -5℃ or less for 7 minutes after the compressor integrating operation time fulfils defrosting prohibition time (T3 ※).<br>c. In HEAT operation and when the outdoor liquid pipe temp.(TH3) continues to be -2℃ or less for 3 minutes after the compressor integrating operation time fulfils the defrosting prohibition time (T1 ※) and the compressor stops twice within 10 minutes from its start-up.<br>d. In HEAT operation and when the outdoor liquid pipe temp.(TH3) continues to be -5℃ or less for 3 minutes after the compressor integrating operation time fulfils the defrosting prohibition time (T3 ※) and the compressor stops twice within 10 minutes from its start-up.<br>(Complementary explanation)<br>The (a) indicates the defrosting operation with the frost amount light.<br>The (b) indicates the defrosting operation with the frost amount heavy<br>The (c) indicates the defrosting operation in case the thermostat is turned on/off frequently because the frost amount is small and the air-conditioning load is heavy.<br>The (d) indicates the defrosting operation in case the thermostat is turned on/off frequently because the frost amount is large and the air-conditioning load is light. | ※ Refer to the table of “Defrosting prohibition time” on this page.<br><br>Defrosting operation frequency<br>Model name / Frequency<br>PUHZ-RP1.6VHA 80Hz<br>PUHZ-RP2VHA 80Hz<br>PUHZ-RP2.5VHA 80Hz<br>PUHZ-RP3VHA 80Hz<br>PUHZ-RP4VHA 80Hz<br>PUHZ-RP5VHA 80Hz<br>PUHZ-RP6VHA 80Hz |
| | 1-2. Actuator at the beginning of defrosting operation<br>Actuator will be activated by the following procedure if any of the above conditions is detected.<br>① Compressor operating frequency will get down to 30Hz.<br>② When the compressor operating frequency becomes 30Hz;<br>• Four way valve will be turned off.<br>• Outdoor fan will be stopped.<br>• Both LEV A and B opening pulse are set to 480.<br>After ① and ② are completed, the compressor will be set to the defrosting operation frequency. | |
| 2. Stop | 2-1. Requirements for ending<br>Defrosting stops when any of the following conditions is satisfied.<br>(Conditions)<br>a. 15 minutes have passed since the defrosting operation started.<br>b. The outdoor liquid pipe temperature (TH3) has become 20℃ or more within 2 minutes from the start of defrosting operation.<br>c. The outdoor liquid pipe temperature (TH3) has become 8℃ or more after the defrosting operation is conducted for 2 minutes.<br>d. During defrosting operation, the compressor has been stopped due to errors or something.<br>e. During defrosting operation, the operation mode except HEAT has been selected by remote controller. | |

Continued to the next page.

From the previous page.

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>2. Stop</td><td>2-2. Actuator at the end of defrosting operation<br>Actuator will be activated by the following procedure if any of the above conditions except d & e is detected.<br>① Start the outdoor fan.<br>② Let the compressor operation frequency down to 30Hz from the defrosting operation frequency.<br>③ Stop the compressor for 1 minute when the compressor operation frequency becomes 30Hz.<br>After ① to ③ are completed, set the compressor operation frequency to the normal (start-up pattern A).</td><td></td></tr>
<tr><td>3. Defrosting prohibition time</td><td>Defrosting prohibition time (T1 and T3) are decided by the previous defrosting operation time (t2).<br>• Prohibition time table for ordinary region
<table>
<tr><th rowspan="2">Previous operation time</th><th colspan="2">Prohibition time</th></tr>
<tr><th>T1</th><th>T3</th></tr>
<tr><td>t2 ≦ 3 minutes</td><td>100 minutes</td><td>30 minutes</td></tr>
<tr><td>3 < t2 ≦ 7 minutes</td><td>60 minutes</td><td>20 minutes</td></tr>
<tr><td>7 < t2 ≦ 10 minutes</td><td>50 minutes</td><td>20 minutes</td></tr>
<tr><td>10 < t2 ≦ 15 minutes</td><td>30 minutes</td><td>20 minutes</td></tr>
<tr><td>t2 = 15 minutes</td><td>20 minutes</td><td>20 minutes</td></tr>
</table>
• Prohibition time table for high humidity region
<table>
<tr><th rowspan="2">Previous operation time</th><th colspan="2">Prohibition time</th></tr>
<tr><th>T1</th><th>T3</th></tr>
<tr><td>t2 ≦ 7 minutes</td><td>50 minutes</td><td>20 minutes</td></tr>
<tr><td>7 < t2 ≦ 15 minutes</td><td>20 minutes</td><td>20 minutes</td></tr>
</table>
• Others
<table>
<tr><th rowspan="2">Previous operation time</th><th colspan="2">Prohibition time</th></tr>
<tr><th>T1</th><th>T3</th></tr>
<tr><td>Operation mode has been changed to the other mode except HEAT during defrosting operation.</td><td>40 minutes</td><td>40 minutes</td></tr>
<tr><td>Protection devices have worked during defrosting operation.</td><td>10 minutes</td><td>10 minutes</td></tr>
<tr><td>Initial prohibition time when power is reset.</td><td>40 minutes</td><td>40 minutes</td></tr>
</table></td><td></td></tr>
<tr><td>4. Defrosting prohibition time</td><td>4-1. Requirements for starting<br>Compulsory defrosting operation will be conducted if all items below are satisfied when SW1-1 (OFF ➜ ON) is detected during HEAT operation.<br>(Conditions)<br>a. The compressor is operating.<br>b. 10 minutes have passed since the compressor started or the last defrosting operation was conducted.<br>c. The outdoor liquid pipe temperature is less than 8℃.<br>4-2. Requirements for ending<br>Same conditions as the above ending conditions of normal defrosting</td><td></td></tr>
</table>

## 8-6. AUTO operation

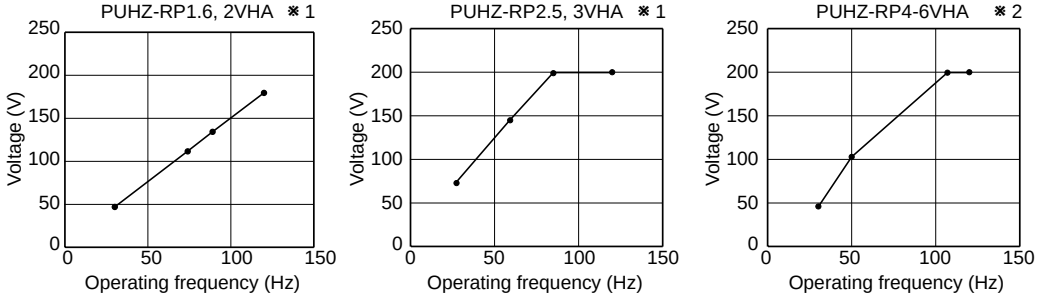
| Control modes | Control details | Remarks |
|---|---|---|
| 1. Initial operation mode | When a operation mode turns into AUTO operation;<br>① HEAT mode will be operated if intake temperature < set temperature<br>② COOL mode will be operated if intake temperature ≧ set temperature | |
| 2. Change of operation mode | ① HEAT mode will turn into COOL mode when intake temperature ≧ set temperature + 2deg and 15 minutes have passed since the HEAT operation started.<br>② COOL mode will turn into HEAT mode when intake temperature ≦ set temperature – 2deg and 15 minutes have passed since the COOL operation started. | |
| 3. COOL mode | Same controls as those of COOL operation. | |
| 4. HEAT mode | Same controls as those of HEAT and defrosting operation. | |

## 8-7. Inverter control

| Control modes | Control details |
|---|---|
| 1. Basic control | 1-1. Frequency setting |

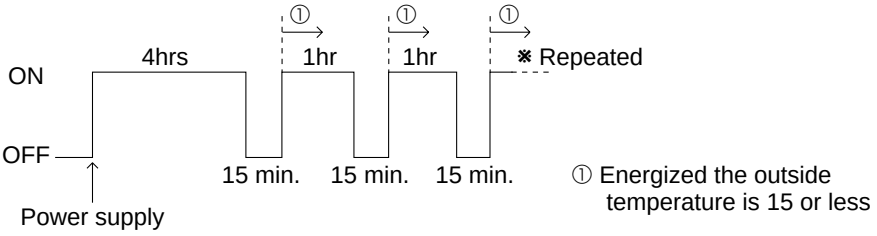
| | | min | PLA-RP•AA | | PCA-RP•GA | | PKA-RP•GAL | | PKA-RP•FAL | | PEA-RP•EA | | PEAD-RP•EA | | PEAD-RP•GA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Rated | max | Rated | max | Rated | max | Rated | max | Rated | max | Rated | max | Rated | max |
| PUHZ- | COOL | 22 | 49 | 66 | - | - | 49 | 76 | - | - | - | - | 53 | 70 | - | - |
| RP1.6VHA | HEAT | 22 | 52 | 77 | - | - | 57 | 80 | - | - | - | - | 62 | 80 | - | - |
| PUHZ- | COOL | 30 | 66 | 82 | 74 | 85 | 74 | 85 | - | - | - | - | 67 | 85 | - | - |
| RP2VHA | HEAT | 30 | 74 | 106 | 77 | 106 | 61 | 106 | - | - | - | - | 82 | 106 | - | - |
| PUHZ- | COOL | 32 | 47 | 54 | 47 | 55 | - | - | 46 | 54 | - | - | 51 | 58 | 51 | 58 |
| RP2.5VHA | HEAT | 32 | 51 | 67 | 51 | 67 | - | - | 51 | 67 | - | - | 57 | 67 | 57 | 67 |
| PUHZ- | COOL | 32 | 55 | 70 | 59 | 69 | - | - | 55 | 67 | 59 | 72 | 55 | 72 | 55 | 72 |
| RP3VHA | HEAT | 32 | 61 | 87 | 58 | 85 | - | - | 58 | 84 | 57 | 84 | 65 | 92 | 65 | 92 |
| PUHZ- | COOL | 30 | 49 | 62 | 53 | 69 | - | - | 54 | 67 | 53 | 65 | 54 | 66 | 54 | 66 |
| RP4VHA | HEAT | 30 | 55 | 81 | 55 | 78 | - | - | 55 | 79 | 53 | 74 | 54 | 74 | 54 | 74 |
| PUHZ- | COOL | 30 | 68 | 86 | 70 | 85 | - | - | - | - | 72 | 88 | 59 | 78 | - | - |
| RP5VHA | HEAT | 30 | 68 | 87 | 68 | 87 | - | - | - | - | 63 | 82 | 71 | 87 | - | - |
| PUHZ- | COOL | 30 | 85 | 96 | 82 | 96 | - | - | - | - | 76 | 96 | 79 | 96 | - | - |
| RP6VHA | HEAT | 30 | 80 | 97 | 77 | 94 | - | - | - | - | 70 | 85 | 79 | 92 | - | - |

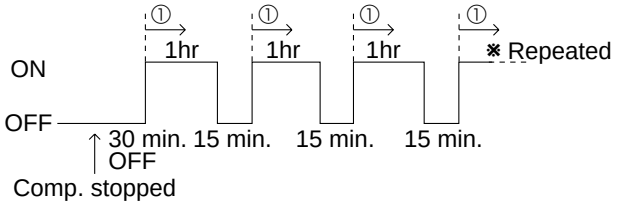
1-2. 1.2 V/F pattern




※1. Actual performance does not exactly match the V/F line on both graphic charts due to the air-conditioning load because the inverter control is based on vector.

※2. Actual values of V/F will be almost the same as the V/F line on the graphic chart because the inverter control is based on voltage and frequency. However, they may not exactly match the V/F line on the graphic chart because voltage correction control makes an effect on the performance.

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>2. Frequency</td><td>2-1. Frequency is restricted by the compressor electrical current (CT1).<br>Frequency control such as Hz-down and no more Hz-up will be conducted according to the compressor electrical current (CT1).
<table>
<tr><th>Models</th><th>No more Hz-up</th><th>Hz-down</th></tr>
<tr><td>PUHZ-RP1.6, 2, 2.5, 3VHA</td><td>12.5 A</td><td>13 A</td></tr>
<tr><td>PUHZ-RP4~6VHA</td><td>24.5A</td><td>26A</td></tr>
</table></td><td>※ Hz-down amount: -5Hz per minute</td></tr>
<tr><td rowspan="2">3. Voltage correction</td><td>3-1. Voltage is corrected by bus voltage.<br>Inverter voltage will be corrected by dc bus voltage.<br>Even though the power supply voltage varies within ±10%, the voltage should be corrected in order to make the output voltage of inverter stable.</td><td></td></tr>
<tr><td>3-2. Voltage correction by compressor's electric current (CT1). (PUHZ-RP4 to 6V only)<br>Output voltage of inverter is corrected by compressor's electric current (CT1).
<table>
<tr><th>Models</th><th>Correction of starting current [A]</th><th>Correction of max current [A]</th></tr>
<tr><td>PUHZ-RP4~6VHA</td><td>16</td><td>24</td></tr>
</table></td><td></td></tr>
<tr><td>4. Power supply to locked compressor</td><td>4-1. Compressor energizing method<br>• Compressor ON/OFF pattern when power is supplied;<br> 

• Compressor ON/OFF pattern when power is cut off;<br> 
</td><td>"08" will be displayed on the LED1 of "A-Control Service Tool" while power is supplied to the compressor.</td></tr>
<tr><td>5. 52C</td><td>ON/OFF method<br>52C will turn ON/OFF in the following conditions.<br>• 52C turns ON when power is supplied, and remains ON regardless of the compressor's ON/OFF.<br>• 52C turns OFF when power is cut off.</td><td></td></tr>
</table>

## 8-8. Replacement operation (RP4 to 6V Only)

| Control modes | Control details | Remarks |
|---|---|---|
| 1. Start and end of replacement operation | 1-1. Requirements for starting<br>Replacement operation will start when SW8-2 on the outdoor controller board is turned on while units are being stopped. | |
| | 1-2. Requirements for ending<br>Replacement operation will end if any of the following conditions is satisfied.<br>a. 2 hours have passed since replacement operation started.<br>b. SW8-2 has been turned off.<br>c. Operation (COOL / DRY / HEAT) has been started and controlled by remote controller. | ※ Normal air conditioning can be operated even if SW8-2 remains ON after the replacement operation is finished. |
| 2. During replacement operation | 2-1. Normal control<br>In COOL operation replacement operation will be conducted by opening the replacement filter circuit in order to circulate refrigerant.<br>• Compressor control<br>The same continuous operation as COOL operation regardless of intake temperature.<br>• LEV(A)control<br>Always closed.<br>• LEV(B)control<br>The same control as that of COOL operation.<br>• Fan control<br>The same control as that of COOL operation.<br>• Four way valve control<br>The same control as that of COOL operation. (Always OFF.)<br>• Solenoid valve<br>Always opened.<br>• Others<br>LED on the outdoor controller circuit board comes ON/OFF per second during replacement operation. | ※ Cold air comes out of indoor unit because the replacement operation is conducted in COOL operation. |
| | 2-2. Indoor frozen prevention control<br>The compressor will be stopped for 3 minutes if the indoor liquid pipe temperature (TH2) or indoor condenser/evaporator temperature (TH5) is 3℃ or less after 10 minutes have passed since the compressor started. | ※ Frozen protection control may be activated when the indoor intake temp. is 15℃ or less. |

## 8-9. Refrigerant collecting (pump down)

| Control modes | Control details | Remarks |
|---|---|---|
| 1. Start and end of pump down operation | 1-1. Requirements for starting<br>Pump down operation will be conducted when SWP on the outdoor controller board is turned on while the unit is being stopped. | |
| | 1-2. Requirements for ending<br>Pump down operation will end if any of the following conditions is satisfied.<br>a. Low pressure switch has been used.<br>b. 3 minutes have passed since the pump down operation started.<br>c. Operation has been stopped by remote controller or changed to the other mode except COOL.<br>d. Error has been detected. | ※ Low pressure switch mentioned in (a) is equipped in RP4 to 6 only. |
| 2. During pump down operation | 2-1. Following controls are activated during pump down operation.<br>• Compressor control<br>The same continuous operation as COOL operation regardless of intake temperature.<br>• LEV(A) control<br>Opening pulse is fixed to step 3 (480 pulse).<br>• LEV(B) control<br>Completely closed (0 pulse).<br>• Fan control<br>Fan step is fixed to step 10.<br>• Four way valve<br>OFF in COOL operation. | |
| <Complementary explanation for above 2 controls> | ① Pump down operation is considered to be finished normally when the ending condition (a) or (b) is satisfied.<br>At this time, the outdoor controller board's LED1 (green) turns OFF and LED2 (red) turns ON. The units cannot be operated until the power is reset.<br>(To prevent the units from operating with pump down operation.)<br>② If the pump down operation ends due to the ending conditions (c) or (d), the unit will be in a state of normal stop. | To prevent the unit from operating with pump down operation. |

# 9 DIP SWITCH FUNCTION

## 9-1. Indoor unit

DIP switch and jumper connector functions.
Each function is controlled by the jumper connector in the control p.c.board. Below table shows that the function setting by the jumper connector is available or not in the control p.c.board of applicable units. Also J11~15 (SW1) and J21~24 (SW2) has Dip switch with their jumper connector.

| | INDOOR CONTROLLER BOARD | |
|---|---|---|
| | type A | type B |
| Applicable units | PLA-RP • AA　PLA-RP •AA.UK<br>PKA -RP •GAL　PKA-RP •FAL<br>PCA-RP •GA | PEA-RP • EA.TH-A<br>PEAD-RP • EA.UK<br>PEAD-RP •GA.UK |
| J11~J15 (SW1) ; Model setting | ○ | ○ |
| J21~J24 (SW2) ; Capacity setting | ○ | ○ |

○ : Changeable function
× : Not changeable function

Functions and signification of the jumper connector (Dip switch)

**J11~J15 (SW1) — Model settings**

**type A**

| J11 | J12 | J13 | J14 | J15 | Model |
|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | × | PLA-RP • AA |
| × | ○ | × | × | × | PCA-RP • GA |
| ○ | ○ | × | ○ | × | PKA-RP • GAL |
| ○ | × | × | × | × | PKA-RP • FAL |

**type B**

| J11 | J12 | J13 | J14 | J15 | Models |
|---|---|---|---|---|---|
| ○ | × | × | × | ○ | PEA-RP • EA |
| × | ○ | × | × | × | PEAD-RP • EA |
| × | ○ | × | × | × | PEAD-RP • GA |

**J21~J24 (SW2) — Capacity settings**

| J21 | J22 | J23 | J24 | Models | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | × | × | PLA-RP1.6AA | | PKA-RP1.6GAL | | | PEAD-RP1.6EA | |
| ○ | × | ○ | × | PLA-RP2AA | PCA-RP2GA | PKA-RP2GAL | | | PEAD-RP2EA | |
| ○ | ○ | ○ | × | PLA-RP2.5AA | PCA-RP2.5GA | | PKA-RP2.5FAL | | PEAD-RP2.5EA | PEAD-RP2.5GA |
| ○ | × | × | ○ | PLA-RP3AA, AA$_1$ | PCA-RP3GA | | PKA-RP3FAL | PEA-RP3EA | PEAD-RP3EA,EA$_1$ | PEAD-RP3GA |
| × | × | ○ | ○ | PLA-RP4AA, AA$_1$ | PCA-RP4GA | | PKA-RP4FAL | PEA-RP4EA | PEAD-RP4EA,EA$_1$ | PEAD-RP4GA |
| × | ○ | ○ | ○ | PLA-RP5AA | PCA-RP5GA | | | PEA-RP5EA | PEAD-RP5EA,EA$_1$ | |
| ○ | ○ | ○ | ○ | PLA-RP5AA$_1$<br>PLA-RP6AA, AA$_1$ | PCA-RP6GA | | | | PEAD-RP6EA,EA$_1$ | |

Service PCB

| SW2 | | | | Models | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | | | | | | | |
| ON | ON | OFF | OFF | PLA-RP1.6AA | | PKA-RP1.6GAL | | | PEAD-RP1.6EA | |
| ON | OFF | ON | OFF | PLA-RP2AA | PCA-RP2GA | PKA-RP2GAL | | | PEAD-RP2EA | |
| ON | ON | ON | OFF | PLA-RP2.5AA | PCA-RP2.5GA | | PKA-RP2.5FAL | | PEAD-RP2.5EA | PEAD-RP2.5GA |
| ON | OFF | OFF | ON | PLA-RP3AA, AA$_1$ | PCA-RP3GA | | PKA-RP3FAL | PEA-RP3EA | PEAD-RP3EA,EA$_1$ | PEAD-RP3GA |
| OFF | OFF | ON | ON | PLA-RP4AA, AA$_1$ | PCA-RP4GA | | PKA-RP4FAL | PEA-RP4EA | PEAD-RP4EA,EA$_1$ | PEAD-RP4GA |
| OFF | ON | ON | ON | PLA-RP5AA | PCA-RP5GA | | | PEA-RP5EA | PEAD-RP5EA,EA$_1$ | |
| ON | ON | ON | ON | PLA-RP5AA$_1$<br>PLA-RP6AA, AA$_1$ | PCA-RP6GA | | | | PEAD-RP6EA,EA$_1$ | |

**J41 J42 — Pair number setting with wireless remote controller**

| Control PCB setting | | Wireless remote controller setting |
|---|---|---|
| J41 | J42 | |
| ○ | ○ | 0 |
| × | ○ | 1 |
| ○ | × | 2 |
| × | × | 3 ~ 9 |

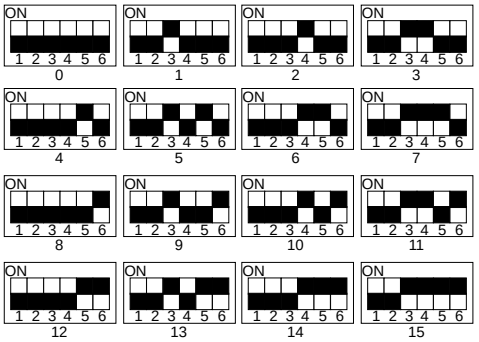
<Settings at time of factory shipment>
Wireless remote controller: 0
Control PCB: ○ (for both J41 and J42)
Four pair number settings are supported.
The pair number settings of the wireless remote controller and indoor control PCB (J41/J42) are given in the table on the left. ('×' in the table indicates the jumper line is disconnected.)

In above table　Jumper connector : ○ Short, × Open

Note 1: If the settings of SW1 (model settings) or SW2 (capacity settings) on the service PCB are made incorrectly:
- •If the SW1 settings are made incorrectly, the unit will not operate, or won't be able to operate normally.
- •The SW1 (model) and SW2 (capacity) settings are used to send the indoor unit's model and capacity information to the outdoor unit. The outdoor unit uses this information to perform control, so the expected performance may not be achieved if the information is incorrect.
- •In models with indoor fan phase control, pulsation control or DC fan control, the SW2 (capacity) settings are used to control the fan air volume. If the settings are made incorrectly, the air volume may be higher or lower than expected, performance may drop, or the noise level may increase.

## 9-2. Outdoor unit

### 9-2-1. 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.

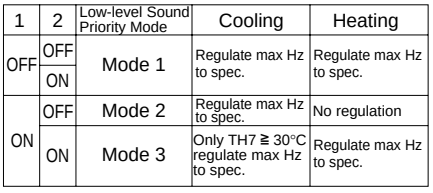
①Change the DIP SW1-1 on the outdoor controller board from OFF to ON.

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 | Frequency setting ※1 | Fixed | Normal | During operation (Except 3 minutes after starting.) |
| | | 2 | Power failure automatic recovery ※2 | Auto recovery | No auto recovery | When power supply ON |
| | | 3 | No function | — | — | — |
| | | 4 | No function | — | — | — |
| | SW7 ※4 | 1 | Switch to "Low-level Sound Priority Mode" ※3 |  | | Always |
| | | 2 | | | | |
| | | 3 | Change of the Hz upper limit in cooling | Limited to 85% of the max Hz in cooling | Normal | Always |
| | | 4 | Change of the Hz lower limit in heating | Limited to 85% of the max Hz in heating | Normal | Always |
| | | 5 | Change of the Hz in defrosting | Limited to 85% of the max Hz in defrosting | Normal | Always |
| | | 6 | Change of the percentage to limit the Hz | Change of the percentage in case of SW7-3,4 (85% → 70%) | Normal | Always |
| | SW8 | 1 | Use of existing pipe | Used | 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. Do not use only SW5-1 to fix the frequency setting. The compressor operating frequency can be fixed to the desired Hz by the combination of the SW5-1 setting and optional parts "A Control Service Tool (PAC-SK52ST)" setting.

※ 2. "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 don't have DIP SW. Please refer to mode 01 in the table on page 69.

※ 3. SW7-1,2 are used to switch the setting of "Low-level Sound Priority Mode". However, local electrical construction will be required to make use of this mode. Therefore SW7-1, 2 are effective only when the mode is available for the model. Refer to 57.

※ 4. Do not use SW7 normally, or troubles may be caused by the units' installed condition and used condition.

Fixing method of the compressor operating frequency

The compressor operating frequency can be fixed by setting the SW2 (a switch of “A Control Service Tool PAC-SK52ST) and turning on/off the SW5-1 on the controller board. However, the setting may not be fixed to the desired value in case of a couple of minutes right after the start-up, in case the operating frequency is limited to some extents by various restrictive controls such as the SW7-3 to 6 settings and in case the operating frequency is set to be out of the operating frequency range designated for each model. Check the operating frequency on the LED display of the outdoor unit every time the setting is changed.

0 : OFF
1 : ON

| SW2 | | | | | | Setting |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | Hz |
| 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| 0 | 0 | 1 | 0 | 0 | 0 | 30 |
| 0 | 1 | 0 | 1 | 0 | 0 | 43 |
| 0 | 0 | 0 | 0 | 1 | 0 | 53 |
| 1 | 0 | 0 | 1 | 1 | 0 | 63 |
| 1 | 1 | 0 | 0 | 0 | 1 | 73 |
| 0 | 0 | 1 | 1 | 0 | 1 | 83 |
| 0 | 0 | 1 | 0 | 1 | 1 | 94 |
| 0 | 1 | 0 | 1 | 1 | 1 | 108 |
| 1 | 1 | 1 | 1 | 1 | 1 | 118 |

※ Frequency can be set by the combination of the 6-bit binary digit as shown above. (SW2-1 stands for the lowest bit, and SW2-6 stands for the upper bit.)

### 9-2-2. Function of connectors and jumpers

<table>
<tr><th rowspan="2">Types</th><th rowspan="2">Connector</th><th rowspan="2">Function</th><th colspan="2">Action by open/ short operation</th><th rowspan="2">Effective timing</th></tr>
<tr><th>Short</th><th>Open</th></tr>
<tr><td>Connector</td><td>CN31</td><td>Emergency operation</td><td>(ON side) Start</td><td>(OFF side) Normal</td><td>When power supply ON</td></tr>
<tr><td rowspan="7">SW6<br>or<br>Jumper</td><td>SW6-1<br>(J1)</td><td>Power supply setting</td><td>3 phase</td><td>Single phase</td><td>Always</td></tr>
<tr><td>SW6-2<br>(J2)</td><td>Switch of cooling only/cooling and heat pump</td><td>Cooling only</td><td>Cooling and heat pump</td><td>When power supply ON</td></tr>
<tr><td>SW6-3<br>(J3)</td><td rowspan="5">Capacity settings</td><td colspan="2" rowspan="5">○:ON(Short) ×:OFF(Open)<br>
<table>
<tr><th>Model \ SW6(JP)</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr>
<tr><td>PUHZ-RP1.6VHA</td><td>×</td><td>×</td><td>×</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>PUHZ-RP2VHA</td><td>×</td><td>×</td><td>○</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>PUHZ-RP2.5VHA</td><td>×</td><td>×</td><td>×</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>PUHZ-RP3VHA</td><td>×</td><td>×</td><td>○</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>PUHZ-RP4VHA</td><td>×</td><td>×</td><td>×</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>PUHZ-RP5VHA</td><td>×</td><td>×</td><td>○</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>PUHZ-RP6VHA</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>○</td></tr>
</table></td><td rowspan="5">Always</td></tr>
<tr><td>SW-6-4<br>(J4)</td></tr>
<tr><td>SW6-4<br>(J5)</td></tr>
<tr><td>SW6-5<br>(J6)</td></tr>
<tr><td>SW6-6<br>(CN31)</td></tr>
</table>

**Special function**

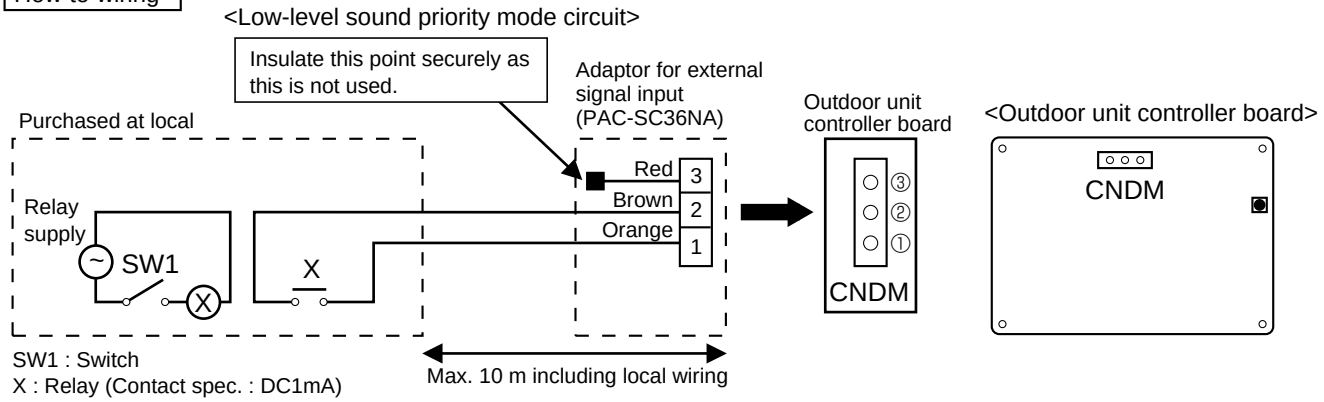
(a) Low-level sound priority mode (Local wiring)

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 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.

(c) Refrigerant collecting (pump down)

Perform the following procedures to collect the refrigerant when relocating or replacing the indoor or outdoor units.

①Before 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. Now, start refrigerant collecting operation. After moving the unit to a new location and completing the test run, set the SW5 switches to the previously recorded settings.

②Turn on the power supply (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 Close the liquid stop valve.

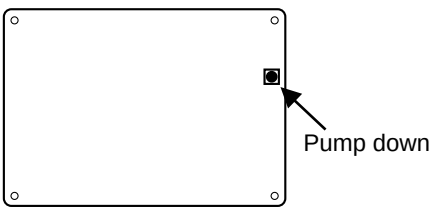
④ Set the SWP switch on the outdoor controller board to ON. The compressor (outdoor unit) and ventilators (indoor and outdoor units) start operating and refrigerant collecting operation begins. LED1 and LED2 on the control board of the outdoor unit are lit.

※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 stops and set the SWP switch to ON again.

⑤Because the unit automatically stops after the refrigerant collecting operation is conducted for around 2 to 3 minutes, make sure to close the gas stop valve immediately. LED1 is not lit and LED2 is lit at this time. If LED1 is lit and LED2 is not lit at this time, please repeat the procedure from ②.

⑥Turn off the power supply (circuit breaker.)

<Outdoor unit controller board>



### 9-2-3. Optional parts
### A-control Service Tool [ PAC-SK52ST ]

## ● Function of switches

(1) Function of switches

| Type of switches | Switch | No. | Function | Action by the switch operation | | Effective timing |
|---|---|---|---|---|---|---|
| | | | | ON | OFF | |
| DIP SW | SW2 | 1 | Changing of LED display <Self-diagnosis> | Operation monitor | Operation monitor | Under operation or suspension |
| | | 2 | | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | SW3 | 1 | Fixing the selected mode <Not applicable> | — | — | — |

※ Use SW3 set to OFF.

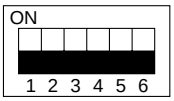
(2) Function of jumpers

| Types | Connector | Function | Action by open/short | | Effective timing |
|---|---|---|---|---|---|
| | | | Short | Open | |
| Connector | CN33 | Not applicable | — | — | OFF |

※ Use CN33 open.

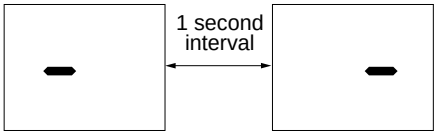
**<Outdoor unit operation monitor function>**
**[When option part 'A-Control Service Tool(PAC-SK52ST)' is connected to outdoor controller board(CNM)]**
Digital indicator LED1 displays 2 digit number or code to inform operation condition and the meaning of error code by controlling DIP SW2 on 'A-Control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

Operation indicator SW2 : Indicator change of self diagnosis

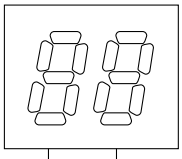
| SW2 setting | Display detail | Explanation for display | Unit |
|---|---|---|---|
|   | | | |

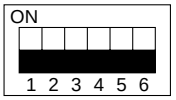
**<Digital indicator LED1 working details>**
(Be sure the 1 to 6 in the SW2 are set to OFF.)

(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


(Initial setting)

The tens digit : Operation mode

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

※C5 is displayed during replacement operation. <RP4~6VHA only>

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 | — |

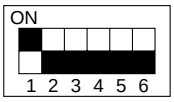
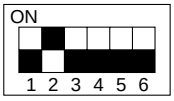
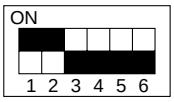
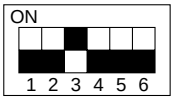
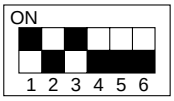
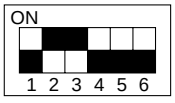
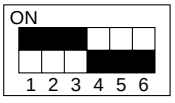
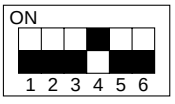
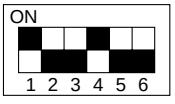
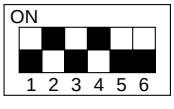
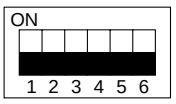
②Display during error postponement
Postponement code is displayed when compressor stops due to the work of protection device.
Postponement code is displayed while error is being postponed.

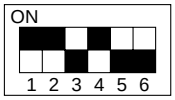
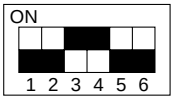
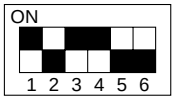
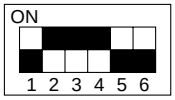
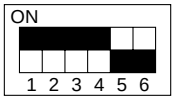
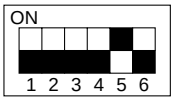
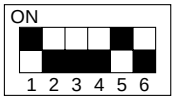
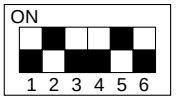
(3) When the display blinks
Inspection code is displayed when compressor stops due to the work of protection devices.

| Display | 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, TH6, TH7 and TH8) |
| U5 | Abnormal temperature of heat sink |
| 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) |

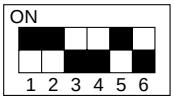
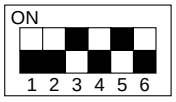
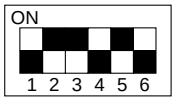
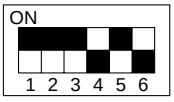
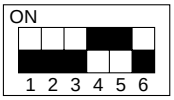
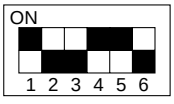
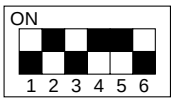
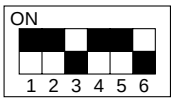
| Display | Inspection unit |
|---|---|
| 0 | Outdoor unit |
| 1 | Indoor unit 1 |
| 2 | Indoor unit 2 |
| 3 | Indoor unit 3 |

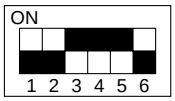
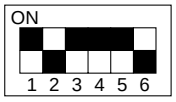
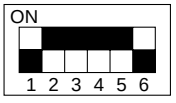
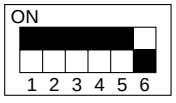
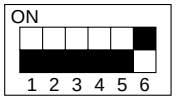
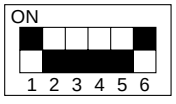
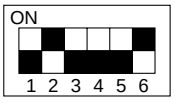
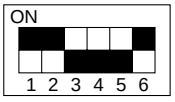
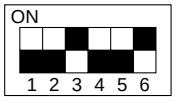
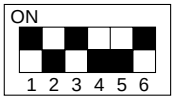
| Display | Contents to be inspected (When power is turned on) |
|---|---|
| F3 | 63L connector(red) is open. |
| F5 | 63H connector(yellow) is open. |
| F9 | 2 connectors (63H/63L) are open. |
| E8 | Indoor/outdoor communication error (Signal receiving error) (Outdoor unit) |
| E9 | Indoor/outdoor communication error (Transmitting error) (Outdoor unit) |
| EA | Mis-wiring of indoor/outdoor unit connecting wire, excessive number of indoor units (4 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 |

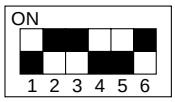
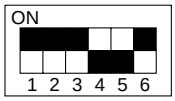
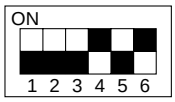
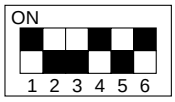
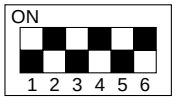
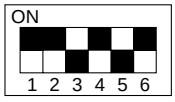
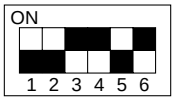
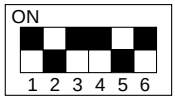
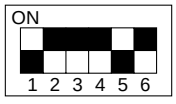
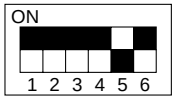
| SW2 setting | Display detail | Explanation for display | Unit |
|---|---|---|---|
|  | Pipe temperature / Liquid(TH3)<br>– 40~90 | – 40~90<br>(When the coil thermistor detects 0℃ or below, "–" and temperature are displayed by turns.)<br>(Example) When -10℃;<br>0.5 secs. 0.5secs. 2 secs.<br>-□ →10 →□□ | ℃ |
|  | Discharge temperature (TH4)<br>3~217 | 3~217<br>(When the discharge thermistor detects 100℃ or more, hundreds digit, tens digit and ones digit are displayed by turns.)<br>(Example) When 105℃;<br>0.5 secs. 0.5secs. 2 secs.<br>□1 →05 →□□ | ℃ |
|  | Output step of outdoor FAN<br>0~10 | 0~10 | Step |
|  | The number of ON / OFF times of compressor<br>0~9999 | 0~9999<br>(When the number of times is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.)<br>(Example) When 42500 times (425 ×100 times);<br>0.5 secs. 0.5secs. 2 secs.<br>□4 →25 →□□ | 100 times |
|  | Compressor integrating operation times<br>0~9999 | 0~9999<br>(When it is 100 hours or more, hundreds digit, tens digit and ones digit are displayed by turns.)<br>(Example) When 2450 hours (245 ×10 hours);<br>0.5 secs. 0.5secs. 2 secs.<br>□2 →45 →□□ | 10 hours |
|  | Compressor operating current.<br>0~50 | 0~50<br>※Omit the figures after the decimal fractions. | A |
|  | Compressor operating frequency<br>0~225 | 0~255<br>(When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.<br>(Example) When 125Hz;<br>0.5 secs. 0.5secs. 2 secs.<br>□1 →25 →□□ | Hz |
|  | LEV-A opening pulse<br>0~480 | 0~480<br>(When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.<br>(Example) When 150 pulse;<br>0.5 secs. 0.5secs. 2 secs.<br>□1 →50 →□□ | Pulse |
|  | Error postponement code history (1) of outdoor unit | Postponement code display<br>Blinking: During postponement<br>Lighting: Cancellation of postponement<br>"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.<br>(SW2)  | Code display |

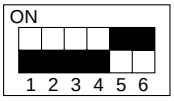
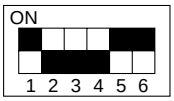
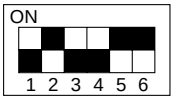
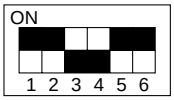
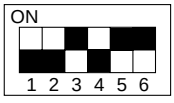
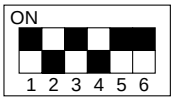
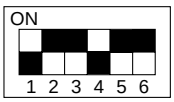
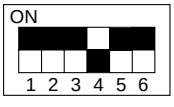
| SW2 setting | Display detail | Explanation for display | Unit |
|---|---|---|---|
|  | Pipe temperature / Liquid(TH3) on error occurring<br>– 40~90 | – 40~90<br>(When the coil thermistor detects 0℃ or below, "–" and temperature are displayed by turns.)<br>(Example) When –15℃;<br>0.5 secs. 0.5secs.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

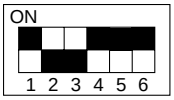
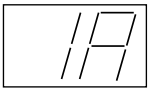
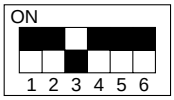
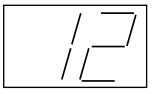
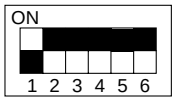
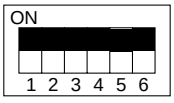
| Capacity | Code |
|---|---|
| RP3V | 14 |
| RP4V | 20 |
| RP5V | 25 |
| RP6V | 28 |

<table>
<tr><th>SW2 setting</th><th>Display detail</th><th>Explanation for display</th><th>Unit</th></tr>
<tr><td>  </td><td>Outdoor unit setting information</td><td>• The tens digit (Total display for applied setting)<br><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<br><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))<br>Indoor 1<br>– 39~88</td><td>– 39~88<br>(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))<br>Indoor 1<br>– 39~88</td><td>– 39~88<br>(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))<br>Indoor 2<br>– 39~88</td><td>– 39~88<br>(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))<br>Indoor 2<br>– 39~88</td><td>– 39~88<br>(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)<br>8~39</td><td>8~39</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor setting temperature<br>17~30</td><td>17~30</td><td>℃</td></tr>
<tr><td>  </td><td>Indoor control status</td><td rowspan="2">This code is referred to check the unit’s operating status.<br><table><tr><th rowspan="2">Code</th><th colspan="2">Status of control</th></tr><tr><th>Indoor unit</th><th>Outdoor unit</th></tr><tr><td>0</td><td>Normal</td><td>Normal</td></tr><tr><td>1</td><td>Hot adjustment</td><td>Hot adjustment</td></tr><tr><td>2</td><td>Defrosting</td><td>Defrosting</td></tr><tr><td>3</td><td>—</td><td>—</td></tr><tr><td>4</td><td>Heater ON</td><td>Heater ON</td></tr><tr><td>5</td><td>Anti-freezing</td><td>Anti-freezing</td></tr><tr><td>6</td><td>Over-rise prevention</td><td>Over-rise prevention</td></tr><tr><td>7</td><td>Compressor OFF</td><td>Compressor OFF</td></tr></table></td><td rowspan="2">Code display</td></tr>
<tr><td>  </td><td>Outdoor control status</td></tr>
</table>

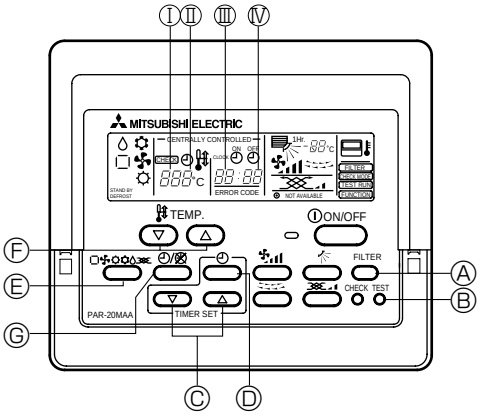
| SW2 setting | Display detail | Explanation for display | Unit |
|---|---|---|---|
|  | Outdoor pipe temperature / Cond./ Eva. (TH6)<br>-39~88 | -39~88<br>(When the temperature is 0℃ or less, "–" and temperature are displayed by turns.) | ℃ |
|  | Outdoor outside temperature (TH7)<br>-39~88 | -39~88<br>(When the temperature is 0℃ or less, "–" and temperature are displayed by turns.) | ℃ |
|  | Outdoor heat sink temperature (TH8)<br>-40~200 | -40~200<br>(When the temperature is 0℃ or less, "–" and temperature are displayed by turns.)<br>(When the thermistor detects 100℃ or more, hundreds digit, tens digit and ones digit are displayed by turns.) | ℃ |
|  | Discharge super heat. SHd<br>0~255<br>[Cooling = TH4-TH6<br>Heating = TH4-TH5] | 0~255<br>(When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.) | °C |
|  | Sub cool. SC<br>0~130<br>[Cooling = TH6-TH3<br>Heating = TH5-TH4] | 0~130<br>(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<br>(When it is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.) | 0.1 A |
|  | LEV-B opening pulse | 0~480<br>(When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.) | Pulse |
|  | Targeted operation frequency<br>0~255 | 0~255<br>(When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.) | Hz |
|  | DC bus voltage<br>180~370 | 180~370<br>(When it is 100V or more, hundreds digit, tens digit and ones digit are displayed by turns.) | V |
|  | Capacity save<br>0~255<br>When air conditioner is connected to M-NET and capacity save mode is demanded, "0"~"100" is displayed.<br>[When there is no setting of capacity save "100" is displayed.] | 0~100<br>(When the capacity is 100% hundreds digit, tens digit and ones digit are displayed by turns.)<br>(Example) When 100%;<br>0.5 secs. 0.5secs. 2 secs.<br>□1 →00 →□□ | % |

| SW2 setting | Display detail | Explanation for display | Unit |
|---|---|---|---|
|   | Error postponement code history (2) of outdoor unit | Postponement code display<br>Blinking: During postponement<br>Lighting: Cancellation of postponement<br>“00” is displayed in case of no postponement. | Code display |
|   | Error postponement code history (3) of outdoor unit | Postponement code display<br>Blinking: During postponement<br>Lighting: Cancellation of postponement<br>“00” is displayed in case of no postponement. | Code display |
|   | Error code history (3) (Oldest)<br>Alternate display of abnormal unit number and code. | When no error history, “0” and “– –“ are displayed by turns. | Code display |
|   | Error thermistor display<br>[When there is no error thermistor, “–“ is displayed.] | 3: Outdoor pipe temperature /Liquid (TH3)<br>6: Outdoor pipe temperature /Cond./Eva. (TH6)<br>7: Outdoor outside temperature (TH7)<br>8: Outdoor radiator panel (TH8) | Code display |
|   | Operation frequency on error occurring<br>0~255 | 0~255<br>(When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.)<br>(Example) When 125Hz;<br>0.5 secs. 0.5secs. 2 secs.<br>□1 →25 →□□ | Hz |
|   | Fan step on error occurring<br>0~10 | 0~10 | Step |
|   | LEV-A opening pulse on error occurring<br>0~480 | 0~480<br>(When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.)<br>(Example) When 130 pulse;<br>0.5 secs. 0.5secs. 2 secs.<br>□1 →30 →□□ | Pulse |
|   | Indoor room temperature (TH1) on error occurring<br>8~39 | 8~39 | ℃ |
|   | Indoor pipe temperature / Liquid (TH2) on error occurring<br>-39~88 | -39~88<br>(When the temperature is 0°C or less, “–” and temperature are displayed by turns.)<br>(Example) When –15°C;<br>0.5 secs. 0.5secs. 2 secs.<br>-□ →15 →□□ | ℃ |
|   | Indoor pipe temperature / Cond./ Eva. (TH5) on error occurring<br>-39~88 | -39~88<br>(When the temperature is 0°C or less, “–” and temperature are displayed by turns.)<br>(Example) When –15°C;<br>0.5 secs. 0.5secs. 2 secs.<br>-□ →15 →□□ | ℃ |

| SW2 setting | Display detail | Explanation for display | Unit |
|---|---|---|---|
|  | Outdoor pipe temperature / Cond./ Eva. (TH6) on error occurring<br>-39~88 | -39~88<br>(When the temperature is 0°C or less, "–" and temperature are displayed by turns.)<br>(Example) When –15°C;<br>0.5 secs. 0.5secs. 2 secs.<br>-□ →15 →□□ | ℃ |
|  | Outdoor outside temperature (TH7) on error occurring<br>-39~88 | -39~88<br>(When the temperature is 0°C or less, "–" and temperature are displayed by turns.)<br>(Example) When –15°C;<br>0.5 secs. 0.5secs. 2 secs.<br>-□ →15 →□□ | ℃ |
|  | Outdoor heat sink temperature (TH8) on error occurring<br>-40~200 | -40~200<br>(When the temperature is 0°C or less, "–" and temperature are displayed by turns.)<br>(When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.) | ℃ |
|  | Discharge super heat on error occurring SHd<br>0~255<br>[Cooling = TH4-TH6<br>Heating = TH4-Th5] | 0~255<br>(When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)<br>(Example) When 150°C;<br>0.5 secs. 0.5secs. 2 secs.<br>□1 →50 →□□ | ℃ |
|  | Sub cool on error occurring. SC<br>0~130<br>[Cooling = TH6-TH3<br>Heating = TH5-TH2] | 0~130<br>(When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)<br>(Example) When 115°C;<br>0.5 secs. 0.5secs. 2 secs.<br>□1 →15 →□□ | ℃ |
|  | Thermostat ON time until error stops<br>0~999 | 0~999<br>(When it is 100 minutes or more, hundreds digit, tens digit and ones digit are displayed by turns.)<br>(Example) When 415 minutes;<br>0.5 secs. 0.5secs. 2 secs.<br>□4 →15 →□□ | Minute |
|  | Indoor pipe temperature / Liquid (TH2 (3))<br>Indoor 3<br>-39~88 | -39~88<br>(When the temperature is 0°C or less, "–" and temperature are displayed by turns.) | ℃ |
|  | Indoor pipe temperature / Cond./ Eva. (TH5 (3))<br>Indoor 3<br>-39~88 | -39~88<br>(When the temperature is 0°C or less, "–" and temperature are displayed by turns.)<br><br>When there is no indoor unit, "00" is displayed. | ℃ |

<table>
<tr><th>SW2 setting</th><th>Display detail</th><th>Explanation for display</th><th>Unit</th></tr>
<tr>
<td> 
</td>
<td>Compressor frequency control</td>
<td>This code is referred to check the unit's operating status.<br>• Tens digit
<table>
<tr><th>Code</th><th>Compressor frequency control</th></tr>
<tr><td>1</td><td>Primary current restriction control</td></tr>
<tr><td>2</td><td>Secondary current restriction control</td></tr>
</table>
• Ones digit
<table>
<tr><th>Code</th><th>Compressor frequency control</th></tr>
<tr><td>1</td><td>Discharging temperature over-rise prevention control</td></tr>
<tr><td>2</td><td>Condensing temperature over-rise prevention control</td></tr>
<tr><td>4</td><td>Frozen prevention control</td></tr>
<tr><td>8</td><td>Heat sink temperature over-rise prevention control</td></tr>
</table>
(Example)<br>In the following cases(① to ③), the code will be displayed as shown in the figure.<br>① Primary current restriction control<br>② Condensing temperature over-rise prevention control<br>③ Heat sink temperature over-rise prevention control<br>  </td>
<td>Code display</td>
</tr>
<tr>
<td> 
</td>
<td>FAN Control</td>
<td>This code is referred to check the unit's operating status.<br>• Tens digit
<table>
<tr><th>Code</th><th>Condensing temperature over-rise</th></tr>
<tr><td>- or<br>0 to 2</td><td>Correction value (-1 to +2 ) of FAN step for this control will be displayed.<br>"-" will be displayed in case the correction value is -1.</td></tr>
</table>
• Ones digit
<table>
<tr><th>Code</th><th>Heat sink temperature over-rise</th></tr>
<tr><td>0 to 2</td><td>Correction value (0 to +2 ) of FAN step for this control will be displayed.</td></tr>
</table>
(Example)<br>In case of ① and ②, correction values of fan step are displayed as shown in the figure.<br>① The correction value of fan step for the condensing temperature over-rise prevention control is +1.<br>② The correction value of fan step for the heat sink temperature over-rise prevention control is +2.<br>  </td>
<td>Code display</td>
</tr>
<tr>
<td> 
</td>
<td>Replacement operation<br>※If replacement operation is conducted even once, "1" is displayed.<br>If replacement operation time is less than 2 hrs. "0" is displayed.</td>
<td>1: Conducted.<br>0: Not yet.</td>
<td>–</td>
</tr>
<tr>
<td> 
</td>
<td>U9 Error status during the Error postponement period</td>
<td>
<table>
<tr><th>Description</th><th>Detection point</th><th>Display</th></tr>
<tr><td>Normal</td><td>—</td><td>00</td></tr>
<tr><td>Overvoltage error</td><td>Power circuit board</td><td>01</td></tr>
<tr><td>Undervoltage error</td><td>Controller circuit board</td><td>02</td></tr>
<tr><td>T phase interruption error</td><td>Controller circuit board</td><td>04</td></tr>
<tr><td>Abnormal power synchronous signal</td><td>Power circuit board</td><td>08</td></tr>
<tr><td>PFC error<br>(Overvoltage / Undervoltage / Overcurrent)</td><td>Power circuit board</td><td>10</td></tr>
</table>
※ Display examples for multiple errors:<br>Overvoltage (01) + Undervoltage (02) = 03<br>Undervoltage (02) + Power-sync signal error (08) = 0A<br>T phase interruption (04) + PFC error (10) = 14</td>
<td>Code display</td>
</tr>
</table>

# 10 FUNCTION SETTING



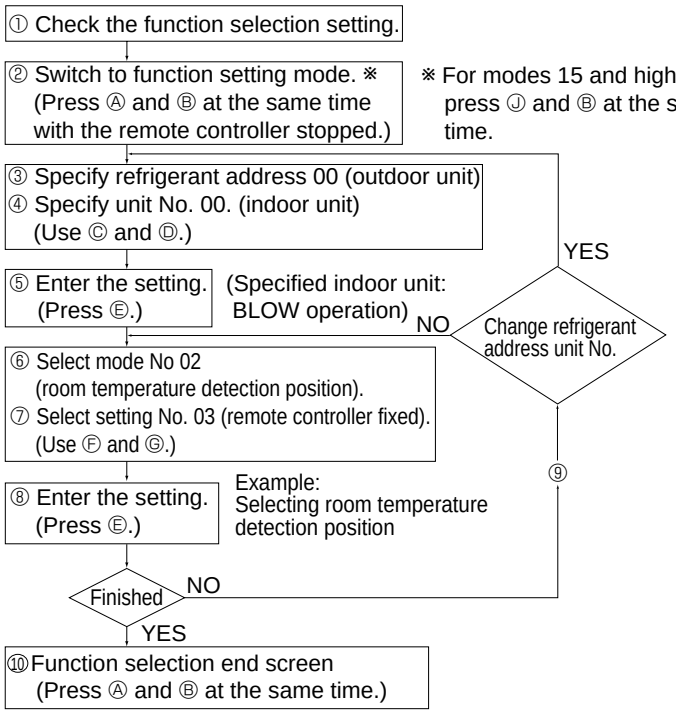

**Wired type**

Ⅰ Mode number
Ⅱ Setting number
Ⅲ Refrigerant address
Ⅳ Unit number

**Changing the power voltage setting**

• Be sure to change the power voltage setting depending on the voltage used.

**Selecting functions using the wired remote controller**

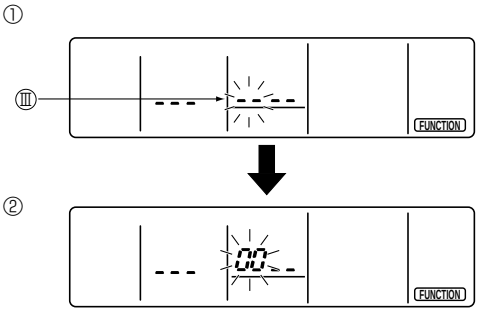



**[Operating instructions]** (entering settings with a wired remote controller)

① **Go to the function setting mode.**

Switch OFF the remote controller.

Press the Ⓐ FILTER and Ⓑ TEST RUN buttons simultaneously and hold them for at least 2 seconds. FUNCTION will start to flash. The refrigerant address display will start to flash momentarily (see diagram ①).



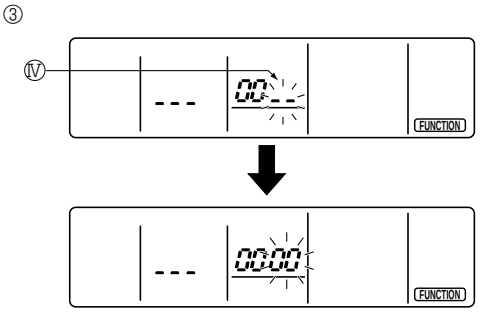

② **Setting the refrigerant address**

Use the Ⓒ ▲ ▼ (TIMER SET) button to set the refrigerant address (Ⅲ) to 00 (see diagram ②). Press ▲ to increase the value or ▼ to decrease it.

* 00 is the typical setting. When operating in a group configuration, use the correlating refrigerant address (see the technical manual for details on setting the refrigerant address for a group). The refrigerant addresses must be set in order when performing the following operation.

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 is some source of transmission interference (noise) nearby.

If you make a mistake during any point of this procedure, you can quit the function setting mode by pressing ⑧ once and then return to step ①.



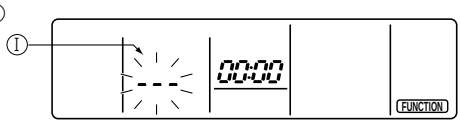

③ **Setting the unit number**

Press Ⓓ (CLOCK ON OFF) and [--] will start to flash in the unit number (Ⅳ) display (see diagram ③).

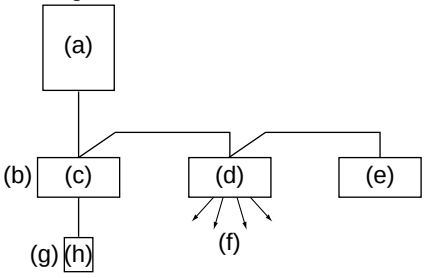
Use the Ⓒ ▲ ▼ (TIMER SET) button to set the unit number to 00 (see diagram ③). Press ▲ to increase the value or ▼ to decrease it.

Unit number 00 = the function setting selection for the entire refrigerant system.

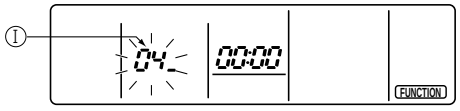
④



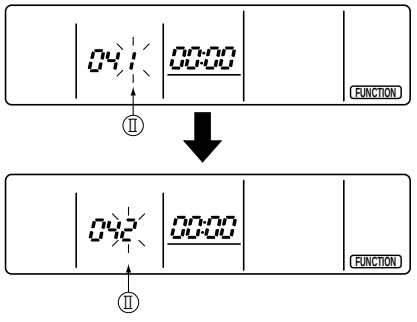

Ⅲ 00 refrigerant address



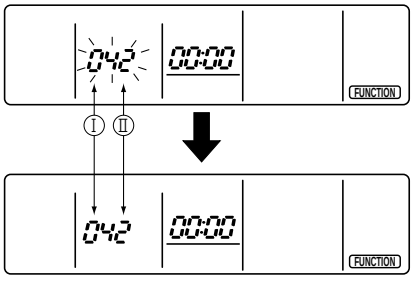

⑤



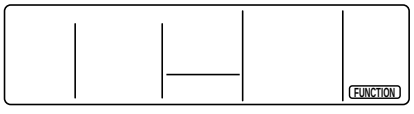

⑥




⑦




⑧




④ **Setting the refrigerant address/unit number**

Press the Ⓔ MODE button to designate the refrigerant address/unit number. [--] will flash in the mode number ( Ⅰ ) display momentarily (see diagram ④).

* If [88] appears in the room temperature 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.

Fan draft operation will start when settings are confirmed using the Ⓔ MODE button. You can also use this operation to find out what functions are assigned to which unit numbers and the locations of those indoor units. Note that the fan draft operation will start for all of the indoor units that have been assigned refrigerant addresses when 00 or AL is the assigned unit number.

* If an indoor unit other than those designated with refrigerant addresses emits a fan draft when a different refrigerant grouping is being used, the set refrigerant address have probably overlapped. Reassign the refrigerant addresses at the DIP switch of the outdoor unit.

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

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

⑤ **Selecting the mode number**

Press the Ⓕ ▲ ▼ (TEMP) buttons to set the mode number ( Ⅰ ) to 04 (see diagram ⑤). Press ▲ to increase the value or ▼ to decrease it.

Mode number 04 ⓘ=power voltage switching mode

⑥ **Selecting the setting number**

1 will start to flash as the currently specified setting number ( Ⅱ ) when the ◴ button Ⓖ is pressed (see diagram ⑥). Use the ▲ ▼ (TEMP) buttons to specify 2 as the setting number (see diagram ⑥). Press ▲ to increase the value or ▼ to decrease it.
( Ⅱ ) Setting number 1 = 240V
( Ⅱ ) Setting number 2 = 220V/230V

⑦ **Designating the mode and setting numbers**

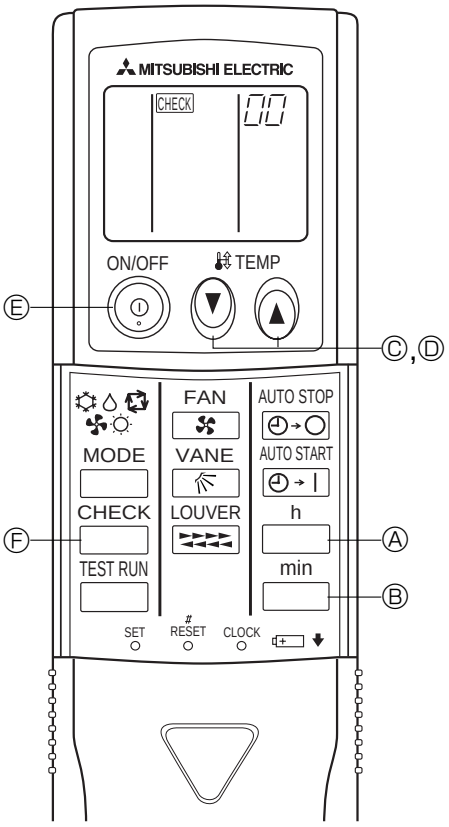
The mode and setting numbers ( Ⅰ ) ( Ⅱ ) will start to flash when the MODE button Ⓔ is pressed and the designation operation will begin (see diagram ⑦). The numbers are set when the flashing settings stay lit (see diagram ⑦).

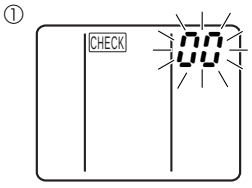
* If [---] appears in the room temperature display as the mode/setting number, or if a flashing [88] display appears, a transmission problem may have occurred. Check to see if there is some source of transmission interference (noise) nearby.

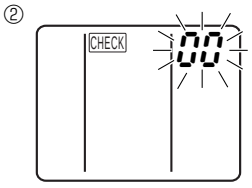
⑧ **Complete function selection**

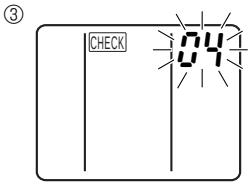
Press the FILTER Ⓐ and TEST RUN Ⓑ buttons simultaneously for at least two seconds. The function selection screen will disappear momentarily and air conditioner OFF display will appear. (See diagram ⑧)

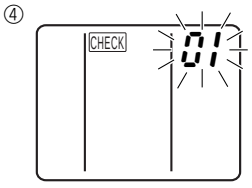
* Do not use the remote controller for 30 seconds after completing the function selection.



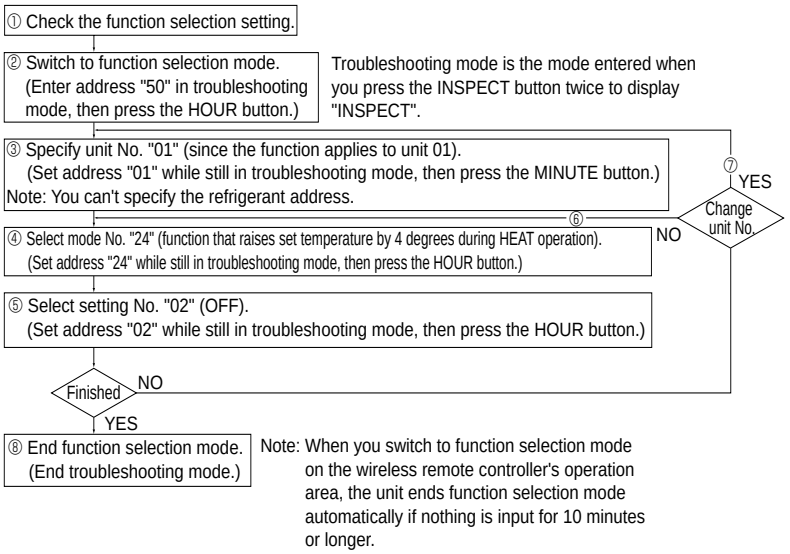




**Wireless remote controller type**

**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]** (entering settings with a wireless remote controller)

**Changing the power voltage setting**

Be sure change the power voltage setting depending on the voltage used.

① **Go to the function select mode**

Press the CHECK button Ⓕ twice continuously.

(Start this operation from the status of remote controller display turned off.)

CHECK is lighted 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 Ⓐ.

② **Setting the unit number**

Press the temp ▼▲ button Ⓒ and Ⓓ to set the unit number “00”. Direct the wireless remote controller toward the receiver of the indoor unit and press the min button Ⓑ. (The display changes at each press: 01 to 50)

**•When controlling each unit (unit 01 to 04) individually ➜ Select "01" to "04."**
**•When controlling all the units (unit 01 to 04) at once ➜ Select "07."**

③ **Selecting a mode**

Enter 04 to change the power voltage setting using the ▼ Ⓒ and ▲ Ⓓ buttons.

Direct the wireless remote controller toward the receiver of the indoor unit and press the h button Ⓐ.

Current setting number: 1 = 1 beep (one second)
2 = 2 beeps (one second each)
3 = 3 beeps (one second each)

④ **Selecting the setting number**

Use the ▼ Ⓒ and ▲ Ⓓ buttons to change the power voltage setting to 01 (240V).

Direct the wireless remote controller toward the sensor of the indoor unit and press the h button Ⓐ.

⑤ **To select multiple functions continuously**
Repeat steps ③ and ④ to change multiple function settings continuously.

⑥ **Complete function selection**
Direct the wireless remote controller toward the sensor of the indoor unit and press the ((⊙)) button Ⓔ.

**Note:**
**Whenever changes are made to the function settings after construction or maintenance, be sure to record the added functions with an "◯", in the "Check" column provided on the chart.**

**Things to remember when entering function selections:**
The basic procedure for entering function selections is the same as described for switching between power voltages. However, there are some differences at step ③ for selecting the unit number, step ⑤ for selecting the mode number and step ⑧ for selecting the unit number. The following Tables 2 and 3 list the various function settings, mode numbers and setting numbers. Table 2 details the functions of the entire refrigerant system while Table 3 shows the functions that can be set for the indoor unit.
In case of setting the mode number from 15 to 28 with the wired remote controller, shift to the function selecting mode by pressing Ⓙ (Air direction) button and Ⓑ (TEST RUN) button at the same time for 2 seconds or more.
(The function selecting mode will be released in the same way as the one of setting it.)

**Other function selections**
Now that you know how to change the power voltage setting, there are several other settings that can be changed as well. The following Table lists the various settings that can be changed through the remote controller and the default settings of the various units.

Table 1

| Mode No. | Function | Settings | PLA-RP • AA | PLA-RP • AA.UK | PCA-RP • GA | PKA-RP • GAL | PKA-RP • FAL | PEA-RP • EA | PEAD-RP • EA.UK<br>PEAD-RP • GA.UK |
|---|---|---|---|---|---|---|---|---|---|
| 01 | Power failure automatic recovery | Not available | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | Available | | | | | | | |
| 02 | Indoor temperature detecting | Indoor unit operating average | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | Set by indoor unit's remote controller | | | | | | | |
| | | Remote controller's internal sensor | | | | | | | |
| 03 | LOSSNAY connectivity | Not supported | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | Supported (indoor unit in not equipped with outdoor-air intake) | | | | | | | |
| | | Supported (indoor unit in equipped with outdoor-air intake) | | | | | | | |
| 04 | Power voltage | 240V | | | | | | | |
| | | 220V, 230V | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| 05 | Auto operating mode | Auto energy-saving operation ON | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | Auto energy-saving operation OFF | | | | | | | |
| 15 | Frost prevention temperature | 2℃ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | 3℃ | | | | | | | |
| 17 | Change of defrosting control | Standard | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | High humidity region | | | | | | | |
| 19 | Thermo differential setting | Normal | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | 5℃ | | | | | | | |
| | | 10℃ | | | | | | | |
| 07 | Filter sign | 100Hr | | | | ◯ | ◯ | | |
| | | 2500Hr | ◯ | ◯ | ◯ | | | | |
| | | No filter sign indicator | | | | | | ◯ | ◯ |
| 08 | Fan speed | Quiet (standard) | ◯ | ◯ | | — | — | — | — |
| | | Standard (High ceiling ① — PLA-RP·AA type) | | | ◯ | — | — | — | — |
| | | High ceiling (High ceiling ②) | | | | — | — | — | — |
| 09 | No. of air outlets | 4 directions | ◯ | ◯ | — | — | — | — | — |
| | | 3 directions | | | — | — | — | — | — |
| | | 2 directions | | | — | — | — | — | — |
| 10 | Installed options (high-performance filter) | Not supported | ◯ | ◯ | ◯ | — | — | — | — |
| | | Supported | | | | — | — | — | — |
| 11 | Up/down vane setting | No vanes | | | | — | — | — | — |
| | | Equipped with vanes (No.1 set) | ◯ | | ◯ | — | — | — | — |
| | | Equipped with vanes (No.2 set) | | ◯ | | — | — | — | — |
| 12 | Energy saving air flow (Heating mode) | Disabled | ◯ | | ◯ | — | — | — | — |
| | | Enabled | | | | — | — | — | — |
| 13 | Humidifier (Direct Add-on type) | Not supported | ◯ | ◯ | — | — | — | — | — |
| | | supported | | | — | — | — | — | — |
| 23 | Swing | Not available | | | | | | — | — |
| | | Available | ◯ | ◯ | ◯ | ◯ | ◯ | — | — |
| 24 | Set temperature in heating mode 4deg-up | Available | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | Not available | | | | | | | |
| 25 | Fan speed when the heating thermostat is OFF. | Extra low | ◯ | ◯ | | ◯ | ◯ | ◯ | ◯ |
| | | Low | | | ◯ | | | | |
| | | Setting fan speed | | | | | | | |
| 27 | Fan speed when the cooling thermostat is OFF. | Setting fan speed | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | Stop | | | | | | | |
| 28 | Detection of abnormality (P8) of the pipe temperature | Available | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| | | Not available | | | | | | | |

Table 2. Itemised functions of the entire refrigerant system (select unit number 00)

| Function | Settings | Mode No. | Setting No. | Check | Remarks |
|---|---|---|---|---|---|
| Power failure automatic recovery | Not available | 01 | 1 | | |
| | Available | | 2 | | Approx. 4-minute wait-period after power is restored. |
| Indoor temperature detecting | Indoor unit operating average | 02 | 1 | | |
| | Set by indoor unit's remote controller | | 2 | | |
| | Remote controller's internal sensor | | 3 | | |
| LOSSNAY connectivity | Not supported | 03 | 1 | | |
| | Supported (indoor unit in not equipped with outdoor-air intake) | | 2 | | |
| | Supported (indoor unit in equipped with outdoor-air intake) | | 3 | | |
| Power 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℃ | 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 | | |
| | High humidity region | | 2 | | |

Table 3. Itemised functions of the indoor unit (select unit numbers 01 to 03 or AL [Wired remote controller] / 07 Wireless remote controller])

| Function | Settings | Mode No. | Setting No. | Check | Remarks |
|---|---|---|---|---|---|
| Filter sign | 100Hr | 07 | 1 | | |
| | 2500Hr | | 2 | | |
| | No filter sign indicator | | 3 | | |
| Fan speed | Quiet / standard | 08 | 1 | | |
| | Standard / High ceiling ① (PLA-RP·AA type) | | 2 | | |
| | High ceiling / 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 set) | | 2 | | Refer to ※1. |
| | Equipped with vane (No.2 set) | | 3 | | Refer to ※2. |
| Energy saving air flow (Heating mode) | Disabled | 12 | 1 | | |
| | Enabled | | 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 | | 2 | | |
| | Setting fan speed | | 3 | | |
| Fan speed when the cooling thermostat is OFF | Setting fan speed | 27 | 1 | | |
| | Stop | | 2 | | |
| Detection of abnormality (P8) of the pipe temperature | Available | 28 | 1 | | |
| | Not available | | 2 | | |

③ Setting the unit numbers
Set “00” as the unit number when setting functions from Table 2.
When setting functions from Table 3:
- When setting functions for an indoor unit in an independent system, set the unit number to 01.
- When setting functions for a simultaneous-Twin Triple indoor unit system, assign unit numbers from 01 to 03 each indoor unit.
- When setting the same functions for an entire simultaneous Twin Triple-indoor unit system, assign “AL” as the unit number.

⑤ Selecting the mode number
Selecting from Table 2 and Table 3.

⑥ Selecting the setting number
Selecting from Table 2 and Table 3.

※1 Horizontal vane First setting: The angle of the vane is set to standard.
※2 Horizontal vane Second setting: The angle of the vane is finely changed as a measure against smudging.

## Supplementary information

1) Energy-saving warm airflow control

Start timing: Starts when thermostat is switched from ON to OFF after HEAT mode and the hot adjust process have finished.

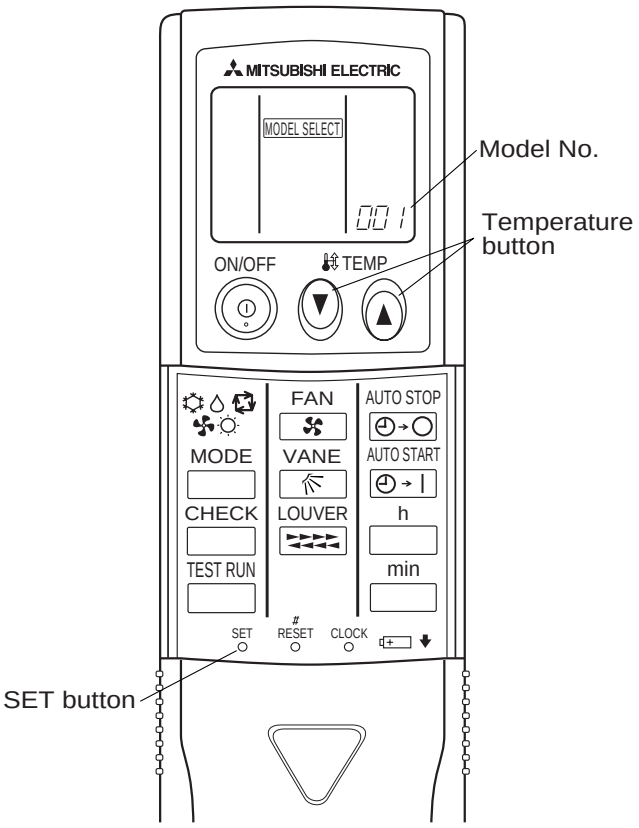
End timing: Ends when any of the following conditions is met:

(1) The unit is switched to any mode other than HEAT.
(2) The unit enters DEFROST operation.
(3) Intake temperature ! Set temperature
(4) More than 5 minutes after the start of energy-saving warm airflow fan control
(5) The unit is switched to hot adjust.

•Energy-saving warm airflow control keeps the vane in the downward position and maintains the fan speed when thermostat is turned OFF.

## Setting model No.

•By setting the wireless remote controller model No., you can change the functions that the remote controller provides. Change the model No. as needed.




**Procedure**

1. Press the SET button using a pointed implement. "MODEL SELECT" flashes and the currently set model No. appears (steadily-lit).
2. Press the temperature buttons to select the model No. to set.
3. Press the SET button using a pointed implement. "MODEL SELECT" and the set model No. appear (steadily-lit) for 3 seconds, then disappear.

•When setting a model No., make sure it is the correct model No. for the unit's functions. If an incorrect model No. is set, the unit's operation will not correspond with the remote controller's display.

| Type | Model No. | Model |
|---|---|---|
| Heat pump | 001 | PLA–RP·AA |
| | 001 | PCA–RP·GA |
| | 001 | PKA–RP·GAL |
| | 003 | PKA–RP·FAL |

List of function for all the models [Wireless remote controller]

| Model No. | | 001 | 002 | 003 | 004 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 013 | 014 | 015 | 016 | 017 | 018 | 019 | 020 | 021 | 022 | 023 | 024 | 025 | 026 | 027 | 028 | 029 | 030 | 031 | 032 | 033 | 034 | 035 | 036 | 037 | 038 | 039 | 040 | 041 | 042 | 043 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.Fan speed | ① Speed 4 | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| | ② Speed 3 | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | |
| | ③ Speed 2 | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ |
| | ④ Speed 1 | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | |
| 2.Vertical vane | ① Louver [None] | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ |
| | ② Louver [Equipped] | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | |
| 3.Horizontal vane | ① Vane [Equipped]/ Swing function [Equipped] | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | |
| | ② Vane [Equipped]/ Swing function [None] | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ |
| | ③ Vane [None] | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | |
| | ④ No definition (Vane [None]) | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | |
| 4.Operation mode | ① Cool/ Dry/ Automatic/ Fan/ Heat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | |
| | ② Cool/ Dry/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | ③ Cool/ Dry/ Automatic/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ④ Cool/ Dry/ Automatic/ Fan/ Burner-used heat/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑤ Cool/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑥ Cool/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑦ Cool/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑧ Cool/ Dry/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



| | | 044 | 045 | 046 | 047 | 048 | 049 | 050 | 051 | 052 | 053 | 054 | 055 | 056 | 057 | 058 | 059 | 060 | 061 | 062 | 063 | 064 | 065 | 066 | 067 | 068 | 069 | 070 | 071 | 072 | 073 | 074 | 075 | 076 | 077 | 078 | 079 | 080 | 081 | 082 | 083 | 084 | 085 | 086 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.Fan speed | ① Speed 4 | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | |
| | ② Speed 3 | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ |
| | ③ Speed 2 | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| | ④ Speed 1 | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| 2.Vertical vane | ① Louver [None] | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | |
| | ② Louver [Equipped] | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ |
| 3.Horizontal vane | ① Vane [Equipped]/ Swing function [Equipped] | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | |
| | ② Vane [Equipped]/ Swing function [None] | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | |
| | ③ Vane [None] | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ |
| | ④ No definition (Vane [None]) | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | |
| 4.Operation mode | ① Cool/ Dry/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ② Cool/ Dry/ Fan | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | |
| | ③ Cool/ Dry/ Automatic/ Heat | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | ④ Cool/ Dry/ Automatic/ Fan/ Burner-used heat/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑤ Cool/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑥ Cool/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑦ Cool/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑧ Cool/ Dry/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

List of function for all the models

| Model No. | | 087 | 088 | 089 | 090 | 091 | 092 | 093 | 094 | 095 | 096 | 097 | 098 | 099 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 |
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| 1.Fan speed | ① Speed 4 | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ |
| | ② Speed 3 | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| | ③ Speed 2 | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | |
| | ④ Speed 1 | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| 2.Vertical vane | ① Louver [None] | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | ○ |
| | ② Louver [Equipped] | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | |
| 3.Horizontal vane | ① Vane [Equipped]/ Swing function [Equipped] | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ |
| | ② Vane [Equipped]/ Swing function [None] | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | |
| | ③ Vane [None] | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | |
| | ④ No definition (Vane [None]) | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 4.Operation mode | ① Cool/ Dry/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ② Cool/ Dry/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ③ Cool/ Dry/ Automatic/ Heat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ④ Cool/ Dry/ Automatic/ Fan/ Burner-used heat/ Heat | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | ⑤ Cool/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ○ |
| | ⑥ Cool/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑦ Cool/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑧ Cool/ Dry/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 |
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| 1.Fan speed | ① Speed 4 | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| | ② Speed 3 | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | |
| | ③ Speed 2 | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| | ④ Speed 1 | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | ○ |
| 2.Vertical vane | ① Louver [None] | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | ○ | ○ | ○ | ○ |
| | ② Louver [Equipped] | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | |
| 3.Horizontal vane | ① Vane [Equipped]/ Swing function [Equipped] | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | |
| | ② Vane [Equipped]/ Swing function [None] | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ |
| | ③ Vane [None] | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | |
| | ④ No definition (Vane [None]) | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | |
| 4.Operation mode | ① Cool/ Dry/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ② Cool/ Dry/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ③ Cool/ Dry/ Automatic/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ④ Cool/ Dry/ Automatic/ Fan/ Burner-used heat/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑤ Cool/ Fan | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | |
| | ⑥ Cool/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | ⑦ Cool/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑧ Cool/ Dry/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

List of function for all the models

| Model No. | | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 |
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| 1.Fan speed | ① Speed 4 | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| | ② Speed 3 | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | |
| | ③ Speed 2 | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| | ④ Speed 1 | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | |
| 2.Vertical vane | ① Louver [None] | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | |
| | ② Louver [Equipped] | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ |
| 3.Horizontal vane | ① Vane [Equipped]/ Swing function [Equipped] | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | |
| | ② Vane [Equipped]/ Swing function [None] | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | |
| | ③ Vane [None] | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | ④ No definition (Vane [None]) | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | |
| 4.Operation mode | ① Cool/ Dry/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ② Cool/ Dry/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ③ Cool/ Dry/ Automatic/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ④ Cool/ Dry/ Automatic/ Fan/ Burner-used heat/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑤ Cool/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑥ Cool/ Automatic/ Fan/ Heat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑦ Cool/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | ⑧ Cool/ Dry/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 |
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| 1.Fan speed | ① Speed 4 | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | |
| | ② Speed 3 | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | |
| | ③ Speed 2 | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | |
| | ④ Speed 1 | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ | | | | ○ |
| 2.Vertical vane | ① Louver [None] | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | |
| | ② Louver [Equipped] | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ | | | | | ○ | ○ | ○ | ○ |
| 3.Horizontal vane | ① Vane [Equipped]/ Swing function [Equipped] | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | |
| | ② Vane [Equipped]/ Swing function [None] | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | |
| | ③ Vane [None] | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | |
| | ④ No definition (Vane [None]) | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 4.Operation mode | ① Cool/ Dry/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ② Cool/ Dry/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ③ Cool/ Dry/ Automatic/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ④ Cool/ Dry/ Automatic/ Fan/ Burner-used heat/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑤ Cool/ Fan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑥ Cool/ Automatic/ Fan/ Heat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑦ Cool/ Fan/ Heat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ⑧ Cool/ Dry/ Fan/ Heat | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

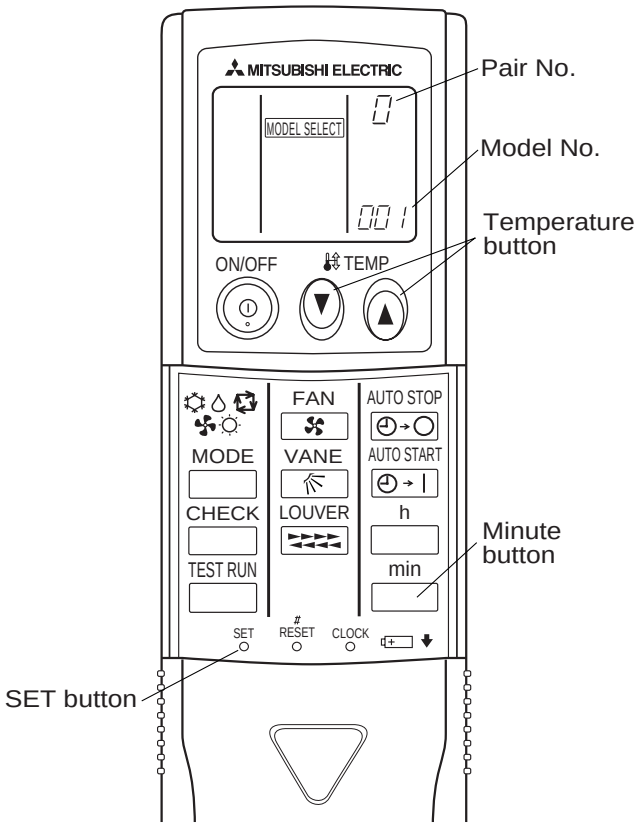
## Wireless remote controller pair number: Setting operation

1. Press the SET button (using a pointed implement).
   Check that the remote controller's display has stopped before continuing.
   MODEL SELECT flashes, and the model No. (3 digits) appears (steadily-lit).

2. Press the MINUTE button twice.
   The pair number appears flashing.

3. Press the temperature ⏷⏶ buttons to select the pair number to set.

4. Press the SET button (using a pointed implement).
   The set pair number is displayed (steadily-lit) for 3 seconds, then disappears.



# 11 TEST RUN • REPLACEMENT OPERATION & EMERGENCY OPERATION

## 11-1. Test run • replacement operation

### 11-1-1. Check points

- After installation of indoor and outdoor units, piping work and electric wiring work, re-check that there is no refrigerant leakage, loosened connections and wrong polarity.
- Check if there is no phase interruption to the power supply.
- Measure impedance between the ground and the terminal block(L, N) of the outdoor power board by 500V Merger and check that it is 1.0MΩ or more. If the indoor unit is equipped with a heater, also check the terminal block(L, N) of the heater power board.

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

Insulation Resistance

- The insulation resistance may get down to around 1.0MΩ as the liquid refrigerant collects in the compressor right after the installation of units or if the units are left for a long time with the main power OFF. In that case, there is no abnormality on units. Follow the procedure below.
  ① Measure the insulation resistance of the compressor itself by disconnecting any wires from it.
  ② It is considered that the insulation resistance will get down due to the collected refrigerant in the compressor or the defective compressor when the insulation resistance is below 1.0MΩ.
  ③ Start warming up the compressor by turning on the main power supply after connecting all the wires to the compressor again. Measure the insulation resistance again after supplying electricity to the compressor during the time indicated below.
  a) Warming-up time needed to get the insulation resistance back to 1.0MΩ or more from the insulation resistance decline: 2 to 3 hours (More time may be needed due to the outside temperature conditions or the refrigerant collected conditions.)
  b) Warming-up time needed to prevent the compressor from failure when the compressor is started with some refrigerant collected in compressor: 12 hours or more
  ④ If the insulation resistance is back to 1.0MΩ or more, the compressor is not defective.

- Make sure that the test run switch (SW4) on the outdoor controller board is set to OFF before turning on the power supply.
- Turn on the power supply 12 hours before operation in order to protect the compressor.
- For specific models which require higher ceiling settings or auto-recovery feature from power failure, make proper changes on settings by referring to the description of "Selection of Function through Remote Controller".
- Check if there is something wrong with the outdoor unit. LED1 & LED2 on the outdoor controller board flashes if the outdoor unit is in a trouble.
- Open both the stop valve of liquid/gas pipes completely.
- The surface of DIP switch is covered with the protection sheet. Uncover the protection sheet to make the switch controlled more easily.

After checking the above points, conduct the test run by following the procedure written in the below section. Make sure to read the operation manual before the test run. (Especially items to secure safety.)

### 11-1-2. Replacement operation

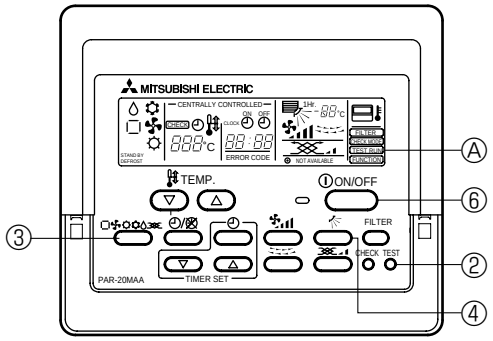
- **When reusing the existing pipes that carried R22 refrigerant for the RP4, RP5 and RP6 models, replacement operation must be performed before performing a test run.**
  ① If new pipes are used, these procedures are not necessary.
  ② If existing pipes that carried R22 refrigerant are used for the RP3 model, these procedures are not necessary. (The replacement operation cannot be performed.)
  ③ During replacement operation, "C5" is displayed on "A-Control Service Tool(PAC-SK52ST)". (This is applied to only RP4, RP5 and RP6 models.)
- Replacement operation procedures
  ① Turn on the power supply.
  ② Set DIP switch SW8-2 on the outdoor controller board 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 (green) and LED2 (red) on the control board of the outdoor unit flash together.
  ③ Replacement operation requires at least two hours to complete.
  • After setting switch SW8-2 to ON, the unit automatically stops after two hours.
  • Replacement operation can be performed repeatedly by setting switch SW8-2 from OFF to ON. Make sure to perform the operation more than 2 hours. (If the operation is performed less than 2 hours, the existing pipes cannot be cleaned enough and the unit may be damaged.)
  • If replacement operation is performed over 2 hours, this action is recorded into nonvolatile memory of controller board.
  ④ Set switch SW8-2 to OFF. (Replacement operation is completed.)
  ※The unit can be operated normally by remote controller even if SW8-2 remains ON.
  ※If the indoor temperature is less than 15℃, the compressor will operate intermittently but the unit is not faulty.

## 11-2. Before test run

- **After installation of indoor and outdoor units, and piping and electric wiring work, re-check that the unit is free from leaks of refrigerant, loosened connections, and incorrect polarity.**

- **Measure and impedance between the power supply terminal block on the outdoor unit and the ground with a 500V Merger and check that it is equal to or greater than 1.0MΩ.**
  **For the heater integrated units, make the similar measurement on the heater power supply terminal block (L, N, ⏚).**
  **(*) Never apply any voltage to the both terminal blocks for the indoor and outdoor unit connection (S1, S2, S3) and the remote controller (1,2).**

- **For specific models requiring changing of settings for higher ceilings or selection of power supply ON/OFF capability, make proper changes referring to the description for Selection of Functions through Remote Controller.**




## 11-3. Test run procedures

### (1) Indoor unit

### Wired type

**Operating procedures**

① **Turn on the main power supply.**
While the room temperature display on the remote controller reads “H0”, the remote controller is disabled. Turn off the “Ho” display before using the remote controller.

② **Press “TEST RUN” button twice.**
Ⓐ the ‘TEST RUN’ indicator should light up.

③ **Press button.**
Cool in/drying mode: Cool air should start to blow.
Heating mode: Warm air should start to blow (after a while).

④ **Press 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. 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, which does not mean malfunction.

⑥ **Press the “ON/OFF” button to reset the test run in progress.**
- The test run will be automatically shut down after two hours in response to the AUTO STOP setting of two hours on the timer.
- During the test run, the room temperature display shows the indoor unit tubing temperatures.

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

(*1)
After turning ON the power supply, the system will go into start up mode and “ H0” will be blinked on the operation lamp of the remote controller (green) and the display section of the room temperature .
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.) and LED3 will be blinked.
As to OUTDOOR BOARD LED , LED1(green) and LED2(red) will be lit up.(After the startup mode of the system will be finished ,LED2(red) will be turned off.)
In case OUTDOOR BOARD LED is the digital display, [—] and [—] will be displayed alternately every second.

- If one of the above operations does not function correctly, the following causes should be considered, and if applicable, dealt with. (The following symptoms have been determined under test run mode. Note that “start up” in the chart means the *1 display above.)

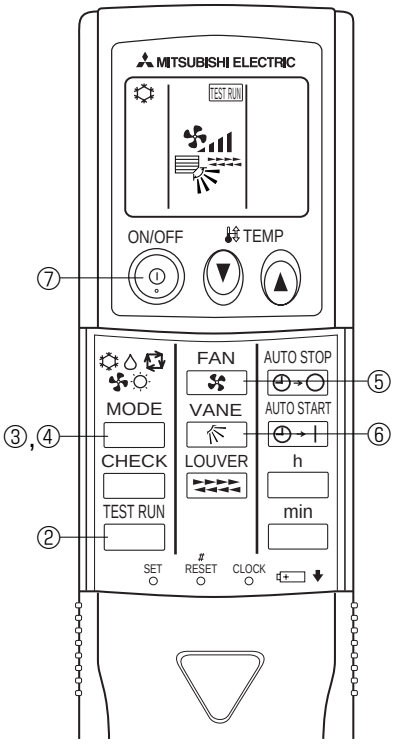
| Symptoms | | Cause |
|---|---|---|
| **Remote Controller Display** | **OUTDOOR BOARD LED Display** In case of digital display, < > is displayed. | |
| Remote controller is displaying "H0", and operation is not possible. | After "startup" is displayed, only green is lit up. < 00 > | • After power is turned ON, system startup lasts for about 2 mins., and "H0" is displayed (correct operation). |
| After power is turned ON, "H0" is displayed for 3 mins., then error code is displayed. | After "startup" is displayed, the green(once) and red(once) are blinked alternately. <F1> | • Outdoor unit`s safeguard installation connector is open.<br>• Negative phase and open phase of outdoor unit`s power terminal board (Single phase: L,N⏚) |
| | After "startup" is displayed, the green(once) and red(twice) are blinked alternately. <F3,F5,F9> | • Incorrect connection of outdoor terminal board (Single phase: L,N ⏚ grounding and S1,S2,S3) |
| Display messages do not appear even when remote controller operation switch is turned ON (operation lamp does not light up). | After "startup" is displayed, the green(twice) and red(once) are blinked alternately. <EA,Eb> | • Wiring for the indoor and outdoor unit is not connected correctly. (Polarity is wrong for S1,S2,S3)<br>• Remote controller transmission wire short |
| | After "startup" is displayed, only green is lit up. < 00 > | •There is no outdoor unit for address 0 (address is something other than 0).<br>• Remote controller transmission wire burnout |
| Operation display appears but soon disappears even when remote controller operations are executed. | After "startup" is displayed, only green is lit up. < 00 > | • After cancellation of function selection, operation is not possible for about 30 secs. (correct operation). |

* Press the remote controller`s “CHECK” button twice consecutively to be able to run a self diagnosis. See the chart below for content of error code displays.

| LCD | Nonconformity Content | LCD | Nonconformity Content |
|---|---|---|---|
| P1 | Abnormality of room temperature thermistor (TH1). | E0~E5 | Abnormality of the signal transmission between remote controller and indoor unit. |
| P2 | Abnormality of pipe temperature thermistor/Liquid (TH2) | | |
| P4 | Abnormality of drain sensor (DS) | E6~EF | Abnormality of the signal transmission between indoor unit and outdoor unit. |
| P5 | Malfunction of drain-up machine | | |
| P6 | Freezing/overheating protection is working | U0~UL | Abnormality in outdoor unit. |
| P8 | Abnormality of pipe temperature | F1~F9 | Abnormality in outdoor unit. |
| P9 | Abnormality of pipe temperature thermistor/Cond./Eva. (TH5) | ---- | No trouble generated in the past. |
| | | FFFF | No corresponding unit. |

See the chart below for details of the LED displays (LED 1,2,3) on the indoor substrate.

| | |
|---|---|
| LED 1 (microcomputer power supply) | Displays the ON/OFF of power for control. Check that this is lit during normal use. |
| LED 2 (remote controller feed) | Displays the ON/OFF of feed to wired remote controller. Is only lit for indoor unit linked to outdoor unit with address "00". |
| LED 3 (indoor and outdoor signals) | Displays signal between indoor and outdoor units. Check that this is flashing during normal use. |




### Test run [for wireless remote controller]

Measure an impedance between the power supply terminal block on the outdoor unit and ground with a 500V Megger and check that it is equal to or greater than 1.0MΩ.

① Turn on the main power to the unit.

② Press the TEST RUN button twice continuously.
(Start this operation from the status of remote controller display turned off.)
A TEST RUN and current operation mode are displayed.

③ Press the MODE ( ☼♢♣☼⮌ ) button to activate COOL☼ mode, then check whether cool air is blown out from the unit.

④ Press the MODE ( ☼♢♣☼⮌ ) button to activate HEAT☼ mode, then check whether warm air is blown out from the unit.

⑤ Press the FAN button and check whether strong air is blown out from the unit.

⑥ Press the VANE button and check whether the auto vane operates properly.

⑦ Press the ON/OFF button to stop the test run.

**Note:**

- **Point the remote controller towards the indoor unit receiver while following steps ② to ⑦.**
- **It is not possible to run the in FAN, DRY or AUTO mode.**

### (2) Outdoor Unit

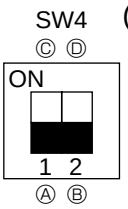
**Test run by outdoor unit SW4**

The setting of test run (ON/OFF) and its operation mode (cooling/heating) can be set by SW4 on the controller board of outdoor unit.

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 ( ↓ ).




(Factory setting)

Ⓐ Stop
Ⓑ Cooling
Ⓒ Operation
Ⓓ Heating

- 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.
- There may be a small clicking sound near the compressor after power is supplied, but this is not a malfunction. The linear expansion valve is working in order to adjust its opening pulse.

- There may be a clanging sound near the compressor for a couple of seconds after the compressor gets started, but this is not a malfunction. The valving element of the check valve emits this sound because the pressure difference in pipes is small.

**※ Operation mode cannot be changed by SW4-2 during test run.**
**(If it's necessary to change the operation mode, stop the test run by SW4-1. Then restart the test run by SW4-1 after changing the operation mode.)**

## 11-4. Emergency Operation

### (1) Indoor unit

1. When the wired remote controller or indoor unit micro computer troubles if there is not any other wrong, emergency operation starts as the indoor control board switch (SWE) is set to ON.
   During the emergency operation the indoor unit is as follows;
   (1) Indoor fan high speed operation (2) Drain pump. (only provided model)
   ※ When the remote controller cannot be used for the wireless remote controller, emergency operation is available by operating the emergency operation switch (SW1/SW2 in the wireless remote controller receiving p.c/board) in the indoor unit.

2. When emergency operating for COOL or HEAT, setting of the switch (SWE) in the indoor control board and outdoor unit emergency operation are necessary.

3. Check items and notices as the emergency operation
   (1) Emergency operation cannot be used as follows;
   - When the outdoor unit is something wrong.
   - When the indoor fan is something wrong.
   - When drain over flow protected operation is detected during self-diagnosis. (optional drain up mach.)

   (2) Emergency operation will be serial operation by the power supply ON/OFF.
   ON/OFF or temperature, etc. adjustment is not operated by the remote controller.
   (3) Do not operate for a long time as cold air is blown when the outdoor unit starts defrosting operation during heat emergency operation.
   (4) Cool emergency operation must be within 10 hours at most. It may cause heat exchanger frosting in the indoor unit.
   (5) After completing the emergency operation, return the switch setting, etc. in former state.
   (6) As for PLA-RP·AA Type series, since vane does not work at emergency operation position the vane manually and slowly.

### (2) Outdoor unit

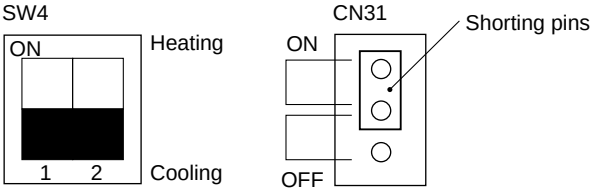
1. When the error codes shown below are displayed on outdoor unit or microcomputer for wired remote controller or indoor unit has a failure, but no other problems are found, emergency operation will be available by setting the emergency operation switch (SWE) to ON and short-circuiting the connector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

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

| Error code | Inspected content |
|---|---|
| U4 | Open/short of pipe thermistor (TH3/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) |

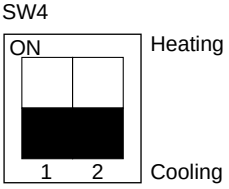
2. Check the following items and cautions for emergency operation
   ①Make sure that there is no abnormality in outdoor unit other than the above abnormalities. (Emergency operation will not be available when error code other than the above are indicated.)
   ②For emergency operation, it is necessary to set the emergency operation switch (SWE) on indoor controller 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 board.
   ③Set the shorting pins of emergency operation connector (CN31) on outdoor controller board to ON.
   ④Use SW4-2 on outdoor controller 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 board to OFF.
   ③Set the shorting pins of emergency operation connector (CN31) on outdoor controller board to OFF.
   ④Set SW4-2 on outdoor controller board as shown in the right.




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

### (3) Operation data during emergency operation

During emergency operation, no communication is performed with the indoor unit, so the data items needed for operation are set to the following values:

| Operation data | Operation mode | | Remarks |
|---|---|---|---|
| | COOL | HEAT | |
| **Intake temperature (TH1)** | 27℃ | 20.5℃ | |
| **Indoor fluid pipe temperature (TH2)** | 5℃ | 45℃ | |
| **Indoor 2-phase pipe temperature (TH5)** | 5℃ | 50℃ | |
| **Set temperature** | 25℃ | 22℃ | |
| **Outdoor fluid pipe temperature (TH3)** | 45℃ | 5℃ | (※1) |
| **Outdoor discharge pipe temperature (TH4)** | 80℃ | 80℃ | (※1) |
| **Outdoor 2-phase pipe temperature (TH6)** | 50℃ | 5℃ | (※1) |
| **Outdoor air temperature (TH7)** | 35℃ | 7℃ | (※1) |
| Temperature difference code (intake temperature - set temperature) (ΔTj) | 5 | 5 | |
| **Discharge super heat (SHd)** | 30deg | 30deg | (※2) |
| **Sub-cool (SC)** | 5deg | 5deg | (※2) |

※1: If the thermistor temperature data is normal (not open/short), that data is loaded into the control as valid data.
If the unit enters emergency operation because TH values have become mismatched, setting the thermistors to open/short corrects the settings.

※2: If one thermistor is set to open/short, the values for each will be different.

[Example] When liquid temperature thermistor (TH3) has an open or short circuit.

| Thermistor | COOL | HEAT |
|---|---|---|
| TH3 | 45℃ | 5℃ |
| TH6 | Ta | Tb |
| | Regard normal firure as effective data. | |
| TH4 | Tc | Td |
| | Regard normal firure as effective data. | |
| TH5 | 5℃ | 50℃ |
| TH2 | 5℃ | 45℃ |

Discharge superheat (SHd)
Cooling = TH4 - TH6 = Tc - Ta
Heating = TH4 - TH5 = Td - 50

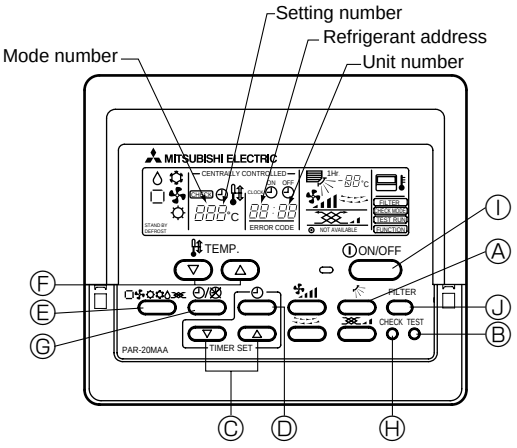
Degree of subcooling (SC)
Cooling = TH6- TH3 = Ta -45
Heating = TH5- TH2 = 50 - 45 = 5 deg.

# 12 SELF-DIAGNOSIS

## 12-1. Malfunction-diagnosis method by remote controller

### 12-1-1. 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.

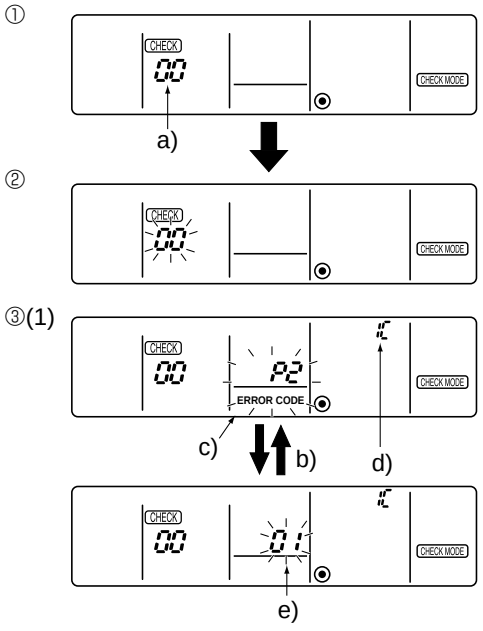
③ Press the "ON/OFF" button to cancel error code.
In case of central control by the controller of MELANS, cancel the error code by the controller of the MELANS, and in case of distant-handy combined operation, cancel the error code by cancelling distant operation.

**<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.

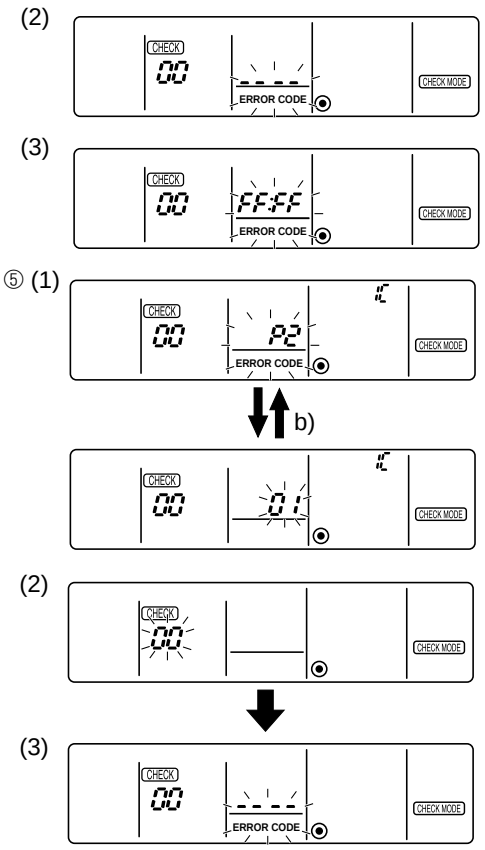
**Search error histories of each unit by remote controller.**

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 page 102 to 105 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>**

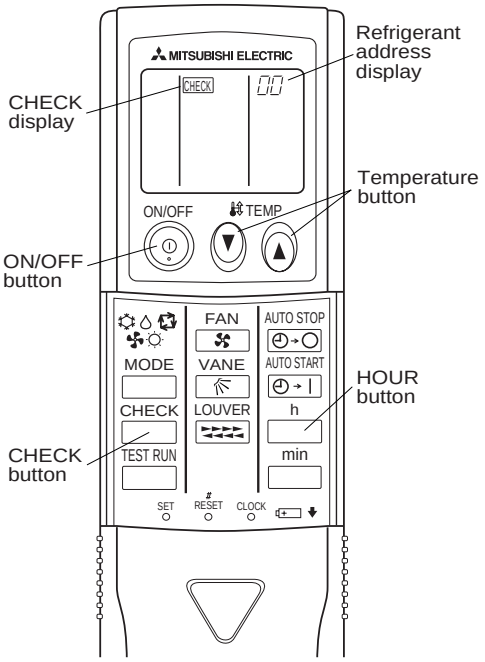
Refer to **9-2-1. Function of switches** on page 64.

### (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 canceled.

✻ 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 | | | | |

## 12-1-2. 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.

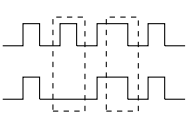
When there might be other problems than diagnosed remote controller,

(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)

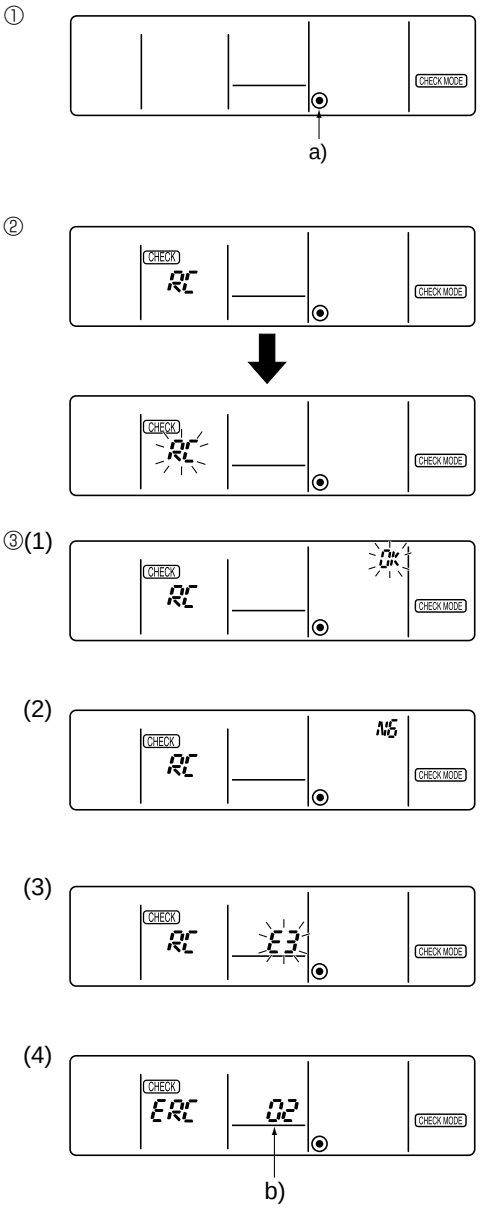
When the number of data errors is 02.

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.

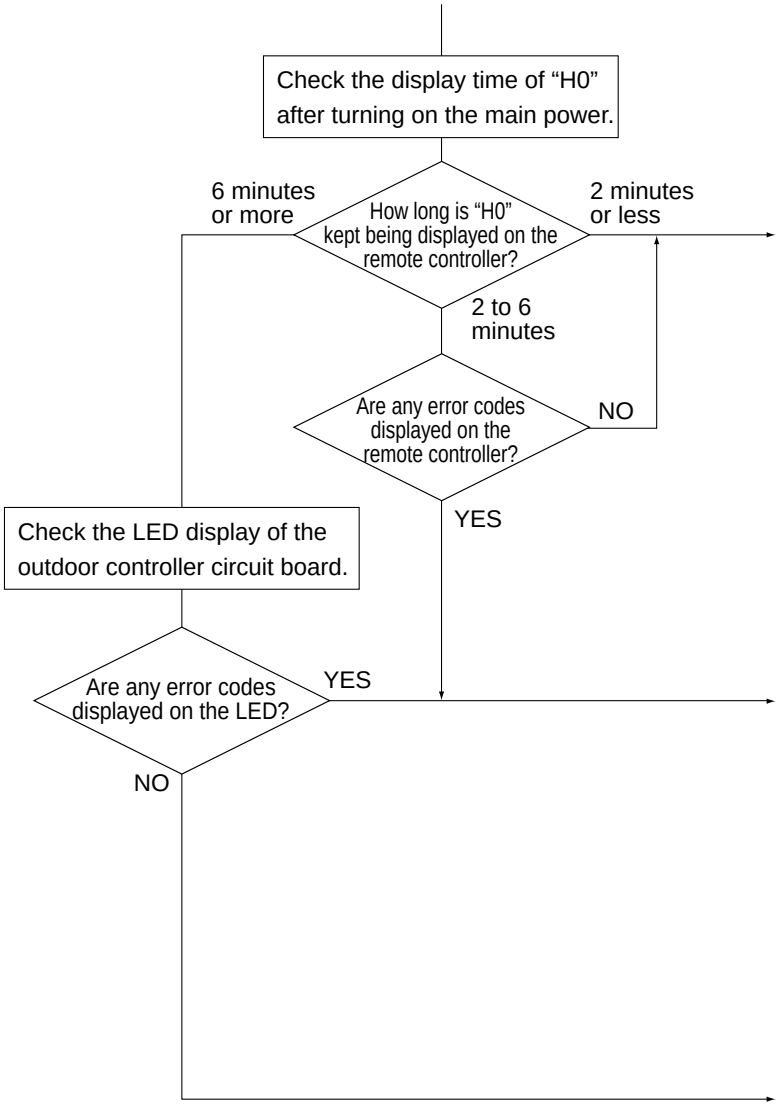


## 12-2. Trouble shooting by inferior phenomena

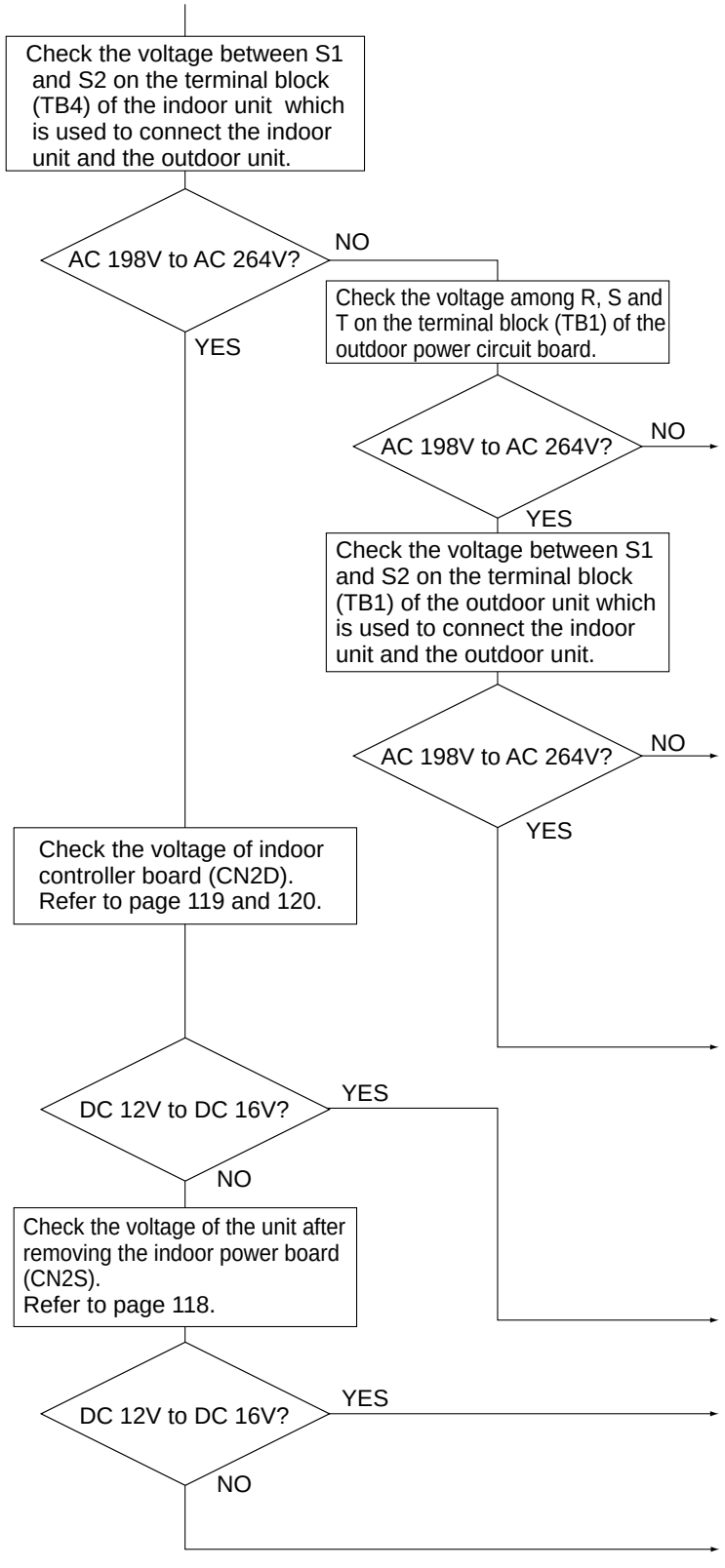
| Phenomena | Factor | Countermeasure |
|---|---|---|
| (1)Remote controller display does not work.<br>(Electric current marker " ◉ " is not displayed on the remote controller.)<br><br>Reference (Meaning of the indoor control board LED)<br>LED1 : Micro computer power supply<br>....Display of DC14V is supply or not from indoor power.<br>LED2 : Power output supplied to remote controller<br>....Display the power condition supplied to wired remote controller. When the refrigerant address is "0" supplied power output ON.<br>LED3 : Indoor outdoor communication monitor<br>....Blinking, when receiving the signal normally from the outdoor unit. | | |
| Indoor control p.c.board LED<br>LED1 / LED2 / LED3 | | |
| ① off / off / off | ①Main power is not turned on. (Power supply inferior)<br>②Mis-wiring, breaking or contact failure of the connecting line. | ①Check the power wiring to the outdoor unit and the breaker.<br>②Check for incorrect wiring, wiring breaks and poor connections between the indoor and outdoor units. (Refer to page 99.) |
| ② Lighting / off / off (or blinking) | ①Refrigerant address excepts "0".<br>②Mis-wiring, breaking or contact failure of the connecting line. | ①Set the refrigerant address to "0" (only 1 refrigerant can be "0" for group control).<br>②Check for incorrect wiring, wiring breaks and poor connections between the indoor and outdoor units. (Refer to page 100.) |
| ③ Lighting / Blinking (or lighting) / – | ①Short circuit, mis-wiring and breaking | ①Check for shorts, incorrect wiring and wiring breaks in the remote controller wires.<br>②Replace the remote controller if the voltage to the remote controller terminal block (TB6) is between 10 and 16V DC. (Refer to page 101.) |
| (2)Remaining "H0" display on the remote controller. | ①At longest 2 minutes after the power supply "H0" is displayed to start up. | Normal operation |
| | ①Communication fault between the remote controller and indoor.<br>②Communication fault between the indoor and outdoor.<br>③Outdoor unit protection device is opened. (Abnormal code will be displayed after 2~6 minutes.) | Turn the power supply OFF/ON, and check the following:<br>①If an error is displayed on the remote controller or outdoor unit's LED within 6 minutes:<br>Refer to the self-diagnosis table on page 106 to take appropriate action.<br>②If "H0" display remains for 6 minutes:<br>Failure in indoor controller board or remote controller (Refer to page 98.) |
| (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. | Normal operation |
| (4)Even controlling by the wireless remote controller no beep and not working. (Display is available on the wireless remote controller) | ①The pair number settings of the wireless remote controller and indoor controller board are mismatched.<br>②Disconnecting of wireless receiving board and contact failure.<br>③Factor of the above (1). | ①Check the pair number settings.<br>②Check the indoor controller board connector (CN90).<br>Check the wireless receiving board connector (CNB)<br>③Check the details of above (1). |
| (5)When operating by the wireless remote controller, beep sound is heard without working. | ①No operation for max. 2 minutes after the power supply ON.<br>②Remote operation is prohibited.<br>•Remote controlling adaptor is connected to the indoor control board (CN32).<br>•Remote operation is prohibited by centralised controller etc. since it is connected to MELANS.<br>③Factor of the above (2). | ①Normal operation<br>②Normal operation<br>③Check the details of above (2). |
| (6)Upward/downward vane performance fault. | ①When the unit is as follows in the HEAT mode, the vane is not downward.<br>(Working of COOL protection function)<br>•During HEAT preparation.<br>•During defrosting.<br>•During compressor stop.<br>②When setting the downward vane in the cool/dry mode, the vane changes to Horizontal position after 1 hour.<br>③Vane motor does mot rotate.<br>A) Vane motor fault.<br>B) Disconnecting, breaking and contact fault of the connector.<br>C) Setting to no vane unit. | ①Normal operation<br>②Normal operation<br>③ A) Vane motor resistance value check. Refer to "5, HOW TO CHECK THE PARTS".<br>B) Disconnecting, breaking, and contact fault of the connector.<br>Stepping motor adopting model<br>.... CN6V check<br>AC timing motor adopting model<br>.... CNV check<br>C) Check the setting details by selecting the remote controller function.<br>Setting check of the indoor control board J11~J15 (SW1). |

| Phenomena | Factor | Countermeasure |
|---|---|---|
| (7)Though the remote controller display is normal in cool mode, the capacity is not enough. | ①Filter clogging (dirt)<br>②Heat exchanger clogging (dirt)<br>③Air duct short cycle.<br>④Refrigerant shortage.<br>⑤Operation failure in linear expansion valve<br>⑥Thermistor connection failure<br>⑦Incorrect piping size<br>⑧Piping is too long. | ①Open the grille to check the filter. Clean the filter and remove dust or dirt away.<br>②Clean the heat exchanger. Lowering the indoor piping temperature and intake pressure means clogging in the heat exchanger.<br>③Remove screen in the air duct (air outlet/ intake).<br>④Check if gas leaks or not in the piping joint.<br>⑤,⑥Check the refrigerant circuit operation status.<br>⑦Check the piping size.<br>⑧Check the capacity loss characteristic for the piping length. |
| (8)Though the remote controller display is normal in Heat mode, the capacity is not enough. | ①Filter clogging (dirt)<br>②Heat exchanger clogging (dirt)<br>③Air duct short cycle.<br>④Refrigerant shortage.<br>⑤Outdoor unit bypass circuit failure<br>⑥Indoor reverse check valve failure Reverse check valve failure may cause refrigerant leakage and restrictor failure.<br>⑦Heat insulator of refrigerant pipes is defective.<br>⑧Malfunction of LEV.<br>⑨Loose connection in thermistor. | ①Open the grille to check the filter. Clean the filter and remove dust or dirt away.<br>②Clean the heat exchanger. Rising the indoor piping temperature and outlet pressure means clogging in the heat exchanger.<br>③Remove screen in the air duct (air outlet/ intake).<br>④Check if gas leaks or not in the piping joint.<br>⑤Operating condition check in the refrigerant cycle.<br>⑥Since outlet temperature and indoor heat exchanger temperature does not rise, measure the outlet pressure and determine the countermeasure.<br>⑦Check the heat insulator.<br>⑧,⑨Check the function of refrigerant circuit. |
| (9)Operation failure of the outdoor fan (Fan does not rotate.) | ① Defective outdoor fan motor (Short or open of the winding)<br>② Defective outdoor fan motor (Rotating-position detecting circuit built in the motor does not output any signals.)<br>③ Defective outdoor controller board | ① Check the resistance of winding. Refer to “5, HOW TO CHECK THE PARTS”.<br>② First of all, check the voltage of FAN12 and FAN22 on the outdoor controller board. Check the voltage between pin 1 and 5, between pin 2 and 5, between pin 3 and 5. If any of them does not repeat the pattern “0V → 5V → 0V”, the rotating-position detecting circuit is defective. Replace the outdoor fan motor. Second of all, make sure the voltage between pin 4 and 5 is always 5V± 0.2V. If not, replace the outdoor controller board and recheck the voltage.<br>③ Replace the outdoor controller board. |

**Symptoms: “HO” is kept being displayed on the remote controller.**

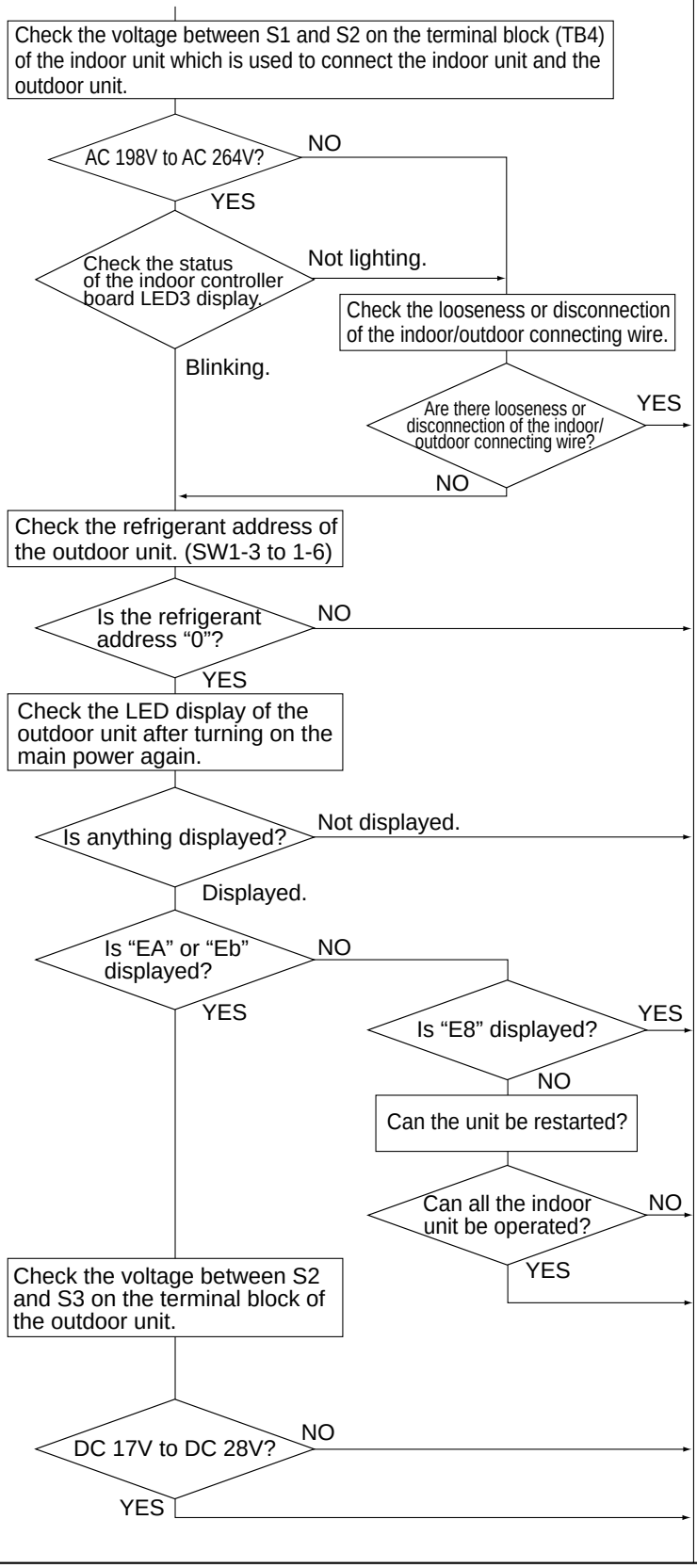
| Diagnosis flow | Cause | Inspection method and troubleshooting |
|---|---|---|
|  | • “H0” will be displayed during the start-up diagnosis after turning on the main power.<br><br>• Mis-wiring of indoor/ outdoor connecting wire<br>• Breaking of indoor/ outdoor connecting wire (S3)<br>• Defective indoor controller board<br>• Defective outdoor controller circuit board<br><br>• Defective indoor controller board<br>• Defective remote controller | • Normal.<br>The start-up diagnosis will be over in around 2 minutes.<br><br>• Refer to “Self-diagnosis action table” in order to solve the trouble.<br><br>• In case of communication errors, the display of remote controller may not match the LED display of the outdoor unit. |

| **Symptoms: Nothing is displayed on the remote controller ①** | LED display of the indoor controller board<br>LED1 : ○<br>LED2 : ○<br>LED3 : ○ |
|---|---|

| Diagnosis flow | Cause | Inspection method and troubleshooting |
|---|---|---|
|  | • Troubles concerning power supply.<br><br>• Bad wiring of the outdoor controller board.<br>• The fuses on the outdoor controller circuit board are blown. (FUSE1, FUSE2)<br><br>• Bad wiring of the outdoor controller board.<br>• The fuses on the outdoor controller circuit board are blown. (FUSE1, FUSE2)<br><br>• Defective indoor controller board<br><br>• Mis-wiring, breaking or poor connection of in door/outdoor connecting wire.<br><br>• Defective indoor power board | • Check the power wiring to the outdoor unit.<br>• Check the breaker.<br><br>• Check the wiring of the outdoor unit.<br>• Check if the wiring is bad. Check if the fuses are blown. The fuses on the outdoor controller circuit board will be blown when the indoor /outdoor connecting wire short-circuits. (FUSE1, FUSE2)<br><br>• Check if mis-wiring, breaking or poor contact is causing this problem. Indoor/outdoor connecting wire is polarized 3-core type. Connect the indoor unit and the outdoor unit by wiring each pair of S1, S2 and S3 on the both side of indoor/outdoor terminal blocks.<br><br>• Replace the indoor controller board.<br><br>• Check if there is mis-wiring or breaking of wire.<br><br>• Replace the indoor power board. |

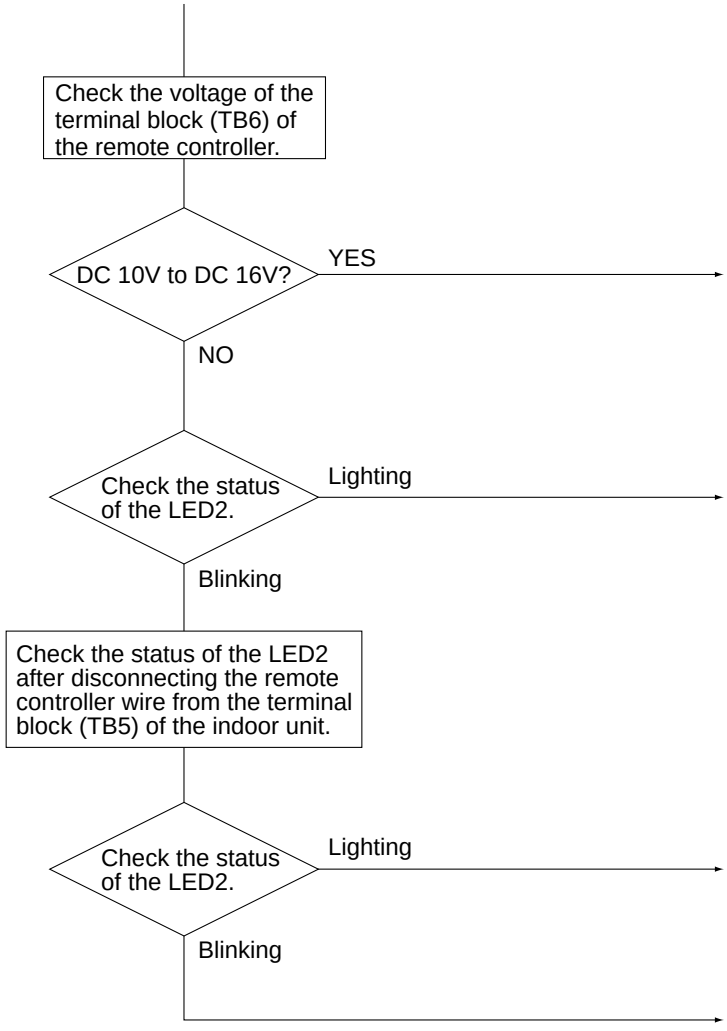
## Symptoms: Nothing is displayed on the remote controller ②

LED display of the indoor controller board
LED1 : ☀
LED2 : ○
LED3 : ○ or ◐




| Cause | Inspection method and troubleshooting |
|---|---|
| • Breaking or poor contact of the indoor/outdoor connecting wire. | • Fix the breaking or poor contact of the indoor/outdoor connecting wire. |
| • Normal. Only the unit which has the refrigerant address “0” supplies power to the remote controller. | • Set the refrigerant address to “0”. In case of the multiple grouping system, recheck the refrigerant address again. |
| • Defective outdoor controller circuit board. | • Replace the outdoor controller circuit board. |
| • Defective outdoor controller circuit board. | • Replace the outdoor controller circuit board. |
| • Defective indoor controller board | • Replace the indoor controller board of the indoor unit which doesn’t operate. |
| • Influence of electromagnetic noise. | • Not abnormal. There may be the influence of electromagnetic noise. Check the transmission wire and get rid of the causes. |
| • Defective outdoor power circuit board. | • Replace the outdoor power circuit board. |
| • Defective indoor power board. | • Replace the indoor power board. |

| **Symptoms: Nothing is displayed on the remote controller ③** | LED display of the indoor controller board<br>LED1 : ●<br>LED2 : ◐ or ☀<br>LED3 : — |
|---|---|

| Diagnosis flow | Cause | Inspection method and troubleshooting |
|---|---|---|
|  | • Defective remote controller.<br>• Breaking or poor contact of the remote controller wire.<br>• The remote controller wire short-circuits.<br>• Defective indoor controller board. | • Replace the remote controller.<br>• Check if there is breaking or poor contact of the remote controller wire. Check the voltage of the terminal block (TB5) connecting the remote controller wire. If it is not between DC 10V and DC16V, the indoor controller board must be defective.<br>• Check if the remote controller wire is short-circuited.<br>• Replace the indoor controller board. |

## 12-3. Error code list.

Error codes are explained on the below tables.

※1. When a communication error is occurring, the display of remote controller may not match that of the optional parts "A control service kit (PAC-SK52ST)", or may not come on at all.
※2. Beeping sounds come out of the signal receiving section of the wireless remote controller only when the malfunction-diagnosis is conducted by using the wireless remote controller.

① Indoor unit error

| Error code | | | Unit which detects error | Error details | Inspection method and troubleshooting |
|---|---|---|---|---|---|
| Display of remote controller or A control service tool | Beep output | High prior remote controller | | | |
| P1 | Beep(one sec.) x 1 | 5101 | Indoor | Abnormality of room temperature thermistor (TH1) | P106 |
| P2 | Beep(one sec.) x 2 | 5102 | Indoor | Abnormality of pipe temperature thermistor/Liquid (TH2) | P106 |
| P4 | Beep(one sec.) x 4 | 2503 | Indoor | Abnormality of drain sensor (DS) | P106 |
| P5 | Beep(one sec.) x 5 | 2500, 2502 | Indoor | Drain overflow protection | P106 |
| P6 | Beep(one sec.) x 6 | 1503 | Indoor | Freezing protection in cooling operation | P107 |
| | | 1504 | | Overheating protection in heating operation | |
| P8 | Beep(one sec.) x 8 | 1110 | Indoor | Abnormality of pipe temperature | P107 |
| P9 | Beep(one sec.) x 2 | 5103 | Indoor | Abnormality of pipe temperature thermistor/Cond./Eva | P108 |

② Outdoor unit error

| Error code | | | Unit which detects error | Error details | Inspection method and troubleshooting |
|---|---|---|---|---|---|
| Display of remote controller or A control service tool | Beep output | High prior remote controller | | | |
| F3 | Short 2 beeps (0.4 sec.) x 1 | 5202 | Outdoor | Connector(63L) is open.<br><RP4~RP6 only> | P109 |
| F5 | Short 2 beeps (0.4 sec.) x 1 | 5201 | Outdoor | Connector(63H) is open. | P109 |
| F9 | Short 2 beeps (0.4 sec.) x 1 | 4119 | Outdoor | 2 or more connectors are open.<br><RP4~RP6 only> | P109 |
| U1 | Short 2 beeps (0.4 sec.) x 1 | 1302 | Outdoor | Abnormal high pressure (63H worked) | P111 |
| U2 | Short 2 beeps (0.4 sec.) x 1 | 1102 | Outdoor | Abnormal discharging temperature | P111 |
| U3 | Short 2 beeps (0.4 sec.) x 1 | 5104 | Outdoor | Open/short circuit of discharging thermistor (TH4) | P112 |
| U4 | Short 2 beeps (0.4 sec.) x 1 | 5105 | Outdoor | Open/short circuit of outdoor pipe temperature thermistor/Liquid (TH3) | P112 |
| | | 5107 | | Open/short circuit of outdoor pipe temperature thermistor/Cond./Eva. (TH6) | |
| | | 5106 | | Open/short circuit of outside temperature thermistor (TH7) | |
| | | 5110 | | Open/short circuit of heat sink thermistor (TH8) | |
| U5 | Short 2 beeps (0.4 sec.) x 1 | 4230 | Outdoor | Abnormal temperature of heat sink | P112 |
| U7 | Short 2 beeps (0.4 sec.) x 1 | 1502 | Outdoor | Abnormality of super heat due to low discharge temperature (RP3 only) | P112 |
| U9 | Short 2 beeps (0.4 sec.) x 1 | 4220 | Outdoor | Abnormality such as overvoltage or voltage shortage | P113 |
| U6 | Short 2 beeps (0.4 sec.) x 1 | 4250 | Outdoor | Abnormality of power module | P112 |
| UF | Short 2 beeps (0.4 sec.) x 1 | 4100 | Outdoor | Compressor overcurrent interruption (When compressor locked) | P113 |
| UH | Short 2 beeps (0.4 sec.) x 1 | 5300 | Outdoor | Current sensor error | P113 |
| UL | Short 2 beeps (0.4 sec.) x 1 | 1300 | Outdoor | Abnormal low pressure (63L worked)<br><RP4~RP6 only> | P113 |
| UP | Short 2 beeps (0.4 sec.) x 1 | 4210 | Outdoor | Compressor overcurrent interruption | P113 |

③ Remote controller, indoor/outdoor unit transmission error

| Error code | | | Unit which detects error | Error details | Inspection method and troubleshooting |
|---|---|---|---|---|---|
| Display of remote controller or A control service tool | Beep output | High prior remote controller | | | |
| E0 | No beep | No display | Remote Controller | Remote controller transmission error (Signal receiving error) | P114 |
| E3 | No beep | No display | Remote Controller | Remote controller transmission error (Transmitting error) | P114 |
| E4 | Beep(one sec.) x 9 | 6831 | Indoor | Remote controller transmission error (Signal receiving error) | P108 |
| E5 | Beep(one sec.) x 9 | 3832 | Indoor | Remote controller transmission error (Transmitting error) | P108 |
| E6 | Beep(one sec.) x 3 | 6840 | Indoor | Indoor/outdoor unit transmission error (Signal receiving error) | P108 |
| E7 | Beep(one sec.) x 3 | 6841 | Indoor | Indoor/outdoor unit transmission error (Transmitting error) | P108 |
| E8 | Short 2 beeps (0.4 sec.) x 3 | 6840 | Outdoor | Indoor/outdoor unit transmission error (Signal receiving error) | P114 |
| E9 | Short 2 beeps (0.4 sec.) x 3 | 6841 | Outdoor | Indoor/outdoor unit transmission error (Transmitting error) | P114 |
| EA | Short 2 beeps (0.4 sec.) x 2 | 6844 | Outdoor | Mis-wiring of indoor/outdoor unit connector<br>The number of indoor unit is over the limit. (Limit: 4 units) | P110 |
| Eb | Short 2 beeps (0.4 sec.) x 2 | 6845 | Outdoor | Mis-wiring of indoor/outdoor unit connector<br>(Converse wiring / Disconnection) | P110 |
| EC | Short 2 beeps (0.4 sec.) x 2 | 6846 | Outdoor | Start-up time over | P110 |
| Ed | Short 2 beeps (0.4 sec.) x 4 | 0403 | Outdoor | Serial Transmission error | P114 |
| EF | Beep(one sec.) x 10 | 6607 or 6608 | Indoor | Not defined. | P114 |
| | Short 2 beeps (0.4 sec.) x 10 | | Outdoor | | |

④ M-NET transmission error (High Prior)

| Error code | | | Unit which detects error | Error details | Inspection method and troubleshooting |
|---|---|---|---|---|---|
| Display of remote controller or A control service tool | Beep output | High prior remote controller | | | |
| A0 | Short 2 beeps (0.4 sec.) x 4 | 6600 | Outdoor | M-NET: Address-duplicated definition | P115 |
| A2 | Short 2 beeps (0.4 sec.) x 4 | 6602 | Outdoor | M-NET: Hardware error of transmission P line | P115 |
| A3 | Short 2 beeps (0.4 sec.) x 4 | 6603 | Outdoor | M-NET: BUS BUSY | P115 |
| A6 | Short 2 beeps (0.4 sec.) x 4 | 6606 | Outdoor | M-NET: Transmission error with transmission P line | P115 |
| A7 | Short 2 beeps (0.4 sec.) x 4 | 6607 | Outdoor | M-NET: No ACK | P116, P117 |
| A8 | Short 2 beeps (0.4 sec.) x 4 | 6608 | Outdoor | M-NET: No RESPONSE | P118 |

**<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 board.

[Display] (1)Normal condition

| Unit condition | Outdoor controller 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 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.<br>②Check continuity of pressure switch (63L or 63H) by tester. | P109 |
| | | Connector(63H) is open. | F5 | | P109 |
| | | 2 connectors are open. | F9 | | P109 |
| 2 blinking | 1 blinking | Mis-wiring of indoor/outdoor unit connecting wire, excessive number of indoor units (4 units or more) | — | ①Check if indoor/outdoor connecting wire is connected correctly.<br>②Check if 4 or more indoor units are connected to outdoor unit.<br>③Check if noise entered into indoor/outdoor connecting wire or power supply.<br>④Re-check error by turning off power, and on again. | P110 |
| | | Mis-wiring of indoor/outdoor unit connecting wire (converse wiring or disconnection) | — | | P110 |
| | | Startup time over | — | | P110 |
| | 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.<br>②Check if noise entered into indoor/outdoor connecting wire or power supply.<br>③Check if noise entered into indoor/outdoor controller board.<br>④Re-check error by turning off power, and on again. | P108 |
| | | Indoor/outdoor unit communication error (transmitting error) is detected by indoor unit. | E7 | | P108 |
| | | Indoor/outdoor unit communication error (signal receiving error) is detected by outdoor unit. | — | | P114 |
| | | Indoor/outdoor unit communication error (transmitting error) is detected by outdoor unit. | — | | P114 |
| | 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.<br>②Check if noise entered into transmission wire of remote controller.<br>③Re-check error by turning off power, and on again. | P114 |
| | | Remote controller transmitting error is detected by remote controller. | E3 | | P114 |
| | | Remote controller signal receiving error is detected by indoor unit. | E4 | | P108 |
| | | Remote controller transmitting error is detected by indoor unit. | E5 | | P108 |
| | 4 blinking | Error code is not defined. | EF | ①Check if remote controller is MA remote controller(PAR-20MAA).<br>②Check if noise entered into transmission wire of remote controller.<br>③Check if noise entered into indoor/outdoor connecting wire.<br>④Re-check error by turning off power, and on again. | P114 |
| | 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 board and outdoor power board is not disconnected.<br>②Check if there is poor connection of connector on outdoor controller board(CNMNT and CNVMNT).<br>③Check M-NET communication signal. | P114 |
| | | Communication error of high prior signal(M-NET) | A0~A8 | | P115~P117 |

※1.Remote controller displays error code.

| Indication | | Error | | | |
|---|---|---|---|---|---|
| Outdoor controller 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.<br>②Check if connectors (TH4, LEV-A, and LEV-B) on outdoor controller board are not disconnected.<br>③Check if unit fills with specified amount of refrigerant.<br>④Measure resistance values among terminals on indoor valve and outdoor linear expansion valve using a tester. | P111 |
| | | Abnormality of super heat due to low discharge temperature | U7 | | P112 |
| | 2 blinking | Abnormal high pressure (High pressure switch 63H worked.) | U1 | ①Check if indoor/outdoor units have a short cycle on their air ducts.<br>②Check if connector (63H) on outdoor controller board is not disconnected.<br>③Check if heat exchanger and filter is not dirty.<br>④Measure resistance values among terminals on linear expansion valve using a tester. | P111 |
| | 4 blinking | Compressor over current breaking (Start-up locked) | UF | ①Check if stop valves are open.<br>②Check looseness, disconnection, and converse connection of compressor wiring.<br>③Measure resistance values among terminals on compressor using a tester.<br>④Check if outdoor unit has a short cycle on its air duct. | P113 |
| | | Compressor over current breaking | UP | | P113 |
| | | Abnormality of current sensor (P.B.) | UH | | P113 |
| | | Abnormality of power module | U6 | | P112 |
| | 5 blinking | Open/short of discharge thermistor (TH4) | U3 | ①Check if connectors (TH3, TH4, TH6 and TH7) on outdoor controller board and connector (CN3) on outdoor power board are not disconnected.<br>②Measure resistance value of outdoor thermistors. | P112 |
| | | Open/short of outdoor thermistors (TH3, TH6, TH7 and TH8) | U4 | | P112 |
| | | Open/short of outdoor thermistor (TH8) | | | |
| | 6 blinking | Abnormality of radiator panel temperature | U5 | ①Check if indoor/outdoor units have a short cycle on their air ducts.<br>②Measure resistance value of outdoor thermistor(TH8). | P112 |
| | 7 blinking | Abnormality of voltage | U9 | ①Check looseness, disconnection, and converse connection of compressor wiring.<br>②Measure resistance value among terminals on compressor using a tester.<br>③Check the continuity of contactor (52C).<br>④Check if power supply voltage decreases.<br>⑤Check the wiring of CN52C.<br>⑥Check the wiring of CNAF. (RP4~6VHA only) | P113 |
| 4 blinking | 1 blinking | Abnormality of room temperature thermistor (TH1) | P1 | ①Check if connectors (CN20, CN21 and CN29) on indoor controller board are not disconnected.<br>②Measure resistance value of indoor thermistors. | P106 |
| | | Abnormality of pipe temperature thermistor /Liquid (TH2) | P2 | | P106 |
| | | Abnormality of pipe temperature thermistor/Condenser-Evaporator | P9 | | P108 |
| | 2 blinking | Abnormality of drain sensor (DS) | P4 | ①Check if connector (CN31) on indoor controller board is not disconnected.<br>②Measure resistance value of indoor thermistors.<br>③Measure resistance value among terminals on drain-up machine using a tester.<br>④Check if drain-up machine works.<br>⑤Check drain function. | P106 |
| | | 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.<br>②Check if heat exchanger and filter is not dirty.<br>③Measure resistance value on indoor and outdoor fan motors.<br>④Check if the inside of refrigerant piping is not clogged. | P107 |
| | 4 blinking | Abnormality of pipe temperature | P8 | ①Check if indoor thermistors (TH2 and TH5) are not disconnected from holder.<br>②Check if stop valve is open.<br>③Check converse connection of extension pipe. (on plural units connection)<br>④Check if indoor/outdoor connecting wire is connected correctly. (on plural units connection) | P107 |

※1 Error code displayed on remote controller ※2 LED1 on power board for RP4, RP5 and RP6

1 blink: Power is supplied. 3 blinks: Power is supplied to warm up compressor.

2 blinks: Power is supplied to compressor. Blinking: Limited control is being performed.

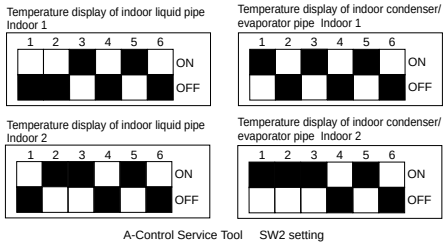
LED indications of fan operating condition (LED5 and LED6 on controller board)

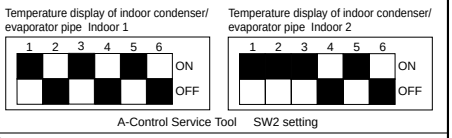
| Operation | LED5/LED6 (Red) | Contents |
|---|---|---|
| Normal (Stop) | Lit | Fan stops. |
| Normal (Operating) | | Controller board is outputting waveform for fan driving. |

| Operation | LED5/LED6 (Red) | Importance | Meaning of error code and detection method | Remark |
|---|---|---|---|---|
| Abnormal is detected | 2 blinks | 1 | **Abnormality of bus voltage**: Abnormal if bus voltage inspected for 1.5msec. is less than 60V or more than 390V. | These LEDs are not used for service. |
| | 6 blinks | 2 | **Abnormality of overcurrent**: Abnormal if current value of DC bus in fan controller board is over the cut-off point. | |
| | 7 blinks | 3 | **Abnormality of startup failure**: Abnormal if the operating speed does not reach 100rpm even 12 sec passed after startup. | |
| | 8 blinks | 4 | **Abnormality of position detection**: Abnormal if the position of U-phase cannot be detected after starting up fan. | |
| | | 5 | **Abnormality of disconnection**: Abnormal if the first pattern of U/V/W-phase position detected after startup is H/H/H or L/L/L. | |

## 12-4. SELF-DIAGNOSIS ACTION TABLE

| Error Code | Meaning of error code and detection method | Case | Judgment and action |
|---|---|---|---|
| P1 | **Abnormality of room temperature thermistor (TH1)**<br>① The unit is in three-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after three minutes. (The unit returns to normal operation, if it has normally reset.)<br>② Constantly detected during cooling, drying, and heating operation.<br>Short: 90℃ or more<br>Open: -40℃ or less | ① Defective thermistor characteristics.<br>② Contact failure of connector (CN20) on the indoor controller board. (Insert failure)<br>③ Breaking of wire or contact failure of thermistor wiring.<br>④ Defective indoor controller board. | ①–③ Check resistance value of thermistor.<br>0℃ ……15.0kΩ<br>10℃ ….9.6kΩ<br>20℃ ….6.3kΩ<br>30℃ ….4.3kΩ<br>40℃ ….3.0kΩ<br>If you put force on (draw or bend) the lead wire with measuring resistance value of thermistor breaking of wire or contact failure can be detected.<br>② Check contact failure of connector (CN20) on the indoor controller board. Refer to page 119 and 120. Put the power on again and check restart after inserting connector again.<br>④ Check room temperature display on remote controller.<br>Replace indoor controller board if there is abnormal difference with actual room temperature.<br>There is no abnormality if none of above comes within the unit.<br>Put the power off, and on again to operate. |
| P2 | **Abnormality of pipe temperature thermistor/Liquid (TH2)**<br>① The unit is in three-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after three minutes. (The unit returns to normal operation, if it has normally reset.)<br>② Constantly detected during cooling, drying, and heating (except defrosting) operation.<br>Short: 90℃ or more<br>Open: -40℃ or less | ① Defective thermistor characteristics.<br>② Contact failure of connector (CN21) on the indoor controller board. (Insert failure)<br>③ Breaking of wire or contact failure of thermistor wiring.<br>④ Defective refrigerant circuit is causing thermistor temperature of 90℃ or more or -40℃ or less.<br>⑤ Defective indoor controller board. | ①–③ Check resistance value of thermistor.<br>For characteristics, refer to (P1) above.<br>② Check contact failure of connector (CN21) on the indoor controller board. Refer to page 119 and 120. Put the power on and check restart after inserting connector again.<br>④ Check pipe <liquid> temperature with remote controller in test run mode. If pipe <liquid> temperature is exclusively low (in cooling mode) or high (in heating mode), refrigerant circuit may have defective.<br>⑤ Check pipe <liquid> temperature with remote controller in test run mode. If there is exclusive difference with actual pipe <liquid> temperature, replace indoor controller board.<br>There is no abnormality if none of above comes within the unit.<br>Put the power off, and on again to operate. |
| P4 | **Abnormality of drain sensor (DS)**<br>① Suspensive abnormality, if short/open of thermistor is detected for 30 seconds continuously.<br>Put off compressor and indoor fan.<br>② Short/open is detected for 30 seconds continuously during suspensive abnormality.<br>(The unit returns to normal operation, if it has normally reset.)<br>③ Detect the following condition.<br>• During cooling and drying operation.<br>• In case that pipe <liquid> temperature - room temperature <-10deg (Except defrosting)<br>• When pipe <liquid> temperature or room temperature is short/open temperature.<br>• During drain pomp operation. | ① Defective thermistor characteristics<br>② Contact failure of connector (CN31) on the indoor controller board. (Insert failure).<br>③ Breaking of wire or contact failure of drain sensor wiring.<br>④ Defective indoor controller board. | ①–③ Check resistance value of thermistor.<br>0℃ ……6.0kΩ<br>10℃ ….3.9kΩ<br>20℃ ….2.6kΩ<br>30℃ ….1.8kΩ<br>40℃ ….1.3kΩ<br>60℃ ….0.6kΩ<br>② Check contact failure of connector (CN31) on the indoor controller board. Refer to page 119 and 120. Put the power on again and check restart after inserting connector again.<br>④ Replace indoor controller board if drain pump operates with the line of drain sensor connector CN31-① and ② is short-circuited, and abnormality reappears.<br>There is no abnormality if none of above comes within the unit. Put the power off, and on again to operate. |
| P5 | **Malfunction of drain pump (DP)**<br>① Suspensive abnormality, if thermistor of drain sensor is let heat itself and temperature rises slightly. Put off compressor and indoor fan.<br>② Drain pomp is abnormal if the condition above is detected during suspensive abnormality.<br>③ Constantly detected during drain pomp operation. | ① Malfunction of drain pump<br>② Defective drain<br>Clogged drain pump<br>Clogged drain pipe<br>③ Attached drop of water at the drain sensor<br>• Drops of drain trickles from lead wire.<br>• Clogged filter is causing wave of drain.<br>④ Defective indoor controller board. | ① Check if drain-up machine works.<br>② Check drain function.<br>③ Check the setting of lead wire of drain sensor and check clogs of the filter.<br>④ Replace indoor controller board if drain pump operates with the line of drain sensor connector CN31-① and ② is short-circuited and abnormality reappears.<br>Refer to page 119 and 120.<br>There is no abnormality if none of above comes within the unit. Put the power off, and on again to operate. |

| Error Code | Meaning of error code and detection method | Case | Judgment and action |
|---|---|---|---|
| P6 | **Freezing/overheating protection is working**<br>① Freezing protection (Cooling mode)<br>The unit is in six-minute resume prevention mode if pipe <liquid or condenser/evaporator> temperature stays under -15℃ for three minutes, three minutes after the compressor started. Abnormal if it stays under -15℃ for three minutes again within 16 minutes after six-minute resume prevention mode.<br>② Frost abnormality (Only for the combination with inverter-type outdoor unit)<br>Suspensive abnormal if unit operates in frost prevention mode (below) for 9 minutes or more. After that, when frost prevention mode is released and compressor restarts its operation, unit is not detected as abnormal if compressor keeps operating for 20 minutes continuously and abnormal if compressor stops operating within 20 minutes and unit operates in frost prevention mode for more than 9 minutes again. (Not abnormal if unit stops operating in frost prevention mode within 9 minutes)<br><Frost prevention mode><br>If pipe <liquid or condenser-evaporator> temperature is 2℃ or below when 16 minutes has passed after compressor starts operating, unit will start operating in frost prevention mode which stops compressor operation. After that, when pipe <liquid or condenser/evaporator> temperature stays 10℃ or more for 3 minutes, frost prevention mode will be released and compressor will restart its operation.<br>③ Overheating protection (Heating mode)<br>The units is in six-minute resume prevention mode if pipe <condenser / evaporator> temperature is detected as over 74℃ after the compressor started. Abnormal if the temperature of over 74℃ is detected again within 10 minutes after six-minute resume prevention mode. | (Cooling or drying mode)<br>① Clogged filter (reduced airflow)<br>② Short cycle of air path<br>③ Low-load (low temperature) operation beyond the tolerance range<br>④ Defective indoor fan motor<br>• Fan motor is defective.<br>• Indoor controller board is defective.<br>⑤ Overcharge of refrigerant<br>⑥ Defective refrigerant circuit (clogs)<br><br>(Heating mode)<br>① Clogged filter (reduced airflow)<br>② Short cycle of air path<br>③ Over-load (high temperature) operation beyond the tolerance range<br>④ Defective indoor fan motor<br>• Fan motor is defective.<br>• Indoor controller board is defective.<br>⑤ Overcharge of refrigerant<br>⑥ Defective refrigerant circuit (clogs)<br>⑦ Bypass circuit of outdoor unit is defective. | (Cooling or drying mode)<br>① Check clogs of the filter.<br>② Remove shields.<br>④ Measure the resistance of fan motor's winding.<br>Measure the output voltage of fan's connector (FAN) on the indoor controller board.<br>※The indoor controller board should be normal when voltage of AC220V to 240V is detected while fan motor is connected.<br>Refer to page 119 and 120.<br>⑤⑥ Check operating condition of refrigerant circuit.<br><br>(Heating mode)<br>① Check clogs of the filter.<br>② Remove shields.<br>④ Measure the resistance of fan motor's winding.<br>Measure the output voltage of fan's connector (FAN) on the indoor controller board.<br>※The indoor controller board should be normal when voltage of AC220V to 240V is detected while fan motor is connected.<br>Refer to page 119 and 120.<br>⑤~⑦Check operating condition of refrigerant circuit. |
| P8 | **Abnormality of pipe temperature**<br><Cooling mode><br>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.<br>Note 1) It takes at least 9 min. to detect.<br>Note 2) Abnormality P8 is not detected in drying mode.<br>Cooling range : Indoor pipe temperature (TH2 or TH5) – intake temperature (TH1) ≦ -3 deg<br>TH: Lower temperature between: liquid pipe temperature and condenser/ evaporator temperature<br><br><Heating mode><br>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.<br><br>Note 3) It takes at least 27 minutes to detect abnormality.<br>Note 4) It excludes the period of defrosting (Detection restarts when defrosting mode is over)<br>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<br>• Shortage of refrigerant<br>• Disconnected holder of pipe <liquid or condenser / evaporator> thermistor<br>• Defective refrigerant circuit<br>② Converse connection of extension pipe (on plural units connection)<br>③ Converse wiring of indoor/ outdoor unit connecting wire (on plural units connection)<br>④ Defective detection of indoor room temperature and pipe <condenser / evaporator> temperature thermistor<br>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.<br>Pipe <liquid or condenser / evaporator> temperature display is indicated by setting SW2 of outdoor controller circuit board as follows.<br>( Conduct temperature check with outdoor controller circuit board after connecting 'A-Control Service Tool(PAC-SK52ST)'. )<br>  <br>A-Control Service Tool SW2 setting<br>②③Check converse connection of extension pipe or converse wiring of indoor/outdoor unit connecting wire. |

| Error Code | Meaning of error code and detection method | Case | Judgment and action |
|---|---|---|---|
| P9 | **Abnormality of pipe temperature thermistor / Condenser-Evaporator (TH5)**<br>① The unit is in three-minute resume protection mode if short/open of thermistor is detected. Abnormal if the unit does not get back to normal within three minutes. (The unit returns to normal operation, if it has normally reset.)<br>② Constantly detected during cooling, drying, and heating operation (except defrosting)<br>Short: 90℃ or more<br>Open: -40℃ or less | ① Defective thermistor characteristics<br>② Contact failure of connector (CN29) on the indoor controller board. (Insert failure)<br>③ Breaking of wire or contact failure of thermistor wiring.<br>④ Temperature of thermistor is 90℃ or more or -40℃ or less caused by defective refrigerant circuit.<br>⑤ Defective indoor controller board. | ①–③ Check resistance value of thermistor. For characteristics, refer to (P1) above.<br>② Check contact failure of connector (CN29) on the indoor controller board. Refer to page 119 and 120. Put the power on and check restart after inserting connector again.<br>④ Operate in test run mode and check pipe <condenser / evaporator> temperature with outdoor controller circuit board. If pipe <condenser / evaporator> temperature is exclusively low (in cooling mode) or high (in heating mode), refrigerant circuit may have defective.<br>⑤ Operate in test run mode and check pipe <condenser / evaporator> temperature with outdoor control circuit board. If there is exclusive difference with actual pipe <condenser / evaporator> temperature replace indoor controller board.<br>There is no abnormality if none of above comes within the unit.<br>Put the power off and on again to operate.<br>( In case of checking pipe temperature with outdoor controller circuit board, be sure to connect A-control service tool (PAC-SK52ST). )<br>  <br>A-Control Service Tool SW2 setting |
| E4 | **Remote controller signal receiving error**<br>① Abnormal if indoor controller board can not receive normally any data from remote controller or from other indoor controller board for three minutes.<br>② Indoor control board cannot receive any signal from remote controller for two minutes. | ① Contact failure at transmission wire of remote controller<br>② All remote controllers are set as “sub” remote controller. In this case, E0 is displayed on remote controller, and E4 is displayed at LED (LED1, LED2) on the outdoor controller circuit board.<br>③ Defective transmitting receiving circuit of remote controller<br>④ Defective transmitting receiving circuit of indoor controller board<br>⑤ Noise has entered into the transmission wire of remote controller. | ① Check disconnection or looseness of indoor unit or transmission wire of remote controller.<br>② Set one of the remote controllers “main”. If there is no problem with the action above.<br>③ Diagnose remote controllers.<br>a) When “RC OK” is displayed, Remote controllers have no problem. Put the power off, and on again to check. If abnormality generates again, replace indoor controller board.<br>b) When “RC NG” is displayed, Replace remote controller.<br>c) When “RC E3” is displayed,<br>d) When “ERC 00-06” is displayed,<br>[ c),d)➜Noise may be causing abnormality. ]<br>✻ If the unit is not normal after replacing indoor controller board in group control, indoor controller board of address “0” may be abnormal. |
| E5 | **Remote controller transmitting error**<br>① Abnormal if indoor controller board cannot check the blank of transmission path for three minutes.<br>② Abnormal if indoor controller board cannot finish transmitting 30 times consecutively. | ① Defective transmitting receiving circuit of indoor controller board<br>② Noise has entered into the transmission wire of remote controller. | ①② Put the power off, and on again to check. If abnormality generates again, replace indoor controller board. |
| E6 | **Indoor/outdoor unit communication error (Signal receiving error)**<br>① Abnormal if indoor controller board cannot receive any signal normally for six minutes after putting the power on.<br>② Abnormal if indoor controller board cannot receive any signal normally for three minutes.<br>③ Consider the unit abnormal under the following condition: When two or more indoor units are connected to one outdoor unit, indoor controller board cannot receive a signal for three minutes from outdoor controller circuit board, a signal which allows outdoor controller circuit board to transmit signals. | ① Contact failure, short circuit or, mis-wiring (converse wiring) of indoor/outdoor unit connecting wire<br>② Defective transmitting receiving circuit of indoor controller board<br>③ Defective transmitting receiving circuit of indoor controller board<br>④ Noise has entered into indoor/ outdoor unit connecting wire. | ✻ Check LED display on the outdoor control circuit board. (Connect A-control service tool, PAC-SK52ST.) Refer to EA-EC item if LED displays EA-EC.<br>① Check disconnection or looseness of indoor/ outdoor unit connecting wire of indoor unit or outdoor unit. Check all the units in case of twin triple indoor unit system.<br>②-④ Put the power off, and on again to check. If abnormality generates again, replace indoor controller board or outdoor controller circuit board.<br>✻ Other indoor controller board may have defective in case of twin triple indoor unit system. |
| E7 | **Indoor/outdoor unit communication error (Transmitting error)**<br>Abnormal if “1” receiving is detected 30 times continuously though indoor controller board has transmitted “0”. | ① Defective transmitting receiving circuit of indoor controller board<br>② Noise has entered into power supply.<br>③ Noise has entered into outdoor control wire. | ①-③ Put the power off, and on again to check. If abnormality generates again, replace indoor controller board. |

**<Abnormalities detected when the power is put on>**

| 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.<br>a) Power supply breaker is put off.<br>b) Contact failure or disconnection of power supply terminal<br>c) Open phase (L or N phase)<br>② Electric power is not charged to power supply terminal of outdoor power circuit board.<br>a) Contact failure of power supply terminal<br>b) Open phase on the outdoor power circuit board<br>RP1.6-3VHA :Disconnection of connector R or S<br>RP4-6VHA :Disconnection of connector SC-R or SC-S<br>③ Electric power is not supplied to outdoor controller circuit board.<br>a) Disconnection of connector (CNDC)<br>④ Disconnection of reactor (DCL or ACL)<br>⑤ Disconnection of outdoor noise filter circuit board or parts failure in outdoor noise filter circuit board<br>⑥ Defective outdoor power circuit board<br>⑦ Defective outdoor controller circuit board. | ① Check following items.<br>a) Power supply breaker<br>b) Connection of power supply terminal block. (TB1)<br>c) Connection of power supply terminal block. (TB1)<br>② Check following items.<br>a) Connection of power supply terminal block. (TB1)<br>b) Connection of terminal on outdoor power circuit board.<br>RP1.6-3VHA :Disconnection of connector R or S. Refer to page 124.<br>RP4-6VHA :Disconnection of connector SC-R or SC-S. Refer to page 125.<br>③ Check connection of the connector (CNDC) on the outdoor controller circuit board.<br>Check connection of the connector, LD1 and LD2 for RP3V and CNDC for RP4-RP6V, on the outdoor power circuit board.<br>④ Check connection of reactor. (DCL or ACL)<br>RP1.6-3VHA: Check connection of "LO" and "NO" on the outdoor noise filter circuit board.<br>Check connection of "R" and "S" on the outdoor power circuit board.<br>Refer to page 122, 123 and 125.<br>RP4-6VHA: Check connection of "L1"and "L2" on the active filter module.(ACTM)<br>⑤ a) Check connection of outdoor noise filter circuit board.<br>b) Replace outdoor noise filter circuit board.<br>Refer to page 122, 123 and 124.<br>⑥ Replace outdoor power circuit board.<br>⑦ Replace controller board (When items above are checked but the units can not be repaired.) |
| F3<br>(5202) | **63L connector open**<br>Abnormal if 63L connector circuit is open for three minutes continuously after power supply.<br>63L: Low-pressure switch<br><PUHZ-RP4-6VHA only> | ① Disconnection or contact failure of 63L connector on outdoor controller circuit board<br>② Disconnection or contact failure of 63L<br>③ 63L is working due to refrigerant leakage or defective parts.<br>④ Defective outdoor controller circuit board | ① Check connection of 63L connector on outdoor controller circuit board.<br>Refer to page 121.<br>② Check the 63L side of connecting wire.<br>③ Check refrigerant pressure.<br>Charge additional refrigerant.<br>Check continuity by tester.<br>Replace the parts if the parts are defective.<br>④ Replace outdoor controller circuit board. |
| F5<br>(5201) | **63H connector open**<br>Abnormal if 63H connector circuit is open for three minutes continuously after power supply.<br>63H: High-pressure switch | ① Disconnection or contact failure of 63H connector on outdoor controller circuit board<br>② Disconnection or contact failure of 63H<br>③ 63H is working due to defective parts.<br>④ Defective outdoor controller circuit board | ① Check connection of 63H connector on outdoor controller circuit board.<br>Refer to page 121.<br>② Check the 63H side of connecting wire.<br>③ Check continuity by tester.<br>Replace the parts if the parts are defective.<br>④ Replace outdoor controller circuit board. |
| F9<br>(4119) | **2 connector open**<br>Abnormal if both 63H and 63L connector circuits are open for three minutes continuously after power supply.<br>63H: High-pressure switch<br>63L: Low-pressure switch<br><PUHZ-RP4~6VHA only> | ① Disconnection or contact failure of connector (63H,63L) on outdoor controller circuit board.<br>② Disconnection or contact failure of 63H, 63L<br>③ 63H and 63L are working due to defective parts.<br>④ Defective outdoor controller board. | ① Check connection of connector(63H,63L) on outdoor controller circuit board.<br>Refer to page 121.<br>② Check the 63H and 63L side of connecting wire.<br>③ Check continuity by tester.<br>Replace the parts if the parts are defective.<br>④ Replace outdoor controller circuit board. |

| Error Code | Meaning of error code and detection method | Case | Judgment and action |
|---|---|---|---|
| EA<br>(6844) | **Indoor/outdoor unit connector mis-wiring, excessive number of units (4 units or more)**<br>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.<br>2. Abnormal if outdoor controller circuit board recognizes the number of connected indoor units as “4 units or more”. | ① Contact failure or mis-wiring of indoor/outdoor unit connecting wire<br>② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity.<br>③ 4 or more indoor units are connected to one outdoor unit.<br>④ Defective transmitting receiving circuit of outdoor controller circuit board<br>⑤ Defective transmitting receiving circuit of indoor controller board<br>⑥ Defective indoor power board<br>⑦ Two or more outdoor units have refrigerant address “0” . (In case of group control)<br>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.<br>② Check diameter and length of indoor/outdoor unit connecting wire.<br>Total wiring length: 80m<br>(including wiring connecting each indoor unit and between indoor and outdoor unit)<br>Also check if the connection order of flat cable is S1, S2, S3.<br>③ Check the number of indoor units that are connected to one outdoor unit. (If EA is detected)<br>④~⑥ Put the power off once, and on again to check.<br>Replace outdoor controller circuit board, indoor controller board or indoor power board if abnormality occurs again.<br>⑦ Check if refrigerant addresses (SW1-3 to SW1-6 on outdoor controller circuit board) are overlapping in case of group control system.<br>⑧ Check transmission path, and remove the cause.<br>※ The descriptions above, ①-⑧, are for EA, Eb and EC. |
| Eb<br>(6845) | **Mis-wiring of indoor/outdoor unit connecting wire (converse wiring or disconnection)**<br>Outdoor controller circuit board can automatically set the unit number of indoor units.<br>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<br>② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity.<br>④ Defective transmitting receiving circuit of outdoor controller circuit board.<br>⑤ Defective transmitting receiving circuit of indoor controller board<br>⑥ Defective indoor power board.<br>⑦ Two or more outdoor units have refrigerant address “0” . (In case of group control)<br>⑧ Noise has entered into power supply or indoor/outdoor unit connecting wire. | |
| EC<br>(6846) | **Start-up time over**<br>The unit can not finish start-up process within four minutes after power on. | ① Contact failure of indoor/ outdoor unit connecting wire<br>② Diameter or length of indoor/ outdoor unit connecting wire is out of specified capacity.<br>⑦ Two or more outdoor units have refrigerant address “0” . (In case of group control)<br>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<br>(1302) | **Abnormal high pressure (High-pressure switch 63H worked)**<br>Abnormal if high-pressure switch 63H worked (more than 4.41 MPa) during compressor operation.<br>63H: High-pressure switch | ① Short cycle of indoor unit<br>② Clogged filter of indoor unit<br>③ Decreased airflow caused by dirt of indoor fan<br>④ Dirt of indoor heat exchanger<br>⑤ Locked indoor fan motor<br>⑥ Malfunction of indoor fan motor<br>⑦ Defective operation of stop valve (Not full open)<br>⑧ Clogged or broken pipe<br>⑨ Locked outdoor fan motor<br>⑩ Malfunction of outdoor fan motor<br>⑪ Short cycle of outdoor unit<br>⑫ Dirt of outdoor heat exchanger<br>⑬ Decreased airflow caused by defective inspection of outside temperature thermistor (It detects lower temperature than actual temperature.)<br>⑭ Disconnection or contact failure of connector (63H) on outdoor controller board<br>⑮ Disconnection or contact failure of 63H connection<br>⑯ Defective outdoor controller board<br>⑰ Defective action of linear expansion valve<br>⑱ Malfunction of fan driving circuit | ①~⑥Check indoor unit and repair defectives.<br>⑦ Check if stop valve is full open.<br>⑧ Check piping and repair defectives.<br>⑨~⑫ Check outdoor unit and repair defectives.<br>⑬ Check the inspected temperature of outside temperature thermistor on LED display. (SW2 on A-Control Service Tool : Refer to page 68.)<br>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.<br>⑰ Check linear expansion valve. Refer to page 28.<br>⑱ Replace outdoor controller board. |
| U2<br>(1102) | **Abnormal high discharging temperature**<br>(1) Abnormal if discharge temperature thermistor (TH4) exceeds 125℃ or 110℃ continuously for 5 minutes.<br>Abnormal if condenser/evaporator temperature thermistor (TH5) exceeds 40℃ during defrosting and discharge temperature thermistor (TH4) exceeds 110℃.<br><br>(2) Abnormal if discharge super heat (Cooling: TH4 – TH5 / Heating: TH4 – TH6) increases.<br>All the conditions in A or B are detected simultaneously for 10 minutes continuously after 6 minutes past from compressor start-up (including the thermo indication or recovery from defrosting).<br><Condition A><br>• Heating mode<br>• When discharge super heat is less than 70 deg.<br>• When the TH6 temp is more than the value obtained by TH7 – 5 deg.<br>• When the condensing temp of TH5 is less than 35℃.<br><br><Condition B><br>• During comp operation (Cooling and Heating)<br>• When discharge super heat is less than 80 deg in Cooling.<br>• When discharge super heat is less than 90 deg in Heating.<br>• When condensing temp of TH6 is more than –40℃. (In Cooling only.) | ① Over-heated compressor operation caused by shortage of refrigerant<br>② Defective operation of stop valve<br>③ Defective thermistor<br>④ Defective outdoor controller board<br>⑤ Defective action of linear expansion valve | ① Check intake super heat.<br>Check leakage of refrigerant.<br>Charge additional refrigerant.<br>② Check if stop valve is full open.<br>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.<br>⑤ Check linear expansion valve. Refer to page 28. |

| Error Code | Meaning of error code and detection method | Case | Judgment and action |
|---|---|---|---|
| U3<br>(5104) | **Open/short circuit of discharge temperature thermistor (TH4)**<br>Abnormal if open (3℃ or less) or short (217℃ or more) is detected during compressor operation.<br>(Detection is inoperative for 10 minutes of compressor starting process and for 10 minutes after and during defrosting.) | ① Disconnection or contact failure of connector (TH4) on the outdoor controller circuit board.<br>② Defective thermistor<br>③ Defective outdoor controller circuit board | ① Check connection of connector (TH4) on the outdoor controller circuit board.<br>Check breaking of the lead wire for thermistor (TH4). Refer to page 121.<br>② Check resistance value of thermistor (TH4) or temperature by microcomputer.<br>(Thermistor/TH4: Refer to page 28.)<br>(SW2 on A-Control Service Tool : Refer to page 68.)<br>③ Replace outdoor controller board. |
| U4<br>(TH3:5105)<br>(TH6:5107)<br>(TH7:5106)<br>(TH8:5110) | **Open/short of outdoor unit thermistors (TH3, TH6, TH7, and TH8)**<br>Abnormal if open or short is detected during compressor operation.<br>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.<br>※Check which unit has abnormality in its thermistor by switching the mode of SW2.<br>(Refer to page 64.) | ① Disconnection or contact failure of connectors<br>(Outdoor controller circuit board: TH3,TH6/TH7<br>Outdoor power circuit board: CN3)<br>② Defective thermistor<br>③ Defective outdoor controller circuit board | ① Check connection of connector (TH3,TH6/TH7) on the outdoor controller circuit board.<br>Check connection of connector (CN3) on the outdoor power circuit board.<br>Check breaking of the lead wire for thermistor (TH3,TH6,TH7,TH8). Refer to page 121,125 and 126.<br>② Check resistance value of thermistor (TH3,TH6,TH7,TH8) or check temperature by microcomputer.<br>(Thermistor/TH3,TH6,TH7,TH8: Refer to page 28.)<br>(SW2 on A-Control Service Tool : Refer to page 68.)<br>③ Replace outdoor controller circuit board.<br>※Emergency operation is available in case of abnormalities of TH3, TH6 and TH7.<br>Refer to page 90. |
| U5<br>(4230) | **Abnormal temperature of heat sink**<br>Abnormal if heat sink thermistor(TH8) detects temperature indicated below.<br>RP1.6, 2VHA·····85℃<br>RP2.5, 3VHA·····77℃<br>RP4-6VHA·····85℃ | ① The outdoor fan motor is locked.<br>② Failure of outdoor fan motor<br>③ Air flow path is clogged.<br>④ Rise of ambient temperature<br>⑤ Defective thermistor<br>⑥ Defective input circuit of outdoor power circuit board<br>⑦ Failure of outdoor fan drive circuit | ①② Check outdoor fan.<br>Refer to "(9) Operation failure of the outdoor fan " on page 97.<br>③ Check air flow path for cooling.<br>④ Check if there is something which causes temperature rise around outdoor unit.<br>(Upper limit of ambient temperature is 46℃.)<br>Turn off power, and on again to check if U5 is displayed within 30 minutes.<br>If U4 is displayed instead of U5, follow the action to be taken for U4.<br>⑤ Check resistance value of thermistor (TH8) or temperature by microcomputer.<br>(Thermistor/TH8: Refer to page 28.)<br>(SW2 on A-Control Service Tool : Refer to page 68.)<br>⑥ Replace outdoor power circuit board.<br>⑦ Replace outdoor controller circuit board. |
| U6<br>(4250) | **Abnormality of power module**<br>Check abnormality by driving power module in case overcurrent is detected.<br>(UF or UP error condition) | ① Outdoor stop valve is closed.<br>② Decrease of power supply voltage<br>③ Looseness, disconnection or converse of compressor wiring connection<br>④ Defective compressor<br>⑤ Defective outdoor power circuit board | ① Open stop valve.<br>② Check facility of power supply.<br>③ Correct the wiring (U•V•W phase) to compressor. Refer to page 125 and 126.<br>④ Check compressor referring to page 28.<br>⑤ Replace outdoor power circuit board. |
| U7<br>(1520) | **Abnormality of super heat due to low discharge temperature (RP1.6-3VHA)**<br>Abnormal if discharge super heat is continuously detected less than or equal to 0℃ for 3 minutes even though linear expansion valve has minimum open pulse after compressor starts operating for 10 minutes.<br>(RP1.6-3VHA only) | ① Disconnection or loose connection of discharge temperature thermistor. (TH4)<br>② Defective holder of discharge temperature thermistor.<br>③ Disconnection or loose connection of linear expansion valve's coil.<br>④ Disconnection or loose connection of linear expansion valve's connector.<br>⑤ Defective linear expansion valve. | ①② Check the installation conditions of discharge temperature thermistor (TH4).<br>③ Check the coil of linear expansion valve. Refer to page 32.<br>④ Check the connection or contact of LEV-A and LEV-B on outdoor controller circuit board.<br>⑤ Check linear expansion valve. Refer to page 28. |

| Thermistors | | Open detection | Short detection |
|---|---|---|---|
| Symbol | Name | | |
| TH3 | Pipe temperature thermistor / Liquid | – 40℃ or below | 90℃ or above |
| TH6 | Condenser/evaporator temperature thermistor | – 40℃ or below | 90℃ or above |
| TH7 | Outside temperature thermistor | – 40℃ or below | 90℃ or above |
| TH8 | Heat sink temperature thermistor | – 27℃ or below | 102℃ or above |

| Error Code | Meaning of error code and detection method | Case | Judgment and action |
|---|---|---|---|
| U9<br>(4220) | **Abnormality such as overvoltage or voltage shortage and abnormal synchronous signal to main circuit**<br><br>Abnormal if any of followings are detected during compressor operation;<br>• Decrease of DC bus voltage to 310V<br>• Instantaneous decrease of DC bus voltage to 200V<br>• Increase of DC bus voltage to RP1.6-3VHA : 420V RP4-6VHA : 400V<br>• 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<br>② Disconnection of compressor wiring<br>③ Defective 52C<br>④ Disconnection or loose connection of CN52C<br>⑤ Defective PFC module of outdoor power board (RP1.6-3VHA only)<br>⑥ Defective ACT module (RP4-6VHA only)<br>⑦ Defective ACT module drive circuit of outdoor power circuit board (RP4-6VHA only)<br>⑧ Disconnection or loose connection of CNAF (RP4-6VHA only)<br>⑨ Defective 52C drive circuit of outdoor controller circuit board<br>⑩ Disconnection or loose connection of CN5 on the outdoor power circuit board. Refer to page 124 and 125.<br>⑪ Disconnection or loose connection of CN2 on the outdoor power circuit board. Refer to page 124 and 125. | ① Check the facility of power supply.<br>② Correct the wiring (U•V•W phase) to compressor.<br>③ Replace 52C.<br>④ Check CN52C wiring.<br><br>⑤ Replace outdoor power circuit board. (RP1.6-3VHA only)<br>⑥ Replace ACT module. (RP4-6VHA only)<br><br>⑦ Replace outdoor power circuit board. (RP4-6VHA only)<br><br>⑧ Check CNAF wiring. (RP4-6VHA only)<br><br>⑨ Replace outdoor controller circuit board.<br><br>⑩ Check CN5 wiring on the outdoor power circuit board. Refer to page 125 and 126.<br><br>⑪ Check CN2 wiring on the outdoor power circuit board. Refer to page 125 and 126. |
| UF<br>(4100) | **Compressor overcurrent interruption (When compressor locked)**<br>Abnormal if overcurrent of DC bus or compressor is detected within 30 seconds after compressor starts operating. | ① Stop valve is closed.<br>② Decrease of power supply voltage<br>③ Looseness, disconnection or converse of compressor wiring connection<br>④ Defective compressor<br>⑤ Defective outdoor power board | ① Open stop valve.<br>② Check facility of power supply.<br><br>③ Correct the wiring (U•V•W phase) to compressor. Refer to page 125 and 126.<br>④ Check compressor. Refer to page 28.<br>⑤ Replace outdoor power circuit board. |
| UH<br>(5300) | **Current sensor error**<br>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<br>② Defective circuit of current sensor on outdoor power circuit board | ① Correct the wiring (U•V•W phase) to compressor. Refer to page 125 and 126.<br>② Replace outdoor power circuit board. |
| UL<br>(1300) | **Abnormal low pressure (63L worked)**<br>Abnormal if 63L is worked (under-0.03MPa) during compressor operation.<br>63L: Low-pressure switch<br><br>(RP4-6VHA only) | ① Stop valve of outdoor unit is closed during operation.<br>② Disconnection or loose connection of connector (63L) on outdoor controller board<br>③ Disconnection or loose connection of 63L<br>④ Defective outdoor controller board<br>⑤ Leakage or shortage of refrigerant<br>⑥ Malfunction of linear expansion valve | ① Check stop valve.<br><br>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.<br><br>⑤ Correct to proper amount of refrigerant.<br>⑥ Check linear expansion valve. Refer to page 28. |
| UP<br>(4210) | **Compressor overcurrent interruption**<br>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.<br>② Decrease of power supply voltage<br>③ Looseness, disconnection or converse of compressor wiring connection<br>④ Defective fan of indoor/outdoor units<br>⑤ Short cycle of indoor/outdoor units<br>⑥ Defective input circuit of outdoor controller board<br>⑦ Defective compressor | ① Open stop valve.<br>② Check facility of power supply.<br>③ Correct the wiring (U•V•W phase) to compressor. Refer to page 125 and 126.<br>④ Check indoor/outdoor fan.<br>⑤ Solve short cycle.<br>⑥ Replace outdoor controller circuit board.<br>⑦ Check compressor. Refer to page 28.<br>※ 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. |

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

**<M-NET communication error>**

(Note) “Indoor unit” in the text indicates M-NET p.c. board in outdoor unit.

| Error Code | Meaning of error code and detection method | Case | Judgment and action |
|---|---|---|---|
| A0<br>(6600) | **Address duplicate definition**<br>This error is displayed when transmission from the units of same address is detected.<br>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.<br>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.<br>Check transmission waveform or noise on transmission wire. |
| A2<br>(6602) | **Hard ware error of transmission processor**<br>Transmission processor intended to transmit “0”, but “1” appeared on transmission wire.<br>Note) The address and attribute display at remote controller indicate the controller that detected abnormality. | ① Error is detected if waveform 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.<br>② Defective transmitting receiving circuit of transmission processor<br>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.<br>② Check transmission waveform or noise on transmission wire. |
| A3<br>(6603) | **BUS BUSY**<br>1. Over error by collision damage<br>Abnormal if transmitting is not possible for 8-10 minutes continuously because of collision of transmission.<br>2. Data could not reach transmission wire for 8-10 minutes continuously because of noise or etc.<br>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.<br>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.<br>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.<br>② Check if transmission wore of indoor unit, FRESH MASTER or LOSSNAY is not connected to terminal block for transmission wire of outdoor unit.<br>③ Check if terminal block for transmission wire (TB3) and terminal block for central control (TB7) is not connected.<br>④ Check transmission waveform or noise on transmission wire. |
| A6<br>(6606) | **Communication error with communication processor**<br>Defective communication between unit processor and transmission processor<br>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.<br>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. |

| Error Code | Meaning of error code and detection method | Case | Judgment and action |
|---|---|---|---|
| A7<br>(6607) | **NO ACK signal**<br>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.<br>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.<br>① The unit of former address does not exist as address switch has changed while the unit was energized.<br>② Extinction of transmission wire voltage and signal is caused by over-range transmission wire.<br>• Maximum distance ·····200m<br>• Remote controller line ··(12m)<br>③ Extinction of transmission wire voltage and signal is caused by type-unmatched transmission wire.<br>Type ·····<br>With shield wire-<br>CVVS, CPEVS<br>With normal wire (no shield)-<br>VCTF, VCTFK, CVV<br>CVS, VVR, VVF, VCT<br>Diameter····1.25mm² or more<br>④ Extinction of transmission wire voltage and signal is caused by over-numbered units.<br>⑤ Accidental malfunction of abnormality-detected controller (noise, thunder surge)<br>⑥ Defective of abnormality-generated controller | **Always try the followings when the error "A7" occurs.**<br><br>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.<br>② Check address switch of abnormality-generated address.<br>③ Check disconnection or looseness of abnormality-generated or abnormality-detected transmission wire (terminal block and connector)<br>④ Check if tolerance range of transmission wire is not exceeded.<br>⑤ Check if type of transmission wire is correct or not.<br><br>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.<br>• If there was no trouble with ①-⑤ above in single refrigerant system (one outdoor unit), controller of displayed address or attribute is defective.<br>• If there was no trouble with ①-⑤ above in different refrigerant system (two or more outdoor units), judge with ⑥.<br><br>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.<br>Only the system FRESH MASTER or LOSSNAY are connected to, or the system that is equipped with group setting of different refrigerant system.<br><br>If there was no trouble with ①-⑥ above, replace the controller board of displayed address or attribute.<br>If the unit does not return normally, multi-controller board of outdoor unit may be defective (repeater circuit).<br>Replace multi-controller board one by one to check if the unit returns normally. |
| | 2. If displayed address or attribute is outdoor unit,<br>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<br>② Disconnection of transmission connector (CN2M) of outdoor unit<br>③ Defective transmitting receiving circuit of outdoor unit or indoor unit | |
| | 3. If displayed address or attribute is indoor unit,<br>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.<br>② Contact failure of transmission wire of remote controller or indoor unit<br>③ Disconnection of transmission connector (CN2M) of indoor unit<br>④ Defective transmitting receiving circuit of indoor unit or remote controller | |
| | 4. If displayed address or attribute is remote controller,<br>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.<br>② Contact failure of transmission wire of remote controller or indoor unit<br>③ Disconnection of transmission connector (CN2M) of indoor unit<br>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) | 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.<br>② Contact failure of transmission wire of indoor unit or FRESH MASTER<br>③ Disconnection of transmission connector (CN2M) of indoor unit or FRESH MASTER<br>④ Defective transmitting receiving circuit of indoor unit or FRESH MASTER | **Same as mentioned in "A7" of the previous page.** |
| | 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.<br>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.<br>③ Contact failure of transmission wire of indoor unit of LOSSNAY<br>④ Disconnection of transmission connector (CN2M) of indoor unit<br>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.<br>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. | |
| A8 (6608) | **M-NET•NO RESPONSE**<br>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.<br>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.<br>② Extension of transmission wire voltage and signal is caused by over-range transmission wire.<br>• Maximum distance ·····200m<br>• Remote controller line ··(12m)<br>③ Extension of transmission wire voltage and signal is caused by type-unmatched transmission wire.<br>Type ·····<br>With shield wire-<br>CVVS, CPEVS<br>With normal wire (no shield)-<br>VCTF, VCTFK, CVV<br>CVS, VVR, VVF, VCT<br>Diameter····1.25mm² or more<br>④ Accidental malfunction of abnormality-generated controller | ① Check transmission waveform or noise on transmission wire.<br>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. |

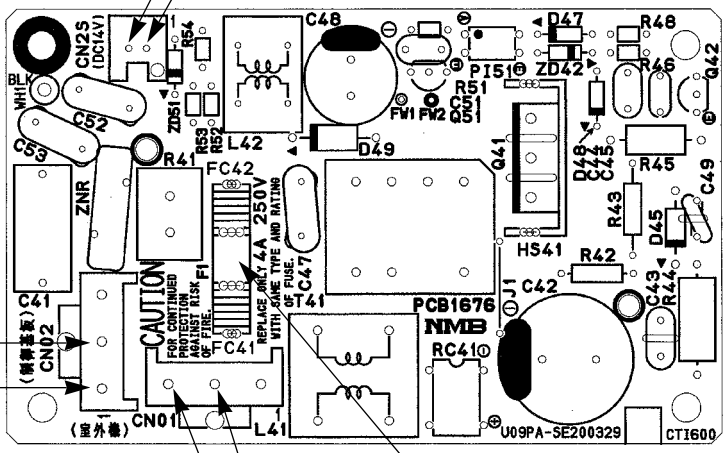
# 13 TEST POINT DIAGRAM

## 13-1. INDOOR UNIT

### 13-1-1. Indoor power board

**PLA-RP • AA**
**PKA-RP • GAL**
**PKA-RP • FAL**
**PCA-RP • GA**
**PEA-RP • EA**
**PEAD-RP • EA**
**PEAD-RP • GA**

CN2S
Connect to the indoor controller board (CN2D)
(12~16V DC)



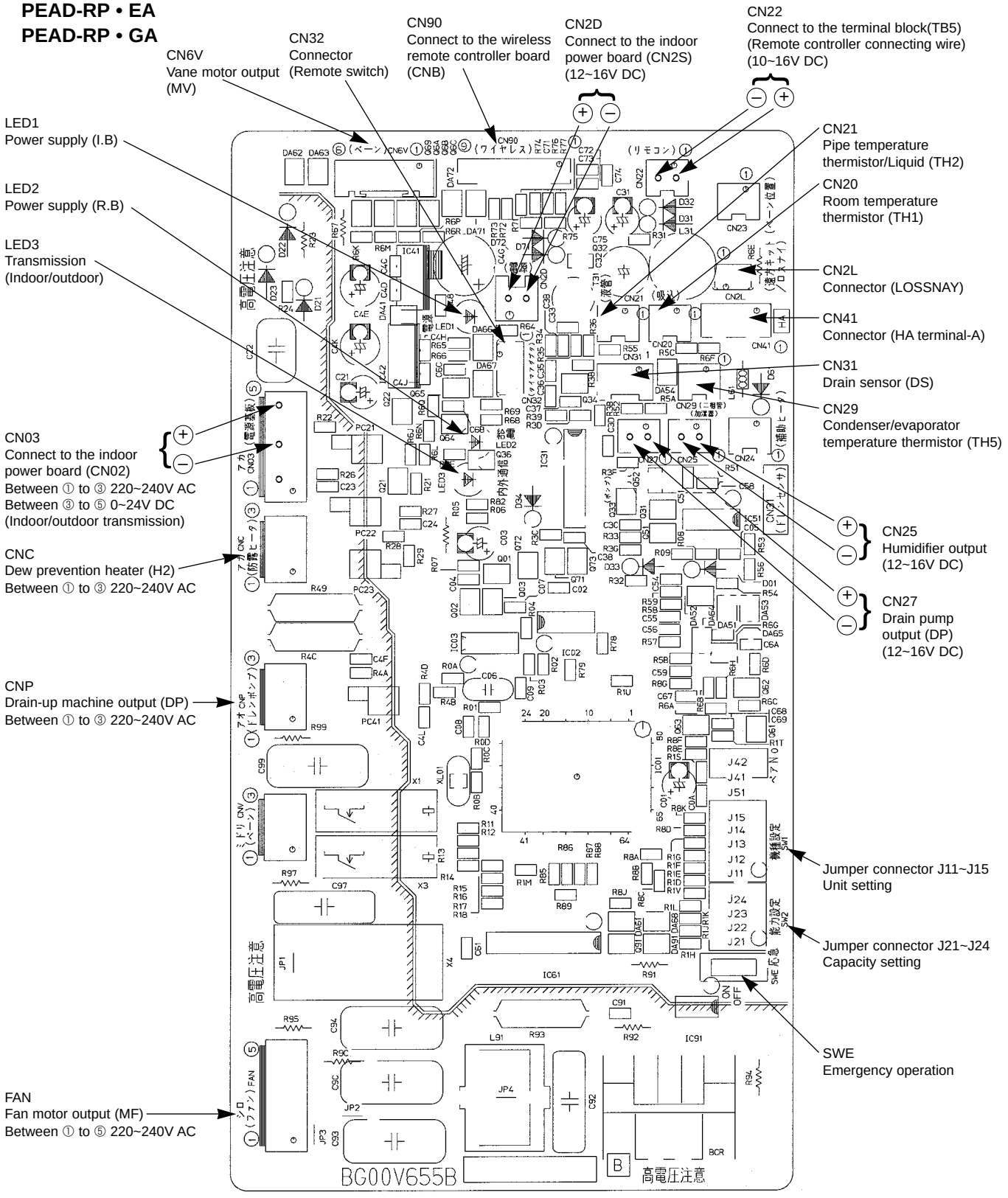

CN02
Connect to the indoor controller board (CN03)
Between ① and ② 0~24V DC
(Indoor/Outdoor transmission)
Between ② and ③ 220~240V AC

Fuse 4A/250V

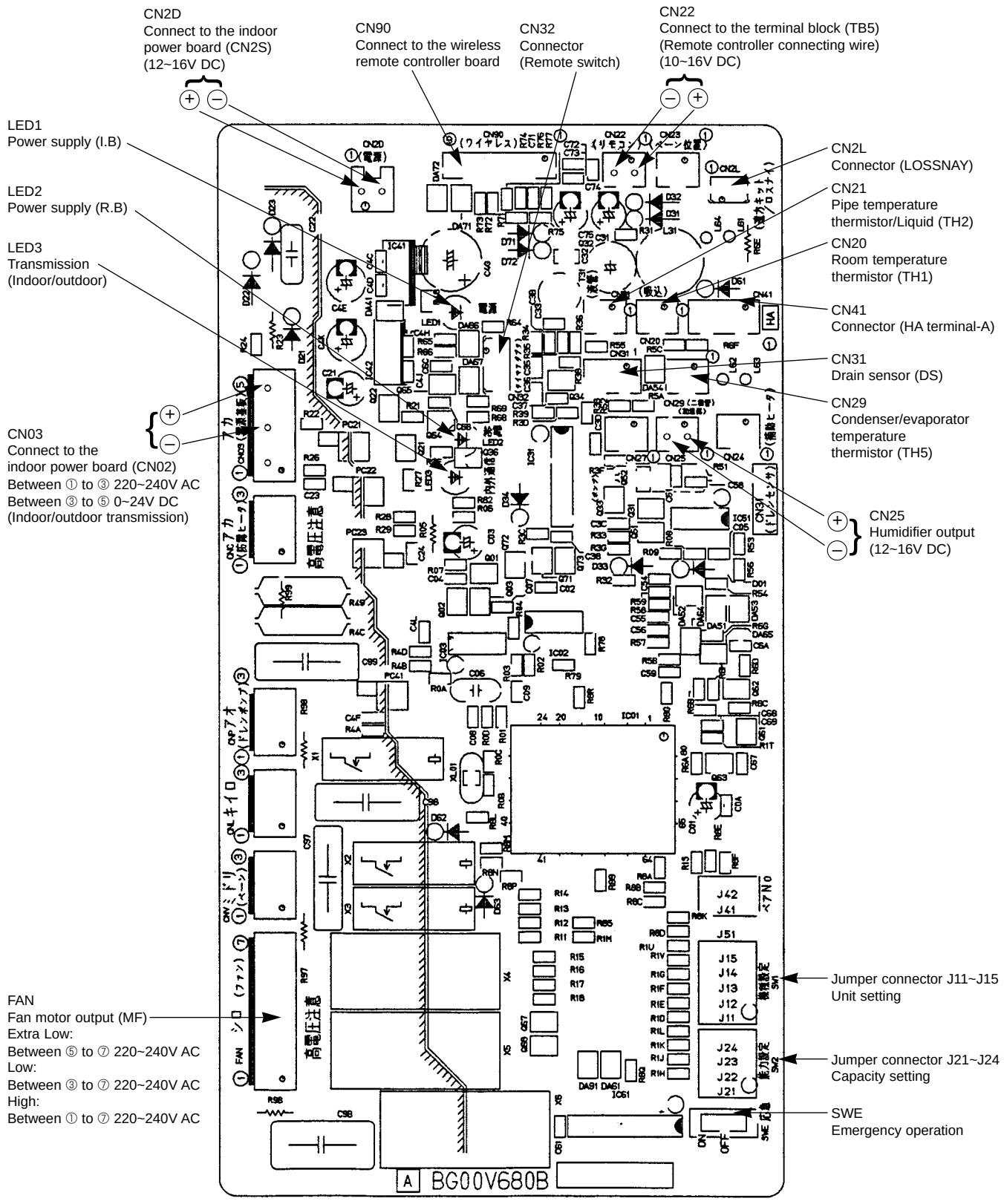
CN01
Connect to the Terminal Block (TB4)
(Indoor/outdoor connecting line)
Between ① and ② 220~240V AC
Between ② and ③ 0~24V DC
(Indoor/outdoor transmission)

## 13-1-2. Indoor controller board

**PLA-RP • AA**
**PKA-RP • GAL**
**PKA-RP • FAL**
**PCA-RP • GA**
**PEAD-RP • EA**
**PEAD-RP • GA**



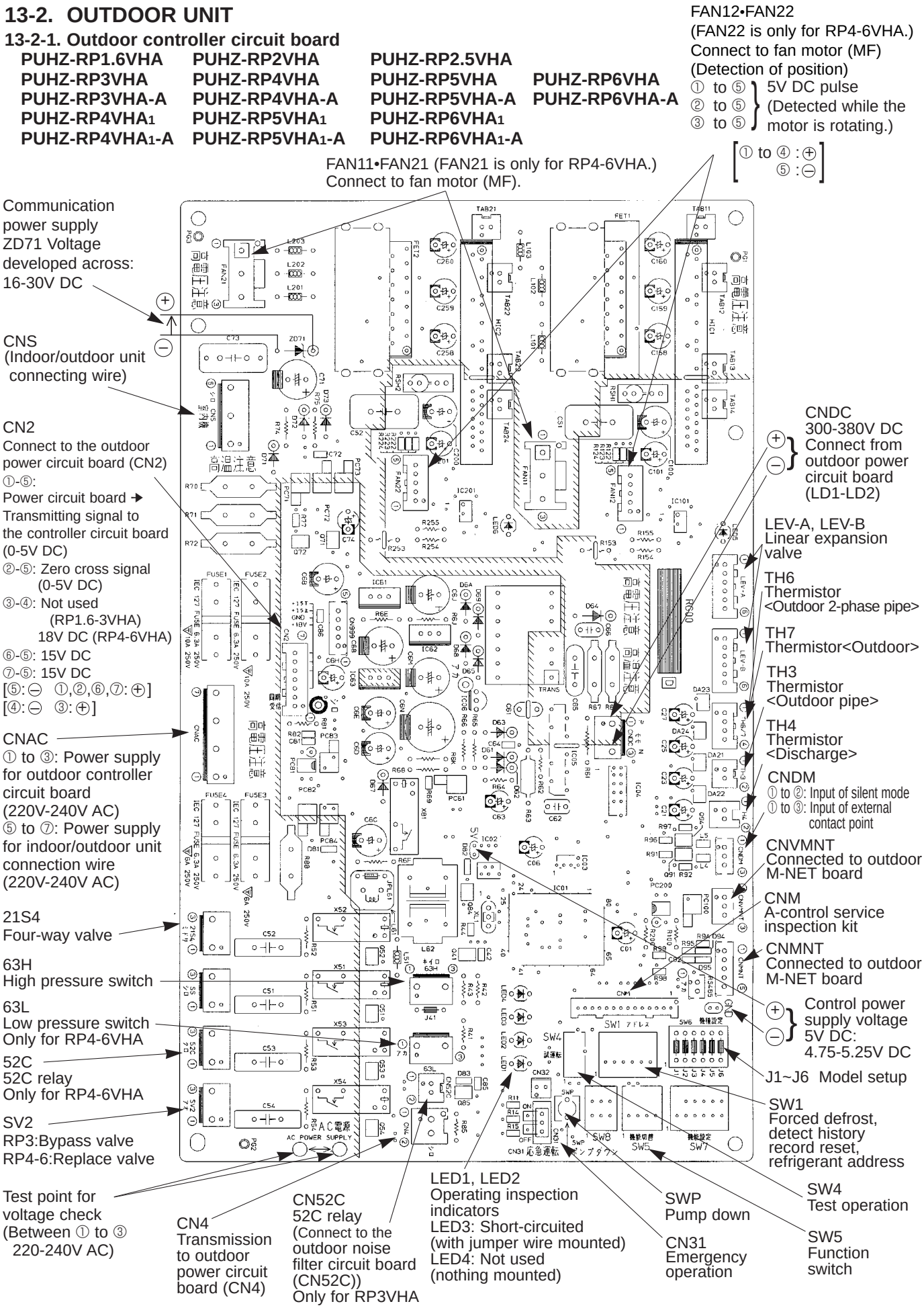
## 13-1-3. Indoor controller board
### PEA-RP • EA



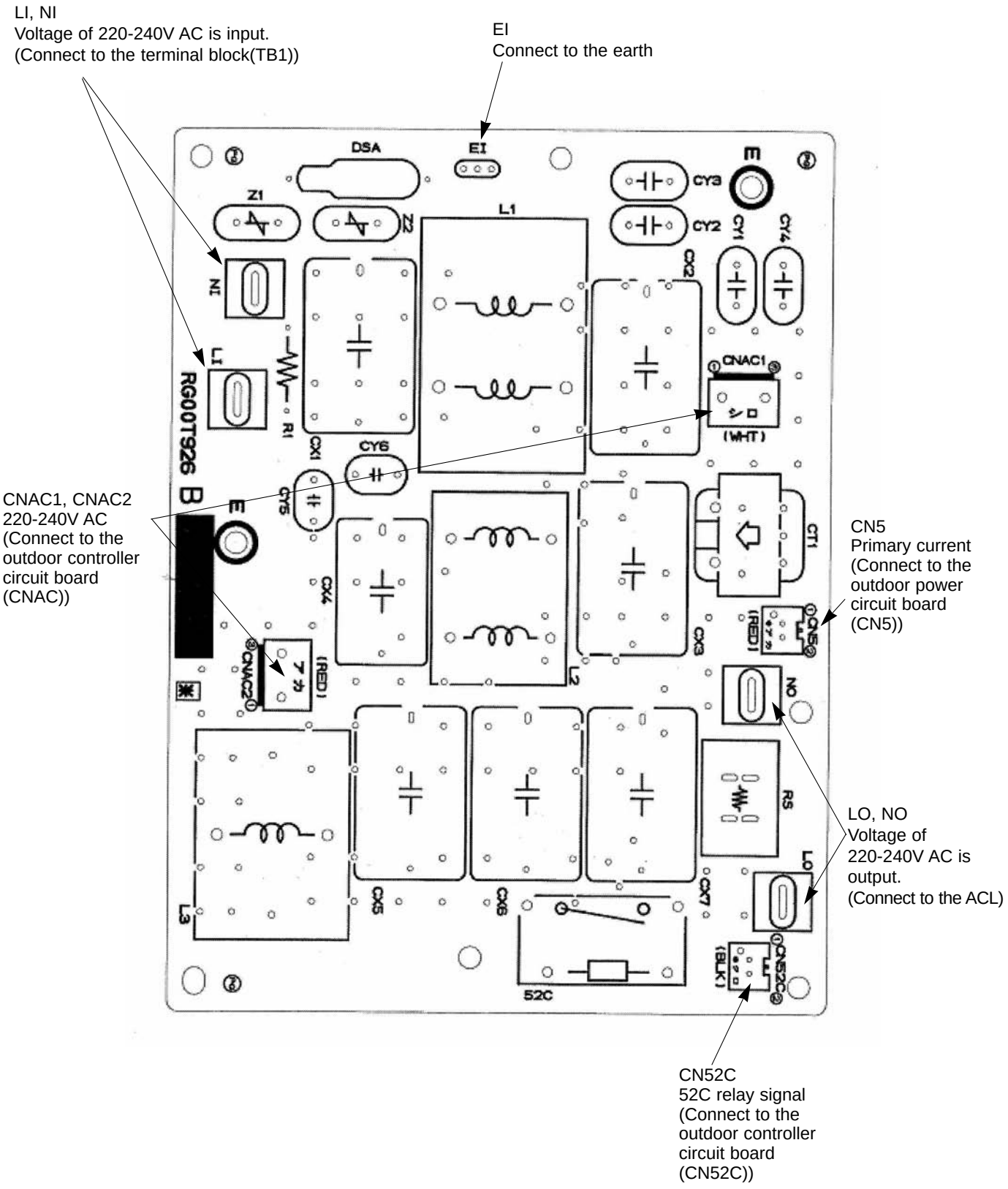
## 13-2. OUTDOOR UNIT

### 13-2-1. Outdoor controller circuit board

**PUHZ-RP1.6VHA** **PUHZ-RP2VHA** **PUHZ-RP2.5VHA**
**PUHZ-RP3VHA** **PUHZ-RP4VHA** **PUHZ-RP5VHA** **PUHZ-RP6VHA**
**PUHZ-RP3VHA-A** **PUHZ-RP4VHA-A** **PUHZ-RP5VHA-A** **PUHZ-RP6VHA-A**
**PUHZ-RP4VHA1** **PUHZ-RP5VHA1** **PUHZ-RP6VHA1**
**PUHZ-RP4VHA1-A** **PUHZ-RP5VHA1-A** **PUHZ-RP6VHA1-A**

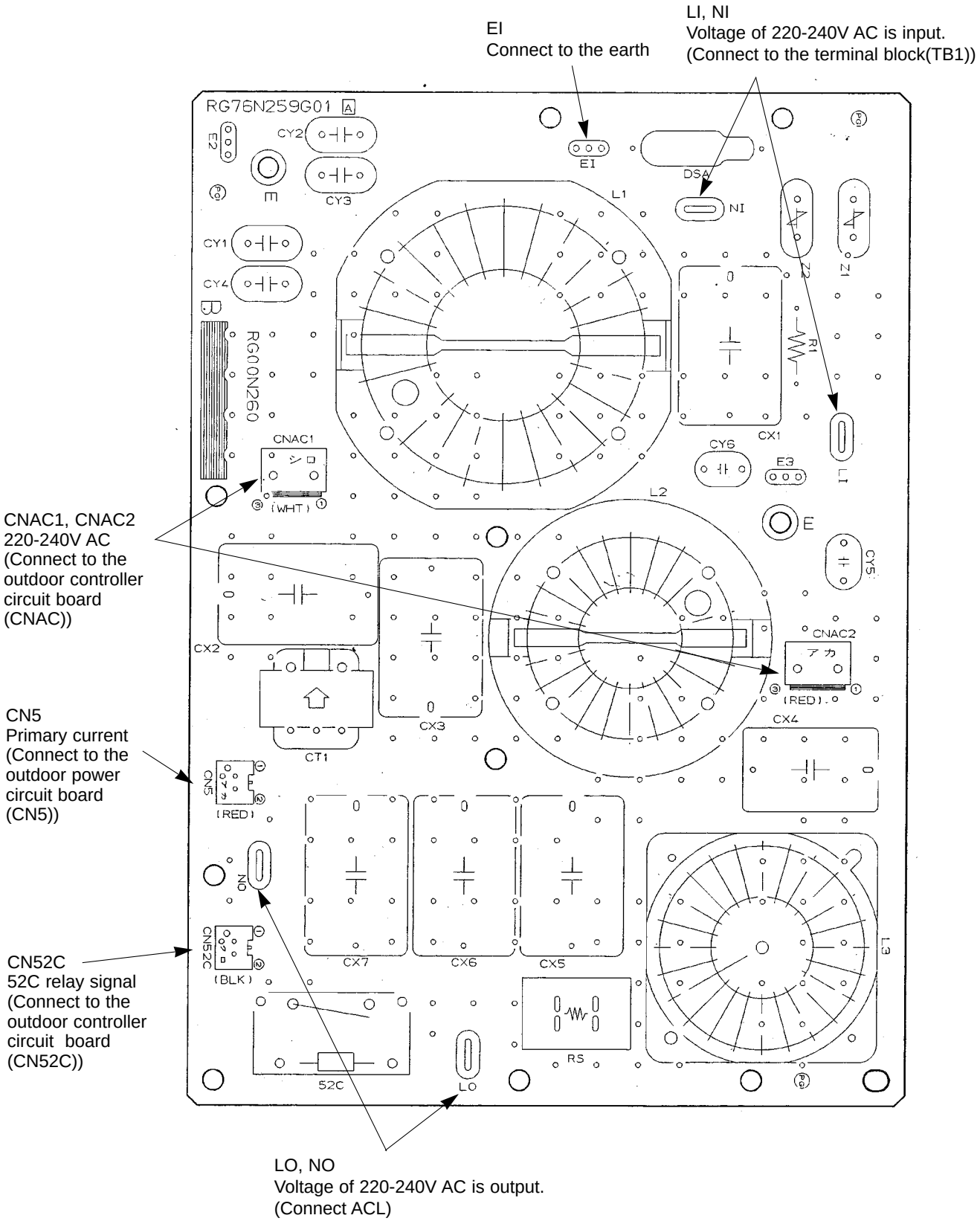


### 13-2.2. Outdoor noise filter circuit board
**PUHZ-RP1.6VHA**
**PUHZ-RP2VHA**



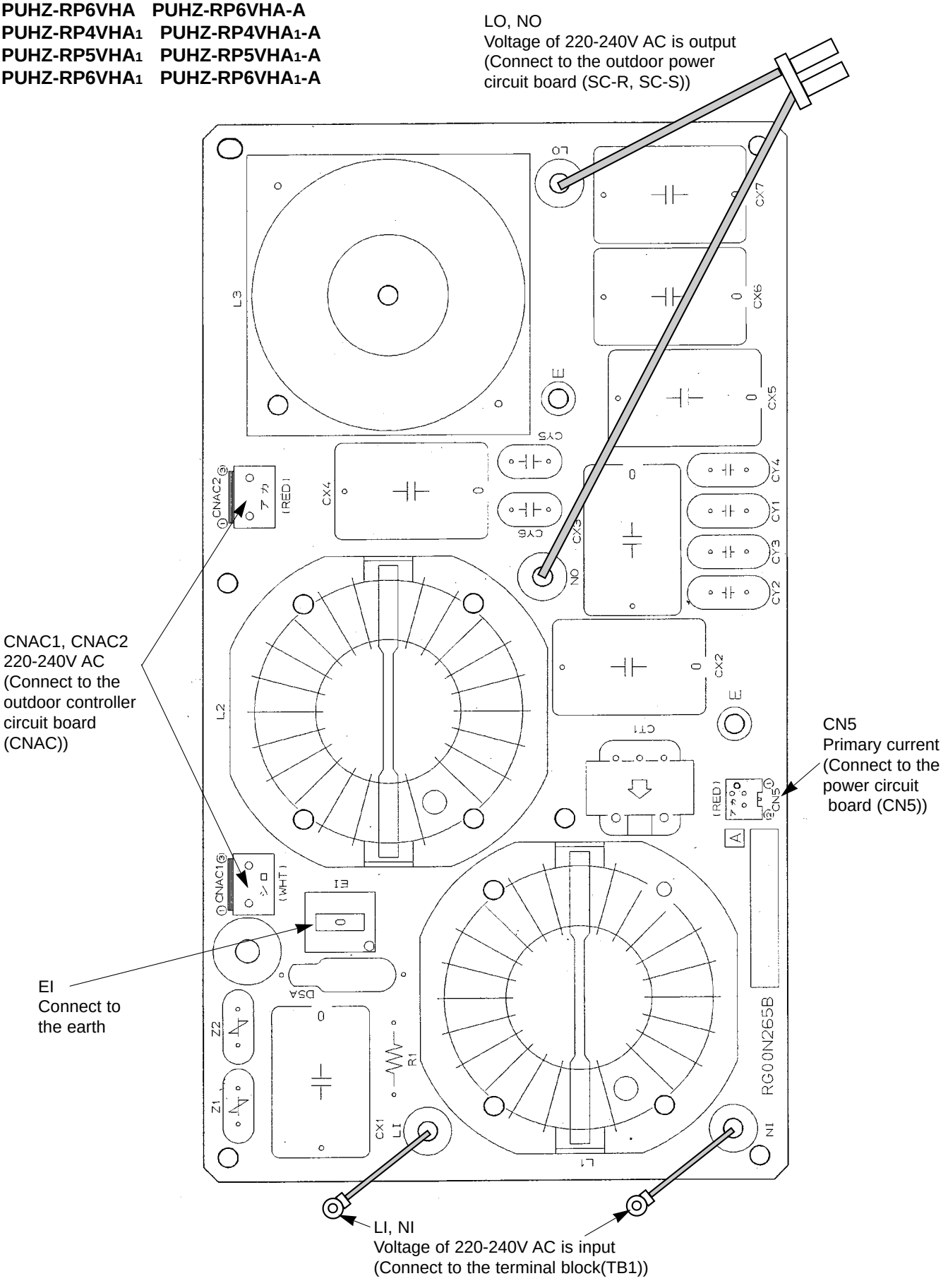
**13-2-3. Outdoor noise filter circuit board**

**PUHZ-RP2.5VHA**
**PUHZ-RP3VHA**
**PUHZ-RP3VHA-A**



### 13-2-4. Outdoor noise filter circuit circuit board

**PUHZ-RP4VHA PUHZ-RP4VHA-A**
**PUHZ-RP5VHA PUHZ-RP5VHA-A**
**PUHZ-RP6VHA PUHZ-RP6VHA-A**
**PUHZ-RP4VHA$_1$ PUHZ-RP4VHA$_1$-A**
**PUHZ-RP5VHA$_1$ PUHZ-RP5VHA$_1$-A**
**PUHZ-RP6VHA$_1$ PUHZ-RP6VHA$_1$-A**



**13-2-5. Outdoor Power circuit board**

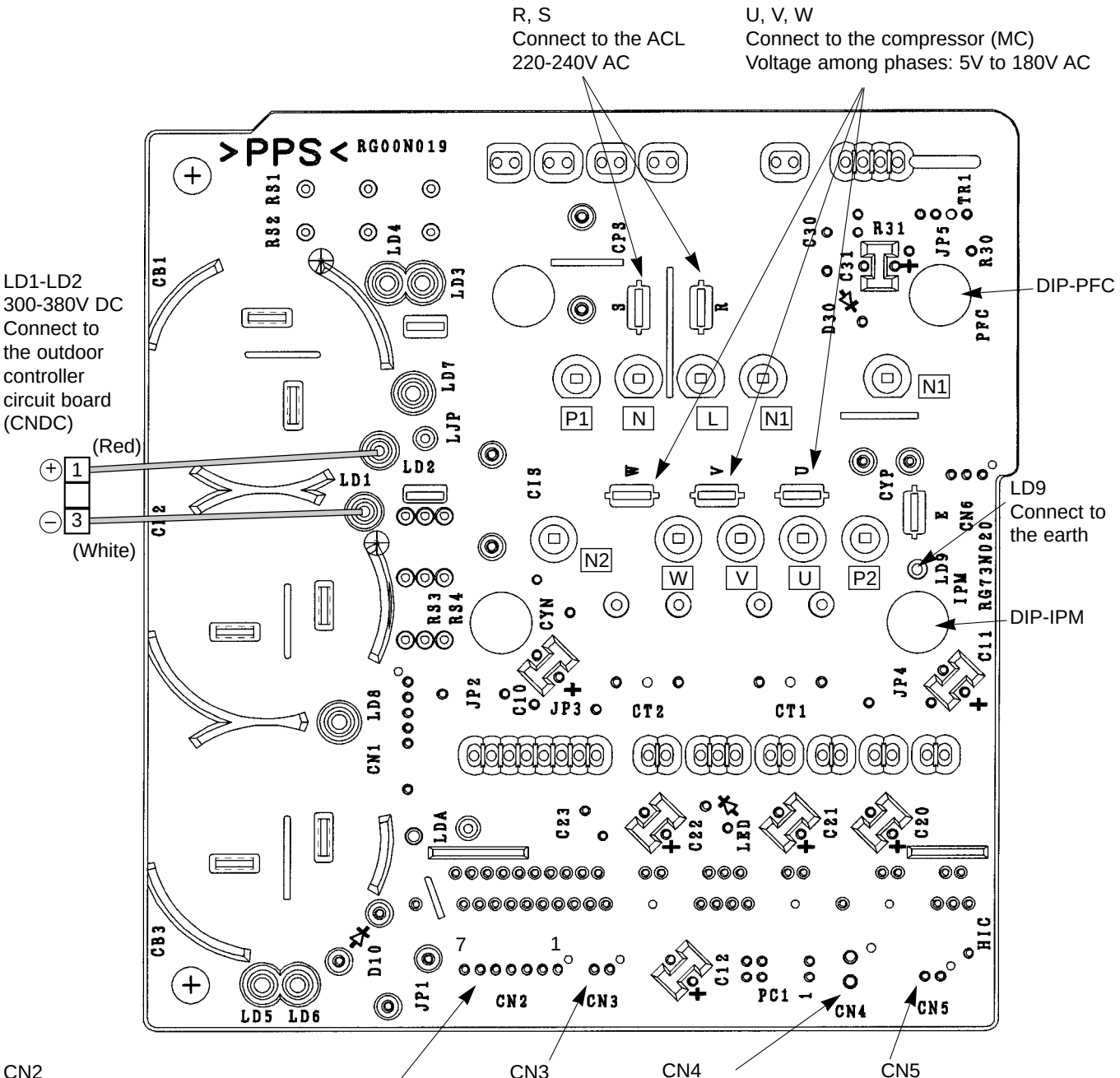
**PUHZ-RP1.6VHA**
**PUHZ-RP2VHA**
**PUHZ-RP2.5VHA**
**PUHZ-RP3VHA**
**PUHZ-RP3VHA-A**

Brief Check of DIP-IPM and DIP-PFC

※ 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 DIP-IPM
   P2 - U , P2 - V , P2 - W , N2 - U , N2 - V , N2 - W
2. Check of DIP-PFC
   P1 - L , P1 - N , L - N1 , N - N1

Note:The marks, L , N , N1 , N2 , P1 , P2 , U , V and W shown in the diagram above are not actually printed on the board.




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

CN3
Thermistor <Heat sink> (TH8)

CN4
Connect from the outdoor controller circuit board (CN4)

CN5
Primary current detection (Connect to the outdoor noise filter circuit board (CN5))

## 13-2-6. Outdoor Power circuit board

**PUHZ-RP4VHA PUHZ-RP4VHA-A**
**PUHZ-RP5VHA PUHZ-RP5VHA-A**
**PUHZ-RP6VHA PUHZ-RP6VHA-A**
**PUHZ-RP4VHA$_1$ PUHZ-RP4VHA$_1$-A**
**PUHZ-RP5VHA$_1$ PUHZ-RP5VHA$_1$-A**
**PUHZ-RP6VHA$_1$ PUHZ-RP6VHA$_1$-A**

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
L - P1, N - P1, L - N1, N - N1
②.Check of IGBT circuit
P2 - U, P2 - V, P2 - W, N2 - U, N2 - V, N2 - W
Note:The marks, L , N , N1 , N2 , P1 , P2 , U , V and W shown in the diagram above are not actually printed on the board.

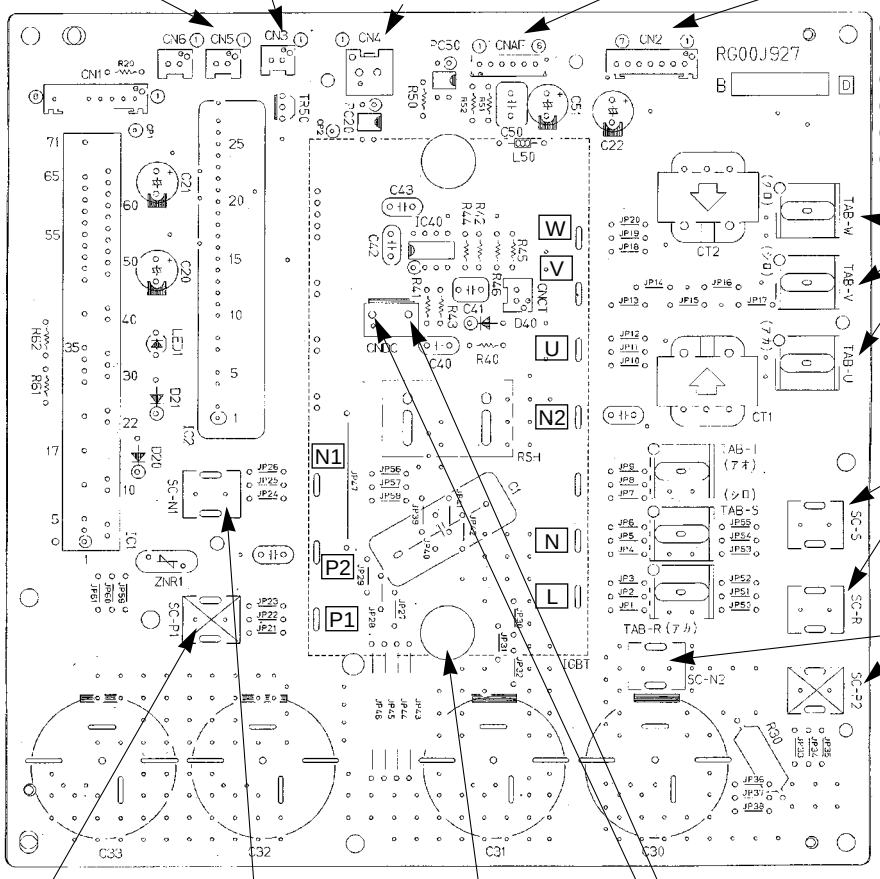
CN5
Detection of primary current (Connect to the outdoor noise filter circuit board (CN5))

CN3
Temperature <Heat sink> (TH8)

CN4
Connect to the outdoor controller circuit board (CN4)

CNAF
Connect to ACTM

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: 18V DC [⑤ :⊖ ①, ②, ⑥, ⑦ :⊕]
⑥-⑤: 15V DC
⑦-⑤: 15V DC [④ :⊖ ③ :⊕]




TAB-U, TAB-V, TAB-W
Connect to the compressor (MC)
Voltage among phases:
5V-180V AC

SC-R, SC-S
Connect to the outdoor noise filter circuit board (LO, NO)
220V-240V AC

SC-P2, SC-N2
Connect to ACTM and the soothing capacitor

SC-P1
Connect to 52C

SC-N1
Connect to ACTM

POWER MODULE

⊖ ⊕ CNDC
300V-370V DC
Connect to the outdoor controller circuit board (CNDC)

## 13-2-6. Outdoor M-NET board (optional)

LED5
Energizing display of M-NET board (12V power supply)

CN2M
Connect to M-NET

LED4
Receiving

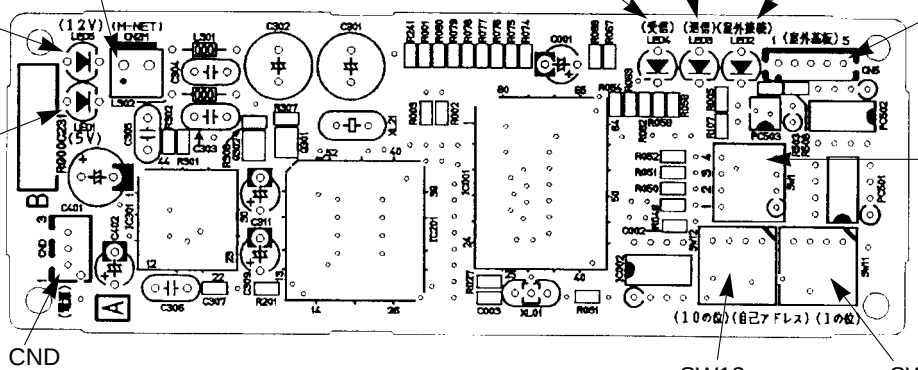
LED3
Transmitting

LED3
Outdoor unit connecting display

CN5
Serial communication with outdoor board

SW1
Switch for communication display between M-NET and board

LED1
Energizing display of M-NET board (5V power supply)




CND
Power supply (5V/12V) input
(② to ③ 5V DC Input
① to ③ 12V DC Input) [①, ② :⊕ ③ :⊖]

SW12
M-NET address (Tens digit)

SW11
M-NET address (Ones digit)

# 14 TROUBLESHOOTING

**• Before repair**
**Frequent calling from customers.**

| Phone Calls From Customers | | How to Respond | Note |
|---|---|---|---|
| Unit does not operate at all. | ① The operating display of remote controller does not come on. | ① Check if power is supplied to air conditioner. Nothing appears on the display unless power is supplied. | |
| | ② Unit cannot be restarted for a while after it's stopped. | ② Wait around 3 minutes. to restart unit. The air conditioner is in a state of being protected by the microcomputer's directive. Once the compressor is stopped, the unit cannot be restarted for 3 minutes. This control is also applied when the unit is turned on and off by remote controller or thermostat. | |
| | ③ Error code appears and blinks on the display of remote controller. | ③ Error code will be displayed if any protection devices of the air conditioner are actuated. What is error code? ----------▶ | Refer to "SELF-DIAGNOSIS ACTION TABLE". Check if servicing is required for the error. |
| Remote controller. | ① "H0" is displayed on the screen. | ① Wait around 2 minutes. An automatic startup test will be conducted for 2 minutes when power is supplied to the air conditioner. "H0" will be kept being displayed while that time. | |
| | ② "FILTER" is displayed on the screen. | ② This indicates that it is time to clean the air filters. Clean the air filters. Press the FILTER button on the remote controller twice to clear "FILTER" from the display. See the operation manual that came with the product for how to clean the filters. | Display time of "FILTER" depends on the model. Long life filter: 2500 hrs. Regular filter: 100 hrs. |
| | ③ "STANDBY" is displayed on the screen. | ③ This is displayed when the unit starts HEAT operation, when the thermostat puts the compressor in operation mode, or when the outdoor unit ends DEFROST operation and returns to HEAT operation. The display will automatically disappear around 10 minutes later. While "STANDBY" is displayed on the remote controller, the airflow amount will be restricted because the indoor unit's heat exchanger is not fully heated up. In addition to that, the up/down vane will be automatically set to horizontal blow in order to prevent cold air from directly blowing out to human body. The up/down vane will return to the setting specified by the remote controller when "STANDBY" is released. | |
| | ④ "DEFROSTING" is displayed on the screen. (No air comes out of the unit.) | ④ The outdoor unit gets frosted when the outside temperature is low and the humidity is high. "DEFROSTING" indicates the DEFROST operation is being performed to melt this frost. The DEFROST operation ends in around 10 minutes (at most 15 minutes). During the DEFROST operation, the indoor unit's heat exchanger becomes cold, so the blower is stopped. The up/down vane will be automatically set to horizontal blow in order to prevent cold air from directly blowing out to human body. The display will turn into "STANDBY" when DEFROST operation ends. | |

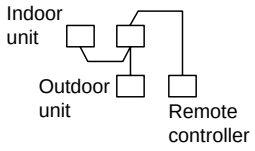
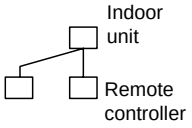
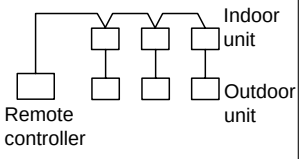
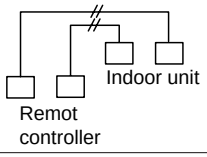
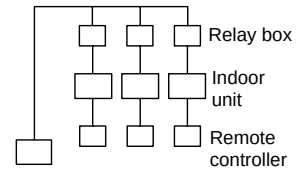
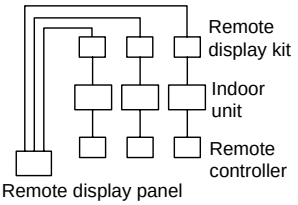
| Phone Calls From Customers | | How to Respondm | Note |
|---|---|---|---|
| The room cannot be cooled or heated sufficiently. | | ① Check the set temperature of remote controller. The outdoor unit cannot be operated if the set temperature is not appropriate.<br>The outdoor unit operates in the following modes.<br>COOL: When the set temperature is lower than the room temperature.<br>HEAT: When the set temperature is higher than the room temperature. | |
| | | ② Check if filters are not dirty and clogged. If filters are clogged, the airflow amount will be reduced and the unit capacity will be lowered. See the instruction manual that came with the product for how to clean the filters. | |
| | | ③ Check there is enough space around the air conditioner.<br>If there are any obstacles in the air intake or air outlet of indoor/outdoor units, they block the airflow direction so that the unit capacity will be lowered. | |
| Sound comes out from the air conditioner. | ① An gas escaping sound is heard sometimes. | ① This is not a malfunction.<br>This is the sound which is heard when the flow of refrigerant in the air conditioner is switched. | |
| | ② A cracking sound is heard sometimes. | ② This is not a malfunction.<br>This is the sound which is heard when internal parts of units expand or contract when the temperature changes. | |
| | ③ A buzzing sound is heard sometimes. | ③ This is not a malfunction.<br>This is the sound which is heard when the outdoor unit starts operating. | |
| | ④ A ticking sound is heard from the outdoor unit sometimes. | ④ This is not a malfunction.<br>This is the sound which is heard when the blower of the outdoor unit is controlling the airflow amount in order to keep the optimum operating condition. | |
| | ⑤ A sound, similar to water flowing, is heard from the unit. | ⑤ This is not a malfunction.<br>This is the sound which is heard when the refrigerant is flowing inside the indoor unit. | |
| Something is wrong with the blower….. | ① The fan speed doesn't match the setting of the remote controller during DRY operation.(No air comes out sometimes during DRY operation.) | ① This is not a malfunction. During the DRY operation, the blower's ON/OFF is controlled by the microcomputer to prevent overcooling and to ensure efficient dehumidification. The fan speed cannot be set by the remote controller during DRY operation. | |
| | ② The fan speed doesn't match the setting of the remote controller in HEAT operation. | ② This is not a malfunction.<br>1) When the HEAT operation starts, to prevent the unit from blowing cold air, the fan speed is gradually increased from zero to the set speed, in proportion to the temperature rise of the discharged air.<br>2) When the room temperature reaches the set temperature and the outdoor unit stops, the unit starts the LOW AIR operation.<br>3) During the HEAT operation, the DEFROST operation is performed to defrost the outdoor unit. During the DEFROST operation, the blower is stopped to prevent cold air coming | The up/down vane will be automatically set to horizontal blow in these cases listed up on the left (①~③). After a while, the up/down vane will be automatically moved according to the setting of the remote controller. |

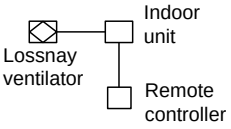
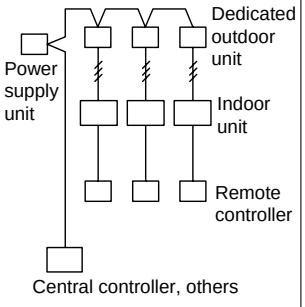
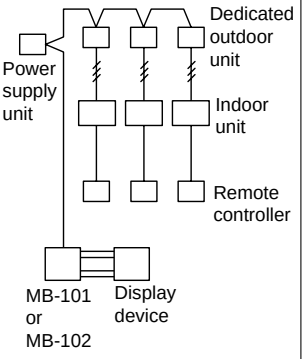
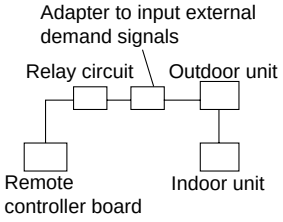
| Phone Calls From Customers | | How to Respond | Note |
|---|---|---|---|
| Something is wrong with the blower….. | ③ Air blows out for a while after HEAT operation is stopped. | ③ This is not a malfunction.<br>The blower is operating just for cooling down the heated-up air conditioner. This will be done within one minute.<br>This control is conducted only when the HEAT operation is stopped with the electric heater ON. | However, this control is also applied to the models which has no electric heater. |
| Something is wrong with the airflow direction…. | ① The airflow direction is changed during COOL operation. | ① If the up/down vane is set to downward in COOL operation, it will be automatically set to horizontal blow by the microcomputer in order to prevent water from dropping down.<br>"1 Hr." will be displayed on the remote controller if the up/down vane is set to downward with the fan speed set to be less than "LOW". | |
| | ② The airflow direction is changed during HEAT operation.<br>(The airflow direction cannot be set by remote controller.) | ② In HEAT operation, the up/down vane is automatically controlled according to the temperature of the indoor unit's heat exchanger.<br>In the following cases written below, the up/down vane will be set to horizontal blow, and the setting cannot be changed by remote controller.<br>1) At the beginning of the HEAT operation<br>2) While the outdoor unit is being stopped by thermostat or when the outdoor unit gets started to operate.<br>3) During DEFROST operation<br>The airflow direction will be back to the setting of remote controller when the above situations are released. | "STANDBY" will be displayed on the remote controller in case of ① and ②.<br>"DEFROSTING" will be displayed on the screen in case of ③. |
| | ③ The airflow direction doesn't change.<br>(Up/down vane, left/right louver) | ③ 1) Check if the vane is set to a fixed position.<br>(Check if the vane motor connector is removed.)<br>2) Check if the air conditioner has a function for switching the air direction.<br>3) If the air conditioner doesn't have that function, "NOT AVAILABLE" will be displayed on the remote controller when "AIR | |
| The air conditioner starts operating even though any buttons on the remote controller are not pressed. | | ① Check if you set ON/OFF timer.<br>The air conditioner starts operating at the time designated if ON timer has been set before. | |
| | | ② Check if any operations are ordered by distant control system or the central remote controller.<br>While "CENTRALLY CONTROLLED" is displayed on the remote controller, the air conditioner is under the control of external directive. | There might be a case that "CENTRALLYCONTROLLED" will not be displayed. |
| | | ③ Check if power is recovered from power failure (black out).<br>The units will automatically start operating when power is recovered after power failure (black out) occurs. This function is called "auto recovery feature from power ". | |
| The air conditioner stops even though any buttons on the remote controller are not pressed. | | ① Check if you set ON/OFF timer.<br>The air conditioner stops operating at the time designated if OFF timer has been set before.<br>② Check if any operations are ordered by distant control system or the central remote controller.<br>While "CENTRALLY CONTROLLED" is displayed on the remote controller, the air conditioner is under the control of external directive. | There might be a case that "CENTRALLY CONTROLLED" will not be displayed. |

| Phone Calls From Customers | How to Respond | Note |
|---|---|---|
| A white mist is expelled from the indoor unit. | This is not a malfunction.<br>This may occur when the operation gets started in the room of high humidity. | |
| Water or moisture is expelled from the outdoor unit. | Cooling; when pipes or piping joints are cooled, they get sweated and water drips down.<br>Heating; water drips down from the heat exchanger.<br>* Make use of optional parts “Drain Socket” and “Drain pan” if these water needs to be collected and drained out for once. | |
| The display of wireless remote controller gets dim or doesn’t come on.<br>The indoor unit doesn’t receive a signal from remote controller at a long distance. | Batteries are being exhausted. Replace them and press the reset button of remote controller. | |

# 15 SYSTEM CONTROL

## 15-1. VARIETY OF SYSTEM CONTROL FUNCTIONS

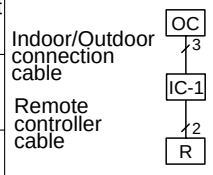
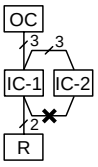
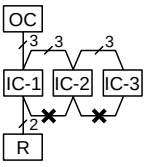
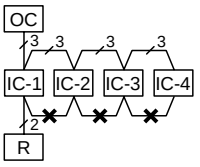
| System Name | System Diagram | Features | Parts To Be Procured (Sold separately or obtained locally.) |
|---|---|---|---|
| A. Remote controller operation (Standard type) |  | • There are two types of remote controllers: wired type and wireless type.<br>• Simultaneous twin, triple and quad units are counted as one unit and the indoor units can be operated or stopped simultaneously.<br>• An individual twin is counted as two units and the indoor units can be operated independently. Each can perform a different operation. For example, one unit can be used for cooling while another is used for heating. | ——— |
| B. Two remote controller operation |  | • Up to two remote controller can be connected to one group.<br>• Simultaneously twin, triple and quad units are counted as one group.<br>• The operating control is the most recent command (last entered priority). | • Wired remote controller<br>• Wireless remote controller |
| C. 1 remote controller group operation |  | • The remote controller is connected and the address for each outdoor unit is set so that a group of up to 16 units can be started sequentially.<br>• Simultaneous twin, triple and quad units are counted as one unit.<br>• One group can operate in the same mode but the on/off operation of the thermostat is performed independently by each outdoor unit. | • Wired remote controller |
| D. Power failure automatic recovery operation | ——— | • This can be set by using the function selection from the remote controller. | ——— |
| E. Individual operation from separate room |  | • The remote controller cord for the wired remote controller can be extended to up to 500 meters.<br>※ The optical receiving section cord for the wireless remote controller cannot be extended. | • Remote controller extension cord (0.3 to 1.25 mm²) |
| F. Control operation of joint remote/ hand-held units. |  | • Group on/off of all air conditioners can be done from remote unit.<br>• Switching of remote control/hand-held control can be performed. | • Remote ON/OFF (PAC-SE55RA-E) Relay box (Installed locally) |
| G. Operation by external signal | ——— | • Compatible with either level or pulse signals. | • Remote ON/OFF (PAC-SE55RA-E) |
| H. Erasing of remote display |  | • Connect the "Remote Operation Adapter" (sold separately) and "Remote Display Panel" (Installed locally) to permit no-voltage contact output of each signal for operation and error and remote input functions (pulse input) to be added. | • Remote operation adapter (PAC-SF40RM-E)<br>• Remote Display Panel (Installed locally) |
| I. Timer operation | ——— | ① On/Off time can be set in increments of 10 minutes. The standard model allows for up to one control cycle in a 24 hour period. There are three kinds of timers: on timer, off, timer and on/off timer. | ——— |
| | | ② Connecting the "Program Timer" (sold separately) to the remote controller will provide setting control for On/Off in 30 minute increments in day increments. | • Program timer (PAC-SC32PTA) |
| | | ③ Connection the "Remote Operation Adapter" to the circuit board of the indoor unit will allow operating control to be performed by a commercially available timer | • Remote Operation Adapter (PAC-SE55RA-E)<br>• Timer (Commercially available) |

| System Name | System Diagram | Features | Parts To Be Procured (Sold separately or obtained locally.) |
|---|---|---|---|
| J. Air conditioners operating control together with peripheral equipment |  | • Connect the indoor unit with a Mitsubishi Lossnay ventilator and the function selection of the remote controller can be used to change the fan speed of the Lossnay and operate it linked with or independent of the indoor unit. | • Wired remote controller<br>• Lossnay operating cable (PAC-SB81VS) |
| K. Method for obtaining humidifier signal | ——— | • It can obtain the humidifying signal linked to the heater operation of the air conditioners. | ——— |
| L. Temperature sensor external mounting method | ——— | • Temperature sensors for the air conditioners are provided as standard equipment at the intake port of the indoor unit and two locations of the wired remote controller. The function selection from the wired remote controller can be used for switching. | • Wired remote controller |
| | ——— | • If the sensor in the intake port of the indoor unit is replaced with a "Temperature Sensor" (sold separately), it can be externally mounted. | • Temperature sensor (PAR-SE40TS-E) |
| M. Central control |  | • If a dedicated outdoor unit is used, it can be connected to a MELANS system controller (for M-NET).<br>• The hand held remote controller is the Slim A control remote controller .<br>• In the restriction of the MELANS system, the number of indoor units controlled is calculated as the number of dedicated outdoor units in the case of the A controller. (Any of from among simultaneous twin, triple and quad is counted as one unit.)<br>• Number of dedicated outdoor units controlled:<br>Central controller (MJ-102MTR-B): 50 units<br>Multi-panel controller (MJ-111AN-B): 50 units<br>Group remote controller (PAC-SC30GR): 16 units | • Outdoor unit for connecting to M-NET<br>• Central controller (MJ-102MTR-B)<br>• Group remote controller (PAC-SC30GR)<br>• Multi-panel controller (MJ-111AN-B) |
| N. Operation with external display device and control panel |  | • It is possible to form blocks (collections of multiple groups) to obtain contact points for operation settings (starting, stopping) and contact points for status monitoring (operation, error).<br>MB-101: Maximum of 48 contact points. 12 blocks.<br>MB-102: Maximum of 96 contact points, 24 blocks.<br>• Operation setting<br>Starting and stopping can be done by block units or all at once.<br>• Status monitoring<br>It is possible to monitor operation or stop status and error or normal operation status. | • Outdoor unit for connecting to M-NET<br>• Parallel interface kit (MB-101, MB-102) |
| O. Demand control |  | • When outdoor controller board receives demand signals, outdoor unit is suspended and indoor units run under “fan” operation mode. | • Adapter to input external demand signals (PAC-SC36NA)<br>• Relay circuit (PAC-SA86SK) |

## 15-2. One Remote Controller (Standard) Operation

**(1) One Wired Remote Controller**

(OC: Outdoor unit IC: Indoor unit R: Remote controller (for wireless type: optical receiver adapter)

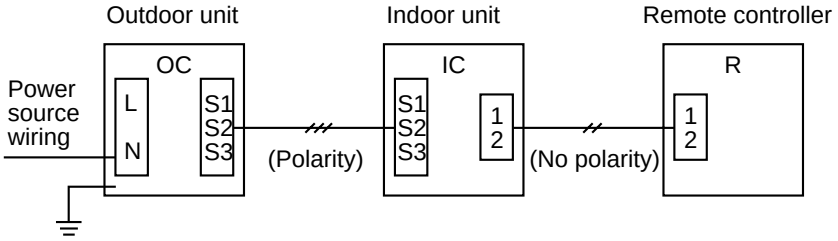
| Slim Air Conditioners System | | Standard 1:1 | Simultaneous Twin | Simultaneous Triple | Simultaneous Quadro |
|---|---|---|---|---|---|
| Remote controller connection circuit (Controller cable) | Outdoor unit OC<br>Indoor unit IC<br>Wired remote controller R |  |  |  |  |

(Reference)

① If simultaneous twin, triple or four, connect the remote controller to anyone of the indoor units. Can control all functions of the indoor unit even if different models (different types) are mixed.

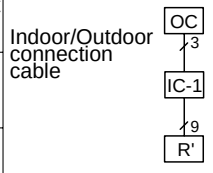
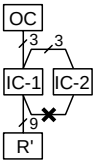
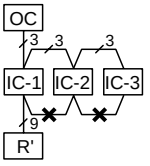
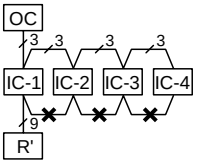
② Do not use crossover wiring among indoor units with simultaneous twin, triple or quadro units. (Prohibited item.)

③ Electrical wiring diagram




- Power supply terminal block L, N
- Indoor/outdoor connection cable terminal block S1, S2, S3 (Polarity)
- Remote controller cable terminal block 1,2 (No polarity)

**(2) Wireless remote controller**

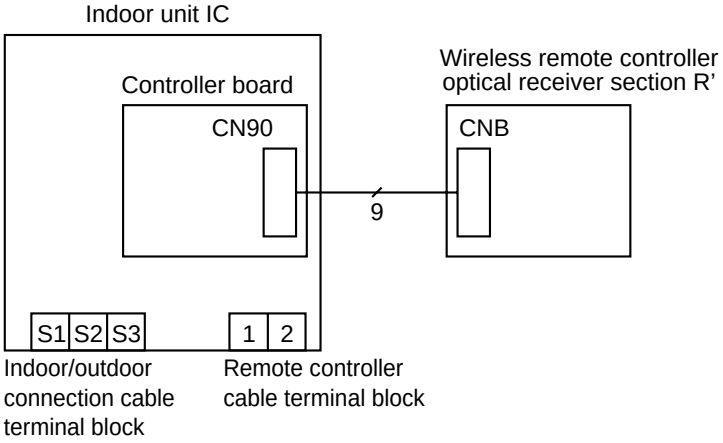
| Slim Air Conditioners System | | Standard 1:1 | Simultaneous Twin | Simultaneous Triple | Simultaneous Quadro |
|---|---|---|---|---|---|
| Remote controller optical receiver section connection circuit | Outdoor unit OC<br>Indoor unit IC<br>Wireless remote controller optical receiver section R' |  |  |  |  |

(Reference)

① If simultaneous twin, triple or four, connect the remote controller to anyone of the indoor units. Can control all functions of the indoor unit even if different models (different types) are mixed.

② Do not use crossover wiring among indoor units with simultaneous twin, triple or quadro units. (Prohibited item.)

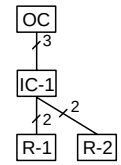
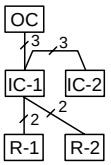
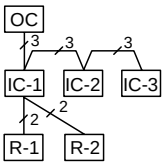
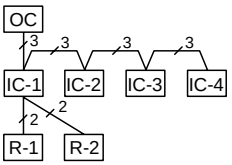
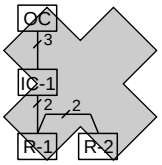
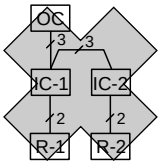
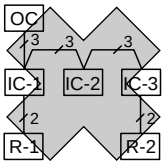
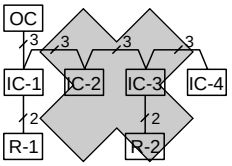
③ Electrical wiring diagram



## 15-3. Two remote controller control operation

**(1) Two Wired Remote Controllers**

(OC: Outdoor unit IC: Indoor unit R-1 Master remote controller R-2 Slave remote controller)

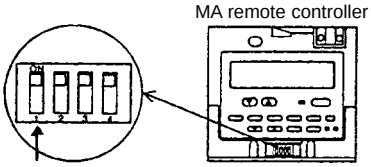
| Slim Air Conditioners System | | Standard 1:1 | Simultaneous Twin | Simultaneous Triple | Simultaneous Quadro |
|---|---|---|---|---|---|
| Remote controller connection circuit (Controller cable) | Outdoor unit OC<br>Indoor unit IC<br>Wired remote controller R |  |  |  |  |
| | Outdoor unit OC<br>Indoor unit IC<br>Wired remote controller R |  |  |  |  |

(Reference)

① If simultaneous twin, triple or four, connect the remote controller to anyone of the indoor units. Can control all functions of the indoor unit even if different models (different types) are mixed.

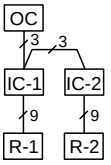
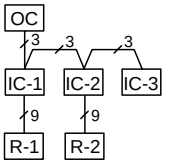
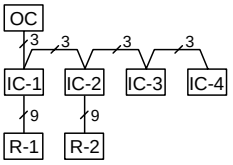
② Do not use crossover wiring among indoor units with simultaneous twin, triple or quadro units. (Prohibited item.)

③ On the main body of each remote controller, set the "Main/Sub selection switch" on one unit to "Main" (factory setting) and the other to "Sub". If MA remote controller, set switch No.1 to ON [(Main) Factory setting] and remaining switches to OFF (Sub).




**(2) Two wireless remote controllers**

(OC: Outdoor unit IC: Indoor unit R: Master remote controller R': Wireless remote controller optical receiver section)

| Slim Air Conditioners System | | Standard 1:1 | Simultaneous Twin | Simultaneous Triple | Simultaneous Quadro |
|---|---|---|---|---|---|
| Remote controller optical receiver section connection circuit | Outdoor unit OC<br>Indoor unit IC<br>Wireless remote controller optical receiver section R' | Cannot use two remote controllers. |  |  |  |

(Reference)

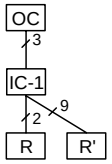
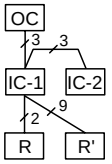
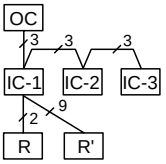
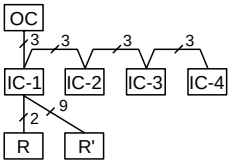
① If simultaneous twin, triple or four, connect the remote controller to anyone of the indoor units. Can control all functions of the indoor unit even if different models (different types) are mixed.

② Do not use crossover wiring among indoor units with simultaneous twin, triple or quadro units. (Prohibited item.)

③ Standard 1:1 While it is not possible to connect two remote controller optical sections to an indoor unit, it is possible to connect one each of the remote controller optical sections to each indoor unit. When this is done, all pair numbers are set to "0" (No setting required. Factory setting) and they can be stopped and started simultaneously.

**(3) One each of wired and wireless remote controllers**

(OC: Outdoor unit IC: Indoor unit R: Master remote controller R': Wireless remote controller optical receiver section)

| Slim Air Conditioners System | | Standard 1:1 | Simultaneous Twin | Simultaneous Triple | Simultaneous Quadro |
|---|---|---|---|---|---|
| Remote controller optical receiver section connection circuit | Outdoor unit OC<br>Indoor unit IC<br>Remote controller optical receiver section R-R' |  |  |  |  |

(Reference)

① If simultaneous twin, triple or four, connect the remote controller to anyone of the indoor units. Can control all functions of the indoor unit even if different models (different types) are mixed.

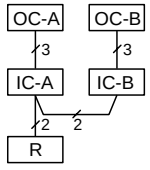
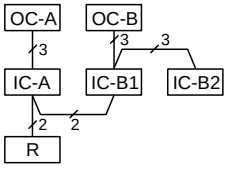
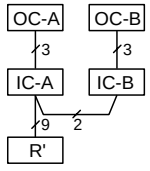
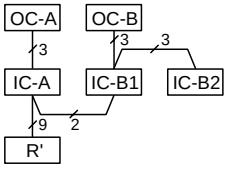
② Do not use crossover wiring among indoor units with simultaneous twin, triple or quadro units. (Prohibited item.)

③ On simultaneous twin, triple or four, it is possible to connect one each of the remote controller optical receiving section to each indoor unit.

## 15-4. Group control operation (Operating control of multiple refrigerant systems (2 to 16) as one group)

- Multiple Slim air conditioners operate at the same setting (operating mode, set temperature, etc.). However, each outdoor unit is turned on and off individually by the intake sensor.
- Can be used when there are restrictions when combining Free Combo Multi units (such as floor mount type and ceiling cassette, ceiling suspended, ceiling recessed, etc.) Up to 16 refrigerant systems can be controlled as a group by one remote controller.
- The outdoor unit addresses must be set. An address can be between 0 and 15 with no duplicates. Also, always set one unit as zero (0).

※ Simultaneous twin, triple and quad are one refrigerant systems. They are not multiple refrigerant systems. Individual twin is a two refrigerant system and addresses must be set for two refrigerant systems.

| Slim Air Conditioners System | | Standard 1:1 x 2 | Standard 1:1 + simultaneous twin |
|---|---|---|---|
| Remote controller connection circuit (Controller cable) | Outdoor unit OC<br>Indoor unit IC<br>Wired remote controller R |  |  |
| | Outdoor unit OC<br>Indoor unit IC<br>Remote controller optical receiver section R' |  |  |

(Reference)

① When there is two remote controller control, refer to two remote controller control operation.

② When there are different indoor unit models mixed within the same group, always set the outdoor unit that is connected to the indoor unit with the most functions (fan speed, vanes, louvers, etc.) as the host (refrigerant address = 00).

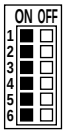
③ Do not use crossover wiring among indoor units with simultaneous twin, triple or quadro units.

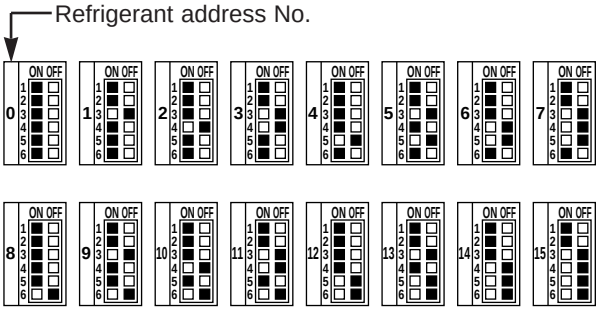
■ Outdoor unit address setting

- The address of each outdoor unit must be set when there is to be group control.
- The setting of the address of the outdoor unit is done by using DIP switch SW1 (3 to 6) on the circuit board of each outdoor unit. (Factory setting: all are set to off).
- The address setting by SW1 is as follows.

| | Function | Operation by switch operation | |
|---|---|---|---|
| | | ON | OFF |
| SW1 function selection | 1. Forced defrosting | | Normal |
| | 2. – | | Normal |
| | 3. Refrigerant address setting<br>4. ↑<br>5. ↑<br>6. ↑ | Set outdoor unit address between 0 and 15 | |

<SW1>



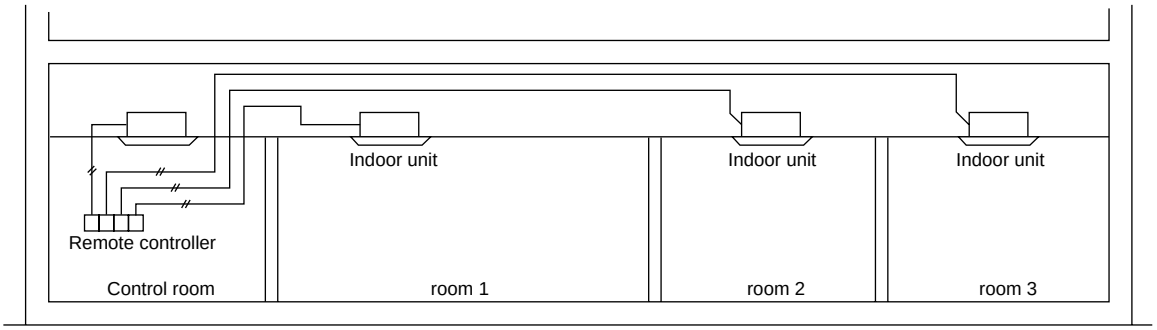

**Factory setting: All off refrigerant addresses are No. 0.**

## 15-5. Power Outage Automatic Recovery Operation

- Whenever a power outage or switching of the power supply causes the power supply of an operating air conditioner to go from OFF to ON, this function will automatically restore the operation of the air conditioner to its previous operating mode.
  ※ If the power is turned from OFF to ON when the air conditioner is not in operation, the air conditioner will not automatically be turned on. However, the timer operation will be cancelled if the air conditioner is in timer operation (including when the unit is waiting for its start time). Setting for timer operation must be performed once again.
- If there is a momentary power outage of less than one second while the air conditioner is in operation, there may not be a clear determination of whether or not there was a power failure. When it has been determined that there has been a power failure, recovery will take approximately four minutes after the power is restored. Please wait. (Once "H0" has appeared on the display, a protection system will operate to prevent the unit from restarting for three minutes.)
  When it has been determined that there has been no power failure, operation will continue as is.
- Settings can be made by function selections from the remote controller.
- When there is group control, selection of all refrigerants is required.

## 15-6. Individual control operation from a separate room

- By simply centralizing the remote controllers installed in each room in a separate control room, individual control or centralized monitoring of the air conditioners in each room can be attained.
- Air conditioner control can be performed up to a total of 500 meters away by connecting the indoor units and remote controllers with 0.3 to 1.25 $mm^2$ 2-core cable.




- If a remote controller is installed in a room and control room, refer to the section on operating with two remote controllers.

## 15-7. Combined Remote/Hand-held Control

- Operation/remote controller prohibit/ stop can be controlled from a remote location by routing the remote stop/start adapter (PAC-SE55RA-E sold separately) through the relay box installed on site. When this remote control is cancelled, the hand-held remote controller can be used for operating and stopping the air conditioner.

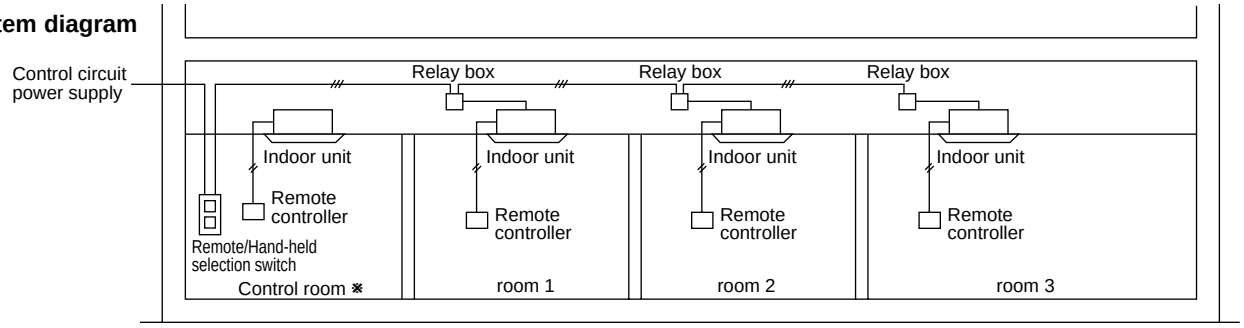
**1. Basic system wiring**

- Use the remote start/stop adapter (PAC-SE55RA-E) and connect the "Start/Stop Circuit From Remote Location" that comes from the relay box and remote/hand-held selection switch and connect it to the CN32 connector on the printed circuit board for the indoor unit

**<Points of precaution>**

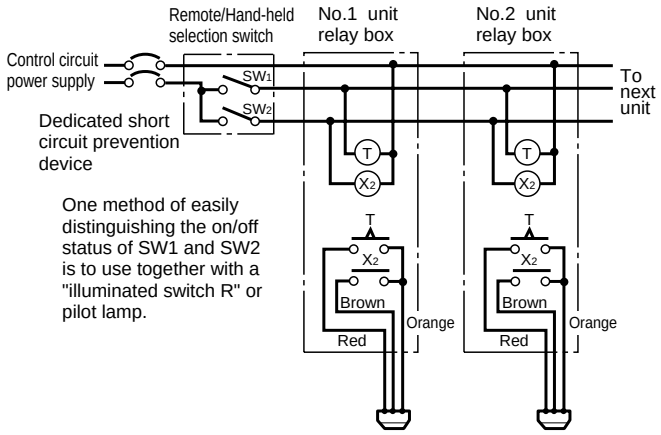
① Match the rated power supply voltage of the remote/hand-held selection switch and relay (X2) with the power supply for the controller.
② When performing group control of multiple outdoor unit using a timer, be sure to arrange the timer so that all units do not start at the same time. If this is not performed, all of the units will start at one time creating an over current that will cause the circuit breaker to operate.
③ An on-delay system is one that includes specifications for operating a limited time when an on signal is received and has a temporary off timer for recovery operations.
④ Use a connecting relay when the wiring length exceeds 10 meters, such as when performing remote wiring. If this is not provided, abnormal operation will occur.

**(1). System diagram**




※ The AC for the control room is usually disconnected from the remote/hand-held control system.

**(2). Basic wiring diagram**




Note: When using group address, connect to refrigerant address "0" on the inside.

**(3). Part specifications**

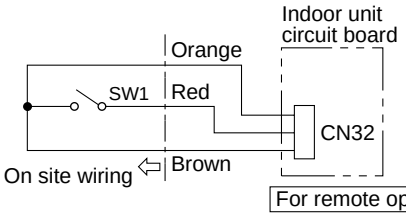
| ① Remote/Hand-held selection switch | ② Adapter for remote start/stop | ③ Relay box |
|---|---|---|
| (Example) Single polarity single-throw switch (125V rating) | Model PAC-SE55RA-E (Sold separately) | Ⓣ Timer (On delay system) ⓧ Relay |

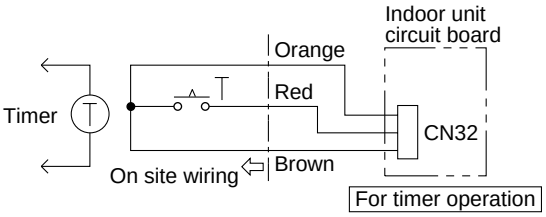
| Remote control | SW1 | ON | | OFF | |
|---|---|---|---|---|---|
| Remote/Hand-held selection switch | SW2 | ON | OFF | ON | OFF |
| Description of functions | | • Starting/stopping with remote controller disabled. • AC is in operation. • Starting/stopping by remote operation enabled. | • Starting/stopping with remote controller disabled. • Starting/stopping by remote operation enabled. | • Starting/stopping with remote controller disabled. • AC is in operation. • Starting/stopping by remote operation enabled. | • Starting/stopping with remote controller disabled. • Starting/stopping by remote operation enabled. |

**2. Examples of system applications**

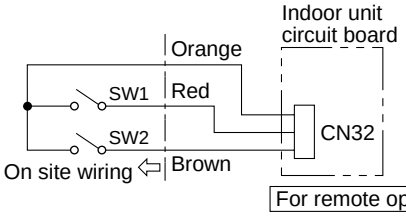
In any of the following examples, there is a five to six second delay from the time the operating command is issued until the operation begins.

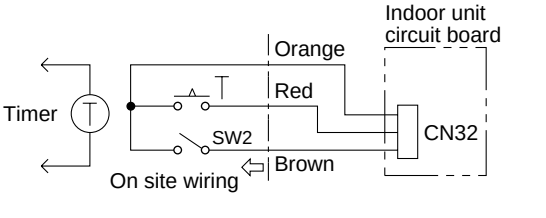
① This is when starting and stopping is performed by remote operation or external timer and when starting and stopping by the remote controller is to be prohibited.



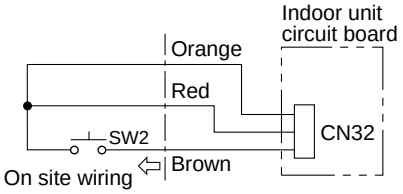




② This is when starting and stopping is performed by remote operation or external timer and when starting and stopping by the remote controller is to be separated.



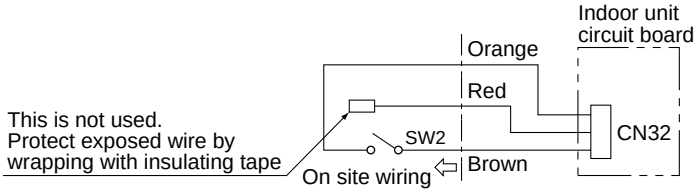




③ This is when starting and stopping is performed by remote operation and then allowing starting or stopping by remote control at any time.




Use momentary switch for SW2. (Manual operation/automatic recover switch on time is more than one second.)
Press SW2 (on time is more than one second) and operation starts. After this has been done, stopping or restarting can be down by remote controller.

④ This is when permitting or prohibiting operation by remote controller is performed by external circuit.

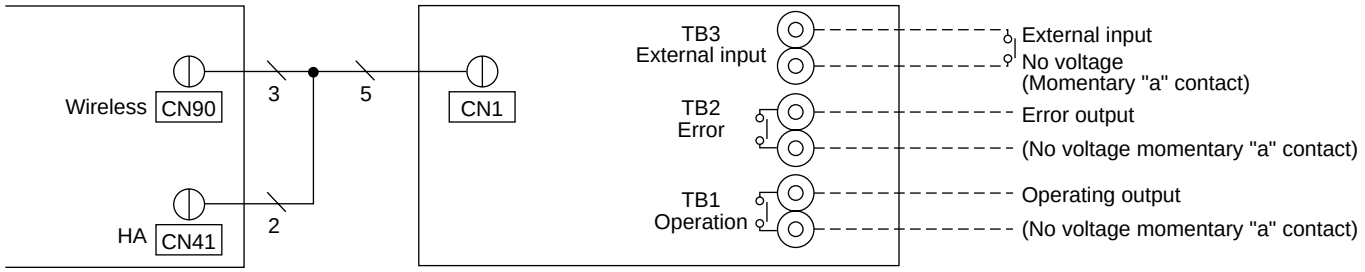



If SW2 is on, operation by remote controller cannot be performed.
If SW2 is off, operation by remote controller is permitted.

## 15-8. Obtaining remote display

Use the A control operating display kit (PAC-SF40RM-E) to provide operation/error non-voltage contact output and on/off input function.

**(1). Wiring method**




A control indoor control circuit board

A control operating display kit

| ⚠Caution | **TB3 is a dedicated terminal for contact point input. Never input voltage. It will damage the indoor control circuit board.** |
|---|---|

<Connections on the indoor unit side>

① When using external output function
Insert the 9-prong connector (3-core) of the attached cable to CN90 on the indoor control circuit board.

② When using the external input function
Insert the 4-prong connector (2-core) of the attached cable to CN41 on the indoor control circuit board.

※ The connector is direction-sensitive. Use care not to make an error when inserting.
Never force the connectors. This will result in damage.

**(2). Locally procured parts**

| Item | Name | Model and specifications |
|---|---|---|
| External output function | External output signal wire | Use sheathed vinyl coated cord or cable.<br>Wire type: CV, CVS or equivalent.<br>Wire size: Stranded wire 0.5mm² to 1.25mm²<br>One-wire: ϕ0.65mm to 1.25mm |
| | Display lamp, etc. | No voltage “a” contact AC200V (DC30V), 1A or less |
| External input function | External input signal wire | Use sheathed vinyl coated cord or cable.<br>Wire type: CV, CVS or equivalent.<br>Wire size: Stranded wire 0.5mm² to 1.25mm²<br>One-wire: ϕ0.65mm to 1.2mm |
| | Switch | No voltage “a” contact<br>(Start and stop operation is switched by inputting a pulse of 200ms or more) |

## 15-9. Timer operation

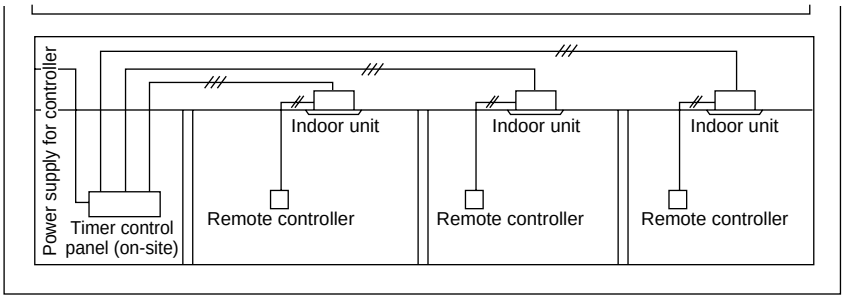
- Timer operation can be performed by setting the wired or wireless remote controller timer. Start and stop times can be set in 10-minute increments within a 24-hour period.
- When used in combination with the central control remote controller of the M-NET control system for the outdoor unit, one program timer can be used for individual timer settings for each group of the central control system. (Each timer setting can be stored in data memory so timer settings for up to 50 groups can be set individually.)

※ Please refer to the MELANS catalog or technical information for details about the central control remote controller.

### 1.Operating with on-site timer

**(1). Summary of system**

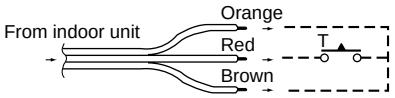
If the “Remote ON/OFF adaptor” (PAC-SE55RA-E) (sold separately) is used, the on-site timer can be operated to turn each unit on and off.



**(2). Basic pattern for timer control**

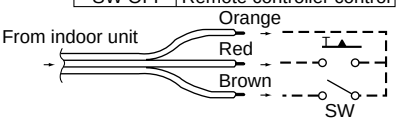
Use a no-voltage contact point output timer (one that has separate circuits for the load side and timer power supply).

a) Timer-independent control




b) Combined control by timer and remote controller

| | |
|---|---|
| SW ON | Timer control |
| SW OFF | Remote controller control |




**(3). Basic system**

12-6 Refer to the section on combined control by remote control and hand-held remote controller.

## 15-10. Linked operation with peripheral air conditioners equipment

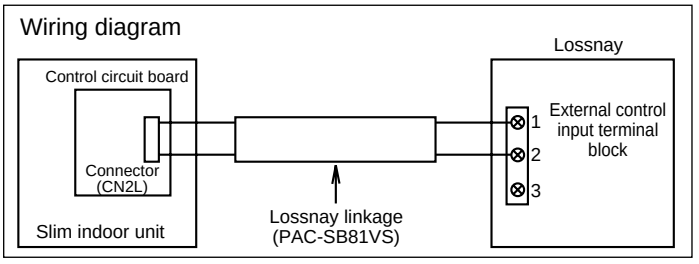
### ■ Lossnay operation

● Linked operation with a Lossnay unit can be obtained by connecting Lossnay linkage cable (Model PAC-SB81VS - sold separately) to the CN2L (Remote kit) on the circuit board of the indoor unit. This function must be selected from the remote controller.
Refer to “7. Function Setting.”

**① Summary of wiring**

● Connect the Lossnay linkage cable (Model PAC-SB81VS) connector to CN2L on the indoor unit on the circuit board of the indoor unit.

● Connect the lead wire of the Lossnay linkage cable to the Lossnay external control input terminal blocks (1) and (2).
(At this time, the input terminal blocks (1) and (2) have no polarity.)




**② Precautions when wiring**

● The Lossnay linkage cable can be extended up to a maximum of 500 meters.
When extending the Lossnay linkage cable, be sure to connect securely and take proper steps to ensure insulation.
(Extension cable specifications: Sheathed vinyl cord or cable 0.5 to 0.75mm$^2$)

● Lossnay linked cable

● Arrange wiring so that there can be no contact between the Lossnay linkage cable and the power supply cord. Contact may cause malfunctioning. (Separate by 5cm or more.)

## 15-11. External mounting of temperature sensor

● Temperature control from an alternative external location can be performed by connecting the temperature sensor (Model PAC-SE41TS-E - sold separately) to the CN20 connector on the circuit board for the indoor unit.

● The wired remote controller also has an internal temperature sensor. Function selection from the remote controller is required.
Refer to “10. FUNCTION SETTING” for information about selecting functions with the remote controller.

Mr.SLIM™

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