LG AIRCONDITIONER ENGINEERING PRODUCT DATA BOOK

Single A

(60Hz/R410A)

6CSL0-02B(Replace : 6CSL0-02A)

LG
Life's Good

Introduction

Part 1 General information

Part 2 Product data

Part 3 Design and installation

Part 4 Accessories

Introduction

Preface

New era brings the more sophisticated and advanced buildings which in turn demands for specialized and optimized direct expansion air conditioning systems. Also energy efficiency, environment friendly, low noise and low maintenance cost are the features which are essential for these systems.

As a part of vertical integration LG makes all the key components in house, which gives an edge to LG to make better and latest technology products with best quality in optimized time.

SINGLE A™ systems with are equipped with DC inverter technology and R410A refrigerant which is perfect solution to various installation locations.

LG SINGLE A™ system consists of a single common outdoor unit for single indoor unit, such as ceiling cassette and floor standing.

This Engineering product data book incorporates information about the product itself, its installation and designing for SINGLE A™ system.

The comprehensive study of this book will improve your knowledge about the system and its application in details.

LG Electronics Inc.

Air Conditioning Company

Publication history

Pub. No.	Category	Type	Refrigerant	Outdoor units	Notes	Published in
6CSL0-01A	CAC	Inverter Single	R410A	AUUW243D[LUU245HV] AUUW423D[LUU425HV]	- New indoor unit models ATNH243PLAD[LCN245HV] ATNH423MLAD[LCN425HV] APNH2433LAD[LFN245HV] APNH423TLAD[LFN425HV]	Feb.2009
6CSL0-01B	CAC	Inverter Single	R410A	-	- Revise content indoor unit models. APNH2433LAD[LFN245HV]	July.2009
6CSL0-02A	CAC	Inverter Single	R410A	- Revise content outdoor units models. AUUW243E[LUU246HV] AUUW423E[LUU426HV]	- Revise content indoor units models. ATNH243PLAE[LCN246HV] ATNH423MLAE[LCN426HV] APNH2433LAE[LFN246HV] APNH423TLAE[LFN426HV]	May.2010
6CSL0-02B	CAC	Inverter Single	R410A	AUUW243E[LUU246HV] AUUW423E[LUU426HV]	Error Correction - Dimensions - Electric characteristics	Nov.2010

Step by step Single A system selection process (reference)

(1) **Calculate or obtain the maximum heat load for the area(s) to be air conditioned**

(2)

Indoor unit specifications

Outdoor unit specifications

Capacity coefficient factor

Air flow and temperature distributions

(3)

Electrical wiring

Electrical characteristics

Field wiring

⚠CAUTION

1. Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is installed close to the sea shore, direct exposure to the sea breeze should be avoided and choose an outdoor unit with anti-corrosion treatment.

Part 1 General information

1. Model line up

1.1 Indoor units

Category	Type	Chassis		Model Name Capacity, Btu/h(kW)	
				23,000(6.74)	41,000(12.02)
Ceiling cassette	4way		TP	ATNH243PLAE [LCN246HV]	
			TM		ATNH423MLAE [LCN426HV]
Floor Standing			P3	APNH2433LAE [LFN246HV]	
			PT		APNH423TLAE [LFN426HV]

* High Efficiency Indoor Units

1.2 Outdoor units

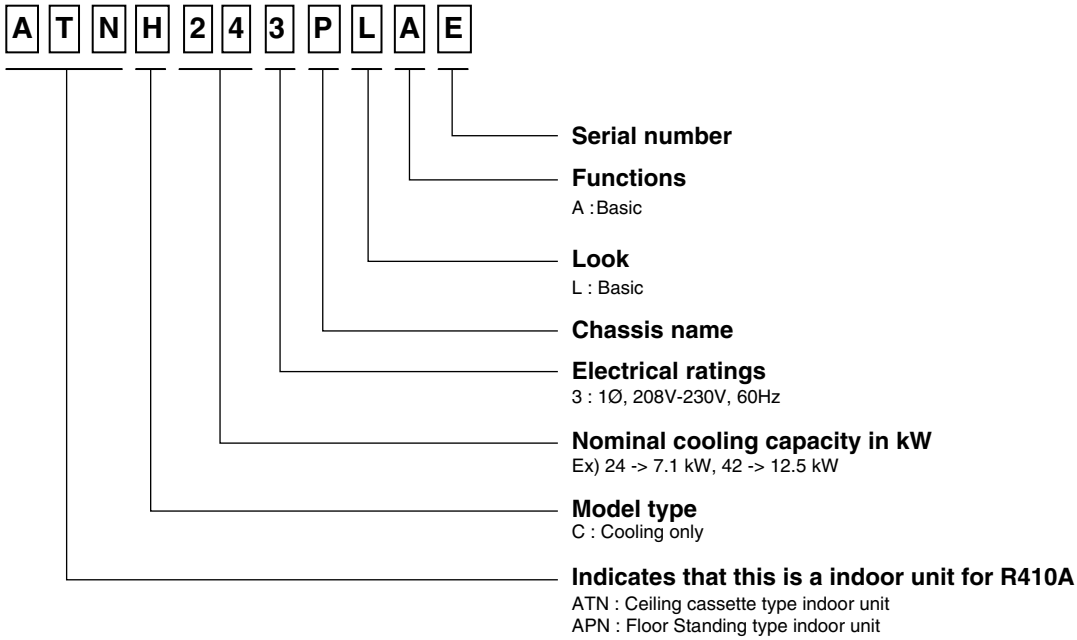
DC Inverter SINGLE A (1Ø)

DC Inverter		AUUW243E [LUU246HV]	AUUW423E [LUU426HV]
No. of connectable indoor units		1	
Total capacity index of connectable indoor units	Btu/h	23,000	41,000
	kW	6.74	12.02
Power supply		1Ø, 208-230V, 60Hz	
Chassis			

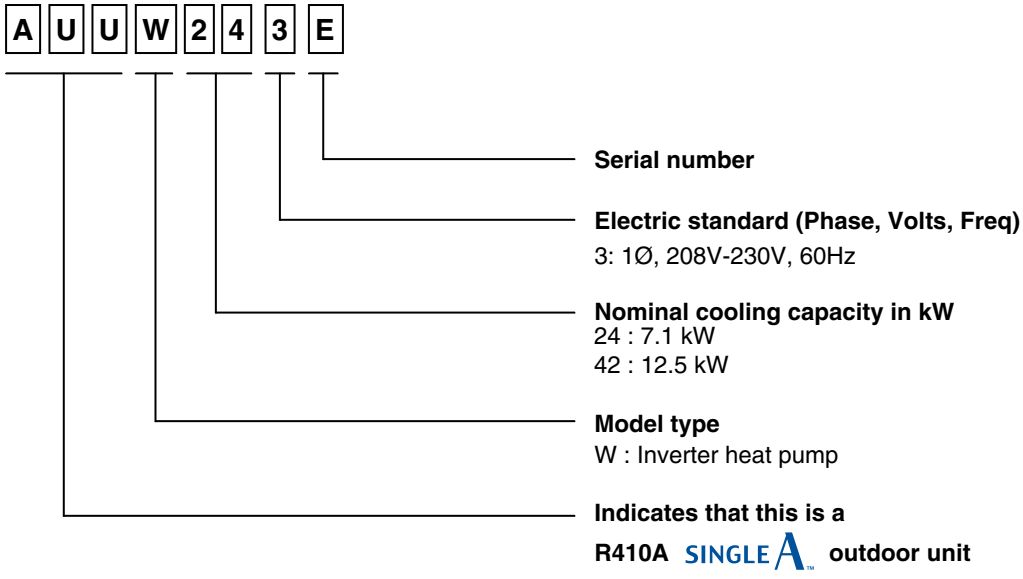
2. Nomenclature

Model number nomenclature

2.1 Indoor unit(Global)



2.2 Outdoor units(Global)



3. List of functions

Category	Function	Ceiling Cassette 4-way	Floor Stnading
Air flow	Air supply outlet	4	3*
	Airflow direction control(left & right)	-	O
	Airflow direction control(up & down)	Auto	O
	Auto swing(left & right)	X	O
	Auto swing(up & down)	O	O
	Airflow steps(fan / cool / heat)	4 / 5 / 4	3 / 3 / 3*
	Chaos swing	O	O
	Chaos wind(auto wind)	O	X
	Jet cool(Power wind)	O	O
	Swirl wind	O	X
Air purify-ing	Deodorizing filter	X	O*
	Plasma air purifier	X	O*
	Prefilter(washable / anti-fungus)	O	O
Installation	Drain pump	O	X
	E.S.P. control	O	X
	Electric heater	-	X
	High ceiling operation	O	X
Reliability	Hot start	O	O
	Self diagnosis	O	O
	Soft dry operation	O	O
Convenience	Auto changeover	O	O
	Auto cleaning	X	O*
	Auto operation(artificial intelligence)	X	X
	Auto restart operation	O	O
	Child lock	O	O
	Forced operation	O	O
	Group control	X	X
	Sleep mode	X	X
	Timer(on/off)	O	O
	Timer(weekly)	O	X
	Two thermistor control	O	O
Individual control	Standard wired remote controller	X	X
	Picto wired remote controller	O	X
	Deluxe wired remote controller	X	X
	Simple wired remote controller	X	X
	Wired remote controller(for hotel use)	X	X
	Wireless remote controller(simple)	X	X
	Wireless LCD remote control	O*	O*(New EZ)
CAC network function	General central control(Non LGAP)	X	X
	Dry contact	X	X
	Network Soluation(LGAP)	X	X
	PDI(power distribution indicator)	X	X
	PI 485	X	X
Special function kit	CTIE	X	X
	Zone control	-	X
Others	Thermistor	X	X

Note:

• O: Applied, • X: Not applied, • - : No relation,

• Option: Model name & price are different according to options, and assembled in factory with main unit.

• Accessory: Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

* : Some of functions are slightly different depending upon models, refer individual function table on "PART 2. indoor units".

4. Features

4.1 Technologies

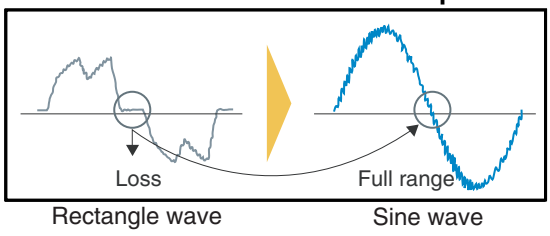
Inverter Technology

With the advancement of inverter technology comes more silent, economical and powerful air conditioning systems.

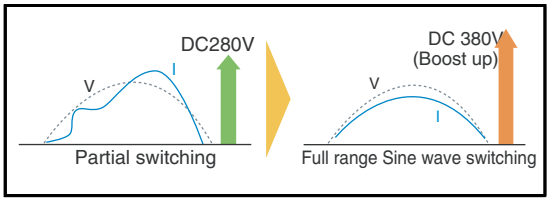
Step-up Inverter by the PFC & the Sine Wave Control Technology (PFC :Power Factor Correction)

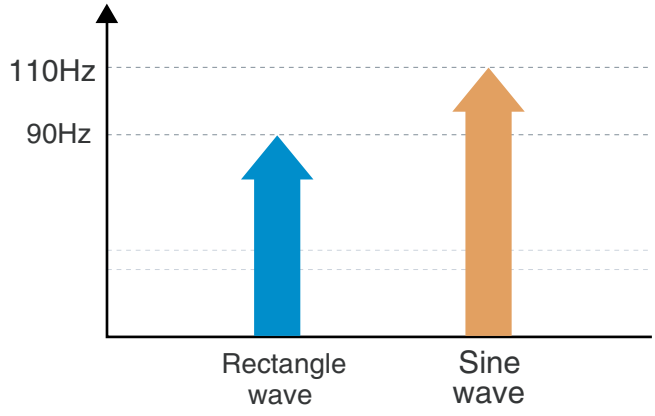
The LG air conditioner is manufactured using the PFC and the sine wave technology. By the PFC contorl, raising the operating voltage from the existing DC 280V to DC 380V can be done. Thereby, it makes the operation smooth in a high-frequency area. The sine wave control enables soft operation in a low frequency area, thereby expanding the product's operating range. This also markedly improves the product's energy efficiency.

• Sine wave Control in BLDC Compressor



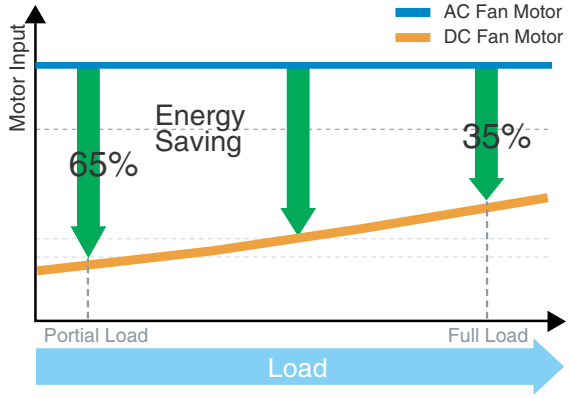
• PFC Control in Power Input





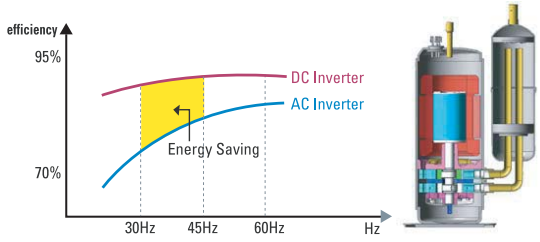
BLDC Fan motor

BLDC fan motor offers additional energy saving in operating mode. Compared with AC motors, BLDC fan motor can cut energy by 35%at full velocity. AC motor is operating at full velocity only, but BLDC Motor can change velocity according to load. Energy efficiency levels at low velocities in particular have been improved by 65%.



Powerful BLDC Compressor

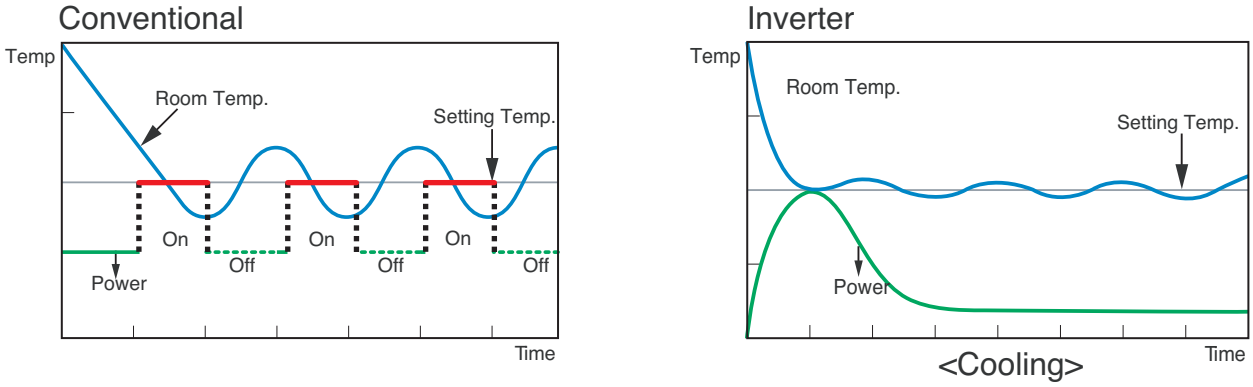
The LG inverter air conditioner comes with a BLDC compressor that uses a strong neodymium magnet. Its compressor thus has improved efficiency compared with AC inverter. Notably, during partial-load operation (30-45 Hz), the efficiency of the compressor motor of the LG inverter air conditioner increases, as opposed to the existing AC motors, and the subcooling effects of the bigger condensor will further increase the product's energy consumption efficiency.

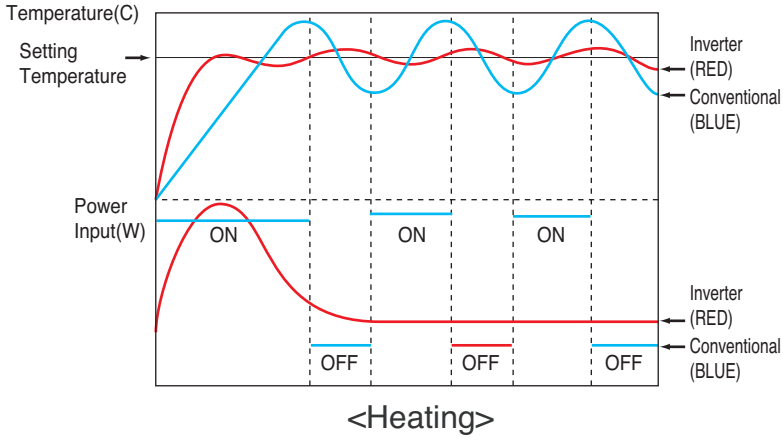


Comfortable with Fast Cooling & Heating Performance

When the air conditioner is initially activated to either heat or cool, the compressor will operate at maximum speed to reach the desired temperature quickly.

Once the desired temperature is achieved, unlike conventional air conditioners that turn the compressor on and off, LG inverter units constantly adjust and vary the compressor speed to maintain the desired temperature with minimal fluctuation to ensure that your comfort is not compromised.





4.2 Indoor units

Ceiling Cassette – 4 way

- ■ Compact design and easy installation
- ■ Low noise
- ■ Hygienic and easy-to-clean filter
- ■ 2-thermistor(unit body and remote controller)
- ■ Jet cool
- ■ Plasma air purifying system(Accessory)
- ■ High head drain pump(700mm)
- ■ High-ceiling corresponding operation
- ■ LCD wired remote controller
- ■ Wireless remote controller(Accessory)

• New Wired Remote Controller

The wired remote controller with a large wide LCD screen featuring large font letters and a 4-direction key control enables the user more convenient control of operational conditions of the indoor unit.

PQRCVSL0

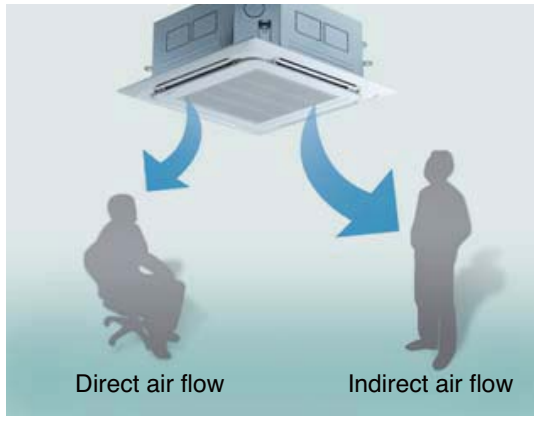
PQRCVSL0QW

- **Backlight LCD**
- **Big Font to see even from a distance**
- **Large wide LCD for easy check**
- **Easy installation**

• 4 Vane Independent Operation

Vane angle control satisfies both users who like direct wind or indirect wind. And also it prevents cold air draft.

- This function can be controlled with new wired remote controller



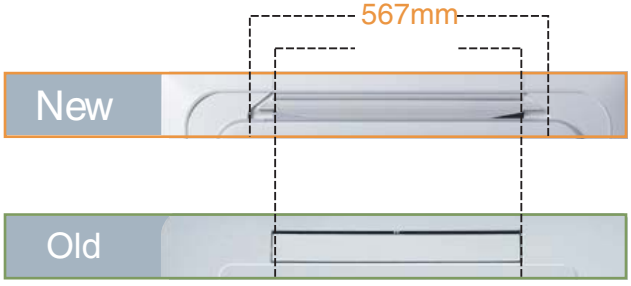
All vane operation

Individual vane operation

Individual vane angle control

• Wide Jet Air Flow

Improved wide and narrow vane will provide comfortable temperature distribution without air flow dead zone.



80mm Wider!!

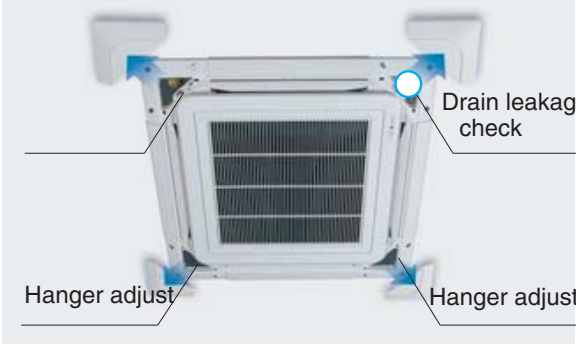
• Slim & Compact size

The indoor unit with slim and compact size enables successful installation in confined spaces.

Model	Size("a")
LCN246HV	8.03 in
LCN426HV	11.34 in

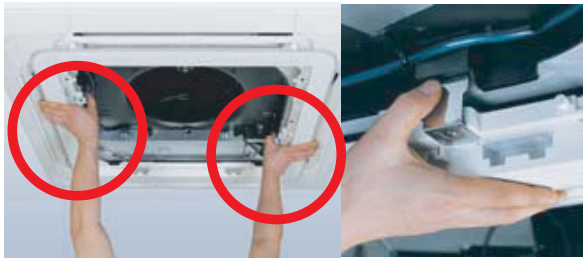
• Convenient Installation

Easy installation with corner detachable decoration panel.



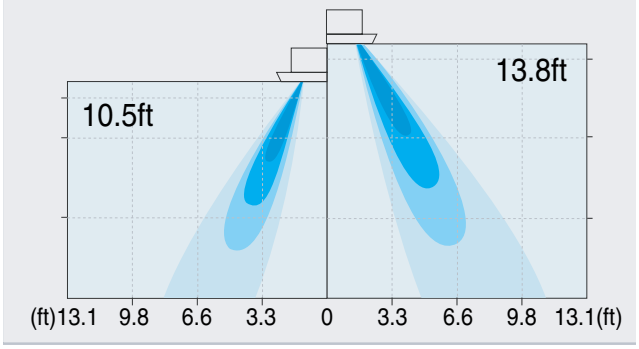
• One touch type Panel

It provides easy installation with a one-touch detachable panel.



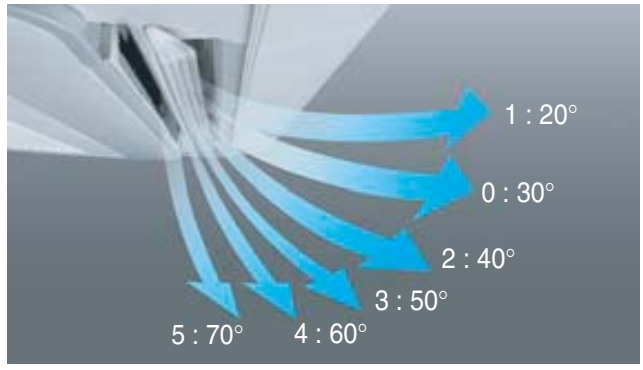
• Extra high ceiling mode

A 4.2m maximum high ceiling mode is available with the support of the indoor unit fan position control algorithm design. This setting offers a reduction of droughts.



• Independent Automatic Vane Control

One motor per vane is adopted to control each of four vane independently, freely controlling air current according to situations.



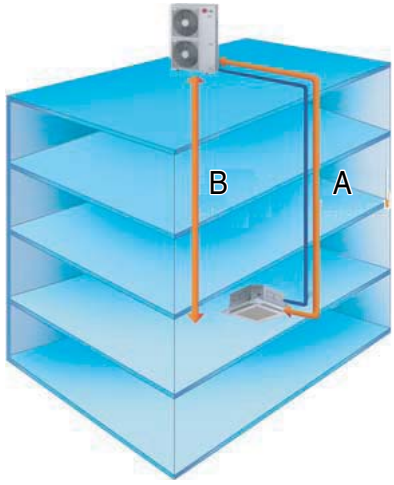
• Two Thermistor Control

There may be a significant difference between the temperature taken at the installed product and indoor temperature. Two thermistor control provides option to control temperature by referring any of the two temperatures. With the help of the slide switch at the back of the LCD wired remote controller, selection of the desired thermistor for controlling the unit can be done. One thermistor is in the Indoor unit & the other one is in the LCD wired remote.

• Long Distance, High Elevation Piping

LG air conditioners (cassette and floor standing models) can be installed for long distance (up to A ft) And high elevation applications (up to B ft).

Capacity	Indoor	A(ft)	B(ft)
23kBtu/h	Cassette type	164	98
	Floor standing type	98	66
41kBtu/h	Cassette type	164	98
	Floor standing type	131	82



• Weekly Program

The operator can set an On/Off reservation of the air conditioner for a period of one week.

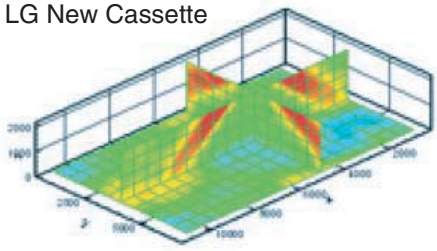
LCD Wired Remote Controller

- 24-Hour ON/OFF Timer in 1 hour intervals
- TEST RUN Mode
- Self-Diagnosis function
- 3-Step Fan Speed selection
- Operation Indication
- Room Temperature Display
- Only 20mm thickness

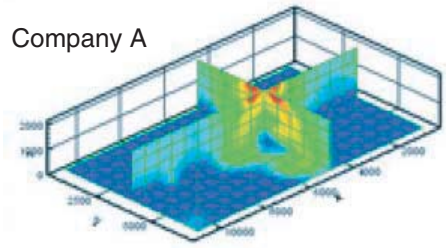
• Swirl Swing

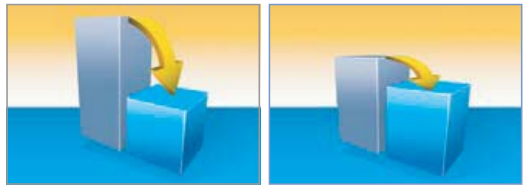
Swirl swing distributes air evenly throughout the room to ensure a more comfortable conditioned environment by adjusting the movement of the louvers.

LG New Cassette



Company A



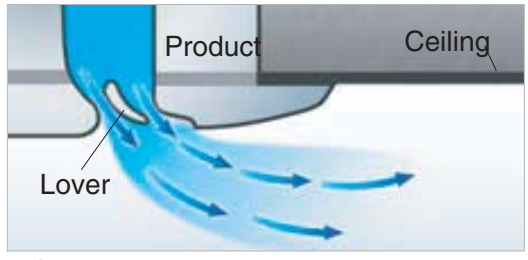


Vertical Temp. Differences Horizontal Temp. Differences

• Design to Reduce the Ceiling Stains

The new outlet design can reduce ceiling contamination from air current flowing along the ceiling.

Existing type



Ceiling pollutions prevention type

• Cassette Cover (Accessory : PTDCQ / PTDCM)

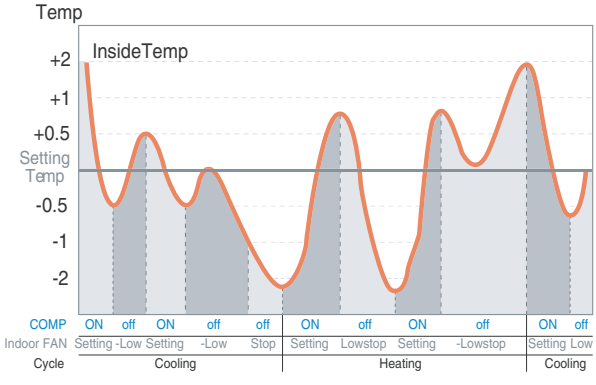
Maintains the ceiling elegance.
- Covers the side area of cassette.
- Gives elegant looks.
- Light weight.
- Suitable when false ceiling is unavailable.

• Auto Changeover

With reverse cycle models, the air conditioner will switch automatically from cooling to heating modes depending on the set temperature.

• Initial Setting Temp : 64.4°F(18°C)
(Memory the final setting temp)

• Control of setting temp.
Wired Remoted Controller : 64.4~86°F(18~30°C)
Reset Button in indoor unit : finally memorized temp.
Wireless Remoted Controller : 73.4~80.6°F(23~27°C)

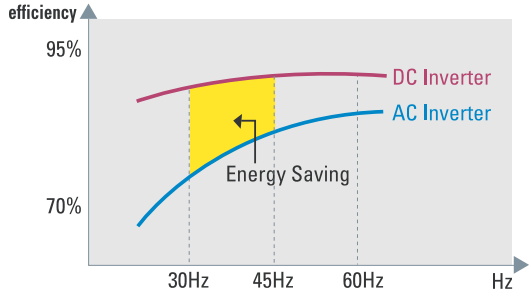


• High efficiency Inverter Technology

You may have heard the excitement about Inverter technology, LG Inverters are the pinnacle of energy efficiency due to the innovative operation. Rather than using a constant speed compressor, the LG Inverter system uses a variable speed compressor, which means the Cooling or Heating capacity of the Air Conditioning can be varied to suit Indoor conditions.
This makes the LG Inverter Units more economical & efficient to operate, produce less noise than standard counterparts and contain most superior features on the market.

• Powerful BLDC Compressor

The LG inverter air conditioner comes with a BLDC compressor that uses a strong neodymium magnet. Its compressor thus has improved efficiency compared with AC inverter. Notably, during partial-load operation (30-45 Hz), the efficiency of the compressor motor of the LG inverter air conditioner increases, as opposed to the existing AC motors, and the subcooling effects of the bigger condensor will further increase the product's energy consumption efficiency.

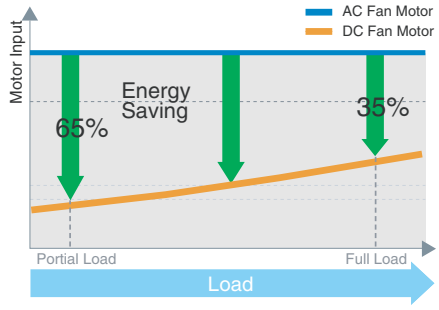


• BLDC Fan motor

BLDC fan motor offers additional energy saving in operating mode. Compared with AC motors, BLDC fan motor can cut energy by 35%at full velocity. AC motor is operating at full velocity only, but BLDC Motor can change velocity according to load. Energy efficiency levels at low velocities in particular have been improved by 65%.

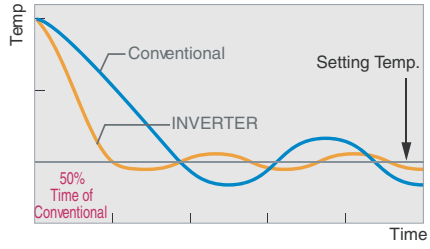
Stator

Rotor



• Quick Cooling &Heating

Inverter air conditioners can operate their compressors faster to give them more powerful performance. This results in being able to attain the desired temperature much faster in both heating and cooling modes than conventional air conditioners.



• Group Control

1) Operation Summary

- Where several products are linked, one specific control device can control a specific number of products.

2) Specific Operation

- Connecting line is linked to each of the indoor equipments for communication.
  A specific control device is connected to each of them and this control device can control the same function.
- Group control function is enabled by dip switches in the wired remote control.
  At this time, the main system will not respond in order to prevent data collision.
- While executing group control command, use the random data(0-3minutes) in the main body of indoor equipment for limiting starting current.
- Control device can control up to 16 indoor equipments.

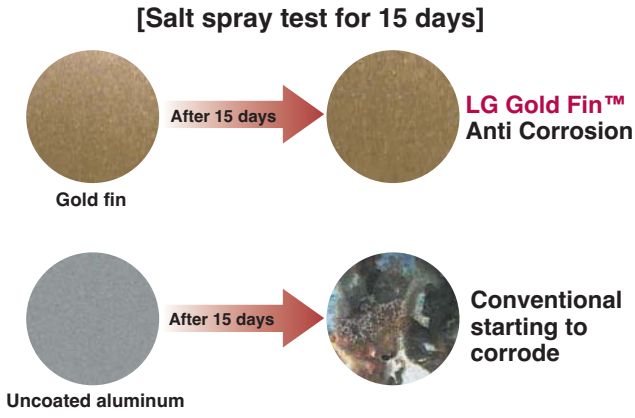
Floor Standing

Jet Cool:

- In this mode quick & fast cooling is done. Cold and high velocity air is supplied to the room till the indoor temperature reaches 64.4°F(18°C).

Anti Corrosion Gold Fin™

- LG 's Outdoor Heat Exchanger is coated with a golden anti-corrosive epoxy treatment on the aluminum coil to minimized corrosion. This maintains heat transfer properties of the coil for an extended time where as non-Gold Fin coils progressively lose efficiency due to surface corrosion. Standard on every LG air conditioner, this assists in areas suffering from pollution or near the ocean where the unit may subjected to higher levels of salt.



Auto Swing:

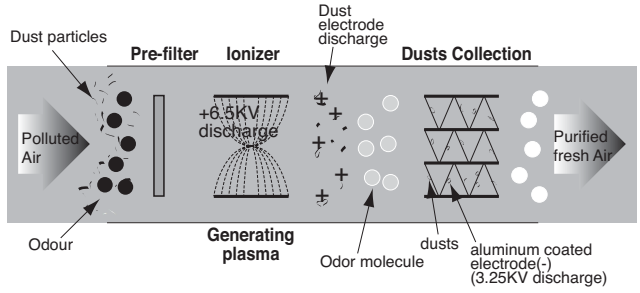
- Hot or cold air can be evenly distributed throughout the room as the auto swing function blows air in 2 or 4 directions.

7-Hour On/Off Timer:

- This function allows you to set the timer for one or up to seven hours.

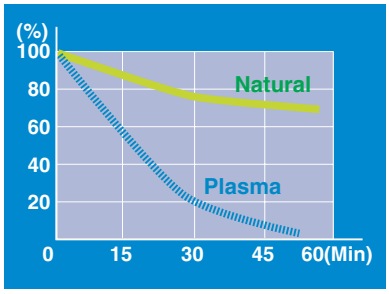
Plasma Air Purifier:

- It not only removes microscopic contaminants & dust, but also removes house mites, pollen, and pet fur helps to prevent allergic diseases like asthma. It provides odor free, dust free and allergy free air.



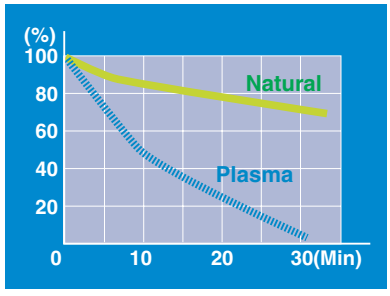
Dust Reduction

Respirable particles from 5 cigarettes in a sealed room removed by LG Plasma Air Purifying System



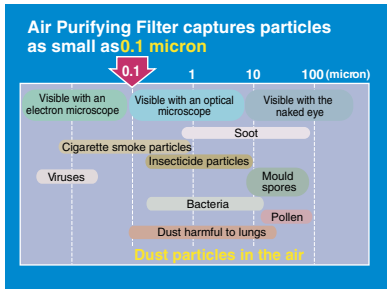
Deodorization

LG's Plasma unit effectively removes high concentration tobacco odors confirmed in Sensory tests of odor index carried out in Korea and Japan.

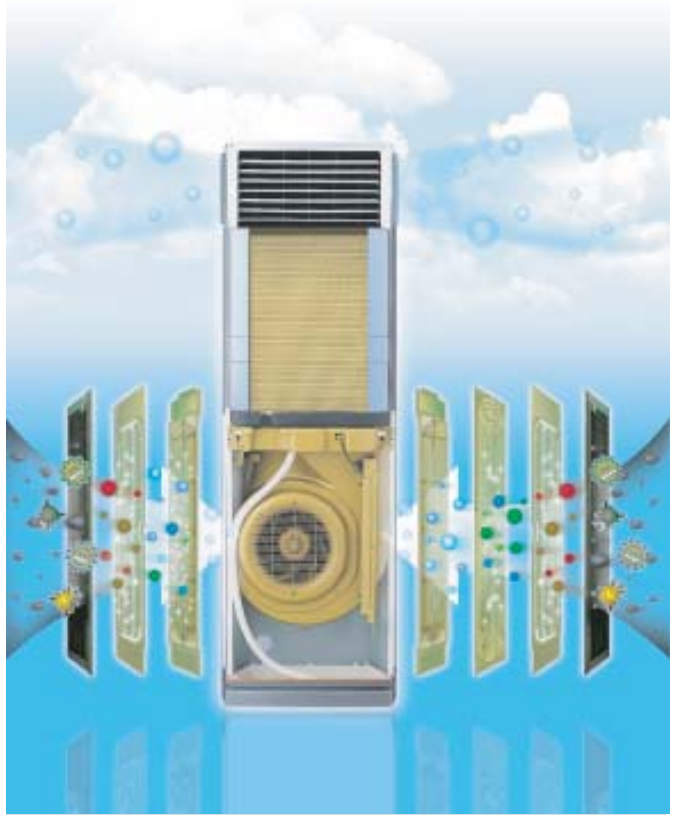


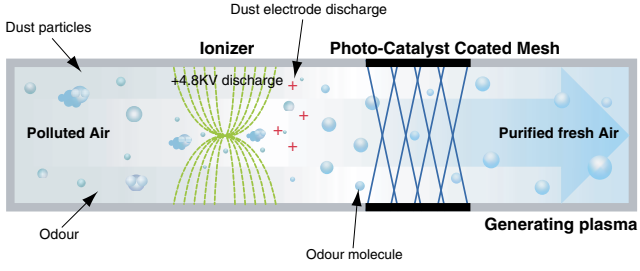
Anti-Allergy

In clinical tests,the plasma unit has earned a satisfaction ratio of 82%.



Evaluated by CSIRO Australia (DBCE Doc 98/204)
Tested by Korean Food Research Institute and Japanese Environmental Centre and Yonsei Univ.College of Medicine.(Allergy Research Lab.)





Child Lock Function:

- It prevents the children or others from tampering with the control buttons on the unit. Unit can be controlled by the wireless remote controller.

Self Diagnosis Function:

- This function provides diagnosis of the unit. An error code will be displayed on the LED display panel & diagnosis can be done as per the code indication.

Cooling, Heating & Fan Operation:

- LG Floor Standing type air conditioners can provide cooling, heating & fan operation. In the cooling mode, it cools the air with an operation range of 64.4~86°F(18~30°C). In the heating mode, it heats the air with an operation range of 60.8~86°F(16~30°C). In the fan operation mode, only indoor fan at the selected speed will run, outdoor fan and compressor will be off.

Wireless Remote Control:

- It provides ease of control.

Auto Restart Operation :

- Whenever there is electricity failure to the unit, and after resumption of the power, unit will start in the same mode prior to the power failure. Memorized condition are on/off condition, operting mode (cooling/heating), set temperature and fan speed. The unit will memorize the above conditions and start with same memorized condition.

Hot Start Function :

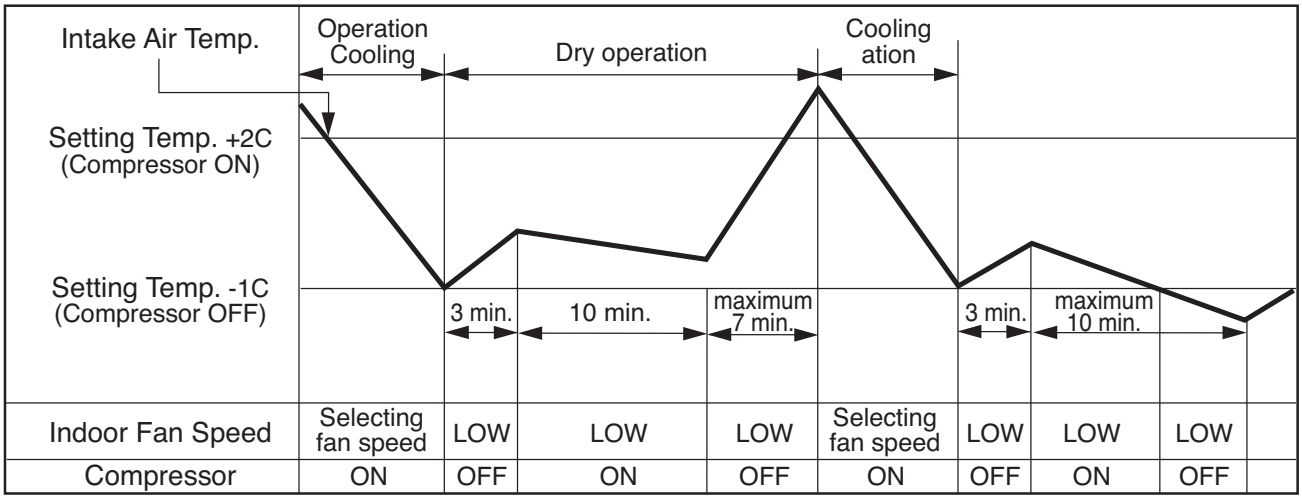
- During starting of the unit in the heating mode, it prevents cold air blow from the unit. It starts the indoor fan only after indoor unit pipe temperature reaches a preset value [82.4°F(28°C)]. When indoor unit pipe temperature has reached 28°C, then for initial 1 minute the indoor fan runs at low speed and after that at the set fan speed.

Defrost / Deicing :

- In the heating mode, it prevents the ice formation on the outdoor unit. The heating cycle is reversed to the cooling cycle to defrost the evaporator pipe of the outdoor unit. While defrost cycle, the compressor is on and indoor fan, outdoor fan and 4-way valve are off.

Soft Dry Operation :

- During Soft Dry Operation, the compressor ON temperature is the setting temperature +35.6°F, the compressor OFF temperature is the setting temperature -33.8°F. When the room temperature rises over the compressor ON temperature, the operation mode is switched to the Cooling mode. When the room temperature falls between the compressor ON temperature and OFF temperature, the operation mode is switched to the Soft Dry Operation.



Indoor Fan Speed	Selecting fan speed	LOW	LOW	LOW	Selecting fan speed	LOW	LOW	LOW	
Compressor	ON	OFF	ON	OFF	ON	OFF	ON	OFF	

Time Delay Safety Function:

-It delays restarting of the compressor by three minutes preventing any damage to the compressor.

4.3 Outdoor units

DC Inverter SINGLE A

■ **Inverter system**
- **High efficiency**
- **Low noise**

■ **Meet EU New harmonics regulation**

■ **Long pipe / high elevation piping**

■ **Energy saving using DC inverter**

23,000 Btu/h

41,000 Btu/h

Model name(1Ø)
AUUW243E[LUU246HV] AUUW423E[LUU426HV]
Power supply: 1Ø, 208-230V, 60Hz

5. Control system

5.1 Wide Remote controller (PQRCVSL0/PQRCVSL0QW)

Item		Model name	Image	Function	Applicable model
Wired remote controller	**Picto type**	PQRCVSL0 PQRCVSL0QW		• On/off, fan speed, mode, tempeture • Room tempeture • Fan, plasma, swirl swing • Automatic • Vane control • ESP function • Reservation(simple/weekly) • Simple reservation • Timer function • Auto swing, child lock • 4 Vane independent operation • Backlight LCD	Ceiling cassette Ceiling Concealed duct

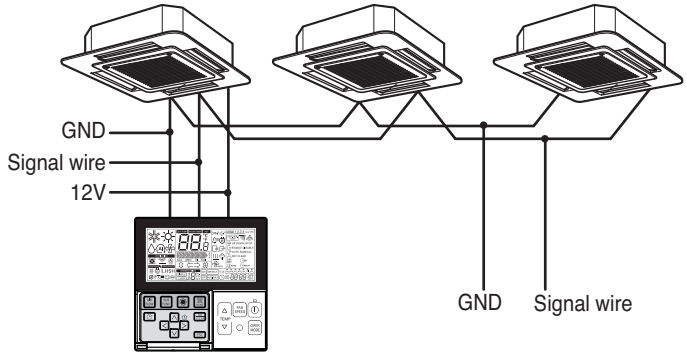
❉ For detail information, refer to the accessory part of design & installation book.

5.2 Wide Remote controller (PQRCVSL0/PQRCVSL0QW) installation guide

1. When installing more than 2 units of air conditioner to one wired remote controller, please connect as the right figure.

• If it is not event communication indoor unit, set the unit as slave.

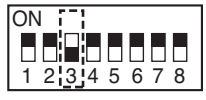
• Check for event communication through the product manual.



When controlling multiple indoor units with event communication function with one remote controller, you must change the master/slave setting from the indoor unit.

- Indoor units, the master/slave configuration of the product after completion of indoor unit power 'OFF' and then 'ON' the power after 1 minutes elapsed sign up.
- For ceiling type cassette and duct product group, change the switch setting of the indoor PCB.

#3 switch OFF: Master
(Factory default setting)



#3 switch ON: Slave

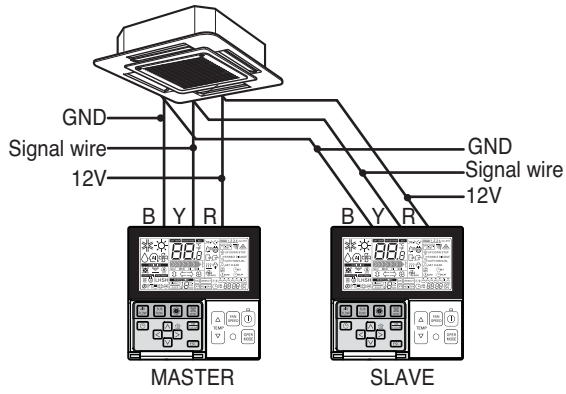
- For wall-mount type and stand type product, change the master/slave setting with the wireless remote controller. (Refer to wireless remote controller manual for detail)

❉ When installing 2 remote controllers to one indoor unit with event communication function, set the master/slave of the remote controller. (Refer to remote controller master/slave selection)

When controlling the group, some functions excluding basic operation setting, fan level Min/Mid/Max, remote controller lock setting and time setting may be limited.

2. When installing more than 2 wired remote controllers to one air conditioner, please connect as the right picture.

- When installing more than 2 units of wired remote controller to one air conditioner, set one wired remote controller as master and the others all as slaves, as shown in the right picture.
- You cannot control the group as shown in the right for some products.
- Refer to the product manual for more detail.



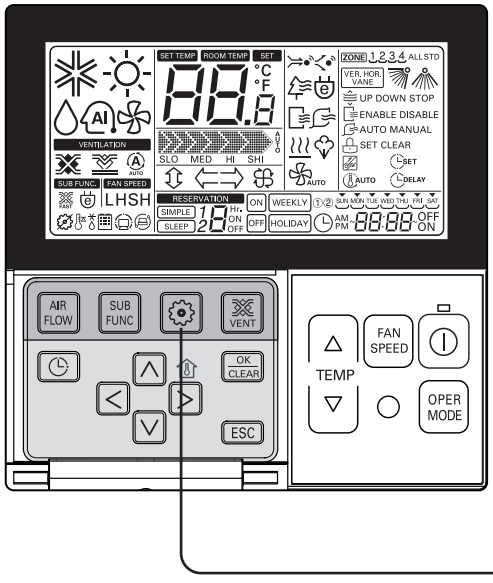
<When simultaneously connecting 2 sets of wired remote controller>

- When controlling in groups, set the master/slaver of the remote controller. Refer to Installer setting section on how to set master/slave for more detail.

Installer Setting -How to enter installer setting mode

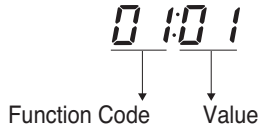
⚠ CAUTION

Installer setting mode is to set the detail function of the remote controller.
If the installer setting mode is not set correctly, it can cause problems to the product, user injury or property damage. This must be set by an certificated installer, and any installation or change that is carried out by a non-certificated person should be responsible for the results. In this case, free service cannot be provided.



1 If pressing ⚙ button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.

2 When you enter the setting mode initially, Function code is displayed on the bottom of the LCD screen.



• Some categories of the menu may not be displayed according to the function of the product, or the menu name may be different.

<Installer Setting Code Table>

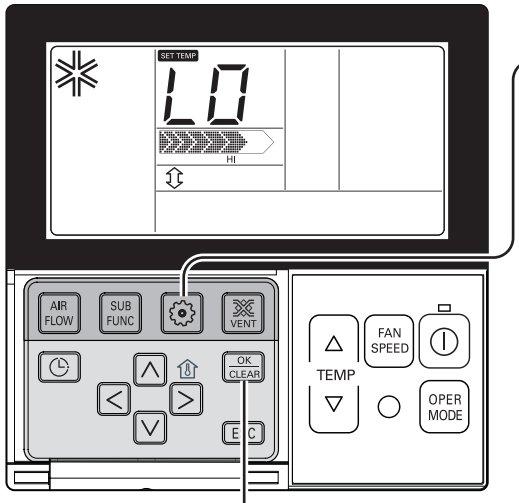
No.	Function	Code	Value
1	Test Run	01	01:Set
2	Address Setting	02	00~FF : Address
3	E.S.P. Value	03	<ESP Step> 01:VeryLow 02:Low 03:Med 04:High 05:Very High <ESP Value> 0 ~ 255 
4	Thermistor	04	01:Remo 02:Indoor 03:2TH
5	Ceiling Height	05	01:Med 02:Low 03:High 04:Very High
6	Static Pressure	06	01:V-H 02:F-H 03:V-L 04:F-L
7	Group Setting	07	00:Slave 01:Master
8	Override Setting	08	00:Slave 01:Master
9	Dry Contact	09	00:OFF 01:ON
10	Release 3 Min. Delay	10	01:Set
11	Zone State	11	01:Variable 02:Fixed
12	Celsius Fahrenheit Switching	12	00:Celsius 01: Fahrenheit (Optimized only for U.S.A)
13	Zone Type	13	00:Old 01:New
14	Zone Number	14	02~04(Zone number)
15	Plasma	20	00: Not Installed 01: Installed
16	Electric heater	21	
17	Humidifier	22	
18	Elevation Grill	23	
19	Ventilation Kit	24	

❊ Some contents may not be displayed depending on the product function

Installer Setting -Test Run Mode

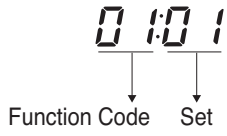
After installing the product, you must run a Test Run mode.

For details related to this operation, refer to the product manual.

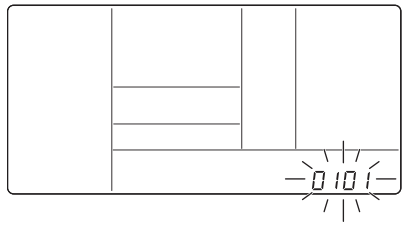


1 If pressing ⚙ button long for 3 seconds, it enters into remote controller setter setup mode.

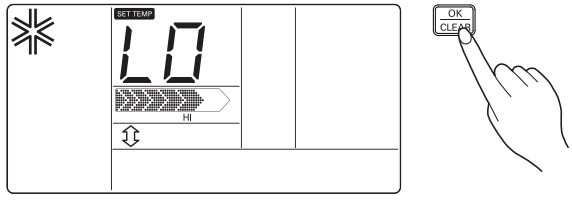
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.
- Please cancel the right and left of wind direction for RAC product.



2 Setup figure '01' blinks at the lower part of indication window.



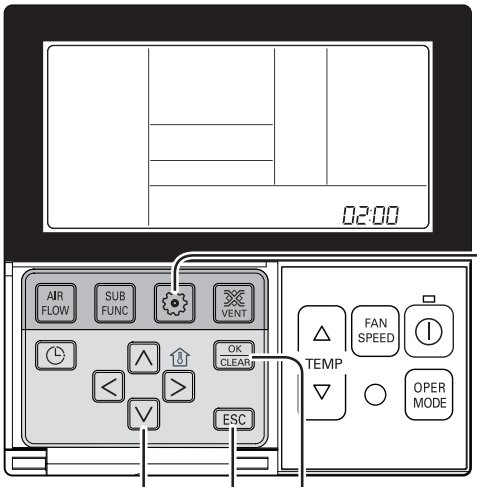
3 Press OK CLEAR button to start.



4 During the test run, pressing the below button will exit the test run.

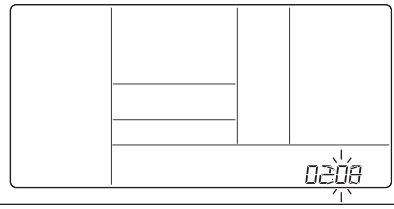
- Select operation, temperature up/down, wind flow control, wind direction, start/stop button.

Installer Setting - Setting Address of Central Control



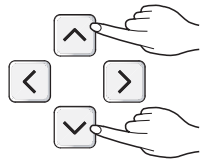
1 If pressing ⚙ button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.

2 If entering into address setup mode by using ⚙ button, it indicates as picture below.



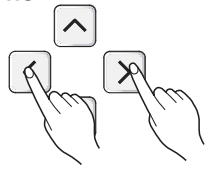
3 Set Group No. by pressing ∧ ∨ button.(0~F)

02:F0



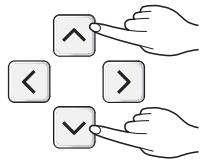
4 Move to Indoor No. setting option by pressing < > button.

02:F0



5 Set Indoor No. by pressing ∧ ∨ button.

02:F5



6 Press OK CLEAR button to save.

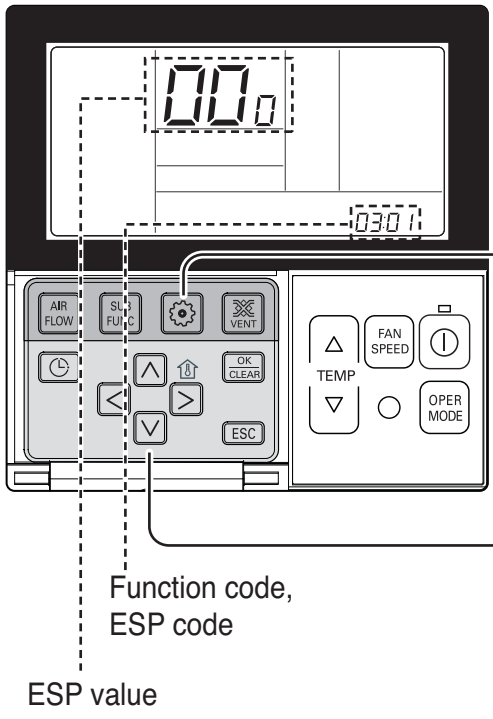
02:F5

7 Pressing ESC button will exit settings mode.
- ❊ After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
- ❊ When exiting without pressing set button, the manipulated value is not reflected.

Installer Setting -E.S.P.

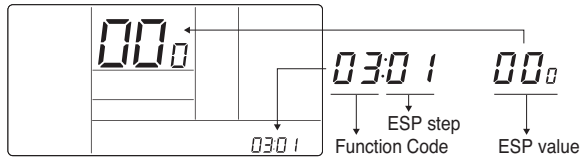
This is the function that decides the strength of the wind for each wind level and because this function is to make the installation easier.

- **If you set ESP incorrectly, the air conditioner may malfunction.**
- **This setting must be carried out by a certificated-technician.**

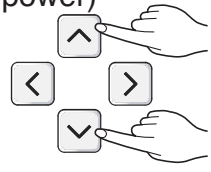


1 If pressing button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.

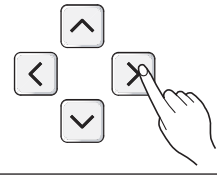
2 If entering into ESP setup mode by using button, it indicates as the picture below.



3 Select ESP fan step by pressing button. (01: very low, 02: low, 03: medium, 04: high, 05: power)

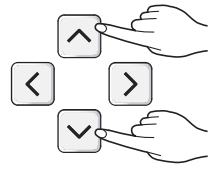


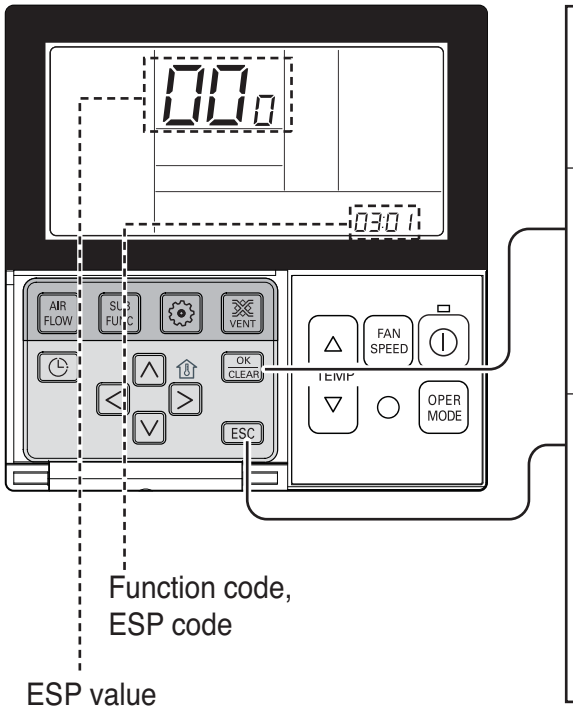
4 Move to ESP value setting by pressing button.
(It is 000 when delivering from the warehouse.)



5 Press button to setup ESP value.

(It is possible to setup ESP value from 1 to 255, and 1 is the smallest and 255 is the biggest.)





6 Select ESP fan step again by using < > button and setup ESP value, as No. 4 and 5, that corresponds each wind flow

7 Press OK CLEAR button to save.

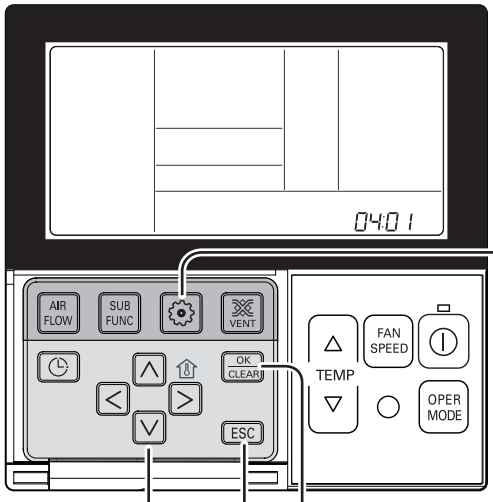
8 Press ESC button to exit.

❉ After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.

❉ When exiting without pressing set button, the manipulated value is not reflected.

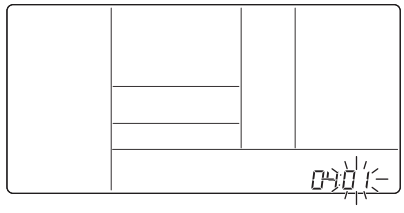
- Please be careful not to change the ESP value for each fan step.
- It does not work to setup ESP value for very low/power step for some products.
- ESP value is available for specific range belongs to the product.

Installer Setting -Thermistor



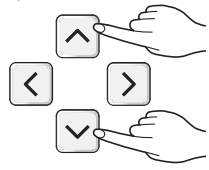
1 If pressing ⚙ button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.

2 If moving to room temperature perception sensor selection menu by pressing ⚙ button, it indicates as picture below.



3 Set Thermistor value by pressing ∧ ∨ button. (01: Remote Controller, 02: Indoor, 03: 2TH)

04:01
Function Code — Thermistor setting



4 Press OK CLEAR button to save.

04:01

5 Pressing ESC button will exit settings mode.
- ✻ After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
- ✻ When exiting without pressing set button, the manipulated value is not reflected.

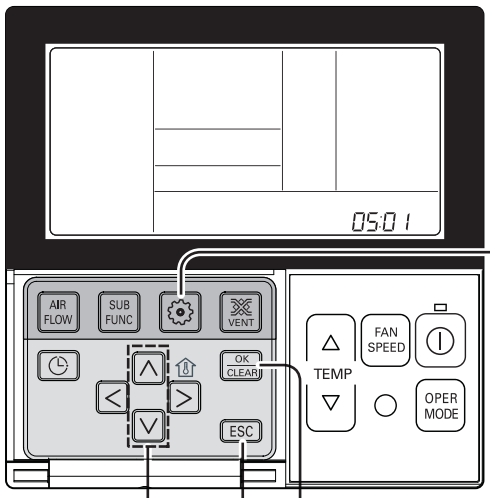
<Thermistor Table>

Temperature sensor selection			Function
01	Remote controller		Operation in remote controller temperature sensor
02	Indoor unit		Operation in indoor unit temperature sensor
03	2TH	Cooling	Operation of higher temperature by comparing indoor unit's and wired remote controller's temperature. (There are products that operate at a lower temperature.)
		Heating	Operation of lower temperature by comparing indoor unit's and wired remote controller's temperature.

✻ The function of 2TH has different operation characteristics according to the product.

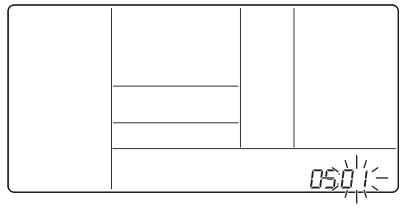
Installer Setting -Ceiling Height Selection

This function is to adjust FAN Airflow rate according to ceiling height (For ceiling type product)



1 If pressing ⚙ button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.

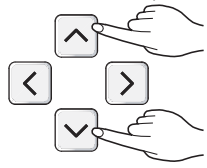
2 If moving to ceiling height selection menu by pressing ⚙ button, it indicates as picture below.



3 Select ceiling height value by pressing ∧ ∨ button. (01:Low, 02:Standard, 03:High,

05:01

Function Code — Thermistor setting



4 Press OK CLEAR button to save.

05:01

5 Pressing ESC button will exit settings mode.
- ❊ After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
- ❊ When exiting without pressing set button, the manipulated value is not reflected.

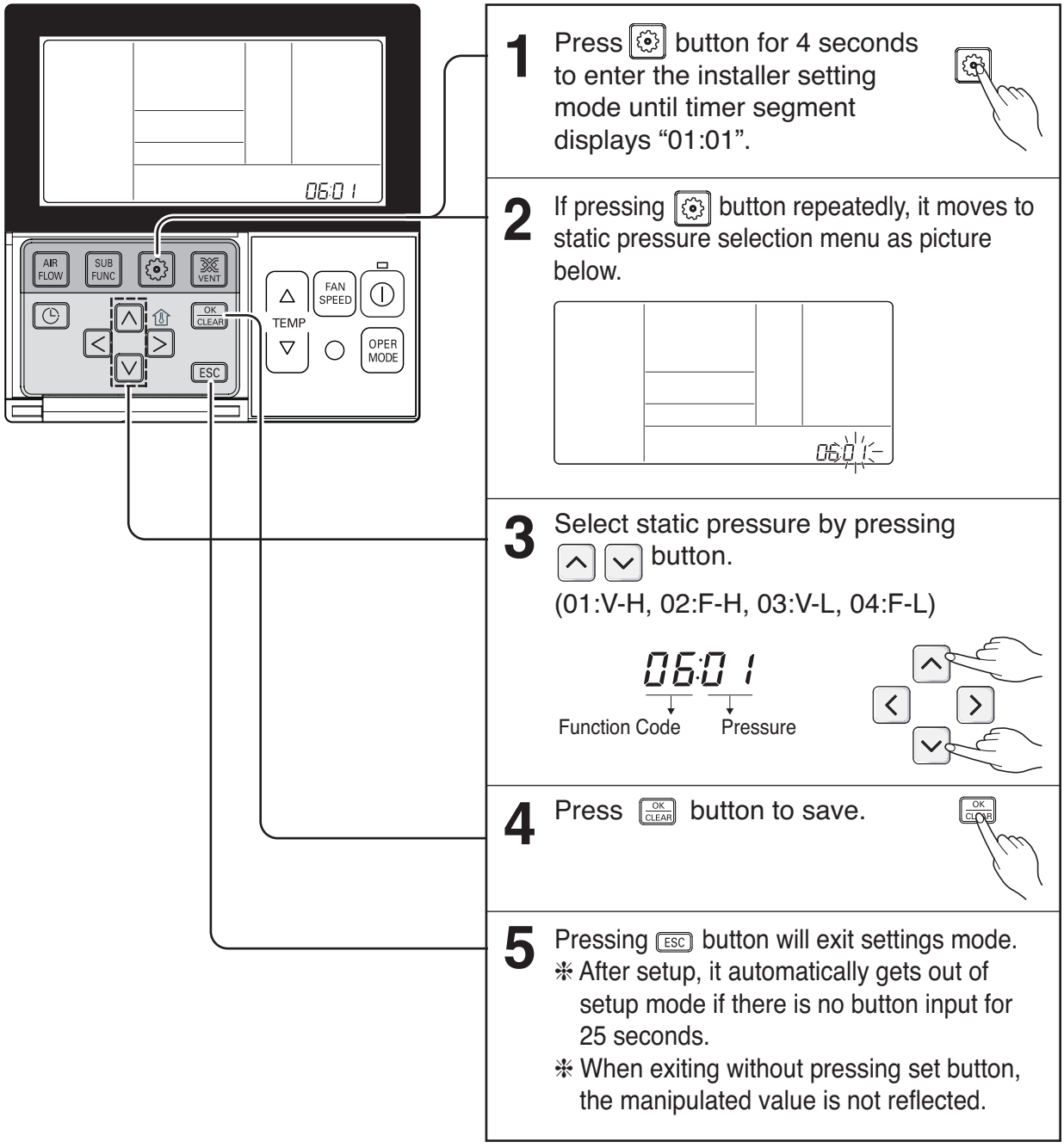
<Ceiling Height Selection Table>

Ceiling Height Level		Description
01	Low	Decrease the indoor airflow rate 1 step from standard level
02	Standard	Set the indoor airflow rate as standard level
03	High	Increase indoor airflow rate 1 step from standard level
04	Very high	Increase indoor airflow rate 2 steps from standard level

- Ceiling height setting is available only for some products.
- Ceiling height of 'Very high' function may not exist depending on the indoor unit.
- Refer to the product manual for more details.

Installer Setting -Static Pressure Setting

This function is applied to only duct type. Setting this in other cases will cause malfunction.

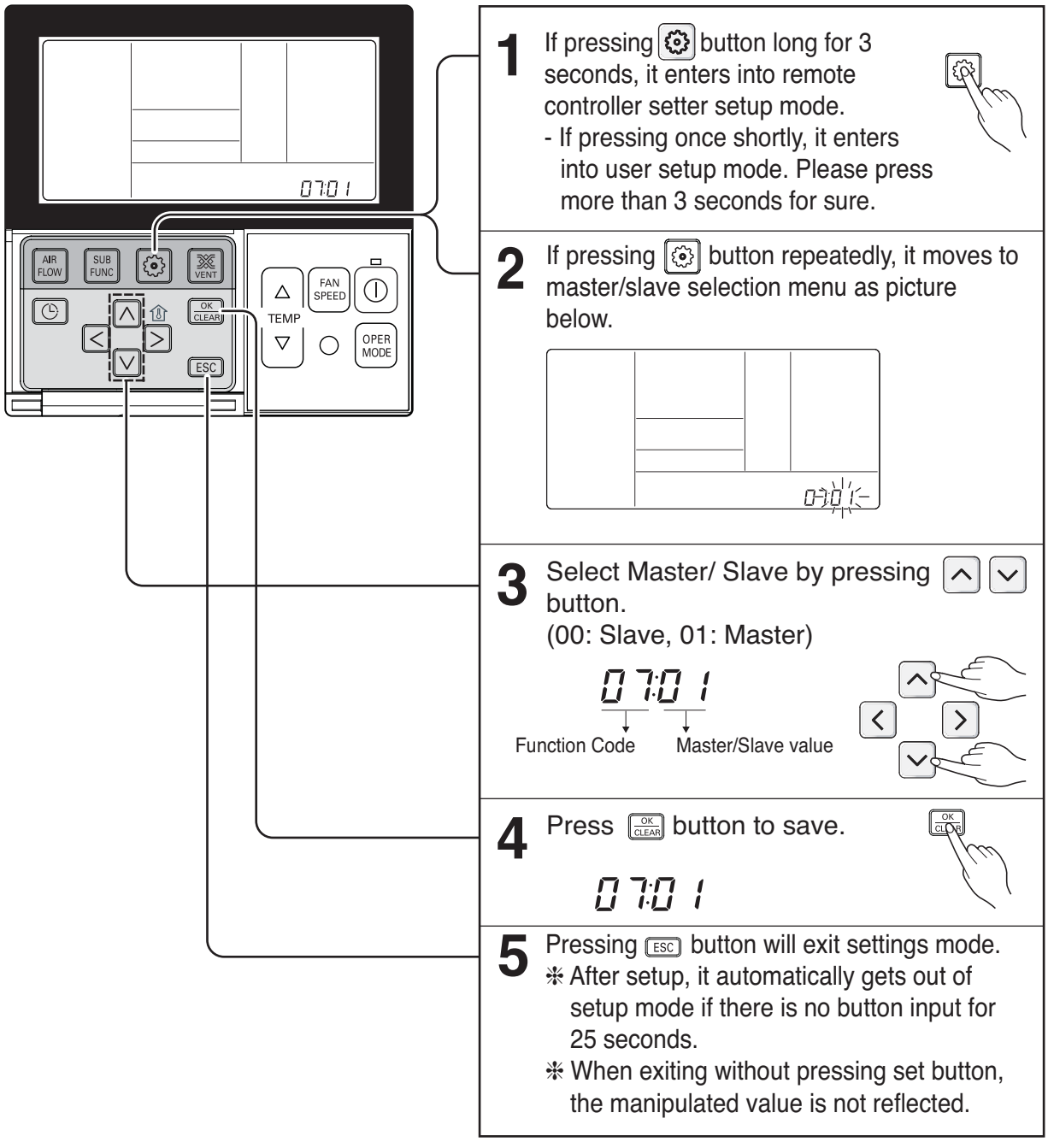


<Static Pressure Setting Table>

Pressure selection		Function	
		Zone state	ESP standard value
01	V-H	Variable	High
02	F-H	Fixed	High
03	V-L	Variable	Low
04	F-L	Fixed	Low

Installer Setting-Group Setting

It is a function for settings in group control, or 2-remote controller control.



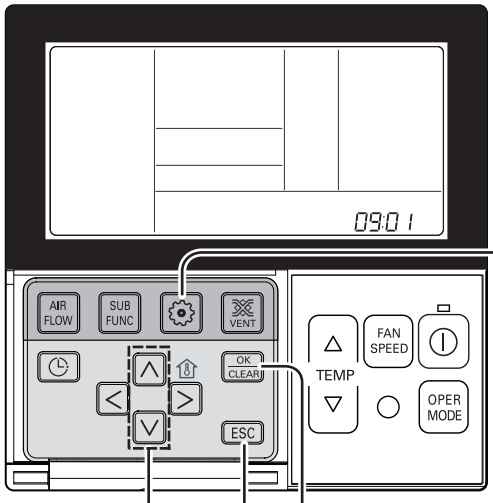
Remote controller	Function
Master	Indoor unit operates based on master remote controller at group control. (Master is set when delivering from the warehouse.)
Slave	Setup all remote controllers except one master remote controller to slave at group control

❉ Refer to the 'group control' part for details

• When controlling in groups, basic operation settings, airflow strength weak/medium/strong, lock setting of the remote controller, time settings, and other functions may be restricted.

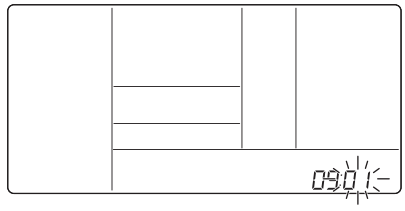
Installer Setting-Dry Contact Mode Setting

Dry contact function is the function that is possible to use only when dry contact equipment is separately purchased/setup.



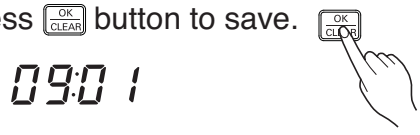
1 If pressing ⚙ button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.

2 If pressing ⚙ button repeatedly, it moves to remote controller dry contact mode setup menu as picture below.



3 Select Dry contact setting by pressing ^ v button.
(00 : Automatic, 01 : manual)

4 Press OK CLEAR button to save.



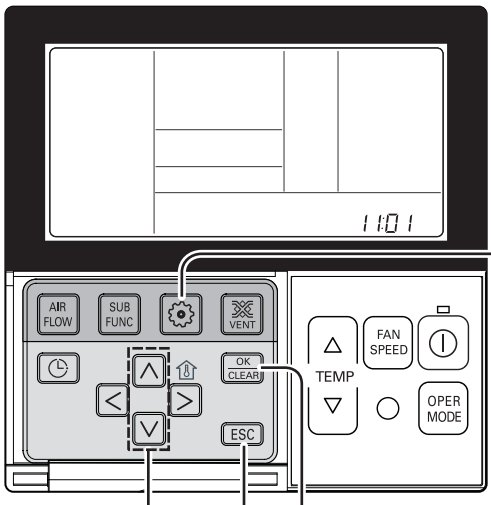
5 Pressing ESC button will exit settings mode.
- ❊ After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
- ❊ When exiting without pressing set button, the manipulated value is not reflected.

▶ What is Dry Contact?
Like hotel card key and body perception sensor, it is the signal of the point of contact when using air-conditioner by interlocking.

• Please refer to dry contact manual for more details.

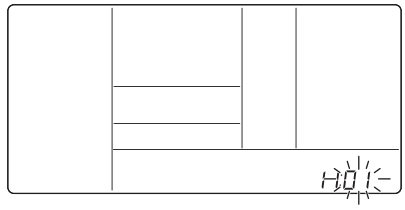
Installer Setting-Zone State Setting

It is the function to setup indoor unit's wind flow to variable or fixed.
- Variable : Comp ON, setup airflow. Comp OFF, weak wind
- Fixed : Comp ON, setup airflow. Comp OFF, setup airflow

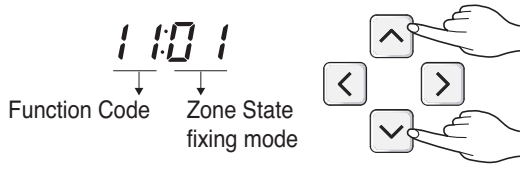


1 If pressing ⚙ button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.

2 If moving to ceiling height selection menu by pressing ⚙ button, it indicates as picture below.



3 Select Zone State rate fixing mode by pressing ∧ ∨ button.
(01: Variable, 02: Fixed)

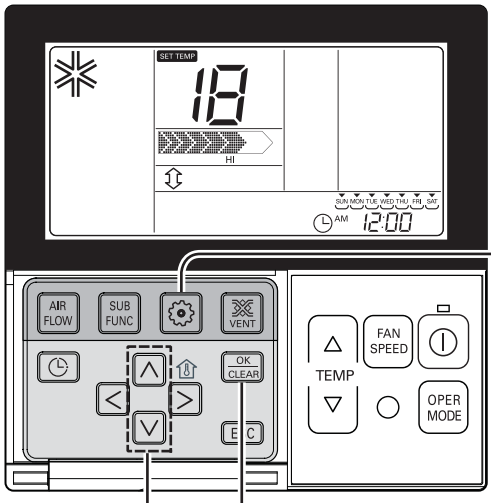


4 Press OK CLEAR button to save.

5 Pressing ESC button will exit settings mode.
- ❊ After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
- ❊ When exiting without pressing set button, the manipulated value is not reflected.

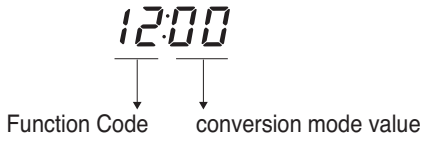
Installer Setting-Celsius / Fahrenheit Switching

This function is used for switching the display between Celsius and Fahrenheit.
(Optimized only for U.S.A)



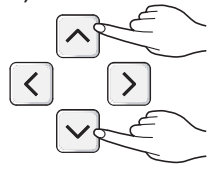
1 If pressing ⚙ button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.

2 Repeat pressing ⚙ button to select Function code 12.

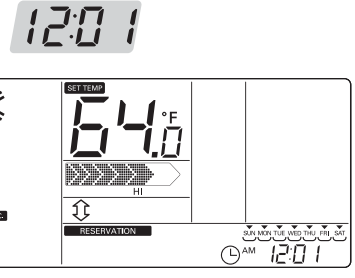


Ex) Fahrengeit Setting

3 Select Temperature unit mode by pressing ^ v button.
(00: Celsius, 01: Fahrenheit)



4 Press OK CLEAR button to save or release.

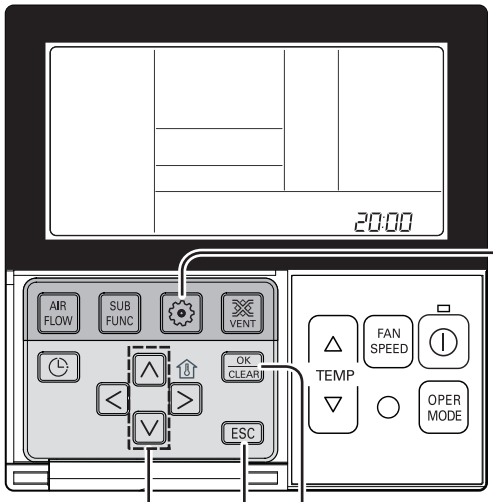


5 Press ESC button to exit or system will automatically exit after 25 seconds without any input.

❊ Whenever press ^ v button in Fahrenheit mode, the temperature will increase/drop 2 degrees.

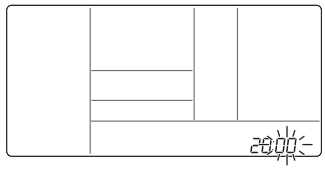
Installer Setting -Optional Function Setting

Setting feature for indoor unit when air cleaning / heater / humidifier / Up/down grill / Ventilation KIT is newly installed, or installed unit is removed.



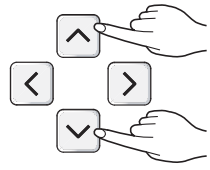
1 If pressing ⚙ button long for 3 seconds, it enters into remote controller setter setup mode.
- If pressing once shortly, it enters into user setup mode. Please press more than 3 seconds for sure.

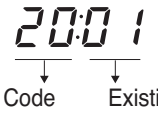
2 If pressing ⚙ button repeatedly, it moves to the selected option function code as picture below.



Function	Code
Plasma purification	20
Electric heater	21
Dehumidifier	22
Elevation grill	23
Ventilation kit	24

3 Select existing condition of each mode by pressing ^ v button.
(00: not installed,
01 : installed)





4 Press OK CLEAR button to save.

5 Pressing ESC button will exit settings mode.
- ❉ After setup, it automatically gets out of setup mode if there is no button input for 25 seconds.
- ❉ When exiting without pressing set button, the manipulated value is not reflected.

6. Combination

6.1 Outdoor units selection

In general, outdoor unit may be selected as follows, though the location of the unit, and usage of the room, etc. should be considered.

The combination of indoor and outdoor unit was to be decided that the sum of indoor unit capacity index should be smaller than the max. combination capacity of outdoor unit.

6.2 Combination of indoor and outdoor unit

Inverter SINGLE A Outdoor Units - 1Ø

LG's SINGLE A system consist of one outdoor unit which can match with three different indoor units as individual system.

Category	Outdoor unit	Indoor unit	
	1Ø	Type	Model name
Standard Line up	AUUW243E[LUU246HV]	Ceiling 4Way cassette	ATNH243PLAE[LCN246HV]
		Floor Standing	APNH2433LAE[LFN246HV]
	AUUW423E[LUU426HV]	Ceiling 4Way cassette	ATNH423MLAE[LCN426HV]
		Floor Standing	APNH423TLAE[LFN426HV]

Part 2 Product data

1. Indoor units
1.1 Ceiling cassette 4-way
1.1.1 List of functions

Category	Function	ATNH243PLAE [LCN246HV]	ATNH423MLAE [LCN426HV]
Air flow	Air supply outlet	4	4
	Airflow direction control(left & right)	X	X
	Airflow direction control(up & down)	Auto	Auto
	Auto swing(left & right)	X	X
	Auto swing(up & down)	O	O
	Airflow steps(fan / cool / heat)	4/5/4	4/5/4
	Chaos swing	O	O
	Chaos wind(auto wind)	O	O
	Jet cool(Power wind)	O	O
	Swirl wind	O	O
Air purify-ing	Deodorizing filter	X	X
	Plasma air purifier	X	X
	Prefilter(washable / anti-fungus)	O	O
Installation	Drain pump	O	O
	E.S.P. control	O	O
	Electric heater(operation)	X	X
	High ceiling operation	O	O
Reliability	Hot start	O	O
	Self diagnosis	O	O
	Soft dry operation	O	O
Convenience	Auto changeover	O	O
	Auto cleaning	X	X
	Auto operation(artificial intelligence)	X	X
	Auto restart operation	O	O
	Child lock	O	O
	Forced operation	O	O
	Group control	O	O
	Sleep mode	X	X
	Timer(on/off)	O	O
	Timer(weekly)	O	O
	Two thermistor control	O	O
Individual control	Standard wired remote controller	X	X
	Picto wired remote controller	PQRCVSL0 / PQRCVSL0QW	PQRCVSL0 / PQRCVSL0QW
	Deluxe wired remote controller	X	X
	Simple wired remote controller	X	X
	Wired remote controller(for hotel use)	X	X
	Wireless remote controller(simple)	X	X
	Wireless LCD remote control	PQWRHDF0	O(PQWRHDF0)
CAC network function	General central control(Non LGAP)	X	X
	Dry contact	X	X
	Network Soluation(LGAP)	X	X
	PDI(power distribution indicator)	X	X
	PI 485	X	X
Special function kit	Zone control	X	X
	CTIE	X	X
	Electric thermostat	X	X
Others	Thermistor	X	X

Note:
• O: Applied, • X: Not applied, • - : No relation,
• Option: Model name & price are different according to options, and assembled in factory with main unit.
• Accessory: Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

1.1.2 Specifications

Indoor unit type			Ceilling Cassette - 4way	
Model			ATNH243PLAE[LCN246HV]	ATNH423MLAE[LCN426HV]
Decoration panel			PT-UMC	PT-UMC
Power Supply		Ø/V/Hz	1 / 208-230 / 60	1 / 208-230 / 60
Cooling Capacity		kW	6.74	12.02
		Btu/h	23,000	41,000
Heating Capacity		kW	7.33	12.02
		Btu/h	25,000	41,000
Current	Nominal running current	A	10.4	20
Fan	Motor Type		BLDC	BLDC
	Fan Type		Turbo Fan	Turbo Fan
	Motor Output x Number of Unit		60 x 1	124 x 1
	Air Flow Rate(H/M/L)	CMM	18 / 16 / 14	34 / 32 / 30
		cfm	636/565/494	1,200/1,130/1,060
	External Static Pressure	mmAq	-	-
	Capacitor	μF/Vac	220 / 450	220 / 450
	Drive		Direct Drive	Direct Drive
Coil	Row x Column x FPI		2R x 8C x 19	2R x 12C x 21
Dimensions (WxHxD)	Body	mm	840 x 204 x 840	840 x 288 x 840
		inch	33 1/16 x 8 1/32 x 33 1/16	33 1/16 x 11 11/32 x 33 1/16
	Decorative Panel	mm	950 x 25 x 950	950 x 25 x 950
		inch	37 13/32 x 31/32 x 37 13/32	37 13/32 x 31/32 x 37 13/32
Weight	Body	kg(lbs)	21(46.3)	26(57.32)
	Decorative Panel	kg(lbs)	5(11.02)	5(11.02)
Air Filter			Long life filter	Long life filter
Sound Level (H/M/L)		dB(A)+3	39 / 37 / 34	46 / 44 / 40
Piping Connections	Liquid	mm(inch)	9.52 (3/8)	9.52 (3/8)
	Gas	mm(inch)	15.88 (5/8)	15.88 (5/8)
	Drain(OD/ID)	mm(inch)	32 / 25(1.26 / 0.98)	32 / 25(1.26 / 0.98)
Dehumidification Rate		l/h	2.1	3.6
Safety devices			Fuse, Thermal protector for fan motor	
Temperature Sensor			Thermistor	Thermistor
Referigerant			R410A	R410A
Referigerant Control			EEV(Outdoor Unit)	EEV(Outdoor Unit)
Connectable outdoor unit			LUU246HV	LUU426HV
Power and transmission interunit cable		No. x AWG	4 x 18	4 x 18

Note :

1. Capacities are based on the following conditions:
   Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
   - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
   Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
   - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
   Piping Length - Interconnecting Piping Length 7.5m(24.6ft)
   - Level Difference of Zero.
2. Without optional accessories(i.e. Plasma kit, elevation grille etc.) and with maximum airvolume (Cassette type is using PQRCUS0)
3. Wiring cable size must comply with the applicable local and national code.

Conversion Formula
Btuh = kW × 3,412
cfm = CMM × 35.3

1.1.3 Dimensions

Ceiling Cassette 4-way

ATNH243PLAE[LCN246HV]

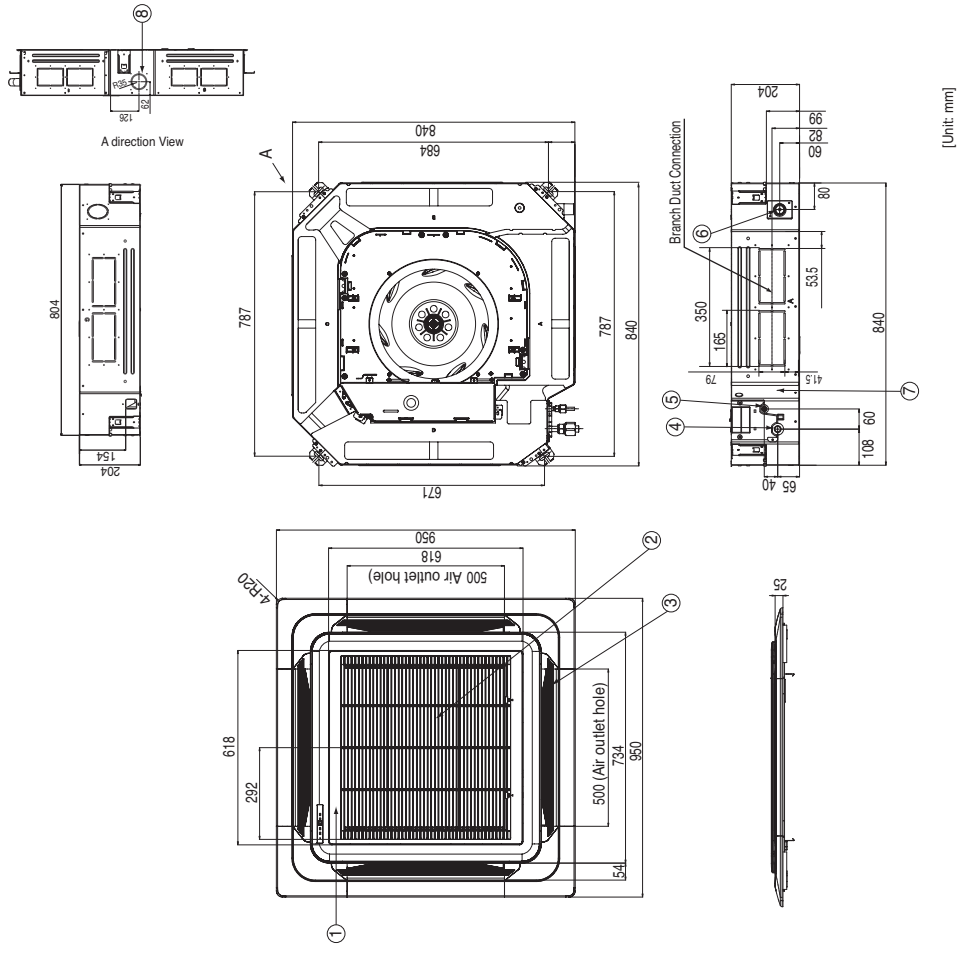
No.	Part Name	Remark
1	Decoration panel	PT-UMC
2	air suction grille	
3	Air discharge grille	
4	Gas pipe connection	
5	Liquid pipe connection	
6	Drain pipe connection	
7	Power supply connection	
8	Fresh air connection	Ø70

■ Technical Specification

Model name		ATNH243PLAE[LCN246HV]
Power supply	Ø/V/Hz	1Ø, 208V-230V, 60Hz
Cooling Capacity	kW	6.74
	Btu/h	23,000
Heating Capacity	kW	7.33
	Btu/h	25,000
Piping Connections	Liquid mm(inch)	Ø9.52(3/8)
	Gas mm(inch)	Ø15.88(5/8)
Drain(OD/ID)	mm(inch)	32 / 25(1.26 / 0.98)

■ Note

1. Unit should be installed in compliance with theinstallation manual in the product box.
2. Unit shall be grounded in accordance with the localregulations or applicable national codes.
3. The Unit is powered from the outdoor unit. So power cable should be connected with the outdoor unit.



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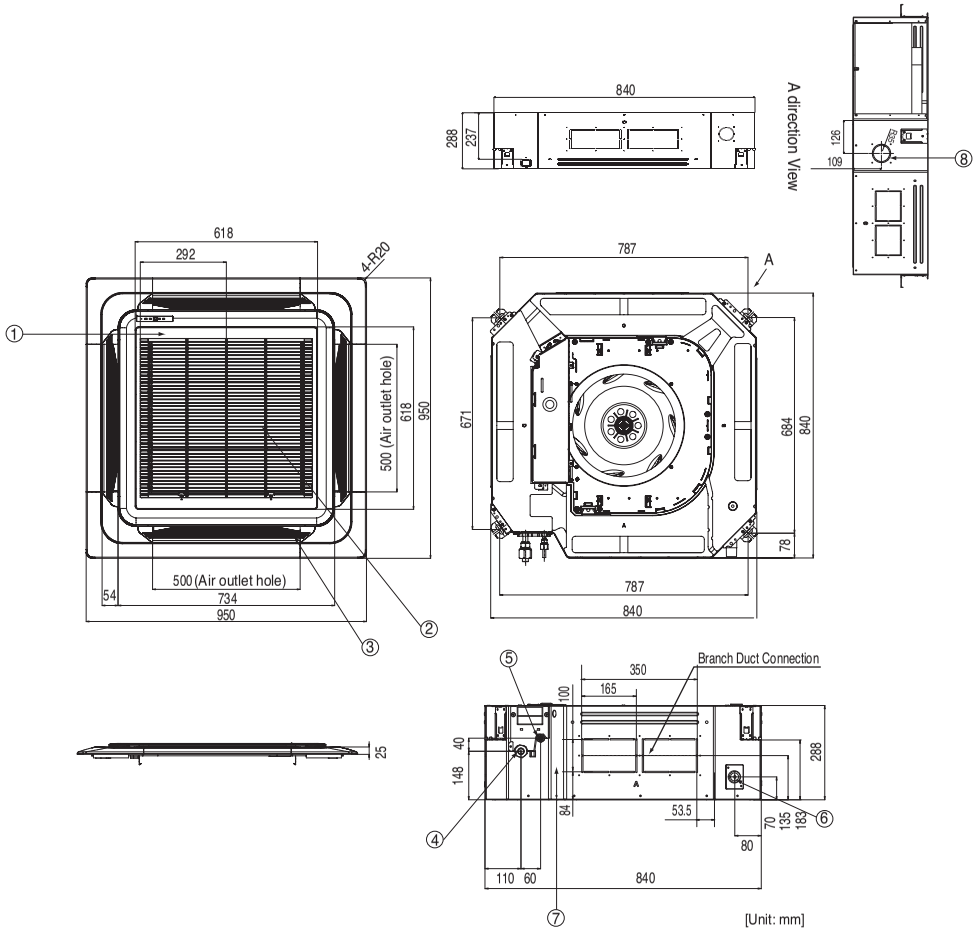
www.lge.com/airconditioner

CHASSIS CODE: TP

Ceiling Cassette 4–way

ATNH423MLAE[LCN426HV]



No.	Part Name	Remark
1	Decoration panel	PT-UMC
2	air suction grille	
3	Air discharge grille	
4	Gas pipe connection	
5	Liquid pipe connection	
6	Drain pipe connection	
7	Power supply connection	
8	Fresh air connection	Ø70

▣ Technical Specification

Model name			ATNH423MLAE[LCN426HV]
Power supply		Ø/V/Hz	1Ø, 208V-230V, 60Hz
Cooling Capacity		kW	12.02
		Btu/h	41,000
Heating Capacity		kW	12.02
		Btu/h	41,000
Piping Connections	Liquid	mm(inch)	Ø9.52(3/8)
	Gas	mm(inch)	Ø15.88(5/8)
Drain(OD/ID)		mm(inch)	32 / 25(1.26 / 0.98)

▣ Note

1. Unit should be installed in complance with the installation manual in the product box.
2. Unit shall be grounded in accordance with the local regulations or applicable national codes.
3. The unit is powered from the outdoor unit. So power cable should be connected with the outdoor unit.

* High efficiency indoor uni.

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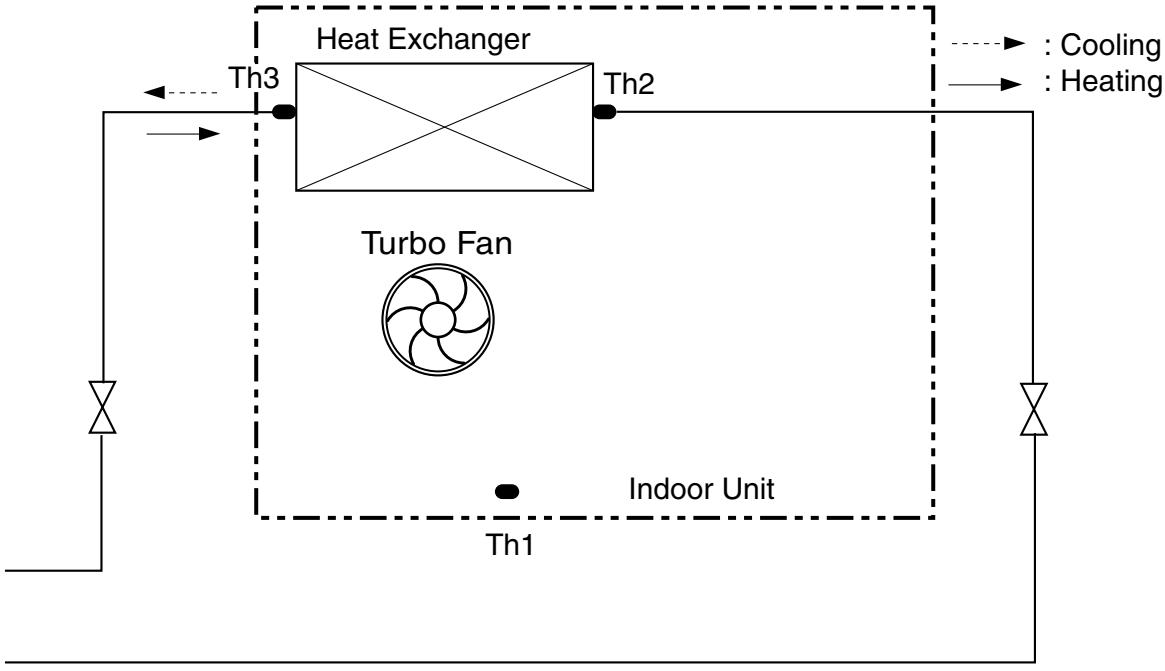
CHASSIS CODE: TM

1.1.4 Piping diagrams



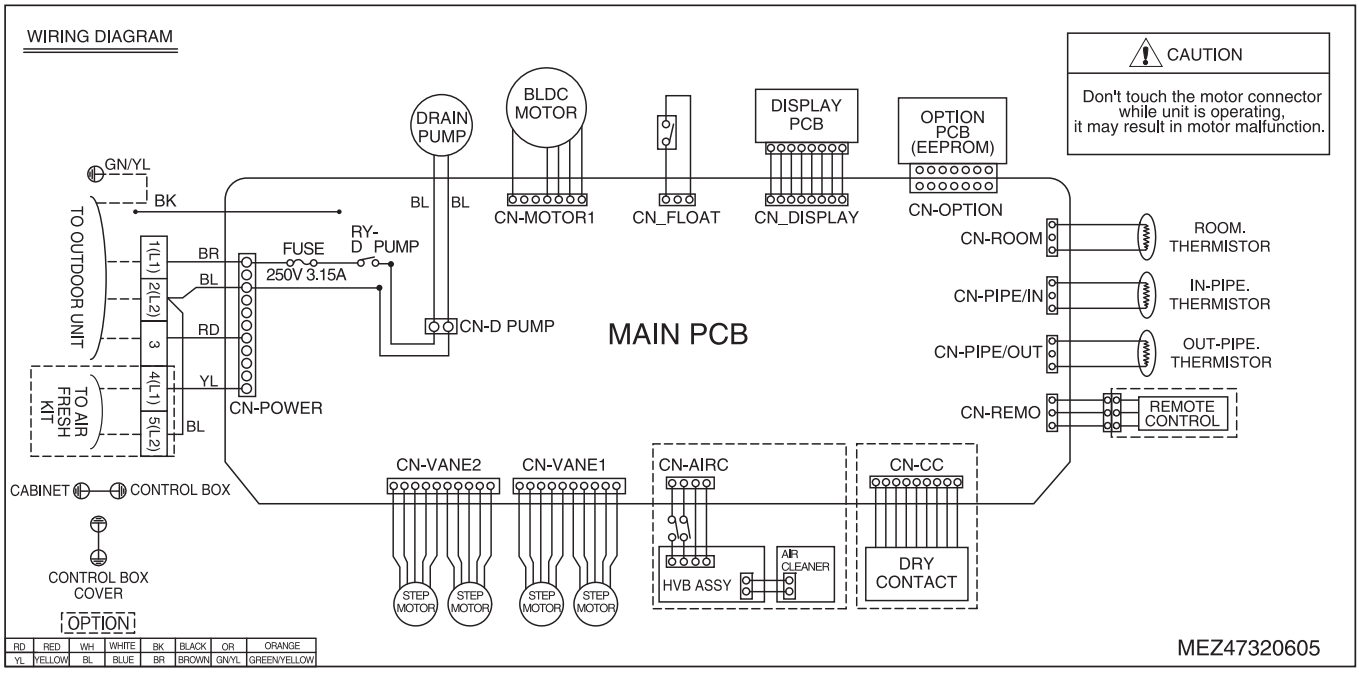
LOC.	Description	PCB Connector
Th1	Thermistor for inlet air temperature	CN_ROOM
Th2	Thermistor for EVA. in temperature	CN_PIPE/IN
Th3	Thermistor for EVA. out temperature	CN_PIPE/OUT

[Unit:mm(inch)]

Model	Gas	Liquid
ATNH243PLAE[LCN246HV]	15.88(5/8)	9.52(3/8)
ATNH423MLAE[LCN426HV]	15.88(5/8)	9.52(3/8)

1.1.5 Wiring diagrams

1) Wiring diagrams

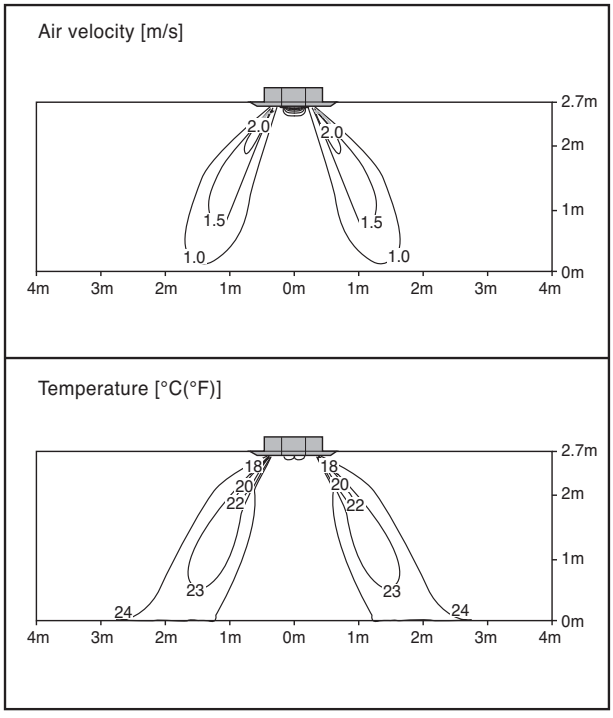


1.1.6 Air flow and temperature distributions (reference data)

Model : ATNH243PLAE[LCN246HV]

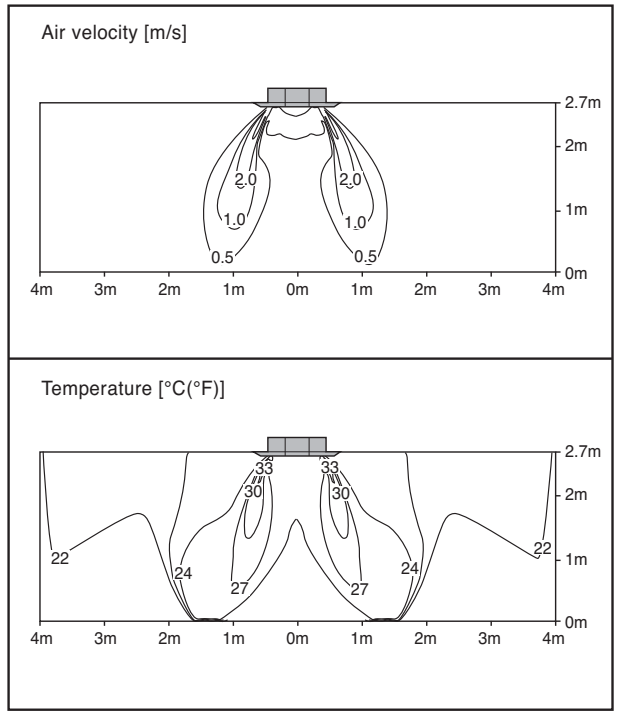
Cooling

Discharge angle: 40°



Heating

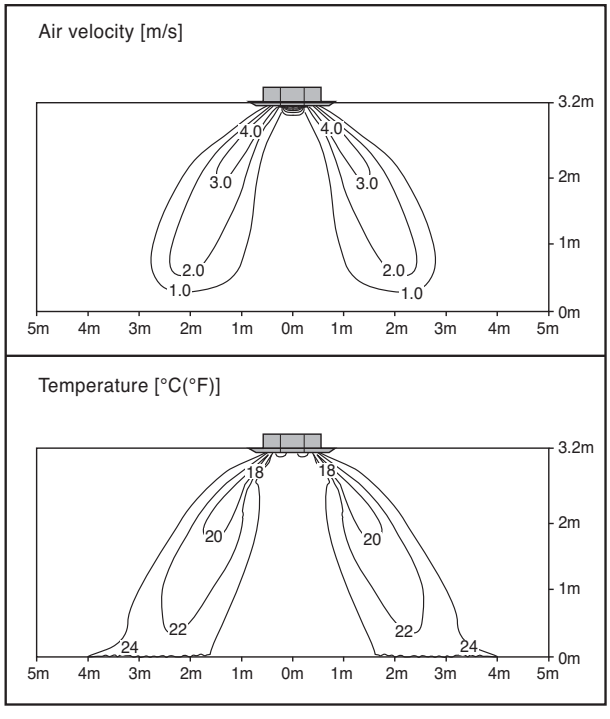
Discharge angle: 50°



Model : ATNH423MLAE[LCN426HV]

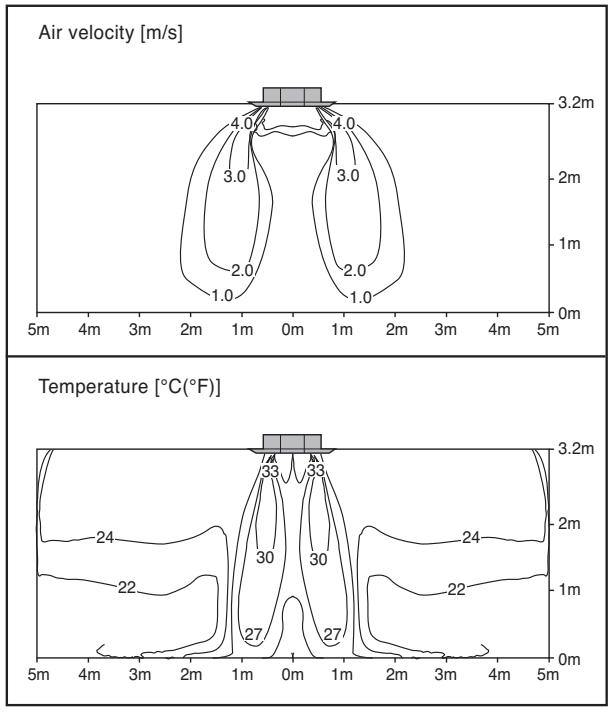
Cooling

Discharge angle: 40°



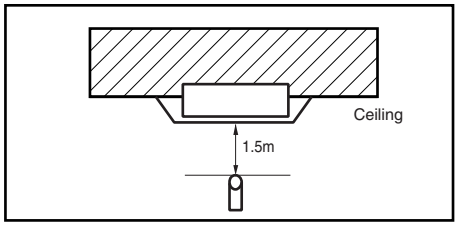
Heating

Discharge angle: 50°



1.1.7 Sound levels

Overall

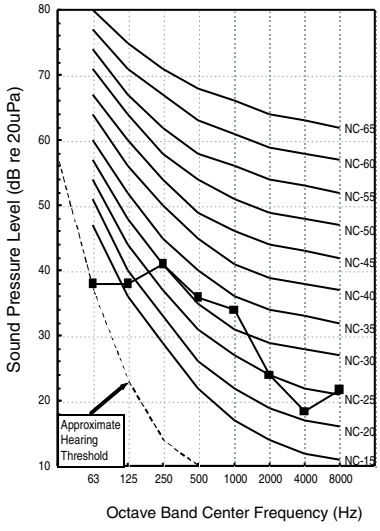


Notes:
- Sound measured at 1.5m below the center of the unit.
- Data is valid at free field condition
- Data is valid at nominal operation condition
- Reference accoustic pressure OdB = 20μPa
- Sound level will vary depending on a range of factors such as the construction(acoustic absorption coefficient) of particular room in which the equipment is installed.
- The operating conditions are assumed to be standard.

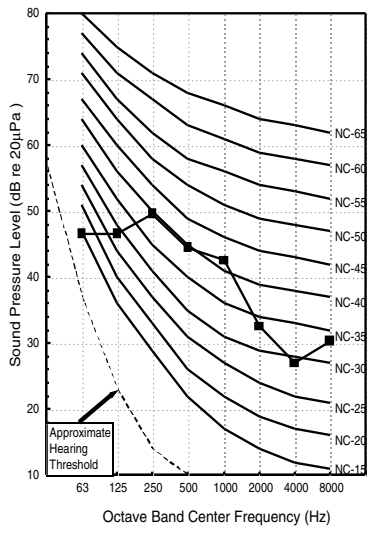
Model	Sound Level [dB(A)+3]		
	H	M	L
ATNH243PLAE [LCN246HV]	39	37	34
ATNH423MLAE [LCN426HV]	46	44	40

Sound pressure level

ATNH243PLAE[LCN246HV]



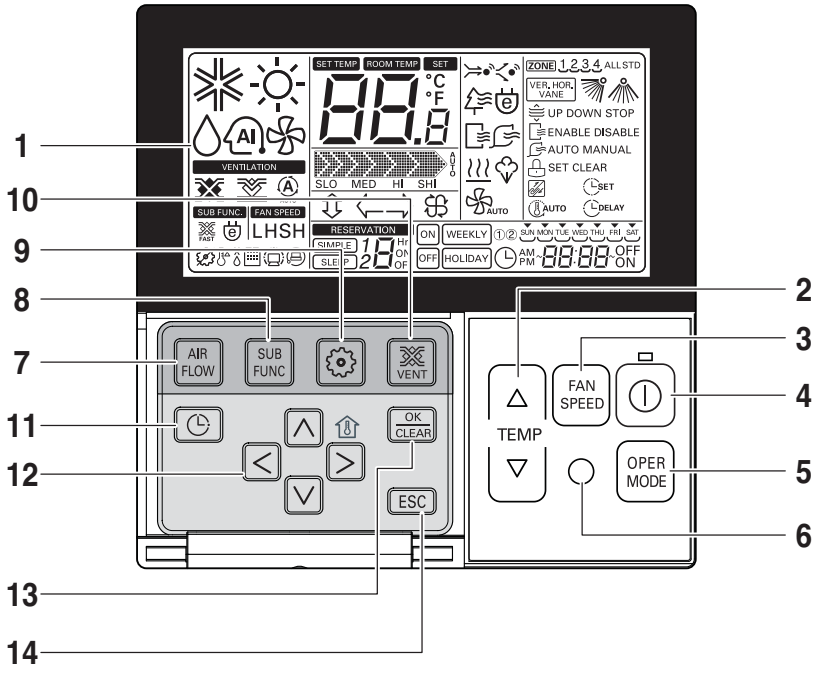
ATNH423MLAE[LCN426HV]



* High Efficiency Indoor units

1.1.8 Controller

■ Wired remote controller



1. Operation indication screen
2. Set temperature button
3. Fan speed button
4. On/Off button
5. Operation mode selection button
6. Wireless remote controller Receiver
7. Air flow button
8. Sub-Function button
9. Function setting button
10. Ventilation butto
11. Reservation Time setting button
12. Up,Down,Left,Right button
13. Setting/Cancel button
14. Exit button

Note

❉ Display temperature can be different from actual room temperature if the remote controller is installed at the place where sun-rays are falling directly or the place nearby heat source.

❉ The actual product can be different from above contents depending upon model type.

1.2 Floor Standing
1.2.1 List of functions

Category	Function	APNH2433LAE [LFN246HV]	APNH423TLAE [LFN426HV]
Air flow	Air supply outlet	3	1
	Airflow direction control(left & right)	O	O
	Airflow direction control(up & down)	O	O
	Auto swing(left & right)	O	O
	Auto swing(up & down)	O	O
	Airflow steps(fan / cool / heat)	3/3/3	3/3/3
	Chaos swing	X	X
	Chaos wind(auto wind)	X	X
	Jet cool(Power wind)	O	O
	Swirl wind	X	X
Air purify-ing	Deodorizing filter	O	X
	Plasma air purifier	O	X
	Prefilter(washable / anti-fungus)	O	O
Installation	Drain pump	X	X
	E.S.P. control	X	X
	Electric heater(operation)	X	X
	High ceiling operation	X	X
Reliability	Hot start	O	O
	Self diagnosis	O	O
	Soft dry operation	O	O
Convenience	Auto changeover	O	O
	Auto cleaning	X	X
	Auto operation(artificial intelligence)	X	X
	Auto restart operation	O	O
	Child lock	O	O
	Forced operation	O	O
	Group control	X	X
	Sleep mode	X	X
	Timer(on/off)	O	O
	Timer(weekly)	X	X
	Two thermistor control	X	X
Individual control	Standard wired remote controller	X	X
	Picto wired remote controller	-	-
	Deluxe wired remote controller	X	X
	Simple wired remote controller	X	X
	Wired remote controller(for hotel use)	X	X
	Wireless remote controller(simple)	X	X
	Wireless LCD remote control	O(New)	O(New EZ)
CAC network function	General central control(Non LGAP)	X	X
	Dry contact	X	X
	Network Soluation(LGAP)	X	X
	PDI(power distribution indicator)	X	X
	PI 485	X	X
Special function kit	Zone control	X	X
	CTIE	X	X
	Electric thermostat	X	X
Others	Thermistor	X	X

Note:
• O: Applied, • X: Not applied, • - : No relation,
• Option: Model name & price are different according to options, and assembled in factory with main unit.
• Accessory: Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

1.2.2 Specifications

Indoor unit type			Floor Standing	
Model			APNH2433LAE [LFN246HV]	APNH423TLAE [LFN426HV]
Decoration panel			-	-
Power Supply		Ø/V/Hz	1 / 208-230 / 60	1 / 208-230 / 60
Cooling Capacity		kW	6.74	12.02
		Btu/h	23,000	41,000
Heating Capacity		kW	7.33	12.02
		Btu/h	25,000	41,000
Current	Nominal running current	A	10.9	1.5
Fan	Motor Type		OBM-4011U1	IC-13870GL15R
	Fan Type		Turbo Fan	Sirocco type
	Motor Output x Number of Unit		70 x 1	254 x 1
	Air Flow Rate(H/M/L)	CMM	19 / 16 / 13	35 / 30 / 25
		cfm	671/565/459	1,236/1,059/882
	External Static Pressure	mmAq	-	-
	Capacitor	μF/Vac	220 / 450	20 / 370
	Drive		-	-
Coil	Row x Column x FPI		2R x 30C x 18	3R x 34C x 19
Dimensions (WxHxD)	Body	mm	570 x 1,820 x 320	590 x 1,810 x 440
		inch	22 7/16 x 71 21/32 x 12 19/32	23 7/32 x 71 1/4 x 17 5/16
	Decorative Panel	mm	-	-
		inch	-	-
Weight	Body	kg(lbs)	43(94.8)	58.0(127.9)
	Decorative Panel	kg(lbs)	-	-
Air Filter			Long life filter	Long life filter
Sound Level (H/M/L)		dB(A)+3	45 / 42 / 40	56/53/51
Piping Connections	Liquid	mm(inch)	9.52 (3/8)	9.52 (3/8)
	Gas	mm(inch)	15.88 (5/8)	15.88 (5/8)
	Drain(OD/ID)	mm(inch)	-	-
Dehumidification Rate		l/h	-	-
Safety devices			Thermal protector for fan motor	
Temperature Sensor			Thermistor	Thermistor
Referigerant			R410A	R410A
Referigerant Control			EEV(Outdoor Unit)	EEV(Outdoor Unit)
Connectable outdoor unit			LUU246HV	LUU426HV
Power and transmission interunit cable		No. x AWG	4 x 18	4 x 18

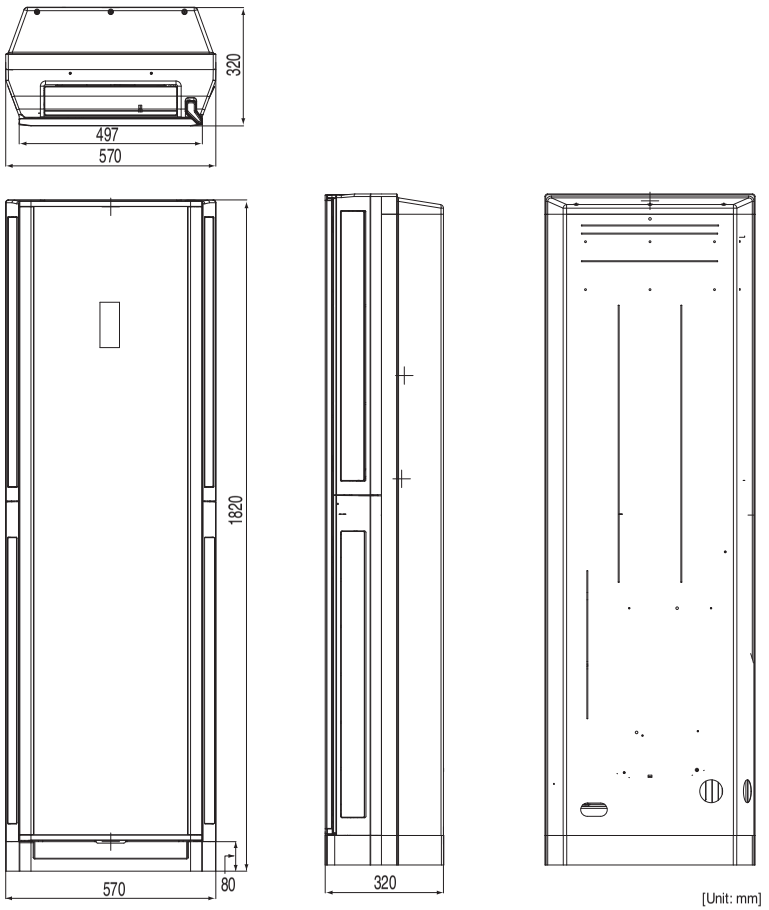
Note :

1. Capacities are based on the following conditions:
   Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
   - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
   Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
   - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
   Piping Length - Interconnecting Piping Length 7.5m(24.6ft)
   - Level Difference of Zero.
2. Without optional accessories(i.e. Plasma kit, elevation grille etc.) and with maximum airvolume (Cassette type is using PQRCUS0)
3. Wiring cable size must comply with the applicable local and national code.

Conversion Formula
Btuh = kW × 3,412
cfm = CMM × 35.3

CEILING & FLOOR

APNH2433LAE[LFN246HV]



[Unit: mm]

No.	Part Name	Remark
1	Front air discharge grille	
2	Display & signal receiver	
3	Air suction grille	
4	Knockout hole	
5	Installation plate	

▣ Technical Specification

Model name			APNH2433LAE[LFN246HV]
Power supply		Ø/V/Hz	1Ø, 208V-230V, 60Hz
Cooling Capacity		kW	6.74
		Btu/h	23,000
Heating Capacity		kW	7.33
		Btu/h	25,000
Piping Connections	Liquid	mm(inch)	Ø9.52(3/8)
	Gas	mm(inch)	Ø15.88(5/8)

▣ Note

1. Unit should be installed in compliance with theinstallation manual in the product box.
2. Unit shall be grounded in accordance with the localregulations or applicable national codes.
3. The Unit is powered from the outdoor unit. So power cable should be connected with the outdoor unit.

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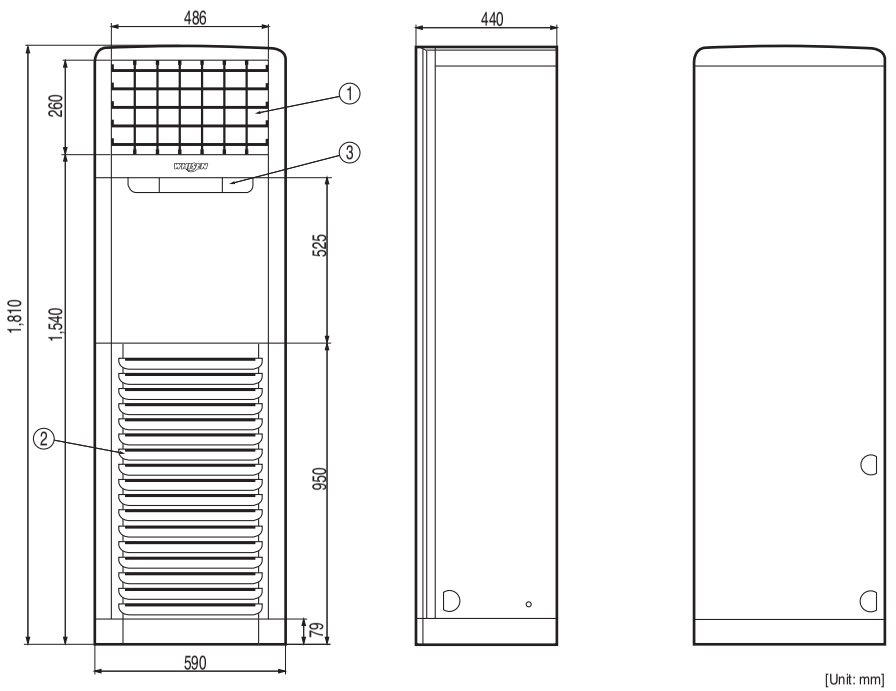
CEILING & FLOOR

APNH423TLAE[LFN426HV]



[Unit: mm]

No.	Part Name	Remark
1	Front air discharge grille	
2	Display & signal receiver	
3	Air suction grille	
4	Knockout hole	
5	Installation plate	

▣ Technical Specification

Model name			APNH423TLAE[LFN426HV]
Power supply		Ø/V/Hz	1Ø, 208V-230V, 60Hz
Cooling Capacity		kW	12.02
		Btu/h	41,000
Heating Capacity		kW	12.02
		Btu/h	41,000
Piping Connections	Liquid	mm(inch)	Ø9.52(3/8)
	Gas	mm(inch)	Ø15.88(5/8)

▣ Note

1. Unit should be installed in compliance with theinstallation manual in the product box.
2. Unit shall be grounded in accordance with the localregulations or applicable national codes.
3. The Unit is powered from the outdoor unit. So power cable should be connected with the outdoor unit.

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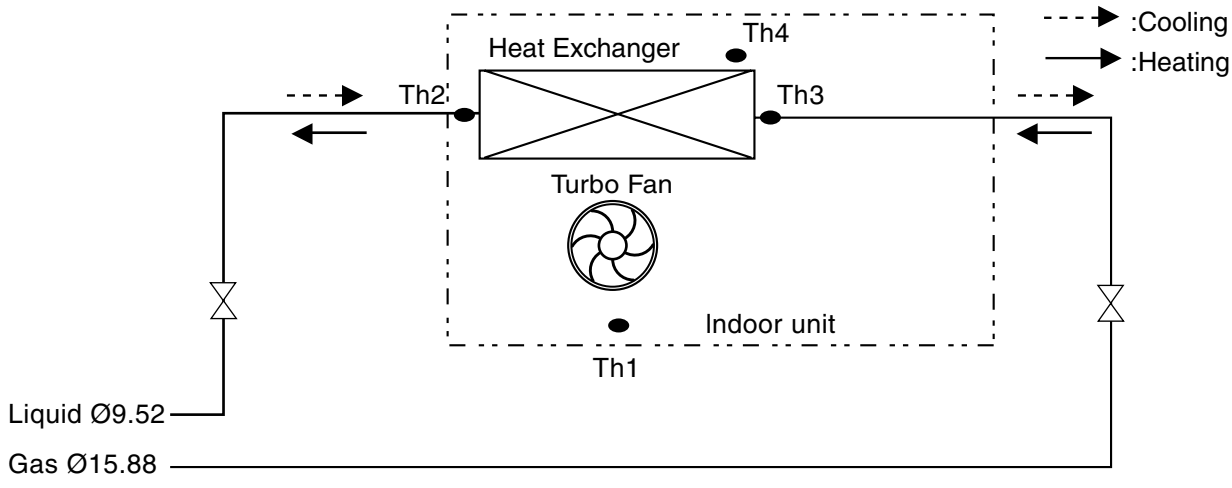
1.2.4 Piping diagrams

Models : APNH2433LAE[LFN246HV]

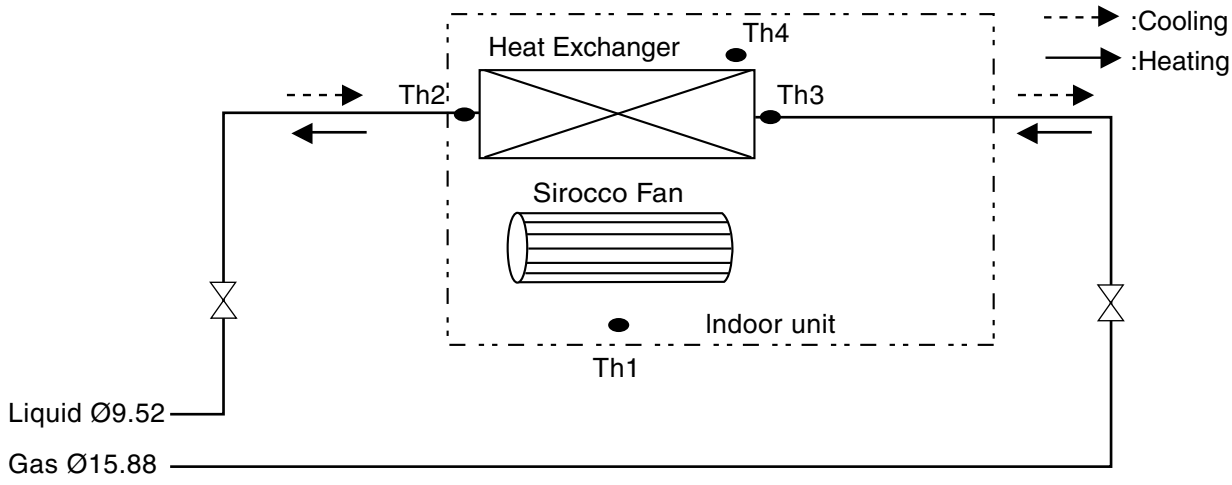


LOC.	Description	PCB Connector
Th1	Thermistor for inlet air temperature	CN_ROOM/TH
Th2	Thermistor for EVA. in temperature	CN_EVA/TH
Th3	Thermistor for EVA. out temperature	CN_EVA/TH2
Th4	Thermistor for EVA middle temperature	CN_MID/TH

[Unit:mm(inch)]

Model	Gas	Liquid
APNH2433LAE[LFN246HV]	Ø15.88(5/8)	Ø9.52(3/8)

Models : APNH2433LAE[LFN246HV]



LOC.	Description	PCB Connector
Th1	Thermistor for inlet air temperature	CN_ROOM/TH
Th2	Thermistor for EVA. in temperature	CN_EVA/TH
Th3	Thermistor for EVA. out temperature	CN_EVA/TH2
Th4	Thermistor for EVA middle temperature	CN_MID/TH

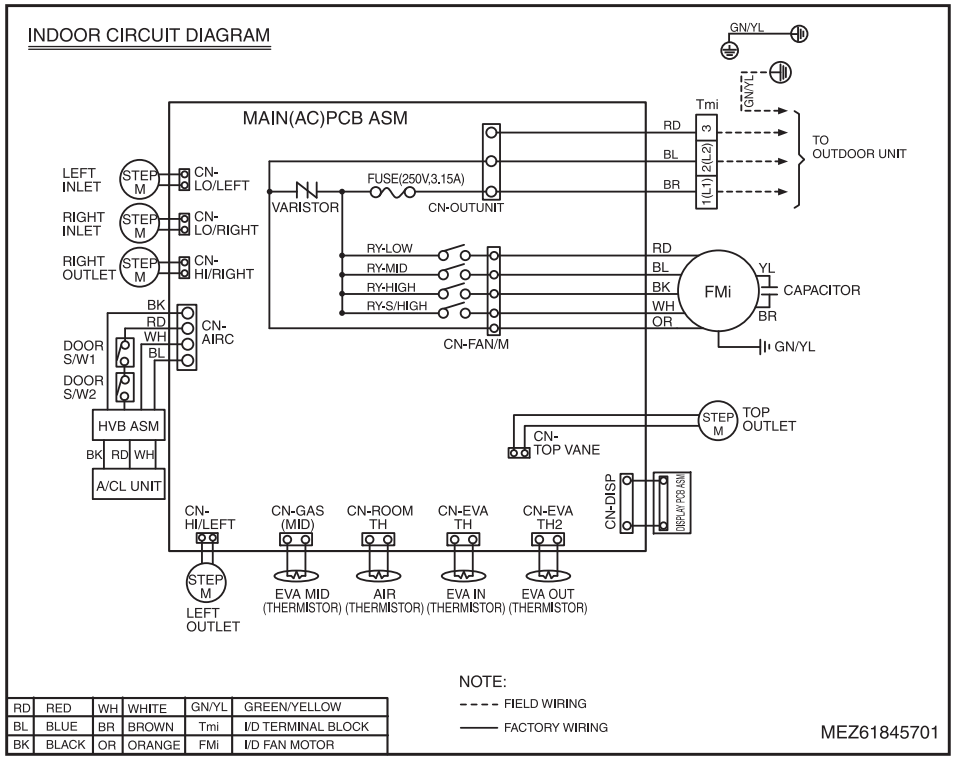
[Unit:mm(inch)]

Model	Gas	Liquid
APNH423TLAE[LFN426HV]	Ø15.88(5/8)	Ø9.52(3/8)

1.2.5 Wiring diagrams

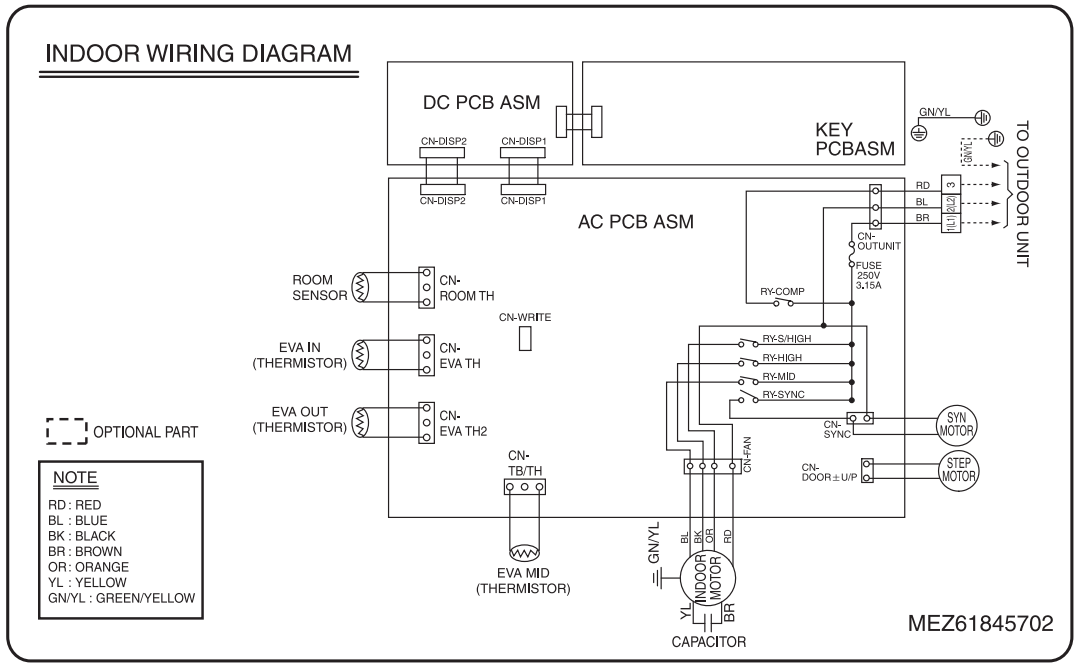
Models : APNH2433LAE[LFN246HV]

1) Wiring diagrams



Models : APNH423TLAE[LFN426HV]

1) Wiring diagrams

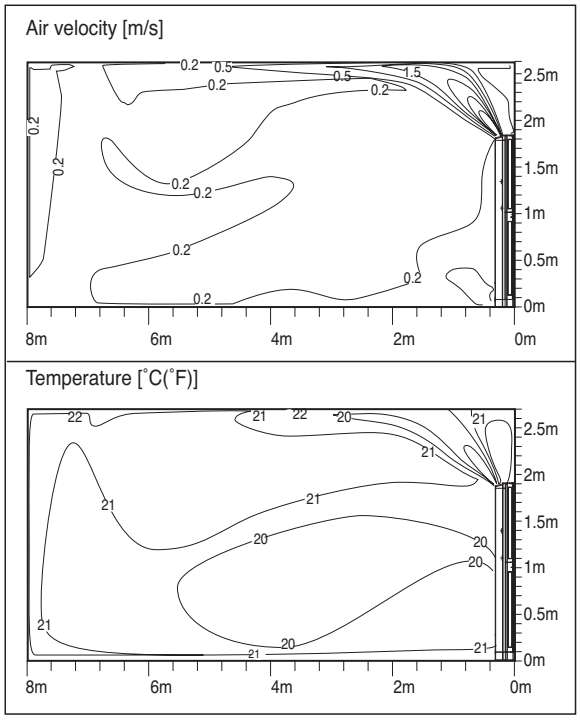


1.2.6 Air flow and temperature distributions (reference data)

Model : APNH2433LAE[LFN246HV]

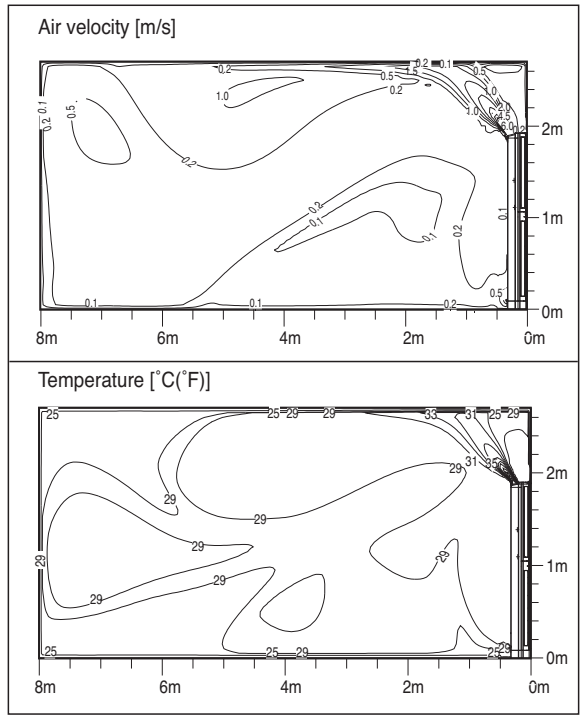
Cooling

Discharge angle:45°



Heating

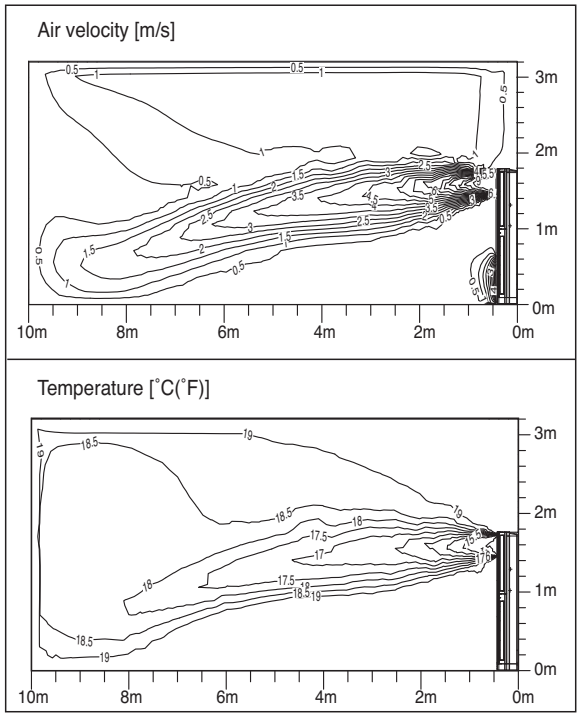
Discharge angle:50°



Model : APNH423TLAE[LFN426HV]

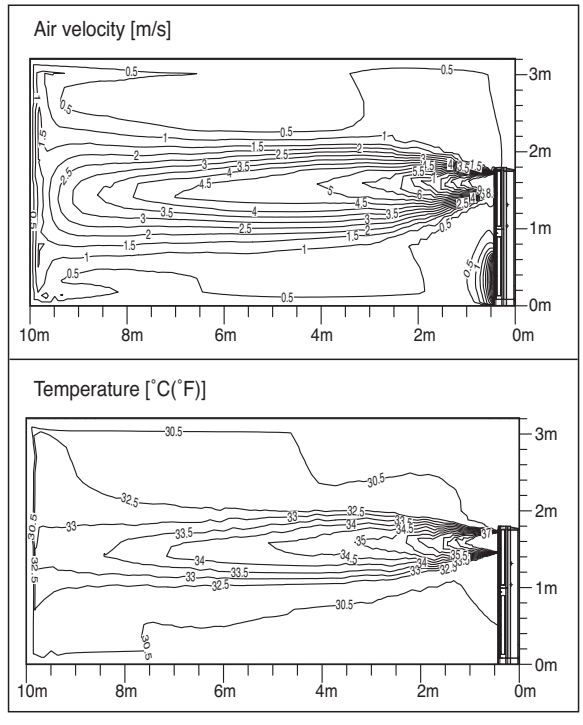
Cooling

Discharge angle:90°



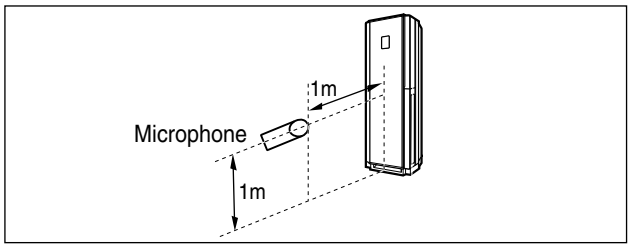
Heating

Discharge angle:90°



1.2.7 Sound levels

Overall

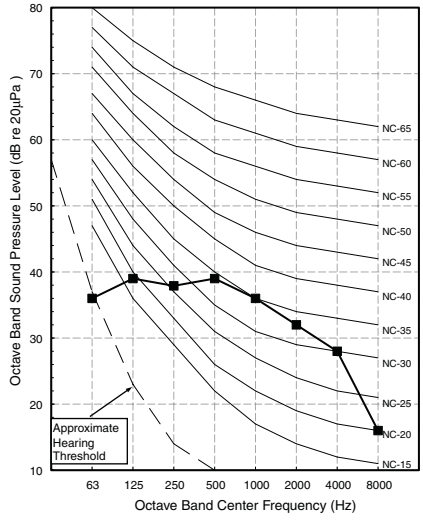


Notes:
- Data is valid at nominal operation condition
- Reference accoustic pressure OdB = 20μPa
- Sound level will vary depending on a range of factors such as the construction(acoustic absorption coefficient) of particular room in which the equipment is installed.
- The operating conditions are assumed to be standard.

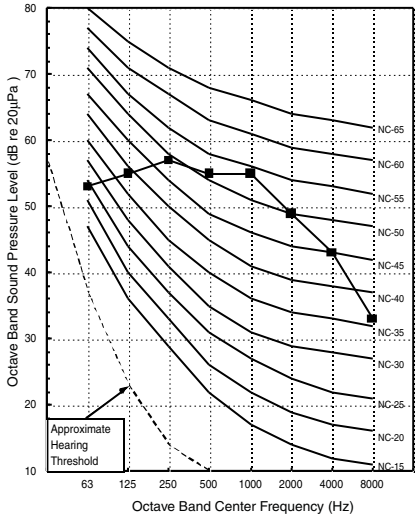
Model	Sound Level [dB(A)+3]		
	H	M	L
APNH2433LAE [LFN246HV]	45	42	40
APNH423TLAE [LFN426HV]	56	53	51

Sound pressure level

APNH2433LAE[LFN246HV]



APNH423TLAE[LFN426HV]

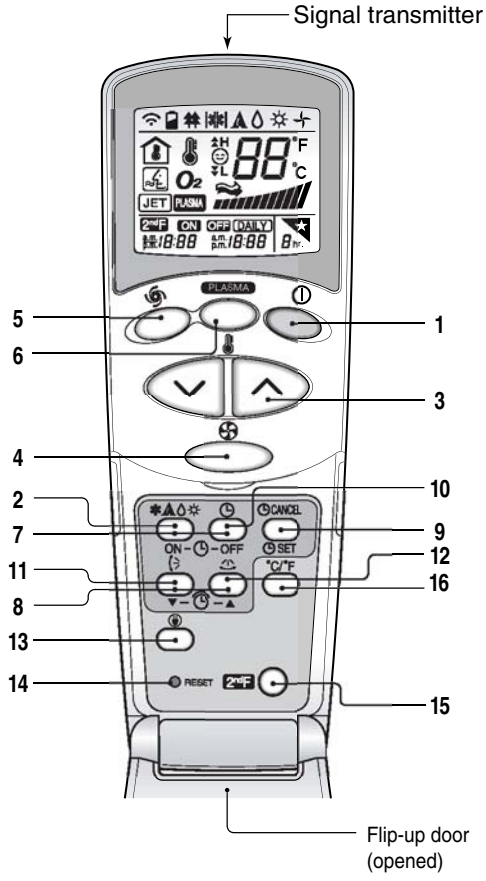


1.2.8 Controller

■ Wireless remote controller

Models : APNH2433LAE[LFN246HV]

This air-conditioner is equipped with wired remote controller basically. But if you want to be available with wireless remote controller, you pay for it.



1. START/STOP BUTTON
Used to turn off/on the unit.

2. OPERATION MODE SELECTION BUTTON
Used to select the operation mode.

3. ROOM TEMPERATURE SETTING BUTTONS
Used to select the room temperature.

4. INDOOR FAN SPEED SELECTOR BUTTON
Used to select fan speed in three steps low, medium, and high.

5. JET COOL/HEAT BUTTON
Used to start or stop the speed cooling/heating.
(It operates fan in super high speed)

6. PLASMA BUTTON(OPTIONAL)
Used to start or stop the plasma-purification function.

7. ON/OFF TIMER BUTTONS
Used to set the time of starting and stopping operation.

8. TIME SETTING BUTTONS
Used to adjust the time.

9. TIMER SET/CANCEL BUTTON
Used to set and to cancel the timer operation.

10. TIME SET BUTTON
It shows current time and can be set

11. UP/DOWN AIRFLOW BUTTON
Used to stop or start louver movement and set the desired up/down airflow direction,

12. HORIZONTAL AIRFLOW DIRECTION CONTROL BUTTON (OPTIONAL)
Used to set the desired horizontal airflow direction.

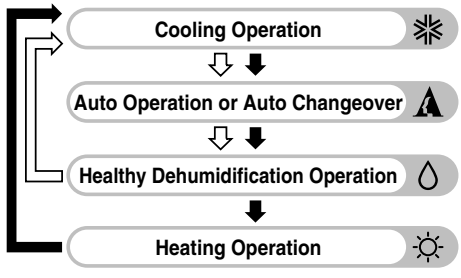
13. ENERGY-SAVING COOLING MODE BUTTON

14. RESET BUTTON
Used prior to resetting time.

15. 2nd F BUTTON
Used prior to using modes printed in blue at the bottom of buttons.

16. ˚C TO ˚F SWITCHING BUTTON
Used to switch temperature reading from Centigrade to Fahrenheit.

Operation Mode

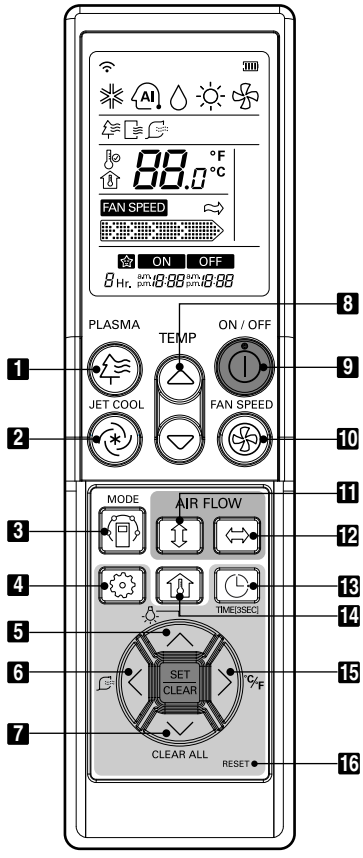


• Cooling Model(⇩), Heat Pump Model(⬇)

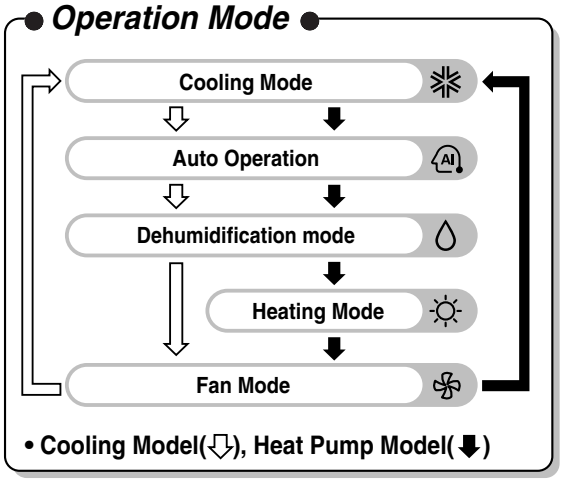
NOTE

To use the functions printed in blue at the bottom of the buttons press 2nd F button first and then the required function button. Pressing the 2nd F button activates the blue printed function of the respective button. To cancel the function press the 2nd F button again else it will automatically cancel if remains idle after 10 seconds.

Models : APNH423TLAE[LFN426HV]



Operation Mode



1 PLASMA Button (Optional)
Used to start or stop the plasma-purification function.

2 JET COOL Button
Speed cooling operates super high fan speed.

3 OPERATION MODE SELECTION Button
Used to select the operation mode.

4 FUNCTION SETTING Button
Used to set or clear Auto Clean or Smart Clean.

5 LCD LUMINOSITY Button (Optional)
Used to adjust LCD luminosity

6 SMART CLEAN Button (Optional)
Used to start or stop Smart Clean.

7 CLEAR ALL Button
Used to clear all timer.

8 ROOM TEMPERATURE SETTING Button
Used to select the room temperature.

9 ON/OFF Button
Used to turn on/off the unit.

10 INDOOR FAN SPEED SELECTION Button
Used to select fan speed in four steps low, medium, high and chaos.

11 UP/DOWN AIRFLOW Button
Used to stop or start louver movement and set the desired up/down airflow direction.

12 LEFT/RIGHT AIRFLOW Button(Optional)
Used to set the desired left/right(horizontal) airflow direction.

13 TIMER AND TIME SETTING Button
Used to set the time of starting or stopping and sleeping operation.

14 ROOM TEMPERATURE CHECKING Button
Used to check the room temperature.

15 °C/°F SWITCH Button
Used to switch temperature reading from Celsius to Fahrenheit.

16 RESET Button
Used to reset the remote controller.

2. Outdoor

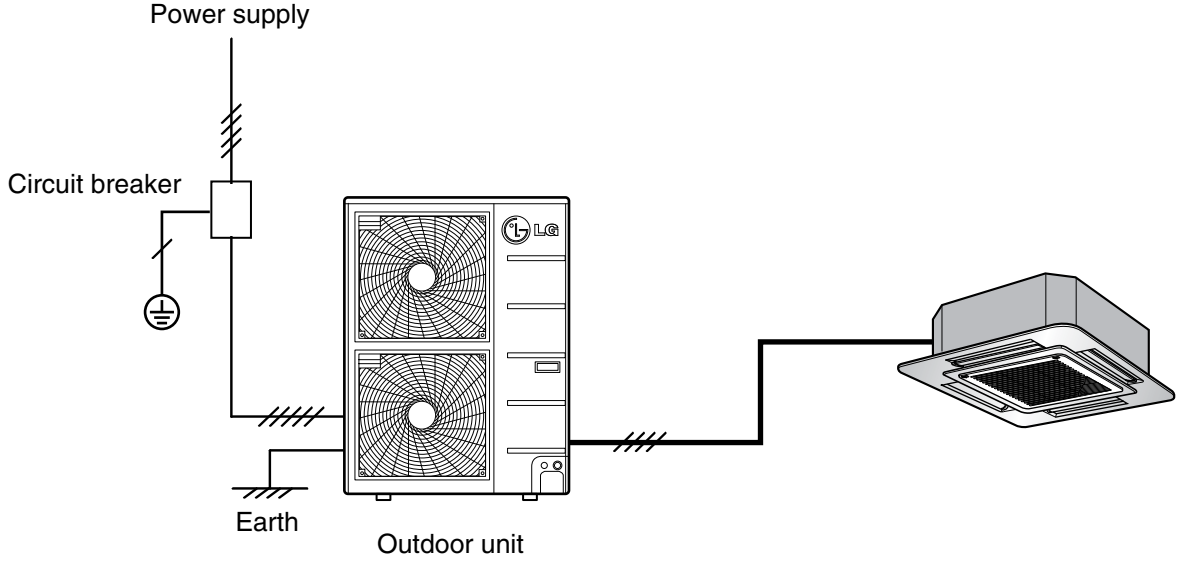
2.1 DC Inverter SINGLE A (1Ø)

2.1.1 Power supply

Type	Outdoor unit	Capacity (Btu/h)	Circuit breaker (A)	Power supply
1Phase Inverter	AUUW243E[LUU246HV]	23,000	25	1Ø, 208-230V, 60Hz
	AUUW423E[LUU426HV]	41,000	35	

External wiring procedure

- The power supply work is needed only to the outdoor unit. The power supply to the indoor unit is conducted through the transmission wiring. Therefore, the power supply work can be carried out at just one place of the outdoor unit. It will contribute to simplify the work procedure and to save cost.
- Wiring cable size must comply with the applicable local and national code.



2.1.2 List of functions

DC Inverter Single A (1Ø)

Category	Function	AUUW243E[LUU246HV]	AUUW423E[LUU426HV]
Reliability	Defrost / Deicing	O	O
	High Pressure Switch	X	O
	Low Pressure Switch	X	X
	Phase protection	X	X
	Restart Delay (3-minutes)	O	O
	Self Diagnosis	O	O
	Soft Start	O	O
	Test Function	O	O
Convenience	Auto Changeover	O	O
	Auto Restart Operation	O	O
CAC Network Function	Central control(LGAP)	X	X
	PDI(Power Distribution Indicator)	X	X
	PI485	X	X
Special Function Kit	Low Ambient Kit	O (Program Logic)	O (program logic)
Others	Thermistor	-	-

• O: Applied, • X: Not applied, • - : No relation,
• Option: Model name & price are different according to options, and assembled in factory with main unit.
• Accessory: Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

2.1.3 Specifications

DC Inverter Single A (1Ø)

Nominal Capacity and Nominal Input				
Indoor Units - Cassette			**ATNH243PLAE [LCN246HV]**	**ATNH423MLAE [LCN426HV]**
Outdoor Units			**AUUW243E [LUU246HV]**	**AUUW423E [LUU426HV]**
Nominal Capacity (Min~Rated~Max)	Cooling	Btu/h	23,000	41,000
	Heating	Btu/h	25,000	41,000
Nominal Input (Min~Rated~Max)	Cooling	kW	2.5	4.67
	Heating	kW	2.55	4.63

Nominal Capacity and Nominal Input				
Indoor Units - Floor Standing			**APNH2433LAE [LFN246HV]**	**APNH423TLAE [LFN426HV]**
Outdoor Units			**AUUW243E [LUU246HV]**	**AUUW423E [LUU426HV]**
Nominal Capacity (Min~Rated~Max)	Cooling	Btu/h	23,000	41,000
	Heating	Btu/h	25,000	41,000
Nominal Input (Min~Rated~Max)	Cooling	kW	2.5	4.67
	Heating	kW	2.55	4.63

Nominal Capacity and Nominal Input

Outdoor Units			AUUW243E[LUU246HV]	AUUW423E[LUU426HV]
Running Current	Cooling/Heating	A	10.0/10.7	17.7/16.7
Starting Current	Cooling/Heating	A	-	-
Power supply		Ø, V, Hz	1, 208-230, 60	1, 208-230, 60
Power Supply Cable (Includes earth)		No.x AWG	3 x 12	3 x 10
Interunit Cable(Includes earth)		No.x AWG	4 x 18	4 x 18
Dimensions	WxHxD	mm	870 x 808 x 320	950 x 1,380 x 330
		inch	34 1/4 x 31 13/16 x 12 19/32	37 13/32 x 54 11/32 x 13
Net Weight	Outdoor	kg(lbs)	60(132)	103(227)
Compressor (Inverter)	Type		Rotary	Rotary
	Quantity		1	1
	Model		5KD240XAE21	5JD420XAD22
	Motor Type		BLDC	BLDC
	Oil Charge	cc	900	1,300
	Oil Type		FV50S(PVE)	FV50S(PVE)
Refrigerant	Charge(at 7.5m)	g(oz)	2,000(70.6)	3,600(127)
	Type		R410A	R410A
	Control		EEV	EEV
Heat exchanger	Fins per inch		18	17
	No. of Rows & Column/No.		2R,36C	2R,32C x 2
	Tube Size (OD)	mm(inch)	7.0(0.276)	7.0(0.276)
	Defrosting Method		Reversing cycle	Reversing cycle
Fan motor	Model		SIC-72FW-F1124-3	SIC-72FW-F1124-3
	Output	kW(Btu/h)	0.124(423)	0.124(423) x 2
	Capacitor	μF/Vac	-	-
	Type		Propeller	Propeller
Fan	No. Used / Diameter	EA/mm(inch)	1/526(20.7)	2/526(20.7)
	Discharge	Side / Top	Side Discharge	Side Discharge
	Air Circulation	CMM(CMF)	58(2,048)	55(1,942) X 2
Noise Level (H/L)	Sound Press,1m	dB(A)+3	55	58
Piping connections	Liquid	mm(inch)	9.52 (3/8)	9.52 (3/8)
	Gas	mm(inch)	15.88 (5/8)	15.88 (5/8)
Max. Piping Length/Elevation		m(ft)	30/20(98.4/65.6)	50/30(164/98.4)
Additional Refrigerant Charge (Over 7.5m)		g/m(oz/ft)	35(0.38)	40(0.43)

Note :

1. Capacities are based on the following conditions:
   Cooling: - Indoor Temperature 27°C(80.6°F) DB /19°C(66.2°F) WB
   - Outdoor Temperature 35°C(95°F) DB /24°C(75.2°F) WB
   Heating: - Indoor Temperature 20°C(68°F) DB / 15°C(59°F) WB
   - Outdoor Temperature 7°C(44.6°F) DB / 6°C(42.8°F) WB
   Piping Length - Interconnecting Piping Length 7.5m (24.6ft)
   - Level Difference of Zero.
2. Due to our policy of innovation some specifications may be changed without notification.
3. At least two indoor units should be connected.
4. Wiring cable size must comply with the applicable local and national code.

Conversion Formula
Btu/h = kW × 3412
cfm = CMM × 35.3

2.1.4 Dimensions

OUTDOOR UNIT

AUUW243E[LUU246HV]

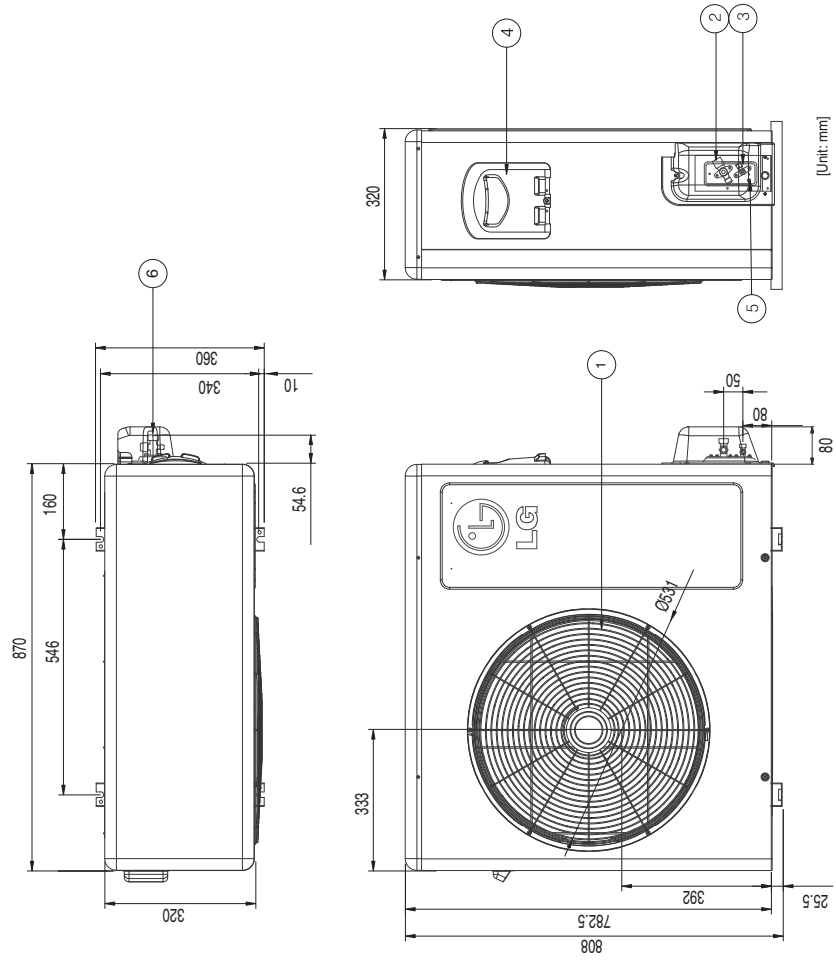
No.	Part Name	Remark
1	Air discharge grille	
2	Gas pipe connection	
3	Liquid pipe connection	
4	Power & transmission connection	
5	Earth screw	
6	SVC valve cover	

▣ Technical Specification

Model name		AUUW243E[LUU246HV]
Power supply	Ø/V/Hz	1 / 208 - 230 / 60
Cooling Capacity	kW	7.03
	Btu/h	24,000
Heating Capacity	kW	7.62
	Btu/h	26,000
Piping Connections	Liquid	Ø9.52(3/8)
	Gas	Ø15.88(5/8)

▣ Note

1. Unit should be installed in compliance with the installation manual in the product box.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials to be supplied on the site must comply with the local regulations or international codes.
4. Electrical characteristics chapter should be considered for electrical work and design. Especially the capacity of power cable and circuit breaker for outdoor unit should be more than that of electrical characteristics chapter.



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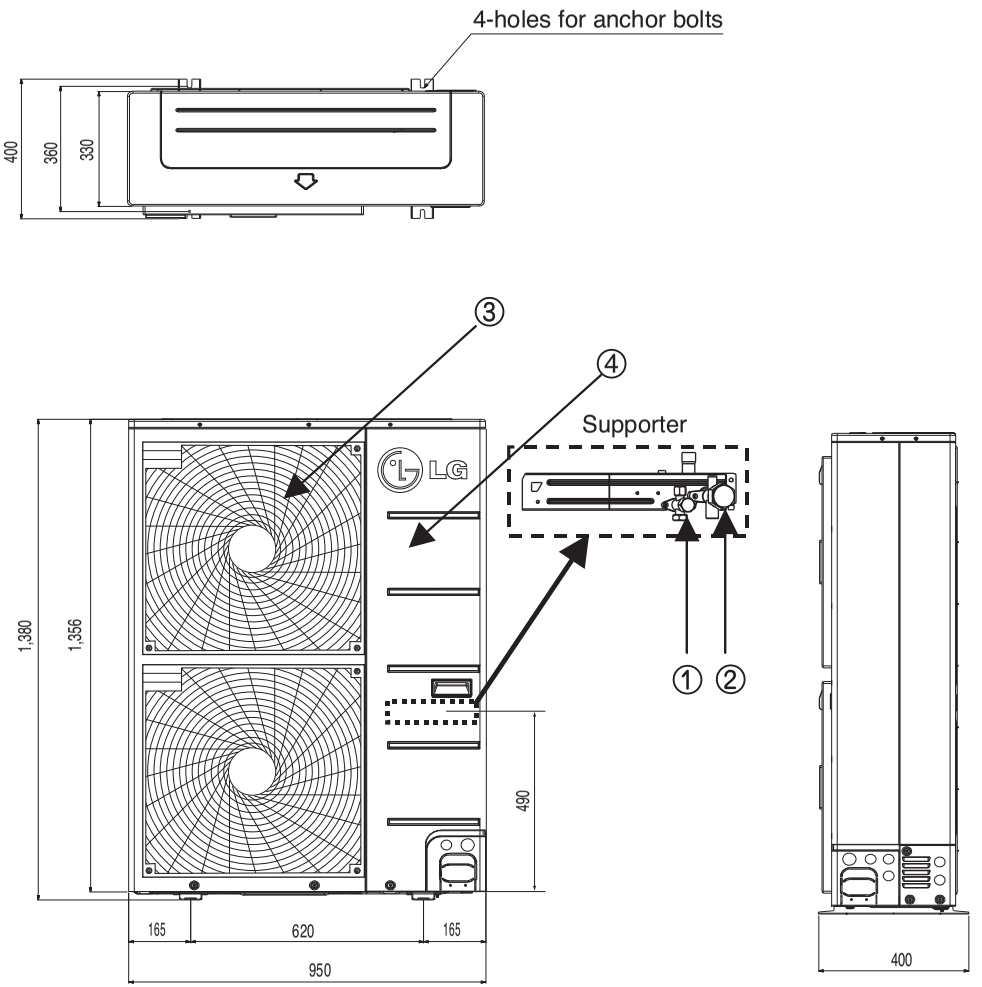
CHASSIS CODE: UE1

OUTDOOR UNIT

AUUW423E[LUU426HV]



[Unit: mm]

No.	Part Name	Remark
1	Air discharge grille	
2	Gas pipe connection	
3	Liquid pipe connection	
4	Power & transmission connection	

▣ Technical Specification

Model name			AUUW423E[LUU426HV]
Power supply		Ø/V/Hz	1 / 208 - 230 / 60
Cooling Capacity		kW	12.3
		Btu/h	42,000
Heating Capacity		kW	12.9
		Btu/h	44,000
Piping Connections	Liquid	mm(inch)	Ø9.52(3/8)
	Gas	mm(inch)	Ø15.88(5/8)

▣ Note

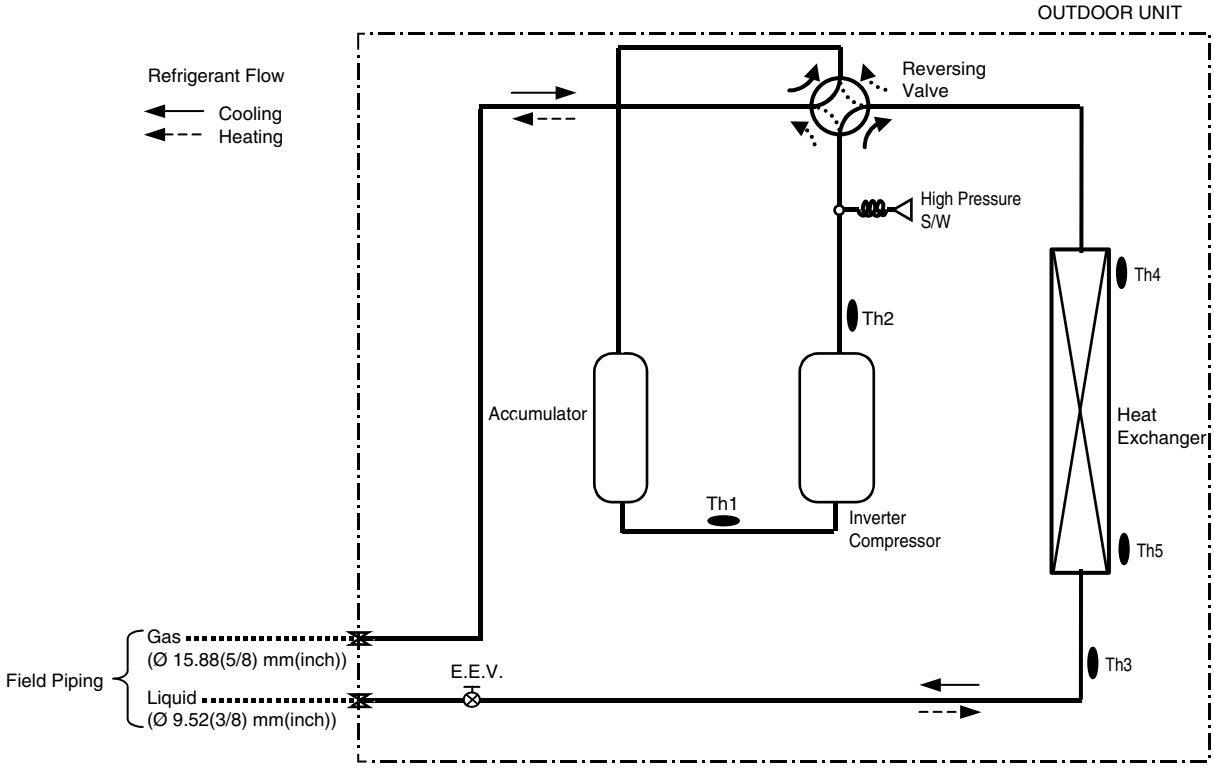
1. Unit should be installed in compliance with the installation manual in the product box.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials to be supplied on the site must comply with the local regulations or international codes.
4. Electrical characteristics chapter should be considered for electrical work and design. Especially the capacity of power cable and circuit breaker for outdoor unit should be more than that of electrical characteristics chapter.

LG Electronics
76, Seongsan-dong, Changwon City, Gyeongnam,
641-713, Korea
www.lge.com/airconditioner

CHASSIS CODE: U3

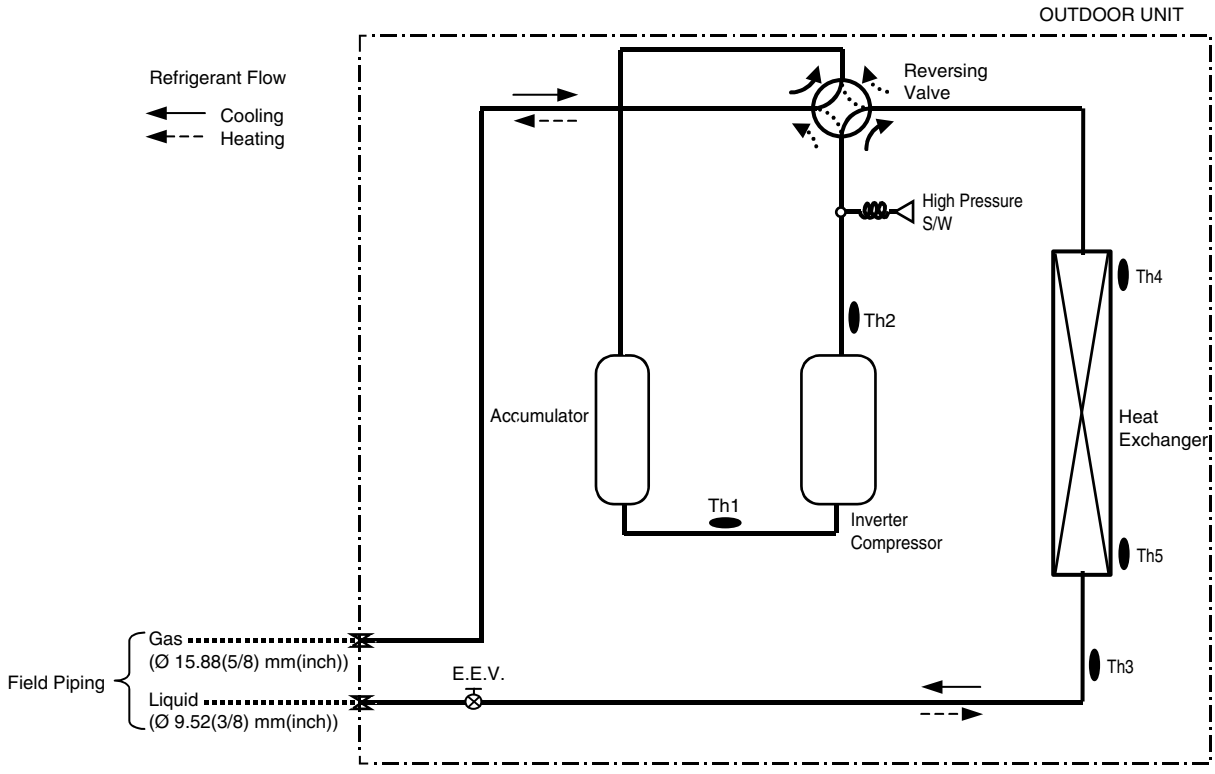
2.1.5 Piping diagrams

Models : AUUW243E[LUU246HV]



LOC.	Description	PCB Connector
EEV	Electronic Expansion Valve	CN-EEV1
Th1	Thermistor for suction pipe temperature	CN-TH2
Th2	Thermistor for discharge pipe temperature	CN-TH2
Th3	Thermistor for condenser pipe temperature	CN-TH1
Th4	Thermistor for outdoor air temperature	CN-TH1
Th5	Thermistor for condenser middle pipe temperature	CN-TH3

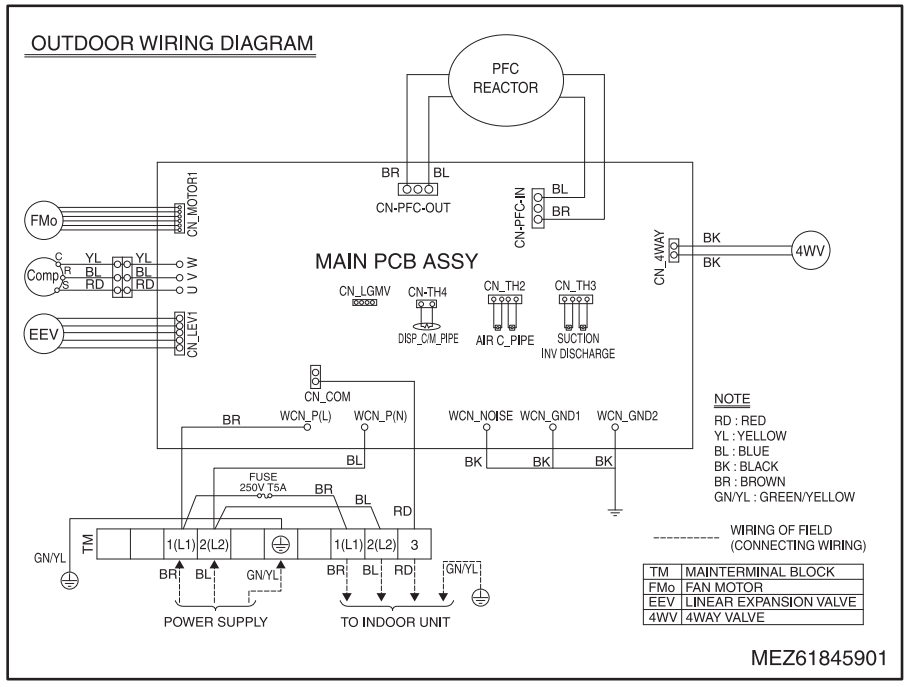
Models : AUUW423E[LUU426HV]



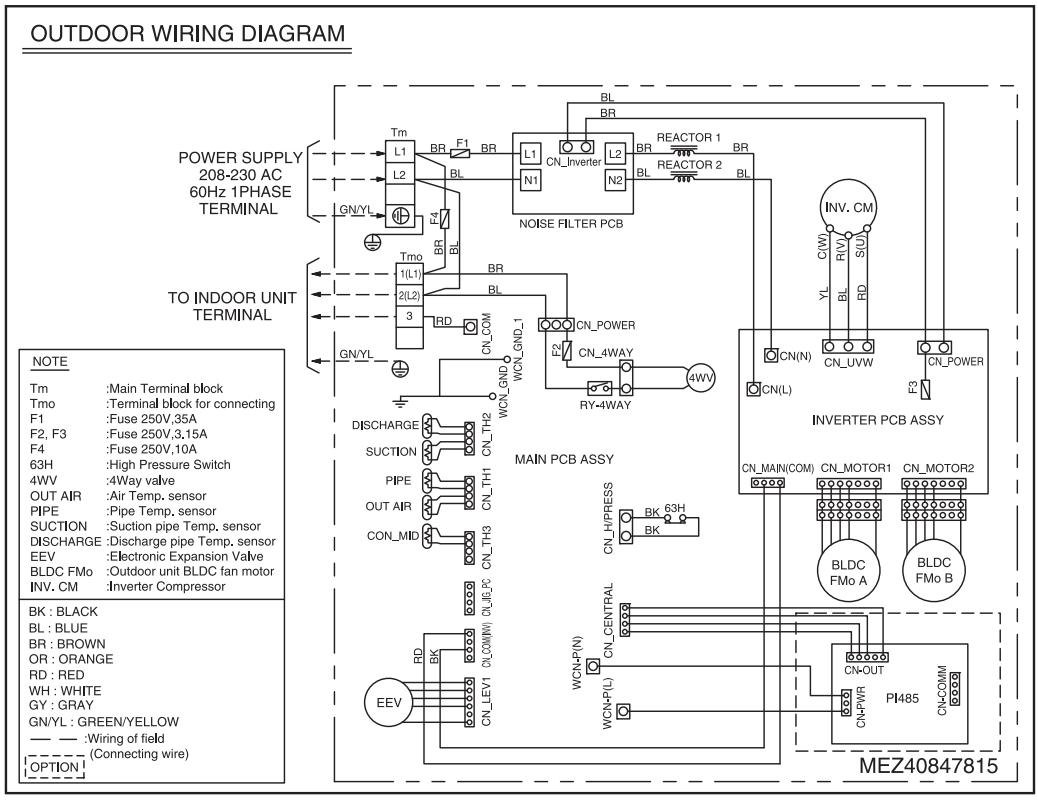
LOC.	Description	PCB Connector
EEV	Electronic Expansion Valve	CN_LEV1
Th1	Thermistor for suction pipe temperature	CN_TH3
Th2	Thermistor for discharge pipe temperature	CN_TH3
Th3	Thermistor for condenser pipe temperature	CN_TH2
Th4	Thermistor for outdoor air temperature	CN_TH2
Th5	Thermistor for condenser middle pipe temperature	CN_TH4

2.1.6 Wiring diagrams

Models : AUUW243E[LUU246HV]



Models : AUUW423E[LUU426HV]



2.1.7 Capacity tables

Models : AUUW243E + ATNH243PLAE + APNH2433LAE [LUU246HV] + [LCN246HV] + [LFN246HV]

• Cooling Capacity

Model	ATNH243PLAE[LCN246HV]
AFR	18

Indoor Air Temperature		Outdoor Air Temperature : °FDB																				
		68.0			77.0			89.6			95.0			104.0			109.4			114.8		
°FWB	°FDB	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
57.2	68.0	22.6	18.1	1.4	21.6	17.5	1.4	20.3	16.8	1.9	19.6	16.3	2.2	18.8	15.8	2.4	18.3	15.2	2.3	17.7	14.7	2.1
60.8	71.6	23.9	18.4	1.9	23.0	17.8	1.9	21.6	17.2	2.3	21.0	16.6	2.5	20.1	16.1	2.6	19.6	15.6	2.4	19.1	15.2	2.1
64.4	77.0	25.3	18.5	2.0	24.3	18.0	2.0	23.0	17.4	2.4	22.4	16.9	2.5	21.5	16.4	2.6	21.0	15.9	2.4	20.5	15.5	2.1
66.2	80.6	26.0	18.7	2.0	25.0	18.2	2.1	23.7	17.6	2.4	23.0	17.0	2.5	22.2	16.7	2.6	21.7	16.1	2.4	21.2	15.7	2.0
71.6	86.0	28.1	19.1	2.0	27.1	18.6	2.1	25.8	18.1	2.5	25.1	17.5	2.6	24.2	17.2	2.6	23.7	16.7	2.4	23.2	16.3	2.0
75.2	89.6	29.5	19.4	2.0	28.5	19.0	2.1	27.1	18.5	2.5	26.5	18.0	2.7	25.6	17.6	2.7	25.1	17.1	2.5	24.6	16.7	2.1

Model	APNH2433LAE[LFN246HV]
AFR	20

Indoor Air Temperature		Outdoor Air Temperature : °FDB																				
		68.0			77.0			89.6			95.0			104.0			109.4			114.8		
°FWB	°FDB	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
57.2	68.0	22.6	16.4	1.4	21.6	15.9	1.4	20.3	15.2	1.9	19.6	14.7	2.2	18.8	14.3	2.4	18.3	13.8	2.3	17.7	13.3	2.1
60.8	71.6	23.9	16.6	1.9	23.0	16.1	1.9	21.6	15.5	2.3	21.0	15.0	2.5	20.1	14.6	2.6	19.6	14.1	2.4	19.1	13.7	2.1
64.4	77.0	25.3	16.8	2.0	24.3	16.3	2.0	23.0	15.8	2.4	22.4	15.3	2.5	21.5	14.9	2.6	21.0	14.4	2.4	20.5	14.0	2.1
66.2	80.6	26.0	16.9	2.0	25.0	16.5	2.1	23.7	15.9	2.4	23.0	15.4	2.5	22.2	15.1	2.6	21.7	14.6	2.4	21.2	14.2	2.0
71.6	86.0	28.1	17.3	2.0	27.1	16.8	2.1	25.8	16.3	2.5	25.1	15.9	2.6	24.2	15.6	2.6	23.7	15.1	2.4	23.2	14.7	2.0
75.2	89.6	29.5	17.6	2.0	28.5	17.2	2.1	27.1	16.7	2.5	26.5	16.3	2.7	25.6	16.0	2.7	25.1	15.5	2.5	24.6	15.1	2.1

• Symbol

AFR : Air flow rate [m^3/min]
DB : Dry bulb temperature [°C]
WB : Wet bulb temperature [°C]
TC : Total capacity [kW]
SHC : Sensible capacity [kW]
PI : Power Input [kW]
(Comp.+ indoor fan motor+outdoor fan motor)

• Notes

1. All capacites are net, evaporator fan motor heat is deducted.
2. ▭ Indicates rated capacity.
3. Direct interpolation is permissible. Do not extrapolate
4. Capacities are based on the following conditions:
   - Interconnecting Piping Length 7.5m(24.6ft)
   - Level Difference of Zero.

Models : AUUW243E + ATNH243PLAE + APNH2433LAE [LUU246HV] + [LCN246HV] + [LFN246HV]

• Heating Capacity

Model	ATNH243PLAE[LCN246HV]
AFR	18

Indoor Air Temperature	Outdoor Air Temperature : °FWB													
	5		14		23		32		42.8		50		59	
°FDB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
60.8	18.8	2.08	19.8	2.03	21.4	2.12	22.9	2.28	25.4	2.44	26.9	2.54	29.1	2.70
64.4	18.6	2.11	19.7	2.08	21.5	2.18	22.9	2.35	25.2	2.50	26.5	2.59	29.1	2.74
68.0	18.5	2.15	19.7	2.13	21.5	2.25	22.8	2.41	25.0	2.55	26.3	2.63	29.1	2.75
69.8	18.4	2.17	19.7	2.16	21.5	2.28	22.8	2.44	24.8	2.57	26.3	2.64	28.9	2.76
71.6	18.4	2.19	19.7	2.19	21.5	2.31	22.7	2.47	24.7	2.60	26.3	2.66	28.7	2.76
75.2	18.2	2.25	19.6	2.25	21.2	2.38	22.5	2.53	24.5	2.64	25.9	2.68	28.3	2.78

Model	APNH2433LAE[LFN246HV]
AFR	20

Indoor Air Temperature	Outdoor Air Temperature : °FWB													
	5		14		23		32		42.8		50		59	
°FDB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
60.8	18.8	2.08	19.8	2.03	21.4	2.12	22.9	2.28	25.4	2.44	26.9	2.54	29.1	2.70
64.4	18.6	2.11	19.7	2.08	21.5	2.18	22.9	2.35	25.2	2.50	26.5	2.59	29.1	2.74
68.0	18.5	2.15	19.7	2.13	21.5	2.25	22.8	2.41	25.0	2.55	26.3	2.63	29.1	2.75
69.8	18.4	2.17	19.7	2.16	21.5	2.28	22.8	2.44	24.8	2.57	26.3	2.64	28.9	2.76
71.6	18.4	2.19	19.7	2.19	21.5	2.31	22.7	2.47	24.7	2.60	26.3	2.66	28.7	2.76
75.2	18.2	2.25	19.6	2.25	21.2	2.38	22.5	2.53	24.5	2.64	25.9	2.68	28.3	2.78

• Symbol

AFR : Air flow rate [m^3/min]
DB : Dry bulb temperature [°C]
WB : Wet bulb temperature [°C]
TC : Total capacity [kW]
SHC : Sensible capacity [kW]
PI : Power Input [kW]
(Comp.+ indoor fan motor+outdoor fan motor)

• Notes

1. All capacites are net, evaporator fan motor heat is deducted.
2. ▭ Indicates rated capacity.
3. Direct interpolation is permissible. Do not extrapolate
4. Capacities are based on the following conditions:
   - Interconnecting Piping Length 7.5m(24.6ft)
   - Level Difference of Zero.

Models : AUUW423E + ATNH423MLAE + APNH423TLAE [LUU426HV] + [LCN426HV] + [LFN426HV]

• Cooling Capacity

Model	ATNH423MLAE[LCN426HV]
AFR	34

Indoor Air Temperature		Outdoor Air Temperature : °FDB																				
		68.0			77.0			89.6			95.0			104.0			109.4			114.8		
°FWB	°FDB	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
57.2	68.0	40.2	31.0	2.6	38.5	30.0	2.7	36.1	28.8	3.6	35.0	27.8	4.0	33.5	27.0	4.4	32.5	26.0	4.3	31.6	25.2	3.9
60.8	71.6	42.7	31.4	3.5	40.9	30.5	3.5	38.6	29.3	4.3	37.4	28.4	4.6	35.9	27.6	4.8	35.0	26.7	4.5	34.1	25.9	3.9
64.4	77.0	45.2	31.7	3.8	43.4	30.8	3.8	41.0	29.8	4.5	39.9	28.8	4.7	38.3	28.1	4.8	37.4	27.2	4.5	36.5	26.5	3.9
66.2	80.6	46.4	32.0	3.8	44.6	31.1	3.9	42.2	30.1	4.5	41.0	29.1	4.7	39.6	28.5	4.9	38.6	27.6	4.5	37.7	26.9	3.8
71.6	86.0	50.1	32.6	3.8	48.3	31.8	3.9	45.9	30.9	4.6	44.8	30.0	4.9	43.2	29.4	4.9	42.3	28.5	4.6	41.4	27.8	3.8
75.2	89.6	52.6	33.2	3.8	50.8	32.4	4.0	48.4	31.6	4.7	47.2	30.7	5.0	45.7	30.1	5.0	44.7	29.3	4.7	43.8	28.6	3.9

Model	APNH423TLAE[LFN426HV]
AFR	35

Indoor Air Temperature		Outdoor Air Temperature : °FDB																				
		68.0			77.0			89.6			95.0			104.0			109.4			114.8		
°FWB	°FDB	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
57.2	68.0	40.2	31.4	2.6	38.5	30.4	2.7	36.1	29.2	3.6	35.0	28.2	4.0	33.5	27.4	4.4	32.5	26.4	4.3	31.6	25.6	3.9
60.8	71.6	42.7	31.9	3.5	40.9	30.9	3.5	38.6	29.8	4.3	37.4	28.8	4.6	35.9	28.0	4.8	35.0	27.1	4.5	34.1	26.3	3.9
64.4	77.0	45.2	32.1	3.8	43.4	31.2	3.8	41.0	30.2	4.5	39.9	29.2	4.7	38.3	28.5	4.8	37.4	27.6	4.5	36.5	26.9	3.9
66.2	80.6	46.4	32.4	3.8	44.6	31.5	3.9	42.2	30.5	4.5	41.0	29.5	4.7	39.6	28.9	4.9	38.6	28.0	4.5	37.7	27.2	3.8
71.6	86.0	50.1	33.1	3.8	48.3	32.2	3.9	45.9	31.3	4.6	44.8	30.4	4.9	43.2	29.8	4.9	42.3	28.9	4.6	41.4	28.2	3.8
75.2	89.6	52.6	33.7	3.8	50.8	32.9	4.0	48.4	32.0	4.7	47.2	31.1	5.0	45.7	30.6	5.0	44.7	29.7	4.7	43.8	29.0	3.9

• Symbol

AFR : Air flow rate [m^3/min]
DB : Dry bulb temperature [°C]
WB : Wet bulb temperature [°C]
TC : Total capacity [kW]
SHC : Sensible capacity [kW]
PI : Power Input [kW]
(Comp.+ indoor fan motor+outdoor fan motor)

• Notes

1. All capacites are net, evaporator fan motor heat is deducted.
2. ▭ Indicates rated capacity.
3. Direct interpolation is permissible. Do not extrapolate
4. Capacities are based on the following conditions:
   - Interconnecting Piping Length 7.5m(24.6ft)
   - Level Difference of Zero.

Models : AUUW423E + ATNH423MLAE + APNH423TLAE [LUU426HV] + [LCN426HV] + [LFN426HV]

• Heating Capacity

Model	ATNH423MLAE[LCN426HV]
AFR	34

Indoor Air Temperature	Outdoor Air Temperature : °FWB													
	5		14		23		32		42.8		50		59	
°FDB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
60.8	30.8	3.77	32.4	3.68	35.2	3.85	37.5	4.14	41.7	4.43	44.0	4.61	47.8	4.91
64.4	30.5	3.83	32.4	3.77	35.2	3.97	37.5	4.26	41.4	4.54	43.5	4.70	47.6	4.97
68.0	30.3	3.90	32.4	3.87	35.2	4.08	37.4	4.37	41.0	4.63	43.2	4.77	47.7	5.00
69.8	30.2	3.94	32.4	3.92	35.2	4.14	37.4	4.43	40.7	4.67	43.2	4.80	47.4	5.00
71.6	30.2	3.98	32.4	3.98	35.2	4.19	37.2	4.48	40.4	4.71	43.1	4.83	47.0	5.00
75.2	29.8	4.08	32.1	4.09	34.8	4.31	37.0	4.59	40.1	4.79	42.4	4.87	46.5	5.04

Model	APNH423TLAE[LFN426HV]
AFR	35

Indoor Air Temperature	Outdoor Air Temperature : °FWB													
	5		14		23		32		42.8		50		59	
°FDB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
60.8	30.8	3.77	32.4	3.68	35.2	3.85	37.5	4.14	41.7	4.43	44.0	4.61	47.8	4.91
64.4	30.5	3.83	32.4	3.77	35.2	3.97	37.5	4.26	41.4	4.54	43.5	4.70	47.6	4.97
68.0	30.3	3.90	32.4	3.87	35.2	4.08	37.4	4.37	41.0	4.63	43.2	4.77	47.7	5.00
69.8	30.2	3.94	32.4	3.92	35.2	4.14	37.4	4.43	40.7	4.67	43.2	4.80	47.4	5.00
71.6	30.2	3.98	32.4	3.98	35.2	4.19	37.2	4.48	40.4	4.71	43.1	4.83	47.0	5.00
75.2	29.8	4.08	32.1	4.09	34.8	4.31	37.0	4.59	40.1	4.79	42.4	4.87	46.5	5.04

• Symbol

AFR : Air flow rate [m^3/min]
DB : Dry bulb temperature [°C]
WB : Wet bulb temperature [°C]
TC : Total capacity [kW]
SHC : Sensible capacity [kW]
PI : Power Input [kW]
(Comp.+ indoor fan motor+outdoor fan motor)

• Notes

1. All capacites are net, evaporator fan motor heat is deducted.
2. ▭ Indicates rated capacity.
3. Direct interpolation is permissible. Do not extrapolate
4. Capacities are based on the following conditions:
   - Interconnecting Piping Length 7.5m(24.6ft)
   - Level Difference of Zero.

2.1.8 Capacity coefficient factor

DC Inverter SINGLE A.(1Ø)

1) Rate of change in capacity due to the main piping length

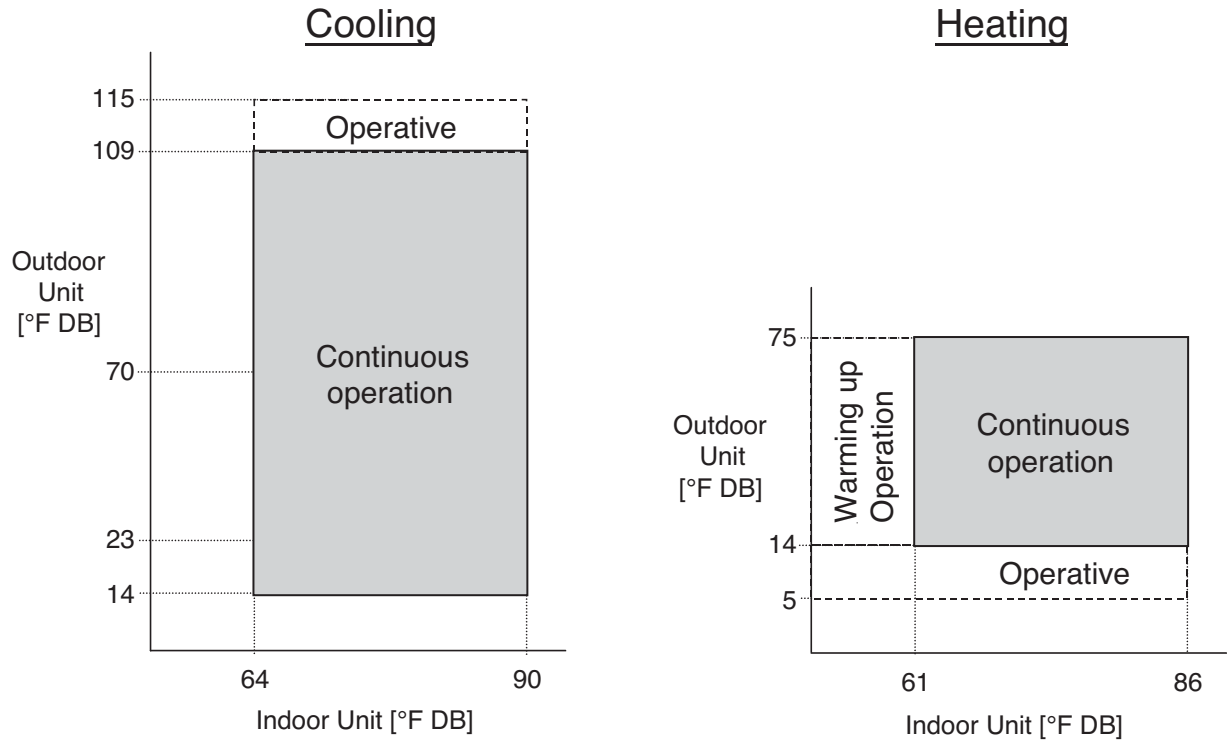
Rate of change in cooling capacity

Main piping length[m(ft)]		5(16.4)	10(32.8)	15(49.2)	20(65.6)	30(98.4)	40(131.2)	50(164)
Rate of change in capacity(%)	23,000 Btu/h	100	99.3	97.9	96.6	93.8	91.1	88.4
	41,000 Btu/h	100	99.3	97.9	96.6	93.8	91.1	88.4

Rate of change in heating capacity

Main piping length[m(ft)]		5(16.4)	10(32.8)	15(49.2)	20(65.6)	30(98.4)	40(131.2)	50(164)
Rate of change in capacity(%)	23,000 Btu/h	100	99.7	99.2	98.7	97.7	96.6	95.6
	41,000 Btu/h	100	99.7	99.2	98.7	97.7	96.6	95.6

2.1.9 Operation range



Operative: Intermittent operation due to the operational conditions (indoor/outdoor temperature, humidity, load etc.) can cause the heating capacity to decrease

2.1.10 Electric characteristics

Unit					Power		Compressor		OFM	
Model	Type	Hz	Voltage	Voltage range	MCA	MOP	MSC	RLA	kW	FLA
AUUW243E[LUU246HV]	1 Phase inverter	60	208-230	Min. : 198 Max. :264	15.6	26.6	-	11.0	0.124	0.6
AUUW423E[LUU426HV]					22.2	37.5	-	15.3	0.248	1.8

Notes :

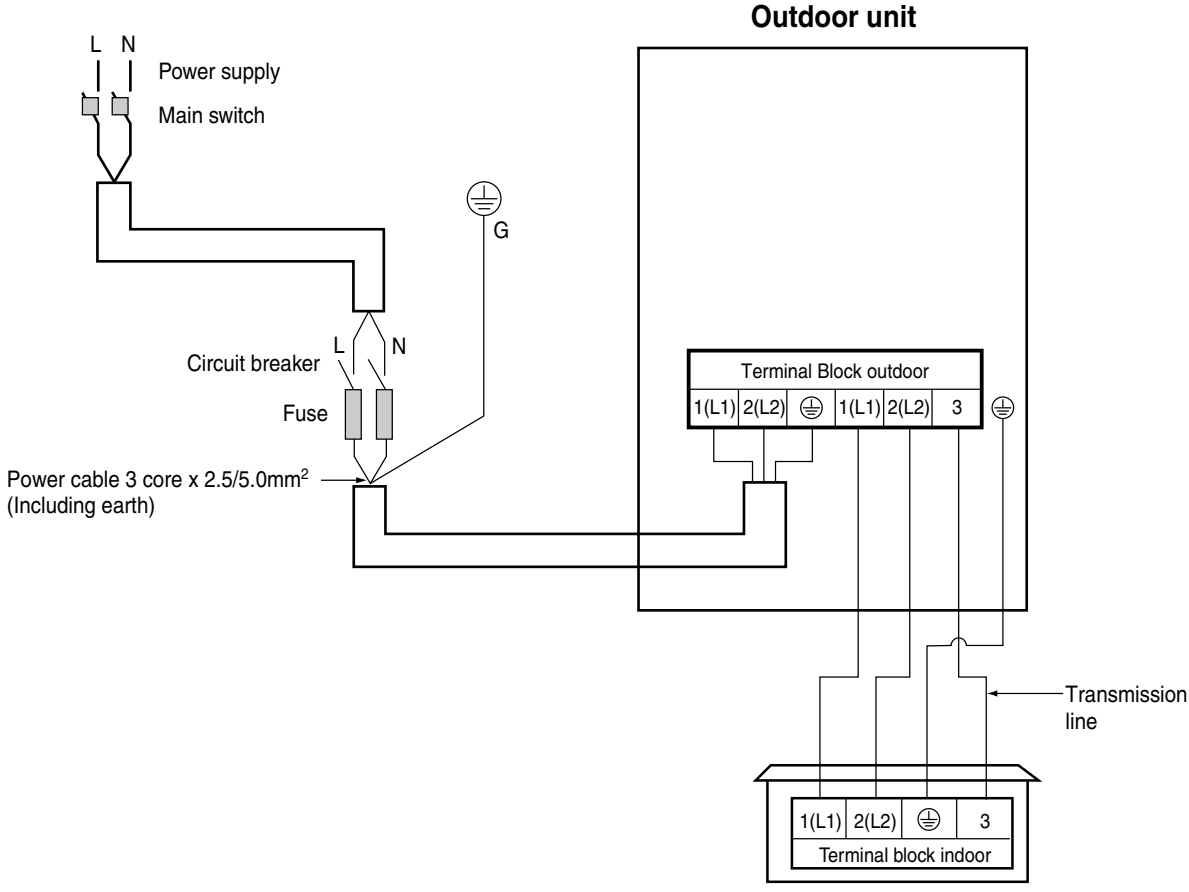
1. Voltage range
   Voltage supplied to the unit terminals should be within the minimum and maximum range
2. Maximum allowable voltage unbalance between phase is 2 %
3. MCA / MOP
   MCA = (1.25 x Load1) + Load2 + Load3
   MOP = (2.25 x Load1) + Load2 + Load3
   - Load1 : Rated running current of largest motor (compressor or other motor)
   - Load2 : sum of current for all other motors
   - Load3 : any other load rated 1.0A or more
4. Select wire spec. based on the MCA
5. Recommended circuit breaker is ELCB (Earth Leakage circuit breaker)
6. MSC & RLA are measured as the compressor only test condition.
7. MSC values
8. RLA is measured during each individual compressor test condition.
9. OFM is measured as the outdoor unit test condition

MCA : Minimum Circuit Amperes (A)
MOP : Maximum rating over current protective device
MSC : Maximum Starting Current
RLA : Rated Load Amperes (A)
OFM : Outdoor Fan Motor
kW : Fan Motor rated output (kW)
FLA : Full Load Amperes (A)

2.1.11 Field wiring diagrams

DC Inverter SINGLE A(1Ø)

1. All wiring must comply with LOCAL REGULATIONS.
2. Select a power source that is capable of supplying the current as required by the air conditioner.
3. Feed the power source to the unit via a distribution switch board designed for this purpose.
4. The terminal screws inside the control box may be loose due to vibration during transport.
   Check the screws for loose connection.
   (Running the air conditioner with loose connection can overload and damage electrical components.)
5. Always ground the air conditioner with a grounding wire and connector to meet the LOCAL REGULATION.



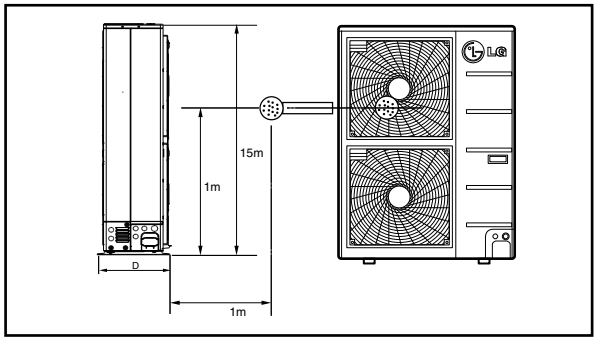
Notes:

1. All wirings, components and materials to be procured on the site should be according to the standard
2. Use copper conductor only
3. Install circuit breaker for safety
4. Unit should be grounded in compliance with the applicable local and national codes
5. Wiring cable size must comply with the applicable local and national code.

2.1.12 Sound levels

DC Inverter SINGLE A(1Ø)

Overall

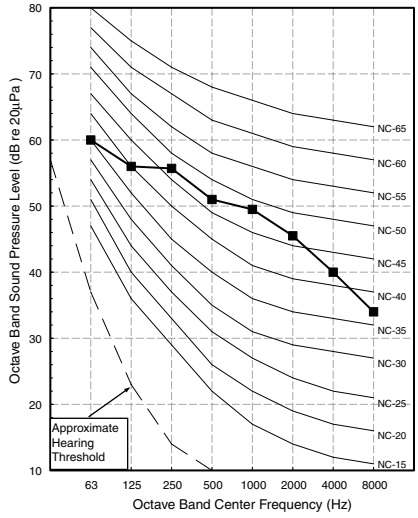


Notes:
- Sound measured at 1m away from the center of the unit.
- Data is valid at free field condition
- Data is valid at nominal operation condition
- Reference accoustic pressure OdB = 20μPa
- Sound level will vary depending on a range of factors such as the construction(acoustic absorption coefficient) of particular room in which the equipment is installed.
- The operating conditions are assumed to be standard

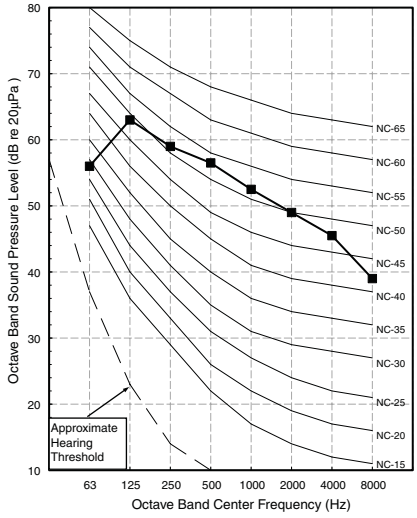
Model	Sound Level [dB(A)+3]
	H/L
AUUW243E [LUU246HV]	55
AUUW423E [LUU426HV]	58

Sound pressure level

AUUW243E[LUU246HV]



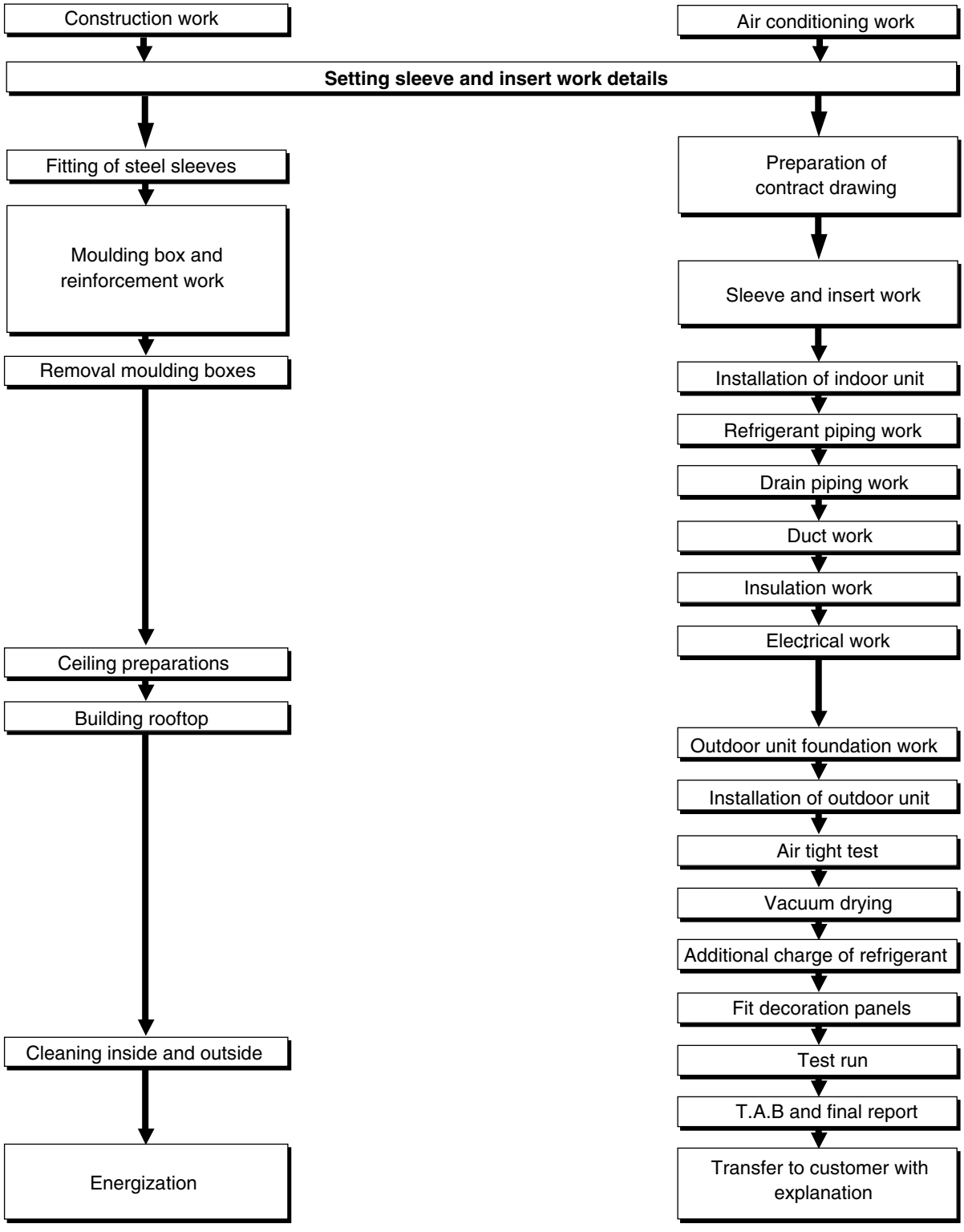
AUUW423E[LUU426HV]



Part 3 Design and installation

1. General installation guideline
1.1 Installation process & Guideline

Striking a balance between system installation & general construction work.



1. The division of the work should be thoroughly clarified.

2. keep a constant check on the progress of the construction work to avoid deviations from the air conditioning work schedule.

1.2 Checking the drawing

Installation procedure	Remarks
Determination of work scope	Check and confirm required loads calculation, model selection, drawings etc.
Preparation of contract drawings	Make a relationship between outdoor ,indoor controller and option connection clear. (prepare control circuit diagram)
Sleeve and insert works	Determine sleeve position, size and counts as required
Installation of indoor units	Check model name to make sure the fitting is made correctly
Refrigerant piping works	Special attention to dryness , cleanness and tightness
Drain pipe works	Make sure that the drain pipe diameter is big enough and adjust it to downward gradient
Duct works	Make sure airflow is sufficient
Insulation works	Make sure no gap is left where the insulating materials are joined
Electrical work	Multiple core cable must not be used (suitable cable should be selected)
Outdoor unit foundation works	The foundation must be vibration proof and in level
Installation of outdoor units	Avoid airflow short circuit and ensure sufficient space is allowed for servicing
Air tight test	For 24 hours at 3.8MPa(R410a) or 2.8MPa(R22) there must be no drop in pressure
Vacuum drying	Less than 5 Torr (At least more than 1hr)
Additional charge of refrigerant	Charge the refrigerant accurately by using a charging cylinder
Fit decoration panels	Make sure there are no gaps left between facing materials used on the ceiling
Test run	Follow the testing operation check sheet
Transfer to customer with explanation	Explain to customer or operator the manual etc

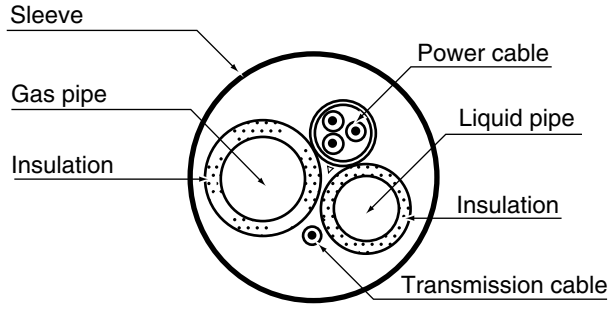
2. Guideline for each installation process
2.1 Sleeve and insert work

2.1.1 Positioning of the pipe holes

1. The through holes for the drain piping should be positioned such that pipes have a downward gradient (the gradient must be at least 1/100.The thickness of the insulating materials must also be taken into consideration.)
2. The diameter of the through holes for the refrigerant piping should include an allowance for the thickness of the heat insulation materials.
3. Attention should be paid to the construction of the beam themselves since there are sometimes parts of the beam which cannot be used to accommodate through holes.

2.1.2 Selection of sleeve

1. Sleeve work should be performed to make a space for passing pipe and wire through the wall or ground under construction.



For example if gas pipe and liquid pipe is 12.7(1/2)mm(inch) , 6.35(1/4) mm(inch) the sleeve diameter is minimum 79.05(3-5/32) mm(inch).

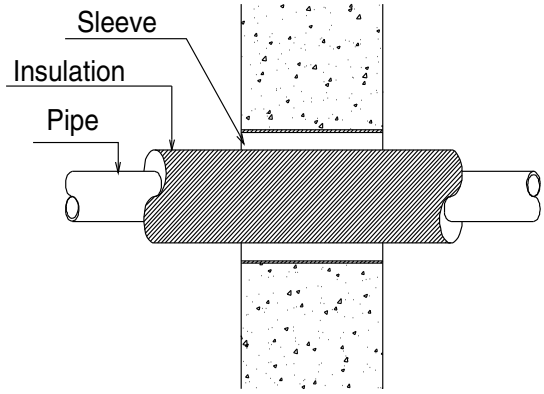
Gas pipe diameter	12.7(1/2)mm(inch)
Liquid pipe diameter	6.35(1/4) mm(inch)
Insulation thickness(gas pipe)	10(3/8) mm(inch) x 2
Insulation thickness(liquid pipe)	10(3/8) mm(inch) x 2
20mm surplus	20(25/32) mm(inch)
Total sleeve diameter	79.05(3-5/32) mm(inch)

* Assumption : Gas pipe insulation thickness and liquid pipe insulation thickness is 10(3/8) mm(inch) and 10(3/8) mm(inch) respectively

NOTE

Use of shielded transmission cable is recommended to avoid the problem of electrical noise.

2.1.3 Sleeve type



NOTE

Sleeve type should be considered as per local regulation & laws.

CAUTION

1. In high voltage generation places, water-proof flexible conduit should be used. (in substation room, in elevator room)
2. Conduit should be chosen in accordance with electrical installation regulation.

NOTE

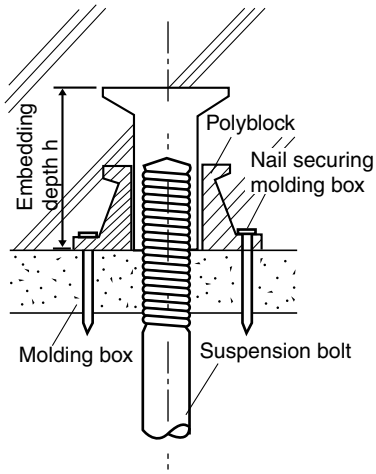
Cable conduit should be considered under the local regulation & laws.

2.1.4 Insert work and support work

An insert is a metal tool which is inserted into a floor or beam before the concrete is set such that fittings such as duct , pipes or suspension bolts for hanging units can be fitted into the place later. The positioning of the inserts must be decided early.

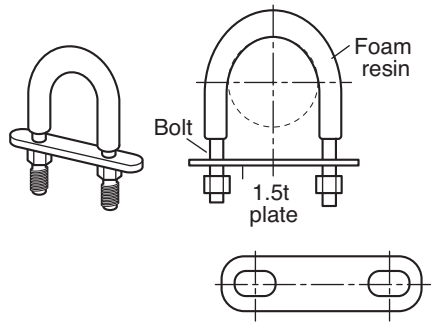
1. Insert work

Example : Through holes in a reinforced concrete beam

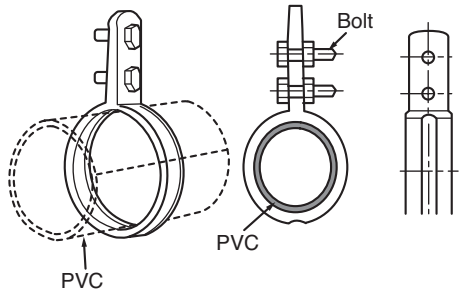


2. Support work.

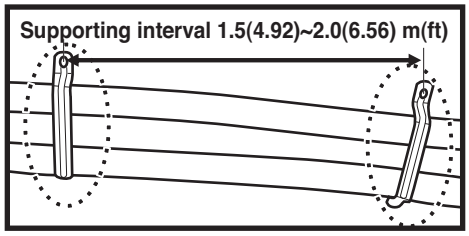
■ Insulated U-bolt type supporting



■ Insulated O-ring band type supporting



■ Saddle supporting

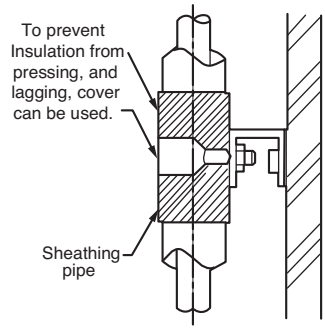


⚠CAUTION

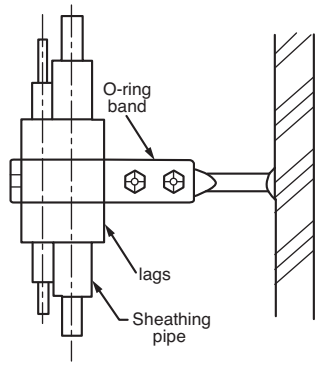
During saddle supporting work, insulation should not be pressed by saddle as this can lead to tearing of insulation and thus falling of condensed water during product operation.

a) Supporting with insulated pipe

① U-bolt supporting

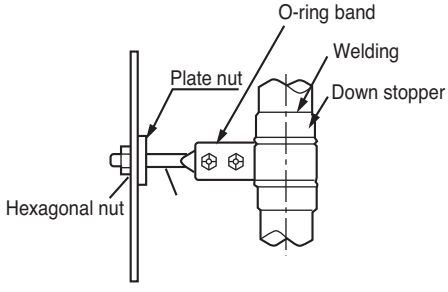


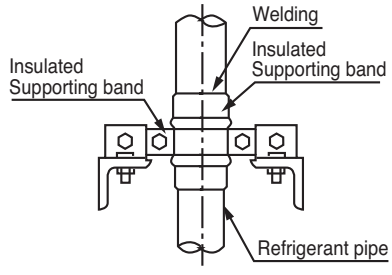
② 0-ring band supporting



B) Down stopper supporting

One point supporter (200(440.9) kg(lbs))





2.2 Refrigerant piping work

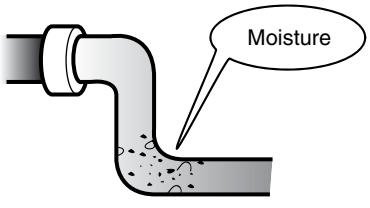
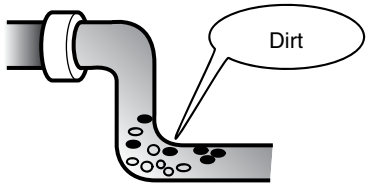
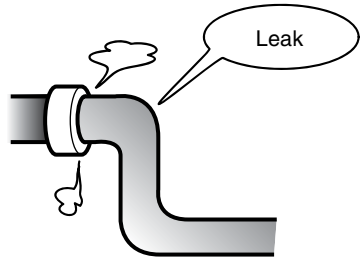
2.2.1 Principles of refrigerant piping

The " principles of refrigerant piping " must be strictly observed.

	Cause of problem	Action to avoid problem
Dry	-Rainwater, work water, etc gets into pipes from outside -Moisture generated inside pipe due to condensation	Flushing → Pipe covering → Vacuum drying
Clean	-Formation of oxides inside pipes during soldering -Dirt,dust or other extraneous material gets into pipes from outside	Replace Nitrogen → Pipe covering Flushing → Pipe covering
Air tight	-Leak from soldered area -Leak from flared area -Leak from flange area	Use the proper materials Adhere strictly to standard soldering work practice. Adhere strictly to standard flaring work practice. Adhere strictly to standard flaring connection work practice.

• The end of all copper pipes should be capped to protect them from dust or water particles while safe keeping

The 3 princples of refrigerant piping work

Dry	Clean	Air tight
Make sure there is no moisture inside the pipes	Make sure there is no dirt inside the pipes	Make sure the refrigerant does not leak out.
		

2.2.2 Flaring work

Main cause for gas leakage is due to defect in flaring work. Carry out correct flaring work in the following procedure.

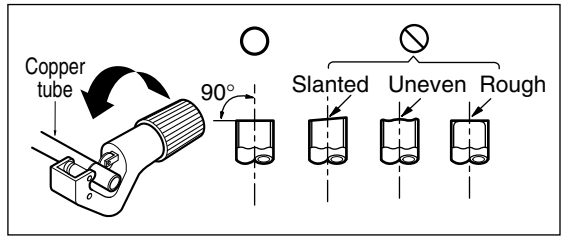
Cut the pipes and the cable.

① Use the piping kit accessory or the pipes purchased locally.

② Measure the distance between the indoor and the outdoor unit.

③ Cut the pipes a little longer than measured distance.

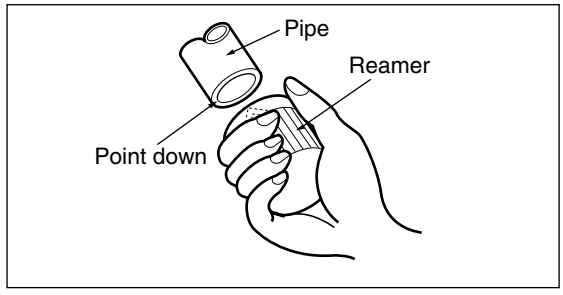
④ Cut the cable 1.5(4.92) m(ft) longer than the pipe length.



2) Burrs removal

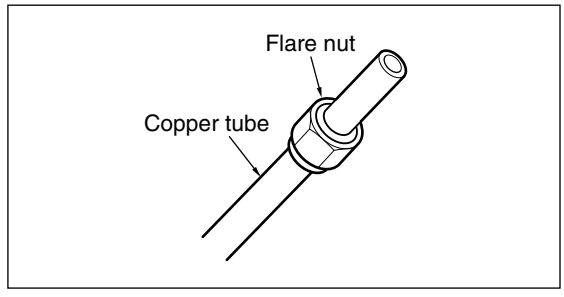
① Completely remove all burrs from the cut cross section of pipe/tube.

② Put the end of the copper tube/pipe in a downward direction as you remove burrs in order to avoid dropping of burrs into the tubing.



3) Putting nut on

① Remove flare nuts attached to indoor and outdoor unit, then put them on pipe/tube having completed burr removal.(not possible to put them on after flaring work)

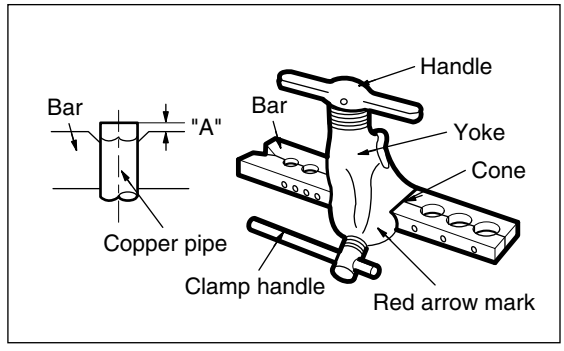


4) Flaring work

① Carry out flaring work using flaring tool as shown below.

② Firmly hold copper pipe in a die in the dimension shown in the table below.

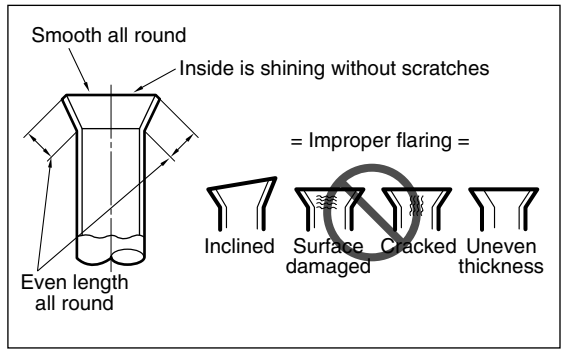
Outer diameter		A	
mm	inch	mm	inch
Ø6.35	1/4	1.1~1.3	0.04~0.05
Ø9.52	3/8	1.5~1.7	0.06~0.07
Ø12.7	1/2	1.6~1.8	0.06~0.07
Ø15.88	5/8	1.6~1.8	0.06~0.07
Ø19.05	3/4	1.9~2.1	0.07~0.08



5) Check after flaring

① Compare the flared work with figure on right side.

② If flare is found to be defective, cut off the flared section and do flaring work again.



NOTE

Choice of material for refrigerant piping
Copper pipe selection

a. The wall thickness of the refrigerant piping should comply with relevant local and national regulation for R410A the design pressure is 3.8MPa.(38.7kgf/cm^2)
b. If not, we recommend to use with phosphorus deoxidized copper type
c. Generally used copper pipe specifications as follows;

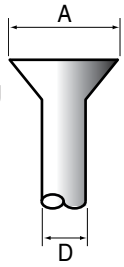
Size(ø)mm(inch)	Thickness	
	R22	R410A
6.35(1/4)	0.7	0.8
9.52(3/8)	0.8	0.8
12.70(1/2)	0.8	0.8
15.88(5/8)	1.0	1.0
19.05(3/4)	1.0	1.0

* Never use the pipe which is mixed scrap or a pipe used somewhere else
The method how to distinguish the pipe mixed scarp : check the oxidization evidence after leaving the pipe for 24hour.

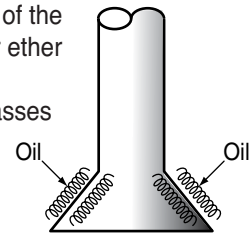
⚠CAUTION

Flare connection and procedure

1. Stiffened pipe must always be annealed at least once prior to the flaring work.
2. A pipe cutter must be used to cut the pipe. (A large pipe cutter must be used where the pipe has a large diameter. When cutting a pipe which is too big for the pipe cutter a metal saw may be used but care must be taken to ensure that the debris from sawing does not get into the pipe.)



3. Set the flaring tool to make sure the flare size remains within the prescribed limits.
4. Coat the inner and outer surface of the flare with refrigerator oil (Ester or ether oil).
(this ensures that the flare nut passes smoothly, preventing the pipe from twisting.)
Do not use SUNISO-4GS oil.



External diameter of pipe D		Pipe widening dimension A
(in)	(mm)	
1/4	6.35	8.6~9.0
3/8	9.52	12.6~13.0
1/2	12.7	15.8~16.2
5/8	15.88	19.0~19.4
3/4	19.05	22.9~23.3

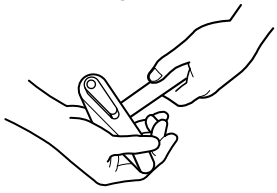
⚠CAUTION

1. Burrs should be carefully removed.
2. 2 spanners should be used to grip the pipe.
3. The flare nut must be inserted before starting the flaring operation.
4. The appropriate amount of torque should be used to tighten the flare nut.
5. Check that there is no superficial damage to the surface of the flare.

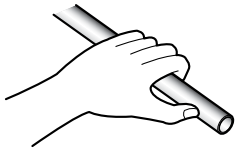
NOTE

Flange connection and procedure

1) Cut the pipe using a pipe cutter.

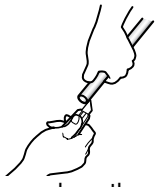


2) The cut edge has burrs.
(the amount of burrs becomes larger when pipe wall is thick)

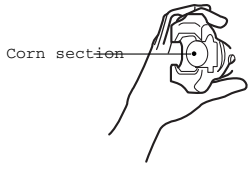


3) Remove the burrs using a reamer
(Be careful not to let particles enter the pipe.
Point the pipe end downward during cutting)

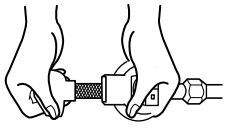
4) Clean the inside of the pipe
(use a thin stick with a cloth wrapped around it)



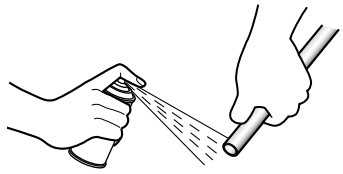
5) Before flaring , clean the cone section of the flaring tool.



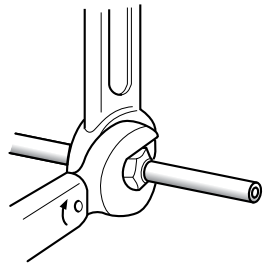
6) Flare the pipe.
Rotate the flaring tool 3 or 4 turns after a clicking sound is produced. this results in a clean flared surface



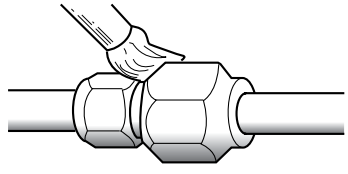
7) Apply refrigerant oil on the inside and outside of the flared section.
(Do not apply SUNISO oil)
(Be careful to keep dust away)



8) Tighten the flare nut. (Use a torque wrench to apply the proper tightening force)



9)
- Check for gas leaks.
(Check at the threaded section of the flare nut for gas leak)
- Spay –type gas leak detecting products are available on the market.
- Soap water may be used to check for leaks , but use only neutral soap to prevent corrosion of the flare nut.
- Be sure to wipe the nut area clean after the gas leak check.



2.2.3 Pipe connection flaring

NOTE

1. After installation completion make sure to open the valve. operating the unit with the valve shut off will destroy the compressor (Refer to the Additional refrigerant charge detail information)
2. Use R410A to add refrigerant. All field piping must be installed by a licensed refrigeration technician
3. Must comply with local and national standard regulations.

1) Connecting the piping to the indoor unit and drain hose to drain pipe

① Align the center of the piping and sufficiently tighten the flare nut by hand.

② Tighten the flare nut with a wrench. Wrap the insulation material around the connecting portion.

Outside diameter(Ø)		Torque
mm	inch	kg·f.m(lbf·ft)
6.35	1/4	18~2.5(13~18)
9.52	3/8	3.4~4.2(24~30)
12.7	1/2	5.5~6.6(40~48)
15.88	5/8	6.3~8.2(46~59)
19.05	3/4	9.9~12.1(72~88)

2) Wrap the insulation material around the connecting portion.

① Overlap the connection pipe insulation material and the indoor unit pipe insulation material. Bind them together with vinyl tape so that there is no gap.

② Wrap the area which accommodates the rear piping housing section with vinyl tape.

③ When the piping is passed through a tray, duct work or a sleeve the insulation wrapping on the pipe is not required.

3) Close up a socket out of use with a brass cap.

① Align the center of the piping and sufficiently tighten the brass cap by hand.

② Tighten the brass cap with a wrench.

③ Wrap the area contacted with insulation.

⚠CAUTION

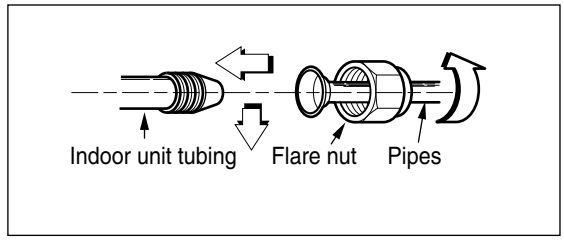
Over tightening of the flare nuts in the pipes may cause nuts to crack or the refrigerant to leak.

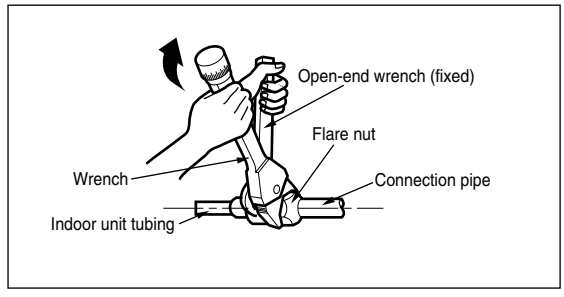
⚠CAUTION

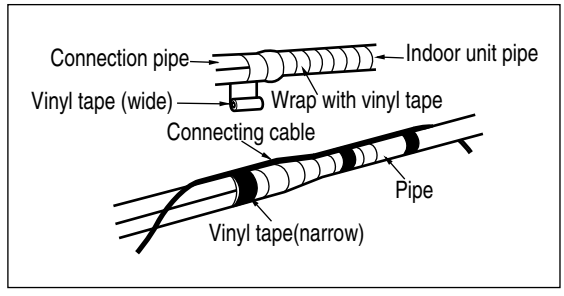
Improper piping and flaring can lead to the leakage of refrigerant

NOTE

For flaring work of the piping, follow the instructions in the installation manual to each unit.







⚠CAUTION

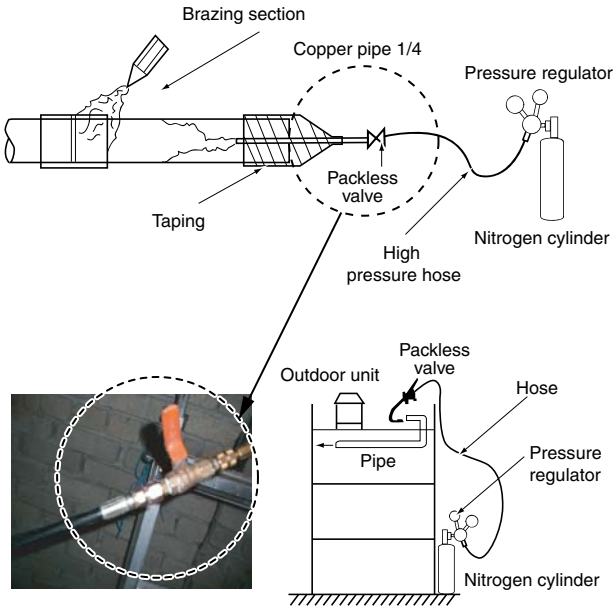
Never use the plastic cap during closing.

2.2.4 Brazing work

⚠CAUTION

Brazing of refrigerant piping :
The following precaution should be taken.
1. Do not use flux when brazing copper to copper refrigerant piping.
(Particularly for the HFC refrigerant piping)
Therefore, use the phosphor copper brazing filler metal (BCuP) which does not require flux.
(Flux has extremely harmful influence on refrigerant piping systems. For instance, if the chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will damage the refrigerant oil.)

1. Niorogen flushing method (During brazing)



⚠CAUTION

Nitrogen Brazing

a. This procedure is designed to prevent formation of oxidation film by filling piping with inert gas. Note that excessive gas pressure will generate pinholes at brazed points. (Nitrogen gas: Supply pressure 0.05~0.1kg/cm^{2}G)
b. When supplying inert gas, be sure to open one end of piping.

If brazing work is carried out without passing nitrogen gas through the pipes then it allows the formation of oxidation bubbles on the inside surface of the pipes.

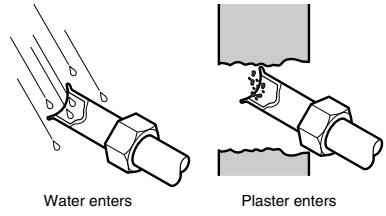
These oxidation bubbles are then carried along inside the pipes to cause damage to various members of the system such as valve or compressors and the system ceases to function properly.

In order to avoid this problem nitrogen is passed through the pipe while the soldering work is being carried out.

This operation work is known as nitrogen replacement.(Air is replaced by nitrogen)

This is standard work during all brazing works.

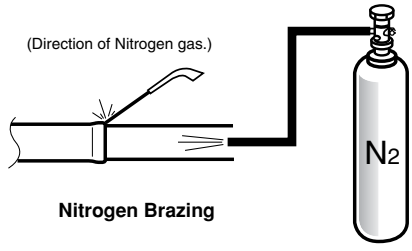
⚠CAUTION



Make sure to keep the connecting piping dry (away from water) , clean (away from dust) , and air tight (avoid refrigerant leakage)

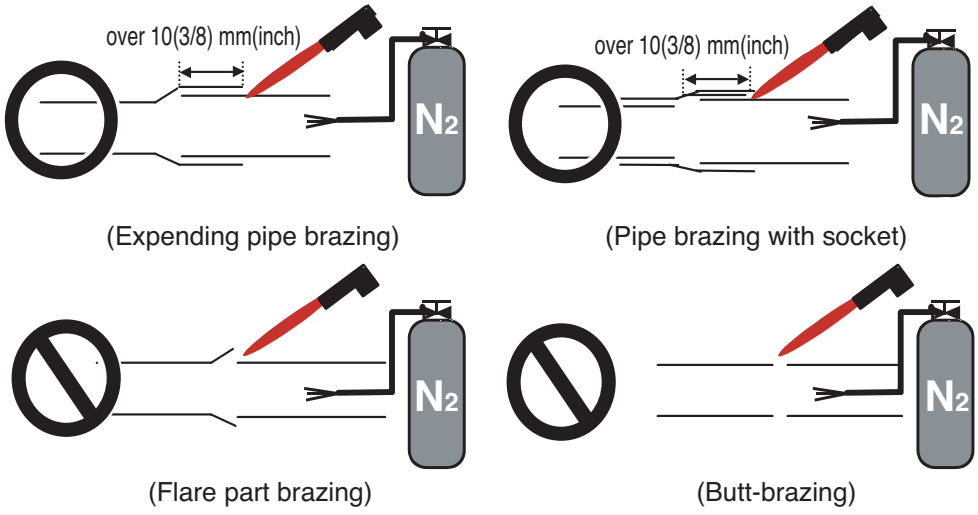
⚠CAUTION

Pipe bending
Annealed copper pipe with small diameter (Ø6.35(1/4) mm(inch) or Ø9.52(3/8) mm(inch)) can be easily bent manually. In this case, secure large R (radius) for the bend section and gradually bend pipe. If annealed copper pipe is large in diameter (Ø15.88(5/8) mm(inch) or over), bend pipe with bender. Use bender appropriate for the pipe diameter.



Nitrogen Brazing

Brazing work should be carried out either downwards or sideways.
An upward direction should be avoided wherever possible(to prevent leakage).



(Expending pipe brazing) (Pipe brazing with socket)

(Flare part brazing) (Butt-brazing)

Table 1: Correlation of nozzle tip and size of refrigeration piping

[Unit:mm(inch)]

Piping size	Nozzle tip No.							Brazing filler diameter Ø		
	# 200	# 225	# 250	# 315	# 400	# 450	# 500	1.6(1/16)	2.4(3/32)	3.2(1/8)
Ø6.35(1/4)										
Ø9.52(3/8)										
Ø12.7(1/2)										
Ø15.9(5/8)										
Ø19.1(3/4)										
Ø22.2(7/8)										
Ø25.4(1)										
Ø31.8(1-1/4)										
Ø38.1(1-1/2)										
Ø44.5(1-25/32)										

CAUTION

1. Generally expending pipe brazing is performed with pan-coil type copper pipe, and socket blazing is performed with straight copper pipe.
2. Do not perform flare part brazing or butt-brazing.
3. Brazing should be performed on welding table.
4. Any dust should enter in the pipe while brazing.
5. Distance of copper pipe support spacing is within 1(3.28)~2(6.56) m(ft)
6. The copper pipe should not be secured directly by metal brackets.

2.2.5 Refrigerant pipe flushing

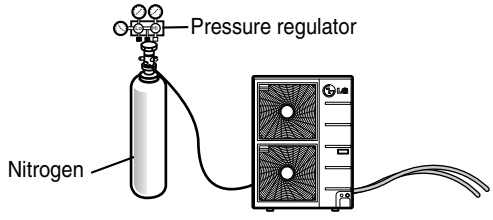
Flushing is a method of cleaning extraneous matter out of pipes using pressurized gas.

NOTE

Refrigerant pipe flushing of 3 major effects
1. Removal of oxidation bubbles formed inside copper pipes when “nitrogen replacement is insufficient” during soldering work
2. Removal of extraneous material and moisture from pipes when covering has been insufficient
3. Checks connections in pipes linking outdoor and indoor units (Both liquid and gas pipes)

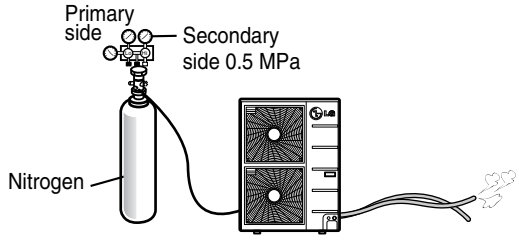
① Set pressure regulator on nitrogen cylinder.

② Connect the charge hose from pressure regulator to service port on the liquid pipe side of the outdoor unit before its connection to BD unit or indoor unit.



③ Open the main valve on the nitrogen cylinder and set the pressure regulator to 0.5MPa.

④ Ensure that nitrogen is flowing through the pipe properly.

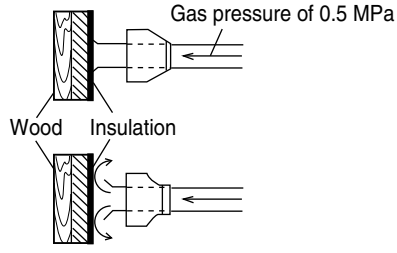


⑤ For flushing block the end of the pipe with wood insulation block.

⑥ When the pressure becomes great remove the block quickly.

⑦ Do step 6 & 7 repeatedly till cleanness is ensured.

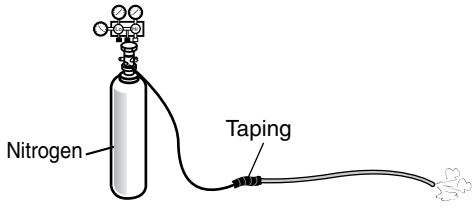
⑧ Connect the charge hose from pressure regulator to service port on the gas pipe side of outdoor unit before its connection to BD unit or indoor unit.



⑨ Flow the steps 3, 4, 5, 6, 7.

⑩ In case of BD unit system, before connecting to indoor units, each pipe should be flushed individually.

⑪ Flow the steps 3, 4, 5, 6, 7.



CAUTION

After welding the pipe, nitrogen flushing is strongly recommended.

2.3 Drain piping work

The purpose of drain piping is to prevent damage of products and ceiling materials by proper draining of dew condensation which is generated from the evaporator of indoor unit when the hot vapors come in contact with the evaporator.

1. Application

Pipes for draining water generated from indoor unit on cooling operation

Specification for drain piping

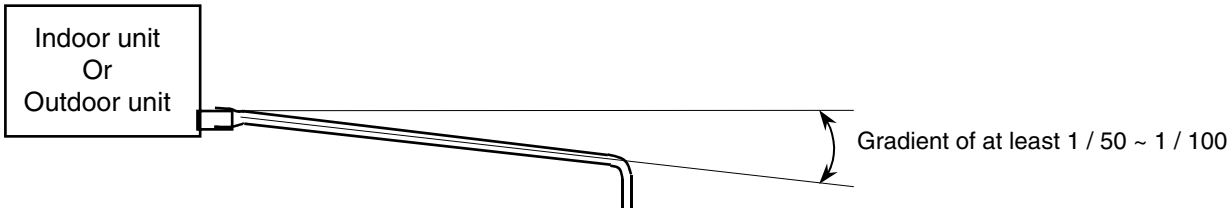
Type		Drain pipe diameter (External/ Internal)	Drain pump	Drain pump discharge head [mm(inch)]	Drain amount (at 10mm height)
					cm³/min (lpm)
Single A	Cassette 4 way	32(1-1/4) / 25(31/32) mm(inch)	Standard	700(27-9/16)	400 (0.4)

[Reference Table] Drain amount per capacity

kW	Air flow rate (CMH)	Drain amount (lpm)	Remark
2.04	8	0.128	Indoor temp. : 26°C DB Indoor humidity RH : 85% Outlet temp. :14°C DB Outlet temp. RH: 50%
2.33	8.5	0.137	
2.91	10.5	0.169	
4.36	11.5	0.185	
5.82	17	0.273	
7.28	19	0.305	
8.73	21	0.337	
10.2	23	0.369	
11.6	25	0.402	
14.6	34	0.546	

2.3.1 Drain pipe slope and support

- Slope gradient for drain should be (1/50~1/100mm) and PVC pipes should be used.
- Support hanger should be at 1(3.28)~1.5(4.92) (m(ft)) interval to prevent from loosing and dropping.
- Drain pipe insulation
  : The inside temperature of drain pipe is about 10°C. When high temperature and humidity air touches the surface of pipe, dew condensation occurs. To prevent that, drain pipe keeps warm using insulation with polyethylene 10mm thickness.



1. Application

Refrigerant pipe length contracts and expands on heating and cooling repeatedly. So supporting work is needed not to hinder each copper pipe connection part.

2. Supporting distance for common drain pipe

[Table]The interval of the supporting hanger for drainage pipe

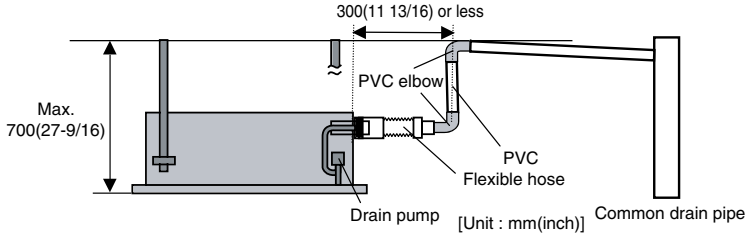
Pipe diameter [mm(inch)]	Ø20(25/32)~40(1-9/16)	Ø40(1-9/16)~50(1-31/32)	Ø65(2-9/16)~125(4-15/16)
Max. interval[m(ft)]	Below 1.0(3.28)	Below 1.2(3.94)	Below 1.5(4.92)

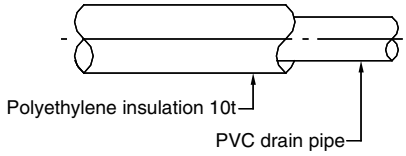
3. Anchor bolt supporting work

Anchor bolt supporting work should be used for supporting a heavy indoor unit to ceiling.
Clamp hanger supporting work is for hanging refrigerant pipe, drain pipe and cables.
It can prevent vibrating noise from passing through pipe.
We recommend set anchor bolt for supporting indoor unit and strong anchor bolt for supporting pipes and cables

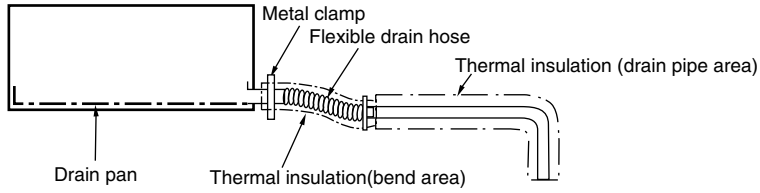
2.3.2 Drain pipe trap

Models with drain pump:





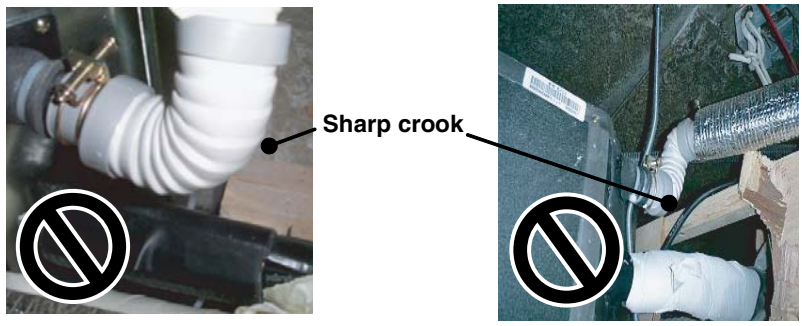
Models without drain pump



2.3.3 Caution for drain piping work

Notice on drain working

1. Drain pipe should be insulated all connected joints and ends.



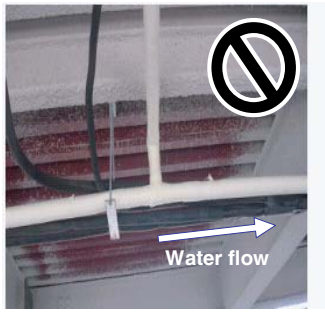
CAUTION

Flexible tube should be connected with clamp concentrically.

If not, water will leak from the connection.

<clamp connection>

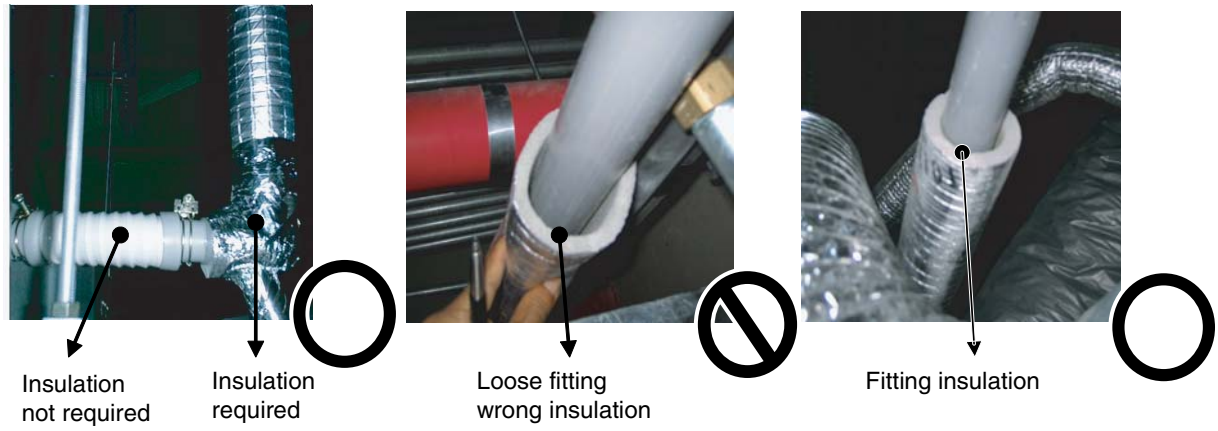
2. No reverse slope for drain connection



<Reverse slope>

Drain pipe insulation

- Drain pipe should be insulated all connected joints and ends.



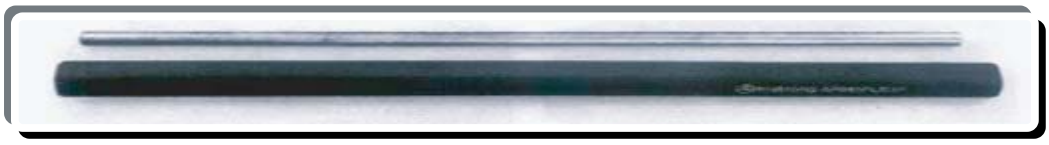
- Do not use the loose fitting insulation.

Drain water leakage test

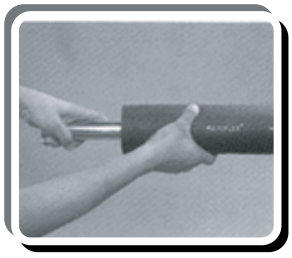
- Water leakage test should be performed 24 hours later after drain work finishing.
- In the test, only water should be used. Other liquids are unacceptable.

2.4 Insulation work

2.4.1 Insulation



1) Operational steps



① EPDM length should be more longer than pipe length.
Do not extend EPDM by force.

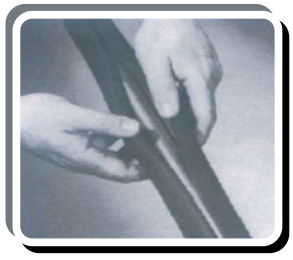
② Put the pipe in EPDM insulation carefully so that the pipe will not get damaged with EPDM.

③ Bond on both side of cut surfaces of move sure to use the correct type of bond for EPDM cut surface attaching.

④ Dry it until it becomes thick, sticky and does not get detached.

2) Bending vertical side of insulation

① Use the original uncut insulation material.



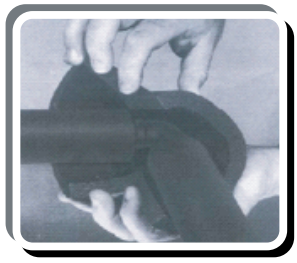
② Only in specialcase is the vertical cutting of the insulation allowed.

③ Bond both sides of the surface of EPDM and press them together for long lasting bonding.

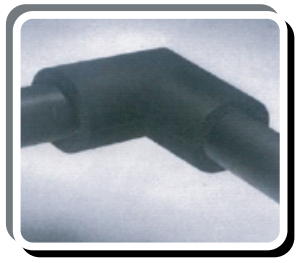
④ Dry it until it becomes thick and sticky.

3) ' L' Fitting connection part insulation

① All of the fitting connecting parts should be insulated.
Bring face to face the each end of EPDM on fitting connection part.



② Make fitting cover to fit the EPDM insulation fitting cover should be overlapped with insulation min 1 inch (2.5cm).



③ Bond the both cutting sides of fitting cover.

2.4.2 Forming the piping

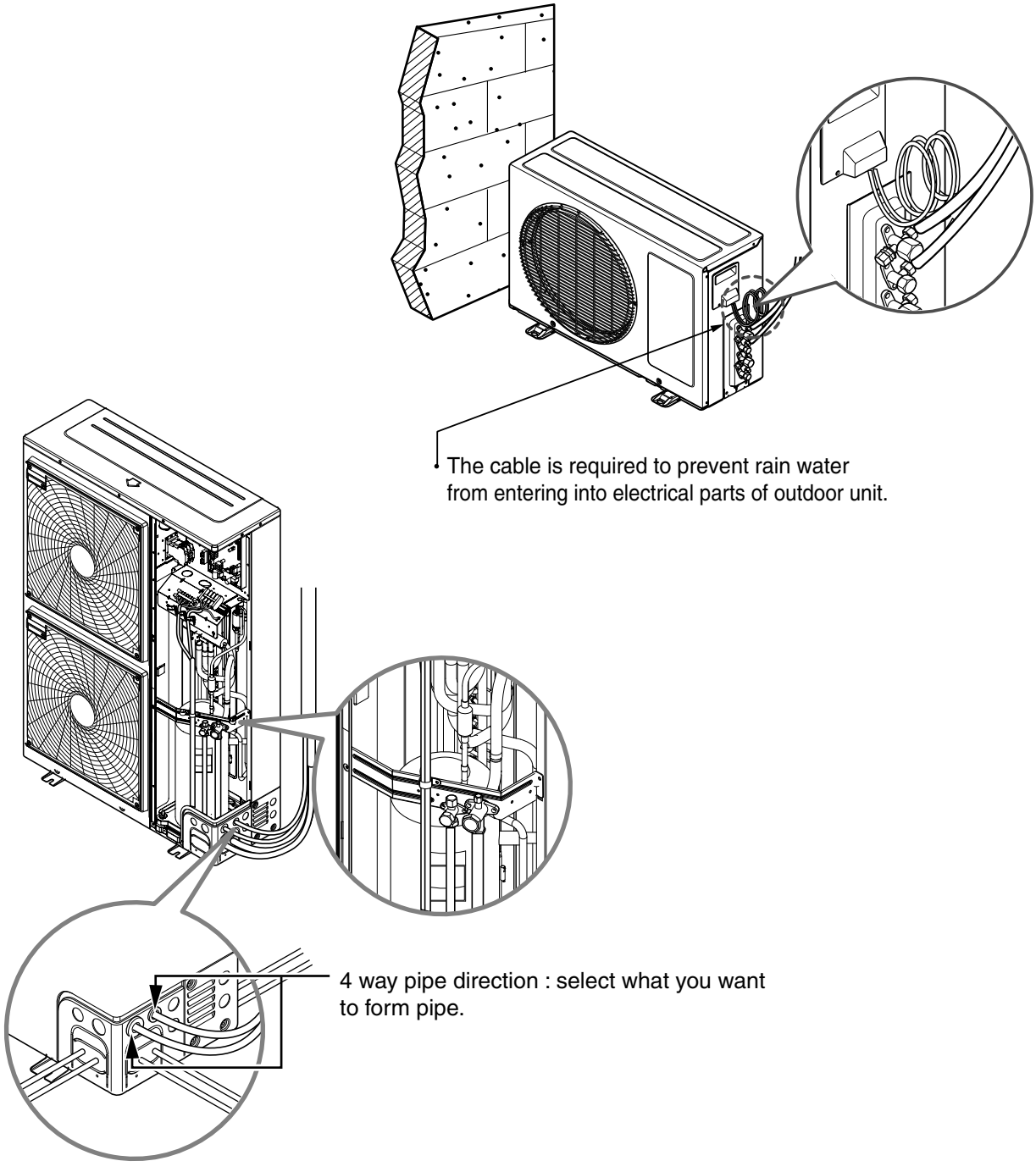
1) Form the piping by wrapping the connecting portion of the indoor unit with insulation material and secure it with two kinds of vinyl tape.

• If you want to connect an additional drain hose, the end of the drain outlet should be routed above the ground. Secure the drain hose appropriately.

2) In cases where the outdoor unit is installed below the indoor unit perform the following.

① Tape the piping, drain hose and transmission cable from down to up.

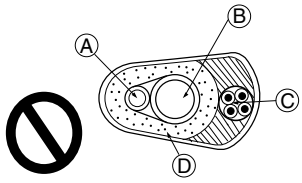
② Secure the tapped piping along the exterior wall using saddle or equivalent.

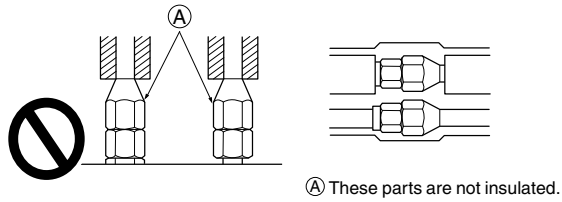


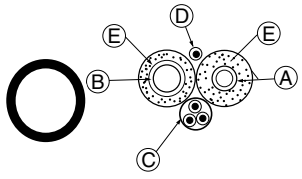
2.4.3 Essential points of thermal insulation

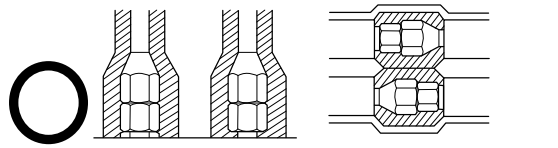
1) Thermal insulation of refrigerant piping

Be sure to give insulation work to refrigerant piping by covering liquid pipe and gas pipe separately with enough thickness heat-resistant insulation materials, so that no gap is observed in the joint between indoor unit and insulating material, and insulating materials themselves. When insulation work is insufficient, there is a possibility of condensation drip, etc. pay special attention to insulation work to ceiling plenum.

<table>
<tr>
<td>Wrong method</td>
<td>• Do not insulate gas or low pressure pipe and liquid or high pressure pipe together.
 

Ⓐ Liquid pipe
Ⓑ Gas pipe
Ⓒ Power cable
Ⓓ Insulation</td>
<td>• Be sure to fully insulate connecting portion.
 

Ⓐ These parts are not insulated.</td>
</tr>
<tr>
<td>Correct method</td>
<td> 

Ⓐ Liquid pipe
Ⓑ Gas pipe
Ⓒ Power cable
Ⓓ Transmission cable
Ⓔ Insulation</td>
<td>  </td>
</tr>
</table>

2) Caution during insulation work

- To avoid electrical noise, the power line and transmission line should be separated from each other.
- In case the cables are installed in the conduit, a finishing tape is not required.
- Defect and insufficient insulation can cause condensation drops.
- Binding the insulation too tight may result in dew drops.
- Be sure not to tie rap the insulation but put special taping or the clamp at the connecting portion.
- The insulation overlapping part at the piping connection must be a distance from the flaring part at the pipe connection.

3) Insulation tube thickness

① Thickness decision of insulation tube
- Insulation material: EPDM or polyethylene foam
- Thermal conductivity 0.035 kcal~0.040kcal/mh°C
- Heat resistance=85°C(Cooling only) or more
  100°C(Heat pump) or over

② The thickness of the thermal insulation material must be determined in the light of the pipe sizes.

Pipe size	Thickness of insulation material
6.35(1/4) ~ 25.4(1) mm(inch)	10(3/8) mm(inch) or more
25.4(1) mm(inch) ~	15(19/32) mm(inch)

③ It will be necessary to increase the thickness of insulation in the above table when conditions are hot and humid.

④ Where a customer supplies his own specifications then these must be adhered to.

⚠CAUTION

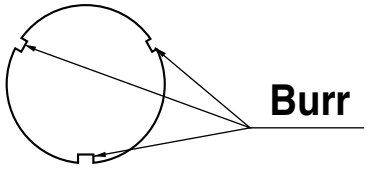
Outdoor temperature and hummidity around the cooling piping might exceed 30°C and RH80%, reinforce the insulation on the cooling piping (at least 20mm thick)

2.5 Electrical work

2.5.1 Precautions

⚠CAUTION

When knocking out knock holes
- To punch a knock hole, hit on it with a hammer.
- After knocking out the holes, we recommend you paint the edges and areas around the edges using paint to prevent rusting.
- When passing electrical wiring through the knock holes, remove any burrs from the knock holes and wrap the wiring with protective tape to prevent damage.



If there are any possibilities that small animals or insects enter the system through the knock holes, plug the holes with packing materials (to be prepared onsite).

Use a conduit for the cable
- Outside the unit, make sure the thin signal cable (i.e. for the remote control, between units, etc.) and the thick electric wiring do not pass near each other and use of the shield signal cable is recommended.
  Otherwise, the outdoor unit may be affected by electrical noise (external noise), and malfunction or fail.
- Secure the wiring with the accessory clamps so that it does not touch the piping.
- Make sure the wiring and the electric parts box cover do not stick up above the structure, and close the cover firmly.

⚠CAUTION

Do not operate the air conditioner until the refrigerant piping work is completed.
(Operating the air conditioner before the refrigerant piping work is completed may damage the compressor.)
- Install an earth leakage circuit breaker.
  Since this is a inverter air conditioner. In order to prevent malfunction of the earth leakage breaker itself, use a breaker resistant to higher harmonics.
- After finishing the electric work, confirm that each electric part and terminal inside the electric parts box is connected securely.

NOTE

- Only professional electricians having sufficient knowledge should perform the electrical wiring work.
  Perform the electrical wiring work in accordance with the electrical wiring diagram.
  Make sure to set OFF the branch switch and over current breaker before starting the work.
- Install an earth leakage breaker.
- Perform grounding to the indoor units and outdoor units.
  - Do not connect the ground wire to gas pipes, sewage pipes, lightning rods telephone ground wires.
  - Gas pipes ···· Can explode or catch fire if gas leaks.
  - Sewage pipes···· Provides no grounding effect if hard plastic pipes are used.
  - Telephone ground wires and lightening rods ···· dangerous when struck by lightening due to abnormal rise in the ele trical potential in the ground.

- Use only copper wires.
- Make sure to shut down the power before starting the electric wiring work.
  Do not set ON any switch until the work is completed.
- The outdoor unit has an inverter compresser which generates noise and charges the outer casing with the leakag current.
  The outdoor unit should be grounded so that the effect of the generated noise on othe equipment can be reduced, and that the outer casing can be discharged.
- Never install a phase advancing capacitor for power factor improvement.
  (Even if it is installed, the power factor is not improved. And if it is installed, the outdoor unit is abnormally overheated.)
- Use specified electric wires in the wiring, and connect them securely.
  Fix them in such a way that external force is not applied at the terminals
  (transmission wiring in the local field and ground terminal).
- Never push excessive electric wires into the units.
- Protect electric wires with conduit tubes or other proper tubes so that they will not be damaged by edges of knock holes.
- Do not use multi conductor cable which have more than 5 wires in one core.

2.5.2 Control wiring / power supply

1) All wiring must comply with LOCAL REGULATIONS.

2) Select a power source that is capable of supplying the current as required by the air conditioner.

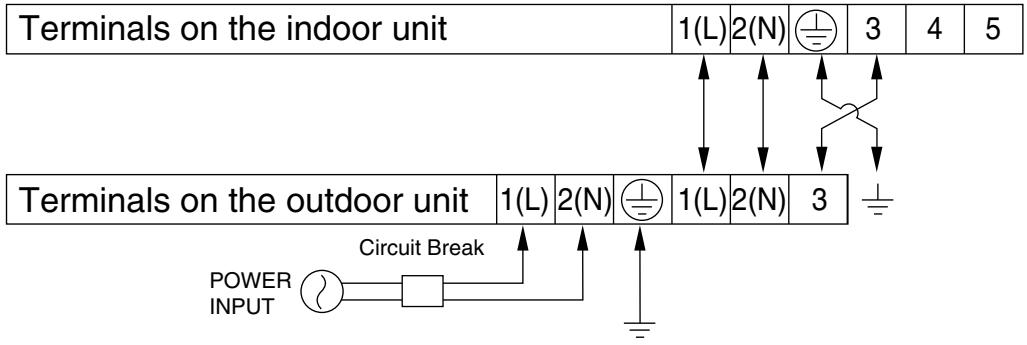
3) Feed the power source to the unit via a distribution switch board designed for this purpose.

4) The terminal screws inside the control box may be loose due to vibration during transport.
   Check the screws for loose connection.
   (Running the air conditioner with loose connection can overload and damage electrical components.)

5) Always ground the air conditioner with a grounding wire and connector to meet the LOCAL REGULATION.

DC inverter Single A

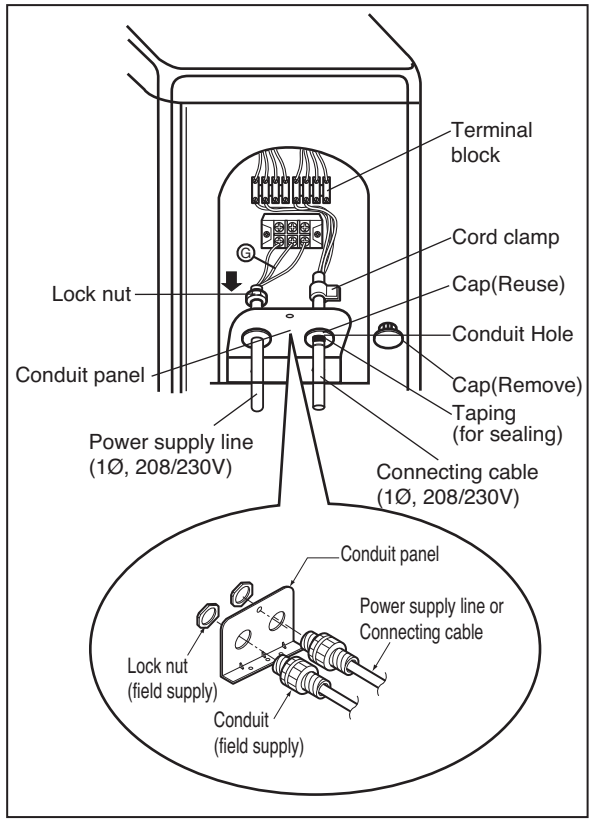
1Phase model



Connecting the cable to Outdoor Unit

Models : AUUW243E[LUU246HV]

1) Remove two-caps on the conduit panel. (for low voltage line)
2) Pull out connection cable through conduit.
3) After conduit to the panel, fix nut to the opposite side of panel.
4) Pass the connection cabel through the hole.
5) Properly connect the cable on the terminal block.
6) Fix the connection cable with cord clamp provided on the unit not to have strain at the terminal when the connection cable is pulled outside up to a 35 pound weight



WARNING

Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, be sure all wiring is tightly connected.

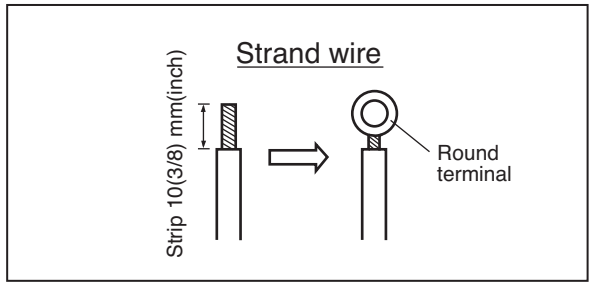
When connecting each power wire to the corresponding terminal, follow instructions "How to connect wiring to the terminals" and fasten the wire tightly with the fixing screw of the terminal plate.

How to connect wiring to the terminals

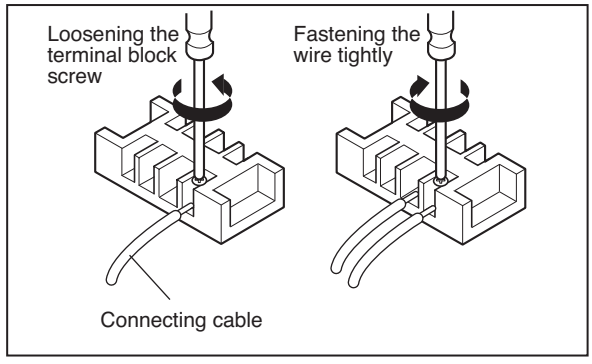
■ For strand wiring

1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to expose the strand wiring about 10(3/8) mm(inch).
2) Using a screwdriver, remove the terminal screw(s) on the terminal plate.
3) Using a round terminal fastener or pliers, securely clamp each stripped wire end with a round terminal.
4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

Power supply cable



Connecting Cable

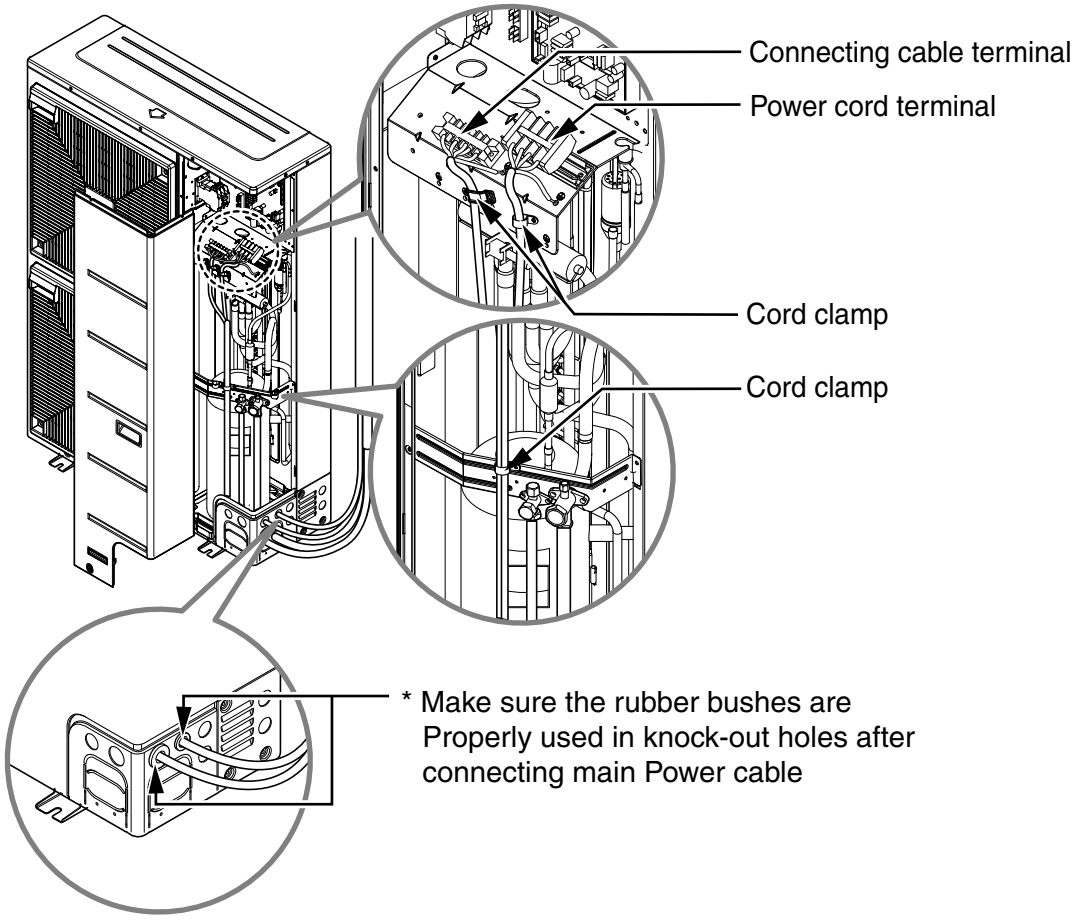


Connecting the cable to Outdoor Unit

Models : AUUW423E[LUU426HV]

- Remove the side panel for wiring connection.
- Use the cord clamp to fix the cord.
- Earthing work
  - Case 1 :Terminal block of Outdoor Unit have ⏚ mark.
- Connect the cable of diameter 1.6mm² or more to the earthing terminal provided in the control box and do earthing.
  - Case 2 :Terminal block of Outdoor Unit don't have ⏚ mark.
- Connect the cable of diameter 1.6mm² or more, to the panel of control box, marked as ⏚ and fasten with earth screw.

❊ Please check !!



⚠CAUTION

- The circuit diagram is not subject to change without notice.
- Be sure to connect wires according to the wiring diagram.
- Connect the wires firmly, so that not to be pulled out easily.
- Connect the wires according to color codes by referring the wiring diagram.

2.6 Leakage test

2.6.1 Leakage test

Air and moisture remaining in the refrigerant system have undesirable effects as indicated below.

① Pressure in the system rises.
② Operating current rises.
③ Cooling (or heating) efficiency drops.
④ Moisture in the refrigerant circuit may freeze and block capillary tubing.
⑤ Water may lead to corrosion of parts in the refrigeration system. Therefore, the indoor/outdoor unit and connecting tube must be checked for leak tight, and vacuumed to remove incondensable gas and moisture in the system.

Checking method

1) Preparation

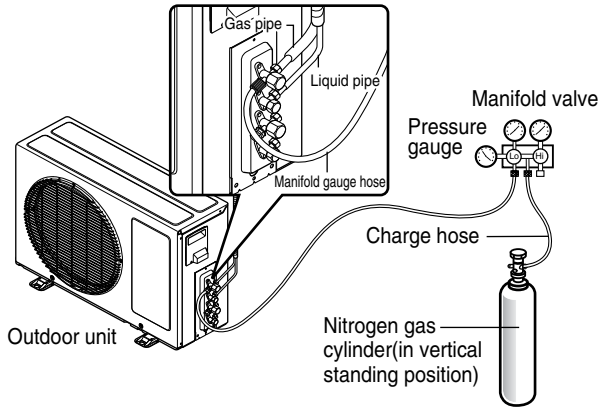
• Check that each pipe (both liquid and gas side pipes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid side on the outdoor unit. Check that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.

2) Leakage test

• Connect the manifold valve (with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.

⚠CAUTION

Be sure to use a manifold valve for leakage test. If it is not available, use a stop valve for this purpose. The "Hi" knob of the manifold valve must always be kept close.



⚠CAUTION

To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than its bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

1. Do a leakage test of all joints of the Tubing (both indoor and outdoor) and both gas and liquid side service valves. Bubbles indicate a leak. Be sure to wipe off the soap with a clean cloth.
2. After the system is found to be free of leaks, relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen cylinder. When the system pressure is reduced to normal, disconnect the hose from the cylinder.

2.6.2 Essential points of testing

The key to successful testing is strict adherence to the following procedure:

a) The liquid and gas piping in each refrigerant system should be pressurized in turn in accordance with the following steps. (Nitrogen gas must be used.)

Step 1: increase pressure to 0.3MPa for 3 minutes or more
Step 1: increase pressure to 1.5MPa for 3 minutes or more
— Indicates existence of major leaks

Step 3: increase pressure to 3.8MPa for approxmate 24 hours
— Indicates existence of major leaks

Increasing the system pressure to 3.8MPa does not guarantee the identification of minor leaks if pressure is maintained for only a short time. It is therefore recommended that the system remain pressurized in accordance with Step 3 above for at least 24 hours.

NOTE

Piping should not be pressured more than 3.8MPa.

b) Check for pressure drop

If there is no drop in pressure then the test is deemed a success.

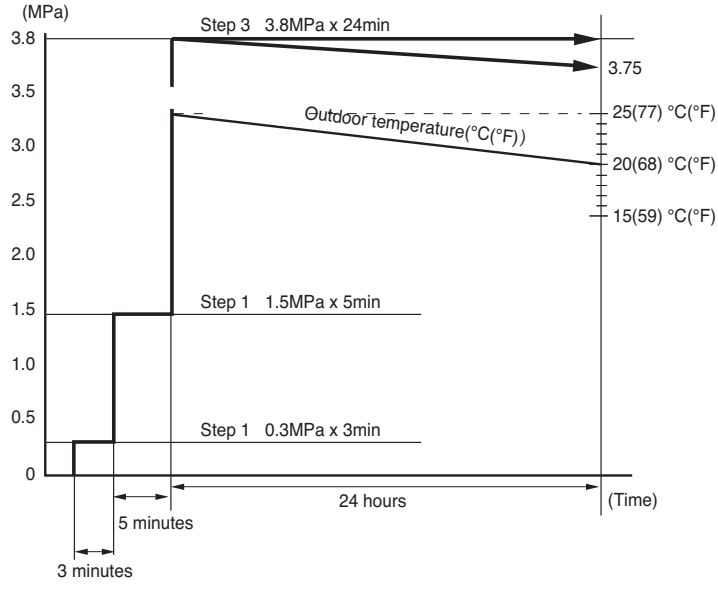
If the pressure drops then the leak must be located. See following page.

However, if there is a change in the ambient temperature between the pressurizing stage and the time when you check for a drop in pressure then you will have to adjust your calculations accordingly since a change of 1°C can account for a pressure change of approximately 0.01MPa.

Compensating adjustment value:
(temperature at time of pressurizing – temperature at time of checking) × 0.01

Example:

During of pressurizing: 3.8MPa 25(77) °C(°F)
24 hours later: 3.75MPa 20(68) °C(°F)
Although the gauge pressure is dropped from 3.8MPa to 3.75MPa, it can be safely assumed that there is no leakage because the gauge pressure can also drop due to the change in outdoor temperature.



2.6.3 Checking for leakage

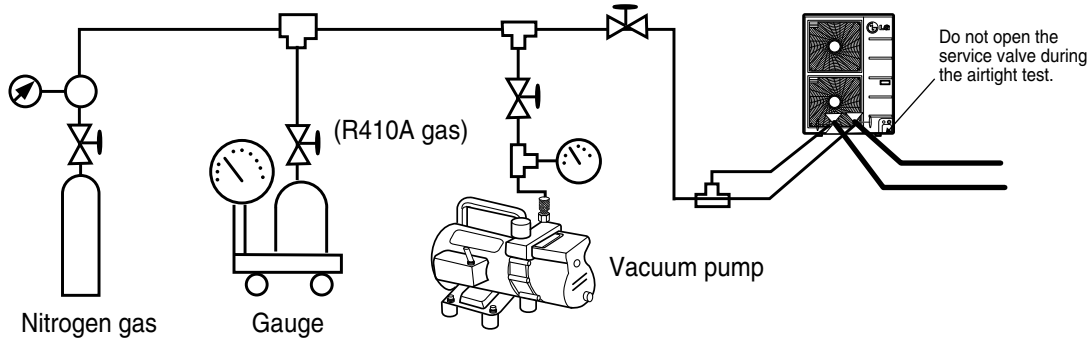
[Check 1] (Where pressure falls while carrying out Steps 1 to 3 described on previous page)

- ▶ Check by measure gage.....gas detector.
- ▶ Check by ear.....Listen for the sound of a major leakage.
- ▶ Check by hand.....Check for leak by feeling around jointed sections with hand.
- ▶ Bubble check .....Bubbles will reveal the presence of a leakage.

[Check 2] (When searching for a minor leak or when there has been a fall in pressure while the system has been fully pressurized but the source of the leak cannot be traced.)

1. Release the nitrogen until the pressure reaches 0.3MPa.
2. Increase pressure to 1.5MPa using gaseous refrigerant(R410).
3. Search for the source of the leakage using a leackage detector such as a halide torch or a propane or electrronic detector.
4. If the source of the leakage still cannot be traced then repressurize with nitrogen up to 3.8MPa and check again. (The pressure must not be increased to more than 3.8MPa.)

(System sample)



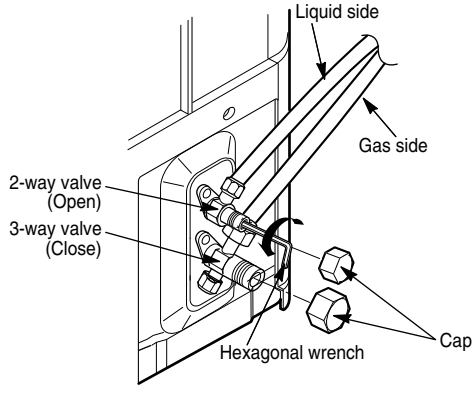
Important points

1. Where the lengths of piping involved are particularly long then the air tight test should be carried out block by block.
   1) Indoor side
   2) Indoor side + vertical pipes
   3) Indoor side + vertical pipes + outdoor side

⚠CAUTION

Soap water method

1. Remove the caps from the 2-way and 3-way valves.
2. Remove the service-port cap from the 3-way valve.
3. To open the 2-way valve turn the valve stem counterclockwise approximately 90°, wait for about 2~3 sec, and close it.
4. Apply a soap water or a liquid neutral detergent on the indoor unit connection or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping.
5. If bubbles appear then those points have leakage.



2.7 Vacuum drying works

2.7.1 What is Vacuum drying?

Vacuum drying is : The use of a vacuum pump to vaporize(gasify) the moisture (liquid) inside the pipe and expel it leaving the pipes completely dry inside.
At 1 atm(760mmHg) the boiling point (evaporating temperature) of water is 100°C but if a vacuum is created inside the pipes using a vacuum pump then the boiling point is rapidly reduced as the degree of the vacuum is increased.
If the boiling point is reduced to a level below that of the ambient temperature then the moisture in the pipes will evaporate.

Example

When outside temperature is 11.7°C as shown in the table on the right , the degree of vacuum must be lowered below -750mmHg

Boilng point of water(°C(°F))	Gauge pressure		
	mmHg	Pa	Torr
40 (104)	-705	7333	55
30 (86)	-724	4800	36
26.7(80.1)	-735	3333	25
24.4(75.9)	-738	3066	22
22.2(72)	-740	2666	20
20.6(69.1)	-742	2400	18
17.8(60)	-745	2000	15
15.0(59)	-747	1733	13
11.7(53.1)	-750	1333	10
7.2(45.1)	-752	1066	8
0(32)	-755	667	5

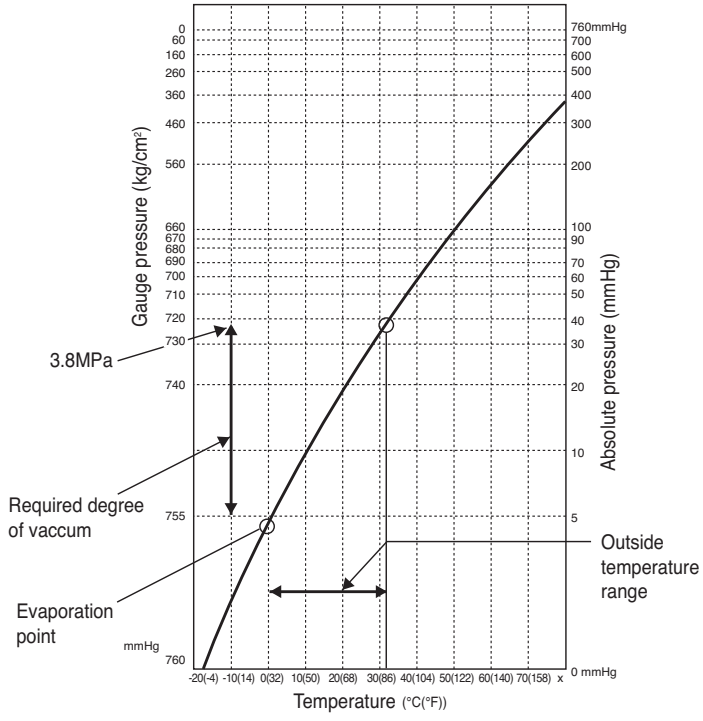
The evacuation of air conditioner piping provides the following effects.

1. Vaccum drying
2. Removes air and nitrogen(used in air-tightness test) from the inside of pipes.

Therefore , it is necessary to ensure that both purposes have been achieved in the vacuum drying operation.

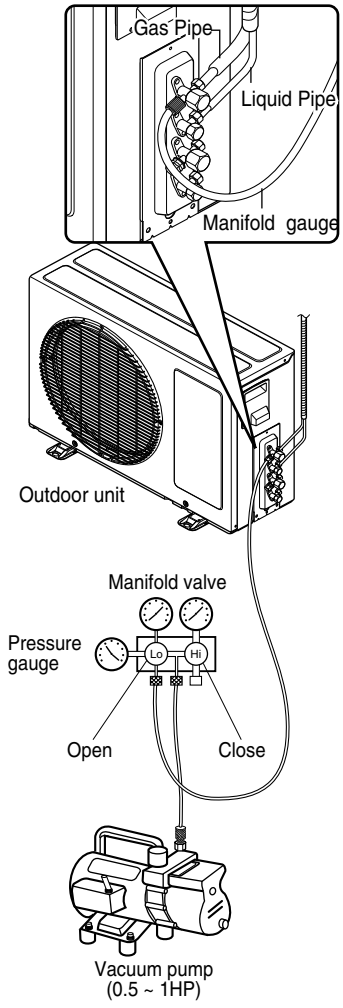
NOTE

Key point: Maintain a vacuum level of -755mmHg



2.7.2 Evacuation

1. Connect the manifold hose end described in the preceding steps to the vacuum pump to evacuate the tubing and indoor unit. Confirm the "Lo" knob of the manifold valve is open. Then, run the vacuum pump. The operation time for evacuation varies with tubing length and capacity of the pump. The following table shows the time required for evacuation.
2. When the desired vacuum is reached, close the "Lo" knob of the manifold valve and stop the vacuum pump.



⚠CAUTION

Finishing the job

1. With a service valve wrench, turn the valve stem of liquid side valve counter-clockwise to fully open the valve.
2. Turn the valve stem of gas side valve counter-clockwise to fully open the valve.
3. Loose the charge hose connected to the gas side service port slightly to release the pressure, then remove the hose.
4. Replace the flare nut and fasten the flare nut securely with an adjustable wrench. This process is very important to prevent leakage from the system.
5. Replace the valve caps at both gas and liquid side service valves and fasten them tight. This completes air purging with a vacuum pump. The air conditioner is now ready for test run.

2.7.3 Choosing a vacuum pump

The necessity for counter flow prevention

After the vacuum process of the refrigerant cycle, the inside of the hose will be vacuumed after stopping the vacuum pump, the oil of vacuumpump may flow back. Moreover, if the vacuum pump stops during the operation for some reason. Therefore, in order to prevent the counter flow from the vacuum pump, a check valve is reguired.

1) Vacuum pump performance

The 2 most important things for determining vacuum pump performance are as follows:

(1) Exhaust velocity

(2) Degree of vacuum

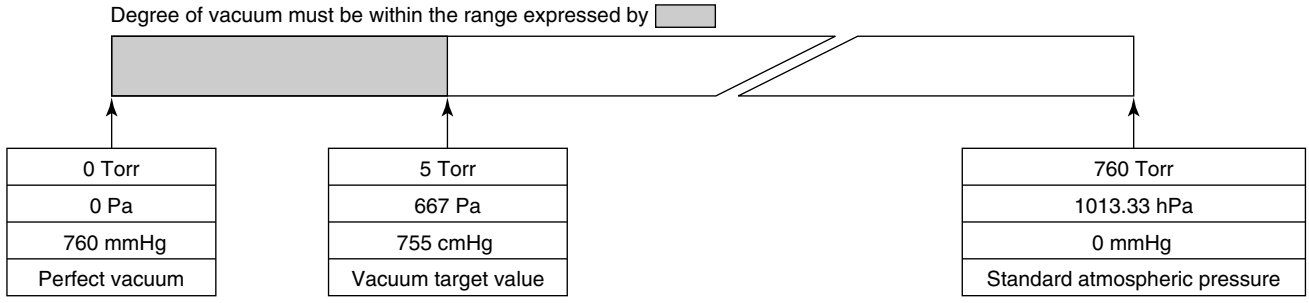
(1) Exhaust velocity

Exhaust volume is usually expressed as l/min or m^3/hr. The larger the number, the faster the vacuum is achieved. Generally speaking, the faster the exhaust velocity, the larger and heavier the vacuum pump itself is. Commercially available vacuum pumps (exhaust velocity of 20 - 30 l/min) usually take an extremely long time to achieve vacuum. (We recommend a vacuum pump of approx. 60 - 100 l/min.)

(2) Degree of vacuum

Ultimate vacuum varies largely according to use of the vacuum pump. Vacuum pumps used for vacuum forming cannot be used for vacuum drying. (A vacuum pump with a high degree of vacuum is required.)
When selecting a vacuum, you should select one which is capable of achieving 0.2 Torr of ultimate vacuum.
Degree of vacuum is expressed in Torr, micron, mmHg, and Pascal (Pa). The units correlate as follows:

	Unit	Standard atmospheric pressure	Perfect vacuum
Gauge Pressure	kg/cm^2	0	-1.033
Absolute Pressure	kg/cm^2abs	1.033	0
Torr	Torr	760	0
Micron	Micron	760000	0
mmHg	mmHg	0	760
Pa	Pa	1013.33	0



2) Vacuum pump maintenance

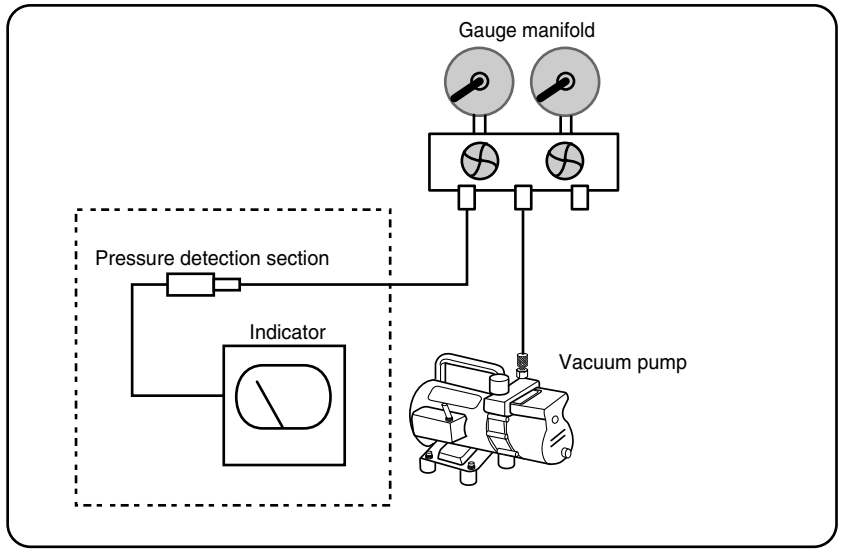
Because of their nature, most vacuum pumps contain large amounts of oil which lubricates bearings, etc., and functions to enhance airtightness of pistons. When using a vacuum pump to discharge air from refrigerant piping, moisture in the air tends to get mixed in with the oil. You must therefore change oil periodically and make sure the proper oil level is maintained. (Perform periodic inspections in accordance with the operating instructions.)

3) Degree of vacuum measurement

An extremely accurate vacuum gauge is required to test degree of vacuum. You cannot accurately measure degree of vacuum with the compound gauge on the gauge manifold. A Pirani vacuum gauge is required to measure degree of vacuum accurately. Because Pirani gauges are very sensitive and require extreme care when using, they are not very suitable for use in the field. You should therefore use the Pirani gauge to calibrate the attached vacuum gauge on the gauge manifold and the degree of vacuum of the vacuum pump.

4) Calibration method

1. Connect a Pirani vacuum gauge and the gauge manifold vacuum gauge (760 mmHg) to the vacuum pump at the same time, and run the pump for about 3 minutes.
2. Make sure the reading of the Pirani vacuum gauge is 5 Torr (667 Pa) or less. The reading of conventional vacuum pumps lowers to about 0.2 Torr.
   If the reading is not 5 Torr or less, check the vacuum pump oil. (Oil is low in many cases.)
3. Check the attached gauge on the gauge manifold. Adjust the gauge if the reading is not exactly correct.
4. Adjust the gauge manifold valve so that the Pirani vacuum gauge reads 5 Torr.
5. Mark the position indicated by the gauge manifold gauge with an oil based ink pen.
6. Use the mark of the gauge manifold as a target when vacuuming in the field.



(Reference) Types of vacuum pump with respect to maximum degree of vacuum

Type	Maximum degree of vacuum	Use	
	Expulsion capacity	Vacuum drying	Air expulsion
Oil rotary (Oil using)	0.02 mmHg 100 l/min	Suitable	Suitable
Oilless rotary (No need of oil)	10 mmHg 50 l/min	Unsuitable	Suitable
	0.02 mmHg 40 l/min	Suitable	Suitable ← Many handy pumps fall into this category

2.7.4 Vacuum drying procedure

There are two vacuum drying methods and the appropriate one should always be chosen to confirm with individual local conditions.
[Normal vacuum drying].....The standard method

[Operational steps]

1. Vacuum drying (1st time): Connect a manifold gauge to the service port of the liquid or gas pipe and operate the vacuum pump for at least 2 hours.
   (The degree of vacuum produced should be in excess of 5 Torr)
   If after 2 hours the vacuum produced has not exceeded 5 Torr then either there is moisture in the pipe or there is a leak.
   Operate the vacuum pump for further one more hour.
   If, even after 3 hours, the vacuum has not reached 5 Torr then check the system for a leak.

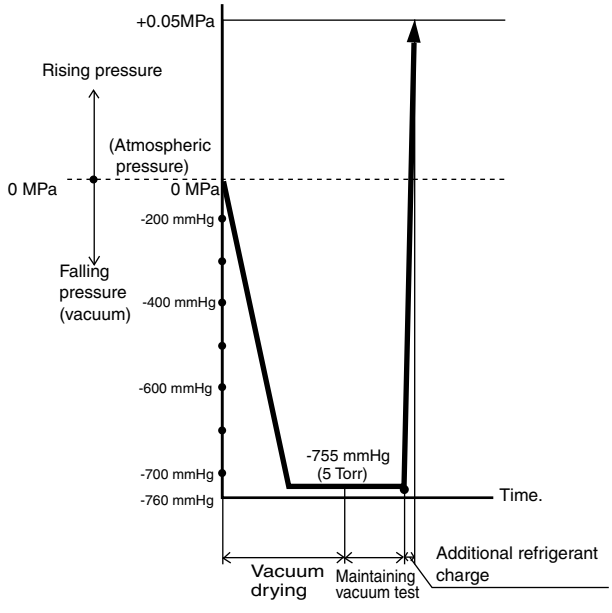
2. Carry out vacuum test.
   Produce a vacuum in excess of 5 Torr and do not release it for an hour or more. Check the vacuum gauge to make sure that it has not risen. (If the gauge rise then there is still moisture in the pipe or there is a leak somewhere.)

3. Additional charge of refrigerant.
   Connect the charging cylinder to the liquid pipe service port and charge with the required amount of refrigerant.

4. Open stop valve to the full.
   Open the stop valve on the liquid and the gas pipes to the full.

NOTE

Vacuums should be produced in both the liquid and the gas pipes.
(Because there are a large number of functional components in the indoor unit which cut off the vacuum mid-way through)



2.8 Additional charge of refrigerant

2.8.1 Refrigerant charging instructions

Refrigerant charging

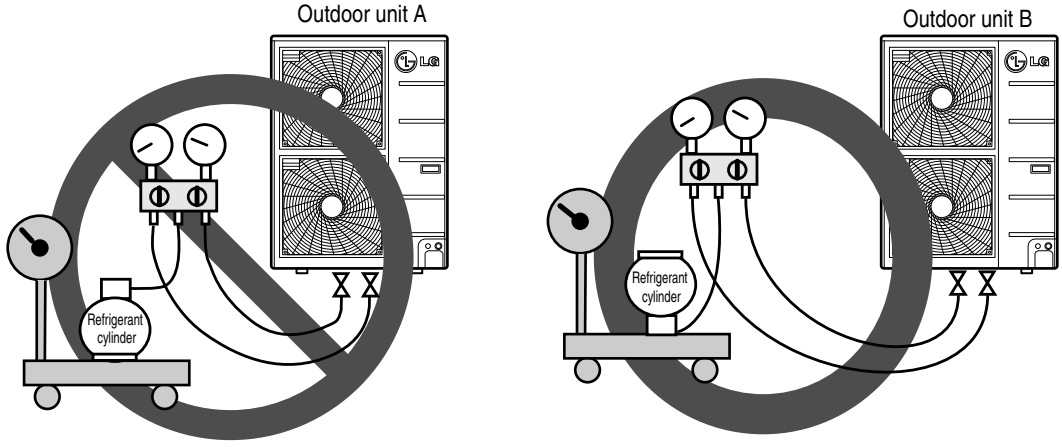
1. The results of all calculations must be recorded. (make a list)
2. The refrigerant will need to be additionally charged when the distance between the outdoor Unit and the most distant indoor unit is more than length (refer to section 8 outdoor unit installation condition)
3. The additional charging operation should be carried out by input of liquid into the liquid pipes from a charging cylinder following completion of the Vacuum drying operation.
4. When the additional charging operation cannot be satisfactorily completed , use the action of the compressor to complete the additional charging during the test run.

R-410A is a non-azeotrope refrigerants. Therefore , these refrigerants must be charged in the Liquid state.

When charging the refrigerant into equipment from the cylinder , turn the refrigerant cylinder upside down.

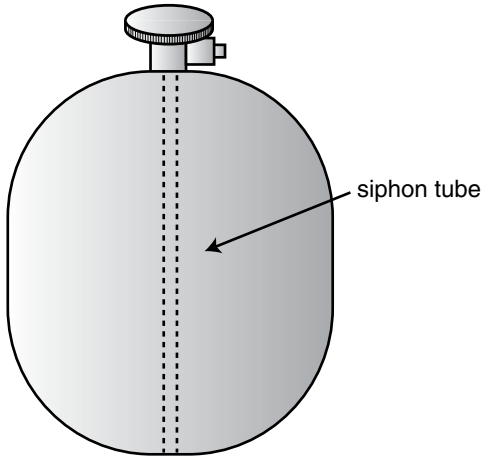
NOTE

Make sure that the refrigerant (liquid) is taken out from the bottom part of the refrigerant cylinder.
Do not take out the refrigerant (gas) at the upper of the refrigerant cylinder for charging.



CAUTION

- Since some refrigerant cylinders differ in the internal mechanism, it is necessary to examine the cylinder carefully. (Some cylinders have a siphon tube to eliminate the need for turning it upside down)



2.9 Trial test run operation

2.9.1 Test run procedure

Check the following before turning power on

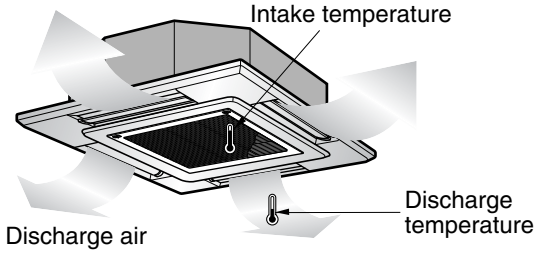
- Wrong power wiring , loosed screws
- Wrong control transmission wiring , loose screws
- Piping size , presence of thermal insulation
- Measurement of main power circuit insulation → Use a mega-tester
- Addition or refrigerant if required → Be sure to record the additional quantity of refrigerant
- Fully open respective stop valves on liquid, gas
- Turn on outdoor unit power

2.9.2 Evaluation performance

Evaluation of the performance

Operate unit for 15~20 minutes, then check the system refrigerant charge:

1. Measure the pressure of the gas side service valve.
2. Measure the temperature of the intake and discharge of air.
3. Ensure the difference between the intake temperature and the discharge is more than 8°C



4. For reference, the gas side pressure of optimum condition is as below. (Cooling)

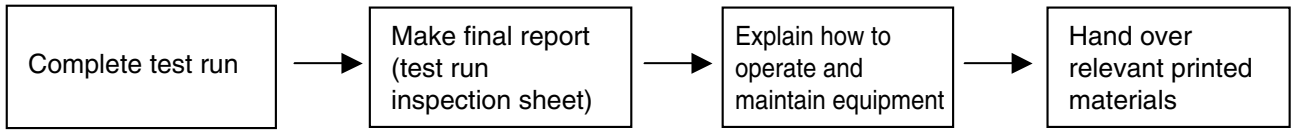
Refrigerant	Outside ambient Temp.	The pressure of the gas side service valve.
R410A	35°C (95°F)	8.0~10.0kg/cm²G

NOTE

: If the actual pressure is higher than shown, the system is most likely overcharged so extra refrigerant should be removed.
If the actual pressure is lower than shown, the system is most likely undercharged so extra refrigerant should be added.
The air conditioner is now ready for use.

2.9.3 Transfer to customer with explanation

1. Operational step



a) The measurements taken during the test run should be recorded and kept on a test run inspection sheet.

b) Do not forget to record the length of the refrigerant piping and the refrigerant additional charging volume on the plate on the back of the outdoor unit external notice board, as this information will be required for servicing the system.

c) Explain to the customer how to operate and maintain the equipment and let him try it.

d) Assemble all the relevant diagrams and other printed matter which is required to operate the system and hand over to the customer (on the spot) and request him to keep it handy.

e) Service contact address.

- List of equipment which has been delivered
- Installation drawing ..... It is essential to prepare a control wiring diagram which clarifies the refrigerant system and the control system.
- 1 set of operation manuals
- Names of those responsible for the work (emergency contact address)
- Equipment guarantees.

3. Installation of indoor unit

3.1 Safety precautions

Please strictly follow the instructions given in the Installation manual .Improper installation by ignoring the instructions can lead to damage of life and property.
Make sure to read the following safety instructions very carefully and throughly .

⚠WARNING	This symbol indicates the possibility of death or serious injury.
⚠CAUTION	This symbol indicates the possibility of injury or damage to properties only.

■ The meanings of the symbols used in this manual are as shown below.

⃠	**Be sure not to do.**
❗	**Be sure to follow the instruction.**

⚠WARNING

Do not use a defective or underrated circuit breaker.
• There is risk of fire or electric shock.

Always use this appliance on a dedicated circuit breaker.
• Otherwise it can cause electric shock or fire.

For electrical work, contact the dealer, seller, a qualified electrician, or an authorized service center. Do not disassemble or repair the product by yourself.
• There is risk of fire or electric shock.

Always ground the product as per the field wiring diagram. Do not connect the ground wire to gas or water pipes lightening rod or telephone ground wire.
• There is risk of fire or electric shock.

Install the panel and the cover of control box securely.
• There is risk of fire or electric shock due to dust , water etc.

Use the correctly rated breaker or fuse.
• There is risk of fire or electric shock.

Do not modify or extend the power cable. If the power cable or cord has scratches or skin peeled off or deterioted then immediately replace it.
• There is risk of fire or electric shock.

For installation, removal or reinstall, always contact the dealer or an Authorized Service Center.
• There is risk of fire, electric shock, explosion, or injury.

Do not install the product on a defective installation foundation. Be sure that the installation area does not deteriorate with age.
• If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

When the product is soaked (flooded or submerged) in water, contact an Authorized Service Center for repair before using it again.
• There is risk of fire or eletric shock.

In outdoor unit the step-up capacitor supplies high voltage electlicity to the electrical components.
Be sure to discharge the capacitor completely before conducting the repair work.
• An charged capacitor can cause electrical shock.

Be sure to use only those parts which are listed in the service parts list. Never attempt to modify the equipment.
• The use of inappropriate parts can cause an electrical shock, excessive heat generation or fire.

Indoor/outdoor wiring connections must be secured tightly and the cable should be routed properly so that there is no force pulling the cable at the connection terminals.
• Improper or loose connections can cause excessive heat generation or fire.

Safely dispose off the packing materials.
• Things like screws, nails, batteries, broken things etc. after installation or svc can cause injury to small kids. Tear away and throw away the plastic packaging bags so that children will not play with them.

During svc be sure to check the refrigerant to the used.
• Incorrect refrigerant used can prevent the normal operation of the unit.

When installing the unit, use the installation kit provided with the product.
• Otherwise the unit may fall and cause severe injury .

Do not touch, operate, or repair the product with wet hands.
• There is risk of electric shock or fire.

Do not place a heater or other appliances near the power cable.
• There is risk of fire and electric shock.

Do not allow water to run into electric parts. Install the unit away from water sources
• There is risk of fire, failure of the product, or electric shock.

Do not store or use or even allow flammable gas or combustibles near the product.
• There is risk of fire or failure of product.

Do not use the product in a tightly closed space for a long time. Perform ventilation regularly.
• Oxygen deficiency could occur and hence harm your health.

If strange sounds, smell or smoke comes from product, immediately turn the breaker off or disconnect the power supply cable.
• There is risk of electric shock or fire.

When installing the unit, use the installation kit provided with the product.
• Otherwise the unit may fall and cause severe injury.

Do not open the front grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)
• There is risk of physical injury, electric shock or product failure.

Ventilate the product room from time to time when operating it together with a stove, or heating element etc.
• Oxygen deficiency can occur and hence harm your health.

Turn the main power when cleaning or repairing the product.
• There is risk of electric shock.

When the product is not to be used for a long time, shut off the circuit breaker.
• There is risk of product damage or failure or unintended operation.

⚠CAUTION

Use two or more people to lift and transport the product.
• Avoid personal injury.

Do not install the product where it will be exposed to sea wind (salt spray) directly.
• It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

Install the drain hose to ensure that water is drained away properly.
• A bad connection may cause water leakage.

Keep level even when installing the product.
• To avoid vibration or noise.

Always check for gas (refrigerant) leakage after installation or repair of product.
• Low pressure levels may cause failure of product.

Do not block the inlet or outlet of air flow.
• It may cause product failure.

Use a soft cloth to clean. Do not use harsh detergents, solvents or splashing water etc .
• There is risk of fire, electric shock, or damage to the plastic parts of the product.

Do not step on or put anyting on the product. (outdoor units)
• There is risk of personal injury and failure of product.

Do not insert hands or other objects through the air inlet or outlet while the product is operating.
• There are sharp and moving parts that could cause personal injury.

Be cautious when unpacking and installing the product.
• Sharp edges could cause injury. Be especially careful of the case edges and the fins on the condenser and evaporator.

If the refrigerant gas leaks during the repair, do not touch the leaking refrigerant gas.
• The refrigerant gas can cause frostbite (cold burn).

Do not tilt the unit when removing or uninstalling it.
• The condensed water inside can cause spill and wet the furniture and the floor.

Do not mix air or gas other than the specified refrigerant used in the system.
• If air enters the refrigerant system, an excessively high pressure results, causing equipment damage or injury.

Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.
• There is risk of fire or explosion.

If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote if the batteries have leaked.
• The chemicals in batteries could cause burns or other health hazards.

Do not use the product for special purposes, such as preserving foods, works of art, etc. It is a consumer air conditioner, not a precision refrigeration system.
• There is risk of damage or loss of property.

Do not touch the metal parts of the product when removing the air filter.
• There is risk of personal injury.

If the refrigerant gas leaks during the installation or operation ventilate the area immediately.
• Otherwise it can be harmfull for your health.

Do not turn off the power immediately after stopping the operation.
• Always wait for 5 minutes before turning off the power otherwise water leakage and troubles can occur.

Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.
• Moisture may condense and wet or damage furniture.

Do not expose your skin or kids or plants to the cool or hot air draft.
• This could harm to your health.

Do not drink the water drained from the product.
• It is not sanitary and could cause serious health issues.

Use a firm stool or ladder when cleaning, maintaining or repairing the product at an height.
• Be careful and avoid personal injury.

Dismantling of the unit , treatment of the refrigerant oil and eventual parts should be done in accordance with local and national standards.

Do not recharge or disassemble the batteries. Do not dispose off batteries in fire.
• They may burn or explode.

3.1.1 Points for explanation about operations

The items with WARNING and CAUTION marks in the operation manual are the items pertaining to possibillties for bodily injury and material damage in addition to the general usage of the product. Accordingly, it is necessary that you make a full explanation about the described contents and also ask your customers to read the owner's manual.

1. Note to the installer

Be sure to instruct customers how to properly operate the unit (especially cleaning filters, operating different functions, and adjusting the temperature) by having them carry out operations themselves while looking at the manual.

3.1.2 Selecting installation site for indoor units

1. Select an installation site where the following conditions are fulfilled and that meets with your customer's approval.

1) Location strong enough to bear the weight of the unit.
2) Location accessible and having enough clearance for inspection and service in the future.
3) Location allowing easy condensate drainage and suitable gradient of the unit and the drain pipe.
4) Piping between the indoor and outdoor unit is possible within the allowable limits.
5) Location free from electrical noise.
6) Location allowing optimum air distribution without any blocking to air flow.
7) Location having no risk of flammable gas leakage.
8) Location free from mineral oil mist or an oil spray or vapor example in kitchen .It could result in leakage .
9) Location free from corrosive gases such as sulphurous acid gas because it corrodes the copper pipes or soldered parts resulting in leakage .
10) Location free from any machinery emitting electromagnetic waves which may disturb the control system thus causing malfunction of the unit .
11) Location free from flammable gases , carbon fibre , or ignitable dust suspensions in the air or where volatile flames are handled like gasoline or thinner. Operating in such conditions may result in fire .
12) Install the indoor and outdoor units, power supply wiring and connecting wires at least 1m away from televisions or radios in order to prevent image interference or noise. (Depending on the radio waves, a distance of 1m. may not be sufficient enough to eliminate the noise.)
13) Consider whether the place where the unit will be installed can support the full weight of the unit, and reinforce it with boards and beams, etc. If needed before proceeding with the installation. Also, reinforce the place to prevent vibration and noise before installing.
14) The indoor artcool, artcool mirror, wallmount unit may not be directly installed on the wall. Use the attached installation plate before installing the unit.
15) Obey the local and national regulations and limits regarding airconditioner installation.

2. For the following items, take special care during construction and check after installation is finished

1. Items to be checked after completion of installtion work

Items to be checked	If not properly done, what is likely to occur	Check
Are the indoor and outdoor unit fixed firmly?	The units may drop, vibrate or make noise.	
Is the gas leak test finished?	It may result in insufficient cooling or heating.	
Is the unit fully insulated?	Condensate water may drip.	
Does drainage flow smoothly?	Condensate water may drip.	
Does the power supply voltage correspond to that shown on the name plate?	The unit may malfunction or the components burn out.	
Are wiring and piping correct?	The unit may malfunction or the components burn out.	
Is the unit safely grounded?	It may be dangerous during electric leakage.	
Is wiring size correct according to specifications?	The unit may malfunction or the components burn out.	
Is there something blocking the air outlet or inlet of either the indoor or outdoor units?	It may result in insufficient cooling or heating.	
Are refrigerant piping length and additional refrigerant charge noted down?	The refrigerant charge in the system is not clear.	

3.1.3 Before installation

1. During product unpacking and removing it from the packing case, be sure to lift it without exerting any pressure on other parts, especially, horizontal flaps, the refrigerant piping, drain piping, and other resin parts.

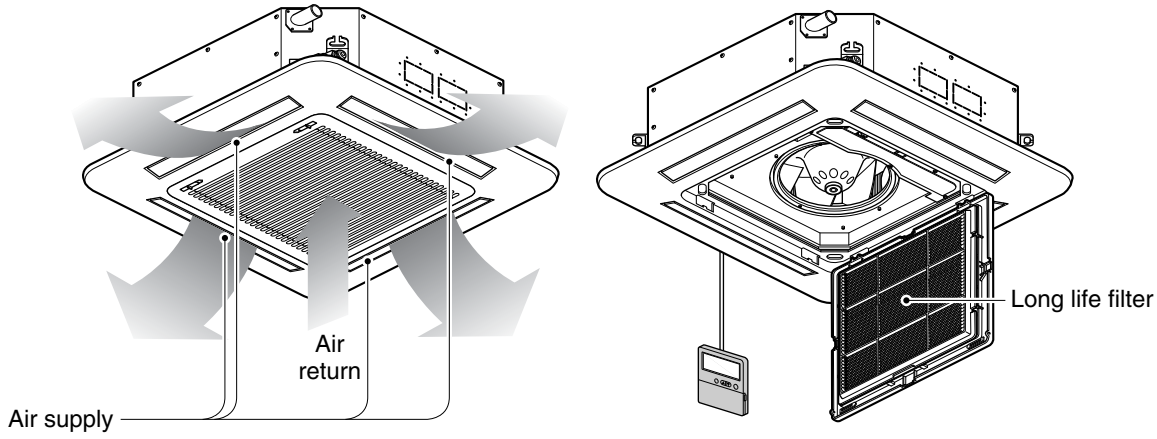
- The accessories needed for installation must be retained in your custody until the installation work is completed. Do not discard them!
- Decide upon a line of transport.
- Leave the unit inside its packaging while moving, until reaching the installation site. Where unpacking is unavoidable, use a sling of soft material or protective plates together with a rope when lifting, to avoid damage or scratches to the unit.
- When using the wireless remote controller, refer to the installation manual attached to the wireless remote controller.

NOTE

- **Be sure to read this manual before installing the indoor unit.**
- Entrust installation to the place of purchase or an authorized serviceman. Improper installation could lead to leaks and in worst cases, electric shock of fire.
- Use only parts provided with the unit or parts satisfying required specifications. Unspecified parts could cause the unit to fall out of place, or could lead to leaks and in the worst cases, electric shock or fire.

3.2 Ceiling cassette 4-way

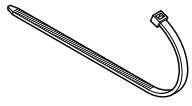
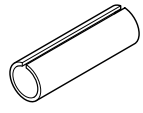
• Please read the instruction sheets completely before installing the product.
• When the power cord is damaged, replacement work shall be performed by authorized personnel only.
• Installation work must be performed in accordance with the national wiring standards by authorized personnel only.



3.2.1 Accessories

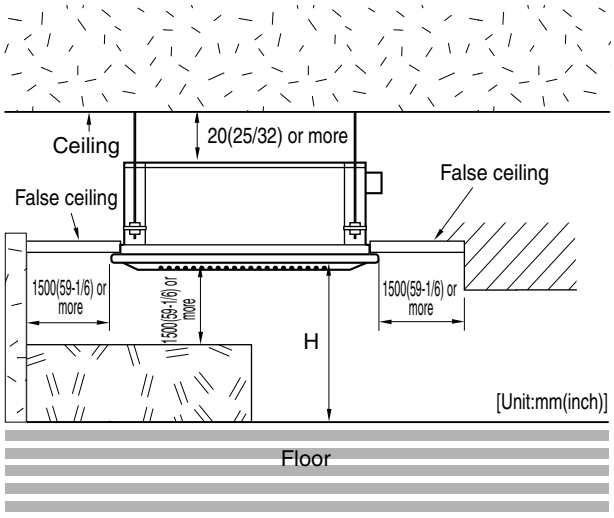
Check whether the following accessories are included with your unit.

1) Standard accessories

Name	Drain hose	Clamp metal	Washer for hanging backet	Clamp	Insulation for fitting	(Other)
Quantity	1 EA	1 EA	8 EA	8 EA	1 SET	
Shape					 for gas pipe  for liquid pipe	• Paper pattern for installation • Owner's manual • Installation manual

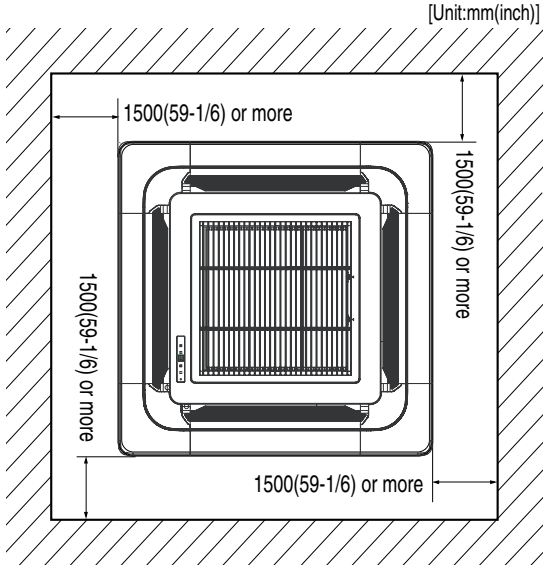
3.2.2 Selection of the best location

- There should not be any heat source or steam near the unit.
- There should not be any obstacles to the air circulation.
- There should be provision of easy condensate drain.
- Taking into accounting the noise prevention criteria, spot the installation location.
- Do not install the unit near the door way.
- Keep proper distances, of the unit, from ceiling, fence, floor, walls and other obstacles as shown in figure.
- The indoor unit must have the maintenance space.



NOTE

Above figure means minimum value. Please keep these value at least.
If H is 2700(106-5/16)~3200(125-31/32) mm(inch) : High ceiling operation control requied
If H is ~2700(106-5/16) mm(inch) : Normal operation

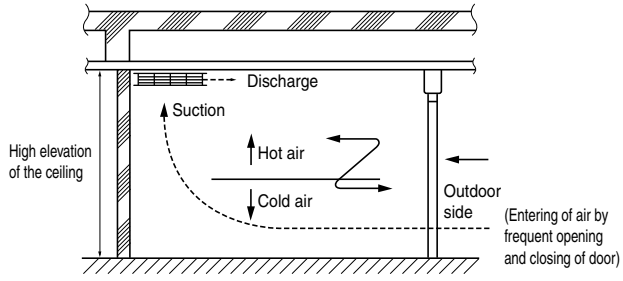


3.2.3 Precautions regarding cassette indoor unit installation

1) Main points about the indoor installation

- **In case of high height ceiling**

In general commercial places and offices though the height of the ceiling is 2.7(8.86)m(ft), the ceiling height can be 3(9.84)m(ft). In such cases because of the temperature difference with the floor the heating effect can fall down.



- **Countermeasure method**

① Air conditioner must be able to operate in high ceiling conditioner.

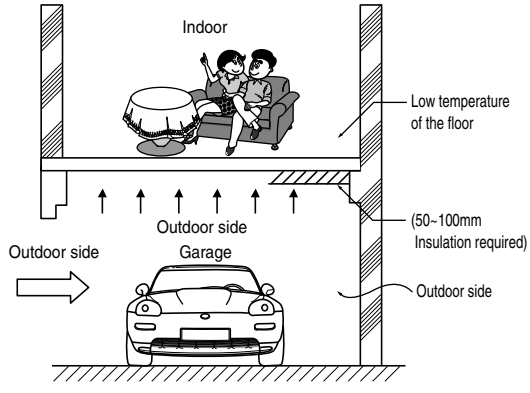
② Plan to install the circulator.

③ The air discharge port is made to give more airflow to the down wood directions.

④ The gate or exit of the building is protected by dual door system.

2) In case the floor or surfaces of the place to be air conditioned is in direct contact with the outdoor air

- **The floor of the heating room indirect contact with the storeroom, garage or the outside air receives the cold air at the floor and the floor temperature decrease will feel cold at the feet.**



In such places where the feet comes in direct contact with floors will give a cold feeling to the floor.

• **Countermeasure:**

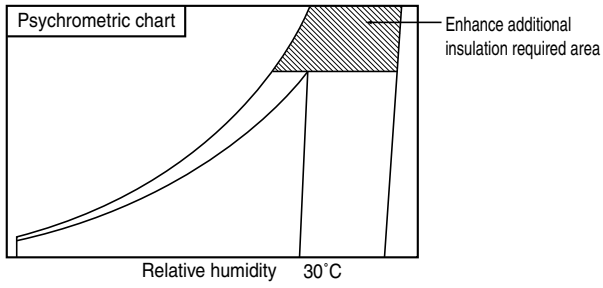
- Use the carpet on the floor (compared to the tiles the carpet over it will have a 3 degree rise in temperature)
- Insulating the floor.
- Floor heating

⚠CAUTION

• **Case of cold air intake:**
The duct surface will have the dew drops so a insulation on the duct is a must.(Insulation material: a glass wool of thickness 25(31/32)mm(inch) will be appropriate.)

3) In case of high temperature or high humidity between the false ceiling and ceiling slab(near by the sea, river, lake, spa)

• **In case of temperature of 30 degree and humidity above 80%, the units body as well as the piping insulation should be strengthened.**
Refer to the picture given below.

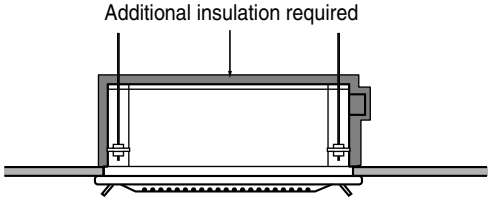


• **Places having the temperature and humidity of the surrounding and the**

The surrounding water sources(sea, river etc.)

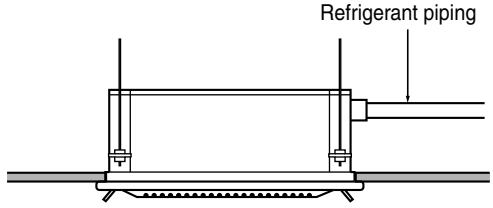
In case the steam is generated between the false ceiling and the ceiling slab

Due to some nearby by steam source.
- Indoor unit: Insulate the unit body with some insulation like glass wool atleast 10(3/8)mm(inch) in thickness.

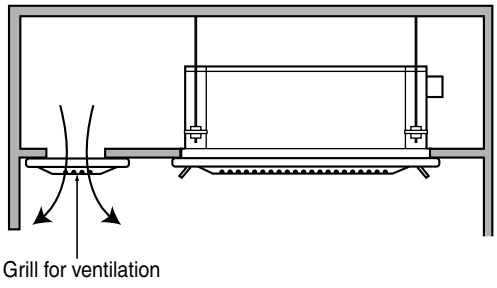


• In case of the multi flow type, use the high humidity kit. Otherwise the dew drops can be seen in the unit body.

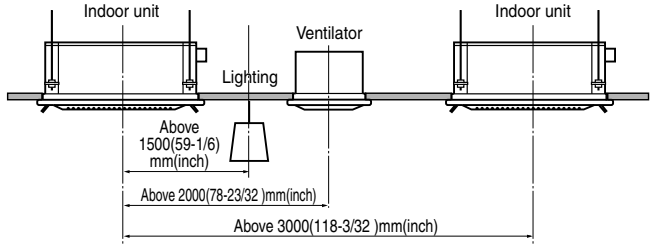
• Refrigerant piping: Increase the piping insulation thickness with thickness above 20(25/32)mm(inch).



• Others: Inside the ceiling near th air tight seal places (no escape of the humidity)



• **In case of multiple indoor cassette units (recommended)**



3.2.4 Ceiling opening dimensions and hanging bolt location

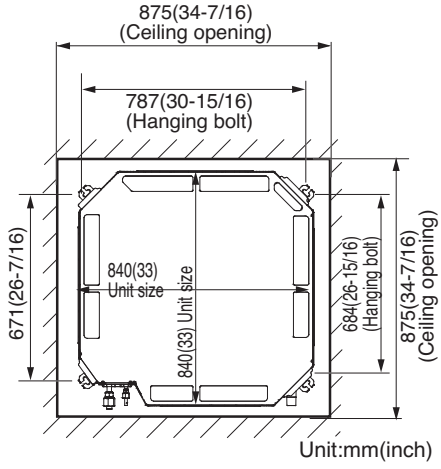
① The dimensions of the paper pattern for installation are the same as those of the ceiling opening dimensions.

② Select and mark the position for fixing bolts and piping hole.

③ Decide the position for fixing bolts slightly tilted to the drain direction after considering the direction of drain hose.

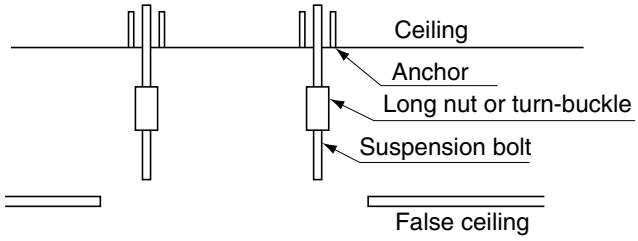
④ Drill the hole for anchor bolt on the wall.

TP/TM Model



1) Install the suspension bolts.

(Use either a W3/8" or M10 size bolt) Use a hole-in anchor for existing ceilings, and a sunken insert, sunken anchor or other field supplied parts for new ceilings to reinforce the ceiling to bear the weight of the unit. Adjust clearance from the ceiling before proceeding further.



NOTE

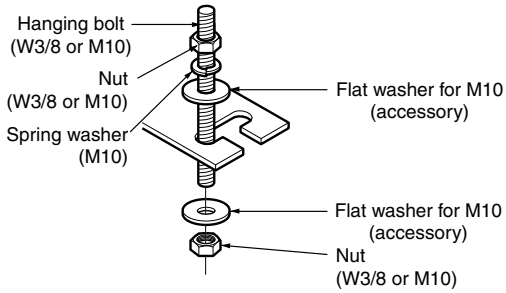
All the above parts are field suppiled.

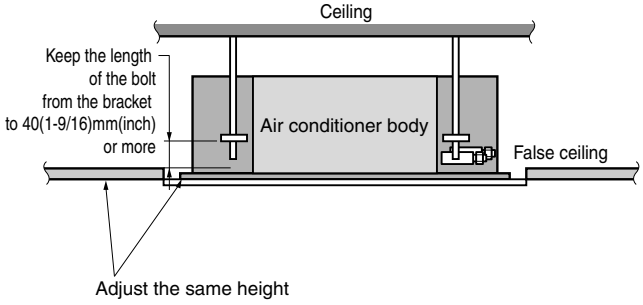
3.2.5 Indoor unit installation

• Installing of the accessories (except for the decoration panel) before installing the indoor unit is easier.

1) Install the indoor unit temporarily.

• Attach the hanger bracket to the suspension bolt. Be sure to fix it securely by using a nut and washer from the upper and lower sides of the hanger bracket.





• The following parts are local purchasing.

- Hanging Bolt - W 3/8 or M10
- Nut - W 3/8 or M10
- Spring Washer - M10
- Plate Washer - M10

2) For new ceilings

(1) Refer to the paper pattern for ceiling opening dimension.

• The center of the ceiling opening is indicated on the paper pattern for installation.
The center of the unit is indicated on the label attached to the unit and on the paper pattern for installation.

• First remove paper packaging material from the 4 corners of the paper pattern for installation , fix the paper pattern to the unit with screws.

• Ceiling height is shown on the side of the paper pattern for installation. Adjust the height of the unit according to this indication.

<Ceiling work>

(2) Adjust the unit to the right position for installation.

(3) Assure that the unit is horizontal.

• The indoor unit is equipped with a built-in drain pump and float switch. At each of the unit's 3 corners, verify that it is level by using awater-level or a water-filled vinyl tube. (Otherwise it will result in the malfunctioning of unit and cause water to drip.)

(4) Remove the washer fixing plate used for preventing the washer from falling and tighten the upper nut.

(5) Remove the paper pattern for installation

3) For existing ceilings

(1) Adjust the height and position of the unit.

(2) Perform steps 3 and 4 in "5.1 For new ceilings".

3.2.6 Connecting pipes to the indoor unit

1) Refrigerant piping work

please refer “REFRIGERANT PIPING WORK”.

2) Piping insulation

① Perform heat insulation work completely on both gas and the liquid pipe. Because improper insulation will result condensate formation over pipe.

② Use the heat insulation material for the refrigerant piping which has an excellent heat resistance (over 120°C).

③ Precautions in high humidity circumstance:

④ Refer to insulation work

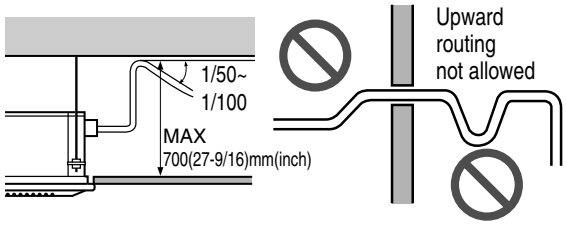
⚠CAUTION

• Make sure to insulate any field piping all the way to the piping connection inside the unit. Any exposed piping may cause condensation or burns if touched.

3) Indoor unit drain piping

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

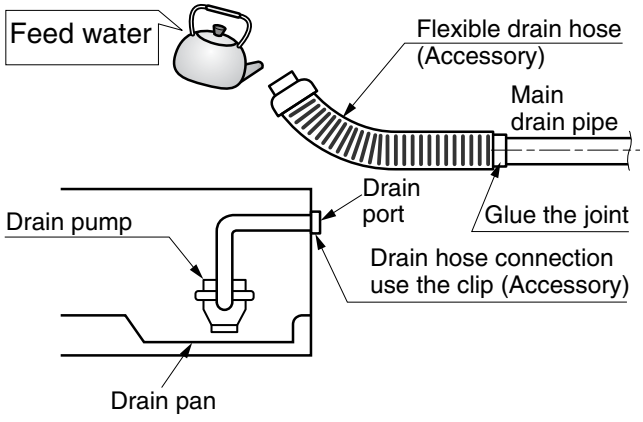
Piping material: Polyvinyl chloride pipe 25(31/32)mm(inch) and pipe fittings



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

Heat insulation material: Polyethylene foam with thickness more than 10(3/8)mm(inch).

4) Drain test

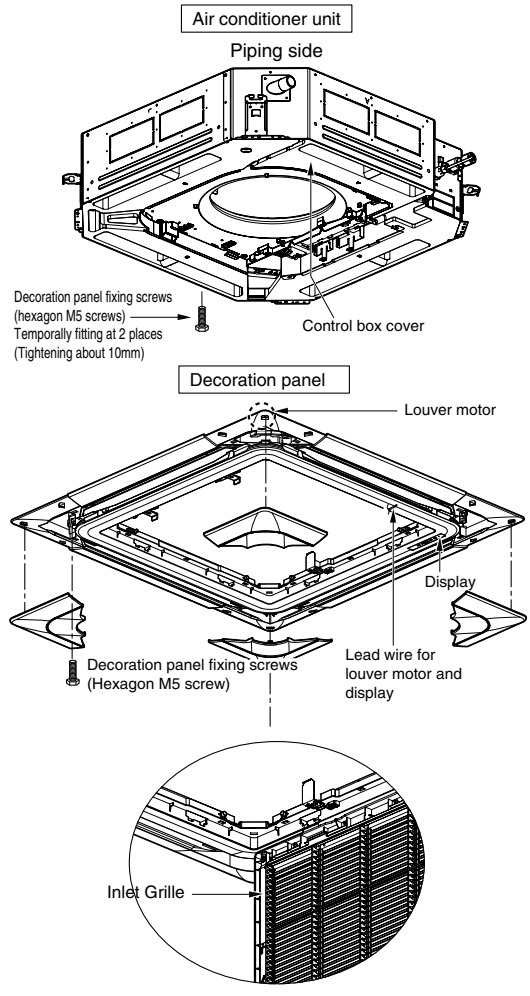


• TP/TM Chassis

The decoration panel has its installation direction.

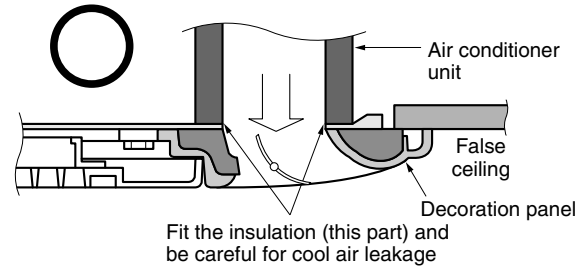
Before installing the decoration panel, always remove the paper template.

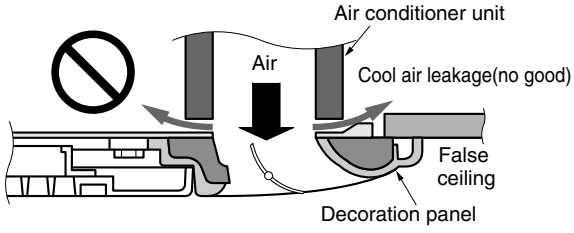
1. Temporarily fix two decoration panel fixing screws (hexagon M5 screw) on the unit body. (Tighten by amount 10mm in length.)
   The fixing screws (hexagon M5 screw) are included the indoor unit box.
2. Remove the air inlet grille from the decoration panel. (Remove the hook for the air inlet grille cord.)
3. Hook the decoration panel key hole (⊂⊃) on the screws fixed in step above, and slide the panel so that the screws reach the key hole edge.
4. Retighten completely two temporarily fixed screws and other two screws. (Total 4 screws)
5. Connect the louver motor connector and display connector.
6. After tightening these screws, install the air inlet grille (including the air filter).



CAUTION

Install certainly the decoration panel.
Cool air leakage causes sweating.
➔ Water drops fall.





3.2.8 Electric wiring work

1) General instructions

① All field supplied parts and materials, electric works must conform to local codes.
Use copper wire only.

② Follow the "WIRING DIAGRAM" attached to the unit body to wire the outdoor unit, indoor units and the remote controller.

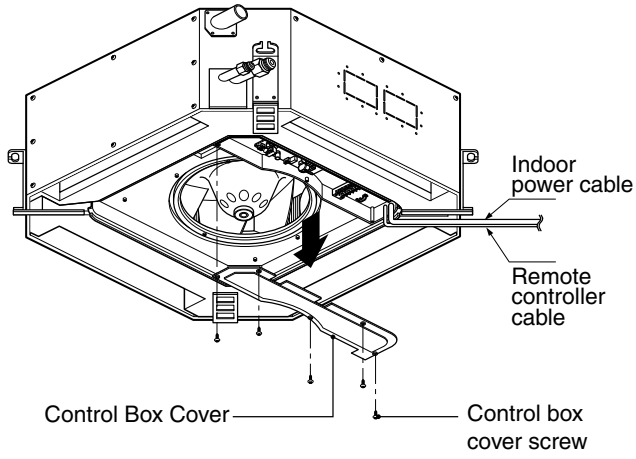
③ All wiring must be performed by an authorized electrician.

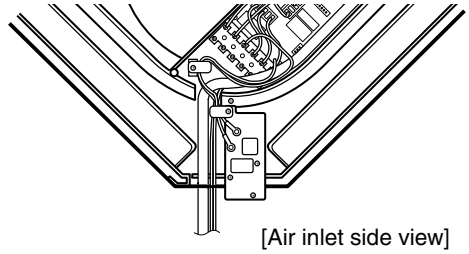
④ This system consists of multiple indoor units. Mark each indoor unit as unit A, unit B..., and be sure the terminal board wiring to the outdoor unit and indoor units are properly matched. If wiring and piping between the outdoor unit and an indoor units are mismatched, the system may cause a malfunction.

⑤ A circuit breaker capable of shutting down the power supply to the entire system must be installed.

2) Wiring Connection

① Open the control box cover and connect the Remote controller cord and Indoor power wires.

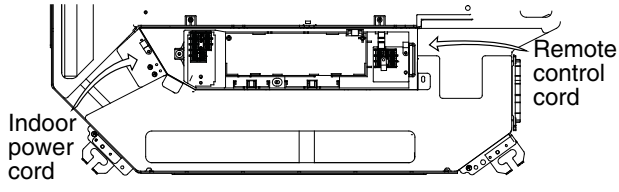




[Air inlet side view]

Terminal block in indoor				
1(L)	2(N)	⏚	3	4

Connected to outdoor Unit



② Make sure to attach the sealing material (field supplied) to hole of wiring to prevent the infiltration of foreign particle from outside. Otherwise a short-circuit may occur inside the electric parts box

③ When clamping the wires, be sure no pressure is applied to the wire connections by using the included clamping material to make appropriate clamps. Also, when wiring, make sure the cover on the electric parts box fits snugly by arranging the wires neatly and attaching the electric parts box cover firmly. When attaching the electric parts box cover, make sure no wires get caught in the edges. Pass wiring through the holes to prevent damage to them.

④ Make sure the remote controller wiring, the wiring between the units, and other electrical wiring do not pass through the same locations outside of the unit, separating them properly, otherwise electrical noise (external static) could cause product malfunction.

⚠WARNING

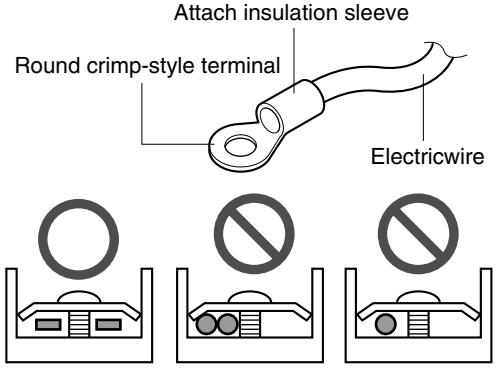
• Make sure that the screws of the terminal are not loose.

NOTE

1. Use round crimp-style terminals for connecting wires to the power supply terminal block. If unavailable, observe the following points when wiring.

• Do not connect wires of different gauge to the same power supply terminal. (Looseness connection may cause overheating.)

• Use the specified electric wire. Connect the wire securely to the terminal. Lock the wire down without applying excessive force to the terminal.



Connect wires of the same gauge to both sides

2. Tightening torque for the terminal screws.

• Use the correct screwdriver for tightening the terminal screws. If the blade of screwdriver is too small, the head of the screw might be damaged, and the screw will not be properly tightened.

• If the terminal screws are tightened too hard, screws might be damaged.

3. Do not connect wires of different gauge to the same grounding terminal. Loose connection may deteriorate protection.

4. At the unit, keep proper separation between transmissio and power supply wiring.
The equipment may malfunction if subjected to electrical (external) noise.

5. Never connect power supply wiring to the terminal block for remote controller wiring. A mistake of the sort could damage the entire system.

6. Use only specified wire and tightly connect wires to terminals. Be careful that wires should not place external stress on terminals. Keep wiring in neat order and so as not to obstruct other equipment such as popping open the electric parts box cover. Make sure the cover closes tight. Incomplete connections could result in overheating, and in worst case, electric shock or fire.

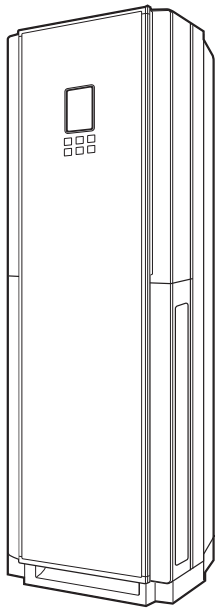
⚠CAUTION

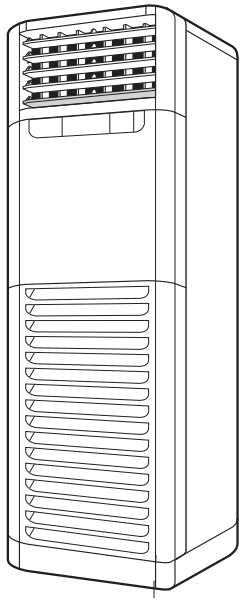
After the confirmation of the above conditions, prepare the wiring as follows:

1) Never fail to have an individual power circuit specifically for the air conditioner. As for the method of wiring, be guided by the circuit diagram posted on the inside of control cover.
2) The screw which fasten the wiring in the casing of electrical fittings are liable to become loose from vibrations to which the unit is subjected during the course of transportation. Check them and make sure that they are all tightly fastened. (If they are loose, it could cause burnout of the wires.)
3) Confirm the specification of power source.
4) Confirm that electrical capacity is sufficient.
5) See to that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.
6) Confirm that the cable thickness is as specified in the power source specification.
(Particularly note the relation between cable length and thickness.)
7) Always install an earth leakage circuit breaker in a wet or moist area.
8) The following would be caused by voltage drop.
• Vibration of a magnetic switch, which will damage the contact point, fuse breaking, disturbance of the normal function of the overload.
9) The means for disconnection from a power supply shall be incorporated in the fixed wiring and have an air gap contact separation of at least 3mm in each active(phase) conductors.

3.3 Floor standing

• Please read the instruction sheets completely before installing the product.
• When the power cord is damaged, replacement work shall be performed by authorized personnel only.
• Installation work must be performed in accordance with the national wiring standards by authorized personnel only.

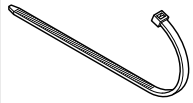
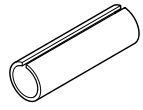




3.3.1 Accessories

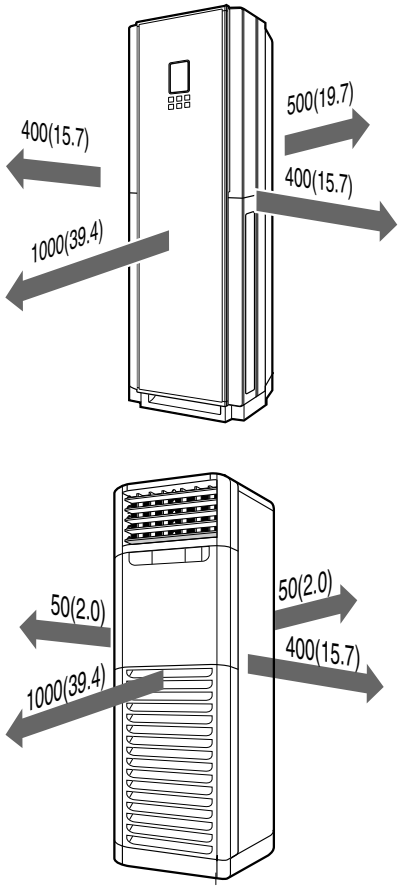
Check whether the following accessories are included with your unit.

1) Standard accessories

Name	Drain hose	Clamp metal	Washer for hanging backet	Clamp	Insulation for fitting	(Other)
Quantity	1 EA	1 EA	8 EA	8 EA	1 SET	
Shape					 for gas pipe  for liquid pipe	• Paper pattern for installation • Owner's manual • Installation manual

3.3.2 Selection of the best location

- There should not be any heat source or steam near the unit.
- There should not be any obstacles to the air circulation.
- There should be provision of easy condensate drain.
- Taking into accounting the noise prevention criteria, spot the installation location.
- Do not install the unit near the door way.
- Keep proper distances, of the unit, from ceiling, fence, floor, walls and other obstacles as shown in figure.
- The indoor unit must have the maintenance space.

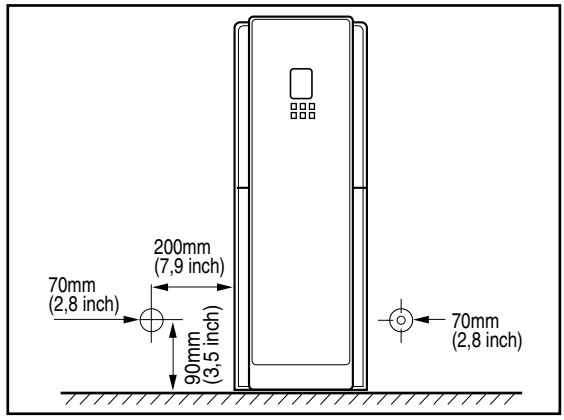


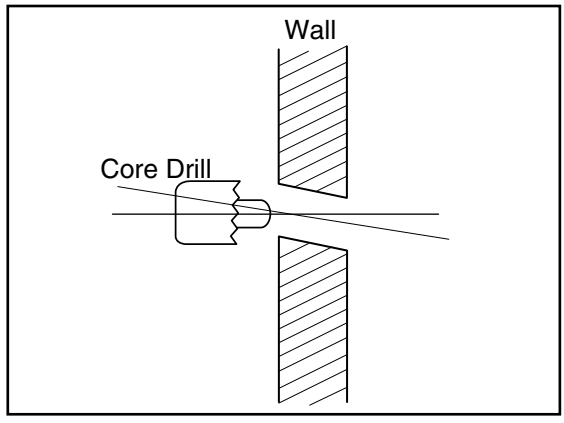
NOTE

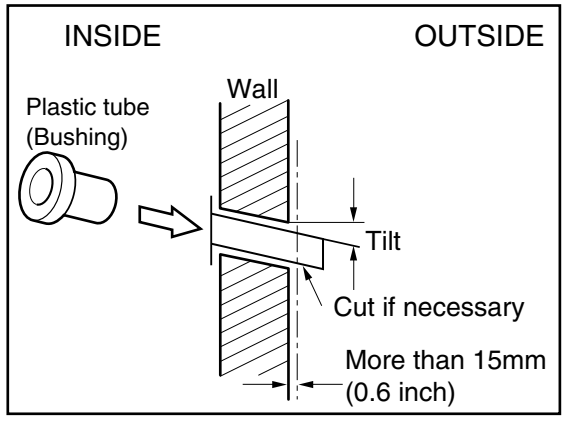
Above figure means minimum value. Please keep these value at least.
If H is 2700(106-5/16)~3200(125-31/32) mm(inch) : High ceiling operation control requied
If H is ~2700(106-5/16) mm(inch) : Normal operation

3.3.3 Procedure of indoor unit installation

- The mounting floor should be strong and solid enough to prevent it from vibration.
- Drill the piping hole with 70mm diameter hole-core drill at either on right or on left of the indoor unit. The hole should be sightly slant to the outdoor side.







- Insert the plastic tube through the hole.
- Cut the extruded outside part of the plastic tube, if necessary.

3.3.4 Connecting cable to outdoor unit

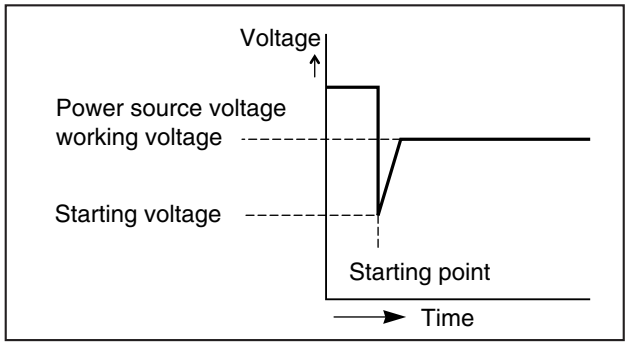
The unit is completely wired internally at the factory according to general rule of electrical technology, but local rules, if they are required, should be complied with.

1) Power supply

Power source must fulfill the following conditions:

① The working voltage should be higher than 90% and lower than 110% of the rated voltage marked on the name plate.

② The starting voltage should be higher than 85% of the rated voltage marked on the name plate.



2) Wiring

After the confirmation of the above conditions, prepare the wiring as follows:

① The power cord connected to the outdoor unit should be comply with the following specifications: ETL recognized and CSA certified. The power connecting cable connected to the indoor and outdoor unit should be comply with the following specifications: ETL recognized and CSA certified.

UNIT	Main power cable	Conductor cross-sectional area
23,000 Btu/h	AWG12	AWG18
41,000 Btu/h	AWG10	AWG18

② Provide a recognized circuit breaker mentioned as below between power source and unit.
A disconnection device to adequately disconnect all supply lines must be fitted.
(for service operations)

UNIT	Circuit breaker capacity
23,000 Btu/h	25A
41,000 Btu/h	40A

③ The screws which fasten the wiring in the casing of electrical fittings are liable to be come loose from vibrations to which the unit is subjected during the course of transportation.
Check them and make sure that they all are tightly fastened.
(If they are loose, it could give rise to burn-out of the wires.)

④ See to it that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.

⑤ The following troubles would be caused by voltage drop-down.
Vibration of a magnetic switch, damage on the contact point there of, fuse breaking, disturbance to the normal function of a overload protection device.

3) P3 chassis

Procedure for Connecting the Cable to Indoor Unit, is as follows:

1. Open The Front Door Manually, as shown in Fig. 1.

2. Open the Control Box Cover (A) with Driver, (⊕) as shown in Fig. 2.

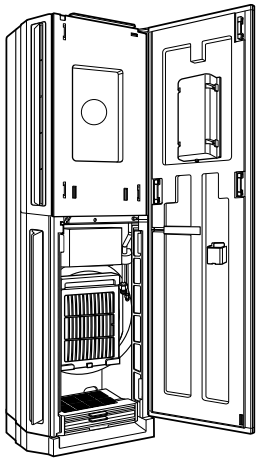
3. Connect the Cables (LG doesn't supply) to the terminal Block of Indoor Unit, as shown in Fig. 3.

4. Install a power supply line or connecting cables as the Fig. 4 in order to prevent the connecting wires from being cut by sharp edge of the hole.

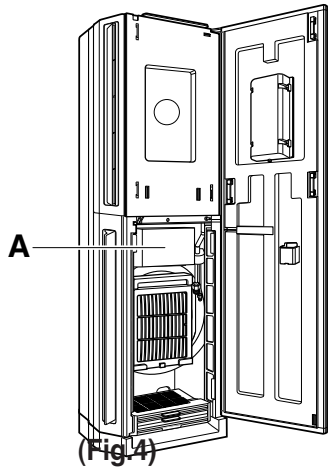
5. Secure the Control Box Cover (A) to its original position with the help of Driver(⊕).

6. Close the Front Door.

(Fig.1)



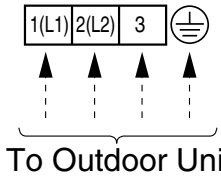
(Fig.2)

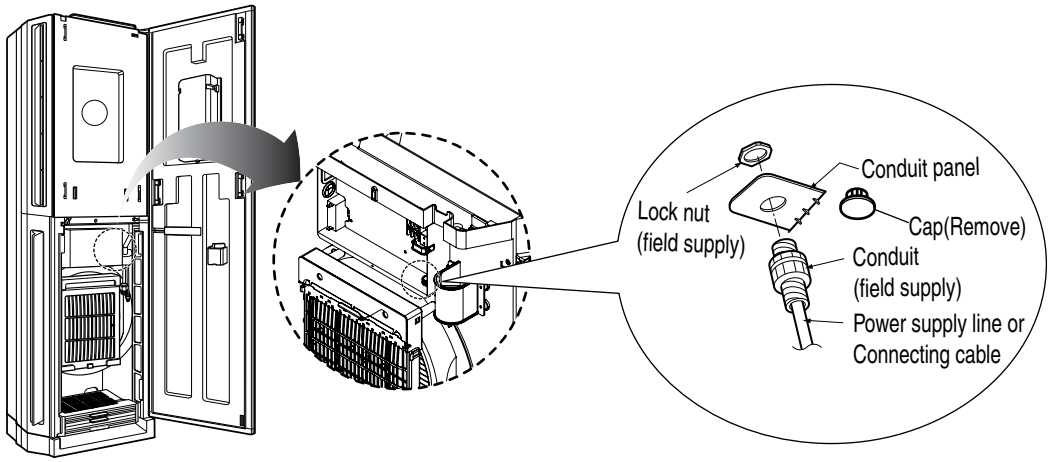


(Fig.4)

(Fig.3)

Detail Wiring for Indoor Unit





4) PT chassis

Procedure for Connecting the Cable to Indoor Unit, is as follows:

1. Open The Front Door Manually, as shown in Fig. 1.

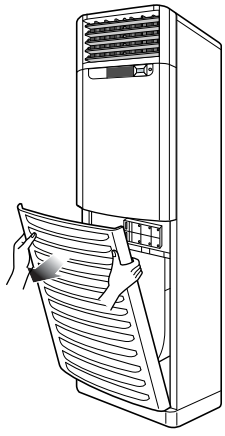
2. Open the Control Box Cover (A) with Driver, (⊕) as shown in Fig. 2.

3. Connect the Cables (LG doesn't supply) to the terminal Block of Indoor Unit, as shown in Fig. 3.

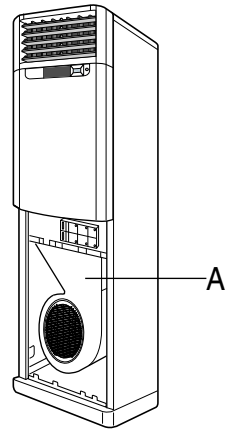
4. Install a power supply line or connecting cables as the Fig. 4 in order to prevent the connecting wires from being cut by sharp edge of the hole.

5. Secure the Control Box Cover (A) to its original position with the help of Driver(⊕).

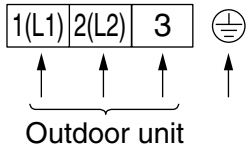
6. Close the Front Door.



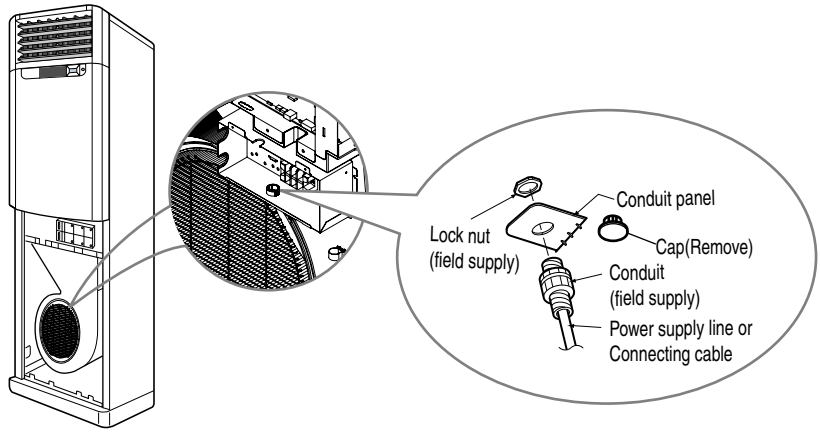
(Fig.1)



(Fig.2)



(Fig.3)



(Fig.4)

4. Installation of outdoor unit
4.1 Safety Precautions

Please strictly follow the instructions given in the Installation manual .Improper installation by ignoring the instructions can lead to damage to life and property.
Make sure to read the following safety instructions very carefully and throughly .

⚠WARNING	This symbol indicates the possibility of death or serious injury.
⚠CAUTION	This symbol indicates the possibility of injury or damage to properties.

■ The meanings of the symbols used in this manual are as shown below.

⃠	**Be sure not to do.**
❗	**Be sure to follow the instruction.**

⚠WARNING

Do not use a defective or underrated circuit breaker.
• There is risk of fire or electric shock.

Do not use a multi consent. Always use this appliance on a dedicated circuit and breaker.
• Otherwise it can cause electric shock or fire.

For electrical work, contact the dealer, seller, a qualified electrician, or an authorized service center. Do not disassemble or repair the product by yourself.
• There is risk of fire or electric shock.

Always ground the product as per the wiring diagram. Do not connect the ground wire to gas or water pipes lightening rod or telephone ground wire.
• There is risk of fire or electric shock.

Install the panel and the cover of control box securely.
• There is risk of fire or electric shock due to dust , water etc.

Use the correctly rated breaker or fuse.
• There is risk of fire or electric shock.

If the power cable or cord has scratches or skin peeled off or deterioted then immediately replace it.
• There is risk of fire or electric shock.

For installation, removal or reinstall, always contact the dealer or an authorized service center.
• There is risk of fire, electric shock, explosion, or injury.

Do not install the product on a defective foundation. Be sure that the installation area does not deteriorate with age.
• If the foundation collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

Never install the outdoor unit at a place from where it can fall down.
• The falling outdoor unit can cause damage or injury or even death of a person and also damage or malfunctioning of the product itself.

When the product is soaked (flooded or submerged) in water, contact an authorized service center for repair before using it again.
• There is risk of fire or eletric shock.

In outdoor units the the step up capacitor supplies high voltage electricity to the electrical components. Be sure to discharge the capacitor completely before conducting the repair work.
• An charged capacitor can cause electrical shock.

Be sure to use only those parts which are listed in the svc parts list. Never attempt to modify the equipment.
• The use of inappropriate parts can cause an electrical shock, excessive heat generation or fire.

Indoor/outdoor wiring connections must be secured tightly and the cable should be routed properly so that there is no force pulling the cable at the connection terminals.
• Improper or loose connections can cause excessive heat heat generation or fire.

Safely dispose off the packing materials.
• Things like screws, nails, batteries, broken things etc after installation or svc can cause injury to small kids. Tear away and throw away the plastic packaging bags so that children will not play with them.

Make sure to check that the power cable plug is not dirty, loose or broken, then only insert the plug completely.
• Dirty,loose or broken power plug can cause electric shock or fire.

During svc be sure to check the refrigerant to the used.
• Incorrect refrigerant used can prevent the normal operation of the unit.

When installing the unit, use the installation kit provided with the product.
• Otherwise the unit may fall and cause severe injury .

Do not touch, operate, or repair the product with wet hands.
• There is risk of electric shock or fire.

Do not place a heater or other appliances near the power cable.
• There is risk of fire and electric shock.

Do not allow water to run into electric parts. Install the unit away from water sources
• There is risk of fire, failure of the product, or electric shock.

Do not store or use or even allow flammable gas or combustibles near the product.
• There is risk of fire or failure of product.

If strange sounds, smell or smoke comes from the product, immediately turn the breaker off or disconnect the power supply cable.
• There is risk of electric shock or fire.

Do not open the front grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)
• There is risk of physical injury, electric shock, or product failure.

Turn the main power off when cleaning or repairing the product.
• There is risk of electric shock.

When the product is not to be used for a long time, turn off the circuit breaker.
• There is risk of product damage or failure, or unintended operation.

Take care to ensure that nobody especially kids could step on or fall onto the outdoor unit.
• This could result in personal injury and product damage.

⚠CAUTION

Use two or more people to lift and transport the product.
• Avoid personal injury.

Do not install the product where it will be exposed to sea wind (salt spray) directly.
• It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

Keep level even when installing the product.
• To avoid vibration or noise.

Do not install the product where the noise or hot air from the outdoor unit could damage or disturb the neighborhoods.
• It may cause a problem for your neighbors and hence dispute.

Always check for gas (refrigerant) leakage after installation or repair of product.
• Low refrigerant levels may cause failure of product.

Do not block the inlet or outlet of air flow.
• It may cause product failure.

Do not step on or put anyting on the product.
• There is risk of personal injury and failure of product.

Do not insert hands or other objects through the air inlet or outlet while the product is operating.
• There are sharp and moving parts that could cause personal injury.

Be cautious when unpacking and installing the product.
• Sharp edges could cause injury. Be especially careful of the case edges and the fins on the condenser and evaporator.

If the refrigerant gas leaks during the repair, do not touch the leaking refrigerant gas.
• The refrigernat gas can cause frostbite (cold burn).

Do not tilt the unit when removing or uninstalling it.
• The condensed water inside can cause spill and wet the furniture and the floor.

Do not mix air or gas other than the specified refrigerant used in the system.
• If air enters the refrigerant system, an excessively high pressure results, causing equipment damage or injury.

If the refrigerant gas leaks during the installation or operation ventilate the area immediately.
• Otherwise it can be harmfull for your health.

Do not expose your skin or kids or plants to the cool or hot air draft.
• This could harm to your health.

Use a firm stool or ladder when cleaning, maintaining or repairing the product at an height.
• Be careful and avoid personal injury.

Dismantling the unit , treatment of the refrigerant oil, oil and eventual parts should be done in accordance with local and national standards.

4.1.1 Points for explanation about operations

The items with WARNING and CAUTION marks in the operation manual are the items pertaining to possibillties for bodily injury and material damage in addition to the general usage of the product. Accordingly, it is necessary that you make a full explanation about the described contents and also ask your customers to read the operation manual.

4.1.2 Note to the installer

Be sure to instruct customers how to properly operate the unit (especially cleaning filters, operating different functions, and adjusting the temperature) by having them carry out operations themselves while looking at the manual.

4.1.3 Selecting installation site for outdoor units

Select an installation site where the following conditions are fulfilled and that meets with your customer's approval.

1. Location strong enough to bear the weight of the unit.
2. Location accessible and having enough clearance for inspection and service in the future.
3. Location allowing easy condensate drainage suitable gradient of the unit and the drain pipe.
4. Piping between the indoor and outdoor unit is possible within the allowable limits.
5. Location free from electrical noise.
6. Location allowing optimum air distribution without any blocking to air flow.
7. Location having no risk of flammable gas leakage.
8. Location free from mineral oil mist or an oil spray or vapor eg in kitchen .It could result in leakage .
9. Location free from corrosive gases such as sulphurous acid gas because it corrodes the copper pipes or soldered parts resulting in leakage .
10. Location free from any machinery emitting electromagnetic waves which may disturb the control system thus causing malfunction of the unit .
11. Location free from flammable gases , carbon fibre , or ignitable dust suspensions in the air or where volatile flames are handled like gasoline or thinner. Operating in such conditions may result in fire .
12. Install the indoor and outdoor units, power supply wiring and connecting wires at least 1m. away from televisions or radios in order to prevent image interference or noise. (Depending on the radio waves, a distance of 1m. may not be sufficient enough to eliminate the noise.)
13. Consider whether the place where the unit will be installed can support the full weight of the unit, and reinforce it with boards and beams, etc. if needed before proceeding with the installation. Also, reinforce the place to prevent vibration and noise before installing. (The installation pitch can be found on the paper pattern for installation (3), so refer to it when considering the necessity for reinforcing the location.)
14. Obey the local and national regulations and limits regarding airconditioner installation.
15. Location free from lavatory (NH3.etc.). NH3 gas will cause corrosion of outdoor unit metallic parts.

4.1.4 For the following items, take special care during construction and check after installation is finished

1. Items to be checked after completion of work

Items to be checked	If not properly done, what is likely to occur	Check
Are the indoor and outdoor unit fixed firmly?	The units may drop, vibrate or make noise.	
Is the gas leak test finished?	It may result in insufficient cooling.	
Is the unit fully insulated?	Condensate water may drip.	
Does drainage flow smoothly?	Condensate water may drip.	
Does the power supply voltage correspond to that shown on the name plate?	The unit may malfunction or the components burn out.	
Are wiring and piping correct?	The unit may malfunction or the components burn out.	
Is the unit safely grounded?	It may be dangerous at electric leakage.	
Is wiring size according to specifications?	The unit may malfunction or the components burn out.	
Is something blocking the air outlet or inlet of either the indoor or outdoor units?	It may result in insufficient cooling.	
Are refrigerant piping length and additional refrigerant charge noted down?	The refrigerant charge in the system is not clear.	

⚠CAUTION

- **Be very careful about product transportation.**
  Some products use PP bands for packaging. Do not use any PP bands for a means of transportation. It is dangerous.
- **Safely dispose of the packing materials.**
  Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
  Tear apart and throw away plastic packaging bags so that children will not play with them. If children play with a plastic bag which was not torn apart, they face the risk of suffocation.

NOTE

- **Install the indoor and outdoor units, power supply wiring and connecting wires at least 1m. away from televisions or radios in order to prevent image interference or noise.**
  (Depending on the radio waves, a distance of 1m. may not be sufficient enough to eliminate the noise.)

4.1.5 Before installation

- **During product unpacking and removing it from the packing case, be sure to lift it without exerting any pressure on other parts, especially, horizontal flaps, the refrigerant piping, drain piping, and other resin parts.**
- Be sure to remove a cushion (corrugated paper) located between the heat exchanger and the right air filter.
- Be sure to check the type of R410A refrigerant to be used before installing the unit. (Using an incorrect refrigerant will prevent normal operation of the unit.)
- The accessories needed for installation must be retained in your custody until the installation work is completed. Do not discard them!
- Decide upon a line of transport.
- Leave the unit inside its packaging while moving, until reaching the installation site. Where unpacking is unavoidable, use a sling of soft material or protective plates together with a rope when lifting, to avoid damage or scratches to the unit.
- For the installation of an outdoor unit, refer to the installation manual attached to the outdoor unit.
- When using the wireless remote controller, refer to the installation manual attached to the wireless remote controller.
- Entrust installation to the place of purchase or an authorized serviceman. Improper installation could lead to leaks and in worst cases, electric shock of fire.
- Use only parts provided with the unit or parts satisfying required specifications. Unspecified parts could cause the unit to fall out of place, or could lead to leaks and, in the worst cases, electric shock or fire.

4.2 Introduction

This installation guidance describes the procedures for outdoor unit installation, piping, wiring, and control between outdoor units, indoor units and controller.
Installation of the indoor units is not described in this part. Please refer to the installation guidance manual which supplied with indoor units for their respective installation.

4.2.1 Lifting method

1. When carrying the unit suspended, pass the ropes under the unit and use the two fork lift slots each at the front and rear.
2. Always lift the unit with ropes attached at four points so that impact is not applied to the unit.
3. Attach the ropes to the unit at an angle of 40° or less.
4. Use two ropes at least 7 m long.

⚠CAUTION

Be very careful when carrying the product.

- PP bands are used to pack some products. Do not use them as a mean for transportation because they are dangerous.
- Do not touch heat exchanger fins with your bare hands. Otherwise you may get a cut.
- Tear plastic packaging bag and scrap it so that children cannot play with it. Otherwise plastic packaging bag may suffocate children to death.
- When carrying in outdoor unit, be sure to support it at four points. Carrying in and lifting with 3-point support may make outdoor unit unstable, resulting in a fall of it.

4.2.2 Inspecting and handling the unit

At the time of delivery, the package should be checked for any damage from out side and inside, If damaged then it should be reported to the carrier claims agent immediately . When handling the unit refer to following cautions:

1. Handle the unit with care. Keep the unit upright in order to avoid inside components damage.
2. If a forklift is to be used it should pass the forklift arms through the openings at the bottom of the unit.
3. If a crane is used, lift the unit preferably with 2 ropes of at least 7m length.
4. When lifting the unit with a crane, always use protectors to prevent belt damage and pay attention to the position of the unit's center of gravity.
5. Bring the unit in original package to prevent damage during local transport.

4.3. Foundation

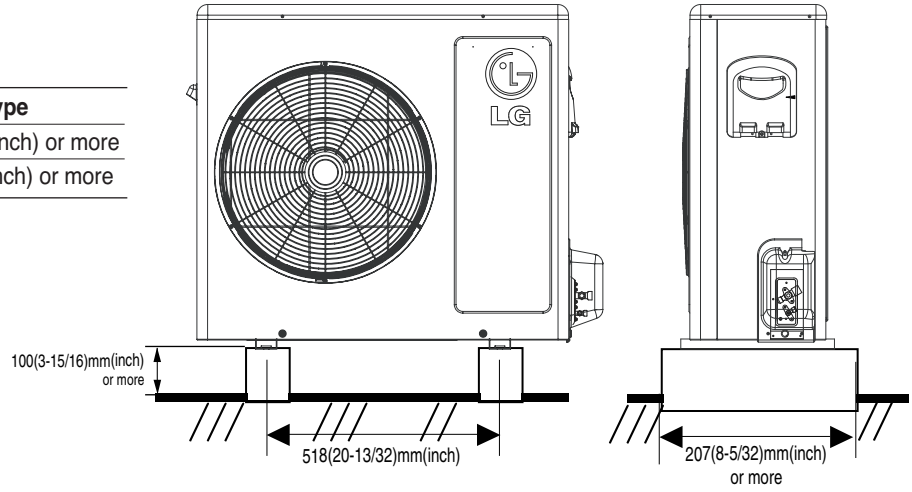
SINGLE A

For good drain of outdoor unit, keep the bottom height from icing upward.

AUUW243E[LUU246HV]

<Basic intensity>

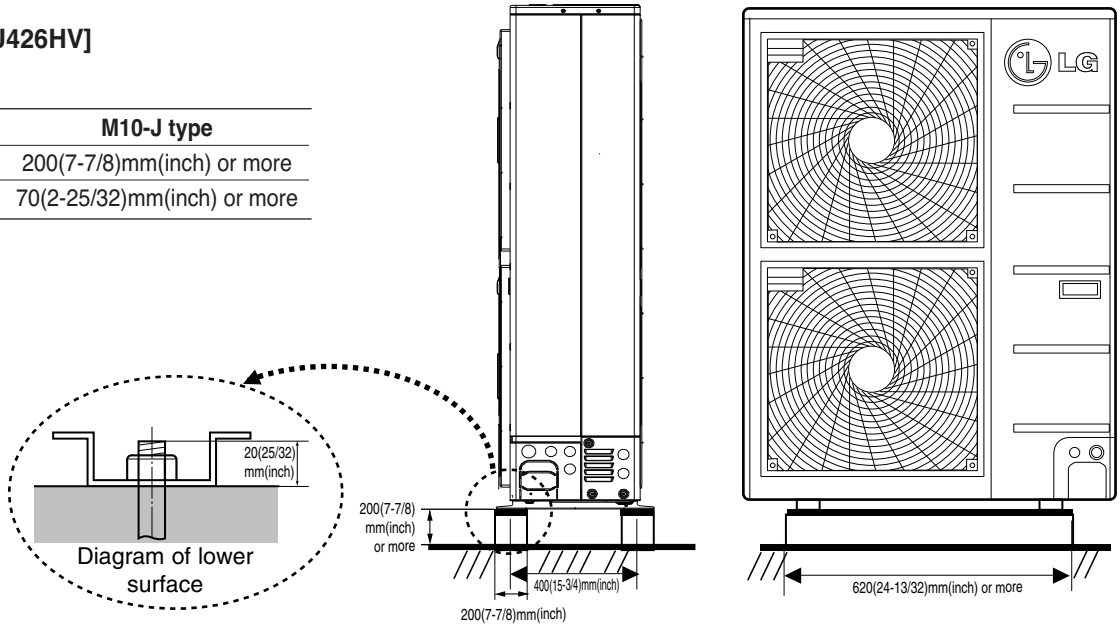
Bolt Factor	M10-J type
Concrete height	100(3-15/16)mm(inch) or more
Bolt inserted depth	70(2-25/32)mm(inch) or more



AUUW423E[LUU426HV]

<Basic intensity>

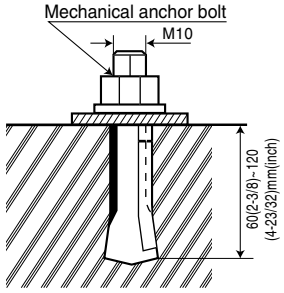
Bolt Factor	M10-J type
Concrete height	200(7-7/8)mm(inch) or more
Bolt inserted depth	70(2-25/32)mm(inch) or more



4.4 Settlement of the outdoor unit

- Anchor the outdoor unit with a bolt and nut tightly and horizontally on a concrete or rigid mount.
- When installing on the wall, roof or rooftop, anchor the mounting base securely with a nail or wire assuming the influence of wind and earthquake.
- In the case when the vibration of the unit is conveyed to the house, secure the unit with an anti-vibration rubber.

Bolt construction work



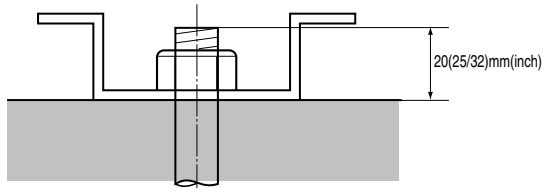
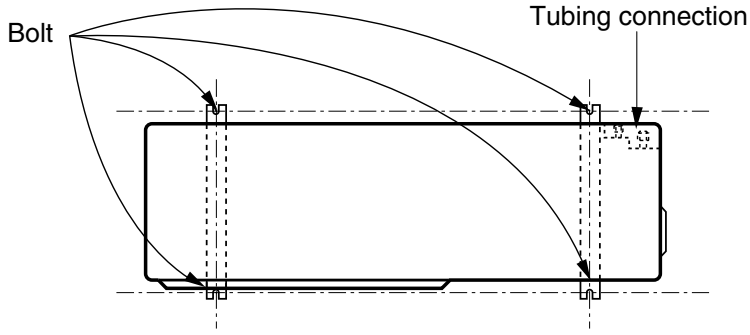


Diagram of lower surface

Settlement draw of outdoor units



⚠CAUTION

- The ingredients of foundation : Cement : Sand : Gravel for the concrete should 1 : 2 : 4 ratio
- The foundation surface should be finished with mortar.
- The edges of foundation should be rounded.
- A drain passage should be made around the foundation to thoroughly drain water away from the equipment installation area.
- If installing the outdoor units on the roof, the roof's strength have to be checked.
- Care should be taken for weather - proofing
- Blocking all gaps of outdoor unit, for passing piping and wiring, using sealing material (Field supply) (Animals and bugs might enter in the machine.)

4.5 Selection of the best location

This Single A unit is suitable for installation in a residential and commercial environmental situation.
If installed near a household appliance it can cause electromagnetic interference.
The units should be installed in a location that meets the following requirements:

1. A robust and strong base which can support the weight of the unit and will not degrade easily
2. If an awning is built over the unit to prevent direct sunlight or rain exposure, make sure that the discharge air of the condenser is not restricted.
3. It is recommended that the outdoor unit should be fenced to avoid animals or plants being exposed in the direct path of the discharged air .
4. Ensure proper spaces between the unit and its surrounding as given in the figure.
5. Ensure that the water shall not cause any damage by overflowing in case of water condensation
6. The noise, vibration and hot discharged air of the outdoor unit should not annoy the surrounding environment.
7. Ensure that there is no damage to the pipes in long run as it may cause the refrigerant leakage.
8. In case the outdoor may have heavy snow :
   a. Make foundation at a suitable height not for ice to grow upward.
   b. Fit a suitable hood or a awning over the unit not to attach outdoor unit heat exchanger directly.
   c. In very cold snowing area, please consult with your consultant.
9. Rooftop Installations : If the outdoor unit is installed on a roof structure, be sure to level the unit. Ensure the roof structure and anchoring method are adequate for the unit location. Consult local codes regarding rooftop mounting.

⚠CAUTION

An inverter air conditioner can cause electronic noise generated from broadcasting frequency. Make sure to maintain proper distances between the products and electric wires keeping away from stereo, TV set or other appliances
1. Branch switch, over current breaker
2. Remote controller
3. Cool/heat selector
4. Radio or TV set
5. Wireless microphone

If frequency signal of AM broadcasting or TV Set is non stable, keep distances of 3m or more from product and use electric wire along with conduit tubes for power and transmission cable.

⚠CAUTION

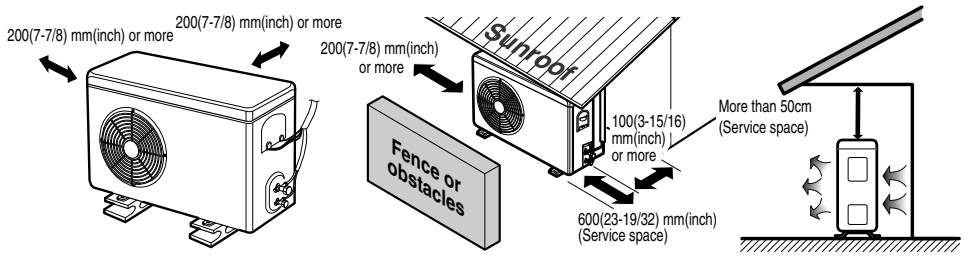
1. Actually the R410A refrigerant is not toxic, nonflammable and odor free. Any how if the refrigerant is leaked then its concentration may exceed the allowable limit depending on the related space volume.
   Due to this, it is necessary to take measures for the volume size against leakage.
2. Do not install unit in following locations.
   - Locations where sulfurous acids or this kind of other corrosive gases might be help to corrode of copper piping and soldered joints, and can cause refrigerant leakage.
   - Locations such as kitchens or cuisine which contain a lot of hot oil or steam or where oil may splatter to the product. Can cause the unit to make leak or other serious problem.
   - Locations where electromagnetic waves is prevalent. The electromagnetic waves may cause the control system to malfunction or causing an abnormal operation.
   - Locations where inflammable gas might leak, where combined gasoline, methane or other volatile substances, carbon dust and other incendiary substances are found in the atmosphere. Leaked gas may accumulate around the unit, can cause an serious explosion.

4.6 Clearance space

4.6.1 Clearance around outdoor unit

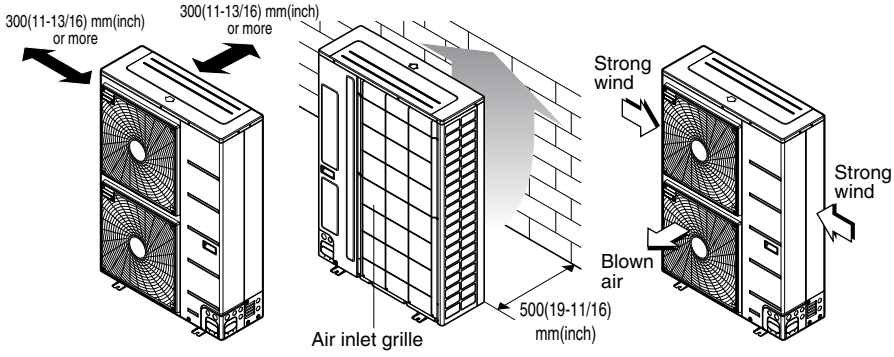
SINGLE A

AUUW243E[LUU246HV]



- Ensure that the space around the back is more than 200(7-7/8) mm(inch) on the opposite to the PCB side and secure 600(23-19/32) mm(inch) space near the compressor and PCB side of the aircondition for service.

AUUW423E[LUU426HV]



- Install the unit so that its discharge port faces to the wall of the building.
  Keep a distance 500(19-11/16) mm(inch) or more between the unit and the wall surface.
- Supposing the wind direction during the operation season of the air conditioner, install the unit so that the discharge port is set at right angle to the wind direction.

Turn the air outlet side toward the building's wall, fence or windbreak screen.

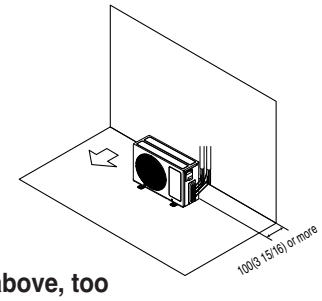
Set the otlet side at a rignt angle to the direction of the wind.

Clearance of side discharge unit [unit : mm(inch)].

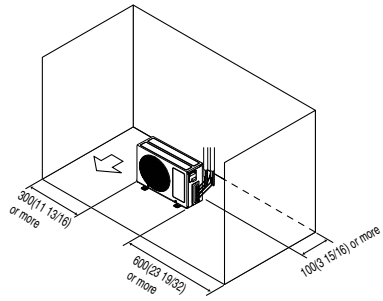
1) Where there is an obstacle on the air intake side:

■ **No obstacle above**

• Obstacle on the suction side only

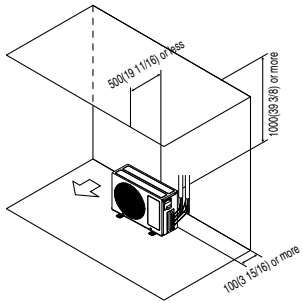


• Obstacle on the both sides

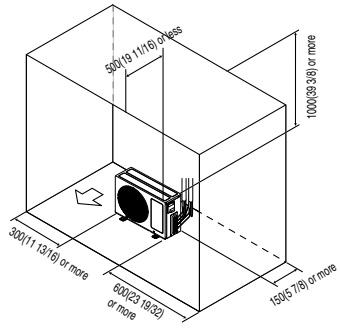


■ **Obstacle above, too**

• Obstacle on the air intake side, too

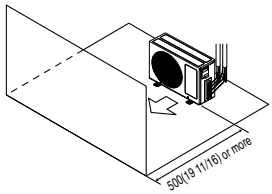


• Obstacle on the air intake side, and both sides

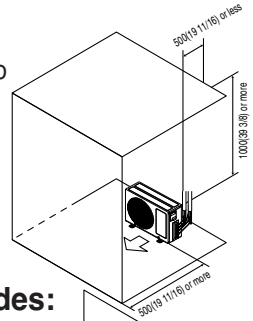


2) Where there is an obstacle on the discharge side:

■ **No obstacle above**



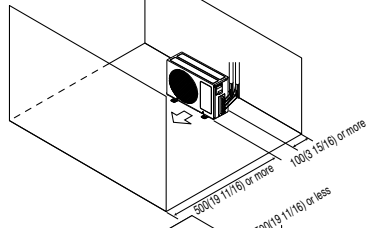
■ Obstacle above, too



3) Where there are obstacles on both suction and discharge sides:

■ **Where the obstacles on the discharge side is higher than the unit:**

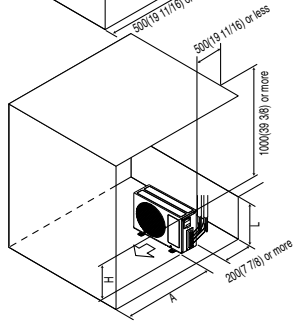
• No obstacle above



• Obstacle above, too

The relations between H, A and L are as follows:

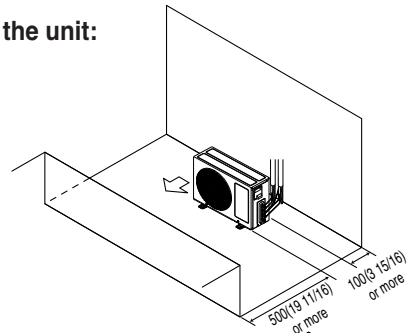
	L	A[mm(inch)]
L ≤ H	0 < L ≤ 1/2H	750(29 1/32)
	1/2H < L	1 000(39 3/8)
H < L	Set the stand as: L ≤ H	



Close the bottom of the installation frame to prevent the discharged air from being bypassed.

■ **Where the obstacles on the discharge side is lower than the unit:**

• No obstacle above

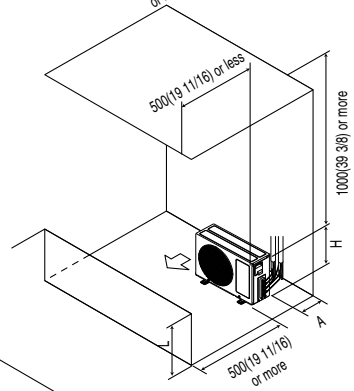


• Obstacle above, too

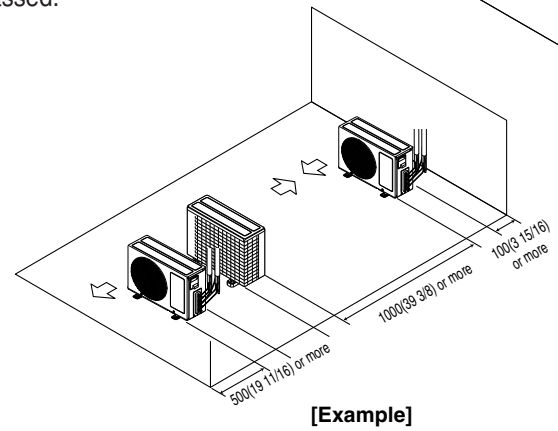
The relations between H, A and L are as follows:

	L	A[mm(inch)]
L ≤ H	0 < L ≤ 1/2H	100(3 15/16)
	1/2H < L	200(7 7/8)
H < L	Set the stand as: L ≤ H	

Close the bottom of the installation frame to prevent the discharged air from being bypassed.



4) Series installation

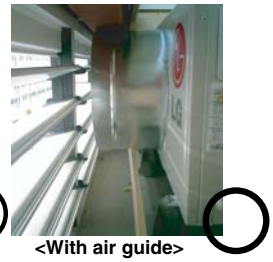


4.6.2 Air guide work

In case of out door unit is located outdoor cabin of apartment or flats, then the efficiency can drop and system pressure increases thus finally damaging the compressor or other components in the system by heat short circuit.

[Example]

<Without air guide>
Safety dorice activation



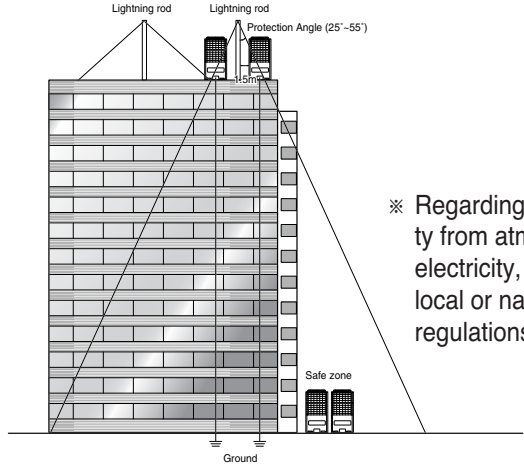
<With air guide>
Normal operation

4.6.3 Lightning safety zone

1) To protect outdoor unit from lightning, it should be placed within lightning safety zone.

Safety zone

Building Height [ft]	66	98	148	197
Protection Angle [˚]	55	45	35	25



2) Power cable and communication cable should be 4.9ft away from lightning rod.

3) High resistance grounded system should be performed against induced lightning or indirect stroke.

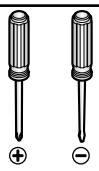
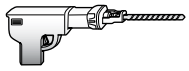
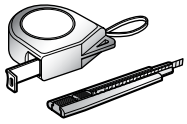
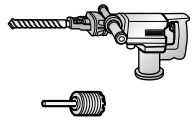
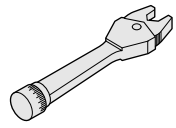
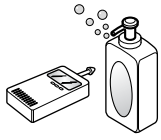
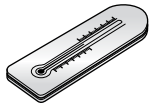
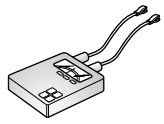
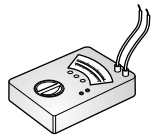
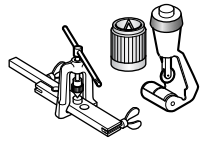
4) If the building has no lightning protection, outdoor may be damage from lightning. This should be informed to customer or building owner in advance.

※ Regarding the safety from atmosphere electricity, follow the local or national regulations

4.7 Outdoor unit piping

4.7.1 Outdoor unit piping

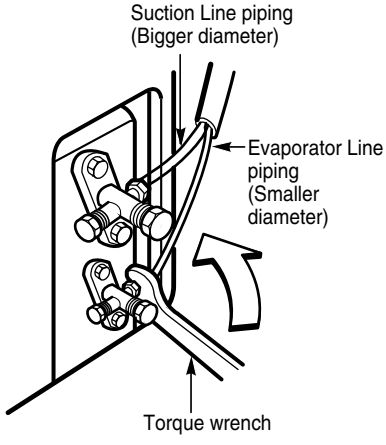
Required tools

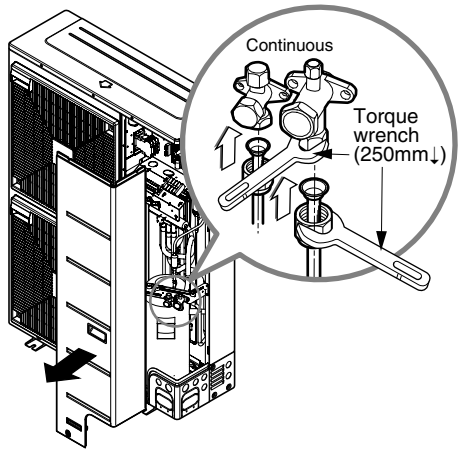
					
Screw Driver	Drill M/C f 3.5/F14.5	Measuring Tape, Blade	Core drill	Spanner	Torque Wrench
					
Soap Foam	Thermometer	Hexagonal wrench(4mm, 5mm)	Hook Meter	Multi Tester	Flare Set

4.7.2 Connecting piping

Tighten the flare nut with torque wrench until the wrench clicks.

• When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.





❊ When tighten the pipe, hold the haxagonal body.

4.8 Outdoor unit installation requirments

4.8.1 Piping elevation and length

Capacity	Pipe Size Unit : mm(inch)		Length A Unit : [m(ft)]		Elevation Unit : [m(ft)]		*Additional refrigerant Unit: g/m(oz/ft)
	Gas	Liquid	Standard	Max.	Standard	Max.	
23,000 Btu/h	15.88 (5/8)	9.52 (3/8)	7.5(24.6)	50(164) Cassette type 30(98) Floor standing type	5(16)	30(98) Cassette type 20(66) Floor standing type	35(0.38)
41,000 Btu/h	15.88 (5/8)	9.52 (3/8)	7.5(24.6)	50(164) Cassette type 40(131) Floor standing type	5(16)	30(98) Cassette type 25(82) Floor standing type	40(0.43)

⚠CAUTION

1. Regulation for refrigerant leakage
   : the amount of refrigerant leakage should satisfy the following equation for human safety.

$$\frac{\text{Total amount of refrigerant in the system}}{\text{Volume of the room at which indoor unit of the least capacity is installed}} \leq 0.3 \ (\text{kg} / \text{m}^3)$$

2. If the above equation can not be satisfied, then follow the following steps.

① Selection of air conditioning system: select one of the followings.
- Effective opening part Installation
- Reconfirmation of outdoor unit capacity and piping length
- Reduction of the amount or refrigerant
- 2 or more security device installation of alarm for gas leakage

② Change indoor unit type
: installation position should be over 2m from the floor (Wall mounted type Cassette type)

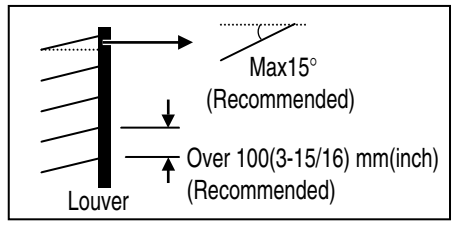
③ Adoption of ventilation system
: choose ordinary ventilation system or building ventilation system

④ Limitation in piping work
: design for earthquake-proof and prevention against thermal stress

4.9 Outdoor unit cabin

4.9.1 Outdoor Cabin louver requirement

1. Outdoor cabin type : Manual door open type
2. Louver angle : less than 15° on the horizontal base
3. Louver interval: over 100(3-15/16) mm(inch) (recommend)
4. Louver shape : wing type or plane type

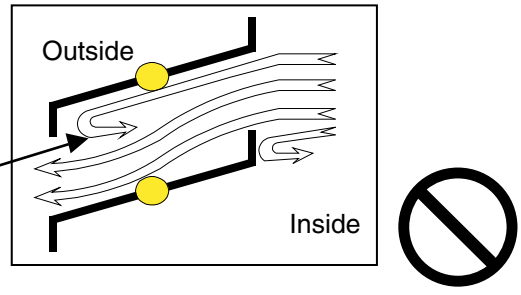


Section

CAUTION

- Opening rate and suction should be considered for louvered outdoor room.
- Do not use 'S' type louver.

Noise can occur due to the backward flow of the air passing through the louver blade

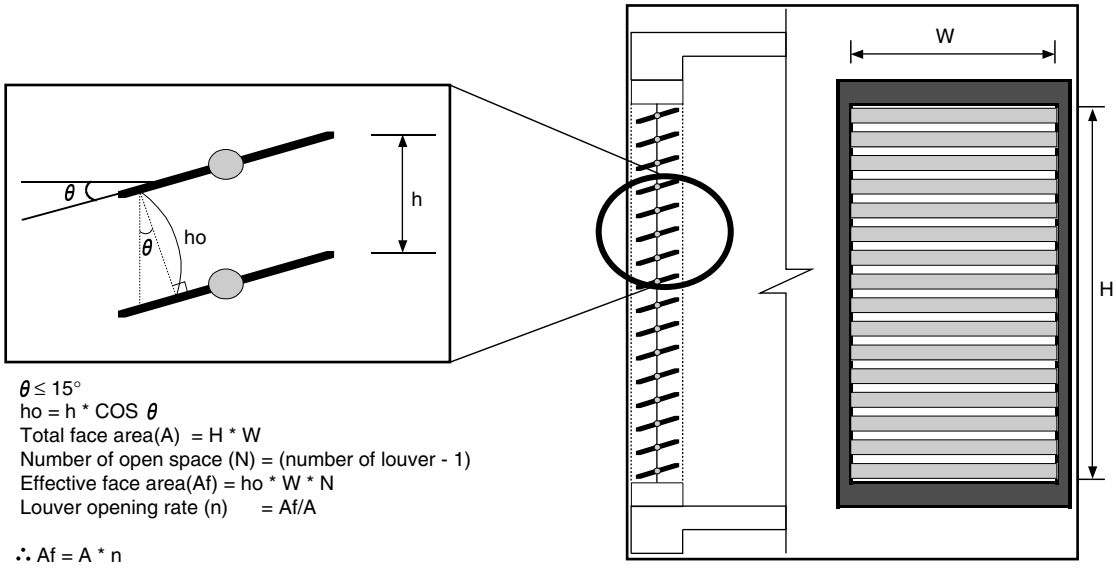


NOTE

The problem in case the louver opening rate is small.

1. Noise can occur due to the increased velocity of the air passing through louver blade.
2. Noise can occur due to the louver blade vibrations.
3. Drop in outdoor fan performance (Excess static pressure damage can cause drop in the performance as well as outdoor heat exchange efficiency).
4. In case the louver opening rate is small or there is insufficient air flow exchange, it might stop the air conditioner.

Opening rate by louver radian



$\theta \leq 15°$
ho = h * COS θ
Total face area(A) = H * W
Number of open space (N) = (number of louver - 1)
Effective face area(Af) = ho * W * N
Louver opening rate (n) = Af/A

$\therefore$ Af = A * n

Effective face area of cross section

[Side view] **[Front view]**

Part 4 Accessories

1. Mechanical accessories
1.1 Cassette cover

Models : PTDCM

Picture:

Functional Description:

Maintains the ceiling elegance.

- Covers the side area of cassette.
- Gives elegant looks.
- Light weight..
- Suitable when false ceiling is unavailable.

LG
Life's Good

P/No.: MFL62069302

LG Electronics

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Yeouido P.O.Box 335 Seoul,
150-721, Korea.
http://www.lgeaircon.com

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The specifications, designs, and information in this brochure are subject to change without notice.

The air conditioners manufactured by LG have received ISO9001 certificate for quality assurance and ISO14001 certificate for environmental management system.