



Ceiling Cassette Air Conditioner **SERVICE MANUAL**

**MODELS: LT-E1820CL/LT-E1820HL
LT-E1860CL/LT-E1860HL
LT-E1862HL
LT-E2460CL/LT-E2460HL
LT-E2462HL**

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Functions

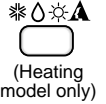
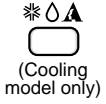
Indoor Unit	
Operation ON/OFF by Remote controller	
Sensing the Room Temperature	• Room temperature sensor. (Thermistor)
Room temperature control	• Maintains the room temperature in accordance with the Setting Temp.
Starting Current Control	• Indoor fan is delayed for 5 seconds at the starting.
Time Delay Safety Control	• Restarting is inhibited for approx. 3 minutes.
Indoor Fan Speed Control	• Jet, High, Med, Low
Soft Dry Operation Mode	• Intermittent operation of fan at low speed.
Airflow Direction Control	• The louver can be set at swing up and down automatically.
Auto Restart	• Although the air-conditioner is turned off by a power failure, it is restarted automatically previous operation mode after power supply.
Auto Operation(Auto Change Over)	• The setting temperature and desired operation mode are automatically set by fuzzy rule.
Deice (defrost) control (Heating)	• Both the indoor and outdoor fan stops during defrosting. • Hot start after defrost ends.
Hot-start Control (Heating)	• The indoor fan stops until the evaporator piping temperature will be reached at 28°C.
Compact and light design	• To install a unit is very convenient size because of smaller than fextile size. (600 x 600)
Low noise	• The most advanced low-noise design. • The adoption of turbo fan and round type heat exchanger give the quietest operation.
Long life filter	• Long life type(wrinkle) and wastable and anti-bacteria filter is adopted.
Plasma Air Purifying Filter(2HL Only)	
High head height Drain pump	• Built-in drain pump automatically drains water. • A standard drain-head height of up to 700mm is possible.
High-Ceilingcorresponding Function	• According to the height of ceiling, the RPM of indoor fan motor is selectable to increase air reaching distance.
Central Control(Optional)	• It is operating individually or totally by central control function.
Group Control(Optional Wiring)	• Each controller can control 16 units and 8 controllers can connect. • It operates maximum 16 units by only one wired remote controller and each unit starts random to prevent overcurrent.

Remote Controller

Operation ON/OFF



Operation Mode Selection



Cooling Operation Mode (*)
 Heating Operation Mode (☀)

Soft Dry Operation Mode (♪)
 Auto Operation Mode (▲)

Fan Speed Selection



Room Temperature Display



: High:39°C ↔ LOW:11°C

Temperature Setting



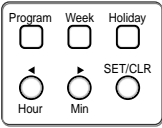
Cooling [Down to 18°C
 Up to 30°C

Heating [Down to 16°C
 Up to 30°C

Setting the Timer



Weekly Program



: Fan Operates without cooling & heating

Fan Operation Mode



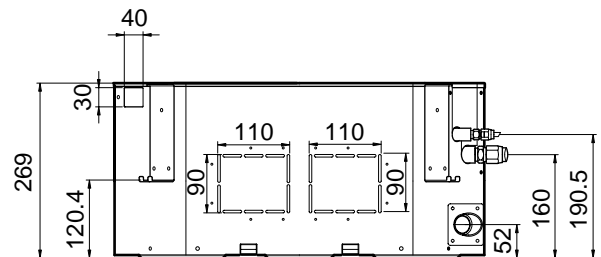
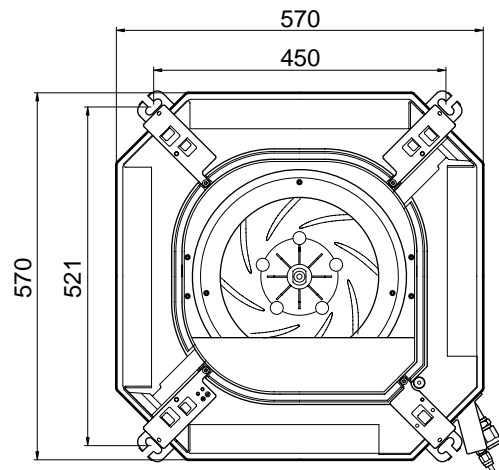
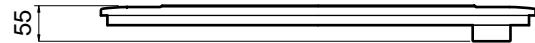
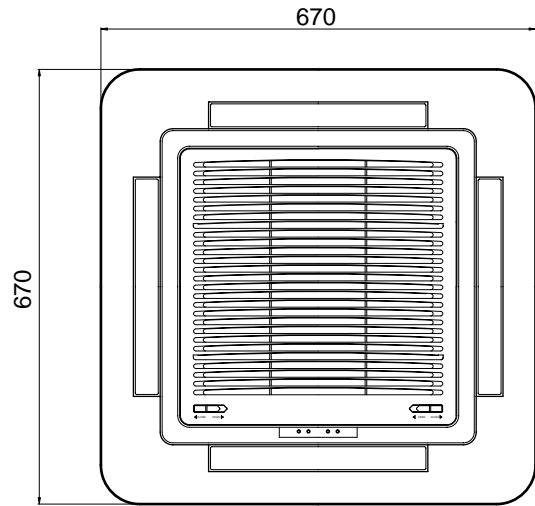
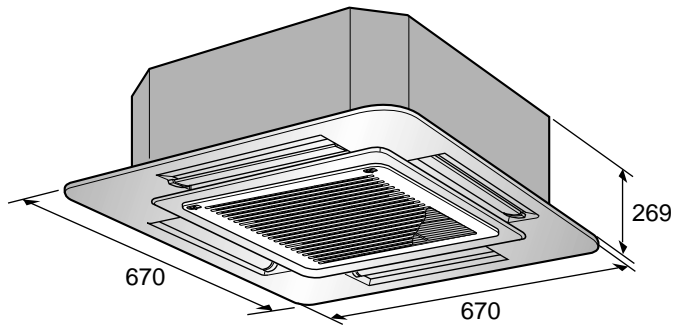
Product Specifications (Cooling & Heating)

Model			LT-E1860CL	LT-E1860HL	LT-E1862HL	LT-E1820CL	LT-E1820HL
Power Supply		ø, V, Hz	1, 220-240, 50	1, 220-240, 50	1, 220-240, 50	1, 220, 60	1, 220, 60
Capacity	Cooling	kcal/h(W)	4,536(5,274)	4,536(5,274)	4,536(5,274)	4,536(5,274)	4,536(5,274)
		Btu/h	18,000	18,000	18,000	18,000	18,000
	Heating	kcal/h(W)	-	4,536(5,274)	4,536(5,274)	-	4,536(5,274)
		Btu/h	-	18,000	18,000	-	18,000
Input	Cooling	W	1,900	2,050	2,050	1,970	1,900
	Heating	W	-	1,850	1,850	-	1,900
Running Current	Cooling	A	9.5	9.5	9.5	9	8.8
	Heating	A	-	9.0	9.0	-	8.8
Starting Current	Cooling	A	53	53	53	53	53
	Heating	A	-	53	53	-	53
E.E.R		kcal/h(W)	2.39	2.21	2.21	2.30	2.39
C.O.P		W/W	-	2.85	2.85	-	2.78
Air Circulation	Indoor	m ³ /min	13	13	13	13	13
	Outdoor	m ³ /min	50	50	50	50	50
Moisture Removal		// h	1.9	1.9	1.9	1.9	1.9
Feature	Air-Flow Direction Control		O	O	O	O	O
	Heating Operation Mode		X	O	O	X	O
	Fan Speeds (steps)		4	4	4	4	4
	Auto Operation (Changeover)		O	O	O	O	O
	Forced Operation		O	O	O	O	O
	Jet Cool		O	O	O	O	O
	Soft Dry Operation		O	O	O	O	O
	Timer Delay Safety Function		O	O	O	O	O
	Air Deflection (Way)		4	4	4	4	4
	Self Diagnosis		O	O	O	O	O
	Hot start		X	O	O	X	O
	Auto Restart		O	O	O	O	O
	Air refresh (Hole)		O	O	O	O	O
	High Ceiling		O	O	O	O	O
	Group Control (Optional wiring)		O	O	O	O	O
	Central Control		Optional	Optional	Optional	Optional	Optional
Wired remote controller (with weekly Program)		O	O	O	O	O	
Plasma A/Cleaner		X	X	O	X	X	
Refrigerant(R-22) Charge		g	1,900	1,800	1,800	1,050	1,910
Dimensions (W x D x H)	Indoor	mm	570 x 570 x 269	570 x 570 x 269	570 x 570 x 269	570 x 570 x 269	570 x 570 x 269
	Panel	mm	670 x 670 x 30	670 x 670 x 30	670 x 670 x 30	670 x 670 x 30	670 x 670 x 30
	Outdoor	mm	870 x 655 x 320	870 x 655 x 320	870 x 655 x 320	870 x 655 x 320	870 x 655 x 320
Net Weight	Indoor	kg	19(16.5+2.5)	19(16.5+2.5)	19(16.5+2.5)	19	19
	Outdoor	kg	60	61	61	60	61
Main Power Cord		AWG#:P*mm ²	14:3*2.5	14:3*2.5	14:3*2.5	14:3*2.5	14:3*2.5
Connection Cable		AWG#:P*mm ²	18:4*0.75	18:6*0.75	18:6*0.75	18:4*0.75	18:6*0.75
Service Valve	Liquid	(inch)	1/4(6.35mm)	1/4(6.35mm)	1/4(6.35mm)	1/4(6.35mm)	1/4(6.35mm)
	Gas	(inch)	5/8(15.88mm)	5/8(15.88mm)	5/8(15.88mm)	5/8(15.88mm)	5/8(15.88mm)
Installation Pipe	Length	(m)	50	50	50	50	50
	Elevation	(m)	30	30	30	30	30
	Insulation(material/thickness)			FoamPE/5mm	FoamPE/5mm	FoamPE/5mm	FoamPE/5mm
Drain Hose(I.D/O.D)		mm	ø25/32	ø25/32	ø25/32	ø25/32	ø25/32

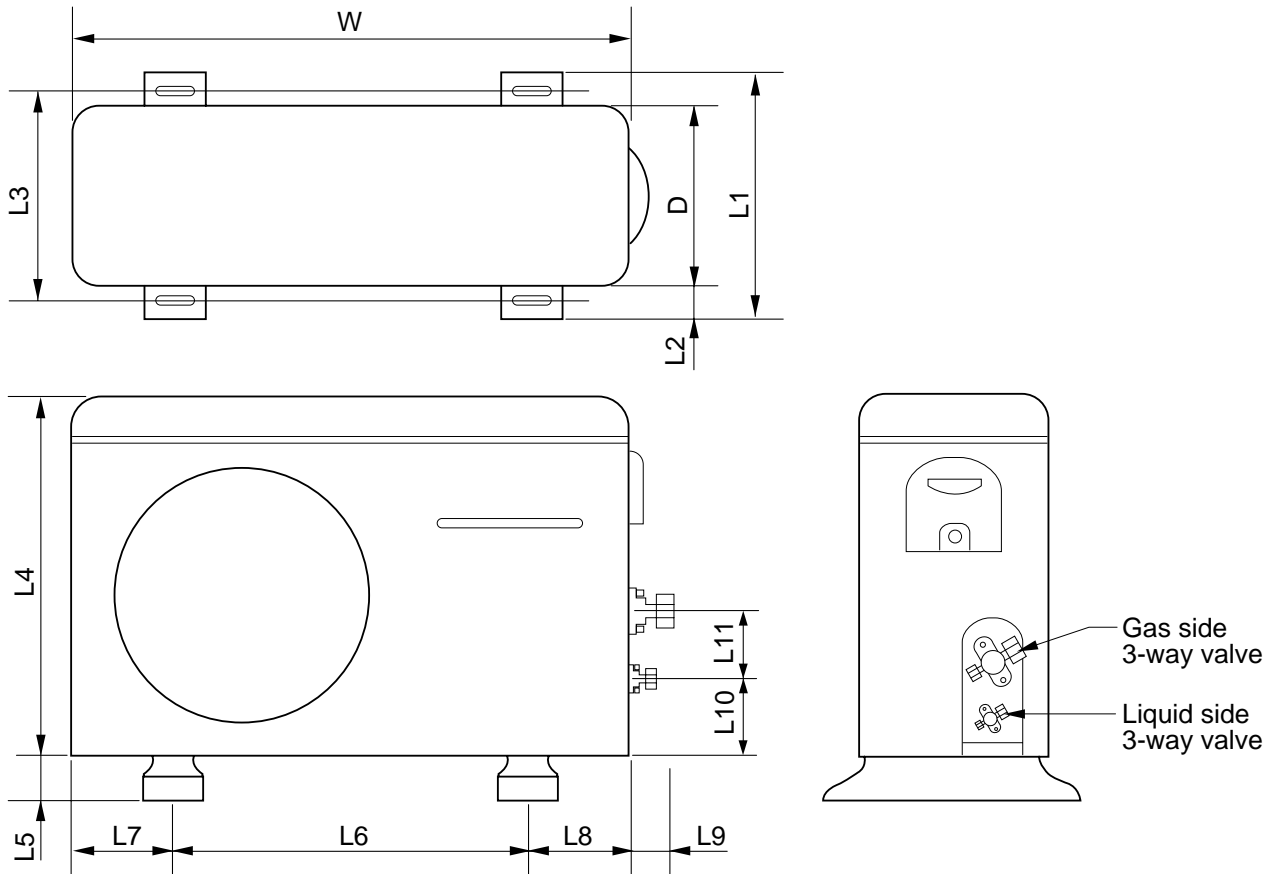
Model			LT-E2460CL	LT-E2460HL	LT-E2462HL
Power Supply		ø, V, Hz	1, 220-240, 50	1, 220-240, 50	1, 220-240, 50
Capacity	Cooling	kcal/h(W)	5,871(6,827)	5,871(6,827)	5,871(6,827)
		Btu/h	23,300	23,300	23,300
	Heating	kcal/h(W)	-	5,922(6,886)	5,922(6,886)
		Btu/h	-	23,500	23,500
Input	Cooling	W	2,600	2,600	2,600
	Heating	W	-	2,600	2,600
Running Current	Cooling	A	13.5	13.5	13.5
	Heating	A	-	13.5	13.5
Starting Current	Cooling	A	62	62	62
	Heating	A	-	60	60
E.E.R		kcal/h(W)	2.26	2.26	2.26
C.O.P		W/W	-	2.65	2.65
Air Circulation	Indoor	m ³ /min	15.5	15.5	15.5
	Outdoor	m ³ /min	50	50	50
Moisture Removal		// h	2.9	2.9	2.9
Feature	Air-Flow Direction Control		O	O	O
	Heating Operation Mode		X	O	O
	Fan Speeds (steps)		4	4	4
	Auto Operation (Changeover)		O	O	O
	Forced Operation		O	O	O
	Jet Cool		O	O	O
	Soft Dry Operation		O	O	O
	Timer Delay Safety Function		O	O	O
	Air Deflection (Way)		4	4	4
	Self Diagnosis		O	O	O
	Hot start		X	O	O
	Auto Restart		O	O	O
	Air refresh (Hole)		O	O	O
	High Ceiling		O	O	O
	Group Control (Optional wiring)		O	O	O
	Central Control		Optional	Optional	Optional
Wired remote controller (with weekly Program)		O	O	O	
Plasma A/Cleaner		X	X	O	
Refrigerant(R-22) Charge		g	1,900	1,900	1,900
Dimensions (W x D x H)	Indoor	mm	570 x 570 x 269	570 x 570 x 269	570 x 570 x 269
	Panel	mm	670 x 670 x 30	670 x 670 x 30	670 x 670 x 30
	Outdoor	mm	870 x 655 x 320	870 x 655 x 320	870 x 655 x 320
Net Weight	Indoor	kg	19(16.5+2.5)	19(16.5+2.5)	19(16.5+2.5)
	Outdoor	kg	61	62	62
Main Power Cord		AWG#:P*mm ²	14:3*2.5	14:3*2.5	14:3*2.5
Connection Cable		AWG#:P*mm ²	18:4*0.75	18:6*0.75	18:6*0.75
Service Valve	Liquid	(inch)	1/4(6.35mm)	1/4(6.35mm)	1/4(6.35mm)
	Gas	(inch)	5/8(15.88mm)	5/8(15.88mm)	5/8(15.88mm)
Installation Pipe	Length	(m)	50	50	50
	Elevation	(m)	30	30	30
	Insulation(material/thickness)			FoamPE/5mm	FoamPE/5mm
Drain Hose(I.D/O.D)		mm	ø25/32	ø25/32	ø25/32

Dimensions

(1) Indoor Unit



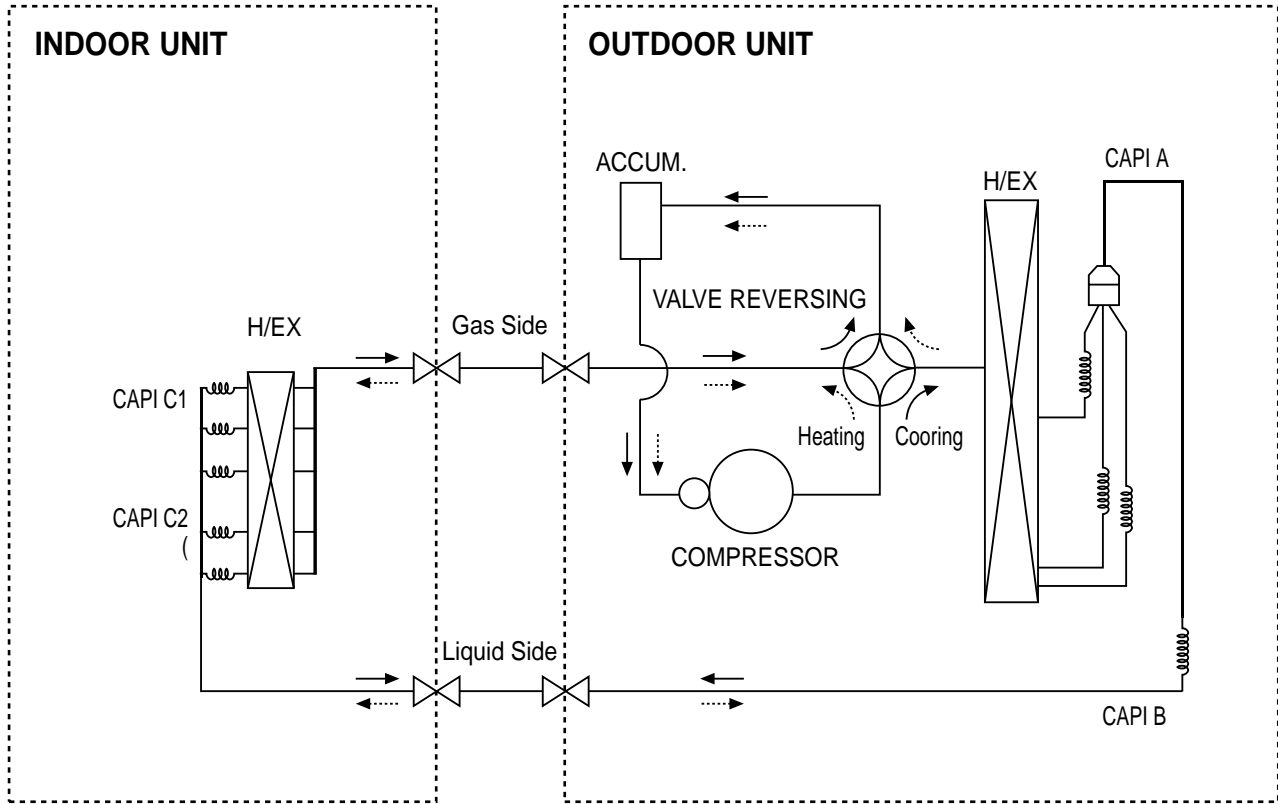
(2) Outdoor Unit



MODEL		All Models
DIM		
W	mm	870
H	mm	655
D	mm	320
L1	mm	370
L2	mm	25
L3	mm	340
L4	mm	630
L5	mm	25
L6	mm	546
L7	mm	162
L8	mm	162
L9	mm	54
L10	mm	74.5
L11	mm	79

Refrigeration Cycle Diagram

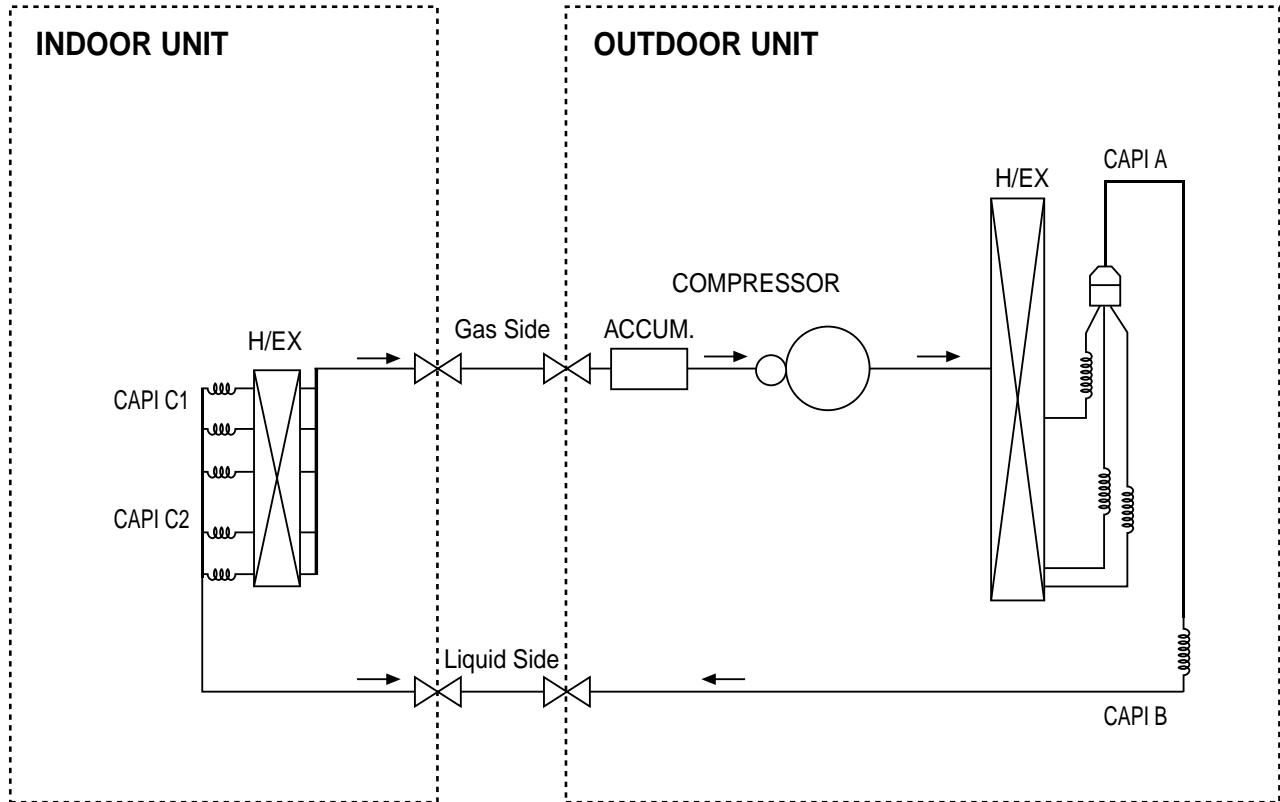
• HEAT PUMP



Capacity	Pipe Size		Length (m)		Elevation (m)		* Additional refrigerant (g/m)
	GAS	LIQUID	Rated	Max.	Rated	Max.	
18K	1/4"	3/8"	7.5	50	5	30	25
24K	1/4"	3/8"	7.5	50	5	30	30

- Rated performance for refrigerant line length of: 7.5m
- If 18K Capacity is installed at a distance of 15m, 187.5g of refrigerant should be added(15-7.5)x25g

• COOLING ONLY



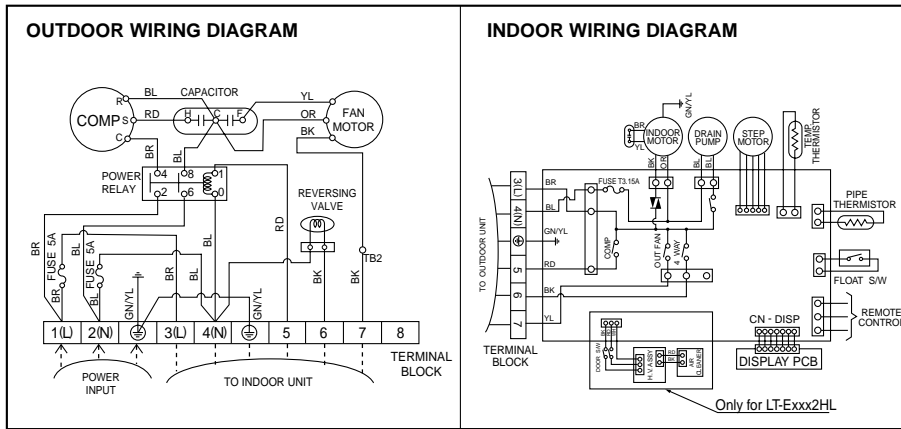
Capacity	Pipe Size		Length (m)		Elevation (m)		* Additional refrigerant (g/m)
	GAS	LIQUID	Rated	Max.	Rated	Max.	
18K	1/4"	3/8"	7.5	50	5	30	25
24K	1/4"	3/8"	7.5	50	5	30	30

- Rated performance for refrigerant line length of: 7.5m
- If 18K Capacity is installed at a distance of 15m, 187.5g of refrigerant should be added(15-7.5)x25g

Wiring Diagram

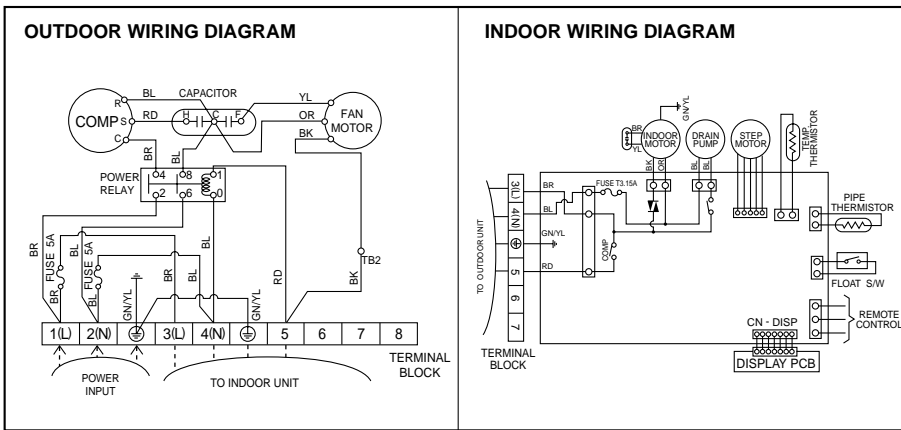
• HEAT PUMP

Model No.: LT-E1860HL/ LT-E1862HL/ LT-E2460HL/ LT-E2462HL

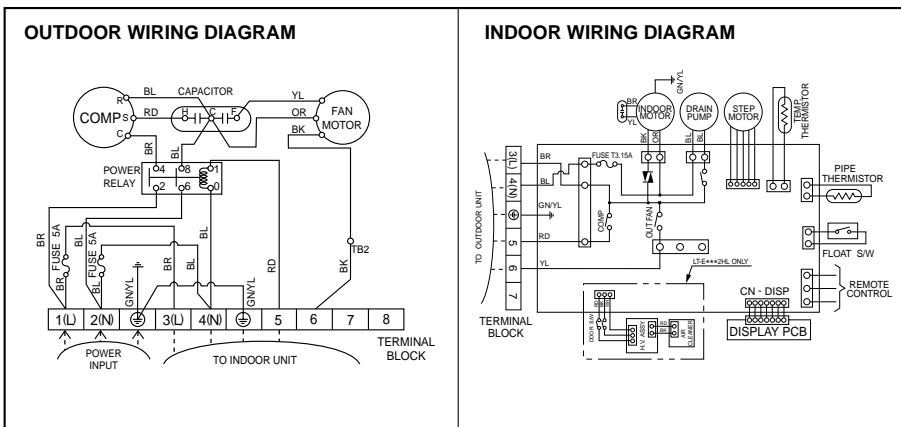


• COOLING ONLY

Model No.: LT-E1860CL



Model No.: LT-E2460CL



Operation Details

(1) The function of main control

1. Time Delay Safety Control

- 3min... The compressor is ceased for 3minutes to balance the pressure in the refrigeration cycle.
(Protection of compressor)
- 5sec... Vertical air flow direction control louvers open in 5 seconds to prevent noise between louvers and wind.
- 30sec... The 4-way valve is ceased for 30sec. to prevent the refrigerant-gas abnormal noise when the Heating operation is OFF or switched to the other operation mode while compress is off.
While compressor is running, it takes 3~5 seconds to switch.

2. Auto Swing Control

- This function is to swing the louver up and down automatically.

3. Air-Filter Checking Control

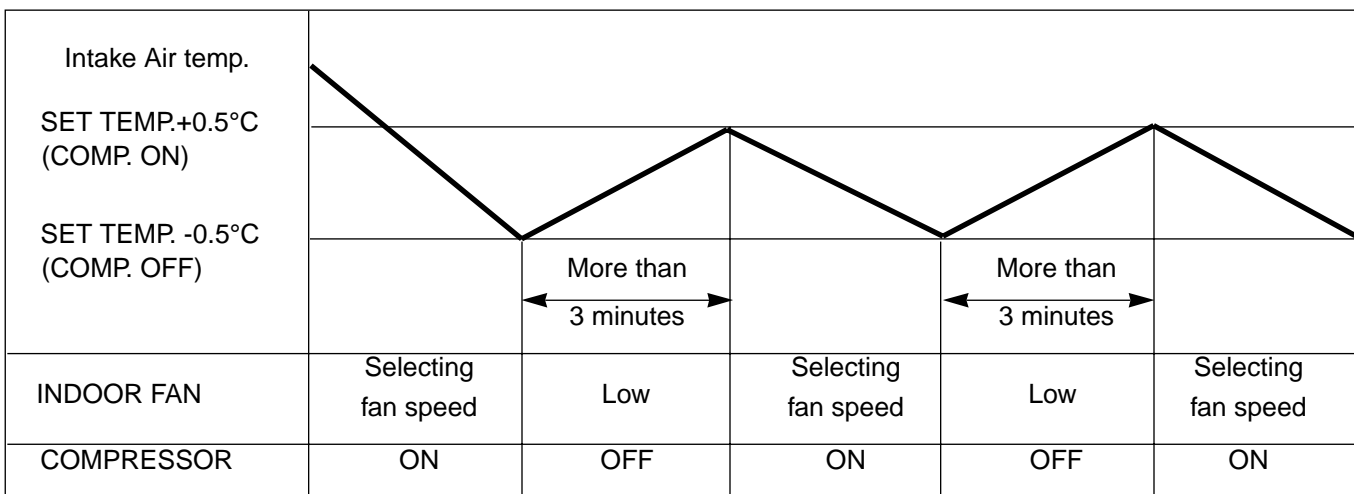
- 'Filter' will display in the remote controller display and main body display when an air-filter is polluted. Then clean the air-filter for reference to Owners Manual.

4. Soft-Dry Operation

- The indoor fan speed is automatically set to the low, so the shift of the indoor fan speed is impossible because of already being set to the best speed for Dry Operation by Micom Control.

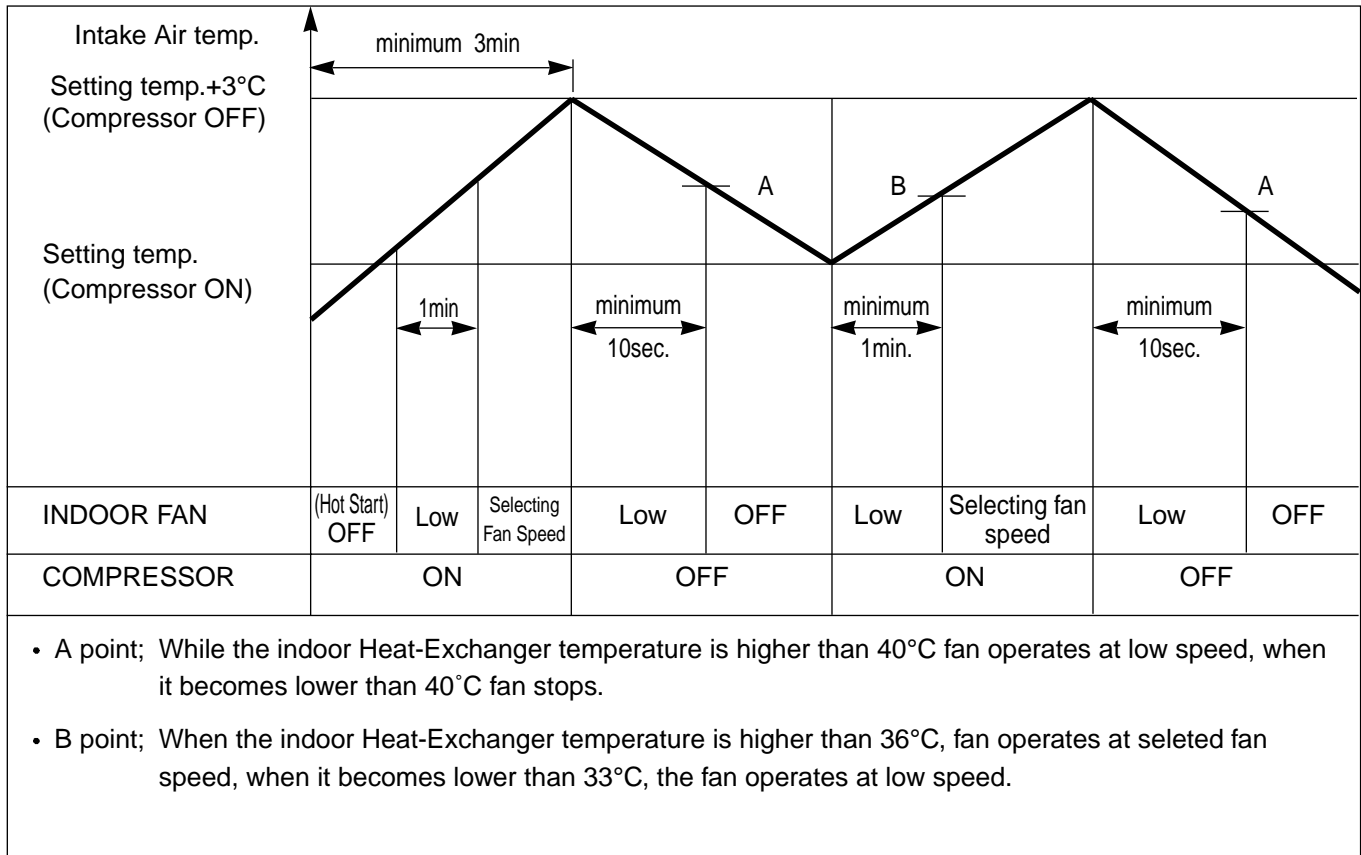
5. Cooling Mode Operation

- When selecting the Cooling(✳) Mode Operation, the unit will operate according to the setting by the remote controller and the operation diagram is as following



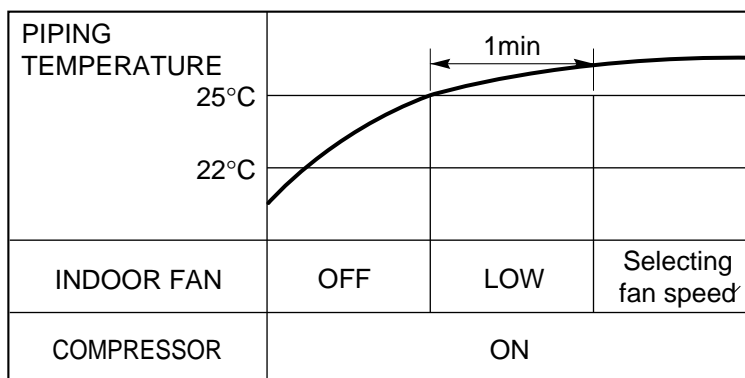
6. Heating Mode Operation (Except Cooling Model)

The unit will operate according to the setting by the remote controller and the operation diagram is shown as following.



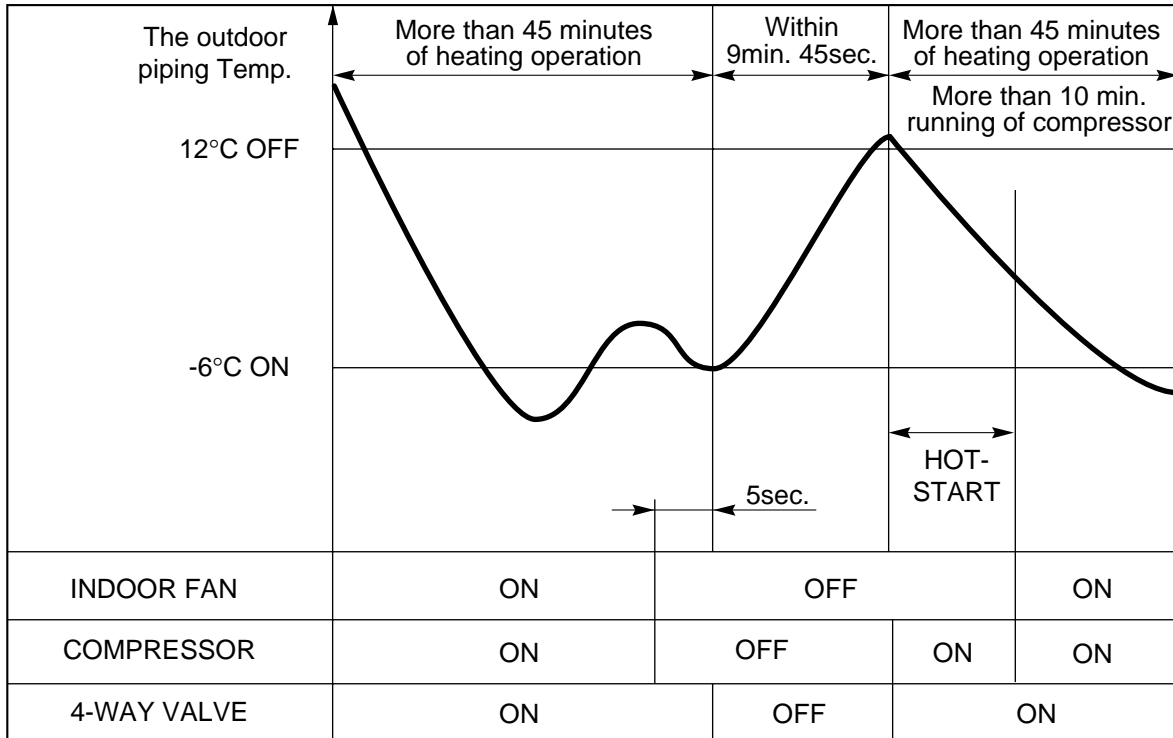
7. Hot-Start Control

- The indoor fan stops until the evaporator piping temperature will be reached to 28°C.
- The operation diagram is as following.



8. Defrost Control

- Defrost operation is controlled by timer and sensing the indoor piping temperature.
- The defrost starts only when the outdoor pipe temperature falls below -6°C after 45 minutes passed from starting of heating operation.
- Defrost ends after 9 minutes 30 seconds passed from starting of defrost operation or when the outdoor pipe temperature rises over 12°C even if before 12 minutes.



9. Self-Diagnosis Function

- 'CHECK' will flash in the remote controller display when a problem occurs. Then please contact your dealer.
- Correct the accident point as shown in the table below before restarting operation.
- During the normal operation 'CHECK' won't be displayed in the remote controller.

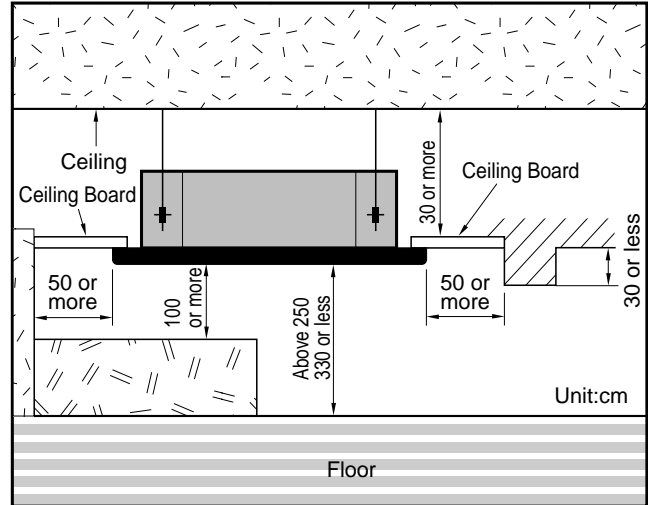
Remote controller LCD	Accident Point
CH 01	Indoor room temperature thermistor error
CH 02	Indoor piping thermistor error
CH 03	Indoor main body / Remote controller unit communication error
CH 04	Water level float switch error

Installation of Indoor, Outdoor Unit

1. Selection of the best location

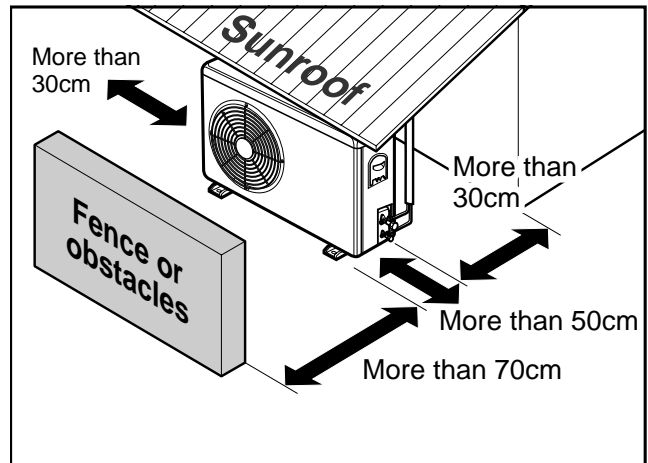
1) Indoor unit

- There should not be any heat source or steam near the unit.
- There should not be any obstacles to prevent the air circulation.
- A place where air circulation in the room will be good.
- A place where drainage can be easily obtained.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, or other obstacles.
- The indoor unit must keep the maintenance space.



2) Outdoor unit

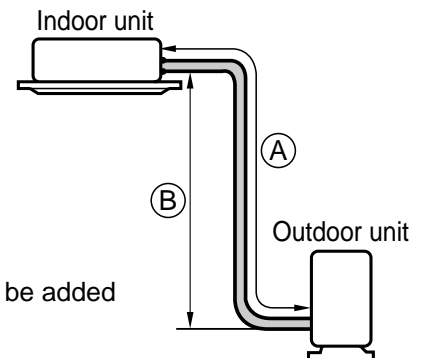
- If an awning is built over the unit to prevent direct sunlight or rain exposure, be careful that heat radiation from the condenser is not restricted.
- There should not be any animals or plants which could be affected by hot air discharged.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.



3) Piping length and the elevation

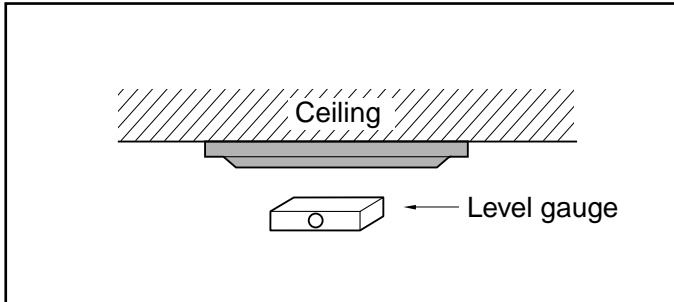
CAPACITY	Pipe Size		Length(A)(m)		Elevation(B)(m)		* Additional refrigerant (g/m)
	GAS	LIQUID	Rated	Max.	Rated	Max.	
18K Btu/h	5/8"	1/4"	7.5	50	5	30	25
24K Btu/h	5/8"	1/4"	7.5	50	5	30	30

- Rated performance for refrigerant line length of: 7.5m
- If 18K Model is installed at a distance of 15m, 187.5g of refrigerant should be added $(15-7.5) \times 25g$



2. Ceiling opening dimensions and hanging bolt location

- The dimensions of the paper model for installing are the same as those of the ceiling opening dimensions.



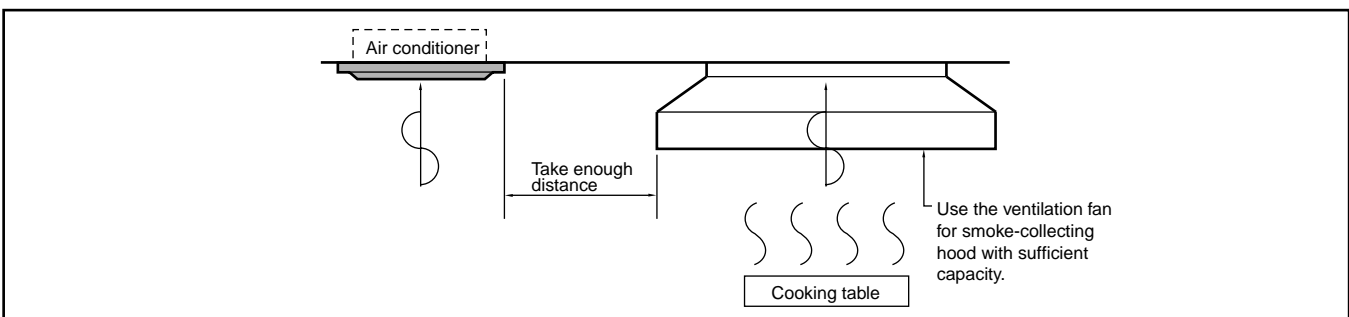
CAUTION

- This air-conditioner uses a drain pump.
- Horizontally install the unit using a level gauge.
- During the installation, care should be taken not to damage electric wires.

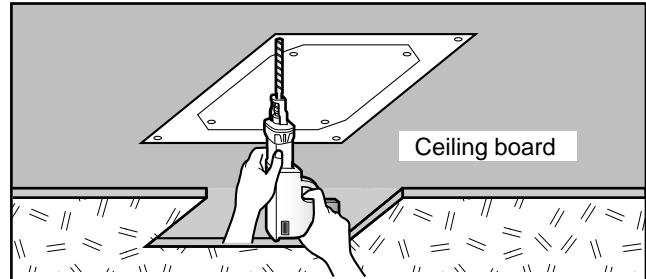
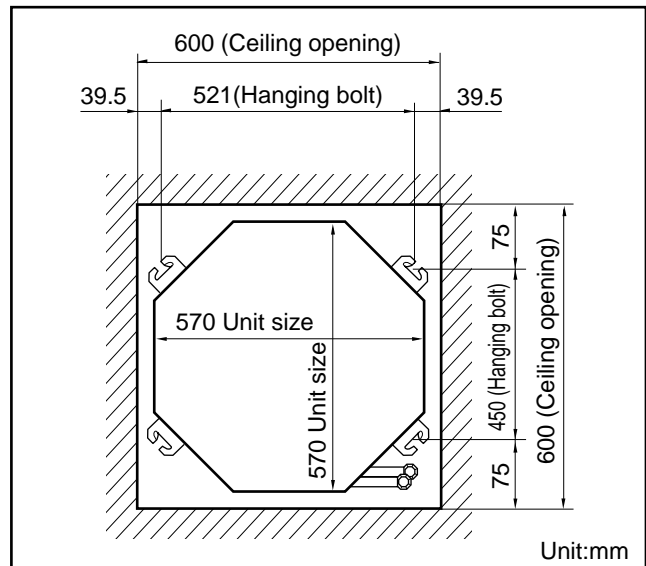
- Select and mark the position for fixing bolts and piping hole.
- Decide the position for fixing bolts slightly tilted to the drain direction after considering the direction of drain hose.
- Drill the hole for anchor bolt on the wall.

NOTE:

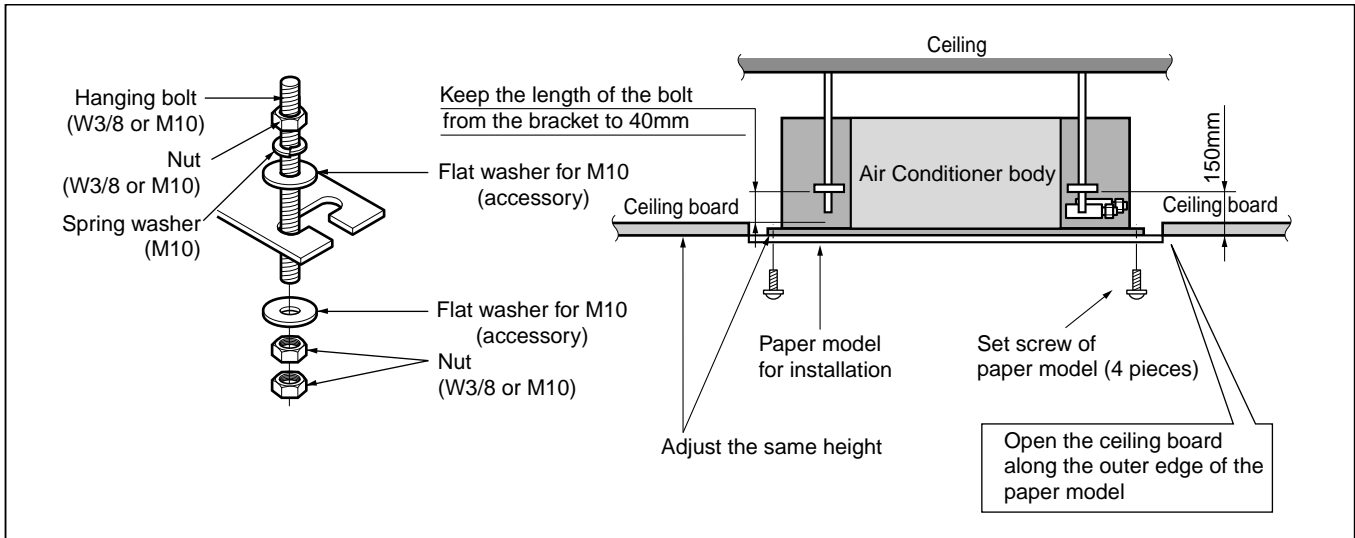
- Thoroughly study the following installation locations:
 1. In such places as restaurants and kitchens, considerable amount of oil steam and flour adhere to the turbo fan, the fin of the heat exchanger and the drain pump, resulting in heat exchange reduction, spraying, dispersing of water drops, drain pump malfunction, etc.
In these cases, take the following actions:
 - Make sure that the ventilation fan for smoke-collecting hood on a cooking table has sufficient capacity so that it draws oily steam which should not flow into the suction of the air conditioner.
 - Make enough distance from a cooking room to install the air conditioner in such a place where it may not suck in oily steam.



2. Avoid installing air conditioner in such circumstances where cutting oil mist or iron powder is in suspension in factories, etc.
3. Avoid places where inflammable gas is generated, flows in, is stored or vented.
4. Avoid places where sulfurous acid gas or corrosive gas is generated.
5. Avoid places near high frequency generators.



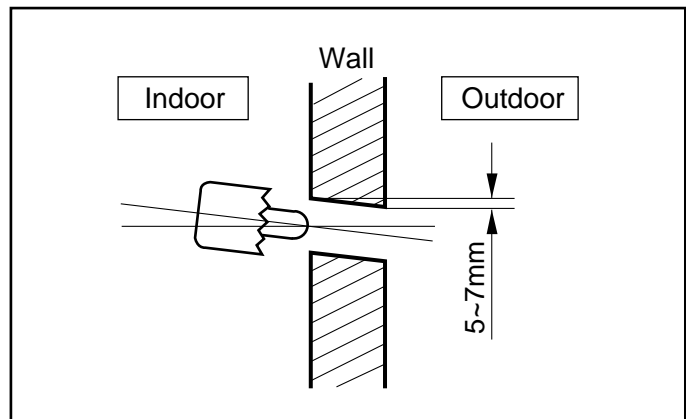
3. The Indoor Unit Installation



• The following parts is option.

- ① Hanging Bolt - W 3/8 or M10
- ② Nut - W 3/8 or M10
- ③ Spring Washer - M10
- ④ Plate Washer - M10

• Drill the piping hole on the wall slightly tilted to the outdoor side using a $\varnothing 70$ hole-core drill.



CAUTION

• Tighten the nut and bolt to prevent unit falling.

4. Remote Controller Installation

• Although the room temperature sensor is in the indoor unit, the remote controller should be installed in such places away from direct sunlight and high humidity.

Installation of the remote controller

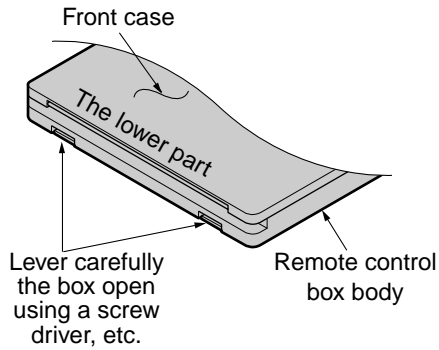
- Select places that are not splashed with water.
- Select control position after receiving customer approval.
- The room temperature sensor is built in the indoor unit.
- This remote controller equipped with liquid crystal display. If this position is higher or lower, display is difficult to see. (The standard height is 1.2 ~ 1.5m high)

Routing of the remote controller cord

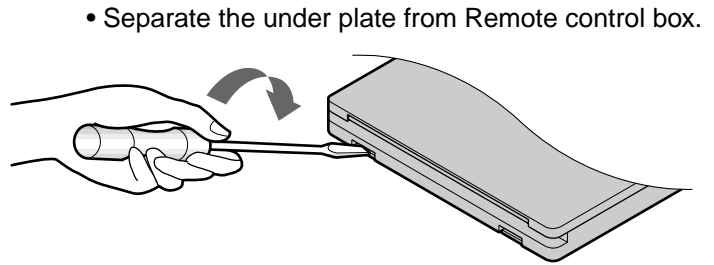
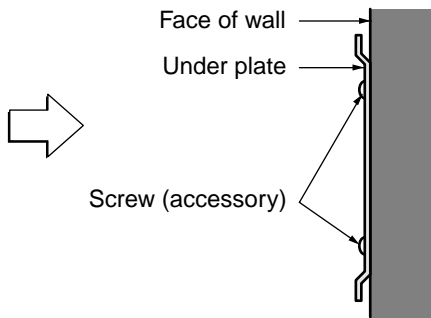
- Keep the remote controller cord away from the refrigerant piping and the drain piping.
- To protect the remote controller cord from electrical noise, place the cord at least 5cm away from other power cables (audio equipment, television set, etc.)
- If the remote controller cord is secured to the wall, provide a trap at the top of the cord to prevent water droplets from running.

WIRED REMOTE CONTROL INSTALLATION

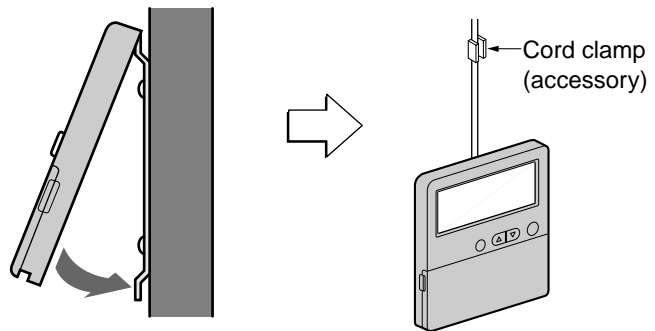
DISASSEMBLING



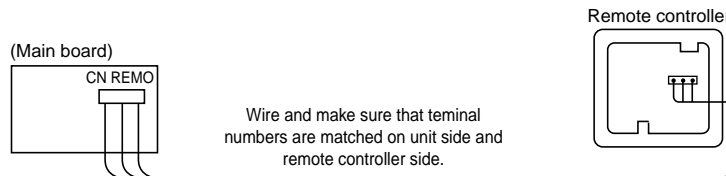
- Fix the under plate on the wall



- Fix the cord clamps on the wall by $\varnothing 3$ tapping screws (accessory).
- Fix the remote control cord.



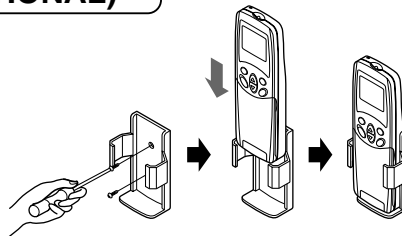
ELECTRICAL WIRING



The maximum length of the cord is 100m.
If the length of the cord exceeds 50m,
use a wire size greater than 0.5mm².

REMOTE CONTROL PREPARATION(OPTIONAL)

HOW TO MOUNT ONTO A WALL



HOW TO INSERT BATTERIES

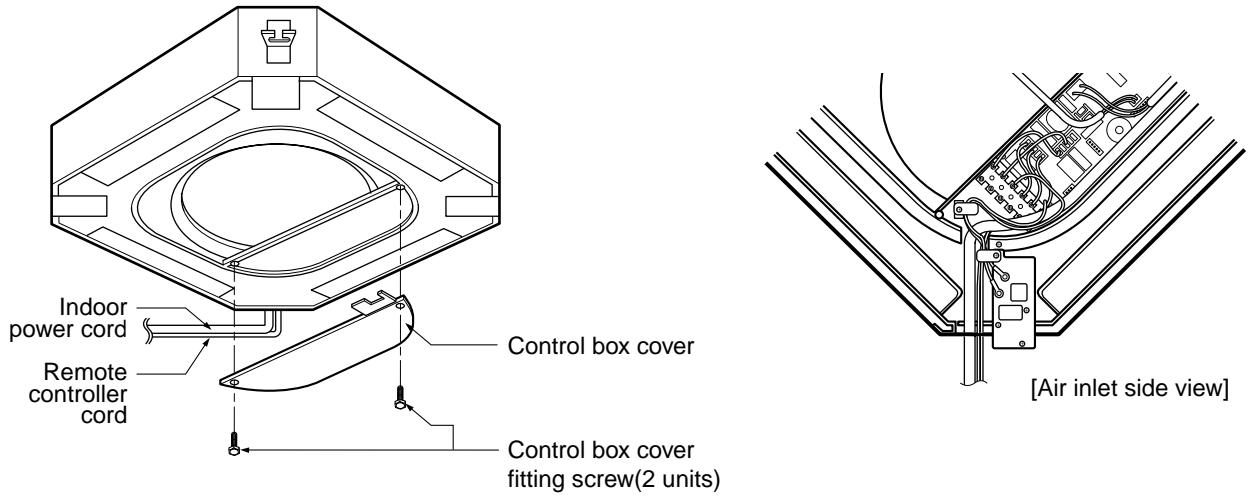
- 1 Remove the battery cover from the remote controller.
 - Slide the cover according to the arrow direction.
- 2 Insert the two batteries.
 - Be sure that the (+) and (-) directions are correct.
 - Be sure that both batteries are new.
- 3 Re-attach the cover.
 - Slide it back into position.



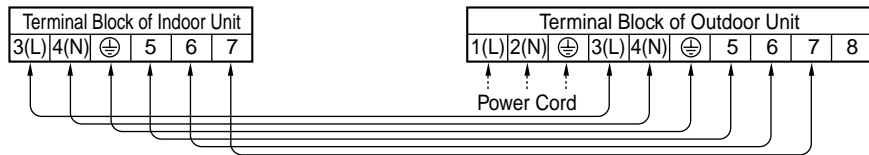
- Do not use rechargeable batteries, such batteries differ from standard dry cells in shape, dimensions, and performance.
- Remove the batteries from the remote controller if the air conditioner is not going to be used for some long time.

5. Wiring Connection

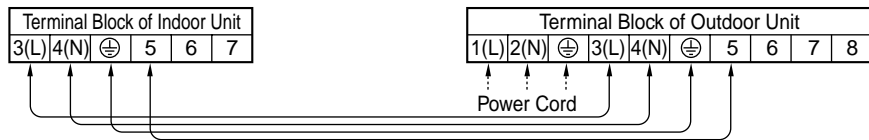
- Open the control box cover and connect the Remote controller cord and Indoor power wires.



• Heat Pump Model

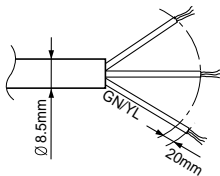


• Cooling Model

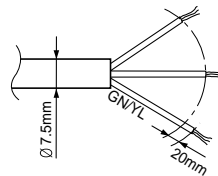


CAUTION

The power cord connected to the outdoor unit should be complied with the following specifications (Rubber insulation, type H05RN-F approved by HAR or SAA).



**NORMAL
CROSS-SECTIONAL
AREA 2.5mm²**



**NORMAL
CROSS-SECTIONAL
AREA 0.75mm²**

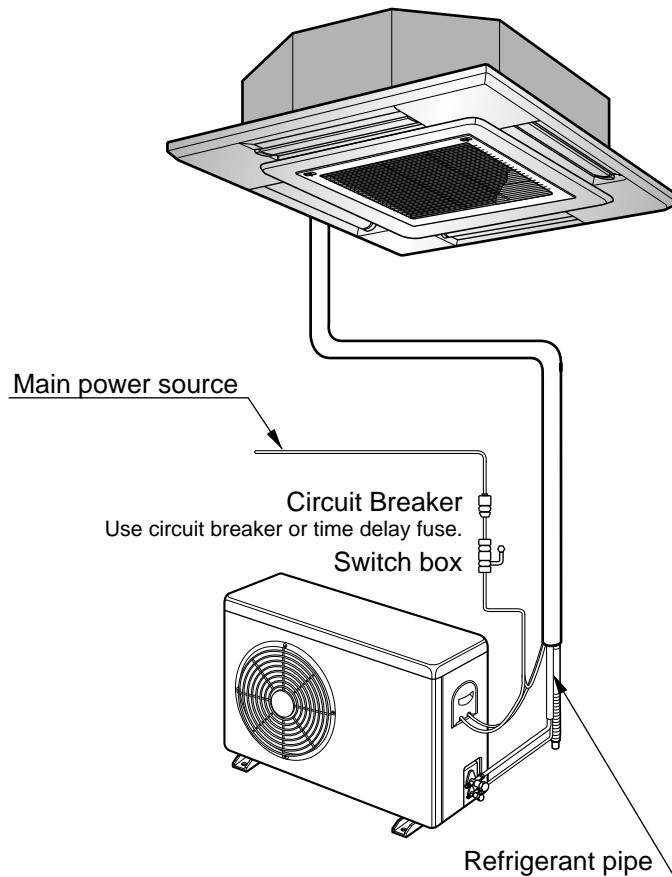
If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.

⚠ WARNING

Make sure that the screws of the terminal are free from looseness.

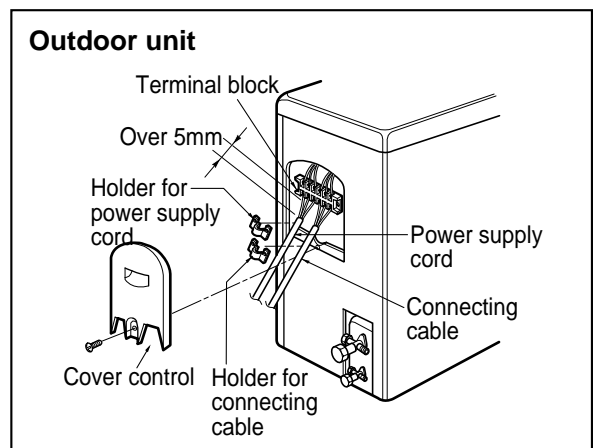
ELECTRICAL WIRING

1. All wiring must comply with LOCAL REGULATIONS.
2. Select a power source that is capable of supplying the current 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.



CONNECTING THE CABLE TO OUTDOOR UNIT

1. Remove the Cover control from the unit by loosening a screw.
Connect the wires to the terminals on the control board individually as following.
2. Secure the cable onto the control board with the holder (clammer).
3. Refix the cover control to the original position with the screw.
4. Use a recognized circuit breaker 20A(18K, 24K) between the power source and the unit. A disconnection device to adequately disconnect all supply lines must be fitted.



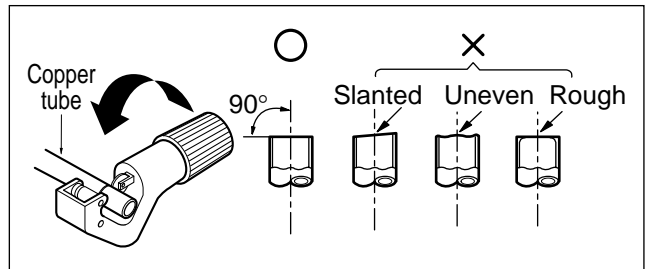
6. Connecting Pipes to the Indoor Unit

• Preparation of Piping

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

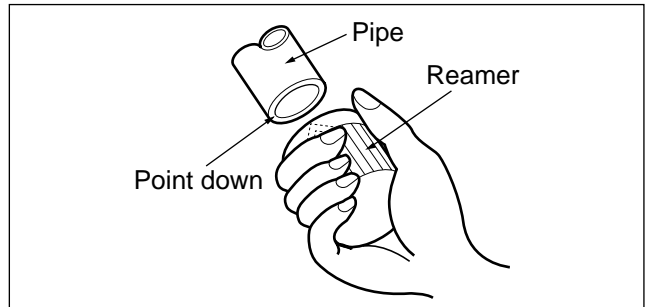
1) Cut the pipes and the cable.

- Use the accessory piping kit or the pipes purchased locally.
- Measure the distance between the indoor and the outdoor unit.
- Cut the pipes a little longer than measured distance.
- Cut the cable 1.5m longer than the pipe length.



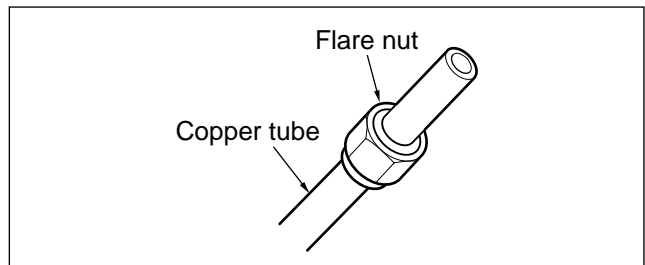
2) Burrs removal

- Completely remove all burrs from the cut cross section of pipe/tube.
- Put the end of the copper tube/pipe to downward direction as you remove burrs in order to avoid to let burrs drop in the tubing.



3) Putting nut on

- Remove flare nuts attached to indoor and outdoor units, than put them on pipe/tube having completed burr removal.
(Not possible to put them on after flaring work)

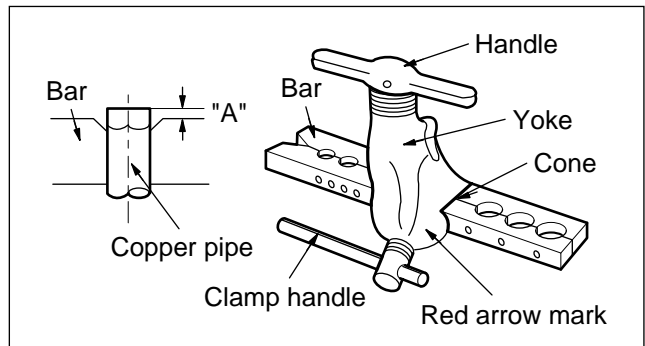


4) Flaring work

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

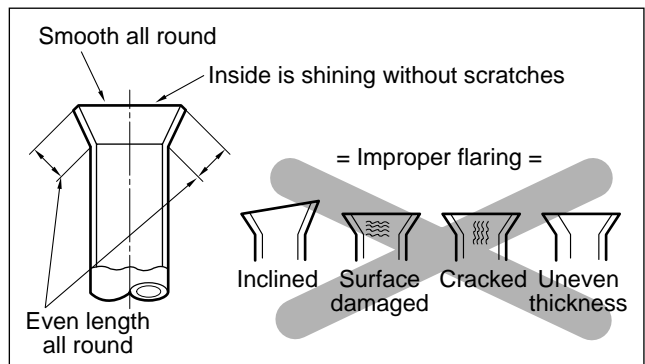
Outside diameter		A
mm	inch	mm
Ø6.35	1/4	0.5~0.8
Ø15.88	5/8	0.8~1.0

Firmly hold copper tube in a bar(or die) as indicated dimension in the table above.



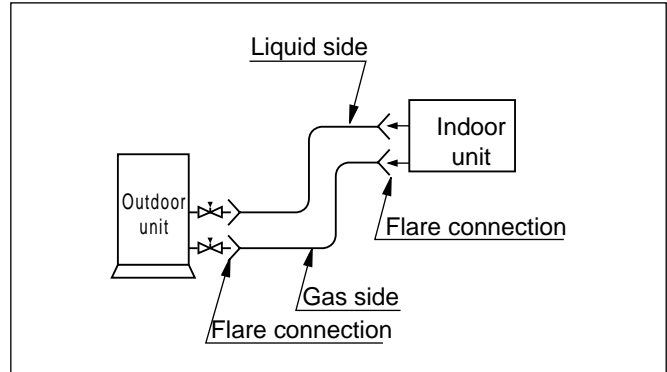
5) Check

- Compare the flared work with figure below.
- If flare is noted to be defective, cut off the flared section and do flaring work again.



Piping Connection

1. Form the piping according to its routing. Avoid bending and bending back the same piping point more than three times. (This will result in hardening the pipe.)
2. After deforming the piping, align centers of the union fitting of the indoor unit and the piping, and tighten them firmly with wrenches.
3. Connect pipe to the service valve or ball valve which is located below the outdoor unit.
4. After completing the piping connection, be sure to check if there is gas leakage in indoor and outdoor connection.



Vacuum drying

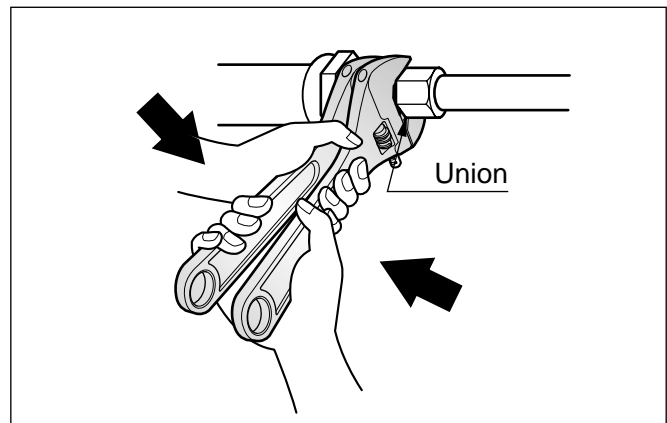
After completing the piping connection, execute vacuum drying for the connecting piping and the indoor unit. The vacuum drying must be carried out using the service ports of both the liquid and gas side valves.

Model	Liquid side piping	Gas side piping
18K, 24K Btu/h	Ø 6.35mm	Ø15.88mm

CAUTION

Use two wrenches and tighten with regular torque.


Flare nut fastening torque	
Ø6.35mm	1.8kg·m
Ø9.52mm	4.0kg·m
Ø12.7mm	5.5kg·m
Ø15.88mm	6.6kg·m
Ø19.05mm	6.6kg·m



7. Installation of Decorative Panel

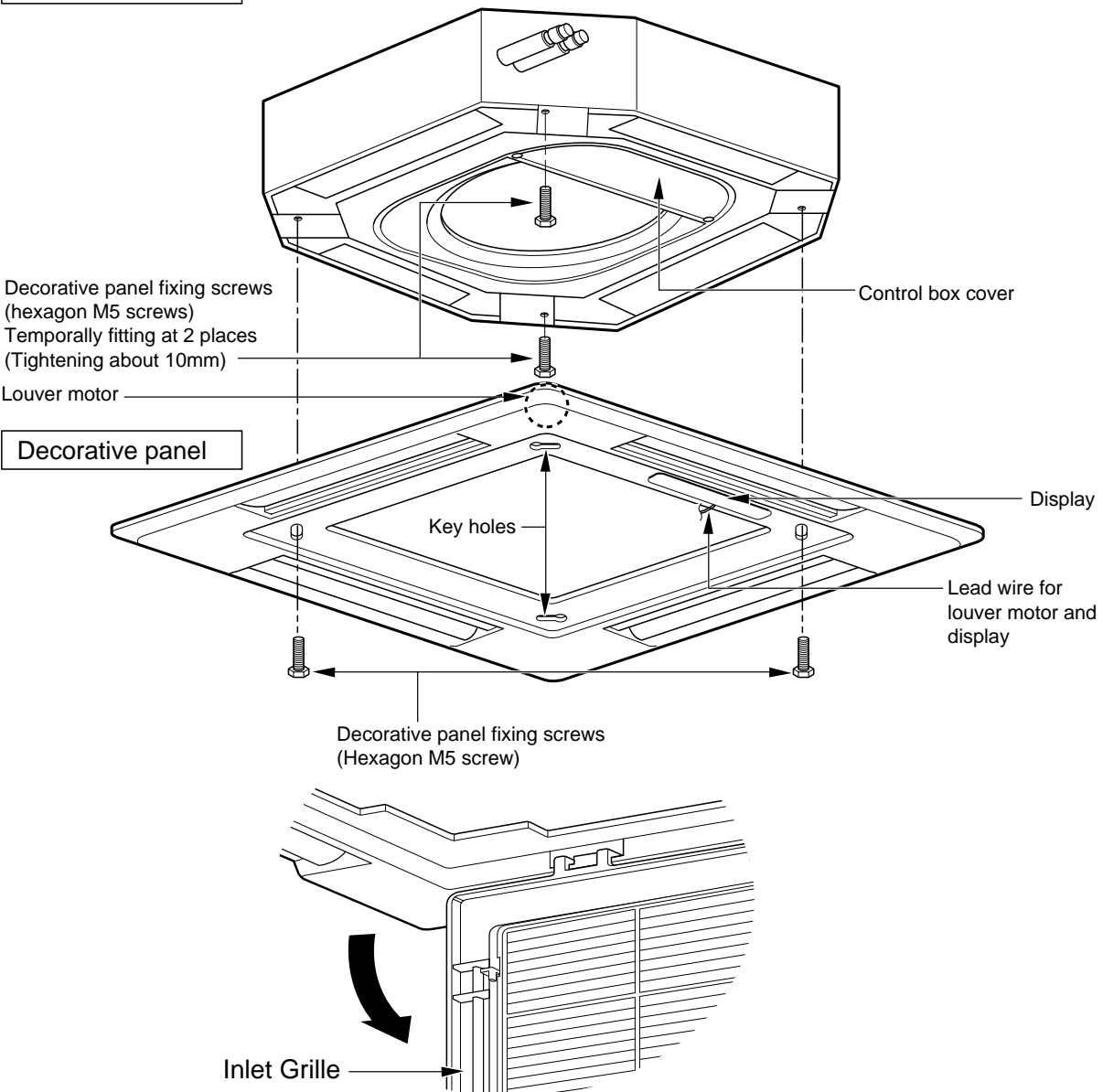
The decorative panel has its installation direction.

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

1. Temporarily fix two decorative 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 decorative panel. (Remove the hook for the air inlet grille cord.)
3. Hook the decorative 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).

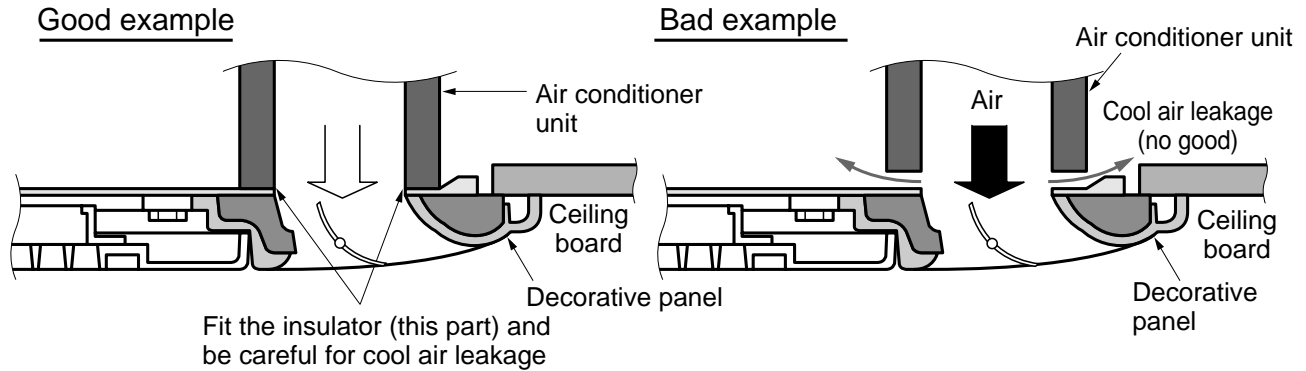
Air conditioner unit

Piping side



CAUTION

Install certainly the decorative panel.
Cool air leakage causes sweating. ⇨ Water drops fall.



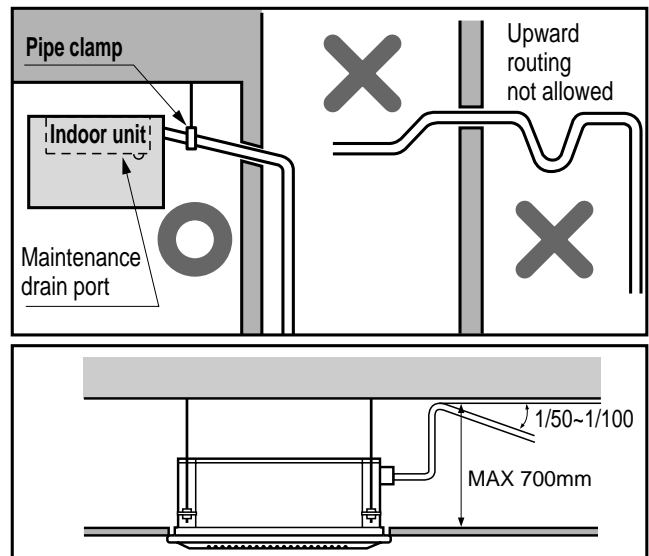
8. Indoor Unit Drain Piping

- Drain piping must have down-slope (1/50 to 1/100): be sure not to provide up-and-down slope to prevent reversal 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 VP-25 and pipe fittings

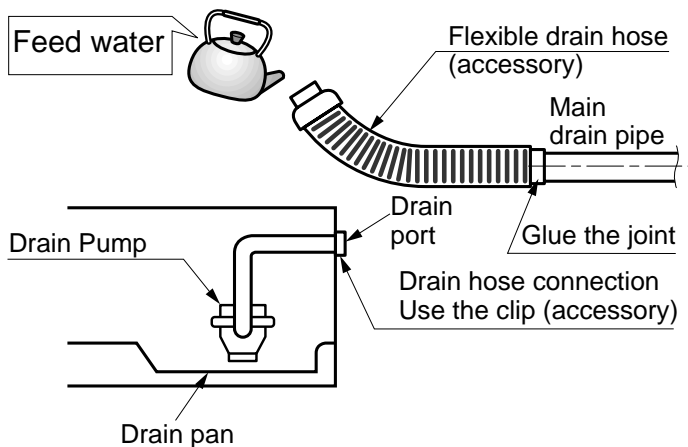
- Be sure to execute heat insulation on the drain piping.

Heat insulation material: Polyethylene foam with thickness more than 8 mm.



Drain test

The air conditioner uses a drain pump to drain water.
Use the following procedure to test the drain pump operation:



- Connect the main drain pipe to the exterior and leave it provisionally until the test comes to an end.
- Feed water to the flexible drain hose and check the piping for leakage.
- Be sure to check the drain pump for normal operating and noise when electrical wiring is complete.
- When the test is complete, connect the flexible drain hose to the drain port on the indoor unit.

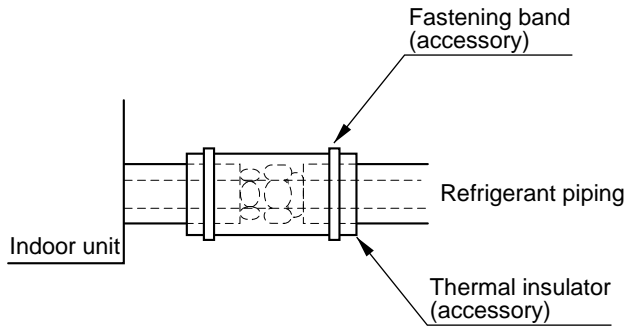
HEAT INSULATION

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

2. Precautions in high humidity circumstance:

This air conditioner has been tested according to the "KS Standard Conditions with Mist" and confirmed that there is not any default. However, if it is operated for a long time in high humid atmosphere (dew point temperature: more than 23°C), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:

- Heat insulation material to be prepared... Adiabatic glass wool with thickness 10 to 20mm.
- Stick glass wool on all air conditioners that are located in ceiling atmosphere.
- In addition to the normal heat insulation (thickness: more than 8mm) for refrigerant piping (gas piping: thick piping) and drain piping, add further 10mm to 30mm thickness material.



FORM THE PIPINGS

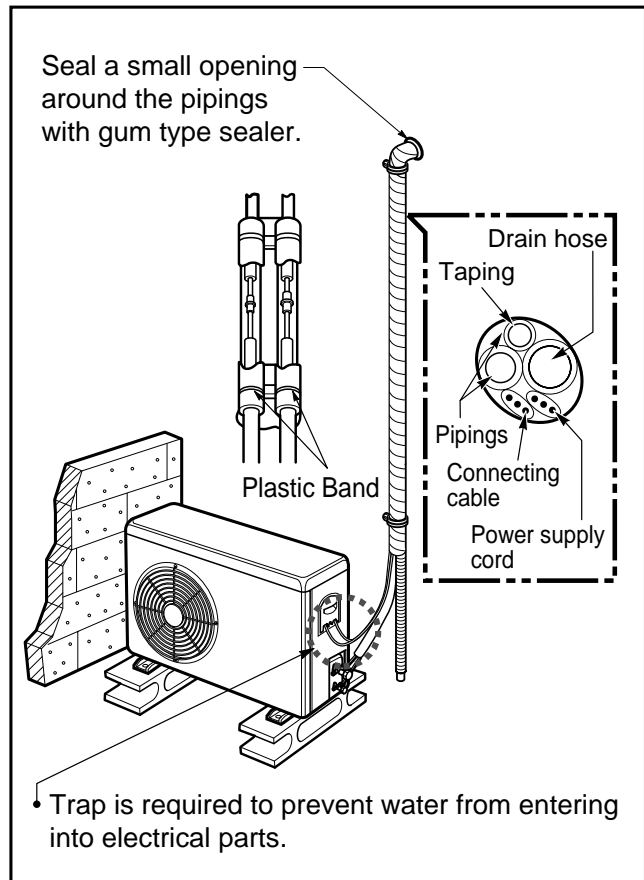
1. Wrap the connecting portion of indoor unit with the Insulation material and secure it with two Plastic Bands. (for the right pipings)

- If you want to connect an additional drain hose, the end of the drain-outlet should keep distance from the ground. (Do not dip it into water, and fix it on the wall to avoid swinging in the wind.)

In case of the Outdoor unit being installed below position of the Indoor unit.

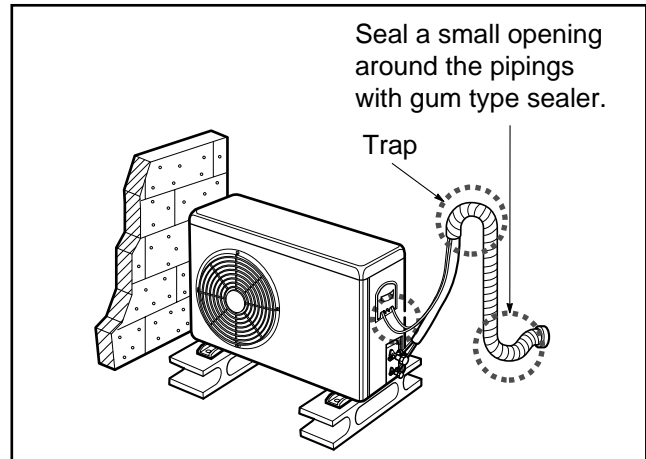
2. Tape the Pipings, drain hose and Connecting Cable from bottom to top.

3. Form the pipings gathered by taping along the exterior wall and fix it onto the wall by saddle or equivalent.



In case of the Outdoor Unit being installed above position of the Indoor Unit.

2. Tape the Pipings and Connecting cable from bottom to top.
3. Form the pipings gathered by taping along the exterior wall, and make the trap prevent water from entering into the room.
4. Fix the pipings onto the wall by saddle or equivalent.



Test running

1) PRECAUTIONS IN TEST RUN

- The initial power supply must provide at least 90% of the rated voltage. Otherwise, the air conditioner should not be operated.

Caution

- ① For test run, carry out the cooling operation firstly even during heating season. If heating operation is carried out firstly, it leads to the trouble of compressor. Then attention must be paid.
 - ② Carry out the test run more than 5 minutes without fail.
(Test run will be cancelled 18 minutes later automatically)
- The test run is started by pressing the room temperature checking button and down timer button for 3 seconds at the same time.
 - To cancel the test run, press any button.

CHECK THE FOLLOWING ITEMS WHEN INSTALLATION IS COMPLETE

- After completing work, be sure to measure and record trial run properties, and store measured data, etc.
- Measuring items are room temperature, outside temperature, suction temperature, blow out temperature, wind velocity, wind volume, voltage, current, presence of abnormal vibration and noise, operating pressure, piping temperature, compressive pressure.
- As to the structure and appearance, check following items.

- Is the circulation of air adequate?
- Is the draining smooth?
- Is the heat insulation complete
(refrigerant and drain piping)?
- Is there any leakage of refrigerant?

- Is the remote controller switch operated?
- Is there any faulty wiring?
- Are not terminal screws loosened?

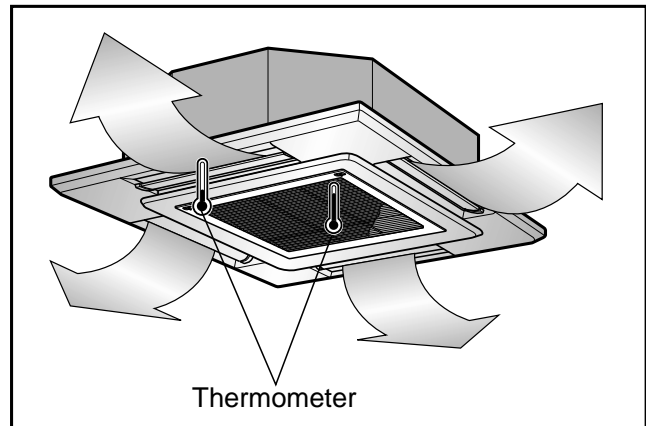
M4.....118N.cm{12kgf.cm} M5.....196N.cm{20kgf.cm}
M6.....245N.cm{25kgf.cm} M8.....588N.cm{60kgf.cm}

2) Connection of power supply

1. Connect the power supply cord to the independent power supply.
 - Circuit breaker is required.
2. Operate the unit for fifteen minutes or more.

3) Evaluation of the performance

1. Measure the temperature of the intake and discharge air.
2. Ensure the difference between the intake temperature and the discharge one is more than 8°C (Cooling) or reversely (Heating).



CAUTION

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

- 1) **Never fail to have an individual power specialized for the air conditioner. As for the method of wiring, be guided by the circuit diagram pasted on the inside of control box cover.**
- 2) **Provide a circuit breaker switch between power source and the unit.**
- 3) **The screw which fasten the wiring in the casing of electrical fittings are liable to come 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 give rise to burn-out of the wires.)**
- 4) **Specification of power source**
- 5) **Confirm that electrical capacity is sufficient.**
- 6) **Be sure that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.**
- 7) **Confirm that the cable thickness is as specified in the power sources specification. (Particularly note the relation between cable length and thickness.)**
- 8) **Never fail to equip a leakage breaker where it is wet or moist.**
- 9) **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.
 - Proper starting power is not given to the compressor.

HAND OVER

Teach the customer the operation and maintenance procedures, using the operation manual (air filter cleaning, temperature control, etc.).

2) Adjusting air volume to the height of ceiling

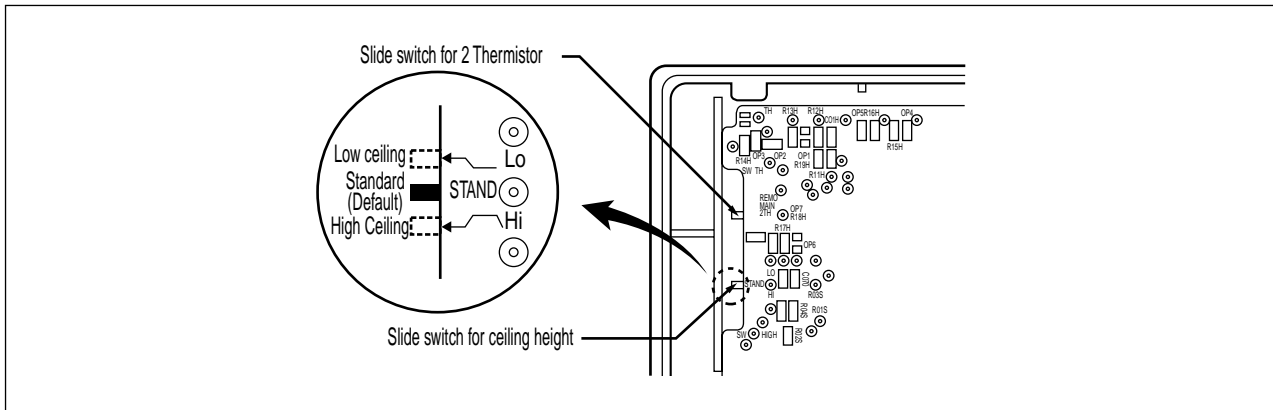
You can choose the RPM(or air volume) of indoor motor according to the height of ceiling to supply the comfortable atmosphere to consumers.

Procedure

1. Choose the selectable position in the table after measuring the height of ceiling.

Ceiling height	Mode of slide switch	Change of air volume	Remark
more than 3.3m	High Ceiling	Increasing	Manufactured in standard mode
2.7~3.3m	Standard	-	
less than 2.7m	Low Ceiling	Decreasing	

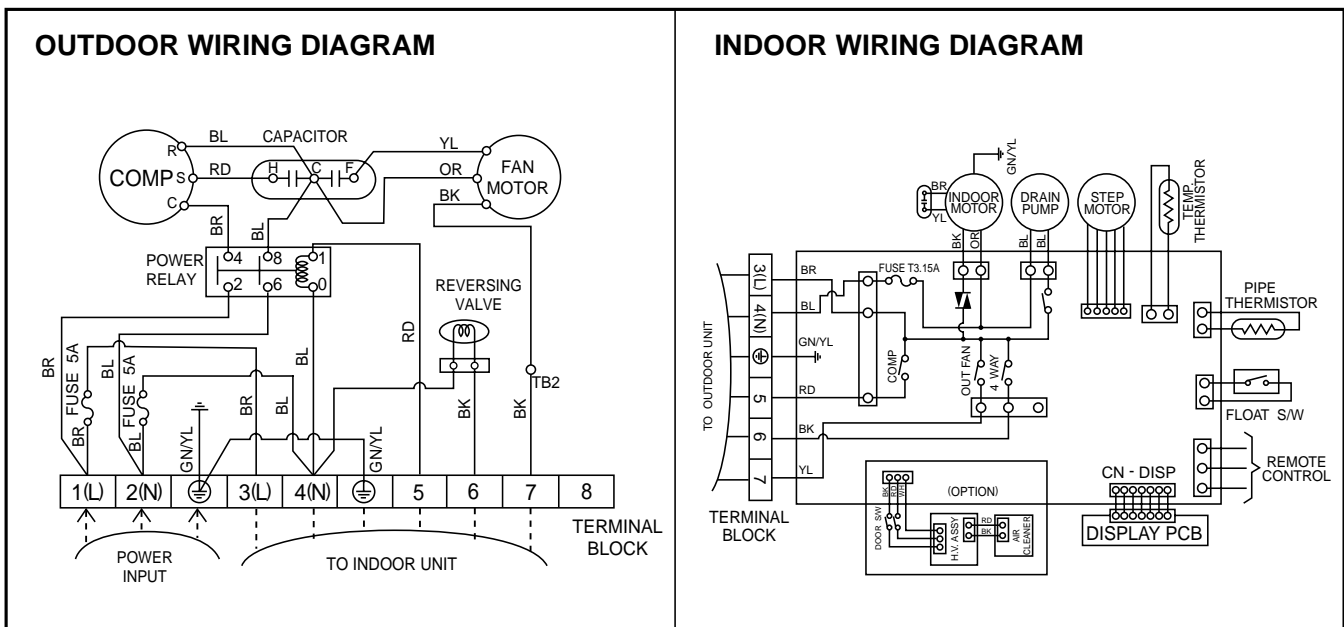
2. In the case of changing the height as "high" or "low", open the rear cover of the wired remote-controller.
3. Move the slide switch to the set position.



4. Close the rear cover and check if it works normally.

NOTICE

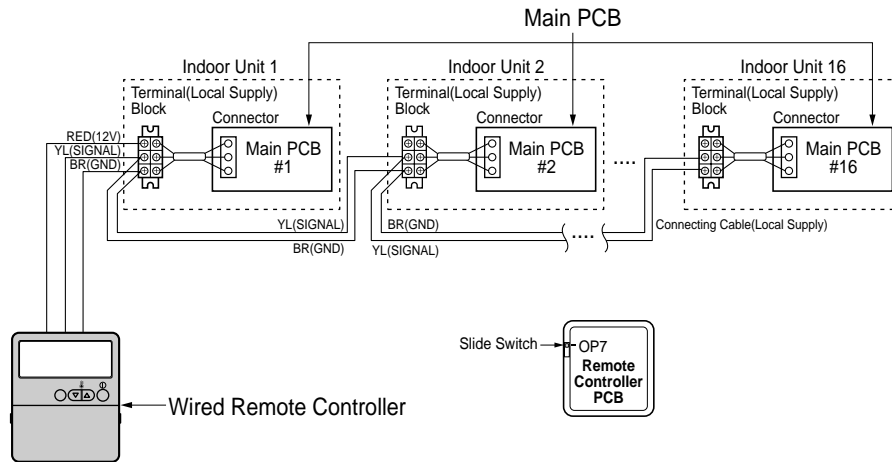
Wiring Diagram for Heat pump



3) Group Control(Optional Wiring)

- You can use a group control operation after connecting the brown and yellow wire of each air-conditioner.
- Remove the resistor "OP 7" in remote controller.
- It operates maximum 16 Units by only one Wired Remote Controller, and each Unit starts sequentially to prevent overcurrent.

Wiring design



Features

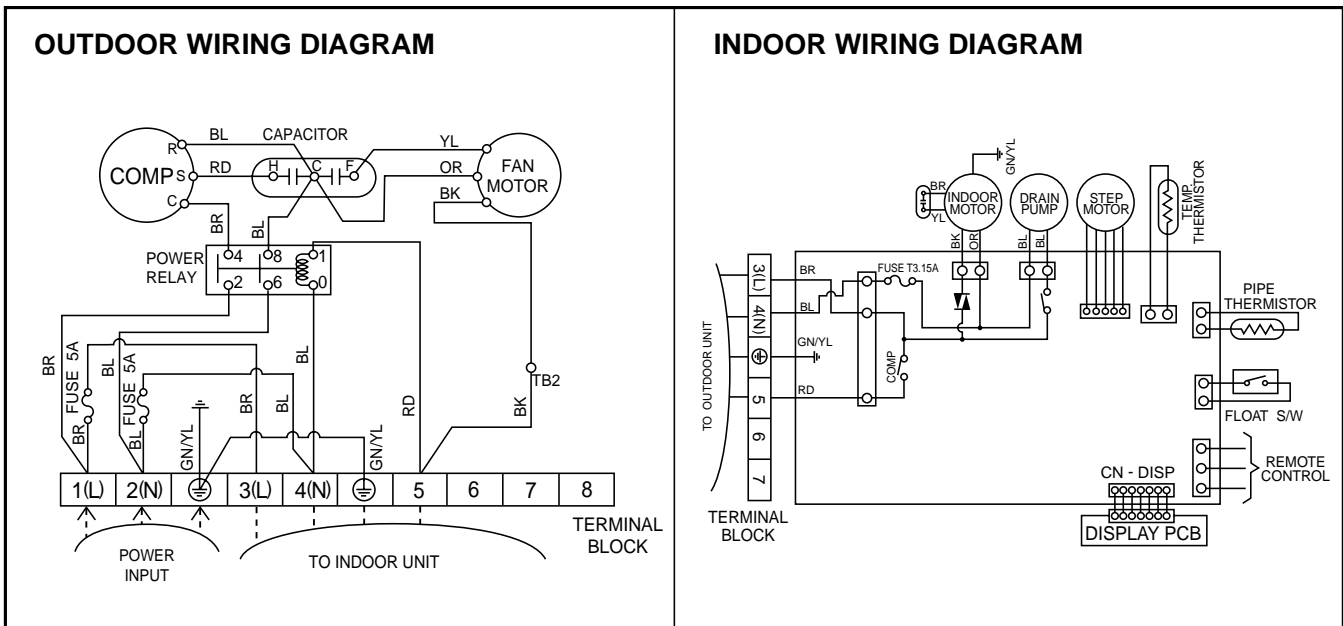
- Use Only One Wired Remote Controller with several air conditioners(max. 16 Units)
- Random starting to prevent overcurrent.

CAUTION

- Be careful not to exchange the color of wires.
- The maximum length of connecting wire should be below 200m(25Ω) on connecting each units.
- Use a wire more than 0.5mm²

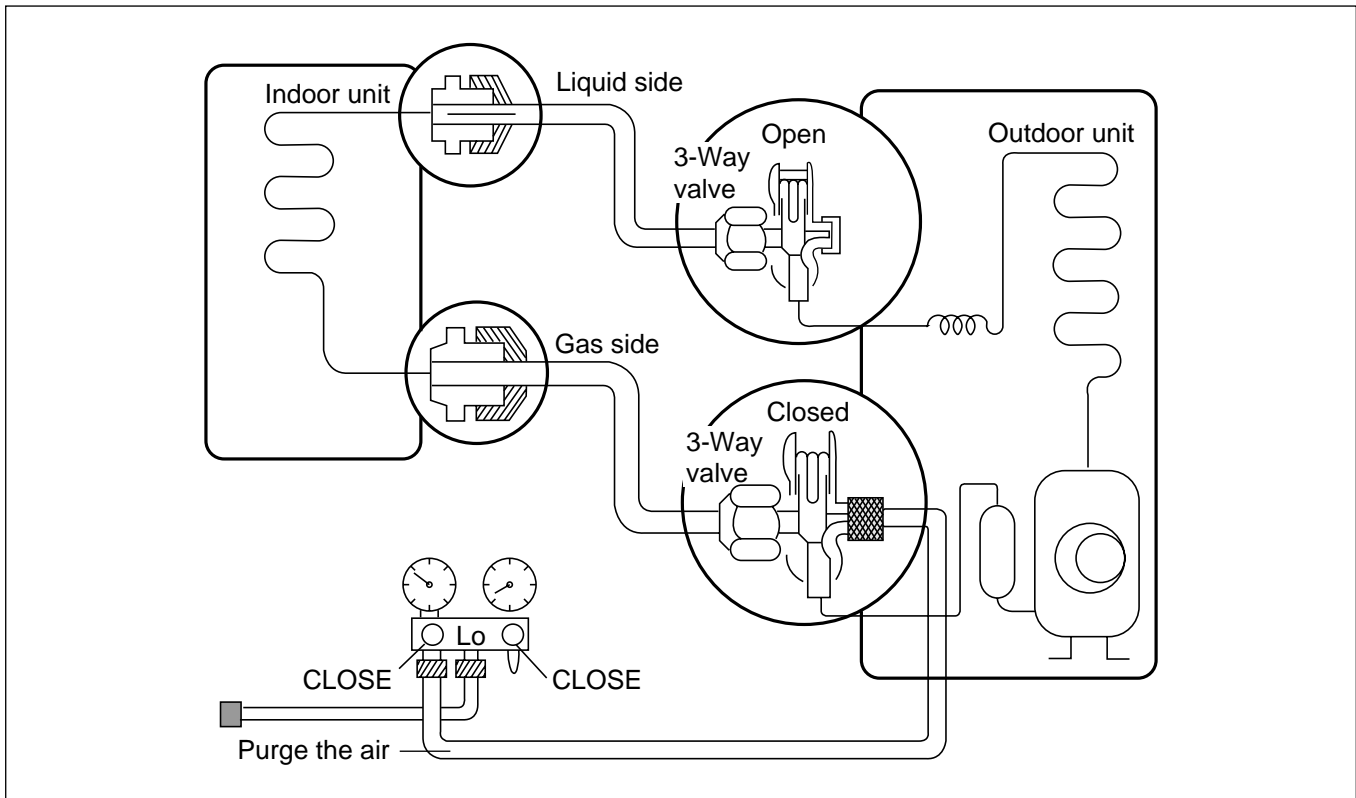
NOTICE

Wiring Diagram for Cooling only



3-way Valve

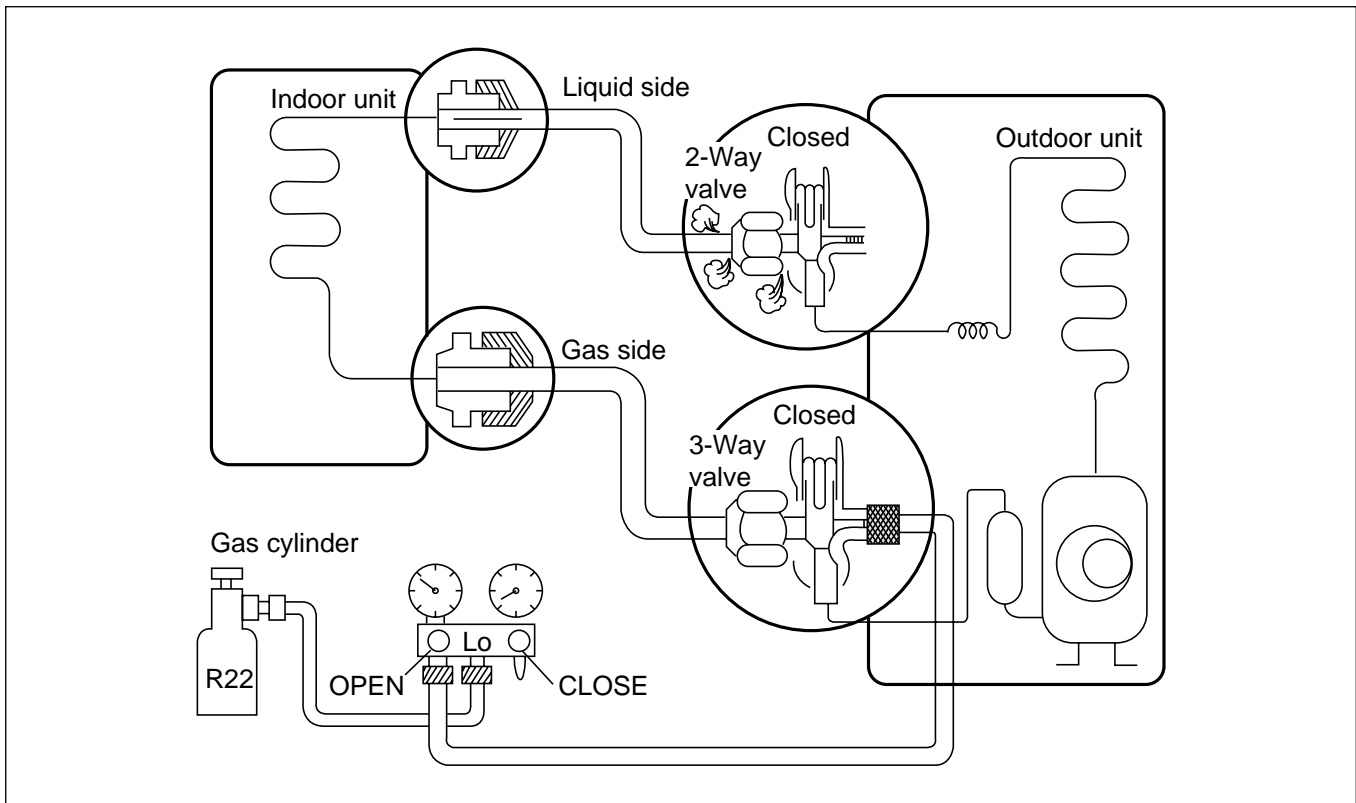
1. Pumping down



• Procedure

- (1) Confirm that both liquid side and gas side valves are set to the open position.**
 - Remove the valve stem caps and confirm that the valve stems are in the raised position.
 - Be sure to use a hexagonal wrench to operate the valve stems.
- (2) Operate the unit for 10 to 15 minutes.**
- (3) Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.**
 - Connect the charge hose to the service port.
- (4) Air purging of the charge hose.**
 - Open the low-pressure valve on the charge set slightly to air purge from the charge hose.
- (5) Set the liquid side valve to the closed position.**
- (6) Operate the air conditioner in cooling mode and stop it when the gauge indicates 1kg/cm²g.**
- (7) Immediately set the 3-way valve to the closed position.**
 - Do this quickly so that the gauge ends up indicating 3 to 5kg/cm²g.
- (8) Disconnect the charge set, and mount the 2-way and 3-way valve's stem nuts and the service port nut.**
 - Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
 - Be sure to check for gas leakage.

1) Re-air purging (Re-installation)

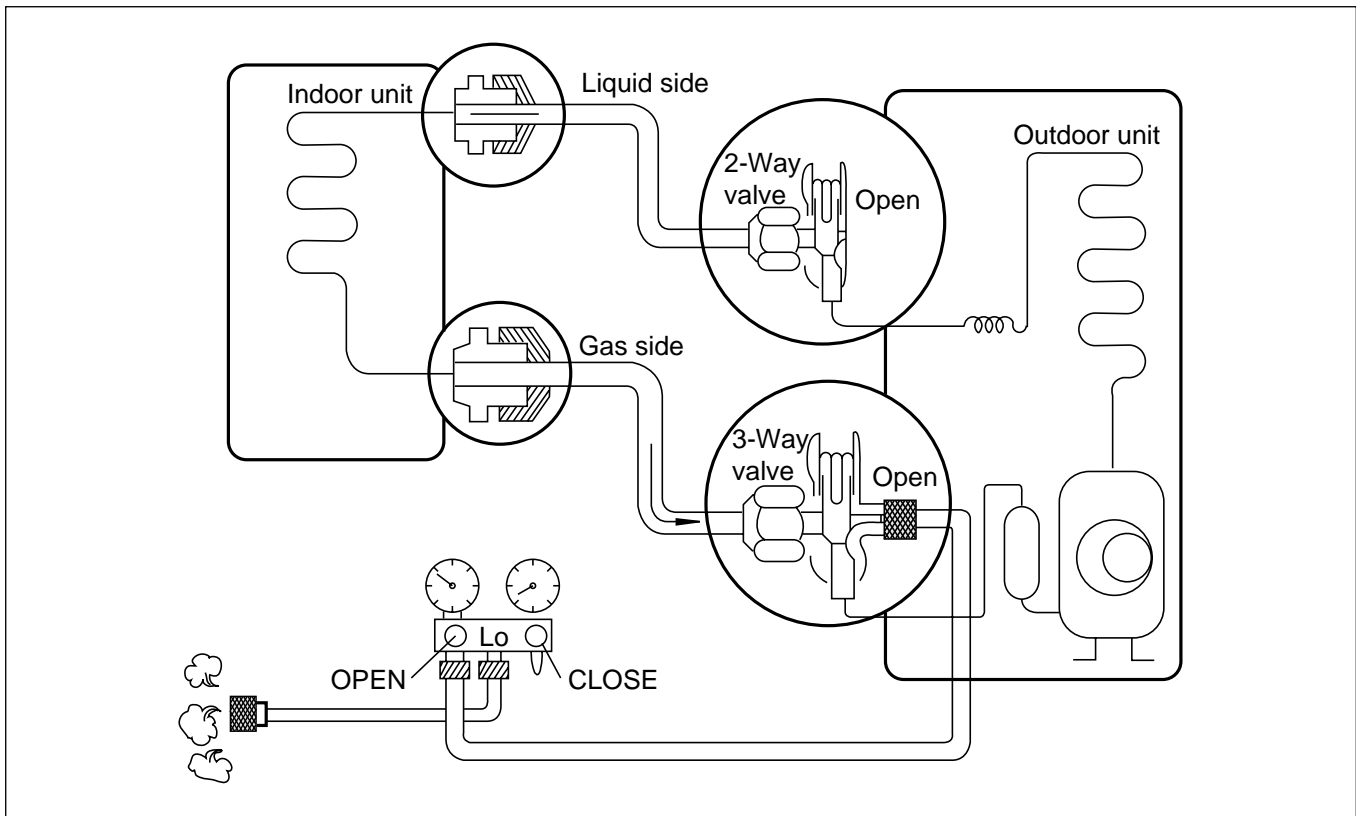


• Procedure

- (1) **Confirm that both the liquid side valve and the gas side valve are set to the closed position.**
 - (2) **Connect the charge set and a gas cylinder to the service port of the 3-way valve.**
 - Leave the valve on the gas cylinder closed.
 - (3) **Air purging.**
 - Open the valves on the gas cylinder and the charge set. Purge the air by loosening the flare nut on the liquid side valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.
 - After purging the air, use a torque wrench to tighten the flare nut on liquid side valve.
 - (4) **Check for gas leakage.**
 - Check the flare connections for gas leakage.
 - (5) **Discharge the refrigerant.**
 - Close the valve on the gas cylinder and discharge the refrigerant until the gauge indicates 3 to 5 kg/cm²g.
 - (6) **Disconnect the charge set and the gas cylinder, and set the 2-way and 3-way valves to the open position.**
 - Be sure to use a hexagonal wrench to operate the valve stems.
 - (7) **Mount the valve stem nuts and the service port nut.**
 - Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
 - Be sure to check for gas leakage.
- * **CAUTION:**
Do not leak the gas in the air during Air Purging.

2) Balance refrigerant of the 3-way valve

(Gas leakage)

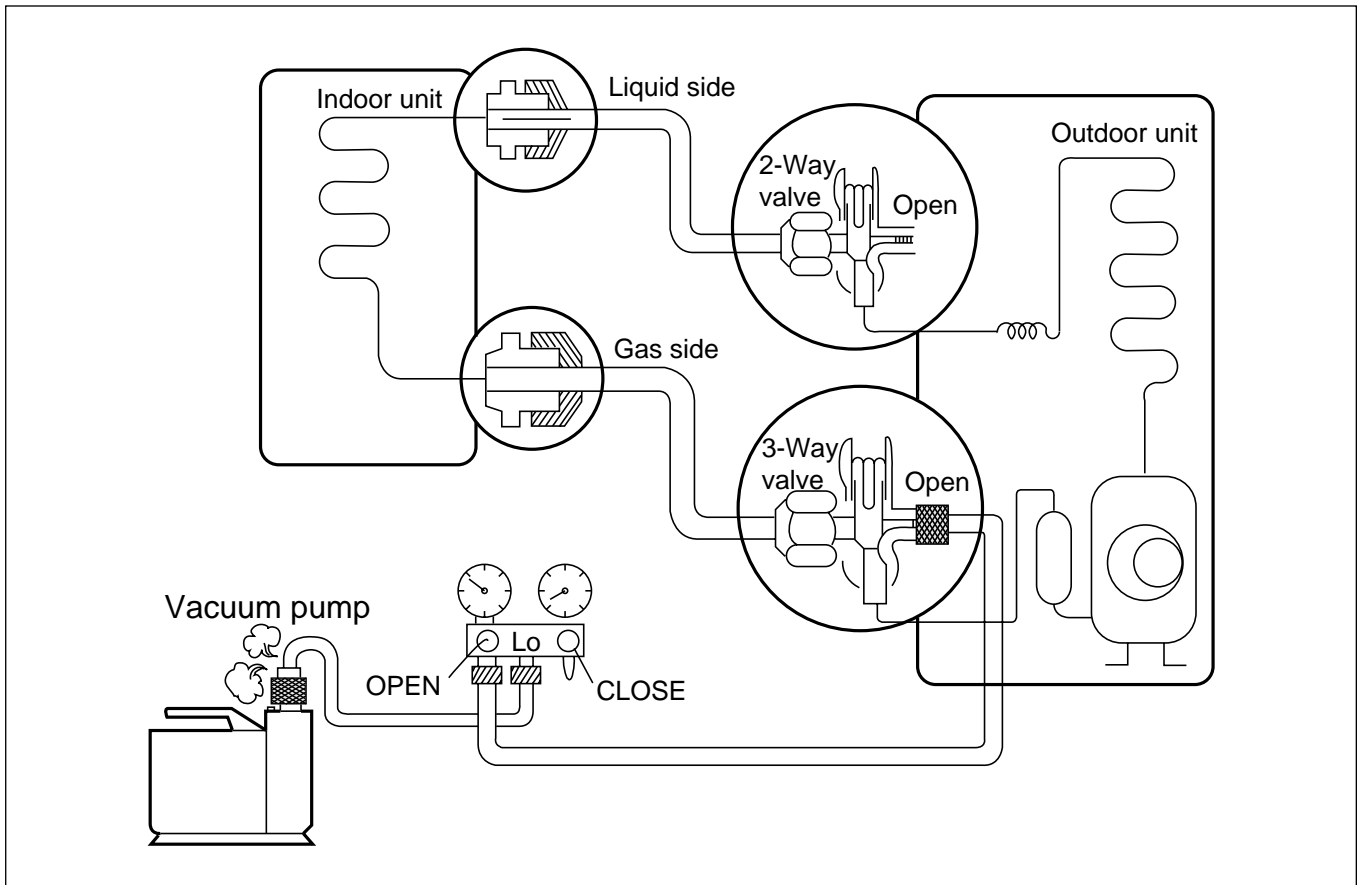


• Procedure

- (1) Confirm that both the liquid side and gas side valves are set to the back seat.
- (2) Connect the charge set to the 3-way valve's port.
 - Leave the valve on the charge set closed.
 - Connect the charge hose to the service port.
- (3) Open the valve (Lo side) on the charge set and discharge the refrigerant until the gauge indicates **0 kg/cm²G**.
 - If there is no air in the refrigerant cycle (the pressure when the air conditioner is not running is higher than 1 kg/cm²G), discharge the refrigerant until the gauge indicates 0.5 to 1 kg/cm²G. If this is the case, it will not be necessary to apply a evacuation.
 - Discharge the refrigerant gradually; if it is discharged too suddenly, the refrigeration oil will also be discharged.

2. Evacuation

(All amount of refrigerant leaked)

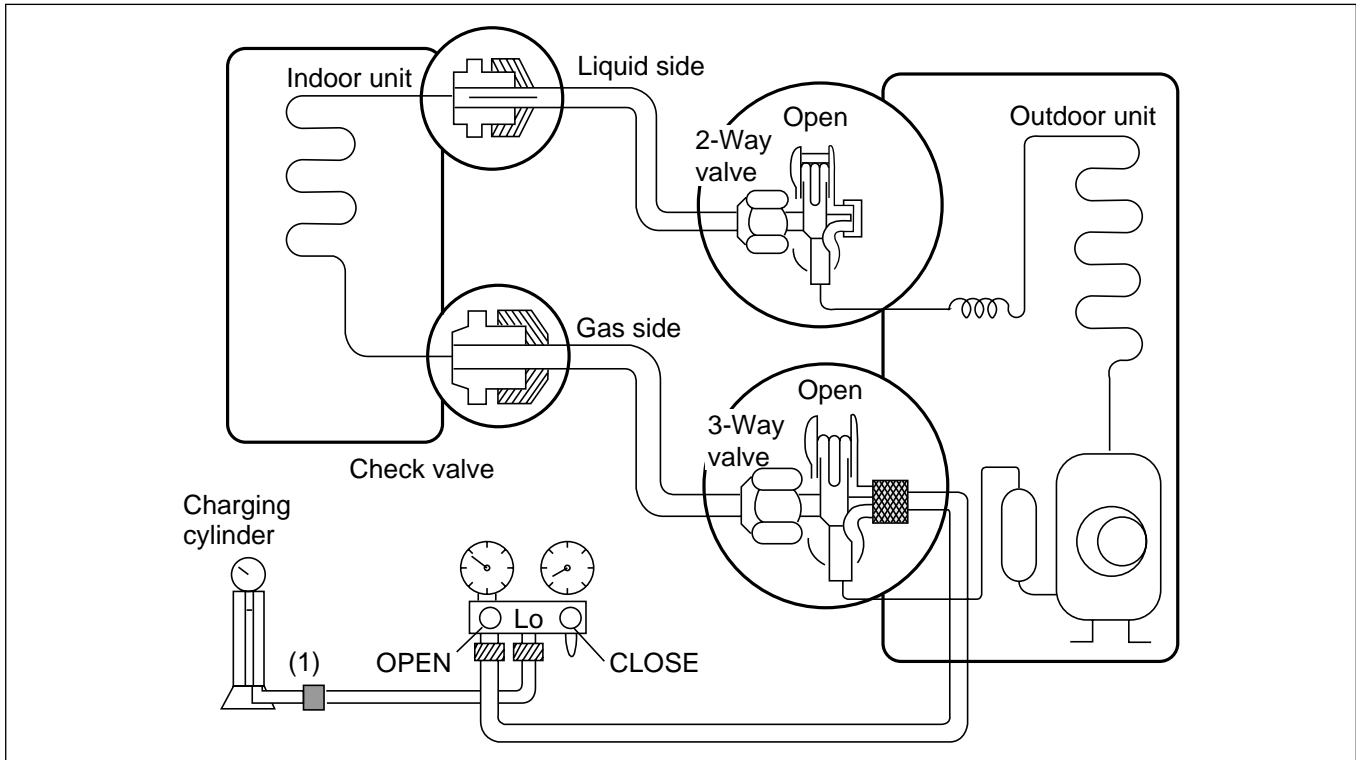


• Procedure

- (1) Connect the vacuum pump to the center hose of charge set center hose
- (2) Evacuation for approximately one hour.
 - Confirm that the gauge needle has moved toward -76 cmHg (vacuum of 4 mmHg or less).
- (3) Close the valve (Lo side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- (4) Disconnect the charge hose from the vacuum pump.
 - Vacuum pump oil.
If the vacuum pump oil becomes dirty or depleted, replenish as needed.

3. Gas Charging

(After Evacuation)



• Procedure

(1) Connect the charge hose to the charging cylinder.

- Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder.
- If you are using a gas cylinder, also use a scale and reverse the cylinder so that the system can be charged with liquid.

(2) Purge the air from the charge hose.

- Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant). The procedure is the same if using a gas cylinder.

(3) Open the valve (Lo side on the charge set and charge the system with liquid refrigerant.

- If the system can not be charged with the specified amount of refrigerant, it can be charged with a little at a time (approximately 150g each time) while operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure (pumping down-pin).

This is different from previous procedures. Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

(4) Immediately disconnect the charge hose from the 3-way valve's service port.

- Stopping partway will allow the gas to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

(5) Mount the valve stem nuts and the service port nut.

- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
- Be sure to check for gas leakage.

Cycle Troubleshooting Guide

Trouble analysis

1. Check temperature difference between intake and discharge air and operating current.

	Temp. difference : approx. 0°C Current : less than 80% of rated current	All amount of refrigerant leaked out Check refrigeration cycle
Temp. Difference	Temp. difference : approx. 8°C Current : less than 80% of rated current	Refrigerant leakage Clog of refrigeration cycle Defective compressor
Operating Current	Temp. difference : less than 8°C Current : over the rated current	Excessive amount of refrigerant
	Temp. difference : over 8°C	Normal

Notice :

Temperature difference between intake and discharge air depends on room air humidity. When the room air humidity is relatively higher, temperature difference is smaller. When the room air humidity is relatively lower temperature difference is larger.

2. Check temperature and pressure of refrigeration cycle.

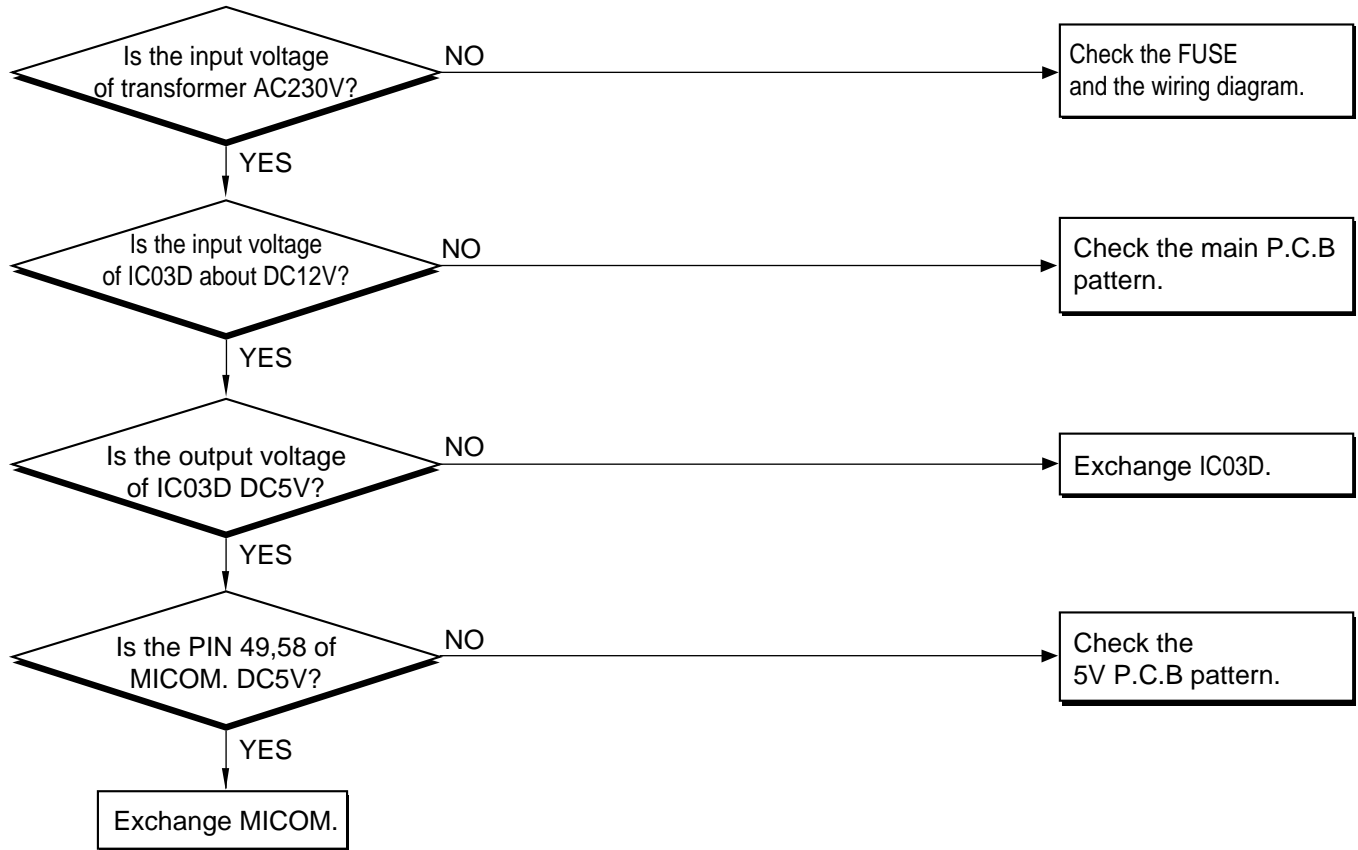
Suction pressure (Compared with the normal value)	Temperature (Compared with the normal value)	Cause of Trouble	Description
Higher	High	Defective compressor Defective 4-way reverse valve	Current is low
	Normal	Excessive amount of refrigerant	High pressure does not quickly rise at the beginning of operation
Lower	Higher	Insufficient amount of refrigerant (Leakage) Clogging	Current is low Current is low

Notice :

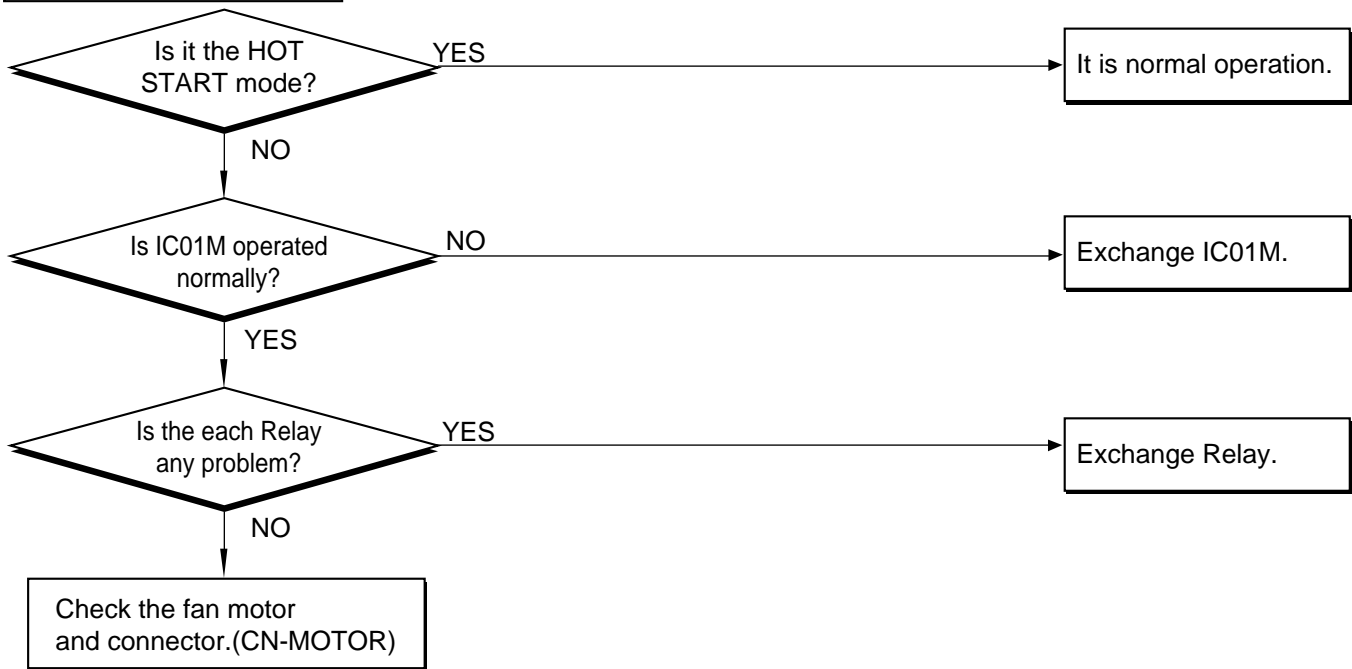
1. The suction pressure is usually 4.5~6.0 kg/cm²G at normal condition.
2. The temperature can be measured by attaching the thermometer to the low pressure tubing and wrap it with putty.

Electronic Parts Troubleshooting Guide

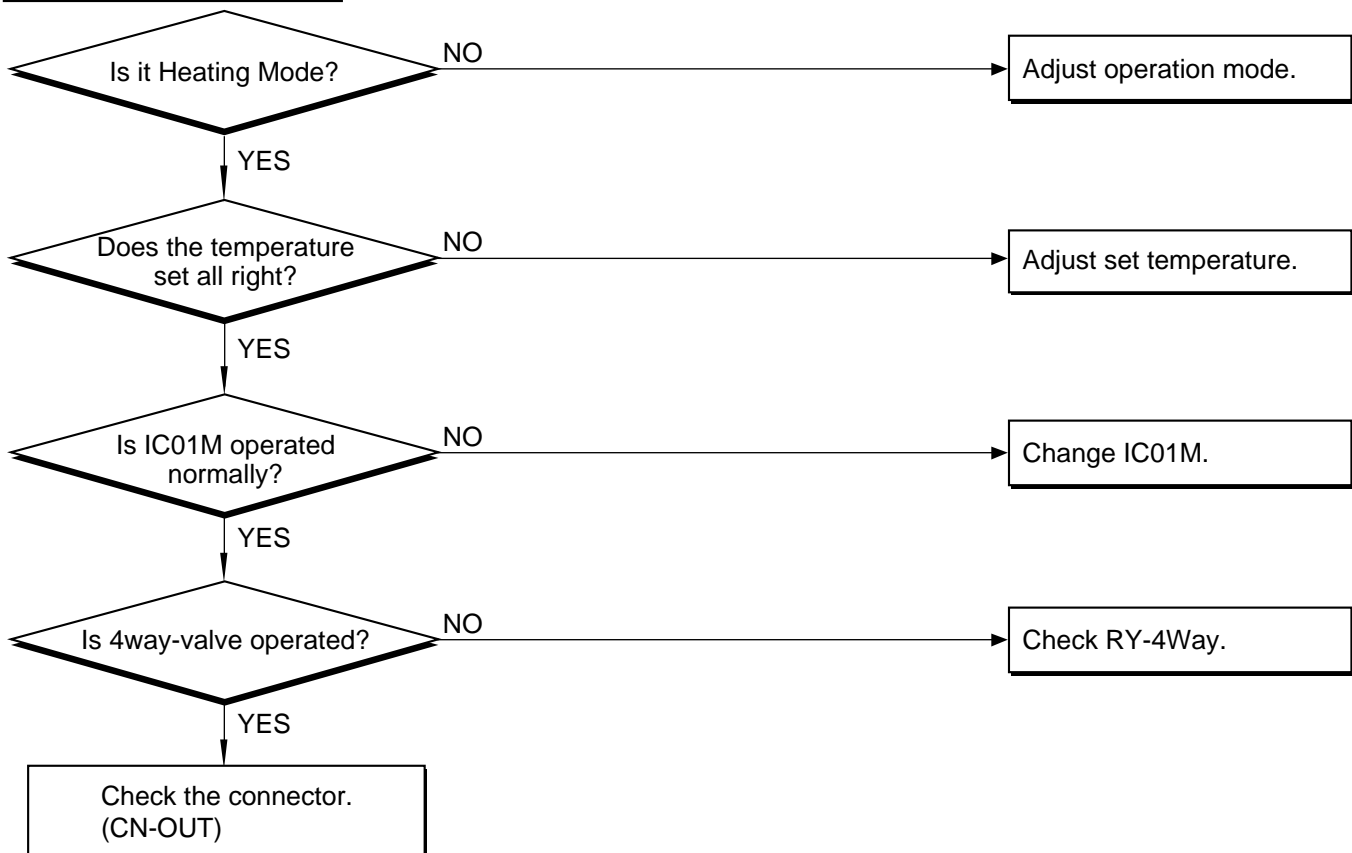
Possible Trouble 1 : The unit does not operate.



Possible Trouble 2 : The indoor fan does not operate.



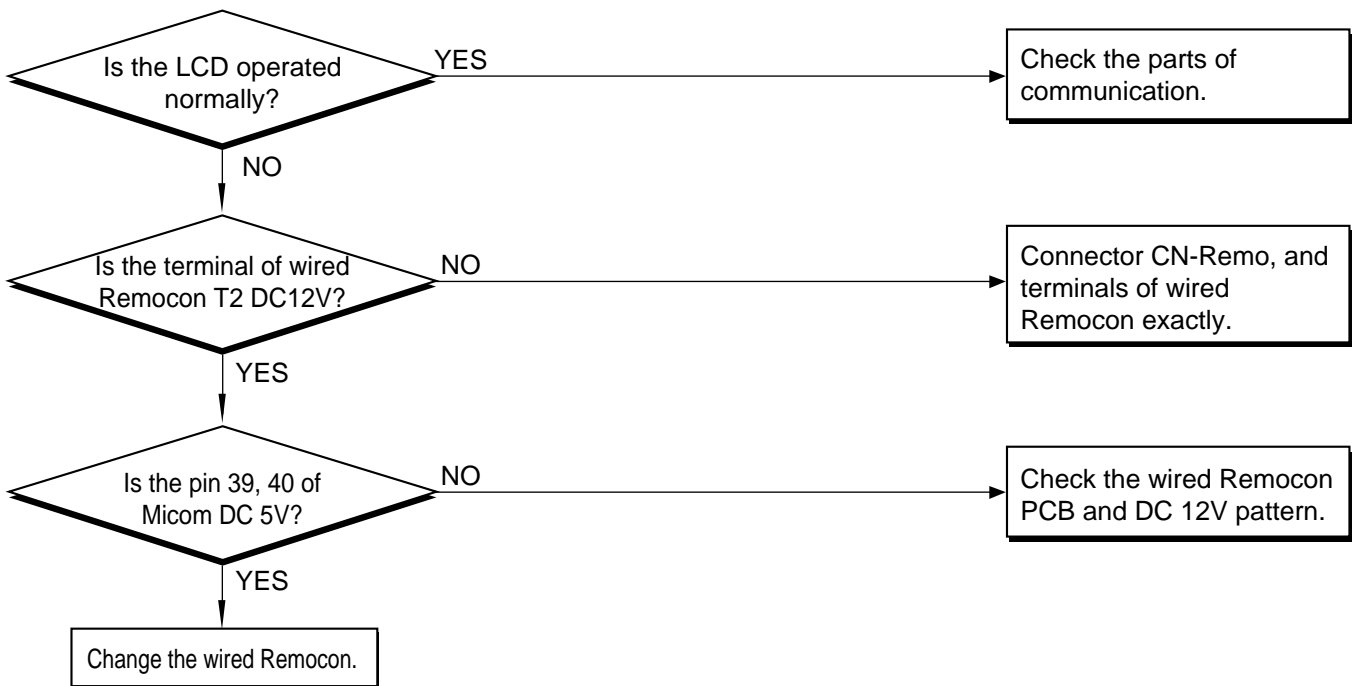
Possible Trouble 3 : Ineffective Heating



Possible Trouble 4 : Auto Air direction louver does not operate.

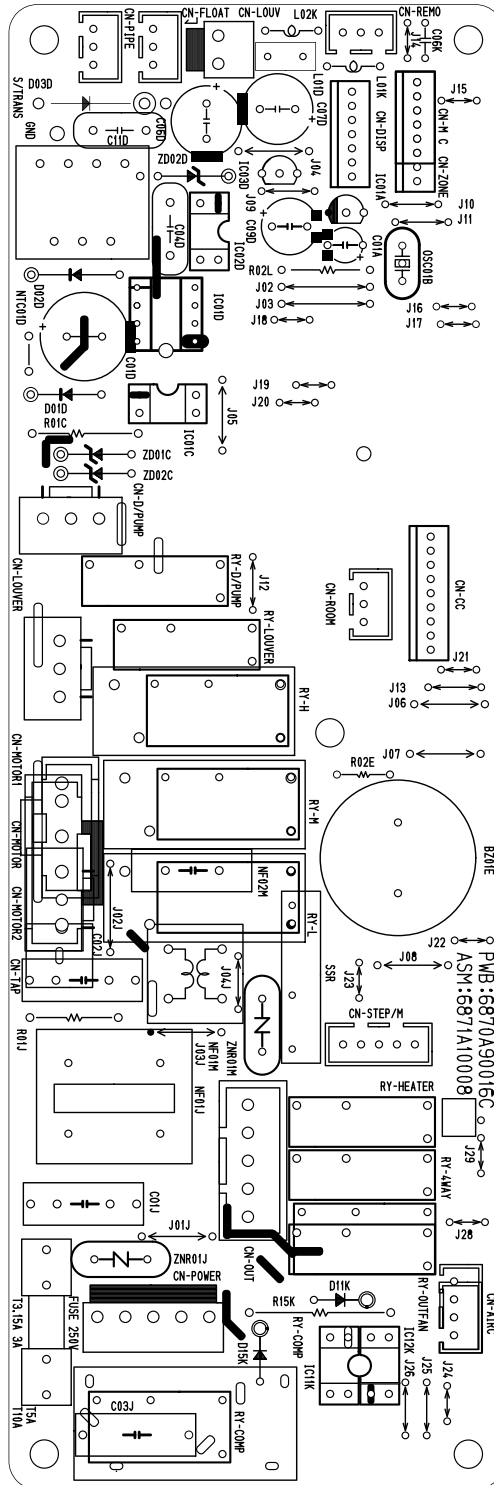


Possible Trouble 5 : Wired remote controller does not operate.

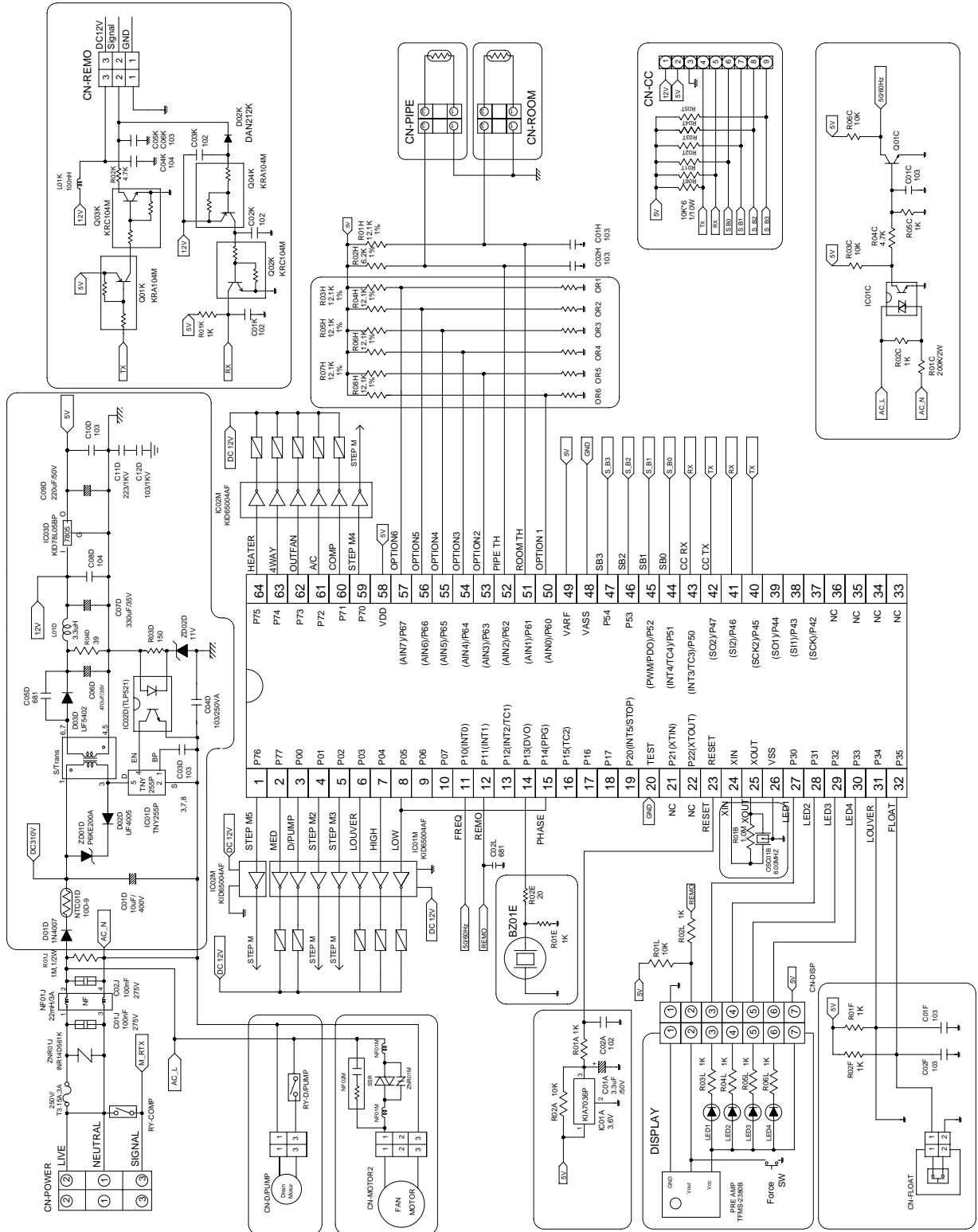


Electronic control device

MAIN P.C.B ASM

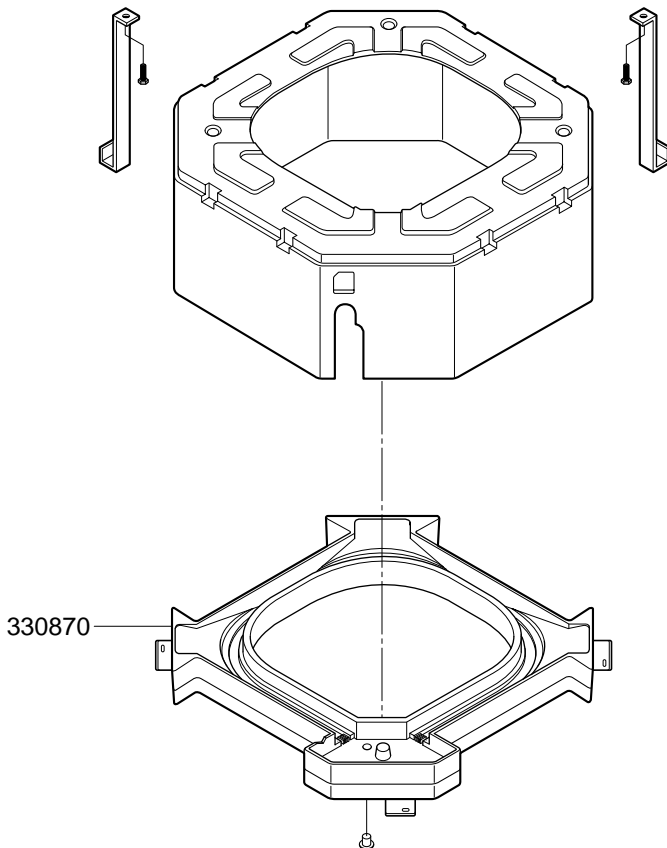
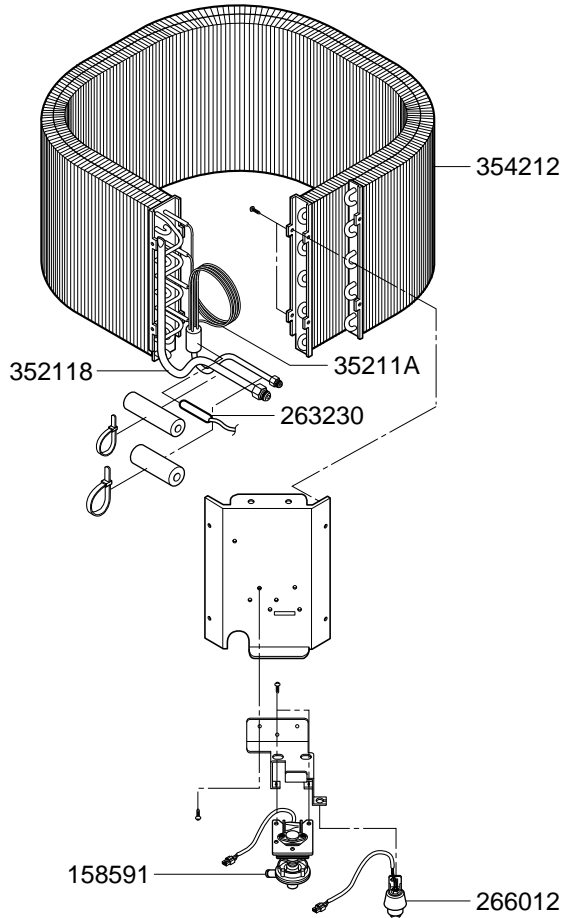
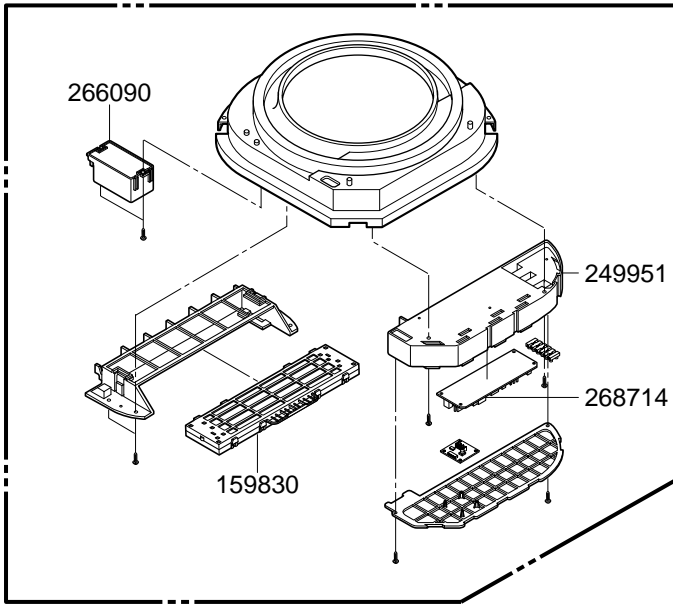


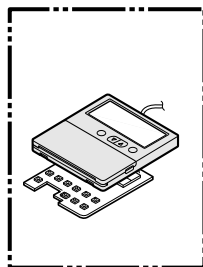
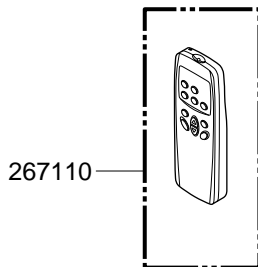
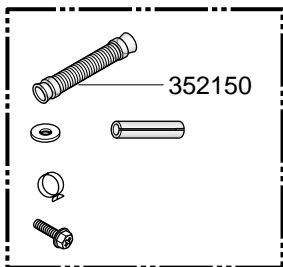
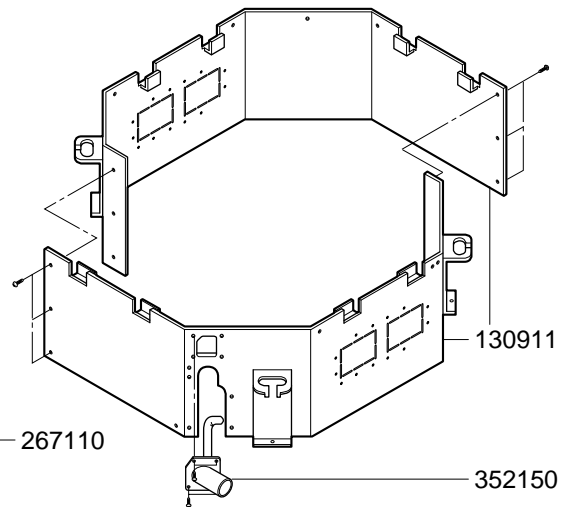
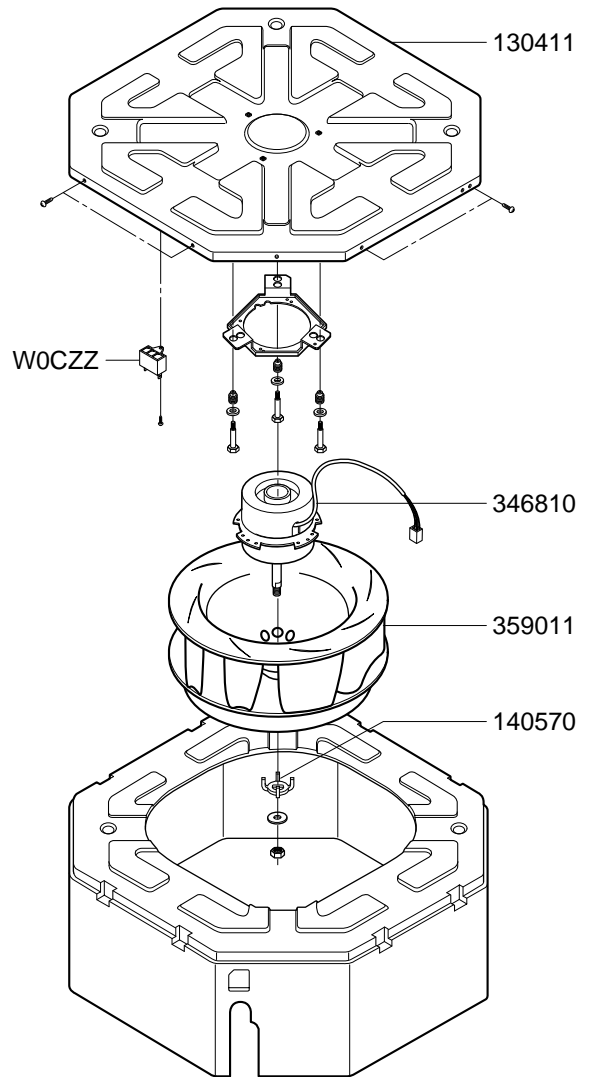
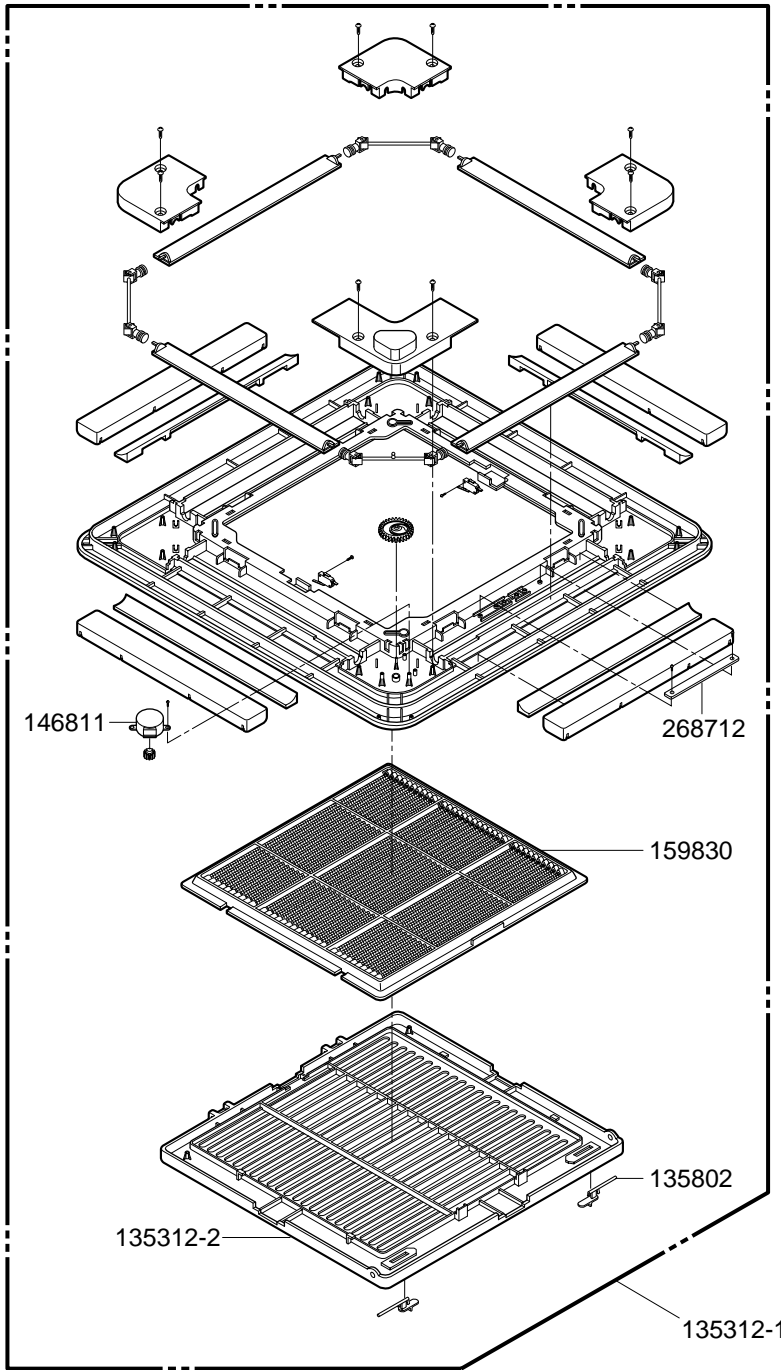
Schematic Diagram



Exploded View and Replacement Parts List

1. Indoor Unit



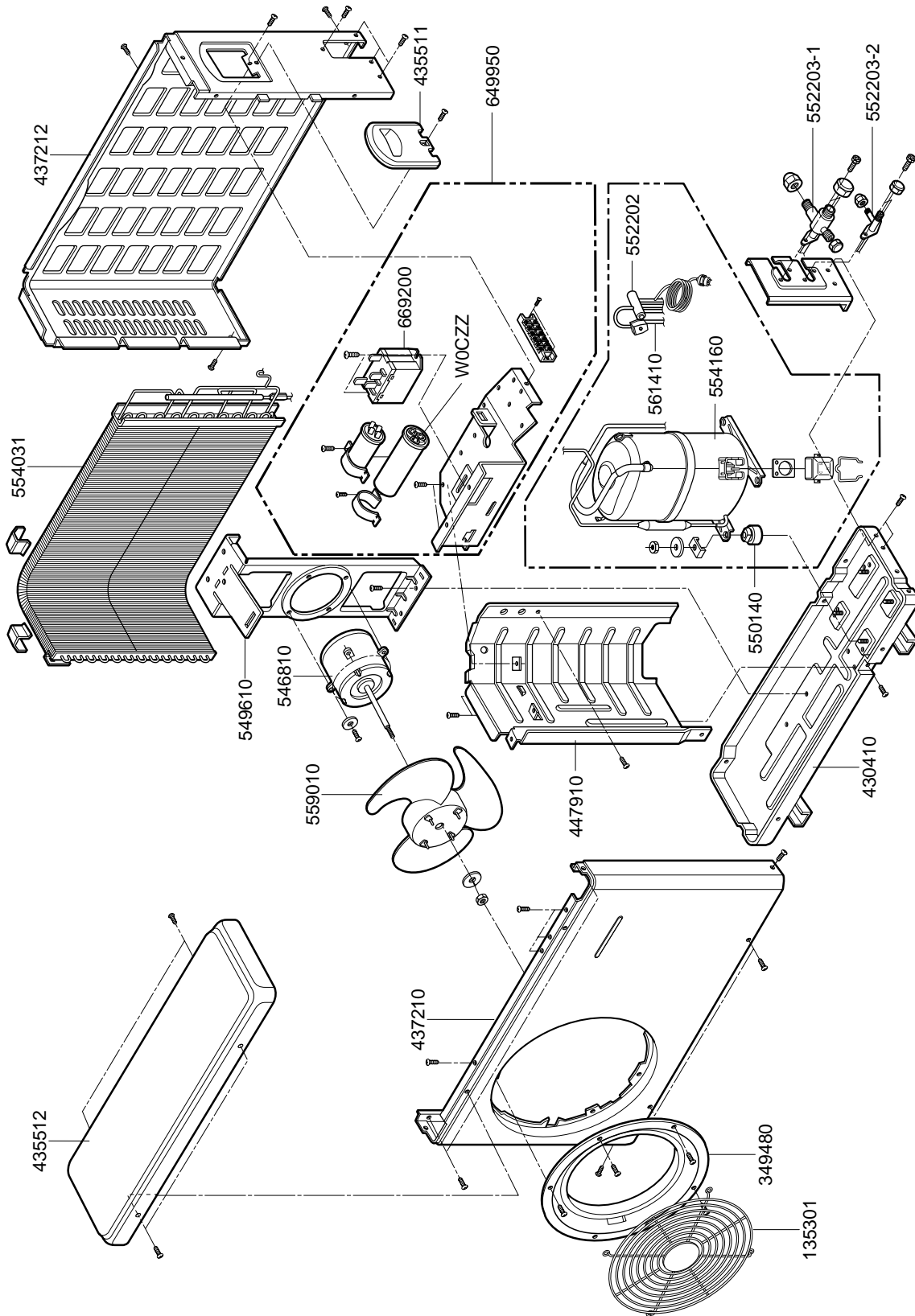


Replacement parts list

Model: LT-E1860CL/LT-E1860HL/ LT-E1862HL/ LT-E1820CL/ LT-E1820HL/ LT-E2460CL/ LT-E2460HL/ LT-E2462HL

LOCATION NO.	DESCRIPTION	PART NO.								RE-MARK	
		LT-E1860CL	LT-E1860HL	LT-E1862HL	LT-E2460CL	LT-E2460HL	LT-E2462HL	LT-E1820CL	LT-E1820HL		
354212	EVEPORATOR ASSY	5421A10007A			5421A10007B			5421A10007A			
35211A	TUBE ASSY, SUCTION	5211A20243A			5211A20243B			5211A20243A			
352118	TUBE ASSY, MENIFOLD	5211A20241A									
158591	PUMP, WATER	5858A10001G									
266012	SWITCH ASSY, FLOAT	6601A20001F									
330870	DRAIN PAN ASSY	3087A10002A									
249951	CONTROL BOX ASSY	4995A10026B	4995A10026A		4995A10026D	4995A10026C	4995A10026C	4995A10026F	4995A10026E		
268714	PWB(PCB) ASSY, MAIN	6871A10008Q	6871A10008F		6871A10008S	6871A10008R		6871A10008V	6871A10008U		
130411	BASE ASSY, WELD INDOOR	3041A10013A									
346810	MOTOR ASSY, INDOOR	4681AC2026C			4681AC2026D			4681AC2026C			
359011	FAN, TURBO	5900A10004A									
140570	LOCKER	4056A20001A									
130911	CABINET ASSY, INDOOR	3091A10023A/B									
352150	DRAIN ASSY, TUBE	5251A20002A									
135312-1	PANEL ASSY, FRONT(INDOOR)	3721A10021C	3721A10021A	3721A10021B	3721A10021C	3721A10021A	3721A10021B	3721A10021C	3721A10021A		
146811	MOTOR ASSY, STEP	4681AP2968D									
268712	PWB(PCB) ASSY, DISPLAY	6871A20096A									
159830	FILTER ASSY	5231A10005A									
135802	DOOR, LOCK	3580A20005A									
267110	WIRED REMOTE CONTROLLER	6711A10002P	6711A10002A	6711A10002B	6711A10002P	6711A10002A	6711A10002B	6711A10002P	6711A10002A		
267110	REMOTE CONTROLLER(OPTIONAL)	(6711A20039G)	(6711A20039H)	6711A20039K	(6711A20039G)	(6711A20039H)	6711A20039K	(6711A20039G)	(6711A20039H)		
266090	HVB	-		6609A20005C	-		6609A20005C	-			
159830	AIR CLEANER ASSY	-		5983A10002A	-		5983A10002A	-			
263230	THERMISTOR ASSY	6323AQ3226F									
W0CZZ	CAPACITOR	3H00660N									
352150	DRAIN TUBE ASSY	5251AP2984A									
135312-2	INLET GRILLE	3530A10056A									

2. Outdoor Unit



• Parts List

Model: LT-E1860CL/LT-E1860HL/ LT-E1862HL/ LT-E1820CL/ LT-E1820HL/ LT-E2460CL/ LT-E2460HL/ LT-E2462HL

LOCATION NO.	DESCRIPTION	PART NO.								RE-MARK
		LT-E1860CL	LT-E1860HL	LT-E1862HL	LT-E2460CL	LT-E2460HL	LT-E2462HL	LT-E1820CL	LT-E1820HL	
430410	BASE ASSY, WELD(OUTDOOR)	3041A30003U			3041A30003K			3041A30003E	3041A30003F	R
435512	COVER ASSY, TOP(OUTDOOR)	3H03266N			3H03266J			3H03266K		R
437210	PANEL ASSY, FRONT(OUTDOOR)	3721A20005N			3721A20005G			3721A20005F		R
437212	PANEL ASSY, REAR(OUTDOOR)	3720AP0003D								R
447910	BARRIER ASSY, OUTDOOR	2H02110E			2H02110A			2H02110A	4791A30004A	R
546810	MOTOR ASSY, OUTDOOR	4681A20008N	4681A20013A		4681A20013K			4681A20013B		R
550140	ISOLATOR, COMP	5040A30017B			4H01765A			4H00982E		R
552202	VALVE, REVERSING	-	3A02027A		-	3A02027A				R
552203-1	VALVE, SERVIDE (P15.88)	2A00392E								R
552203-2	VALVE, SERVICE(P6.35)	2H02479B								R
554031	CONDENSER ASSY, BENT	5402AR2347K	5402AR2347B	5402AR2347B	5402AR2347K	5402AR2347B	5402AR2347B	5402AR2347H	5402AR2347B	
554160	COMPRESSOR ASSY, FINAL	5416A20016A			2A00713D			5416A20003D		R
559010	FAN ASSY, PROPELLER	1A00195B								R
649950	CONTROL BOX ASSY, OUTDOOR	4995A20014D	4995A20014C	4995A20014C	4995A20014D	4995A20014C	4995A20014C	4995A20014G	4995A20014H	
W0CZZ	CAPACITOR, DRAWING	6120AR2194K								
549610	MOUNT MOTOR	4960AP1361A								
669200	RELAY	6920AP3400A								
135301	GRILLE DISCHARGE	3530A20007B								
349480	ORIFICE	4948AP2527A								
435511	COVER, CONTROL	3A01919B								
561410	COIL, REVERSING	-	3A02028Y		-	3A02028Y				

