Refrigerant R410A
INVERTER

AIR CONDITIONER

**Duct type**

# DESIGN & TECHNICAL MANUAL

INDOOR

AR∗G60LHTA

OUTDOOR

AO∗G60LATT

FUJITSU GENERAL LIMITED

# 1. INDOOR UNIT

## DUCT TYPE :

## AR∗G60LHTA

DUCT TYPE
AR∗G60LHTA

# CONTENTS

## 1. INDOOR UNIT

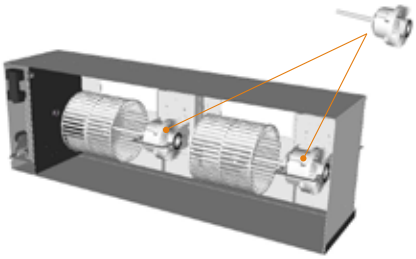
# 1. FEATURES

## ■ MODEL
**AR∗G60LHTA / AO∗G60LATT**

## ■ FEATURES

### ● Energy saving technology (ALL DC)

**DC fan motor**

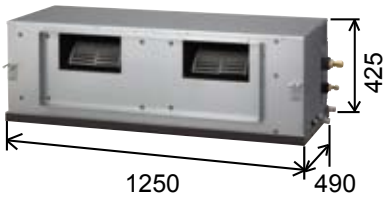


The power consumption has been reduced drastically by the introduction of DC fan motors.

### ● Space saving

**• Compact size**

High performance has been realized with a compact indoor unit.
Due to the compact size of the indoor unit, the installation space required has been reduced allowing for a wider selection on installation locations.



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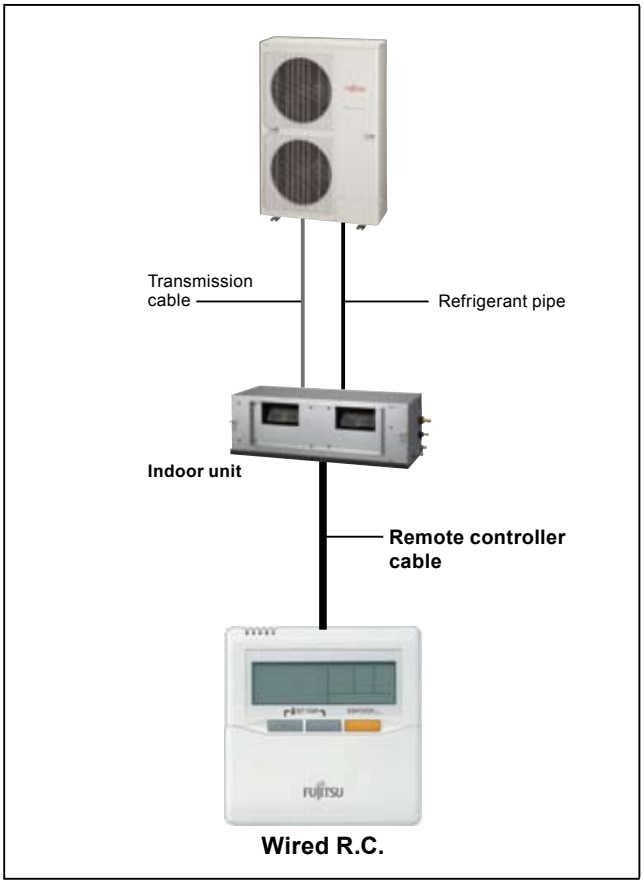
## ● Control system

### • 1-Remote controller control

This is the most basic system.

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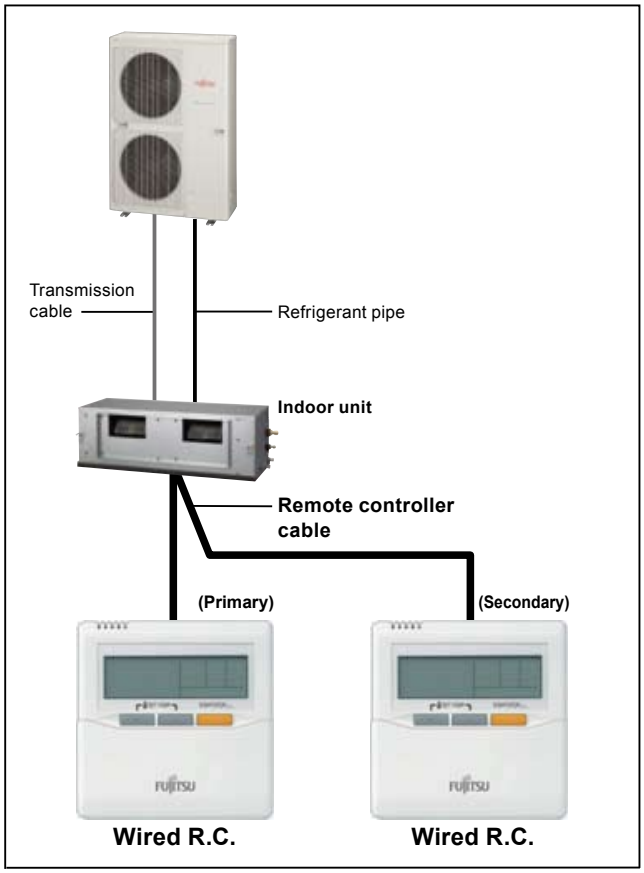
## • 2-Remote controllers control

Control locally and from a remote point is possible using 2-remote controllers.




* For 2-wired type remote controllers, specify a Primary and a Secondary remote controller.
* The timer function of the remote controller specified the Secondary cannot be used.

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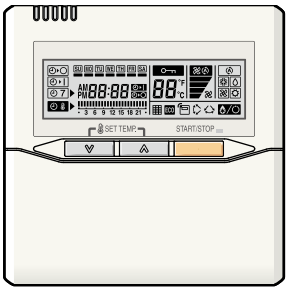
# 2. WIRED REMOTE CONTROLLER

## ■ FEATURES



- ∗ Various timer setup (ON / OFF / WEEKLY) are possible.
- ∗ Equipped with weekly timer as standard function.(2 times Start / Stop per day for a week)
- ∗ When setting up a timer, operation mode and a temperature setup can be changed.
- ∗ When a failure occurs, the error code is displayed. (Maximum of 16)
- ∗ Error indication.(A maximum of 16 error histories are memorizable.)
- ∗ Up to 16 indoor units can be simultaneously controlled.
- ∗ The room temperature can be controlled by being detected the temperature accurately with built-in thermo sensor.

### ● Simple function setting

Setting of the air conditioner selection function is performed by remote controller.

### ● High performance and compact size

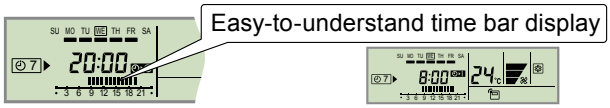
Three functions are combined in one unit.

Wired remote controller + Weekly timer + Setback timer

### ● Built-in timers

**Weekly timer**

Possible to set ON/OFF time to operate twice each day of the week.

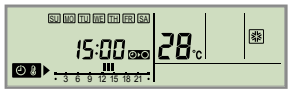



Setup screen example
(Set to Wednesday: 8:00 to 20:00.)

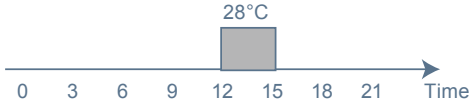
Screen after setup


**Setback timer**

Possible to set temperature for two time spans and for each day of the week.

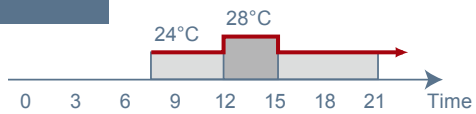



Setup screen example
(Set from Sunday to Saturday: 12:00 to 15:00, 28 °C.)

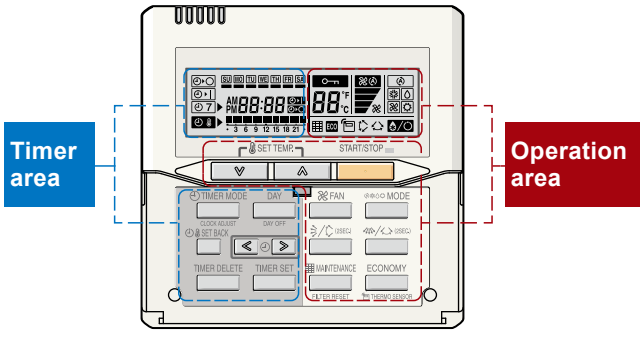



**At "Weekly timer" + "Set back timer" setup**

24°C → 28°C → 24°C




### ● Easy-to-understand operation

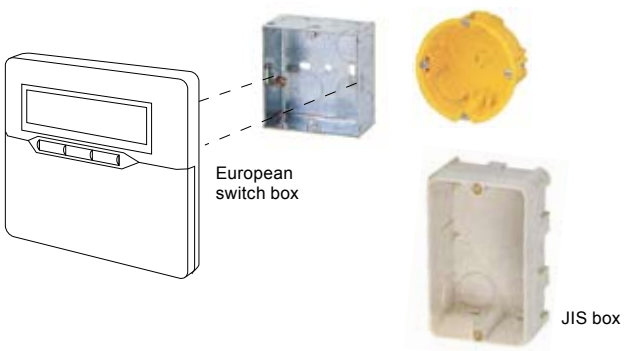



[Variable timer control]

The operation/display sections are zoned according to time and operation, enabling variable programming to match application.

### ● Simple installation

Components are compatible with standard switch boxes. Flat back construction allows equipment to be installed wherever it is needed.



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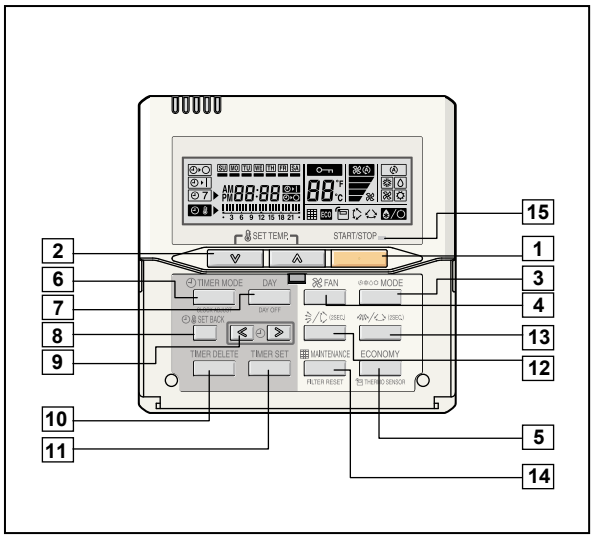
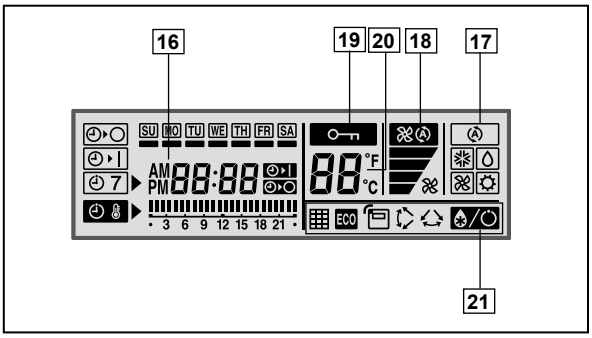
# ■ FUNCTIONS




Display panel




**1** **START/STOP button**
Pressed to start and stop operation.

**2** **SET TEMP. button**
Selects the setting temperature.

**3** **MODE button**
Selects the operating mode (AUTO, HEAT, FAN, COOL, DRY).

**4** **FAN button**
Selects the fan speed (AUTO, LOW, MED, HIGH).

**5** **ECONOMY button**
Turns the economy efficient mode on and off.

**6** **TIMER MODE (CLOCK ADJUST) button**
Selects the timer mode (OFF TIMER, ON TIMER, WEEKLY TIMER). Set the current time.

**7** **DAY (DAY OFF) button**
Temporarily cancels of one day timer.

**8** **SET BACK button**
Pressed to select the set back timer.

**9** **Set time button**
Pressed to set time.

**10** **TIMER DELETE button**
The schedule of a weekly timer is deleted.

**11** **TIMER SET button**
Sets the date, hour, minute and on-off time.

**12** **Vertical airflow direction and swing button**
Push for two seconds to change the swing mode.

**13** **Horizontal airflow direction and swing button**
Push for two seconds to change the swing mode.

**14** **FILTER RESET button**

**15** **Operation lamp**
Lights during operation and when the timer is on.

**16** **Timer and clock display**

**17** **Operation mode display**

**18** **Fan speed display**

**19** **Operation lock display**

**20** **Temperature display**

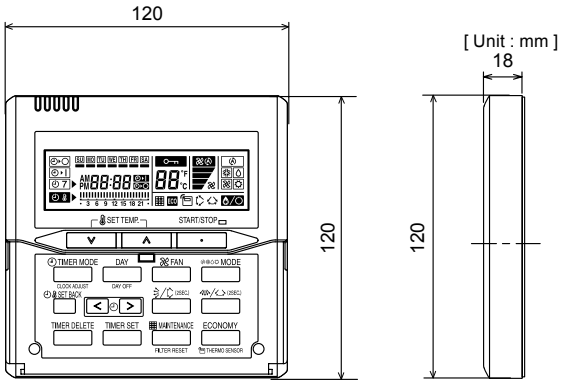
**21** **Function display**

- Defrost display
- Thermo sensor display
- Economy display
- Vertical swing display
- Horizontal swing display
- Filter display

Functions will be different due to type of indoor unit.
For details, please see operation manual.

# ■ DIMENSION

[ Unit : mm ]




Front View　　Side View

# ■ SPECIFICATION

| | | |
|---|---|---|
| SIZE | (H x W x D mm) | 120 x 120 x 18 |
| WEIGHT | ( g ) | 160 |
| CABLE LENGTH | ( m ) | 10 |
| POWER | ( V ) | 12 |

# ■ WIRING SPECIFICATIONS

| Use | Size | Wire type | Remarks |
|---|---|---|---|
| Remote controller cable | 0.33mm$^2$ ( 22AWG ) | Polar 3 core | Use sheathed PVC cable. |

# 3. SPECIFICATIONS

| Type | | | | | DUCTED MODEL |
|---|---|---|---|---|---|
| | | | | | INVERTER HEATPUMP |
| Model name | | | | | AR∗G60LHTA |
| Power source | | | | | 230V 50Hz |
| Available voltage range | | | | | 198 - 264V 50Hz |
| Capacity | Cooling | Rated | | kW | 15.0 |
| | | | | Btu/h | 51,200 |
| | | Min - Max. | | kW | 6.2-17.5 |
| | | | | Btu/h | 21,200-60,000 |
| | Heating | Rated | | kW | 18.0 |
| | | | | Btu/h | 61,500 |
| | | Min - Max. | | kW | 6.2-20.0 |
| | | | | Btu/h | 21,200-68,300 |
| Input power | Cooling | Rated | | kW | 4.70 |
| | | Max | | | 7.15 |
| | Heating | Rated | | | 5.15 |
| | | Max | | | 7.15 |
| Current | Cooling | Rated | | A | 6.9 |
| | Heating | | | | 7.6 |
| EER | | Cooling | | kW/kW | 3.19 |
| COP | | Heating | | | 3.50 |
| Moisture removal | | | | l/h (pints/h) | 2.0 (3.5) |
| Maximum operating current * | | Cooling | | A | 12.5 |
| | | Heating | | | 12.5 |
| Fan | Air flow rate | Cooling | High | $m^3/h$ | 3,550 |
| | | | Med | | 3,000 |
| | | | Low | | 2,450 |
| | | Heating | High | | 3,550 |
| | | | Med | | 3,000 |
| | | | Low | | 2,450 |
| | Type × Q'ty | | | | Sirocco x 2 |
| | Motor output | | | W | 197 x 2 |
| Recommended static pressure | | | | Pa | 60-260 |
| Sound pressure level | | Cooling | High | dB (A) | 45 |
| | | | Med | | 40 |
| | | | Low | | 36 |
| | | Heating | High | | 45 |
| | | | Med | | 40 |
| | | | Low | | 36 |
| Heat exchanger type | | Dimensions (H × W × D) | | mm | 378 x 1,090 x 53.2 |
| | | Fin pitch | | | 1.3 |
| | | Rows x Stages | | | 4 x 18 |
| | | Pipe type | | | Copper |
| | | Fin type | | | Aluminium |
| Enclosure | | Material | | | Steel |
| | | Colour | | | - |
| Dimensions (H × W × D) | Net | | | mm | 425 x 1,250 x 490 |
| | Gross | | | | 490 x 1,440 x 655 |
| Weight | Net | | | kg | 54 |
| | Gross | | | | 61 |
| Connection pipe | Size | Liquid | | mm | Ø 9.52 (Ø 3/8 in.) |
| | | Gas | | | Ø 15.88 (Ø 5/8 in.) |
| | Method | | | | Flare |
| Operation range | | Cooling | | °C | 18 to 32 |
| | | | | %RH | 80 or less |
| | | Heating | | °C | 16 to 30 |
| Remote controller type | | | | | Wired |
| Drain port | Material | | | | Steel |
| | Size | | | mm | Ø 23.4 (I.D.), Ø 25.4 (O.D.) |

Note :
Specifications are based on the following conditions.
Cooling : Indoor temperature of 27 °CDB / 19 °CWB.and outdoor temperature of 35 °CDB/24 °CWB.
Heating : Indoor temperature of 20 °CDB / 15 °CWB.and outdoor temperature of 7 °CDB/6 °CWB.
Standard static pressure : 60 Pa.
Pipe length : 7.5 m, Height difference : 0 m.(Outdoor unit - Indoor unit)
The protective function may work when using it outside the temperature range mentioned above.
Drain hose should be field supplied.
*: The maximum current is the maximum value when operated within the operation range.

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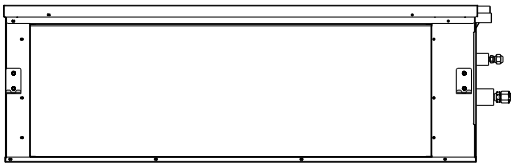
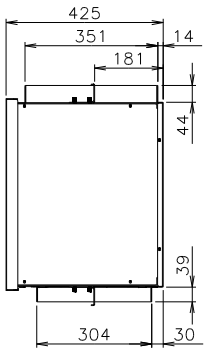
# 4. DIMENSIONS

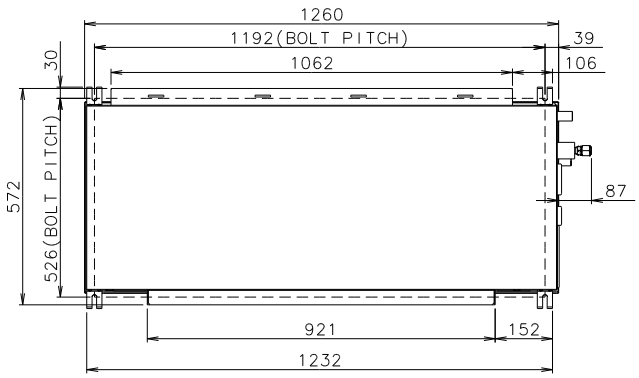
## ■ MODEL: AR∗G60LHTA

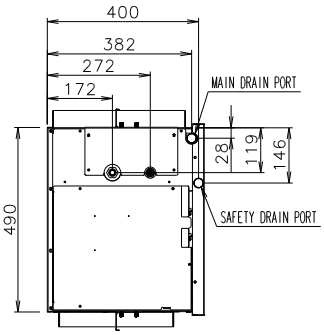


REAR VIEW




SIDE VIEW (L)

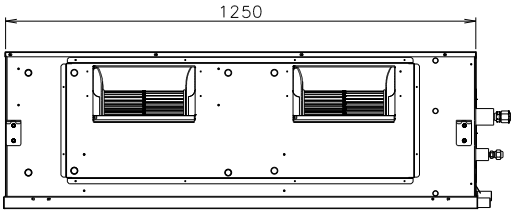



SIDE VIEW (R)

AIR FLOW

TOP VIEW




FRONT VIEW

(Unit : mm)

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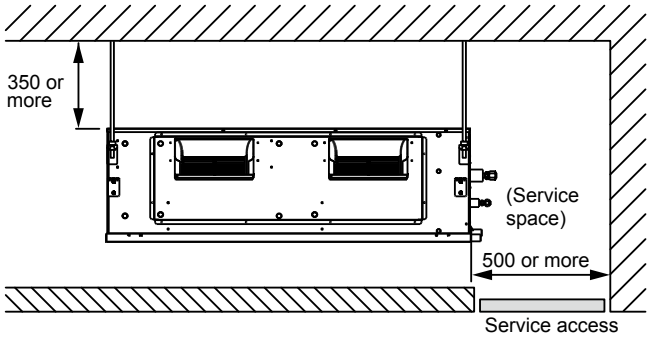
# ■ INSTALLATION PLACE

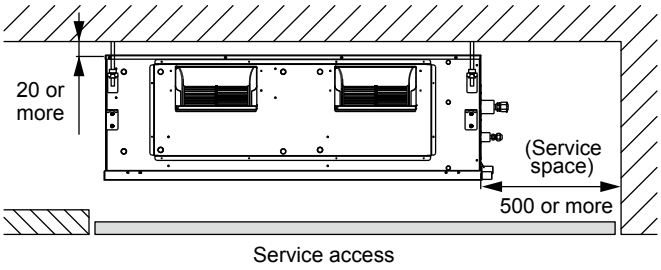
(Unit : mm)

## ●AR∗G60LHTA

Installation by which service space is made on top of the unit (recommended).




Installation by which service is carried out from the bottom of the unit.

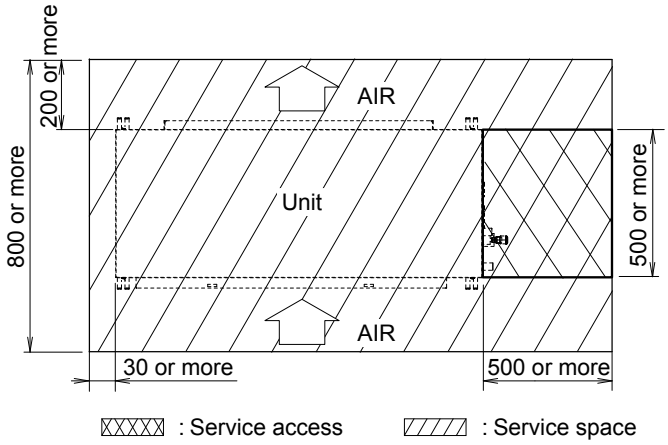



# ■ MAINTENANCE SPACE

Provide a maintenance space for inspection purposes as shown below.
Do not place any wiring or illumination in the service space, as they will impede service.

(Unit : mm)

## ●AR∗G60LHTA



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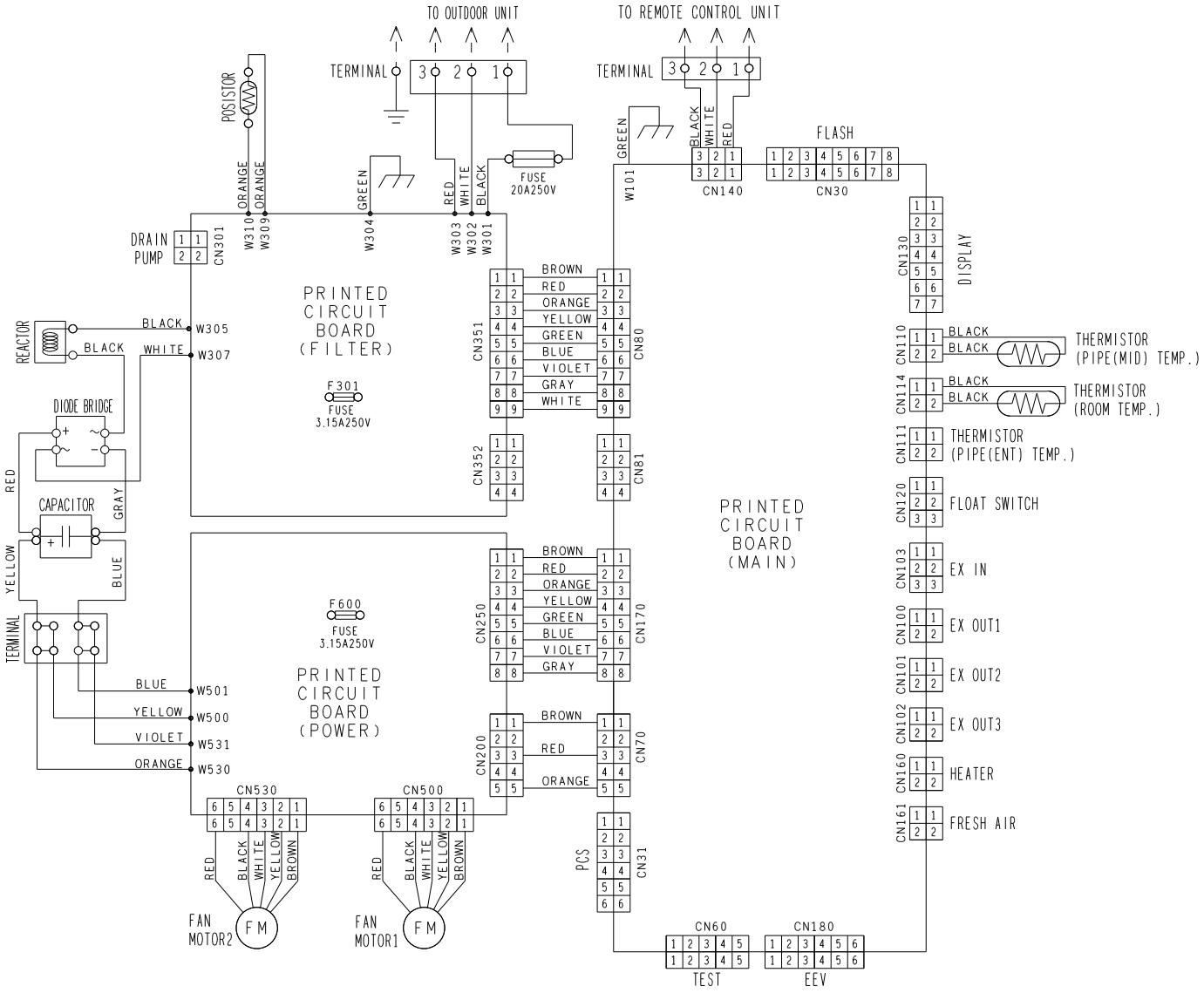
# 5. WIRING DIAGRAMS

## ■ MODEL: AR∗G60LHTA



DUCT TYPE
AR∗G60LHTA

# 6. CAPACITY TABLE

## 6-1. COOLING CAPACITY

**This table is created using the rated capacity.**

## ■ MODEL: AR∗G60LHTA

| AFR | 59.2 |
|---|---|

| | | Indoor temperature | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | °CDB | 18 | | | 21 | | | 23 | | | 25 | | | 27 | | | 29 | | | 32 | | |
| | °CWB | 12 | | | 15 | | | 16 | | | 18 | | | 19 | | | 21 | | | 23 | | |
| Outdoor temperature | °CDB | TC | SHC | IP | TC | SHC | IP | TC | SHC | IP | TC | SHC | IP | TC | SHC | IP | TC | SHC | IP | TC | SHC | IP |
| | -15 | 13.04 | 12.32 | 2.77 | 14.53 | 12.40 | 2.82 | 15.02 | 13.48 | 2.83 | 16.01 | 13.52 | 2.86 | 16.51 | 14.60 | 2.87 | 17.50 | 14.54 | 2.90 | 18.49 | 15.49 | 2.93 |
| | -10 | 13.03 | 12.31 | 2.78 | 14.51 | 12.38 | 2.82 | 15.01 | 13.46 | 2.83 | 16.00 | 13.51 | 2.86 | 16.49 | 14.59 | 2.88 | 17.48 | 14.53 | 2.90 | 18.47 | 15.48 | 2.93 |
| | 0 | 13.03 | 12.33 | 2.79 | 14.51 | 12.40 | 2.84 | 15.00 | 13.48 | 2.85 | 15.99 | 13.53 | 2.88 | 16.49 | 14.61 | 2.89 | 17.48 | 14.55 | 2.92 | 18.47 | 15.50 | 2.95 |
| | 5 | 12.92 | 12.35 | 3.17 | 14.39 | 12.43 | 3.22 | 14.88 | 13.51 | 3.23 | 15.86 | 13.55 | 3.27 | 16.35 | 14.64 | 3.28 | 17.33 | 14.58 | 3.32 | 18.32 | 15.53 | 3.35 |
| | 10 | 12.68 | 12.19 | 3.31 | 14.13 | 12.27 | 3.37 | 14.61 | 13.33 | 3.38 | 15.57 | 13.38 | 3.42 | 16.05 | 14.45 | 3.44 | 17.02 | 14.39 | 3.47 | 17.98 | 15.33 | 3.50 |
| | 15 | 12.45 | 12.00 | 3.56 | 13.86 | 12.08 | 3.62 | 14.34 | 13.13 | 3.63 | 15.28 | 13.17 | 3.67 | 15.76 | 14.22 | 3.69 | 16.70 | 14.17 | 3.73 | 17.65 | 15.09 | 3.76 |
| | 20 | 12.32 | 12.00 | 3.34 | 13.72 | 12.08 | 3.39 | 14.19 | 13.13 | 3.41 | 15.12 | 13.17 | 3.44 | 15.59 | 14.22 | 3.46 | 16.53 | 14.17 | 3.49 | 17.46 | 15.09 | 3.53 |
| | 25 | 12.21 | 11.85 | 3.89 | 13.60 | 11.92 | 3.95 | 14.06 | 12.96 | 3.98 | 14.99 | 13.01 | 4.02 | 15.45 | 14.05 | 4.04 | 16.38 | 13.99 | 4.08 | 17.31 | 14.90 | 4.12 |
| | 30 | 11.69 | 11.62 | 4.46 | 13.03 | 11.74 | 4.53 | 13.47 | 12.77 | 4.56 | 14.36 | 12.81 | 4.60 | 14.80 | 13.83 | 4.63 | 15.69 | 13.78 | 4.67 | 16.58 | 14.68 | 4.72 |
| | 35 | 11.85 | 11.60 | 4.54 | 13.20 | 11.87 | 4.61 | 13.65 | 12.90 | 4.63 | 14.55 | 12.94 | 4.68 | 15.00 | 13.98 | 4.70 | 15.90 | 13.92 | 4.75 | 16.80 | 14.83 | 4.79 |
| | 40 | 11.00 | 10.99 | 5.23 | 12.26 | 11.25 | 5.32 | 12.68 | 12.23 | 5.34 | 13.51 | 12.27 | 5.40 | 13.93 | 13.25 | 5.42 | 14.77 | 13.19 | 5.48 | 15.60 | 14.05 | 5.53 |
| | 46 | 7.14 | 7.14 | 3.66 | 7.95 | 7.67 | 3.71 | 8.22 | 8.13 | 3.73 | 8.76 | 8.36 | 3.77 | 9.03 | 9.03 | 3.79 | 9.57 | 9.00 | 3.83 | 10.12 | 9.58 | 3.87 |

AFR: Air Flow Rate ($m^3$/min)
TC : Total Capacity (kW)
SHC: Sensible Heat Capacity (kW)
IP : Input Power (kW)

DUCT TYPE
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# 6-2. HEATING CAPACITY

**This table is created using the rated capacity.**

## ■ MODEL: AR∗G60LHTA

| AFR | 59.2 |
|---|---|

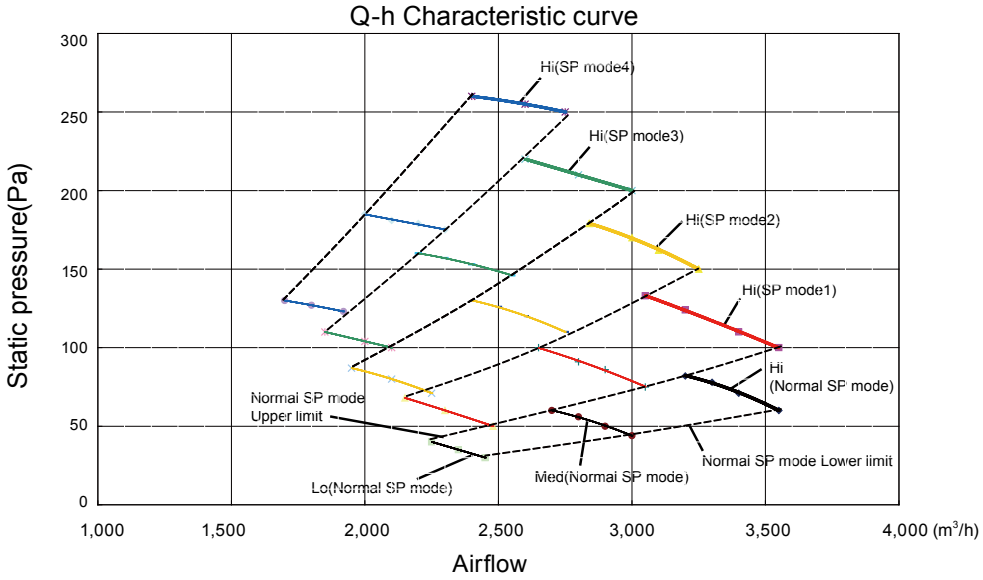
| | | | Indoor temperature | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | °CDB | 16 | | 18 | | 20 | | 22 | | 24 | |
| Outdoor temperature | °CDB | °CWB | TC | IP | TC | IP | TC | IP | TC | IP | TC | IP |
| | -15 | -16 | 13.17 | 5.18 | 12.86 | 5.29 | 12.55 | 5.40 | 12.23 | 5.51 | 11.92 | 5.62 |
| | -10 | -11 | 14.64 | 5.18 | 14.29 | 5.29 | 13.95 | 5.40 | 13.60 | 5.51 | 13.25 | 5.62 |
| | -5 | -7 | 16.23 | 5.18 | 15.85 | 5.29 | 15.46 | 5.40 | 15.07 | 5.51 | 14.69 | 5.62 |
| | 0 | -2 | 17.48 | 5.19 | 17.06 | 5.30 | 16.64 | 5.41 | 16.23 | 5.52 | 15.81 | 5.63 |
| | 5 | 3 | 18.84 | 5.20 | 18.39 | 5.31 | 17.94 | 5.42 | 17.49 | 5.53 | 17.05 | 5.64 |
| | 7 | 6 | 18.90 | 4.94 | 18.45 | 5.05 | 18.00 | 5.15 | 17.55 | 5.25 | 17.10 | 5.36 |
| | 10 | 8 | 20.74 | 4.62 | 20.25 | 4.71 | 19.76 | 4.81 | 19.26 | 4.91 | 18.77 | 5.00 |
| | 15 | 10 | 22.28 | 4.58 | 21.75 | 4.68 | 21.22 | 4.77 | 20.69 | 4.87 | 20.16 | 4.94 |
| | 20 | 15 | 21.63 | 4.51 | 21.12 | 4.60 | 20.60 | 4.69 | 20.09 | 4.79 | 19.57 | 4.86 |
| | 24 | 18 | 19.91 | 3.75 | 19.43 | 3.83 | 18.96 | 3.91 | 18.48 | 3.99 | 18.01 | 4.05 |

AFR: Air Flow Rate ($m^3$/min)
TC : Total Capacity (kW)
IP : Input Power (kW)

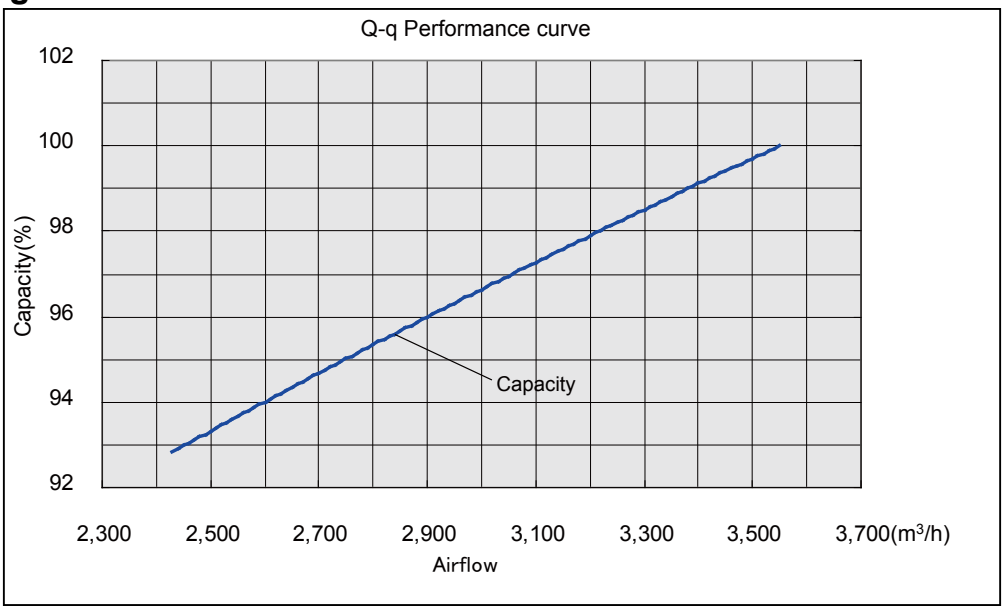
DUCT TYPE
AR∗G60LHTA

# 7. FAN PERFORMANCE AND CAPACITY

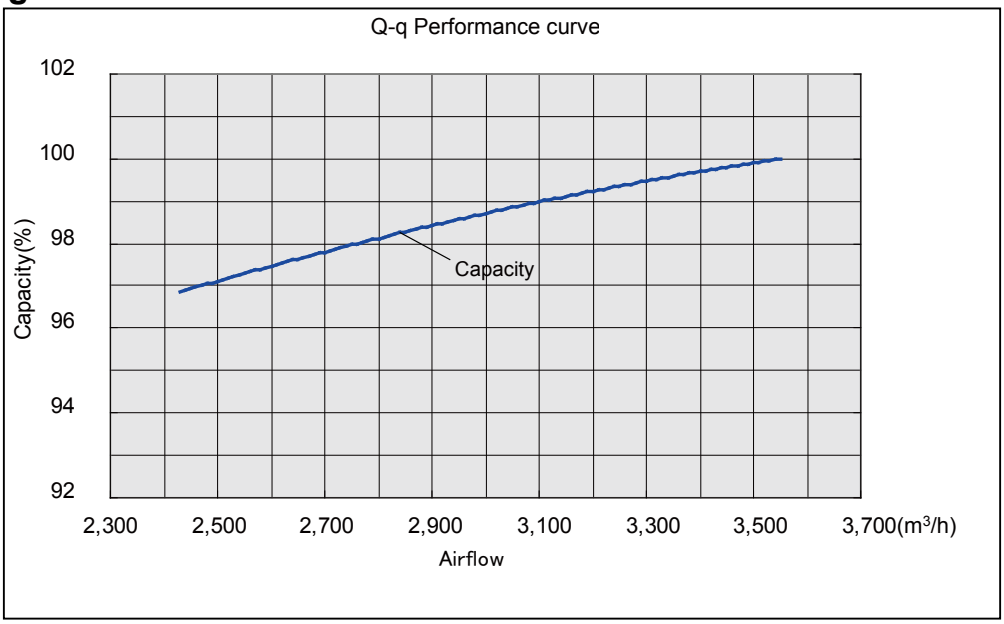
## ■MODEL: AR∗G60LHTA




### ●Cooling




### ●Heating



DUCT TYPE
AR∗G60LHTA

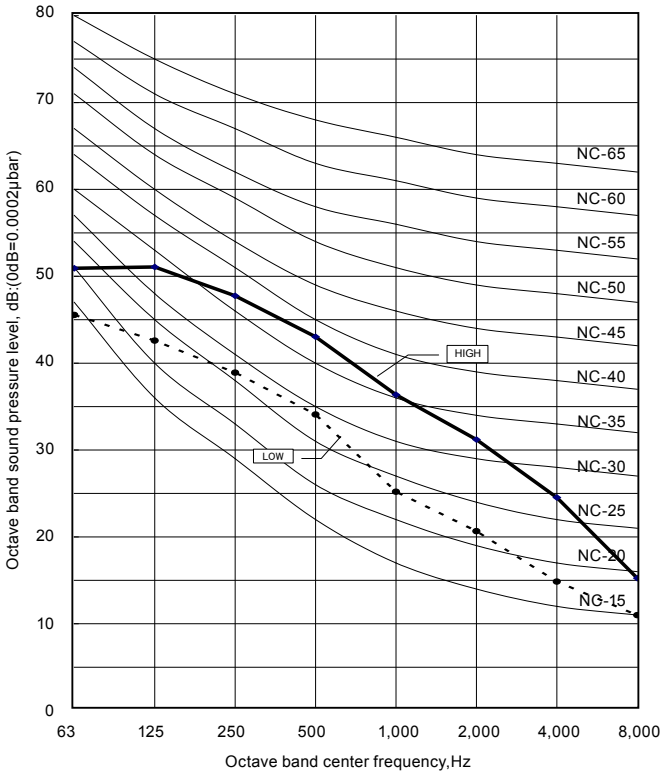
# 8. OPERATION NOISE

## 8-1. NOISE LEVEL CURVE

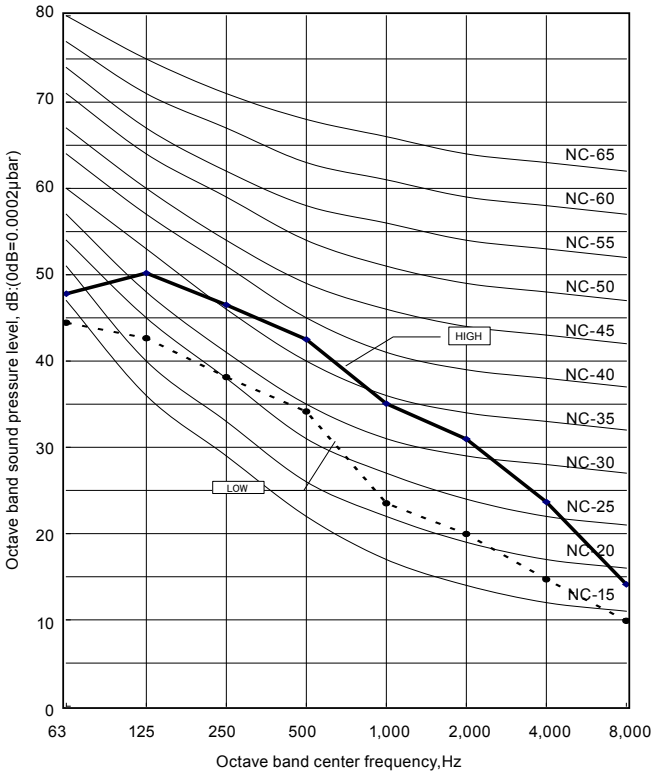
Condition
Static pressure : 60Pa
Static pressure mode : Normal

### ■ MODEL: AR∗G60LHTA

#### ● Cooling

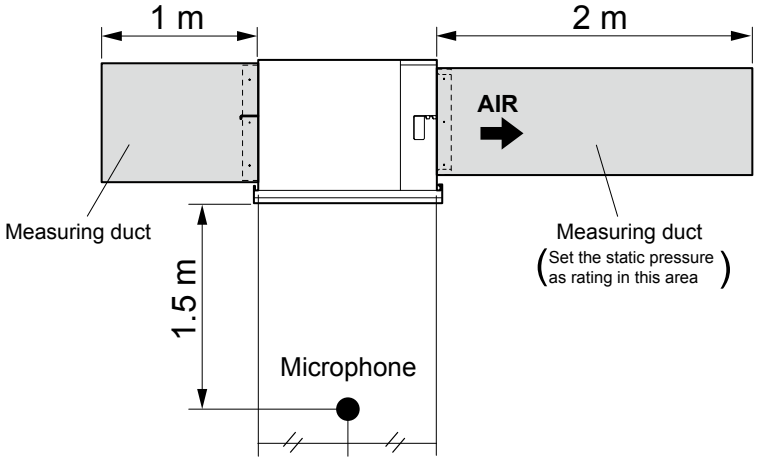


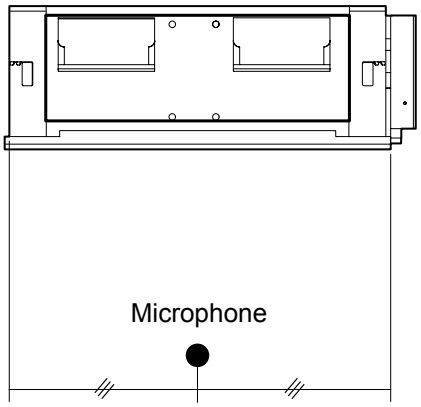

#### ● Heating



DUCT TYPE
AR∗G60LHTA

# 8-2. SOUND LEVEL CHECK POINT



# 9. ELECTRIC CHARACTERISTICS

| Model name | | | AR∗G60LHTA |
|---|---|---|---|
| Power supply | Voltage | V | 230~ |
| | Frequency | Hz | 50 |
| Max Operating Current (Indoor unit) | | A | 3.5 |
| Wiring spec. (Indoor unit to outdoor unit) | Connection cable | $mm^2$ | 1.5 (Min.) |
| | Limited wiring length | m | 75 |

Note: Wiring specification
1. Selected sample
   (Selected based on Japan Electrotechnical Standard and Codes Committee E0005)
2. Limited wiring length : Limit voltage drop to less than 2%. Increase cable gauge if voltage drop is 2% or more.
3. If the transmission wire is longer than 50m, use the bigger conductor size.

# 10. SAFETY DEVICES

| | Protection form | Model |
|---|---|---|
| | | AR∗G60LHTA |
| Circuit protection | Current fuse (PCB) | 250V 3.15A |
| Fan motor protection | Thermal protection program | 115±15°C OFF<br>70°C ON |

DUCT TYPE
AR∗G60LHTA

# 11. EXTERNAL INPUT & OUTPUT

| INPUT | OUTPUT | Connector | REMARKS |
|---|---|---|---|
| CONTROL INPUT | — | CN103 | See external input/output settings for details. |
| — | OPERATION STATUS | CN100 | |
| — | ERROR STATUS | CN101 | |
| — | FRESH AIR CONTROL | CN161 | |
| — | AUXILIARY HEATER | CN160 | |

# 11-1. EXTERNAL INPUT

## ■ CONTROL INPUT (Operation/Stop or Forced stop)

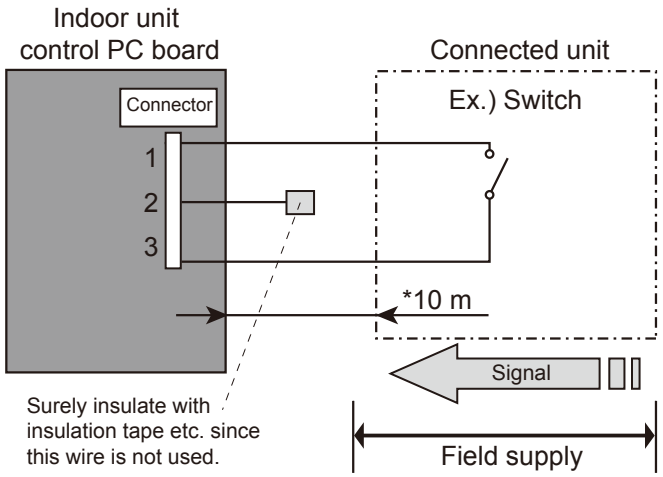
The air conditioner can be remotely operated by means of the following on-site work.

"Operation/Stop" mode or "Forced stop" mode can be selected with function setting of indoor unit.

Unit operation is started at the following contents by adding the contact input of a commercial ON/OFF switch to a connector on the external control PC board and turning it ON.

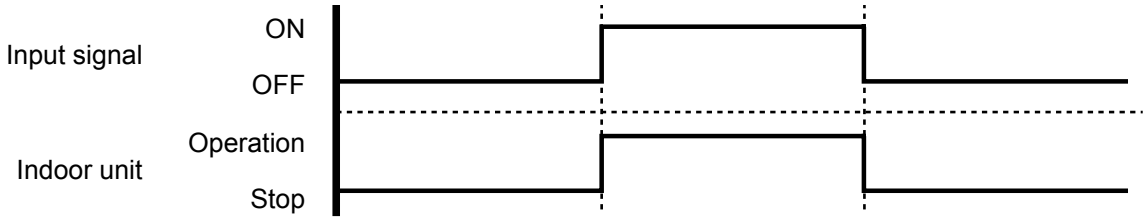
| Unit operation | Initial setting after power is ON | Starting mode other than initial setting |
|---|---|---|
| Operation mode | Auto changeover | Mode at previous operation |
| Set temperature | 24°C | Temperature at previous operation |
| Air flow mode | AUTO | Mode at previous operation |

### ● Circuit diagram example



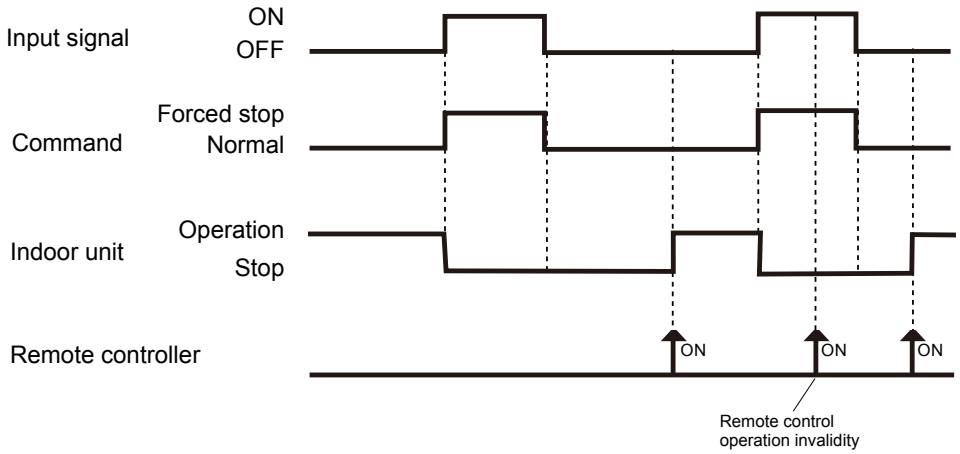

* Make the distance from the PC board to the connected unit within 10 m.
Contact capacity : 5VDC or more, 15mA or more.
Please use non-polar relays and switches.

• When function setting is in "Operation/Stop" mode



DUCT TYPE
AR∗G60LHTA

● When function setting is in "Forced stop" mode




## ● Parts (Optional)

| Model name |
|---|
| UTD-ECS5A |

Wire (External input)

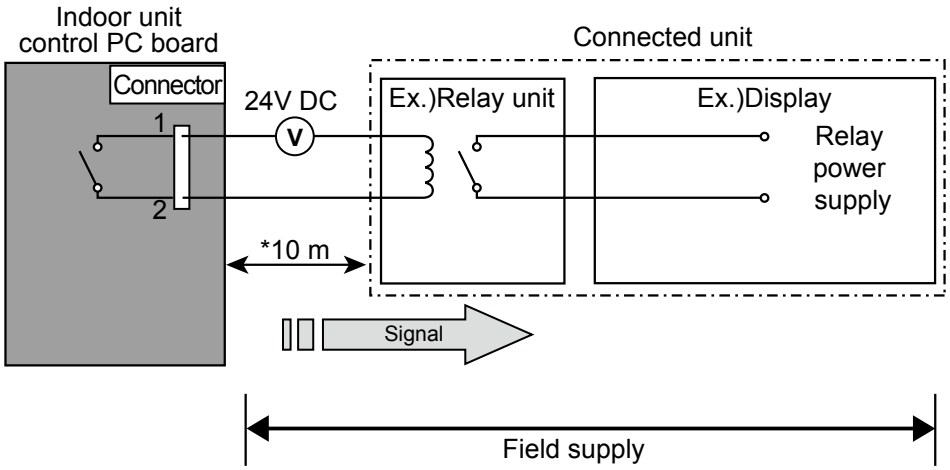
DUCT TYPE
AR∗G60LHTA

# 11-2. EXTERNAL OUTPUT

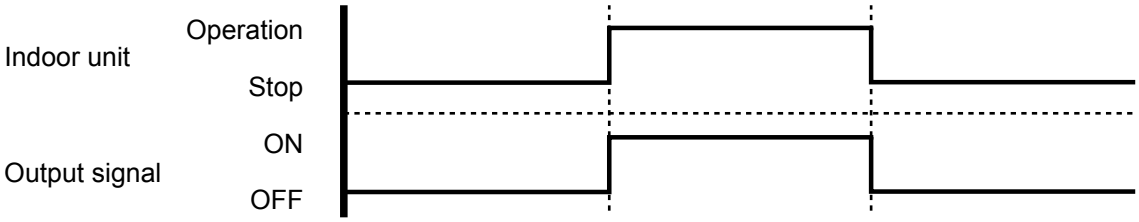
## ■ OPERATION STATUS OUTPUT

An air conditioner operation status signal can be output.

### ● Circuit diagram example




* Make the distance from the PC board to the connected unit within 10m.
Relay spec. : Max.24VDC, 10mA to less than 500mA.




### ● Parts (Optional)

| Model name |
|---|
| UTD-ECS5A |

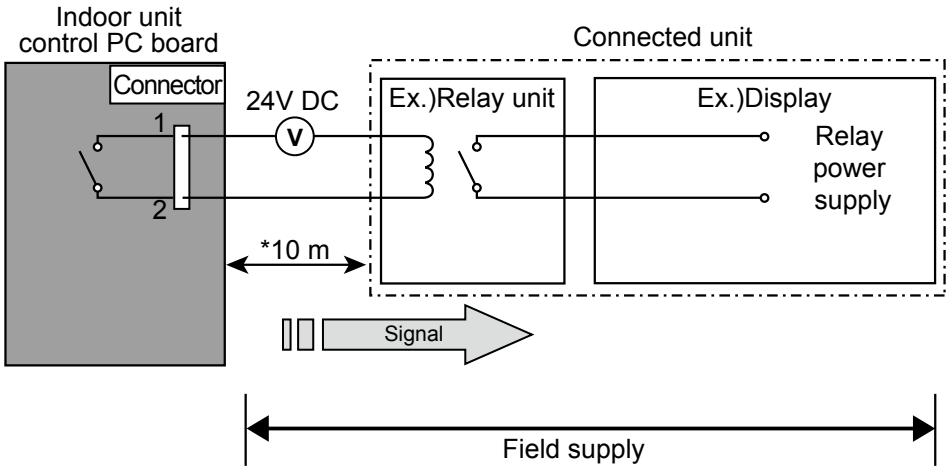
Wire (External output)

DUCT TYPE
AR∗G60LHTA

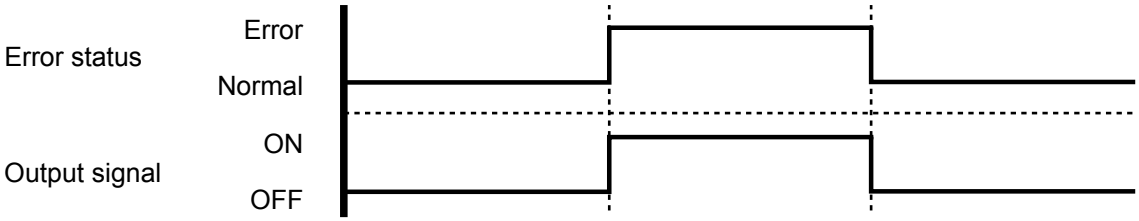
# ■ ERROR STATUS OUTPUT

An air conditioner condition normal/error status signal can be output.

## ● Circuit diagram example




* Make the distance from the PC board to the connected unit within 10m.
Relay spec. : Max.24VDC, 10mA to less than 500mA.




## ● Parts (Optional)

| Model name |
|---|
| UTD-ECS5A |

Wire (External output)

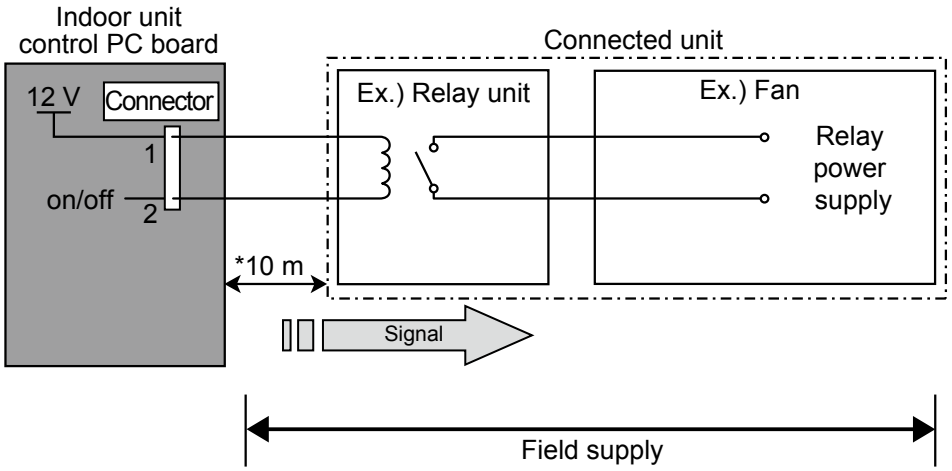
DUCT TYPE
AR∗G60LHTA

# ■ FRESH AIR CONTROL OUTPUT

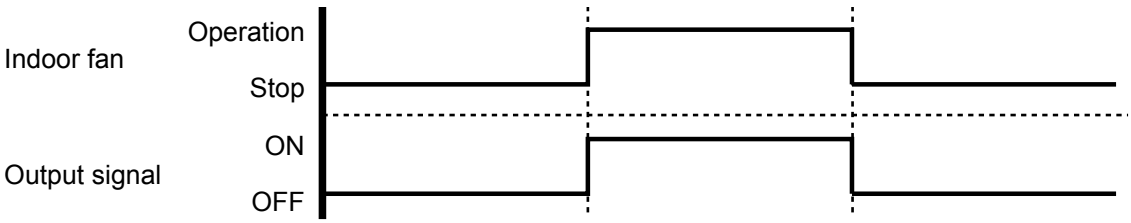
A signal linked to air conditioner indoor fan ON can be output.

* However, signal becomes OFF during cold air prevention control operation.

## ● Circuit diagram example




* Make the distance from the PC board to the connected unit within 10m.
Relay spec. : Rated 12VDC, 50mA or less.




## ● Parts (Optional)

| Model name |
|---|
| UTD-ECS5A |

Wire (Fresh air output)

DUCT TYPE
AR∗G60LHTA

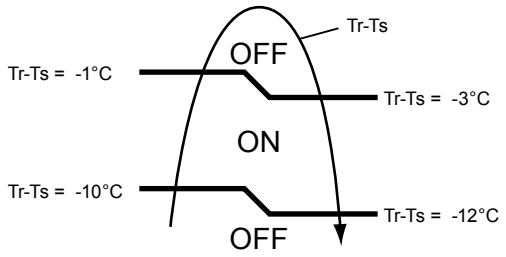
# ■AUXILIARY HEATER OUTPUT

A signal is outputed from Connector when indoor fan and compressor is turned on under heating operation.

*Signal output performance specifications are as shown on the right

Ex. When Set Temperature(Ts) is 22°C ;

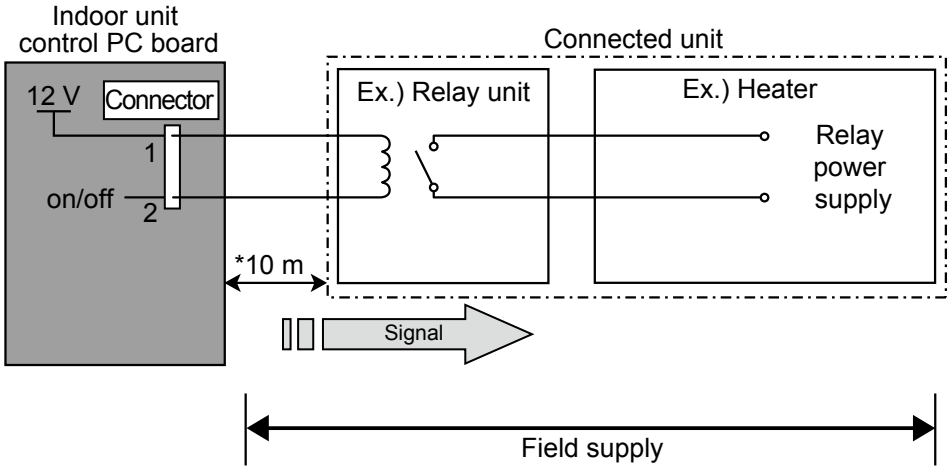
- and Room Temperature(Tr) increase above 12°C, signal output is on.
- and Room Temperature(Tr) increase above 21°C, signal output is off.
- and Room Temperature(Tr) decrease below 19°C, signal output is on.
- and Room Temperature(Tr) decrease below 10°C, signal output is off.



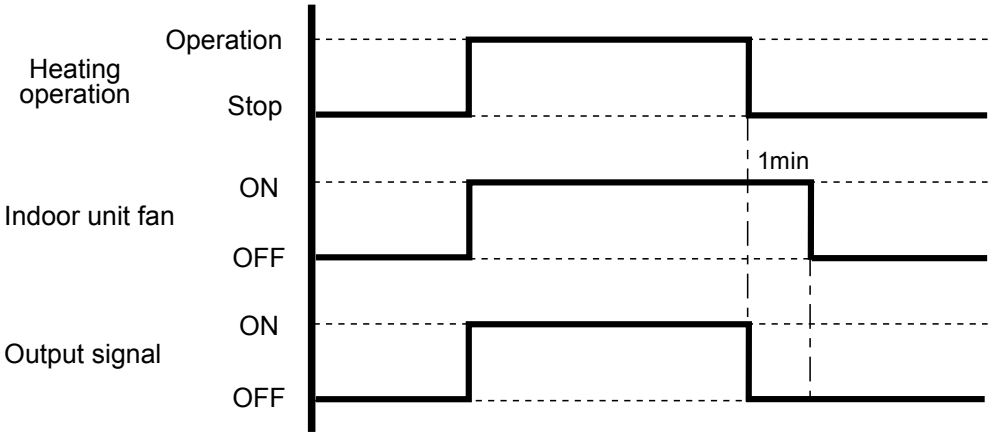

## ●Jumper wire (Indoor Unit)

This is used to continue indoor unit fan operation for 1 minute after thermo OFF in heating mode.
1 minute delay control set by cutting jumper wire on PCB.

## ●Circuit diagram example



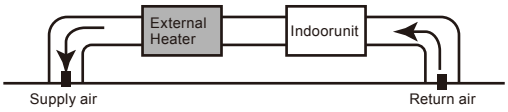

* Make the distance from the PC board to the connected unit within 10m.
Relay spec. : Rated 12VDC, 50mA or less.



DUCT TYPE
AR∗G60LHTA

⚠CAUTION

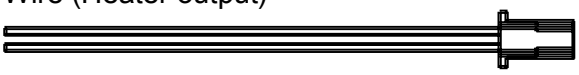
Please place an external a heater between the indoor unit and the ductwork.
Please be sure to use delay control of the fan.




## ● Parts (Optional)

| Model name |
|---|
| UTD-ECS5A |

Wire (Heater output)



DUCT TYPE
AR∗G60LHTA

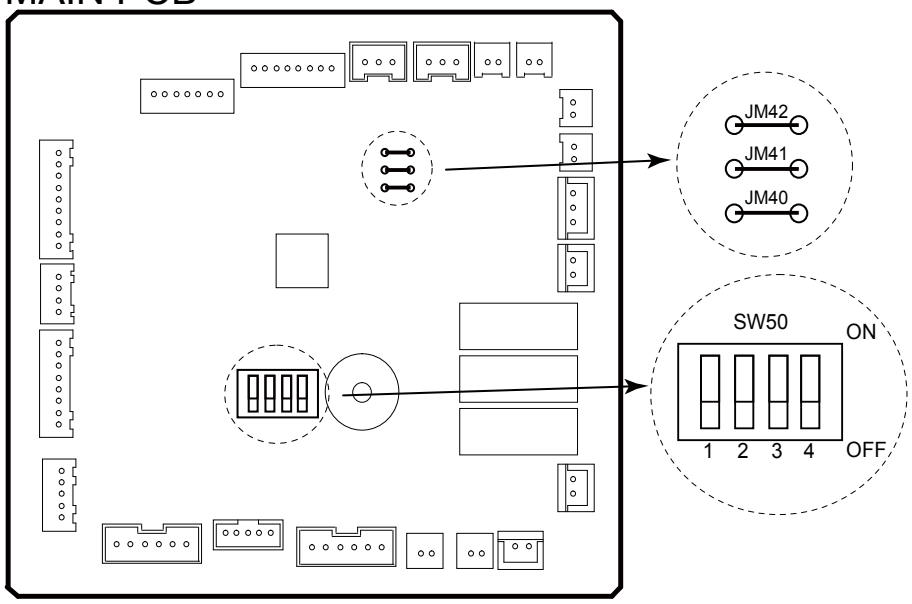
# 12. FUNCTION SETTINGS

## 12-1. INDOOR UNIT

| INDOOR UNIT | | |
|---|---|---|
| DIP-SW50 | 1 | Remote controller address setting |
| | 2 | |
| | 3 | |
| | 4 | |
| Jumper Wire | JM40 | Setting forbidden |
| | JM41 | |
| | JM42 | Fan delay setting |

## ■ SWITCH POSITION

MAIN PCB



DUCT TYPE
AR∗G60LHTA

# ■ DIP-SW SETTING

## ● Remote controller address setting (SW50)

A number of indoor units can be operated at the same time using a single remote controller.
Set the unit number of each indoor unit using the DIP switches on the indoor unit circuit board.
(See the following table.)
The DIP switches are normally set to make the unit number 00.

(◆. . .Factory setting)

| | Remote controller address | DIP switch No. | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| ◆ | 00 | OFF | OFF | OFF | OFF |
| | 01 | ON | OFF | OFF | OFF |
| | 02 | OFF | ON | OFF | OFF |
| | 03 | ON | ON | OFF | OFF |
| | 04 | OFF | OFF | ON | OFF |
| | 05 | ON | OFF | ON | OFF |
| | 06 | OFF | ON | ON | OFF |
| | 07 | ON | ON | ON | OFF |
| | 08 | OFF | OFF | OFF | ON |
| | 09 | ON | OFF | OFF | ON |
| | 10 | OFF | ON | OFF | ON |
| | 11 | ON | ON | OFF | ON |
| | 12 | OFF | OFF | ON | ON |
| | 13 | ON | OFF | ON | ON |
| | 14 | OFF | ON | ON | ON |
| | 15 | ON | ON | ON | ON |

# ■ JUMPER WIRE SETTING

## ● JM40, 41 setting forbidden

## ● Fan delay setting (JM42)

When the indoor unit is stopped while operating in conjunction with auxiliary heater, the indoor unit fan operation will continue for one minute.

(◆. . .Factory setting)

| | JM 42 | JM state |
|---|---|---|
| ◆ | Connect | Invalid |
| | Disconnect | Valid |

DUCT TYPE
AR∗G60LHTA

# 12-2. INDOOR UNIT (Setting by remote controller)

- The function settings of the control of the indoor unit can be changed by this procedure according to the installation conditions. Incorrect settings can cause the indoor unit to malfunction.
- After the power is turned on, perform The Function Setting according to the installation conditions using the remote controller.
- The settings may be selected between the following two: Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

## ■ PREPARATION

- Turn on the power.

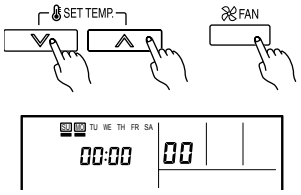
* Before turning on the power of the indoor units, make sure the piping air-tight test and vacuuming have been conducted.

* Also check again to make sure no wiring mistakes were made before turning on the power.

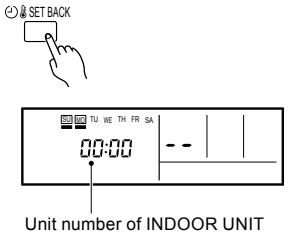
## ■ FUNCTION SETTING METHOD (for Wired remote controller)

### ● Setting method

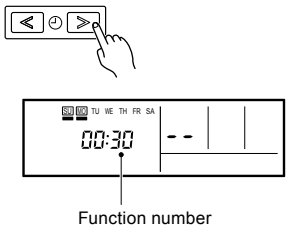
(1) Press the SET TEMP. buttons (⩒) (⩓) and FAN button simultaneously for more than 5 seconds to enter the function setting mode.



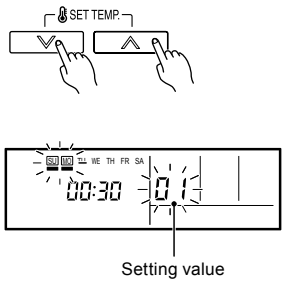

(2) Press the SET BACK button to select the indoor unit number.




3) Press the Set time buttons to select the function number.




(4) Press the SET TEMP. buttons (⩒) (⩓) to select the setting value. The display flashes during setting value selection.



DUCT TYPE
AR∗G60LHTA

(5) Press the TIMER SET button to confirm the setting. Press the TIMER SET button for a few seconds until the setting value stops flashing. If the setting value display changes or if "- -" is displayed when the flashing stops, the setting value has not been set correctly. (An invalid setting value may have been selected for the indoor unit.)

(6) Repeat steps 2 to 5 to perform additional settings. Press the SET TEMP. buttons (⩛) (⩓) and FAN simultaneously again for more than 5 seconds to cancel the function setting mode. In addition, the function setting mode will be automatically canceled after 1 minute if no operation is performed.

(7) After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

| ⚠CAUTION |
|---|
| • After turning off the power, wait 30 seconds or more before turning on it again. The Function Setting will not become active unless the power is turned off then on again. |

# ■ CONTENTS OF FUNCTION SETTING

- Follow the instructions in the Local Setup Procedure, which is supplied with the remote control, in accordance with the installed condition.
  After the power is turned on, perform the Function Setting on the remote control.
- The settings may be selected between the following two: Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

| | |
|---|---|
| 1) | Filter sign |
| 2) | Static pressure |
| 3) | Cooler room temperature correction |
| 4) | Heater room temperature correction |
| 5) | Auto restart |
| 6) | Indoor room temperature sensor switching function |
| 7) | Cool air prevention |
| 8) | External input control |
| 9) | Room temperature control switching |

### 1) Filter sign

The indoor unit has a sign to inform the user that it is time to clean the filter. Select the time setting for the filter sign display interval in the table below according to the amount of dust or debris in the room. If you do not wish the filter sign to be displayed, select the setting value for "No indication".

(◆. . .Factory setting)

| | Setting description | Function number | Setting value |
|---|---|---|---|
| | Standard (2500 hours) | 11 | 00 |
| | Long interval (5000 hours) | | 01 |
| | Short interval (1250 hours) | | 02 |
| ◆ | No indication | | 03 |

### 2) Static pressure

Select appropriate static pressure according to the installation conditions.

(◆. . .Factory setting)

| | Setting description | Function number | Setting value |
|---|---|---|---|
| ◆ | Normal (60Pa) | 21 | 00 |
| | Static pressure 1 (100Pa) | | 02 |
| | Static pressure 2 (150Pa) | | 03 |
| | Static pressure 3 (200Pa) | | 04 |
| | Static pressure 4 (250Pa) | | 05 |

DUCT TYPE
AR∗G60LHTA

### 3) Cooler room temperature correction

Depending on the installed environment, the room temperature sensor may require correction. The settings may be selected as shown in the table below.

(◆. . .Factory setting)

| | Setting description | Function number | Setting value |
|---|---|---|---|
| ◆ | Standard (No correction) | 30 | 00 |
| | Lower control (-1.0°C) | | 01 |
| | Slightly lower control (-0.5°C) | | 02 |
| | Slightly warmer control (+0.5°C) | | 03 |
| | Warmer control (+1.0°C) | | 04 |

### 4) Heater room temperature correction

Depending on the installed environment, the room temperature sensor may require correction. The settings may be changed as shown in the table below.

(◆. . .Factory setting)

| | Setting description | Function number | Setting value |
|---|---|---|---|
| ◆ | Standard (No correction) | 31 | 00 |
| | Lower control (-1.0°C) | | 01 |
| | Slightly lower control (-0.5°C) | | 02 |
| | Slightly warmer control (+0.5°C) | | 03 |
| | Warmer control (+1.0°C) | | 04 |

### 5) Auto restart

Enable or disable automatic system restart after a power outage.

(◆. . .Factory setting)

| | Setting description | Function number | Setting value |
|---|---|---|---|
| ◆ | Yes | 40 | 00 |
| | No | | 01 |

* Auto restart is an emergency function such as for power failure etc.
Do not start and stop the indoor unit by this function in normal operation.
Be sure to operate by the control unit, or external input device.

### 6) Indoor room temperature sensor switching function

(Only for Wired remote controller)

The following settings are needed when use the control by Wired remote controller temperature sensor.

(◆. . .Factory setting)

| | Setting description | Function number | Setting value |
|---|---|---|---|
| ◆ | No | 42 | 00 |
| | Yes | | 01 |

* If setting value is “00”:
Room temperature is controlled by the indoor unit temperature sensor.

* If setting value is “01”:
Room temperature is controlled by either indoor unit temperature sensor or remote controller unit sensor.

### 7) Cool air prevention

This setting is used to set the fan speed when the compressor stops once the room temperature has reached the set temperature during heating operation.

(◆. . .Factory setting)

| | Setting description | Function number | Setting value |
|---|---|---|---|
| ◆ | Super low | 43 | 00 |
| | Follow the setting on the remote controller (corresponding to ventilation) | | 01 |

DUCT TYPE
AR∗G60LHTA

### 8) External input control

"Operation/Stop" mode or "Forced stop" mode can be selected.

(◆. . .Factory setting)

| | Setting description | Function number | Setting value |
|---|---|---|---|
| ◆ | Operation/Stop mode | 46 | 00 |
| | (Setting forbidden) | | 01 |
| | Forced stop mode | | 02 |

### 9) Room temperature control switching

This setting is used to set the room temperature control method when the wired remote controller is selected by the Indoor Room Temperature Sensor Switching Function.

(◆. . .Factory setting)

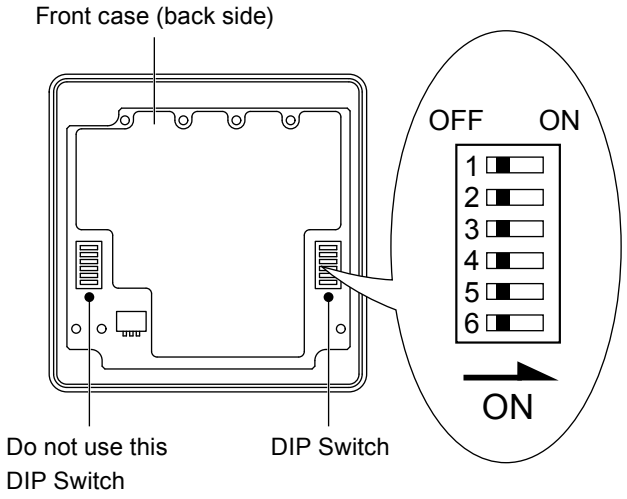
| | Setting description | Function number | Setting value |
|---|---|---|---|
| ◆ | Control by the sensors of both the indoor unit and the wired remote controller. | 48 | 00 |
| | Control only by the sensor of the wired remote controller | | 01 |

DUCT TYPE
AR∗G60LHTA

# 12-3. WIRED REMOTE CONTROLLER

| | | |
|---|---|---|
| DIP SW | 1 | Can not be used. (Do not change) |
| | 2 | Dual remote controller setting |
| | 3 | Can not be used. (Do not change) |
| | 4 | Can not be used. (Do not change) |
| | 5 | Can not be used. (Do not change) |
| | 6 | Memory backup setting |

## ■ SWITCH POSITION




## ■ DIP SWITCH SETTING

### ● Dual remote controller setting

Set the remote controller DIP switch No.2 according to the following table.

(◆···Factory setting)

| | Number of remote controller | Primary unit | Secondary unit |
|---|---|---|---|
| | | DIP-SW No.2 | DIP-SW No.2 |
| ◆ | 1 (Normal) | OFF | — |
| | 2 (Dual) | OFF | ON |

### ● Memory backup setting

Set to ON to use batteries for the memory backup. If batteries are not used, all of the settings stored in memory will be deleted if there is a power failure.

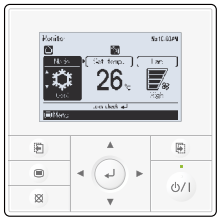
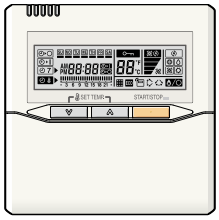
(◆···Factory setting)

| | DIP-SW No.6 | Memory backup |
|---|---|---|
| ◆ | OFF | Invalidity |
| | ON | Validity |

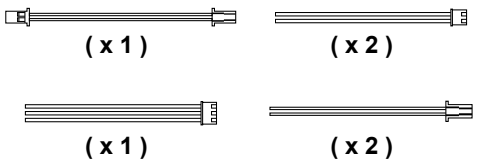
DUCT TYPE
AR∗G60LHTA

# 13. OPTIONAL PARTS

## 13-1. CONTROLLER

| Exterior | Parts name | Model No. | Summary |
|---|---|---|---|
|  | Wired remote controller | UTY-RVN∗M | Large and full-dot liquid crystal screen, wide and large keys easy to press, user-intuitive arrow key. |
|  | Wired remote controller | UTY-RNN∗M | The room temperature can be controlled by being detected the temperature accurately with built-in thermo sensor. |
|  | Simple remote controller | UTY-RSN∗M | Compact remote controller concentrates on the basic functions such as Start/Stop, Fan Control, Temperature Setting and Operation mode. |

## 13-2. OTHERS

| Exterior | Parts name | Model No. | Summary |
|---|---|---|---|
|  | Remote sensor | UTY-XSZX | New amenity space can be offered by installing the **Remote sensor** in the remote controller. |
|  ( x 1 ) ( x 2 ) ( x 1 ) ( x 2 ) | External control set | UTD-ECS5A | Use to connect with various peripheral devices and air conditioner PC board. (Set of 6) |

# 2. OUTDOOR UNIT

## SINGLE TYPE :
## AO∗G60LATT

# CONTENTS

## 2. OUTDOOR UNIT



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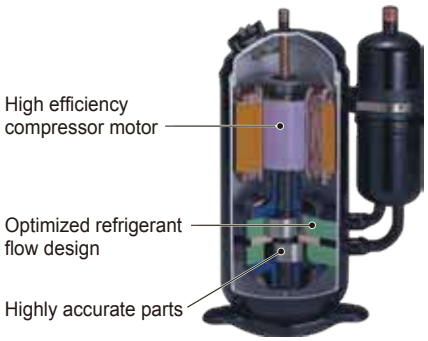
# 1. FEATURES

## ■ FEATURES

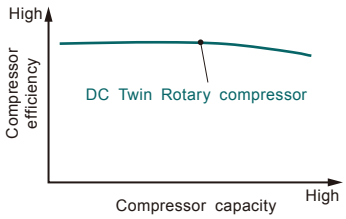
### ● Energy saving technology (ALL DC)

**DC twin rotary compressor**




DC twin rotary compressor

Efficiency in all load regions is good.
Especially good performance from low to medium at normal operation.




**DC fan motor**

Miniaturized, low noise, high efficiency, multi-stage DC fan motor is mounted.

### ● Peak cut operation

Peak cut mode (Optional parts: UTY-XWZXZ2)

Suppresses maximum capacity and performs energy-saving operation and can prevent breaker tripping.

This function performs operation by setting a peak current value and reducing the power consumption.

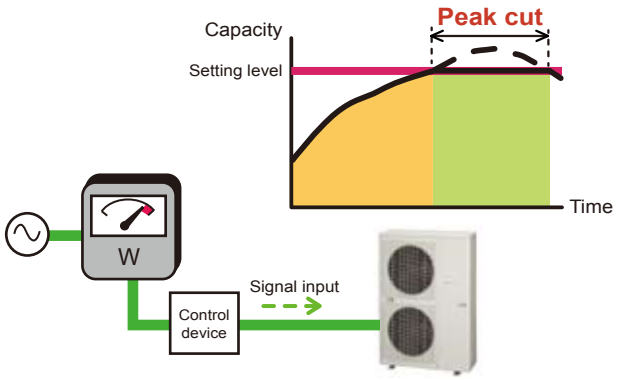
* Performance drops by reducing the power consumption preferentially.

Level 1 ... Performs operation which suppresses the power consumption to almost 0% by stopping the compressor.

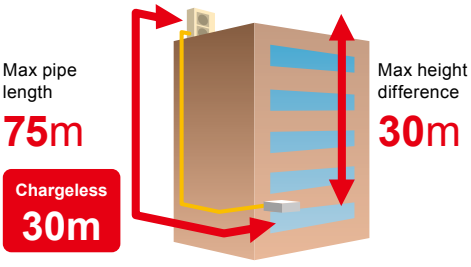
Level 2 ... Performs operation which suppresses the power consumption to 50% of the rated power consumption value.

Level 3 ... Performs operation which suppresses the power consumption to 75% of the rated power consumption value.

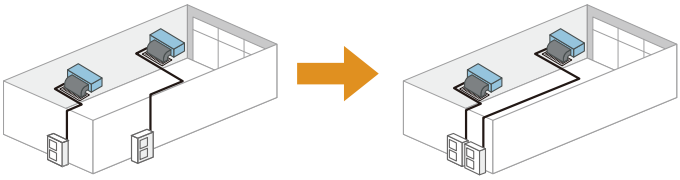
Level 4 ... Performs operation which suppresses the power consumption to the rated power consumption value (100%).




### ● High install ability long piping correspondence




Long piping provides an outdoor unit and indoor unit layout margin.

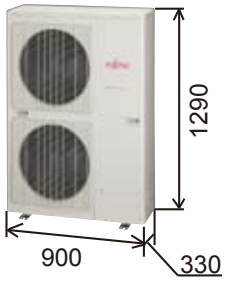


OUTDOOR UNIT
AO*G60LATT

## ● Space saving

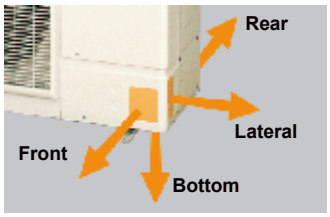
Compact size

High performance has been realized with a compact outdoor unit.
Due to the compact size of the outdoor unit, the installation space required has been reduced allowing for a wider selection on installation locations.




## ● 4-directions piping connection

Four directions piping connection is possible. The perfect route can be selected according to the installation.




## ● Low outdoor air temperature correspondence

Both cooling and heating operations can be performed when the outdoor air temperature is low.

| | | | |
|---|---|---|---|
| Cooling | -15 °C | Heating | Dry-bulb -15 °C<br>Wet-bulb -20 °C |

## ● External output (option)

**Compressor status output**

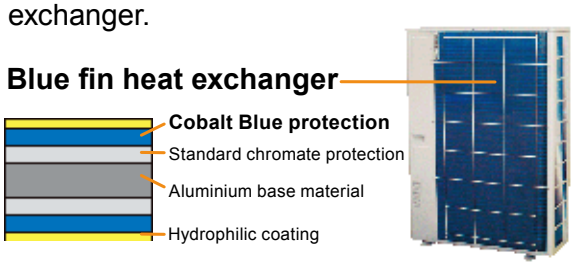
This output indicates the outdoor unit compressor status.

**Error status output**

This output indicates the outdoor unit and connected indoor unit's Normal / Error.

## ● Blue fin heat exchanger

Corrosion-resistance of the heat exchanger even in coastal areas has been improved by blue fin treatment of the outdoor unit heat exchanger.




## ● Service, maintenance

- "Error display" and "Operating information" can be explained by LED display.
- Pump down operation can be performed by one button when refrigerant recovery.

## ● Quiet operation

Low noise mode (Optional parts: UTY-XWZXZ2)

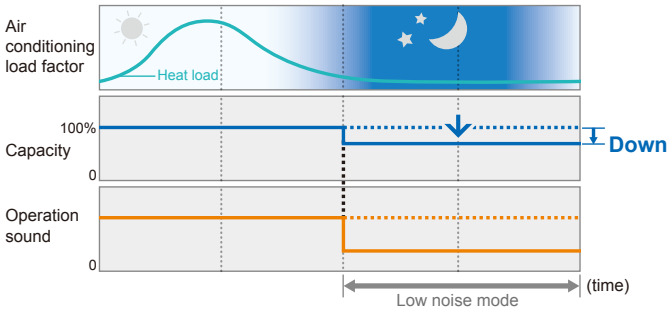
Suppresses operating sound.

This function suppresses the outdoor unit noise value to the following 2 level.

* Performance may drop depending on the outside air temperature condition, etc.

Level 1 ... Rated noise value -2dB

Level 2 ... Rated noise value -4dB



# 2. SPECIFICATIONS

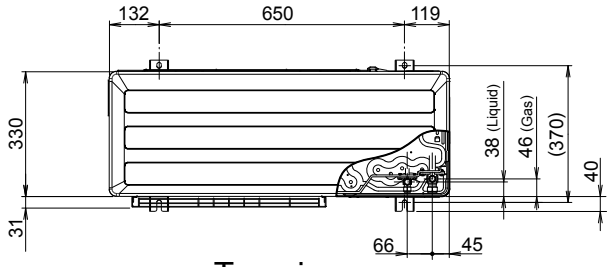
| | | | | |
|---|---|---|---|---|
| Type | | | | INVERTER HEATPUMP |
| Model name | | | | AO*G60LATT |
| Power source | | | | 3N~ 400V 50Hz |
| Available voltage range | | | | 3N~ 342V - 457V 50Hz |
| Starting current | | | A | 7.6 |
| Fan | Airflow rate | Cooling | $m^3/h$ | 6,900 |
| | | Heating | | 7,300 |
| | Type × Q'ty | | | Propeller × 2 |
| | Motor output | | W | 104 |
| Sound pressure level | | Cooling | dB (A) | 56 |
| | | Heating | | 58 |
| Heat exchanger type | | Dimensions (H × W × D) | mm | 1260 × 900 × 36.4 |
| | | Fin pitch | | 1.30 |
| | | Rows x Stages | | 2 × 60 |
| | | Pipe type | | Copper |
| | | Fin type: Type (Material) | | Corrugate (Aluminium) |
| | | Fin type: Surface treatment | | Corrosion resistance (Blue fin) |
| Compressor | Type × Q'ty | | | Twin Rotary × 1 |
| | Motor output | | W | 3750 |
| Refrigerant | | Type | | R410A |
| | | Charge | g | 3450 |
| Refrigerant oil | | Type | | POE |
| Enclosure | | Material | | Steel sheet |
| | | Colour | | BEIGE<br>( Approximate colour of MUNSELL 10YR 7.5 / 1.0 ) |
| Dimensions (H × W × D) | Net | | mm | 1290 × 900 × 330 |
| | Gross | | | 1430 × 1050 × 445 |
| Weight | Net | | kg | 104 |
| | Gross | | | 113 |
| Connection pipe | Size (Standard) | Liquid | mm | Ø 9.52 (Ø 3/8 in.) |
| | | Gas | | Ø 15.88 (Ø 5/8 in.) |
| | Method | | | Flare |
| | Pre-charge length | | m | 30 |
| | Max. length | | | 75 |
| | Max. height difference | | | 30 |
| Operation range | | Cooling | °C | -15 to 46 |
| | | Heating | | -15 to 24 |

Note :
Specifications are based on the following conditions.
Cooling : Indoor temperature of 27 °CDB / 19 °CWB.and outdoor temperature of 35 °CDB/24 °CWB.
Heating : Indoor temperature of 20 °CDB / 15 °CWB.and outdoor temperature of 7 °CDB/6 °CWB.
Pipe length : 7.5 m, Height difference : 0 m.(Outdoor unit - Indoor unit)
The protective function may work when using it outside the temperature range mentioned above.

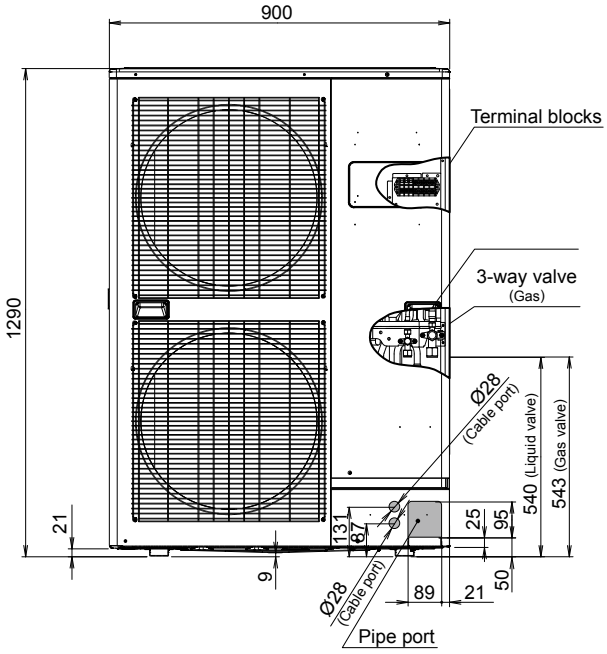
# 3. DIMENSIONS

## ■ MODEL: AO∗G60LATT

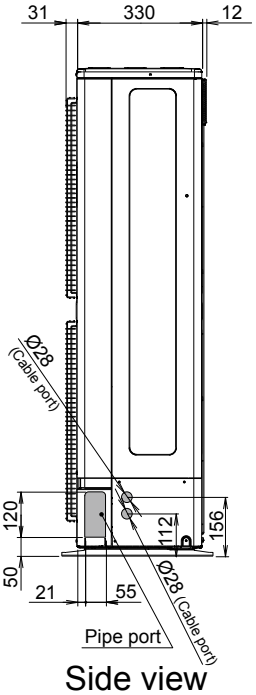
(Unit : mm)



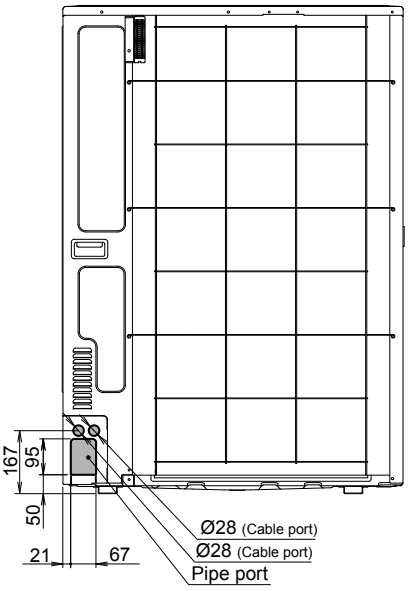

Top view



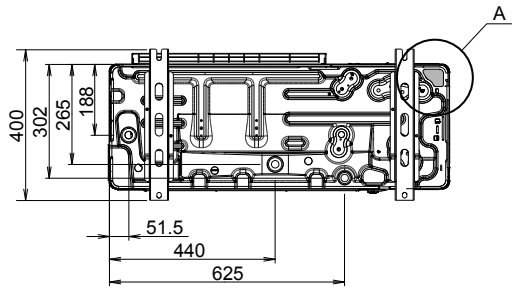

Front view




Side view

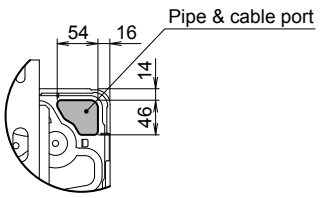



Rear view




Bottom view

Detail A

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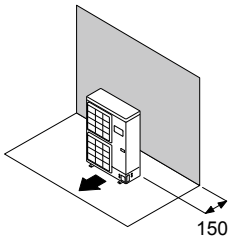
# 4. INSTALLATION PLACE

## 4-1. SINGLE OUTDOOR UNIT INSTALLATION

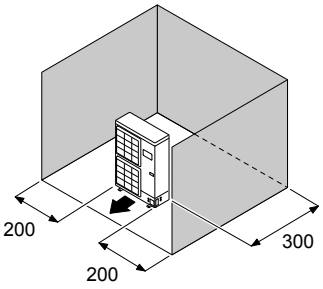
### ■ WHEN THE UPWARD AREA IS OPEN

(Unit : mm)

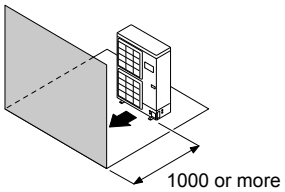
Obstacles at rear only



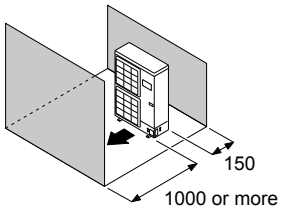

Obstacles at rear and sides only




Obstacles at front only



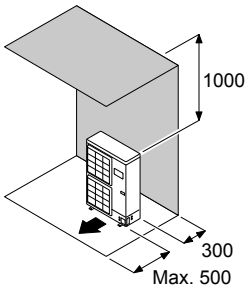

Obstacles at front and rear only



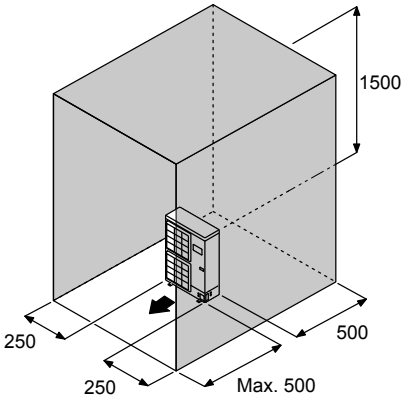

### ■ WHEN AN OBSTRUCTION IS PRESENT ALSO IN THE UPWARD AREA

(Unit : mm)

Obstacles at rear and above only




Obstacles at rear, sides, and above only



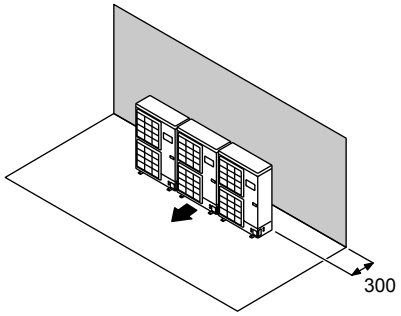
OUTDOOR UNIT
AO*G60LATT

# 4-2. MULTIPLE OUTDOOR UNIT INSTALLATION

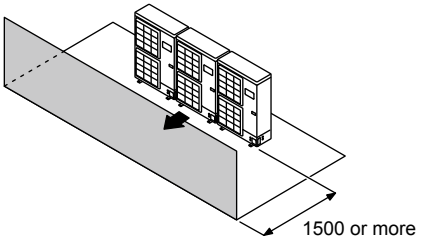
## ■ WHEN THE UPWARD AREA IS OPEN

(Unit : mm)

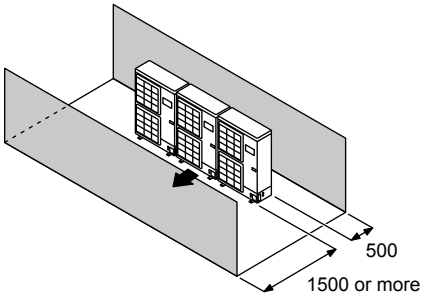
Obstacles at rear only




Obstacles at front only



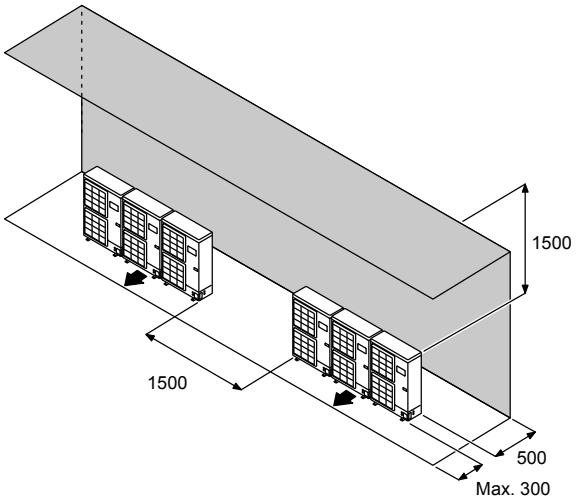

Obstacles at front and rear only




## ■ WHEN AN OBSTRUCTION IS PRESENT ALSO IN THE UPWARD AREA

(Unit : mm)

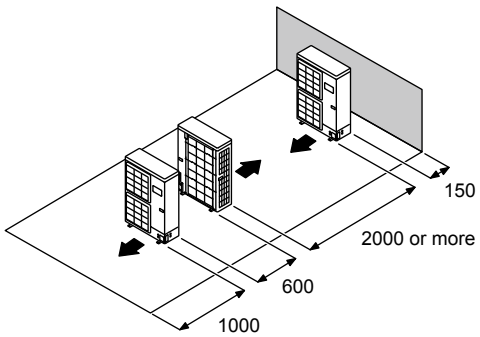
Obstacles at rear and above only



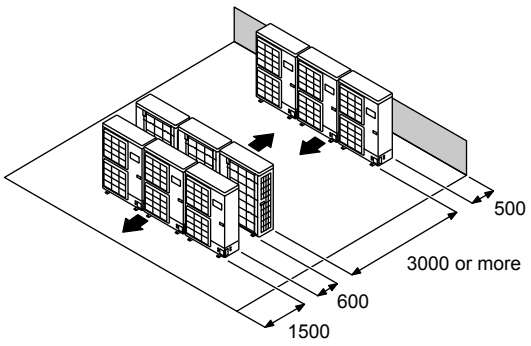

# 4-3. OUTDOOR UNIT INSTALLATION IN MULTI ROW

(Unit : mm)

Single parallel unit arrangement

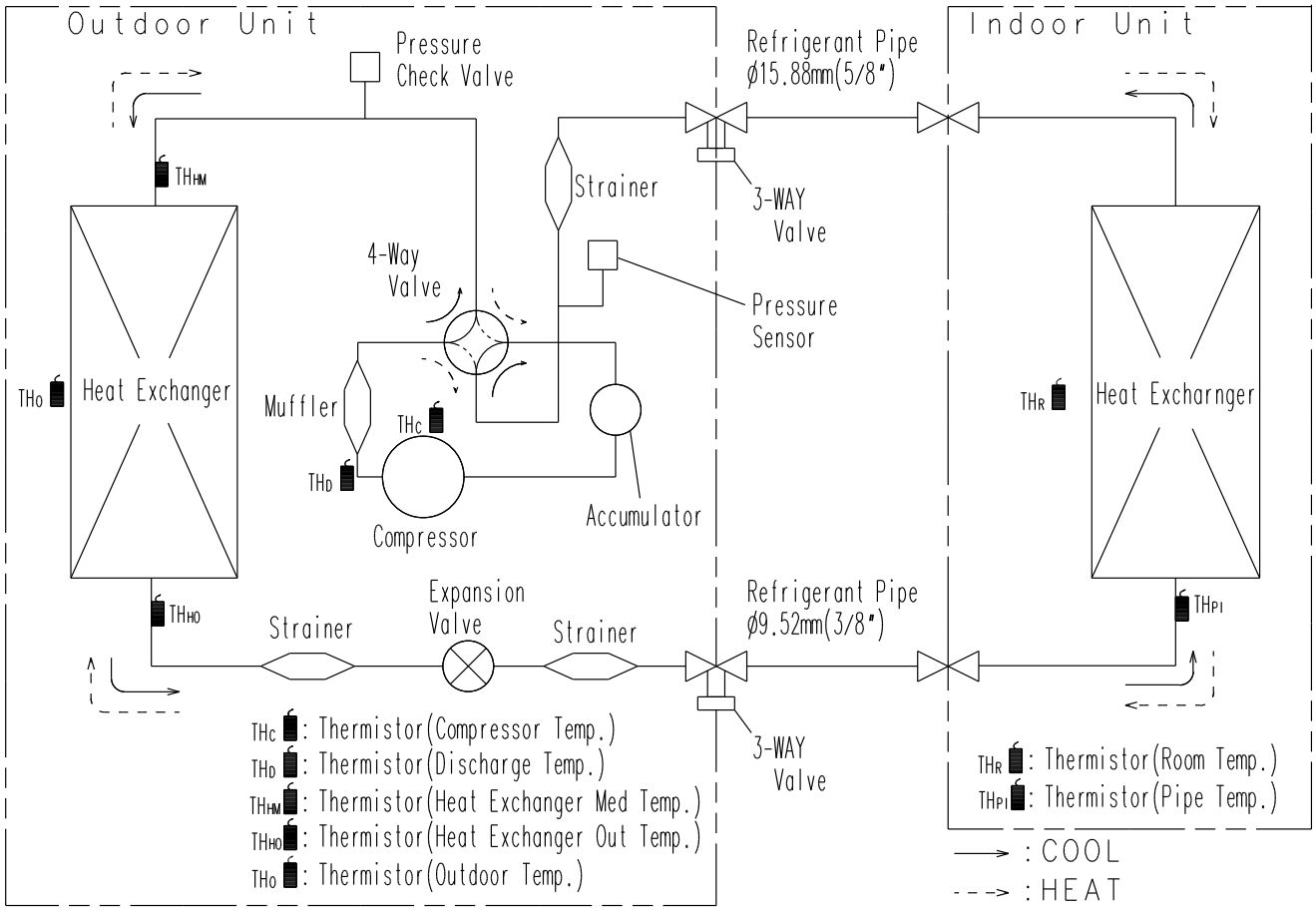



Multiple parallel unit arrangement



# 5. REFRIGERANT CIRCUIT

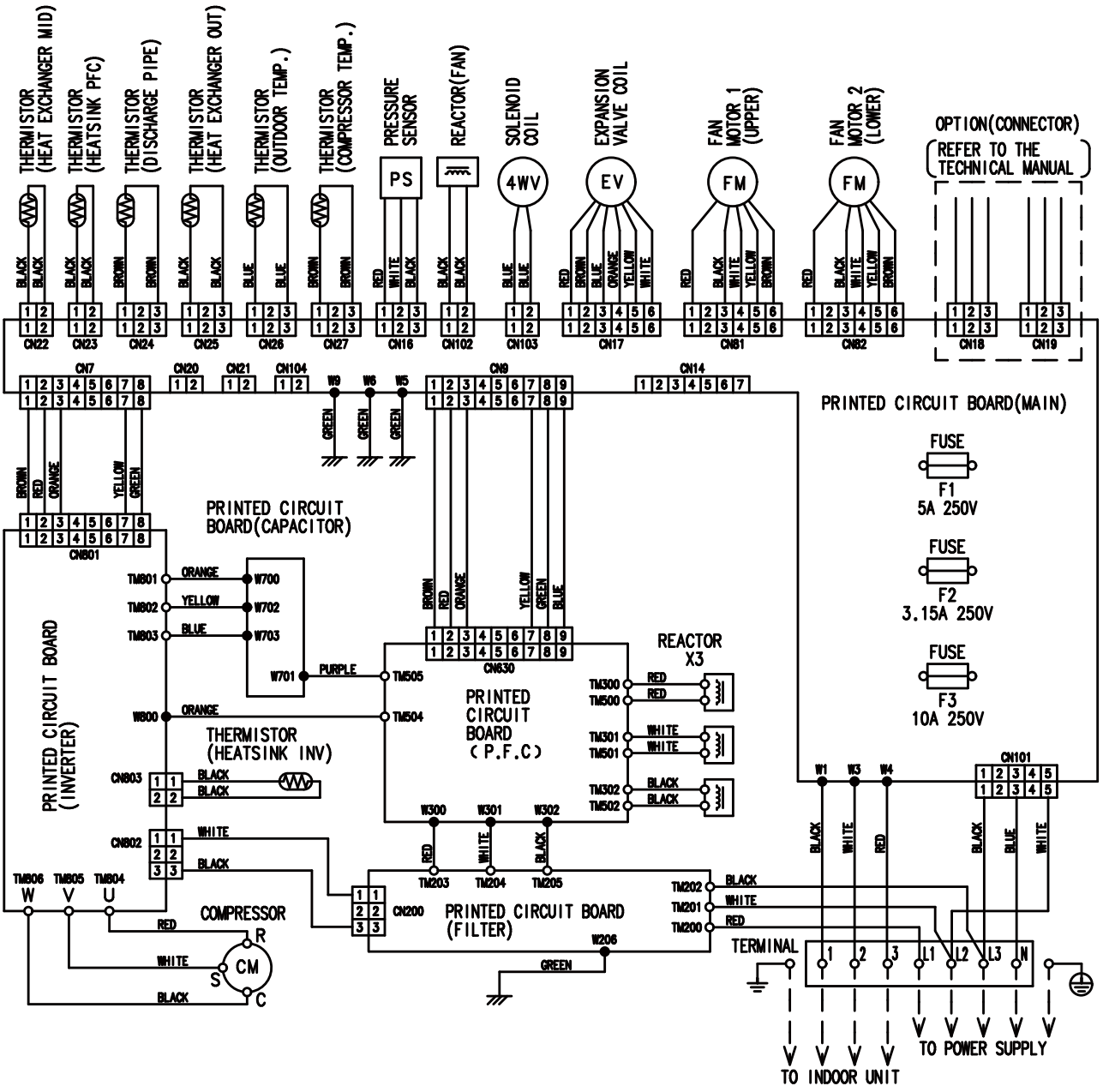
## ■ MODEL: AO*G60LATT




OUTDOOR UNIT
AO*G60LATT

# 6. WIRING DIAGRAMS

## ■ MODEL: AO*G60LATT



OUTDOOR UNIT
AO∗G60LATT

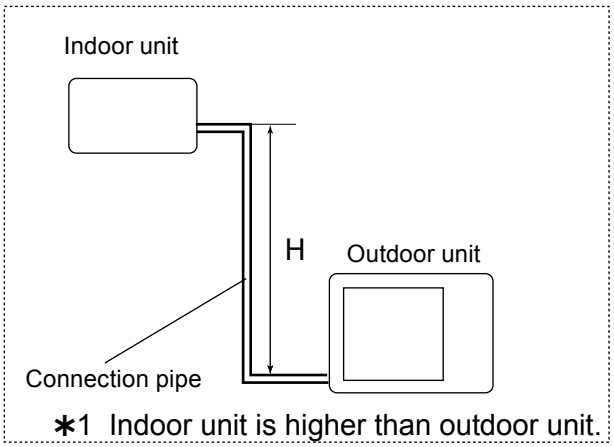
# 7. CAPACITY COMPENSATION RATE FOR PIPE LENGTH AND HEIGHT DIFFERENCE

## ■ MODEL: AO∗G60LATT

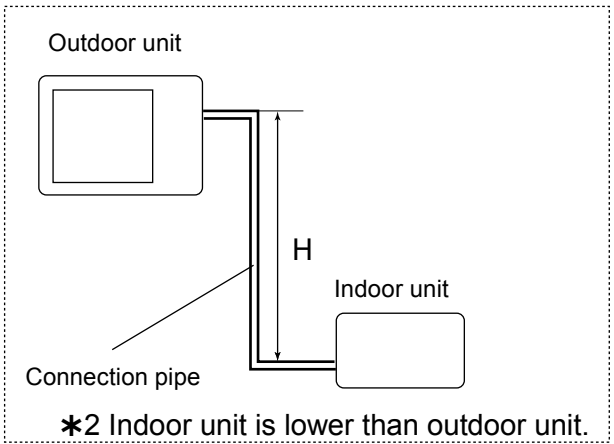
| COOLING | | | Pipe length (m) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5 | 7.5 | 10 | 20 | 30 | 40 | 50 | 60 | 75 |
| Height difference H (m) | ∗1 Indoor unit is higher than outdoor unit. | 30 | - | - | - | - | 0.871 | 0.837 | 0.803 | 0.768 | 0.717 |
| | | 20 | - | - | - | 0.921 | 0.886 | 0.851 | 0.816 | 0.781 | 0.729 |
| | | 10 | - | - | 0.971 | 0.936 | 0.901 | 0.865 | 0.830 | 0.794 | 0.741 |
| | | 7.5 | - | 0.988 | 0.975 | 0.940 | 0.904 | 0.869 | 0.833 | 0.798 | 0.744 |
| | | 5 | 0.992 | 0.992 | 0.979 | 0.944 | 0.908 | 0.872 | 0.836 | 0.801 | 0.747 |
| | | 0 | 1.000 | 1.000 | 0.987 | 0.951 | 0.915 | 0.879 | 0.843 | 0.807 | 0.753 |
| | ∗2 Indoor unit is lower than outdoor unit | -5 | 1.000 | 1.000 | 0.987 | 0.951 | 0.915 | 0.879 | 0.843 | 0.807 | 0.753 |
| | | -7.5 | - | 1.000 | 0.987 | 0.951 | 0.915 | 0.879 | 0.843 | 0.807 | 0.753 |
| | | -10 | - | - | 0.971 | 0.951 | 0.915 | 0.879 | 0.843 | 0.807 | 0.753 |
| | | -20 | - | - | - | 0.951 | 0.915 | 0.879 | 0.843 | 0.807 | 0.753 |
| | | -30 | - | - | - | - | 0.915 | 0.879 | 0.843 | 0.807 | 0.753 |

| HEATING | | | Pipe length (m) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 5 | 7.5 | 10 | 20 | 30 | 40 | 50 | 60 | 75 |
| Height difference H (m) | ∗1 Indoor unit is higher than outdoor unit. | 30 | - | - | - | - | 0.978 | 0.968 | 0.958 | 0.948 | 0.935 |
| | | 20 | - | - | - | 0.988 | 0.978 | 0.968 | 0.958 | 0.948 | 0.935 |
| | | 10 | - | - | 0.998 | 0.988 | 0.978 | 0.968 | 0.958 | 0.948 | 0.935 |
| | | 7.5 | - | 1.000 | 0.998 | 0.988 | 0.978 | 0.968 | 0.958 | 0.948 | 0.935 |
| | | 5 | 1.000 | 1.000 | 0.998 | 0.988 | 0.978 | 0.968 | 0.958 | 0.948 | 0.935 |
| | | 0 | 1.000 | 1.000 | 0.998 | 0.988 | 0.978 | 0.968 | 0.958 | 0.948 | 0.935 |
| | ∗2 Indoor unit is lower than outdoor unit | -5 | 0.995 | 0.995 | 0.993 | 0.983 | 0.973 | 0.963 | 0.953 | 0.943 | 0.930 |
| | | -7.5 | - | 0.993 | 0.990 | 0.980 | 0.970 | 0.960 | 0.950 | 0.940 | 0.928 |
| | | -10 | - | - | 0.988 | 0.978 | 0.968 | 0.958 | 0.948 | 0.938 | 0.926 |
| | | -20 | - | - | - | 0.968 | 0.958 | 0.948 | 0.938 | 0.929 | 0.916 |
| | | -30 | - | - | - | - | 0.948 | 0.939 | 0.929 | 0.919 | 0.907 |

Height difference H



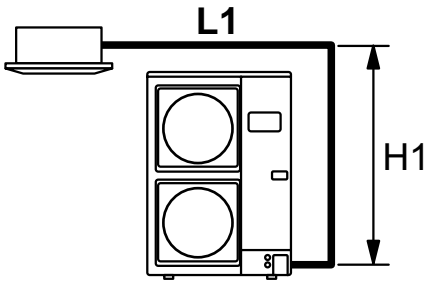

∗1 Indoor unit is higher than outdoor unit.




∗2 Indoor unit is lower than outdoor unit.

# 8. PIPE SIZE SELECTION & LIMITATION

## ■ MODEL : AO∗G60LATT




| Pipe diameter [mm (in.)] | Liquid pipes | 9.52 (3/8) | | 12.70 (1/2) | |
|---|---|---|---|---|---|
| | Gas pipes | 15.88 (5/8) | 19.05 (3/4) | 15.88 (5/8) | 19.05 (3/4) |
| Piping length [m (m)] | Max. piping length < L1 > (Max. chargeless length) | 75 [30] | 50 [30] | 35 [15] | 35 [15] |

* The figures enclosed by a thick-lined frame indicate the standard pipe diameter and max. piping length.

OUTDOOR UNIT
AO∗G60LATT

# 9. ADDITIONAL CHARGE CALCULATION

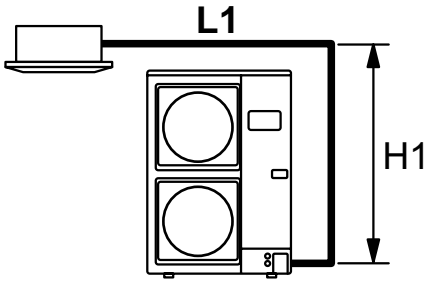
## ■ MODEL : AO∗G60LATT

| | | |
|---|---|---|
| Refrigerant type | | R410A |
| Refrigerant amount | g | 3,450 |

## ■ IF ADDITIONAL REFRIGERANT IS REQUIRED

- When the piping is longer than chargeless piping length, additional charging is necessary.
- For the additional amount, see the table below.

### Additional charging amount




L1 > Chargeless piping length

| Refrigerant pipe size [mm (in.)] | | | Additional charging amount [g] | | | | | Rate [g/m] |
|---|---|---|---|---|---|---|---|---|
| Standard | Piping length | | 30 m or less | 40 m | 50 m | 60 m | 70 m | |
| | Liquid | 9.52 (3/8) | None | 500 | 1,000 | 1,500 | 2,000 | 50 |
| | Gas | 15.88 (5/8) | | | | | | |
| Size up | Piping length | | 30 m or less | 40 m | 50 m | | | |
| | Liquid | 9.52 (3/8) | None | 500 | 1,000 | | | 50 |
| | Gas | 19.05 (3/4) | | | | | | |
| | Piping length | | 15 m or less | 25 m | 35 m | | | |
| | Liquid | 12.70 (1/2) | None | 1,000 | 2,000 | | | 100 |
| | Gas | 15.88 (5/8) | | | | | | |
| | | 19.05 (3/4) | | | | | | |

# 10. AIRFLOW

## ■ MODEL: AO*G60LATT

### ● Cooling

| | Number of rotations (r.p.m.) | Airflow | |
|---|---|---|---|
| Upper fan | 900 | $m^3/h$ | 6900 |
| | | l/s | 1917 |
| Lower fan | 800 | CFM | 4062 |

### ● Heating

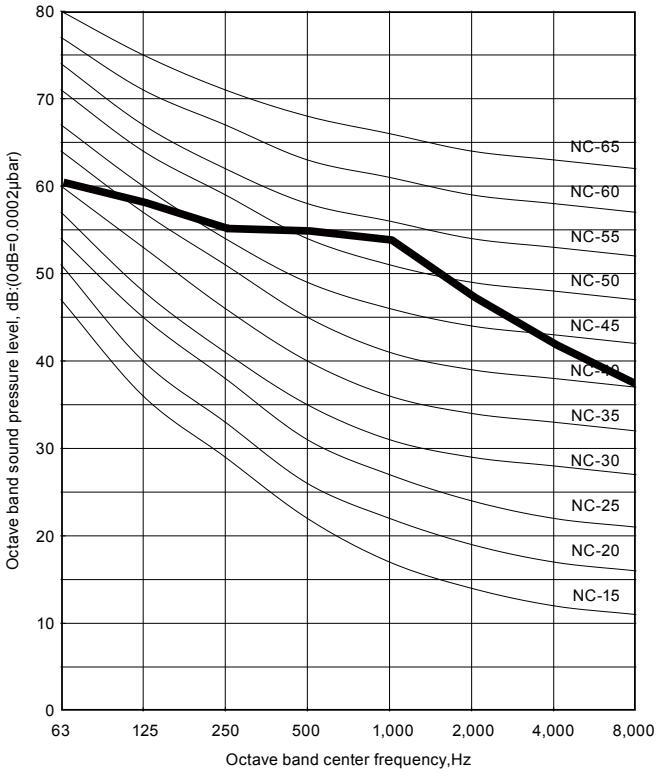
| | Number of rotations (r.p.m.) | Airflow | |
|---|---|---|---|
| Upper fan | 900 | $m^3/h$ | 7300 |
| | | l/s | 2028 |
| Lower fan | 900 | CFM | 4294 |

# 11. OPERATION NOISE

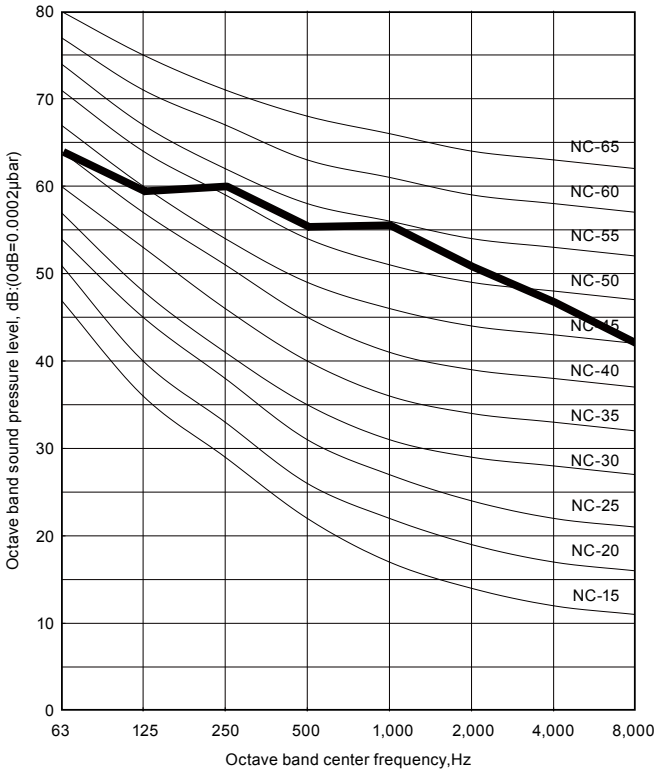
## 11-1. NOISE LEVEL CURVE

### ■ MODEL: AO∗G60LATT

#### ● Cooling




#### ● Heating

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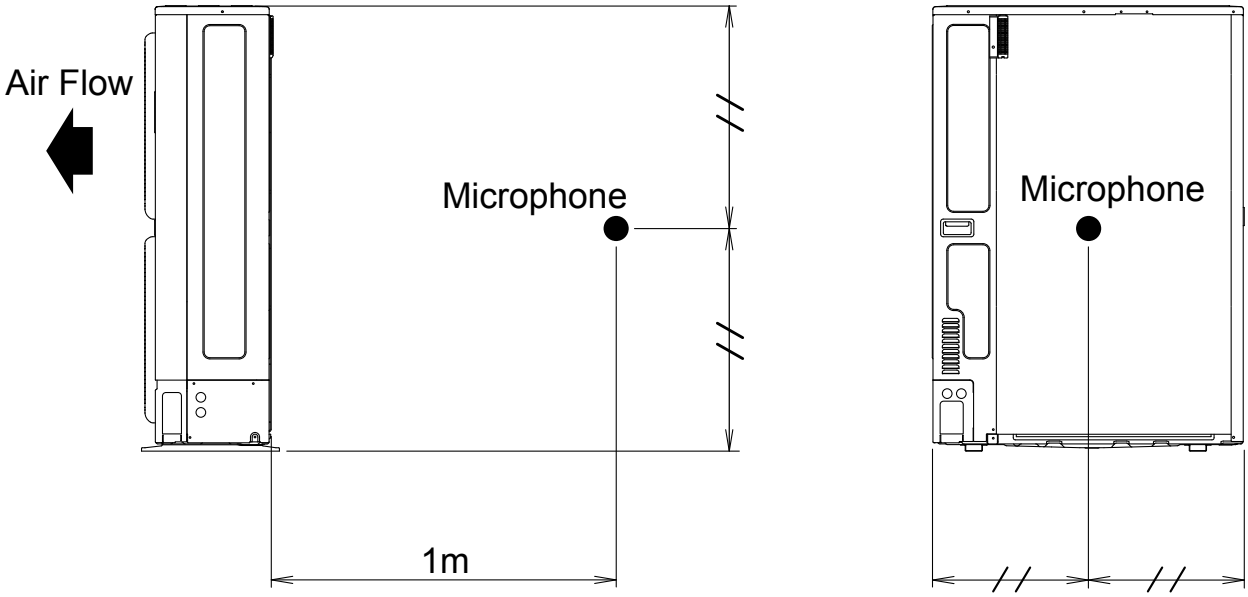
# 11-2. SOUND LEVEL CHECK POINT



# 12. ELECTRIC CHARACTERISTICS

| Model name | | | AO∗G60LATT |
|---|---|---|---|
| Power supply | Voltage | V | 3N~ 400 |
| | Frequency | Hz | 50 |
| *1) Max. operating current | | A | 12.5 |
| *2) Wiring spec. | Main fuse (Circuit breaker) Current | A | 16 |
| | Power cable | $mm^2$ | 2.5 (Min) |

*1) The maximum current is the total current of indoor unit and outdoor unit.
*2) Wiring spec. :
Selected sample
(Selected based on Japan Electrotechnical Standard and Codes Committee E0005)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# 13. SAFETY DEVICES

| | Protection form | | Model |
|---|---|---|---|
| | | | AO∗G60LATT |
| Circuit protection | Current fuse (Main PCB) | | 250V 5A |
| | Current fuse (Main PCB) | | 250V 3.15A |
| | Current fuse (Main PCB) | | 250V 10A |
| | Protector (Filter PCB) | | 500V 15A |
| Fan motor protection | Thermal protector | | OFF:150±15°C<br>ON:120±15°C |
| Compressor protection | Thermal protection program (Compressor temp.) | | OFF:110°C<br>ON:80°C |
| | Thermal protection program (Discharge temp.) | | OFF : 115°C<br>ON : After 7 minutes |
| High pressure protection | Thermal protection program (Heat exchanger temp.) | Cooling | OFF : 68°C<br>ON : 63°C |
| | Pressure sensor | Heating | OFF:4.1MPa<br>ON : After 3 minutes |
| Low pressure protection | Pressure sensor | Cooling | OFF:0.12MPa or less (for 5 minutes)<br>ON : After 7 minutes |

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# 14. EXTERNAL INPUT & OUTPUT

| Input | Output | Connector | Remarks |
|---|---|---|---|
| Low noise mode | — | CN19 | See external input/output settings for details. |
| Peak cut mode | — | CN19 | |
| — | Error status | CN18 | |
| — | Compressor status | CN18 | |

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## 14-1. EXTERNAL INPUT

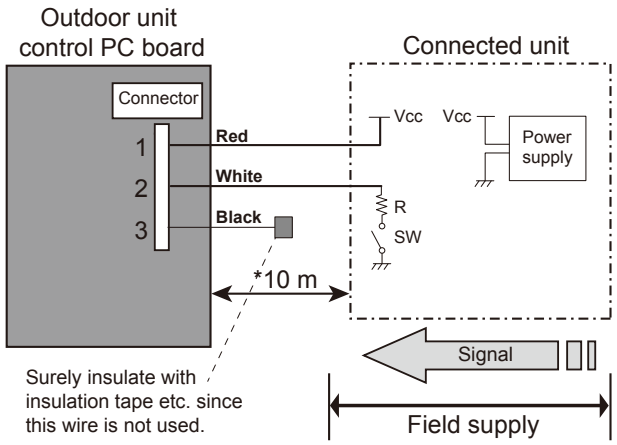
ON/OFF of the "Low noise mode" and "Peak cut mode" functions can be specified by external signal.

### ■ LOW NOISE MODE

• The following reduces the operating sound of the outdoor unit from the normal sound.
The air conditioner is set to the "Low noise mode" when closing the contact input of a commercial timer or ON/OFF switch to a connector on the outdoor control PC board.

* Performance may drop depending on the outside air temperature condition, etc.

#### ● Circuit diagram example



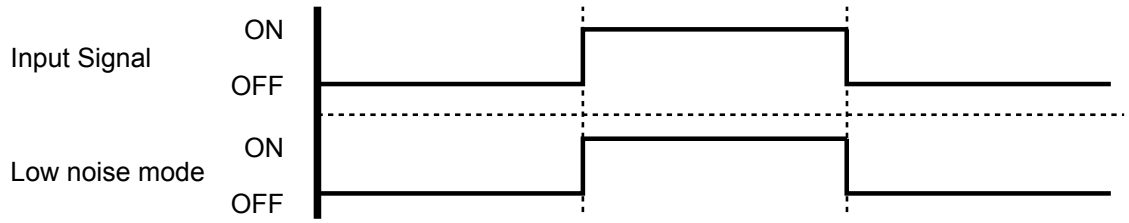

1) Power supply
●Voltage (Chart sign=Vcc) : DC 5V to 24V
●The current capacity : About 100mA
2) Switch (Chart sign=SW)
●Toggle switch or Rocker switch, etc : Switch which maintains the states.
●Prepare switches which are enough capable for DC 10mA current or more
3) Resistance (Chart sign=R)
●Adjust the resistance for current to about DC 10mA
(Example)
●In case of Vcc=DC 5V : Rated resistance value 470Ω 1/4W
●In case of Vcc=DC 12V : Rated resistance value 1kΩ 1/4W
●In case of Vcc=DC 24V : Rated resistance value 2.2kΩ 1/4W

* Make the distance from the PC board to the connected unit within 10 m.

• Use the following parts and construct a circuit as shown above.

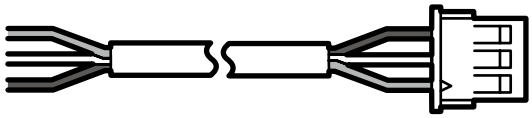
• Input Signal···ON : Low noise mode, Input Signal···OFF : Normal operation

* Set the "Low noise mode" type by "Push switch" on the outdoor control PC board.




#### ● Parts (Optional)

| Parts name | Model name |
|---|---|
| External connect kit | UTY-XWZXZ2 |



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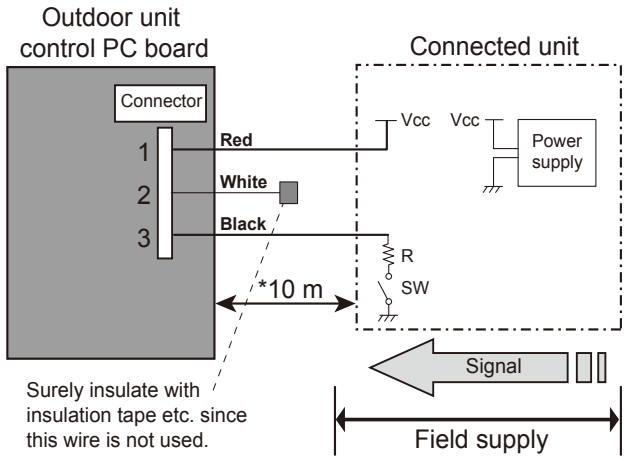
# ■ PEAK CUT MODE

• Operation that suppressed the current value can be performed by means of the following on-site work. The air conditioner is set to the Peak cut mode when closing the contact input of a commercial ON/OFF switch to a connector on the outdoor control PC board.

## ● Circuit diagram example




1) Power supply
- ●Voltage (Chart sign=Vcc) : DC 5V to 24V
- ●The current capacity : About 100mA

2) Switch (Chart sign=SW)
- ●Toggle switch or Rocker switch, etc : Switch which maintains the states.
- ●Prepare switches which are enough capable for DC 10mA current or more

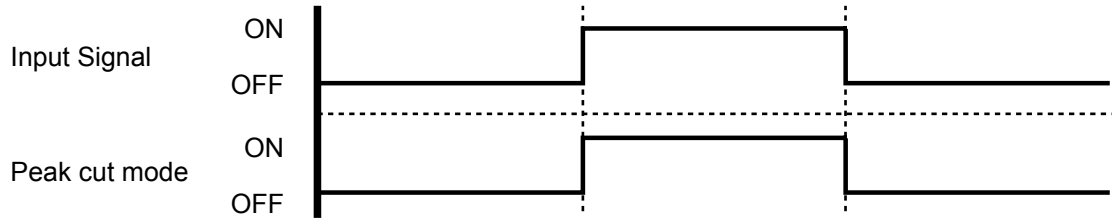
3) Resistance (Chart sign=R)
- ●Adjust the resistance for current to about DC 10mA

(Example)
- ●In case of Vcc=DC 5V : Rated resistance value 470Ω 1/4W
- ●In case of Vcc=DC 12V : Rated resistance value 1kΩ 1/4W
- ●In case of Vcc=DC 24V : Rated resistance value 2.2kΩ 1/4W

* Make the distance from the PC board to the connected unit within 10 m.

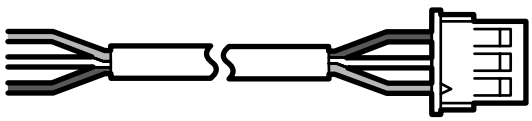
• Use the following parts and construct a circuit as shown above.

• Input Signal···ON : Peak cut mode, Input Signal···OFF : Normal operation
*Set the "Peak cut mode" level, refer to "15.FUNCTION SETTING".




## ● Parts (Optional)

| Parts name | Model name |
|---|---|
| External connect kit | UTY-XWZXZ2 |



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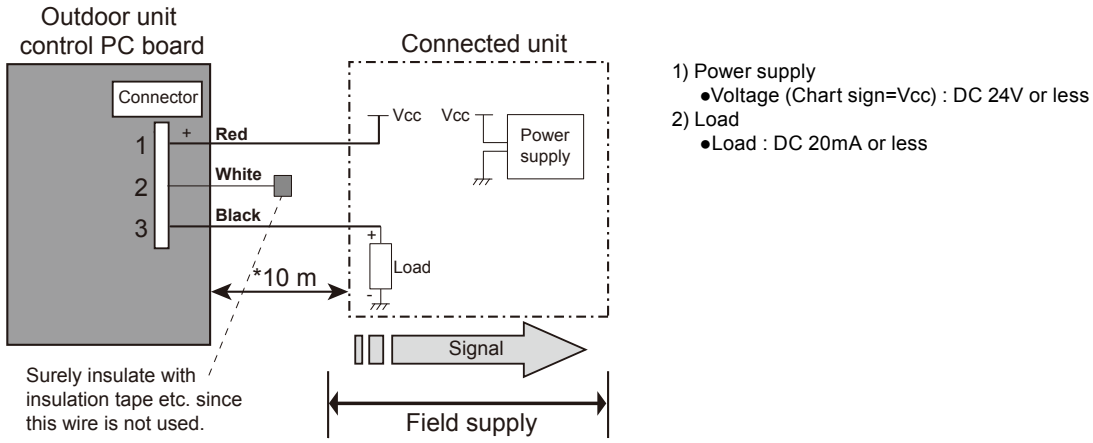
# 14-2. EXTERNAL OUTPUT

## ■ ERROR STATUS OUTPUT

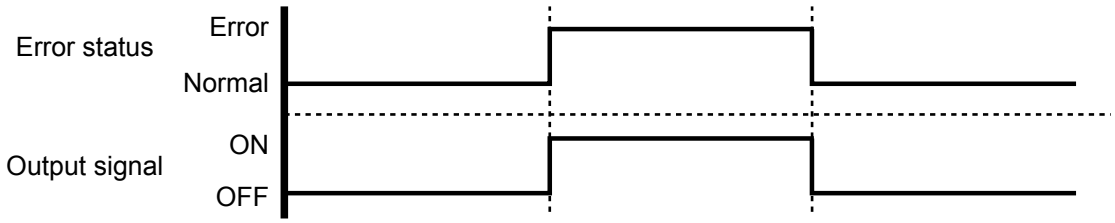
• An air conditioner error status signal is produced when a malfunction occurs.

### ● Circuit diagram example



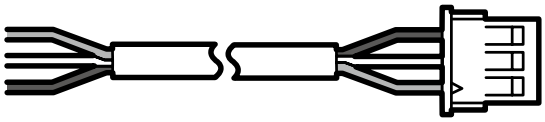

1) Power supply
●Voltage (Chart sign=Vcc) : DC 24V or less
2) Load
●Load : DC 20mA or less

* Make the distance from the PC board to the connected unit within 10 m.




### ● Parts (Optional)

| Parts name | Model name |
|---|---|
| External connect kit | UTY-XWZXZ2 |



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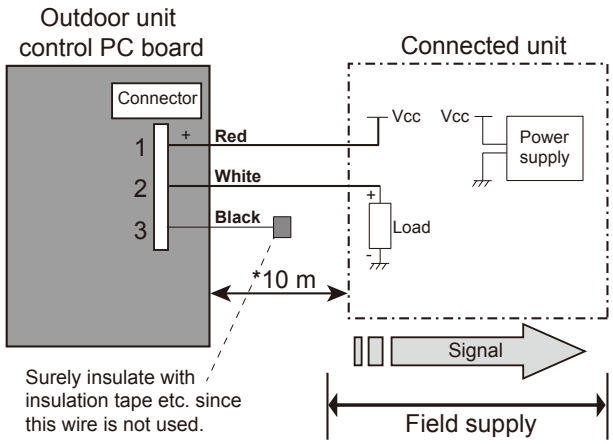
# ■ COMPRESSOR STATUS OUTPUT

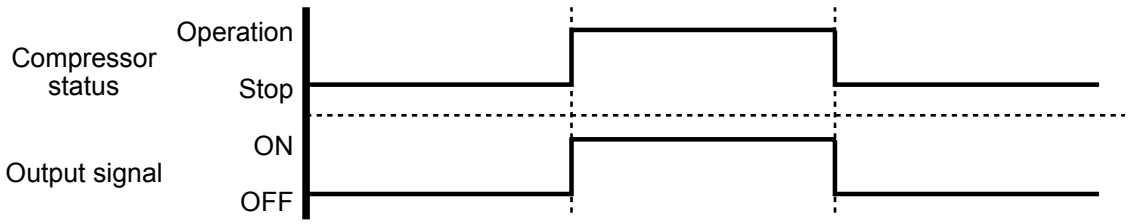
• Compressor operation status signal is produced when the compressor is running.

## ● Circuit diagram example



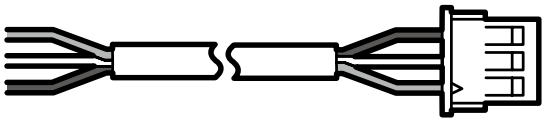

1) Power supply
●Voltage (Chart sign=Vcc) : DC 24V or less
2) Load
●Load : DC 20mA or less

* Make the distance from the PC board to the connected unit within 10 m.




## ● Parts (Optional)

| Parts name | Model name |
|---|---|
| External connect kit | UTY-XWZXZ2 |



# 15. FUNCTION SETTING

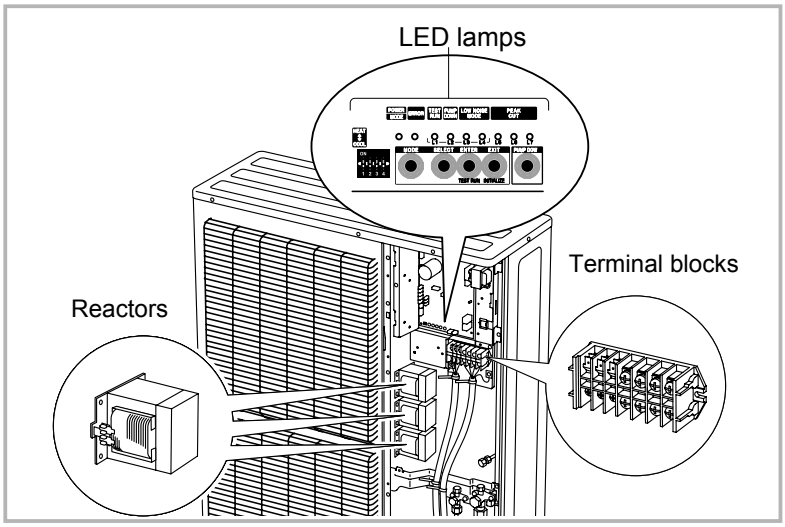
## 15-1. OUTDOOR UNIT

| ⚠ WARNING |
| --- |
| Never touch electrical components such as the terminal blocks or reactor except the switch on the display board. It may cause a serious accident such as electric shock. |

| ⚠ CAUTION |
| --- |
| Discharge the static electricity from your body before setting up the push buttons.<br>Never touch the terminals or the patterns on the parts that are mounted on the board. |

### 15-1-1. FIELD SETTING SWITCHES

The positions of the switches on the outdoor unit control board are shown in the figure below.



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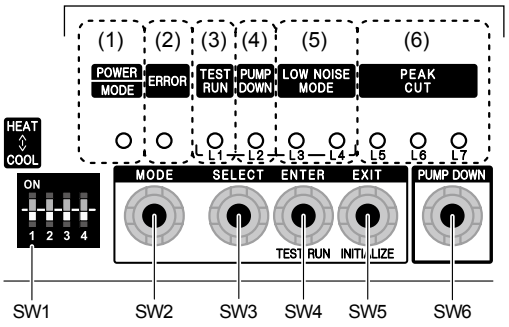
# ■ FUNCTIONS

LED lamps




| Display lamp | | Function or operation method |
|---|---|---|
| (1) POWER / MODE | Green | Lights on while power on Local setting in outdoor unit or error code is displayed with blink. |
| (2) ERROR | Red | Blinks during abnormal air-conditioner operation. |
| (3) TEST RUN (L1) | Orange | Lights on during test operation. |
| (4) PUMP DOWN (L2) | Orange | Lights on during pump down operation. |
| (5) LOW NOISE MODE (L3, L4) | Orange | Lights on during “Low noise” function when local setting is activated. (Lighting pattern of L3 and L4 indicates low noise level) ⇨See page (02-23). |
| (6) PEAK CUT MODE (L5, L6, L7) | Orange | Lights on during “Peak cut” function when local setting is activated.(Lighting pattern of L5, L6 and L7 indicates peak cut level) ⇨ See page (02-24). |

| Switch | | Function or operation method |
|---|---|---|
| SW1 | DIP switch | For selecting cooling or heating during test operation. Positions 2 to 4 of Dip switch are not used. |
| SW2 | Push switch | To switch between “Local setting” and “Error code display”. |
| SW3 | Push switch | To switch between the individual “Local settings” and the “Error code displays”. |
| SW4 | Push switch | To fix the individual “Local settings” and the “Error code displays”. |
| SW5 | Push switch | EXIT |
| SW6 | Push switch | To start the pump down operation. |

- Dip switches 1 to 4 at shipment from the factory are set as follows.

| Switch | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| COOL | OFF | OFF | OFF |

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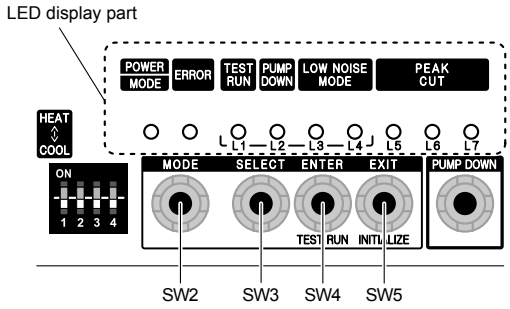
# 15-1-2. SETTING METHOD

※ Stop the operation of air conditioner before this setting.

## ■ LOW NOISE MODE




(1) Switch to “Local setting mode” by pressing [MODE] switch (SW2) for 3 seconds or more.

(2) Confirm (POWER / MODE) blinks 9 times, and press [ENTER] switch (SW4).

| POWER / MODE | ERROR | TEST RUN (L1) | PUMP DOWN (L2) | LOW NOISE (L3) | LOW NOISE (L4) | PEAK CUT (L5) | PEAK CUT (L6) | PEAK CUT (L7) |
|---|---|---|---|---|---|---|---|---|
| Blinks (9 times) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Sign “ ○ ” : Lights off

(3) Press [SELECT] switch (SW3), and adjust LED display as shown below. (Current setting is displayed)

| | TEST RUN (L1) | PUMP DOWN (L2) | LOW NOISE (L3) | LOW NOISE (L4) |
|---|---|---|---|---|
| LOW NOISE MODE | ○ | ○ | ○ | Blink |

(4) Press [ENTER] switch (SW4).

| | TEST RUN (L1) | PUMP DOWN (L2) | LOW NOISE (L3) | LOW NOISE (L4) |
|---|---|---|---|---|
| LOW NOISE MODE | ○ | ○ | ○ | ● |

Sign “ ● ” : Lights on

(5) Press [SELECT] switch (SW3), and adjust LED display as shown in below figure.

| | PEAK CUT (L5) | PEAK CUT (L6) | PEAK CUT (L7) |
|---|---|---|---|
| Level 1 ... Rated noise value -2dB | ○ | ○ | Blink |
| Level 2 ... Rated noise value -4dB | ○ | Blink | ○ |

(6) Press [ENTER] switch (SW4) and fix it.

| | PEAK CUT (L5) | PEAK CUT (L6) | PEAK CUT (L7) |
|---|---|---|---|
| Level 1 ... Rated noise value -2dB | ○ | ○ | ● |
| Level 2 ... Rated noise value -4dB | ○ | ● | ○ |

(7) Return to “Operating status display (Normal operation)” by pressing [EXIT] switch (SW5).

- In case of missing how many times [SELECT] and [ENTER] switch are pressed, restart from the beginning of operation procedure after returning to “Operation status display (normal operation)” by pressing the [EXIT] switch once.

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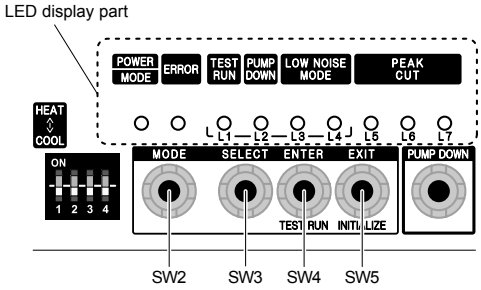
# ■ PEAK CUT MODE




(1) Switch to “Local setting mode” by pressing [MODE] switch (SW2) for 3 seconds or more.

(2) Confirm (POWER / MODE) blinks 9 times, and press [ENTER] switch (SW4).

| POWER / MODE | ERROR | TEST RUN (L1) | PUMP DOWN (L2) | LOW NOISE (L3) | LOW NOISE (L4) | PEAK CUT (L5) | PEAK CUT (L6) | PEAK CUT (L7) |
|---|---|---|---|---|---|---|---|---|
| Blinks (9 times) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Sign “ ○ ” : Lights off

(3) Press [SELECT] switch (SW3), and adjust LED display as shown below. (Current setting is displayed)

| | TEST RUN (L1) | PUMP DOWN (L2) | LOW NOISE (L3) | LOW NOISE (L4) |
|---|---|---|---|---|
| PEAK CUT MODE | ○ | ○ | Blink | ○ |

(4) Press [ENTER] switch (SW4).

| | TEST RUN (L1) | PUMP DOWN (L2) | LOW NOISE (L3) | LOW NOISE (L4) |
|---|---|---|---|---|
| PEAK CUT MODE | ○ | ○ | ● | ○ |

Sign “ ● ” : Lights on

(5) Press [SELECT] switch (SW3), and adjust LED display as shown in below figure.

| | PEAK CUT (L5) | PEAK CUT (L6) | PEAK CUT (L7) |
|---|---|---|---|
| 0% of rated input ratio | ○ | ○ | Blink |
| 50% of rated input ratio | ○ | Blink | ○ |
| 75% of rated input ratio | ○ | Blink | Blink |
| 100% of rated input ratio | Blink | ○ | ○ |

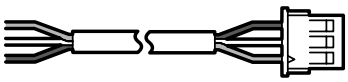
(6) Press [ENTER] switch (SW4) and fix it.

| | PEAK CUT (L5) | PEAK CUT (L6) | PEAK CUT (L7) |
|---|---|---|---|
| 0% of rated input ratio | ○ | ○ | ● |
| 50% of rated input ratio | ○ | ● | ○ |
| 75% of rated input ratio | ○ | ● | ● |
| 100% of rated input ratio | ● | ○ | ○ |

(7) Return to “Operating status display (Normal operation)” by pressing [EXIT] switch (SW5).

• When pressed number is lost during operation, restart from the beginning of operation procedure after returning to “Operation status display (normal operation)” by pressing the [EXIT] switch once.

# 16. OPTIONAL PARTS

| Exterior | Parts name | Model No. | Summary |
|---|---|---|---|
|  | External connect kit | UTY-XWZXZ2 | Use to operate the External input and output function of Outdoor unit. |

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