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Order No.	CWROM-1606-00629
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작업자	연구실 담당자
희령	이상훈

개정일자 :2016-6-1

QA 요청사항 : 1. 원고에 지시된 대로 작업한 후 이상없이 작업 되었는지 재차 검토 후 PDF 파일을 생성한다.
2. 작업완료 후 담당 연구원에게 수정부분에 대한 검증요청한다.
(*** 반드시 필요 - 의뢰자가 요청한 의도대로 작업이 정확히 되었는지 반드시 확인이 필요함)
3. 아래 체크리스트에 따라 놓치기 쉬운 사항을 우선으로 한번 더 확인한다.

* 필수확인 - QA요구사항

작업원고와 수정내용이 일치하는가?	X 예
언어표시띠의 위치(누락여부)는 바른가?	X 예
약물(기호)이 깨지거나 위치가 어긋 난 곳은 없는가?	X 예
그림이 가려지거나 잘려나간 곳은 없는가?	X 예
바코드와 P/No.가 일치하는가? (바코드 확인)	X 예

*최종 확인후 본 체크리스트는 삭제됩니다.

ENGLISH

ESPAÑOL

INSTALLATION MANUAL

AIR CONDITIONER

Please read this installation manual completely before installing the product.
Installation work must be performed in accordance with the national wiring standards by authorized personnel only.
Please retain this installation manual for future reference after reading it thoroughly.

AHU EXPANSION KIT

PATX13A0E PATX20A0E PATX25A0E
PATX35A0E PATX50A0E

P/NO : MFL62049615

www.lg.com

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Safety Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed.

■ Incorrect operation due to ignoring instruction will cause harm or damage. The seriousness is classified by the following indications.

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

■ Meanings of symbols used in this manual are as shown below.

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

⚠WARNING

■ Installation

System air conditioner can only be installed by specialized service provider with air condition installation certifications.

- Inappropriate installation can cause leakage, fire and electric shock.

When moving or reinstalling the air conditioner, please contact the MULTI V$_{TM}$ AHU installation service provider.

- Inappropriate installation can cause leakage, fire and electric shock.

Do not disassemble, repair or reconfigure the product arbitrarily.

- It can cause a fire and electric shock.

Do not store or use flammable gas or volatile substance near the air conditioner.

- It can cause a fire or problem to the product.

Do not mix existing R22 pipe and installation products for the installation.

- When you mix the mineral oil of R22 and R410A oil (PVE), it can decompose with water to cause problems to the product.

Do not mix other refrigerant with the designated refrigerant (R410A) during the installation or moving the air conditioner.

- When other refrigerant is mixed with the original refrigerant, it can cause a problem in the refrigerant cycle and damage the product.

Do not use the existing manifold gauge for R22 refrigerant.

- To charge the refrigerant stably, always use the manifold gauge for high pressure (R410A).

Install the air conditioner at a designated location using the designated material.

- Heat exchanger inlet/outlet pipe location.

■ Operation

Make sure that water does not get inside the product (Controller). Especially, do not clean the product with water.

- It can cause electric shock and problems.

When the air conditioner is submersed in water, always consult MULTI V™ AHU installation service provider.

- It can cause a fire and electric shock.

Do not keep any heating devices near the product.

- It can cause a fire.

Do not install the air conditioner outdoors.

- If installed outdoor inevitably, consult Multi V™ AHU installation service provider.

Do not let any worker or user climb on top of the product.

- The person can get seriously injured.

⚠ CAUTION

■ Installation

After the product installation and repair, always check for gas leakage.

- It can cause problems in the product.

When installing the product, always make sure to level to the product.

- It can cause vibration and leakage.

Do not install the product where flammable gas leaks.

- It can cause a fire and problems to the product.

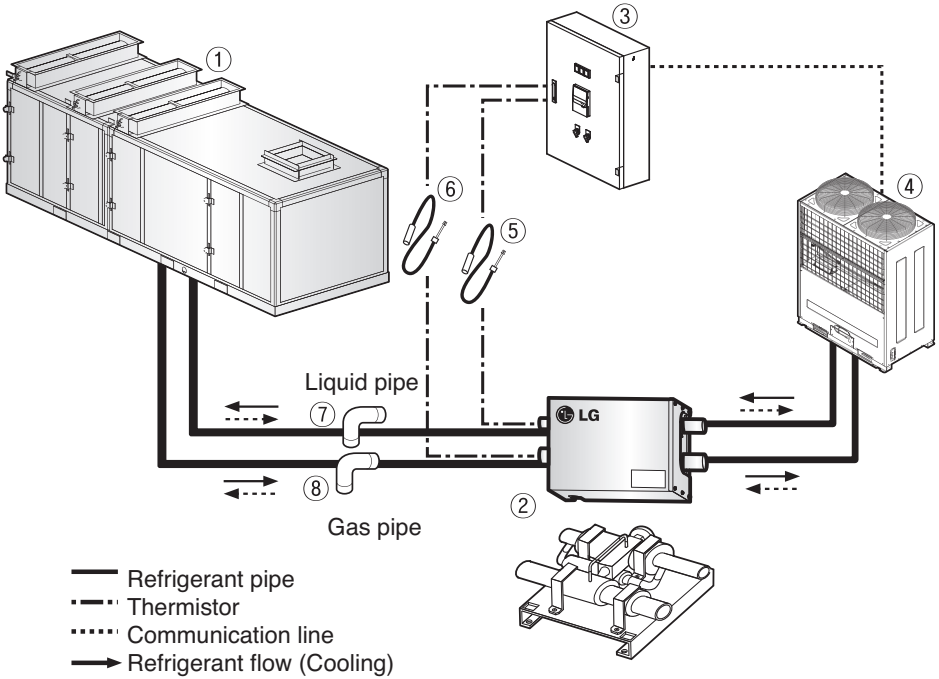
■ Operation

If the refrigerant leaked while installing the product, always ventilate the room.

- The refrigerant gas can react with the fire to turn into hazardous gas to cause an accident.

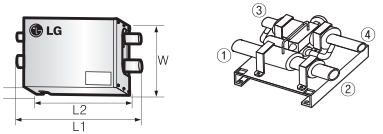
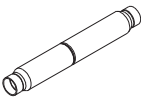
Installation Scene

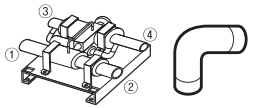
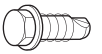
This EXPANSION KIT is the product connecting AHU and Outdoor unit configured as follows.



Installation components				
No.	**Name**		**Remarks**	
①	Air Handling Unit		-	
②	EXPANSION KIT	Connectable outdoor unit capacity		
		PATX13A0E	8 ~ 16 HP	
		PATX20A0E	18 ~ 26 HP	
		PATX25A0E	28 ~ 36 HP	
		PATX35A0E	38 ~ 46 HP	
		PATX50A0E	48 ~ 56 HP	
③	AHU control box		-	
④	Outdoor unit		Multi-V™	
⑤	Thermistor IN		Sensor: Ø5, Length: 10m, Line color: Black	
⑥	Thermistor OUT		Sensor: Ø7, Length: 10m, Line color: Red	
⑦ ⑧	90° Elbow	PATX13A0E	⑦: Ø15.88	⑧: Ø22.22
		PATX20A0E	⑦: Ø22.2	⑧: Ø28.58
		PATX25A0E	⑦: Ø28.58	⑧: Ø34.92
		PATX35A0E	⑦: Ø34.92	⑧: Ø41.3
		PATX50A0E	⑦: Ø34.92	⑧: Ø41.3

Supplies

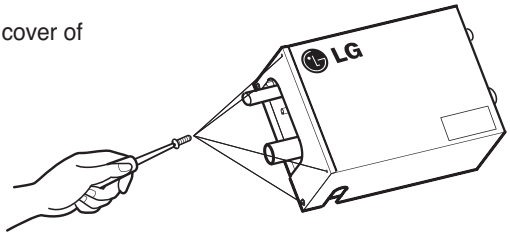
q	EXPANSION KIT	TXV V/V	CHECK V/V
Model naame			
PATX13A0E	- Pipe diameter (mm) ① ② :22.2 ③ : 15.88 ④ : 15.88 - L1 x L2 x W x H(mm) : 491 x 331 x 238 x 174 - Weight (NET/GROSS, kg): 5.6/6.9	- Norminal capacity : 20RT - Applied Outdoor unit capacity : 18~26HP	- Flow rate : 37l /min
PATX20A0E	- Pipe diameter (mm) ① ② :28.58 ③ : 22.2 ④ : 15.88 - L1 x L2 x W x H(mm) : 491 x 331 x 238 x 174 - Weight (NET/GROSS, kg): 5.8/7.1	- Norminal capacity : 20RT - Applied Outdoor unit capacity : 18~26HP	- Flow rate : 37l /min
PATX25A0E	- Pipe diameter (mm) ① ② :34.92 ③ : 28.58 ④ : 22.22 - L1 x L2 x W x H(mm) : 491 x 331 x 238 x 174 - Weight (NET/GROSS, kg): 6.0/7.3	- Norminal capacity : 25RT - Applied Outdoor unit capacity : 28~36HP	- Flow rate : 59l /min
PATX35A0E	- Pipe diameter (mm) ① ② :41.3 ③ : 34.92 ④ : 28.58 - L1 x L2 x W x H(mm) : 491 x 331 x 238 x 174 - Weight (NET/GROSS, kg): 6.2/7.5	- Norminal capacity : 35RT - Applied Outdoor unit capacity : 38~46HP	- Flow rate : 59l /min
PATX50A0E	- Pipe diameter (mm) ① ② :41.3 ③ : 34.92 ④ : 28.58 - L1 x L2 x W x H(mm) : 561 x 331 x 291 x 192 - Weight (NET/GROSS, kg): 8.5/10	- Norminal capacity : 50RT - Applied Outdoor unit capacity : 48~56HP	- Flow rate : 85l /min

	90° Elbow		Thermistor IN	Thermistor OUT	Installation screw	Installation manual
Model name						Installation manual
	①(mm)	③(mm)				
PATX13A0E	22.2	15.88	- Quantity: 1 unit - Sensor: Ø5 Length: 10m - Line color: Black	- Quantity: 1 unit - Sensor: Ø7 Length: 10m - Line color: Red	- Quantity: 4 screws - Self drilling screw (Direct screw) - 20mm	- Quantity: 1 unit
PATX20A0E	28.58	22.2				
PATX25A0E	34.92	28.58				
PATX35A0E	41.3	34.92				
PATX50A0E	41.3	34.92				

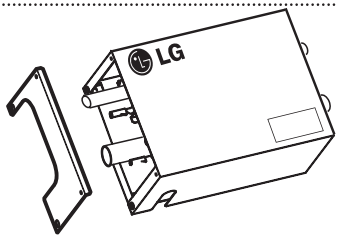
EXPANSION KIT Installation

Mechanical installation

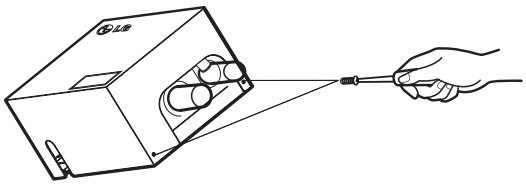
1. Unscrew the 4 screws on the side cover of EXPANSION KIT.



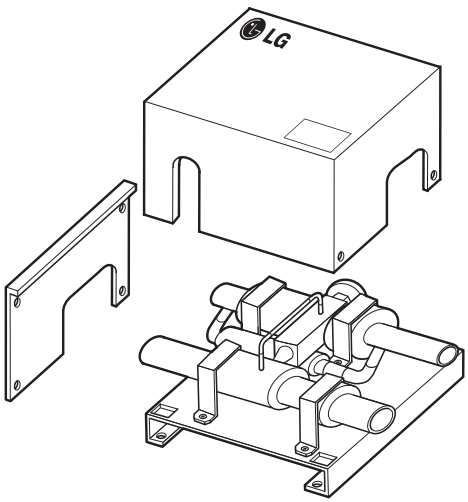
2. Disassemble the side cover.



3. Unscrew the 2 screws on the top cover.



4. Disassemble the top cover.

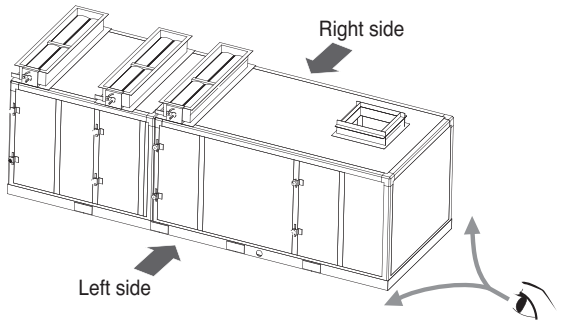


5. Check the location and direction to install EXPANSION KIT on the AHU.

⚠CAUTION

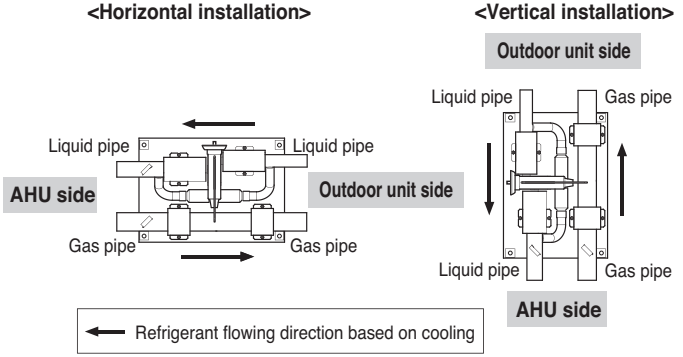
■ **EXPANSION KIT must be installed at the location and direction described on the installation manual. If not, it can cause problems.**

Installation location of EXPANSION KIT



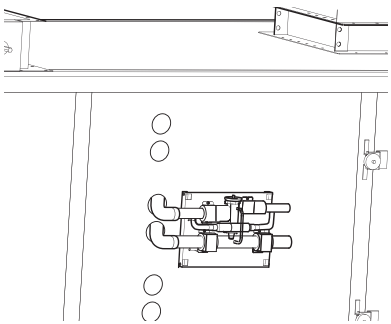
AHU		EXPANSION KIT	
Heat exchanger pipe direction	Checking door direction	Installation location	Installation direction
Left side	Left side	Left side	Horizontal installation
Left side	Right side	Left side	Horizontal installation
Right side	Left side	Right side	Horizontal installation
Right side	Right side	Right side	Vertical installation

Installation direction of EXPANSION KIT

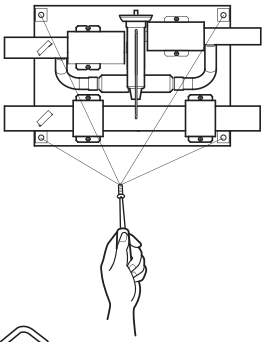


- You have to install EXPANSION KIT according to the installation location and direction provided in the upper table according to the heat exchanger pipe and checking door direction of AHU.

6. Use the installation component 90° elbow to connect AHU and EXPANSION KIT.



7. Use the installation screw to tighten 4 locations of the AHU casing and EXPANSION KIT.



8. Weld 4 connecting locations of AHU heat exchanger pipe and 90° elbow and EXPANSION KIT pipe.

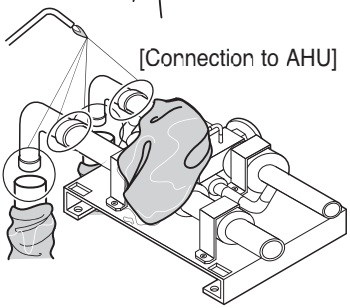
9. Weld the connecting pipe (Field supply) connected to the side of the outdoor unit.

10. When connecting the pipe on Outdoor unit and EXPANSION KIT, always use the socket (Field supply) that fits the specification.

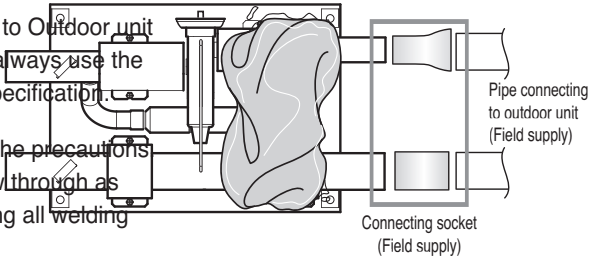
11. As the size of the pipe connected to Outdoor unit and EXPANSION KIT can differ, always use the socket Field supply that fits the specification.

12. During all welding, always follow the precautions. Always have the nitrogen gas flow through as shown in the following figure during all welding processes.

[Connection to AHU]



[Connection to outdoor unit]

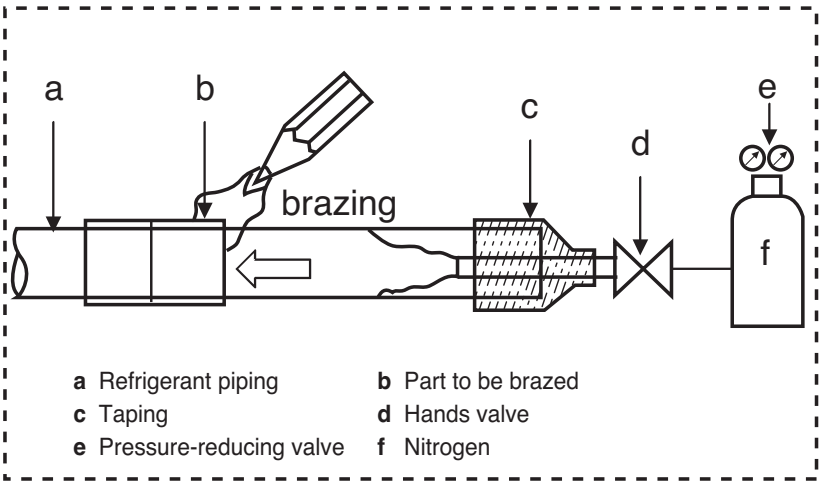


Brazing work

⚠CAUTION

■ Be sure to carry out a nitrogen blow when brazing.
Brazing without carrying out nitrogen replacement or releasing nitrogen into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.

■ When brazing while inserting nitrogen into the piping, nitrogen must be set to 0.02 MPa with a pressure-reducing valve(just enough so that it can be felt on the skin).



a Refrigerant piping **b** Part to be brazed
c Taping **d** Hands valve
e Pressure-reducing valve **f** Nitrogen

■ The leakage test is executed by pressurizing nitrogen gas up to 3.8MPa(38.7kgf/cm^2)
(The test must be done with the service valve of the outdoor unit closed and the gas must be pressurized at the liquid pipe, gas pipe and high/low pressure common pipe of the outdoor unit), and the pressure of the nitrogen gas must not drop for 24 hours.

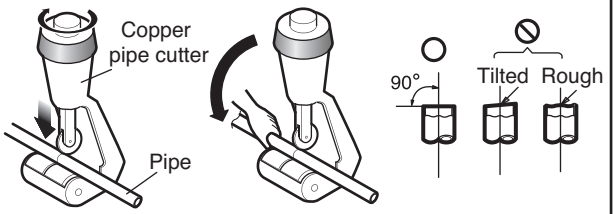
■ For more details, refer to the manual of the outdoor unit.

Pipe cutting work

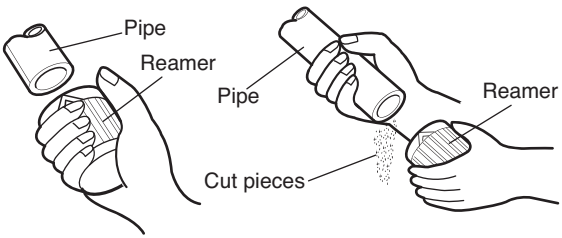
1. Always use the copper pipe cutter when cutting the pipe.

⚠CAUTION

■ **Always cut in a straight line for the cut part.**



2. Always remove the burr.
(Keep the end of the pipe facing down during the work and make sure that the burr does not get inside the pipe.)



⚠CAUTION

■ **If the burr gets inside, it can cause leakage of refrigerant. Therefore always remove the burr with a reamer.**
■ **Cut pieces can cause problems when they go inside the pipe.**

⚠CAUTION

■ **When welding the part, always pass it through nitrogen. If not, the compressor may not work or can be damaged.**
■ **Before/After the welding, wrap the area with a wet water cloth. If not, the part can be damaged.**
■ **Use a protective panel or pay special attention so that the welding torch flame does not directly touch AHU casing.**
■ **After the welding, always do a leakage test.**

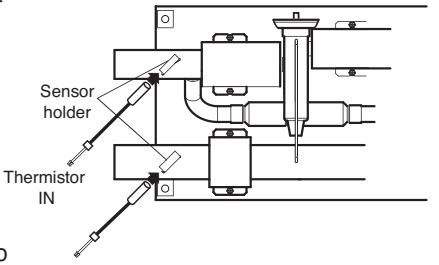
⚠WARNING

■ **Always make sure that the refrigerant is not leaking during the welding.**
■ **When the refrigerant is burnt, it generates a toxic gas hazardous to the human body.**
■ **Do not proceed the welding work in a closed location.**
■ **After the pipe welding, always do a leakage test.**

Thermistor connection

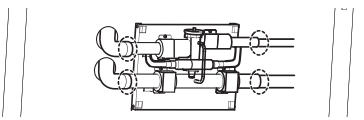
1. Insert the Thermistor IN/OUT to the correct location on the sensor holder.

2. Set the same inserting location of the Thermistor as shown in the picture.



3. Insert the Thermistor so that it is inserted to the end of the sensor holder.

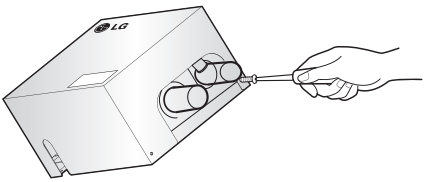
4. After the Thermistor is inserted, insulate the welded part with insulation material (15T or above).



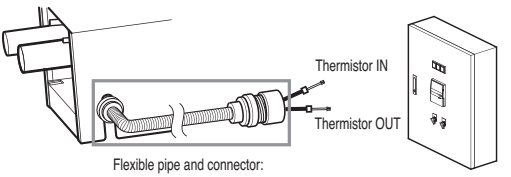
Insulate 4 location of the connecting part

5. Assemble the Top cover of EXPANSION KIT and tighten 2 screws.

6. Use the flexible pipe and connector for the 2 types of connected Thermistor to pull them out of EXPANSION KIT.



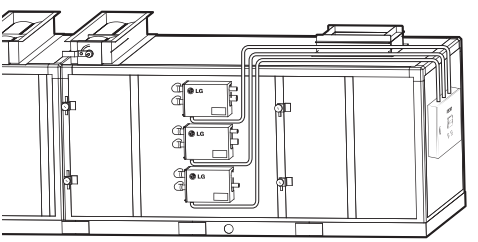
7. Always pull the Thermistor using the flexible pipe and use specified product (Ø16) for the flexible pipe and connector.



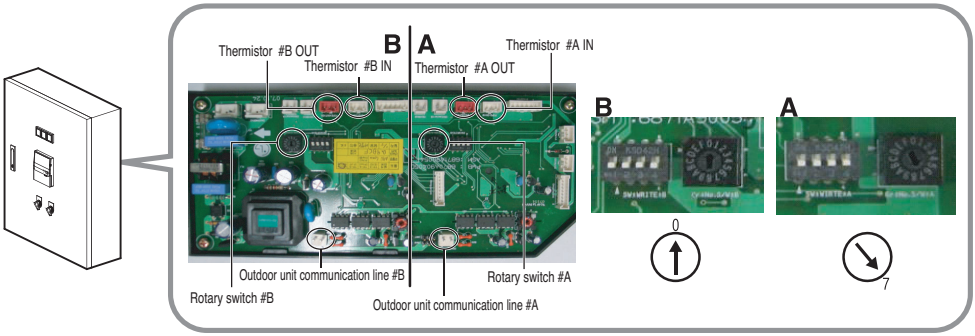
Flexible pipe and connector:
Ø16 (Field supply)

8. Assemble the side cover of EXPANSION KIT and screw the 4 screws.

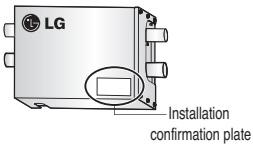
9. Fixate the flexible pipe inserted with the Thermistor to the AHU external casing, and connect it all the way to the AHU control box.



[COMMUNICATION PCB CONFIGURATION]



10. Distinguish and connect the IN and OUT on the Thermistor terminal on the communication PCB inside AHU CONTROL KIT.
11. Check the rotary switch number and write the installation confirmation plate of EXPANSION KIT.
    The error number displayed on AHU Controller in case of an error is displayed for the rotary switch number, and error on Outdoor unit can be easily estimated during the service.



⚠CAUTION

■ **2 EXPANSION KIT and Outdoor unit are connected to one communication PCB, and each is classified and connected.**

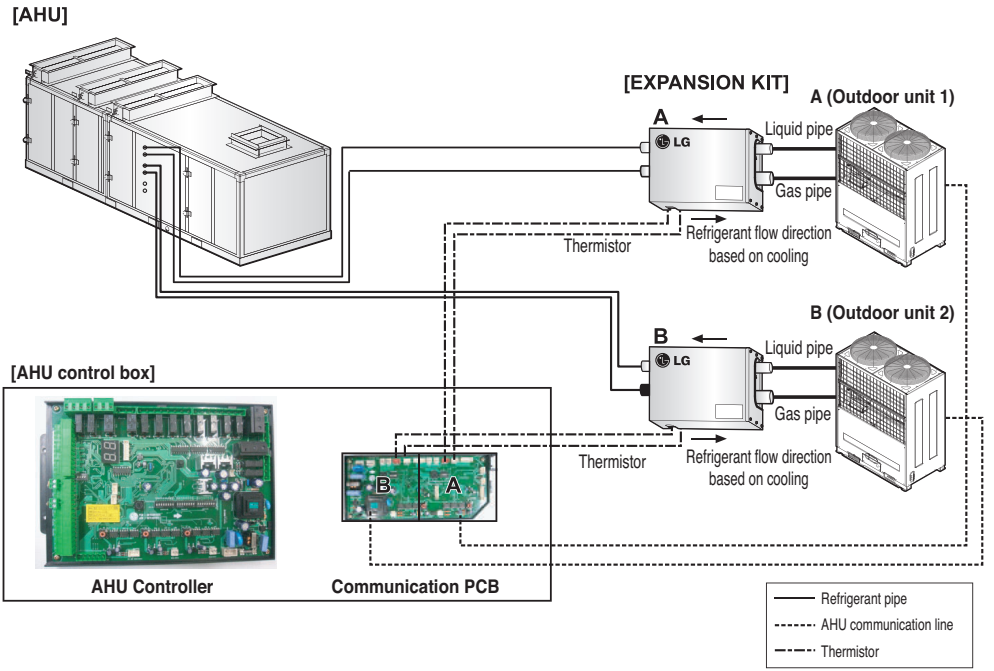
Ex) EXPANSION KIT A, Outdoor unit A, outdoor communication line A, thermistor A IN, thermistor A OUT

➔ All connected to A circuit

EXPANSION KIT B, Outdoor unit B, outdoor communication line B, thermistor B IN, thermistor B OUT

➔ All connected to B circuit

[INSTALLATION CONFIGURATION EXAMPLE]



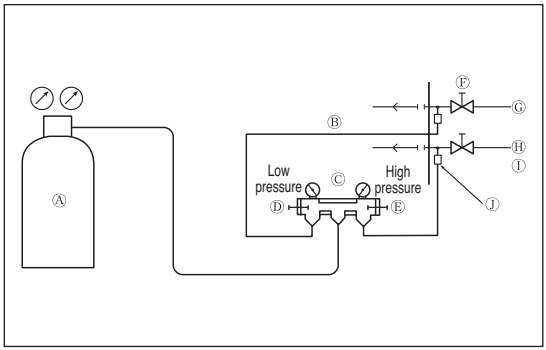
Leakage and vacuum test

Leakage test

Execute the leakage test in the same criteria as MULTIV™ leakage test.

Leakage test is done by apply nitrogen gas at 3.8MPa (38.7kgf/cm³). Refer to the following picture for the test method. (Test with the service valve closed and pressurize the liquid and gas pipe.)

After the nitrogen gas is pressurized, the pressure must not drop for 24 hours.



Ⓐ Nitrogen gas
Ⓑ Indoor unit direction
Ⓒ Manifold gauge
Ⓓ Low pressure side handle
Ⓔ High pressure side handle
Ⓕ Service valve
Ⓖ Gas pipe
Ⓗ Liquid pipe
Ⓘ Outdoor unit
Ⓙ Service port

Vacuum test

Execute the vacuum test in the same criteria as MULTIV™ vacuum test.

As shown in the below picture, close the service valve of the outdoor unit with the vacuum pump and execute the vacuuming process on the connecting pipe and AHU from the service port of the stop valve. (Liquid and gas pipe must always be vacuumed from the service port.)

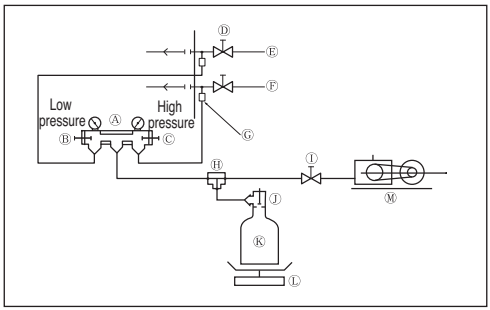
When the vacuum level reaches 5 Torr, additionally vacuum for 1 hour, and the vacuum level must not change for 1 hour. (If there is any change, there should be moisture or leakage within the pipe.)

If there is a possibility of moisture within the pipe, vacuum for 2 hours and insert the nitrogen gas at 0.05Mpa (0.5kgf/cm³).

After this vacuum for another 1 hour to reach 5 Torr. Maintain the vacuum for 1 hour and check for changes in vacuum gauge.

*** Never purge the air with the refrigerant.**

*** Always execute the vacuuming with the vacuum pump with vacuum gauge attached.**



Ⓐ Manifold gauge
Ⓑ Low pressure side handle
Ⓒ High pressure side handle
Ⓓ Service valve
Ⓔ Liquid pipe
Ⓕ Gas pipe
Ⓖ Service port
Ⓗ 3 way joint
Ⓘ Valve
Ⓙ Valve
Ⓚ R410A cylinder
Ⓛ Weight: Use a gravitational weight (Use one that can measure up to 0.1kg) If you cannot get a high precision weight, you can also use the charging cylinder.
Ⓜ Vacuum pump

- Add the accurate amount of refrigerant after the calculation.
- If the amount of refrigerant is not accurate, it can cause problems to the product.
- If the additionally inserted amount of refrigerant exceeds ±10%, the compressor can be burnt and the indoor unit can underperform.

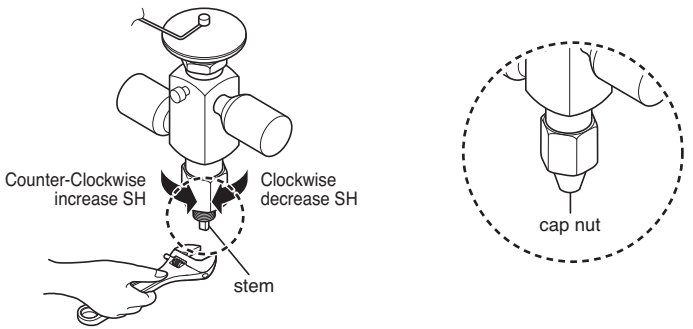
⚠CAUTION

- **Pipe to vacuum: Gas pipe and liquid pipe**
- **When moving the product to a different location, do not charge a different refrigerant than the regulated refrigerant (R410A).**
- **If other refrigerant is mixed to the original refrigerant, it can cause a malfunction in the refrigerant cycle to cause damages.**
- **As the refrigerant composition of R410A changes when inserted in gas condition, always insert the refrigerant in liquid condition.**

Superheat Adjustment

1. After removing the cap nut, turn the stem clockwise to increases superheat / decreases refrigerant flow.

<View of Adjustment Stema>



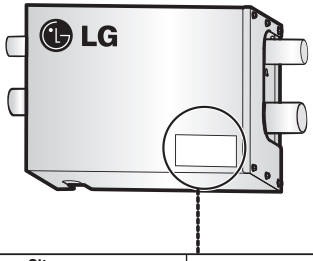
2. Superheat change per 1 turn of adjustment stem according to the evaporator temperature.

Evaporator Temperature	+32°F / 0° C	+41°F / +5° C
Superheat change / turn	2.52°F / 1.4°C	2.16°F / 1.2°C

* Factory setting on preset valves is 9°F / 5°C static superheat.
* Even if the superheat adjustment, system operates according to the logic to meet the target low pressure.

EXPANSION KIT installation confirmation plate preparation

When the installation of EXPANSION KIT is completed, prepare the installation confirmation plate.



Site name		
EXPANSION KIT	Model name	PATX13A0E
	Outdoor unit capacity	8 ~ 16 HP
Outdoor unit	No.	
	Model name	
	Installation location	
Communication PCB rotary S/W No.		
Connecting pipe size (mm)	AHU side	Gas pipe: 22.22 / Liquid pipe: 15.88
	Outdoor unit side	Gas pipe: 22.22 / Liquid pipe: 15.88

Site name		
EXPANSION KIT	Model name	PATX13A0E
	Outdoor unit capacity	8 ~ 16 HP
Outdoor unit	No.	
	Model name	
	Installation location	
Communication PCB rotary S/W No.		
Connecting pipe size (mm)	AHU side	Gas pipe: 22.22 / Liquid pipe: 15.88
	Outdoor unit side	Gas pipe: 22.22 / Liquid pipe: 15.88

Site name		
EXPANSION KIT	Model name	PATX20A0E
	Outdoor unit capacity	18 ~ 26 HP
Outdoor unit	No.	
	Model name	
	Installation location	
Communication PCB rotary S/W No.		
Connecting pipe size (mm)	AHU side	Gas pipe: 28.58 / Liquid pipe: 22.22
	Outdoor unit side	Gas pipe: 28.58 / Liquid pipe: 15.88

Site name		
EXPANSION KIT	Model name	PATX25A0E
	Outdoor unit capacity	28 ~ 36 HP
Outdoor unit	No.	
	Model name	
	Installation location	
Communication PCB rotary S/W No.		
Connecting pipe size (mm)	AHU side	Gas pipe: 34.92 / Liquid pipe: 28.58
	Outdoor unit side	Gas pipe: 34.92 / Liquid pipe: 22.22

Site name		
EXPANSION KIT	Model name	PATX35A0E
	Outdoor unit capacity	38 ~ 46HP
Outdoor unit	No.	
	Model name	
	Installation location	
Communication PCB rotary S/W No.		
Connecting pipe size (mm)	AHU side	Gas pipe: 41.3/ Liquid pipe: 34.92
	Outdoor unit side	Gas pipe: 41.3 / Liquid pipe: 28.58

Site name		
EXPANSION KIT	Model name	PATX50A0E
	Outdoor unit capacity	48 ~ 56HP
Outdoor unit	No.	
	Model name	
	Installation location	
Communication PCB rotary S/W No.		
Connecting pipe size (mm)	AHU side	Gas pipe: 41.3/ Liquid pipe: 34.92
	Outdoor unit side	Gas pipe: 41.3 / Liquid pipe: 28.58


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