

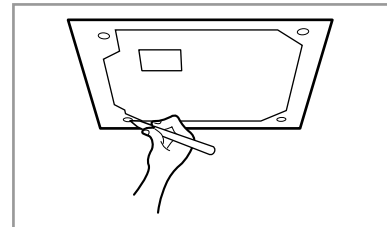


1. Indoor unit

(Example;4-way cassette type)

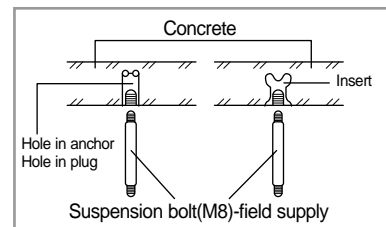
- 1) Place the pattern sheet on the ceiling at the spot where you want to install the indoor unit.

Note ◆ Since the diagram is made of paper, it may shrink or stretch slightly due to temperature or humidity. For this reason, before drilling the holes maintain the correct dimensions between the markings.

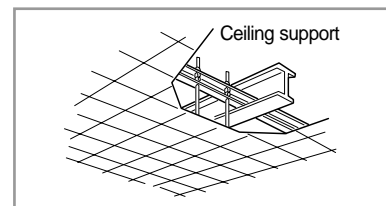


- 2) Insert bolt anchors, use existing ceiling supports or construct a suitable support as shown in figure.

IMPORTANT ◆ Ensure that the ceiling is strong enough to support the weight of the indoor unit. Before hanging the unit, test the strength of each attached suspension bolt.
◆ If the length of suspension bolt is more than 1.5m, it is required to prevent vibration.



- 3) Install the suspension bolts depending on the ceiling type.

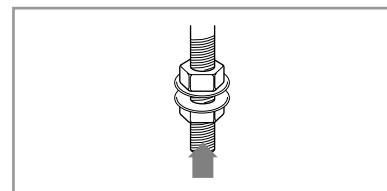


- 4) Screw eight nuts to the suspension bolts making space for hanging the indoor unit.

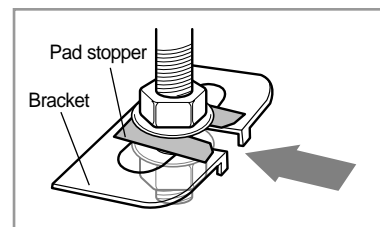
IMPORTANT You must install the suspension bolts more than four when installing the indoor unit.

- 5) Hang the indoor unit to the suspension bolts between two nuts.

Note ◆ Piping must be laid and connected inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the piping into position for connection to the unit before placing the unit inside the ceiling.



- 6) Screw the nuts to suspend the unit. Cut a pad stopper and place it on the bracket at this time.



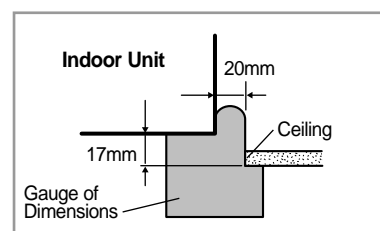
- 7) Adjust the unit to the appropriate position considering the installation area for the front panel.

7-1 Place the pattern sheet on the indoor unit.

7-2 Adjust a space between the ceiling and the indoor unit by using the gauge of dimensions.

7-3 Fix the indoor unit securely after adjusting level of the unit by using a leveler.

7-4 Remove the pattern sheet, connect the other cables and install the front panel.



Note ◆ For installation of another indoor unit, refer to an appropriate installation manual.



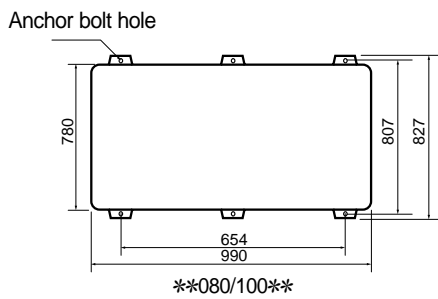
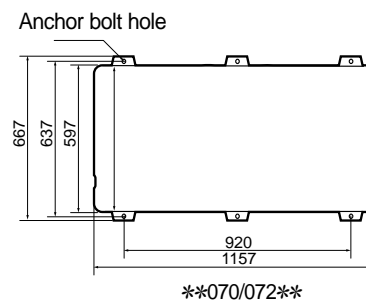
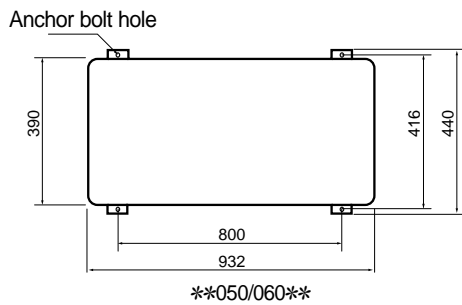
2. Outdoor unit


The outdoor unit must be installed on a rigid and stable base to avoid any increase in the noise level and vibration, particularly if the outdoor unit is to be installed in a location exposed to strong winds or at a height, the unit must be fixed to an appropriate support (wall or ground).

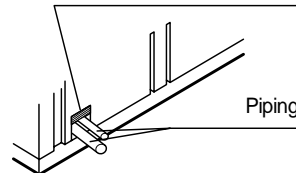
1) Fix the outdoor unit with anchor bolts.

Note ◆ The anchor bolt must be 20mm or higher from the base surface.

Unit : mm



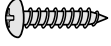







To prevent the unit against a wild animal or something, cover  part after connecting the pipe.



3. Panel

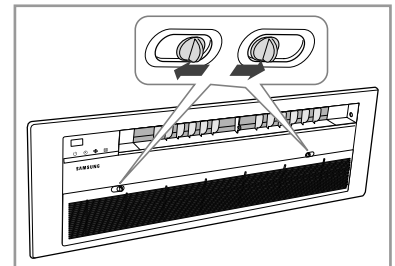
3-1. 1-way cassette type

(1) Accessories

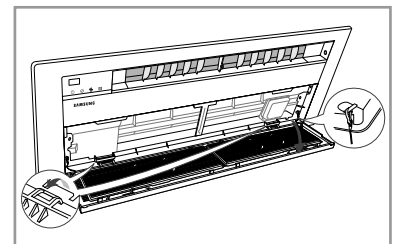
M4x12 tapped screw (6) 	M5x16 bolt (4) 				
Wireless remote controller (1) 	Battery (2) 	STS 2S-2x10 tapped screw (2) 	Remote control holder (1) 	Owner's instructions (1) 	Installation manual (1) 

(2) Installation

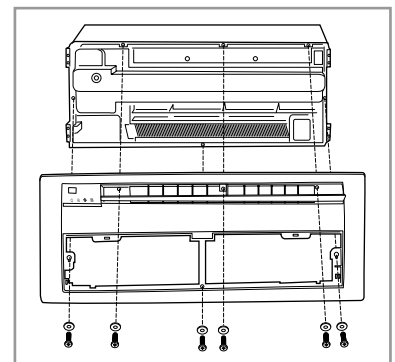
1) Open the front grille by pushing tabs on the grille.



2) Remove safety clips to open the grille completely.



3) Attach the panel to the indoor unit temporarily with 6 screws, then adjust it not to leave a gap between the ceiling and the panel.





3. Panel

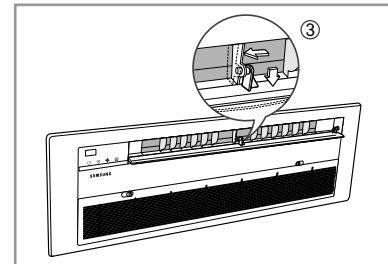
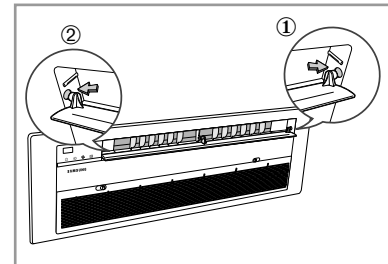
4) Install the air flow blade.

4-1 Fix the right part of the blade to the indoor unit.

4-2 Fix the other side of the blade.

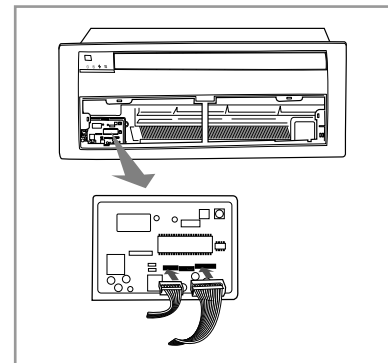
IMPORTANT ◆ If the direction is incorrect, the blade will not be inserted smoothly. Check that prominence of the right side has a small rectangular groove.

4-3 Fix the middle part of the blade by pushing slightly the middle tab in the indoor unit.

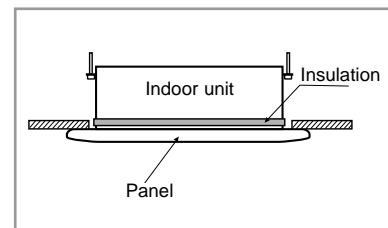
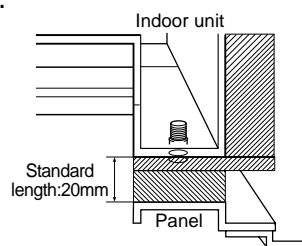


5) Open the electrical component box by removing screws, then connect cables between the electrical component box and the panel.

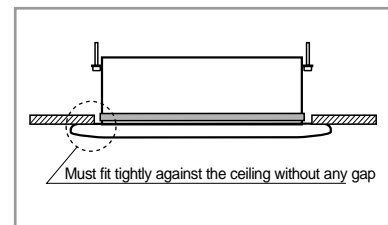
IMPORTANT ◆ Be careful about the color of cables not so that they will be mixed up.



6) Fix the panel by fastening 4 bolts; the bolt can be fastened up to 15mm.









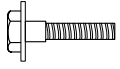
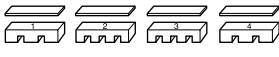
Caution ◆ If there is a gap between the panel and the ceiling, adjust the height of the indoor unit. Unless adjust the height, dew may form and drip from the gap.



7) Reinstall the front grille.

3-2. 4-way cassette type

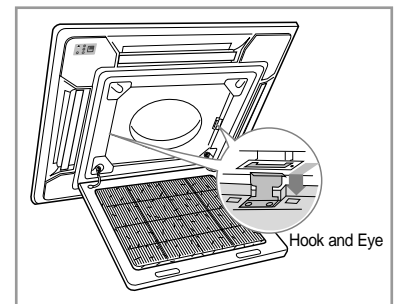
(1) Accessories

Wireless remote controller (1) 	Battery (2) 	Remote control holder (1) 	Owner's instructions (1) 	Owner's instructions (1) 
4x12 Tapped screw (2) 	Bolt (4) 	Air blocking kit (1)  Must be separately purchased		

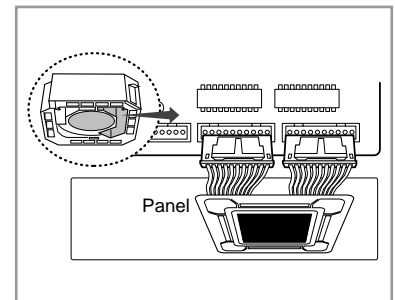
(2) Installation

1) Open the electrical component box cover removing the screws.

2) Install the panel using two hooks on the both sides of the indoor unit.



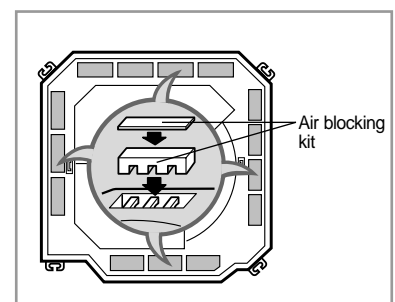
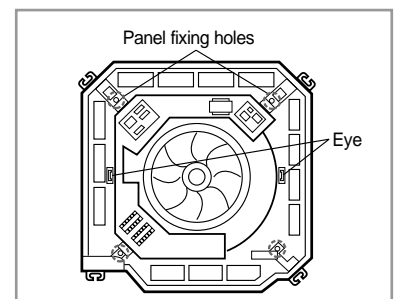
3) Connect the cables of the panel to the PCB as shown in figure.



4) Close the electrical component box cover and secure the screws.

5) Secure the panel to the indoor unit using the bolts(4EA).

- ◆ There are four kinds of air blocking kits. Fill up the air outlet(s) with one or more kits depending on the situation, then install the insulation to block air completely.

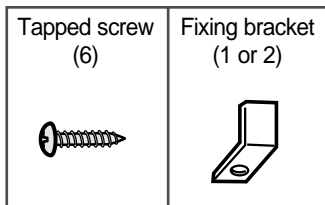




3. Panel

3-3. Duct type (Built-in)

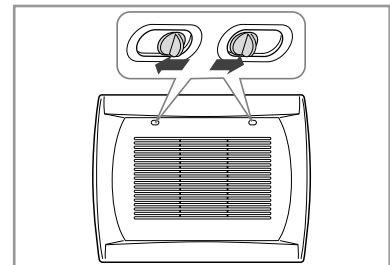
(1) Accessories



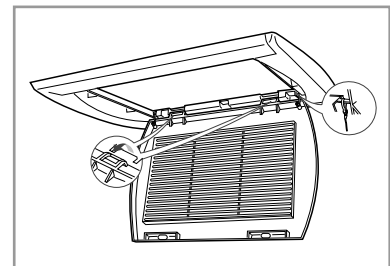
(2) Installation

1) Separate the front grille from the panel.

1-1 Push the lever of front grille right and left to lift it up and then open it.



1-2 Take out the safety clip at the both sides of front grille and separate the front grille.



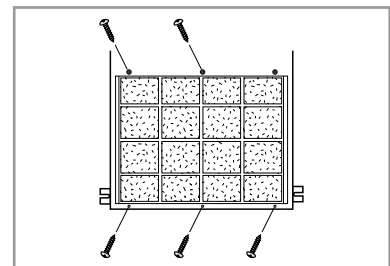
2) Insert panel fixing screws(4EA or 5EA) and tighten them temporarily. Leave space of approx. 7~8mm between the screw and the indoor unit to insert the panel. Do not insert the screw into the rest of one or two hole(s) yet.

****020/026/032/035/040****

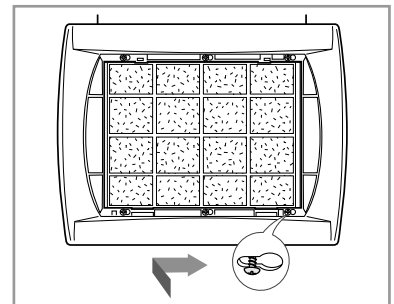
◆ Tighten 5 screws except one hole for fixing a bracket.

****052/070/072****

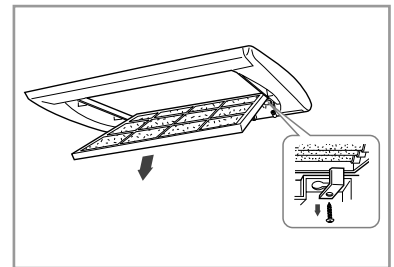
◆ Tighten 4 screws except two holes on right and left.



- 3) Attach the panel to the indoor unit, then push it to right or left to secure the panel. Narrow side of hole on the panel must be inserted between the screw and the indoor unit.



- 4) Adjust the location of panel so that there is no gap between the panel and ceiling, then tighten the screw completely.



- 5) Install the fixing bracket. Each air filter needs its own bracket.

****020/026/032/035/040****

- ◆ Fix 1 bracket to the rest hole on the panel with a supplied screw.

****052/070/072****

- ◆ Fix 2 brackets to two holes on right and left side of the panel with screws.

- 6) Reinstall the front grille.

- ◆ The installation of front grille is in the reverse order of disassembly.



4. Refrigerant pipes

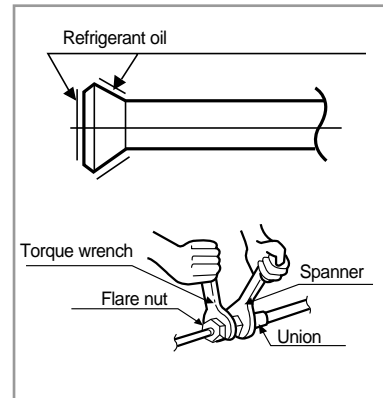
There are two refrigerant pipes of differing diameters:

- ◆ A smaller one for the liquid refrigerant
- ◆ A larger one for the gas refrigerant
- ◆ The inside of copper pipe must be clean & has no dust.

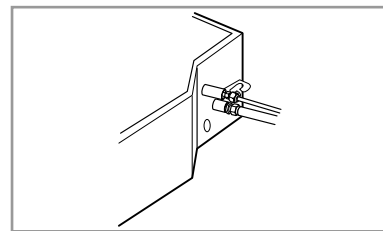
- 1) Remove the pinch pipe on the pipes and connect the assembly pipes to each pipe, tightening the nuts, first manually and then with a wrench, a spanner applying the following torque.

Outer Diameter	Torque (kgf•cm)
6.35 mm (1/4")	144~176
9.52 mm (3/8")	333~407
12.70 mm (1/2")	504~616
15.88 mm (5/8")	630~770
19.05 mm (3/4")	990~1210
22.23 mm (7/8")	990~1210

Note ◆ If the pipes must be shortened refer to page 19.



- 2) Must use insulator which is thick enough to cover the refrigerant pipe to protect the condensate water on the outside of pipe falling onto the floor and the efficiency of the unit will be better.



- 3) Cut off any excess foam insulation.

- 4) Be sure that there must be no crack or wave on the bended area.

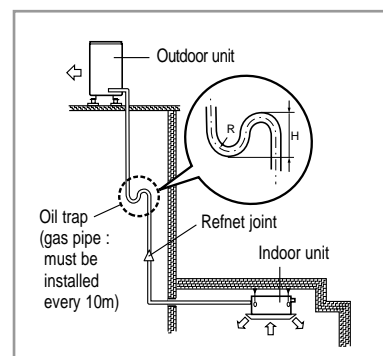
- 5) It would be necessary to double the insulation thickness (10mm or more) to prevent condensation even on the insulator when if the installed area is warm and humid.

- 6) Shape an oil trap.

- ◆ Install the oil trap in case that the outdoor unit is situated higher than the indoor unit.
- ◆ Install the oil trap only in the gas pipe for cooling operation.
- ◆ Install the oil trap only between the outdoor unit and the first refnet joint. In this case, it must be installed every 10 meters from the outdoor unit.
- ◆ The radius of curvature(R) is as followings. (Unit : mm)

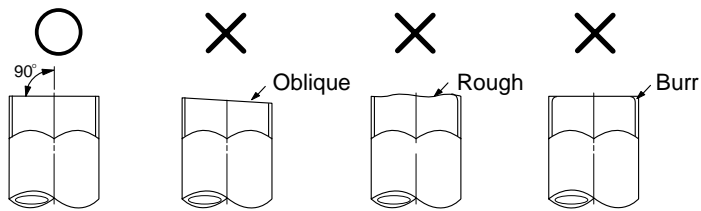
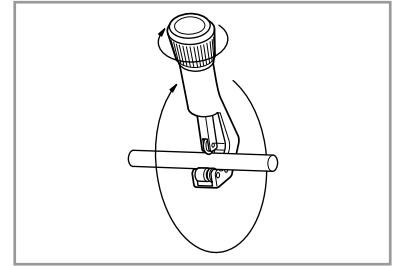
The diameter of the gas pipe(D)	12.70	15.88	19.05	22.23	25.40	28.60	31.75
The radius of curvature(R)	25	32	38	41	51	57	60
	or more	or more	or more	or more	or more	or more	or more

- ◆ The height of the oil trap(H) : $4R \leq H \leq 6R$



Cutting/Flaring the Pipes

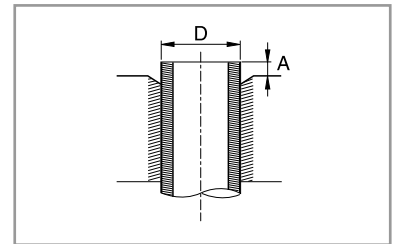
- 1) Make sure that you have the required tools available (pipe cutter, reamer, flaring tool and pipe holder).
- 2) If you wish to shorten the pipes, cut it with a pipe cutter, taking care to ensure that the cut edge remains at a 90° angle with the side of the pipe. Refer to the illustrations below for examples of edges cut correctly and incorrectly.



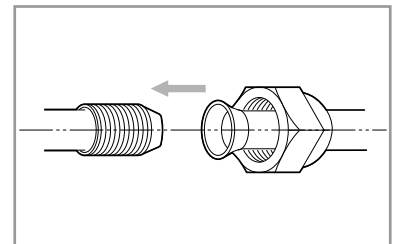
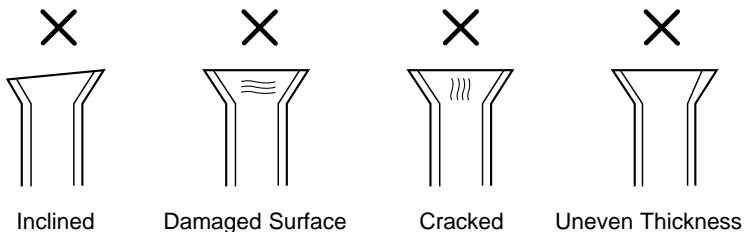
- 3) To prevent any gas from leaking out, remove all burrs at the cut edge of the pipe, using a reamer.

- 4) Slide a flare nut on to the pipe and modify the flare.

Outer Diameter (D)	Depth (A)
6.35 mm (1/4")	1.3mm
9.52 mm (3/8")	1.8mm
12.70 mm (1/2")	2.0mm
15.88 mm (5/8")	2.2mm
19.05 mm (3/4")	2.2mm
22.23 mm (7/8")	2.2mm



- 5) Check that the flaring is correct, referring to the illustrations below for examples of incorrect flaring.



- 6) Align the pipes and tighten the flare nuts first manually and then with a wrench, applying the following torque.

Outer Diameter	Torque (kgf•cm)
6.35 mm (1/4")	144~176
9.52 mm (3/8")	333~407
12.70 mm (1/2")	504~616
15.88 mm (5/8")	630~770
19.05 mm (3/4")	990~1210
22.23 mm (7/8")	990~1210

Caution ◆ In case of welding the pipe, you must weld with nitrogen gas blowing.



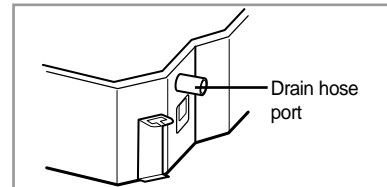
5. Drain hose

(Example; 4-way cassette type)

Care must be taken when installing the drain hose for the indoor unit to ensure that any condensate water is correctly drained outside.

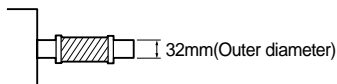
1) Insert the flexible hose to the drain hose port.

Note ◆ Attach the drain hose to the drain hose port with an adhesive for PVC and tape to prevent water leaks, then secure the hose with a band etc..(The band is not supplied with the air conditioner.)

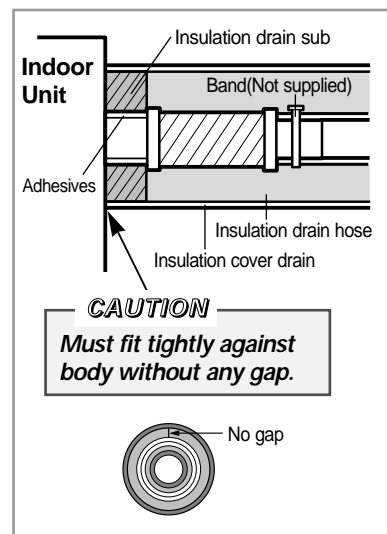


2) Install the drain hose so that its length can be as short as possible. Internal diameter of the drain hose should be the same or slightly bigger than the external diameter of the drain hose port.

◆ Inner diameter of the drain hose



Note ◆ Give a slightly slant to the drain hose for proper drainage of condensate.
◆ Secure the drain hose with an adhesive for PVC and tape not to be separated from the unit.

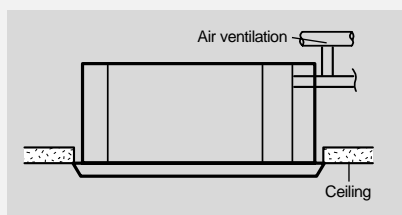


3) Wrap the drain hose with the insulation drain as shown in figure and secure it.

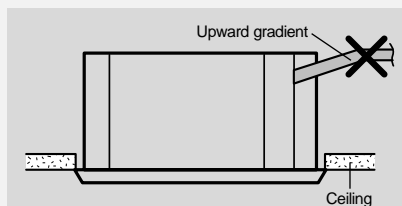
CAUTION

Check that the indoor unit is level with the ceiling by using the leveler.

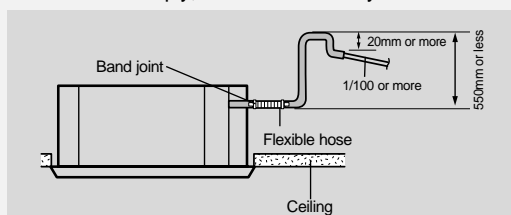
Install air ventilation to drain condensate water smoothly.



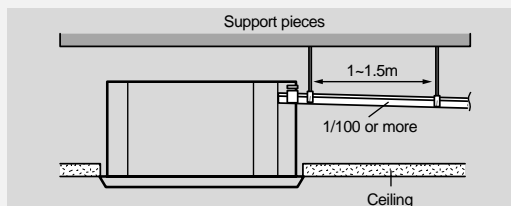
Do not give the hose and upward gradient after the connection port. This will cause water to flow backwards when the unit is stopped, resulting in water leaks.



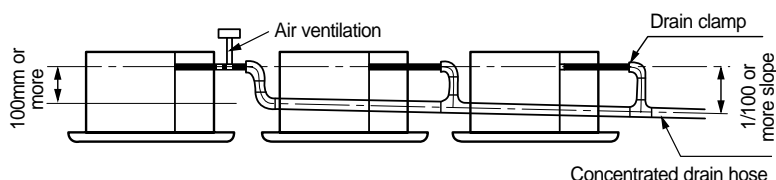
When installing a flexible hose, the difference of pivot of a drain hose port and a drain hose must be within 20mm. If the difference of each pivot is more than 20mm, or a flexible hose is bent steeply, a flexible hose may leak.



Do not apply force to the piping on the unit side when connecting the drain hose. The hose should not be allowed to hang loose from its connection to the unit. Fasten the hose to a wall, frame or other support as close to the unit as possible.



Note ◆ If a concentrated drain hose is installed, refer to the figure below.



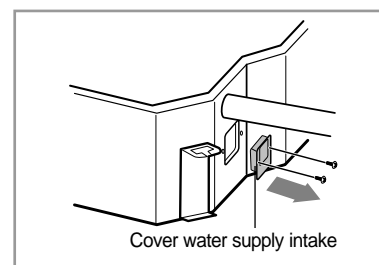
Testing the drainage

*You should test the drainage after completing the installation.
Prepare a little water about 2.0 liters.*

- 1) Supply power to the air conditioner.

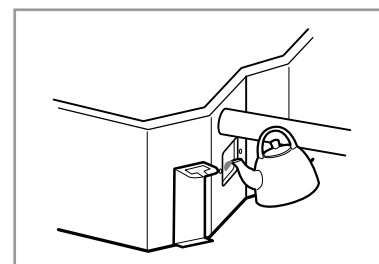
Note ◆ If the $E3$ error is occurred when you supply power, check the float switch.

- 2) Remove two screws on the cover water supply intake and pull out the cover.



- 3) Pour water into the indoor unit as shown in figure.

Note ◆ If you do not pour water inside the water supply intake, water may spill from the indoor unit.



- 4) Check operation of the drain pump.

- 5) Confirm that the water flows out through the drain hose.

- 6) Reassemble the cover drain pump and the screws.

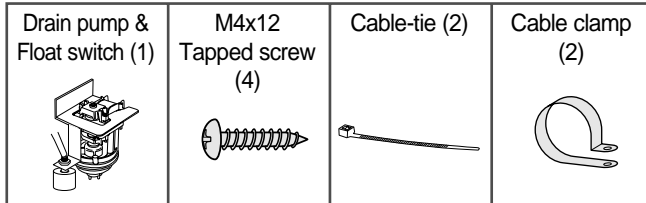
Note ◆ For installation of another drain hose, refer to an appropriate installation manual.



6. Drain pump (optional)

(Example; Low-silhouette duct type)

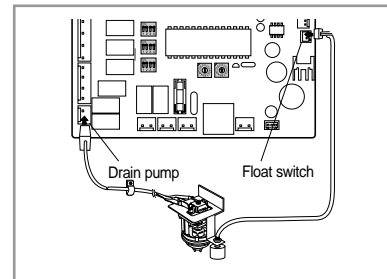
6-1. Accessories



6-2. Installation

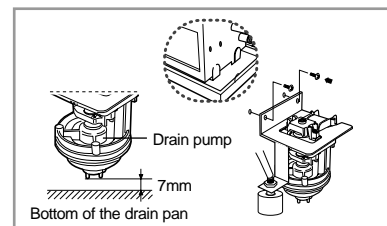
- (1) Connect the cable to the electrical component box as shown at the figure.

Note ◆ Connect the drain pump cable to yellow terminal(CN74) and the float switch to black terminal(CN51).



- (2) Screw the drain pump to the side of the indoor unit with two screws.

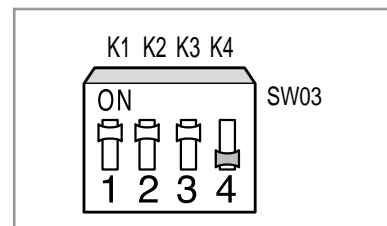
Note ◆ When installing the drain pump, leave a 7mm space between the bottom of the drain pan and the drain pump.



- (3) Adjust K4 DIP switch(SW03) to the "OFF" position.

Switch No.	Switch Position	Using Drain Pump
K4	ON	X
	OFF	O

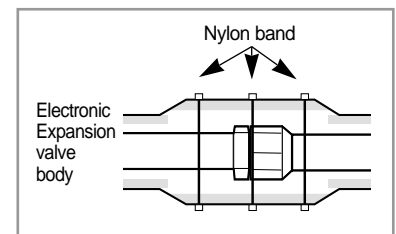
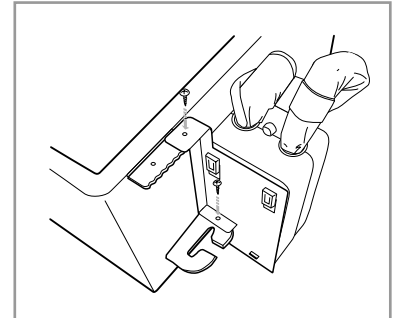
Note ◆ Wrap the drain tube outlet on the right and left side of the indoor unit with an insulating materials.



7. Electronic expansion valve kit

7-1. Built-in type (Example;1-way cassette type)

- (1) Connect a strainer to the "IN" pipe and fix it.
- (2) Fix the electronic expansion valve kit with 2 screws(TH4x12) as shown at the figure.
- (3) Connect the "OUT" pipe to the liquid refrigerant pipe.
- (4) Insulate the connection piping. A joint part of pipe needs double thickness of insulation.
- (5) Connect the electronic expansion valve cable to the main PCB of indoor unit.
- (6) The expansion valve has to be installed that the user has no access to it.(built-in type)

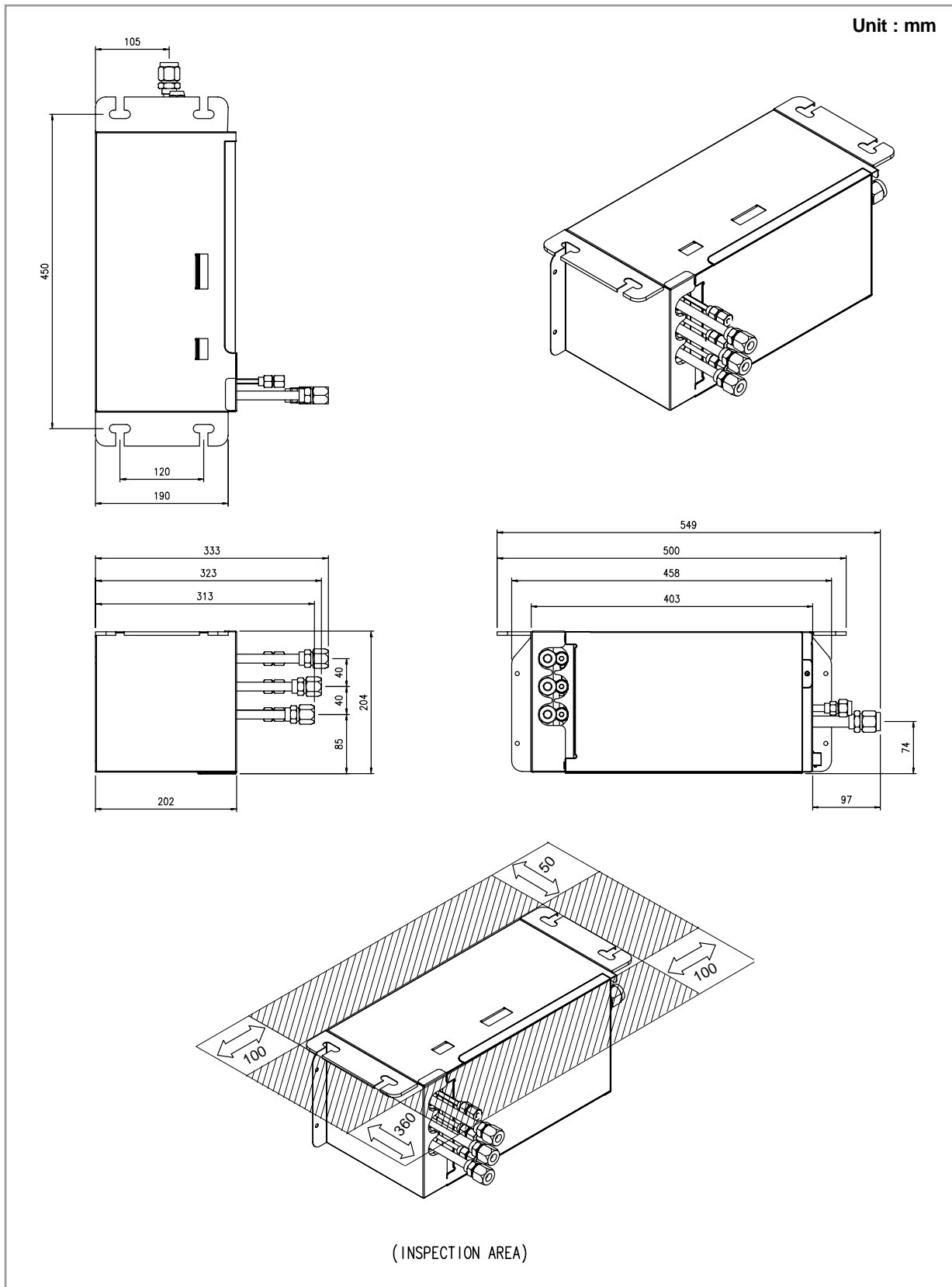




7. Electronic expansion valve kit

7-2. Distributor kit type

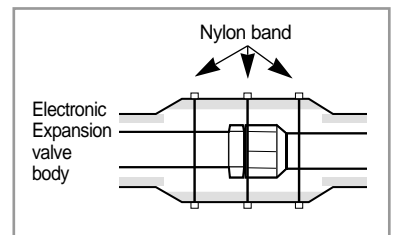
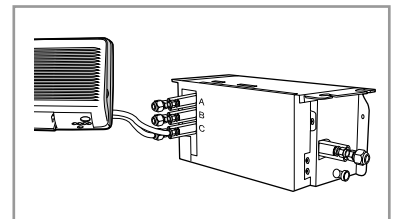
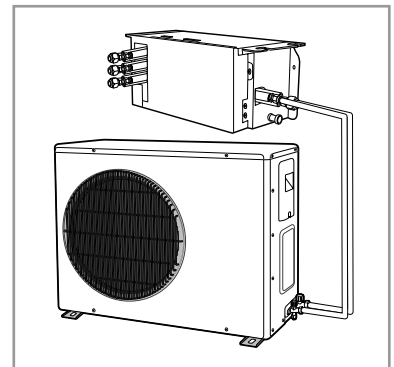
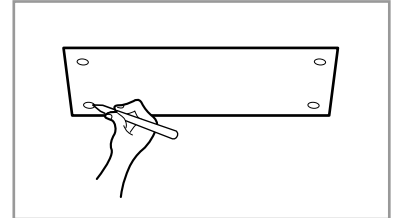
(1) Preparation for installation



(2) Electronic expansion valve kit installation

1) Connection of refrigerant piping & Installation

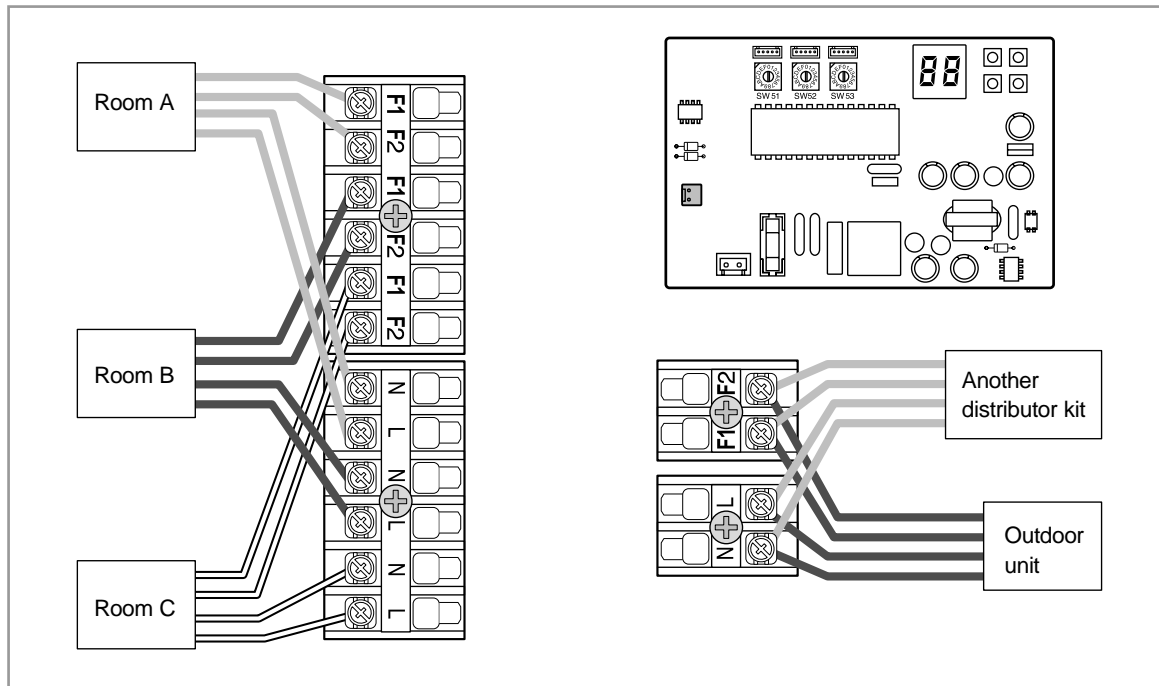
- ① Decide an installation place that can support the electronic expansion valve kit.
- ② Connect the "IN" refrigerant pipe to the outdoor unit.
- ③ Connect the "OUT" refrigerant pipe to each indoor unit (A, B and C).
 - ◆ The liquid and gas pipes should not be crossed when piping connection.
- ④ Insulate the connection piping. A joint part of pipe needs double thickness of insulation.
- ⑤ The expansion valve has to be installed that the user has no access to it.





7. Electronic expansion valve kit

2) Wiring & Assigning address

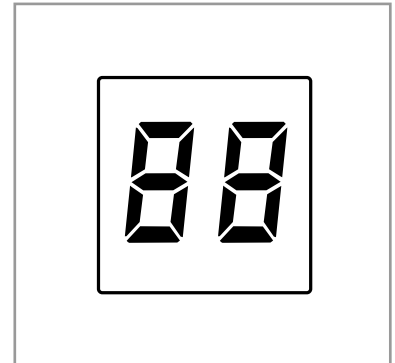


- ① Connect the AC power cable and communication cable from the outdoor unit to terminal, then connect the cable to another electronic expansion valve kit.
- ② Connect the AC power cable and communication cable to each indoor unit (A, B and C).
- ③ Align the SW51, SW52 and SW53's addresses with A, B and C indoor units'.

Switch No.	Appropriate indoor unit (Electronic expansion valve)	Connector No.
SW51	A	CN63(Yellow)
SW52	B	CN62(Blue)
SW53	C	CN61(White)

3) Function of Display

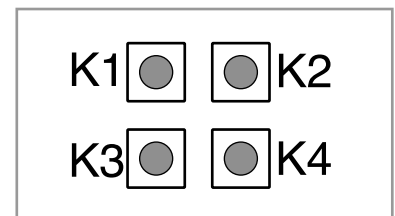
- ◆ The numbers which is displayed on left are the status of indoor unit checking status through communication with same outdoor unit. (If it indicates 1, 3 and 7, that means the ADDRESS of indoor unit is set to 1, 3 and 7.)
- ◆ The numbers which is displayed on right indicate the ADDRESS of SW51, SW52 and SW53 in sequential. (If it indicates 0, 1 and 2, that means the SW51 is set to 0, the SW52 is set to 1, and the SW53 is set to 2.)
- ◆ If the communication error occurs in distributor, the Er=C0 message will be shown on the display alternatively.



4) KEY function

- ◆ If you press a KEY on the PCB, the display will show you a step of appropriate electronic expansion valve.

KEY No.	Meaning	Example
K1	Step of electronic expansion valve A	19
K2	Step of electronic expansion valve B	(19 x 10 =
K3	Step of electronic expansion valve C	190 STEP)
K4	-	-



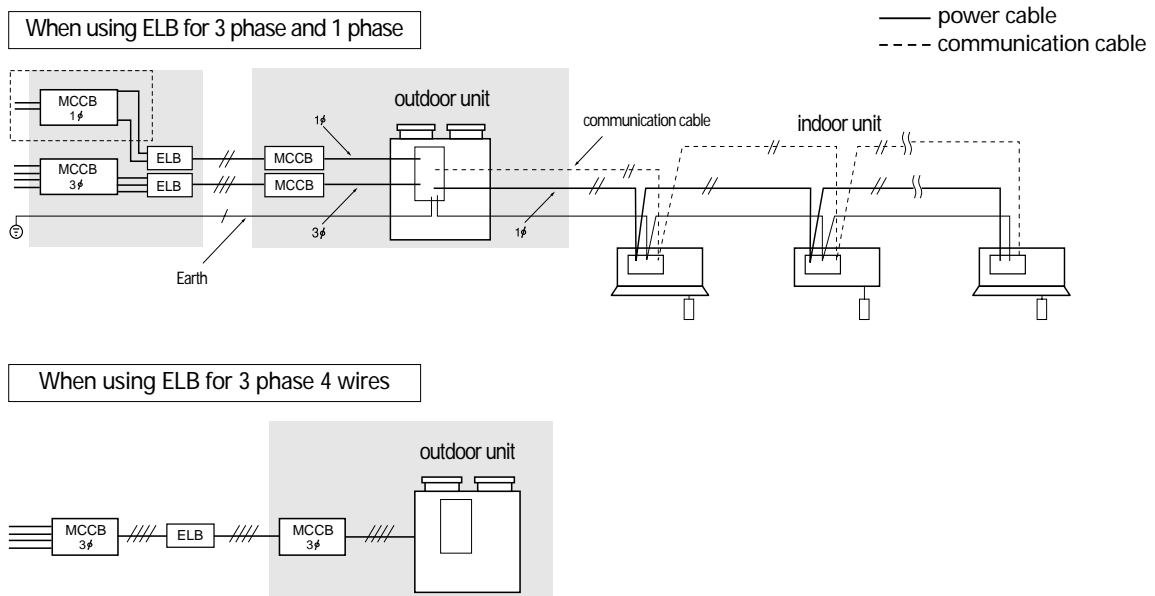


8. Wiring

■ Caution

- All wiring and parts shall be the rated ones.
- For details of wiring, refer to the circuit diagram attached onto the outdoor unit.
- The electrical work shall be performed by the qualified electrical worker.
- The circuit diagram for wiring shows only the concept and so the details for actual work is not described.
- This air conditioner is consist of 3 phase 4 wire system and so the main circuit breaker to block the power shall be installed in the integrated manner.
- Be sure to install the circuit breaker and fuse on power cable of each equipment.
- Connect the wires to the terminals without excessive force and arrange the wires with the cover or other parts so that it may not be loosened. If it is loosened, it may cause the overheating, electrical shock and fire.

8-1. Overall system configuration (example)



* If an outdoor unit is installed in a place in danger of an electric leak or submergence, you must install the ELB.

8-2. Cable specification for outdoor unit

Type of outdoor unit	Power Supply												Earth Cable	Comm- unication Cable
	3 Phase						Single Phase							
	Power Supply	Max/Min (V)	MCCB	ELB	Power Cable	Length	Power Supply	Max/Min (V)	MCCB	ELB	Power Cable	Length		
	-	-	-	-	-	-	208-230V~/60Hz	253/187	25A	25A	3.5mm ² , CV, 3Wires	-	Ø1.6mm, HOS-RN-F, 1 Wire	0.75~1.25mm ² HOS-RN-F, 2 Wires
	380-415V~/50Hz	456/342	Frame:50A Trip:30A	30A	5.5mm ² , HOS-RN-F, 3 Wires	18m or less	220-240V~/50Hz	264/198	15A	15A	2.0mm ² , HOS-RN-F, 2 Wires	-		
					8.0mm ² , HOS-RN-F, 3 Wires	18m~28m						-		
	208-230V~/60Hz	253/187	-	-	-	18m or less	208-230V~/60Hz	253/187	15A	15A		-		
						18m~28m						-		
-	-	-	-	-	18m or less						-			
					18m~28m						-			
	380-415V~/50Hz	456/342	Frame:30A Trip:20A	20A	5.5mm ² , HOS-RN-F, 3 Wires	18m or less	220-240V~/50Hz	264/198	15A	15A	2.0mm ² , HOS-RN-F, 2 Wires	-		
	-	-	-	-	-	18m~28m						-		
	380-415V~/50Hz	456/342	Frame:50A Trip:30A	30A	5.5mm ² , HOS-RN-F, 3 Wires	18m or less	220-240V~/50Hz	264/198	15A	15A	2.0mm ² , HOS-RN-F, 2 Wires	-		
					8.0mm ² , HOS-RN-F, 3 Wires	18m~28m						-		
	208-230V~/60Hz	253/187	Frame:75A Trip:50A	50A	8.0mm ² , HOS-RN-F, 3 Wires	18m or less	208-230V~/60Hz	253/187	15A	15A		-		
					14.0mm ² , HOS-RN-F, 3 Wires	18m~28m						-		
	380V/60Hz	418/342	Frame:50A Trip:30A	30A	5.5mm ² , HOS-RN-F, 3 Wires	18m or less	220V/60Hz	242/198	15A	15A		-		
					8.0mm ² , HOS-RN-F, 3 Wires	18m~28m						-		
-	-	-	-	-	18m or less						-			
					18m~28m						-			
	380-415V~/50Hz	456/342	Frame:75A Trip:50A	50A	8.0mm ² , HOS-RN-F, 3 Wires	20m or less	220-240V~/50Hz	264/198	20A	20A	2.0mm ² , HOS-RN-F, 2 Wires	-		
	208-230V~/60Hz	253/187	Frame:100A Trip:75A	75A	14.0mm ² , HOS-RN-F, 3 Wires	20m~50m						208-230V~/60Hz	253/187	20A
22.0mm ² , HOS-RN-F, 3 Wires					20m~50m	-								

* The power cable is not supplied with air conditioner.

IMPORTANT : All power supply cables/interconnection cables and communication cables must be type HOS-RN-F (at least).



8. Wiring

8-3. Connection cord specification

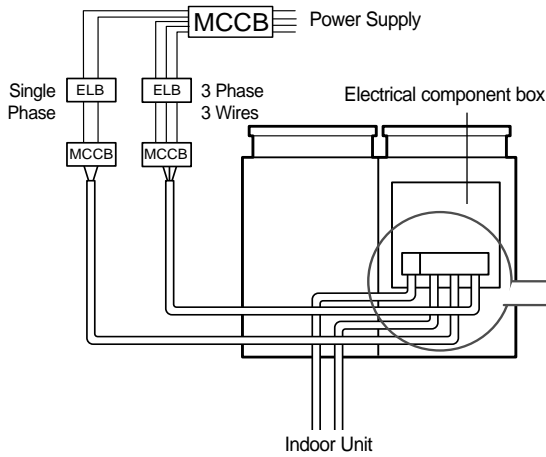
Power supply (1 phase)			Earth wire	Communication cable (VCTF, 2wires)	Home server (VCTF, 2wires)
Power supply	Max/Min (V)	Power cable			
220V / 60Hz 220-240V/50Hz 208-230V/60Hz	± 10%	2.0mm ² (CV, 2wires)	1.6mm (IV, 1wire)	0.75-1.25mm ²	0.75-1.25mm ²



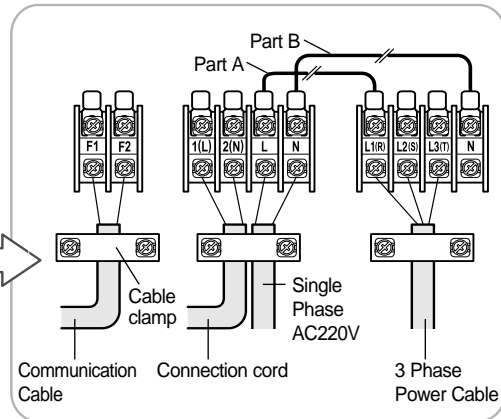
- The power supply cable shall be connected to the power supply terminal and shall be fixed with clamp as in the following figure.
- The unbalance of power shall be within 2% of power supply rating.
 - If the power supply unbalance is great, the lifetime of condenser is shortened.
 - If the power supply unbalance exceeds 4%, the indoor unit stops and error mode displays.

8-4. Wiring diagram

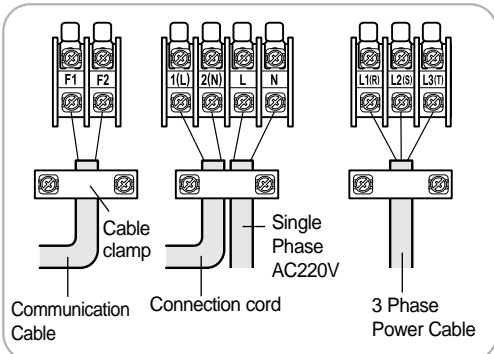
When using ELBs for 3 phase and 1 phase



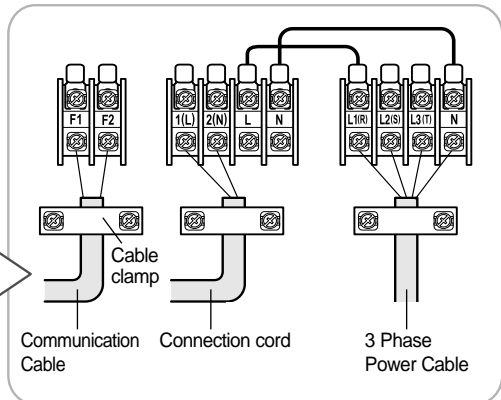
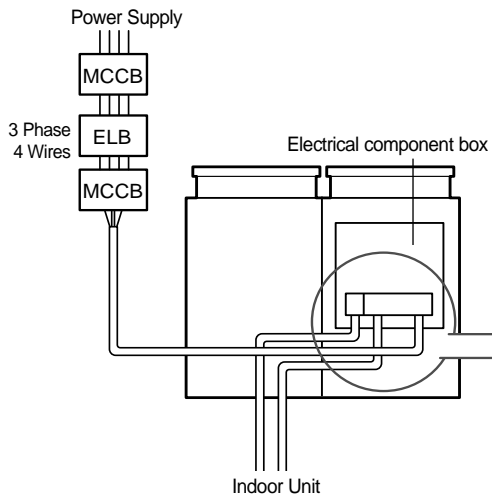
◆ Case 1 Cut off the part A and B



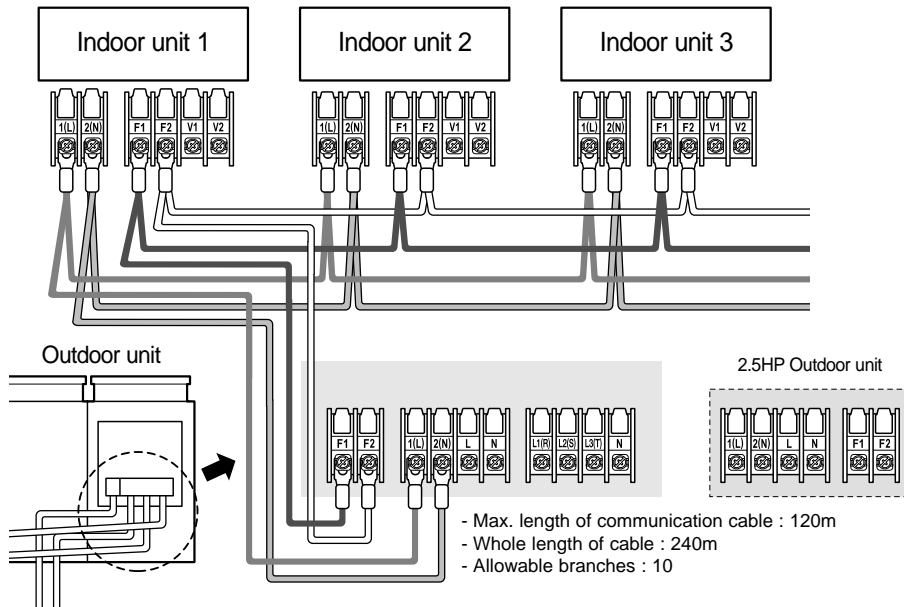
◆ Case 2



When using ELB for 3 phase 4 wires



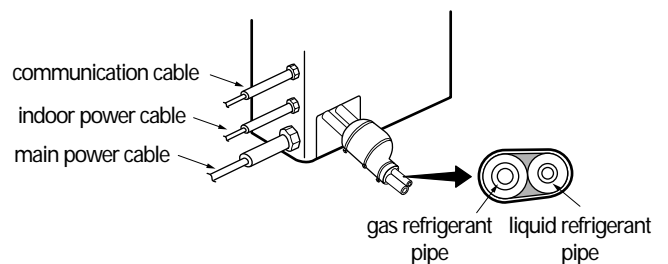
8-5. Connection cord wiring diagram



- The communication cable shall be wired as follows:
- When the communication cable exceeds the specified length, the operation of air conditioner may be impossible due to the trouble of communication between indoor and outdoor unit.
 - Maximum wire length : less than 120 m
 - Total wiring length : less than 240 m
 - Maximum communication branch cable: 10 branches

8-6. Power wiring and communication wiring configuration

- Be sure to run the power supply cable and communication cable through the electrical conduit as shown in the right side figure.
- Select the power supply cable from the left and right knockout hole of outdoor unit.
- The communication cable, indoor power cable and main power cable shall be run through the aluminum protection tube and separated with the distance of 50 mm.



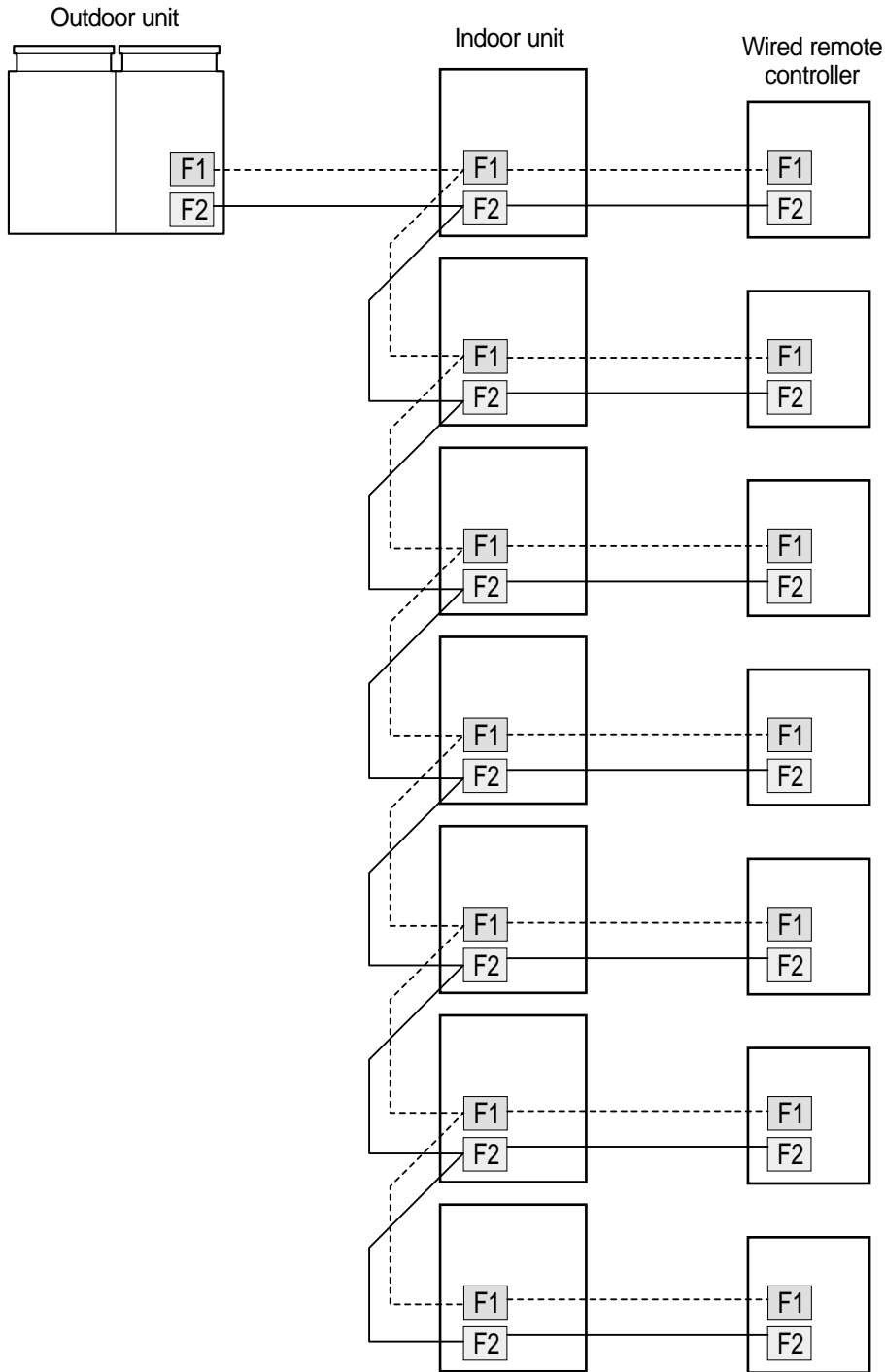
- Be sure to install the power supply cable with the separation distance from the communication cable.
- Take care that the pipe and wire do not contact each other.



8. Wiring

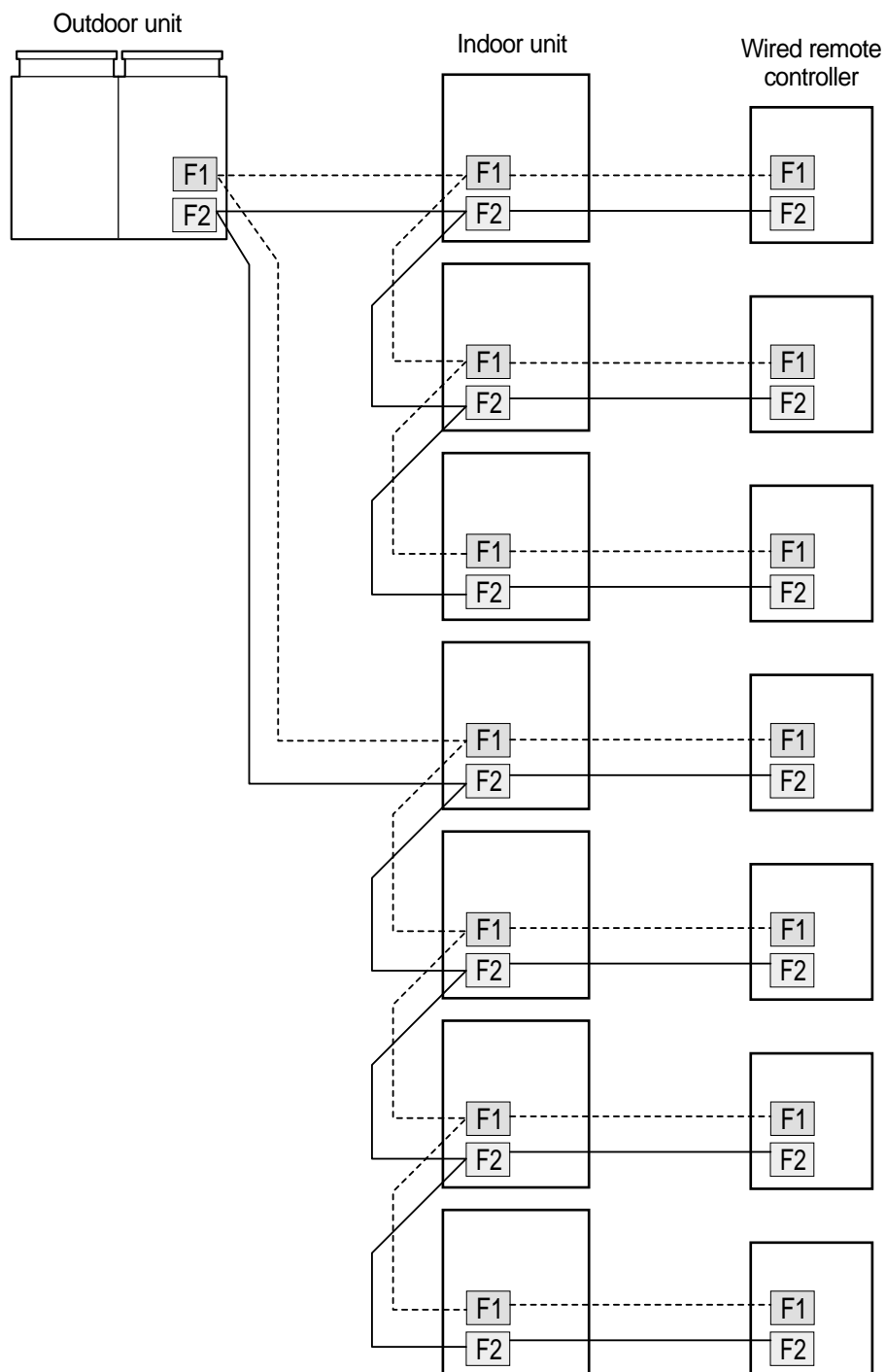
8-7. Communication cable connection

(1) Correct connection



(2) Typical wiring error

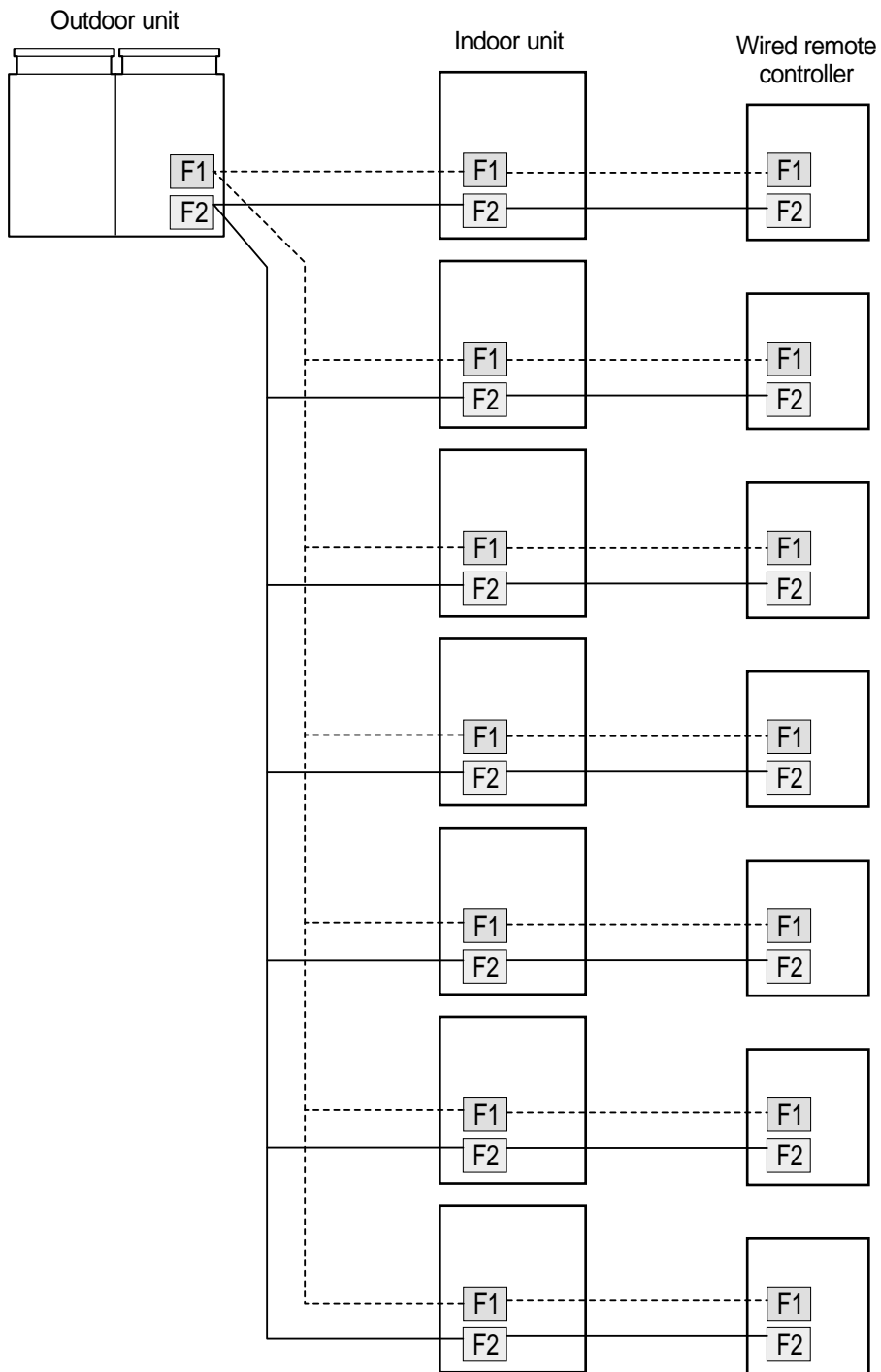
1) Star wiring connection to some of the indoor units



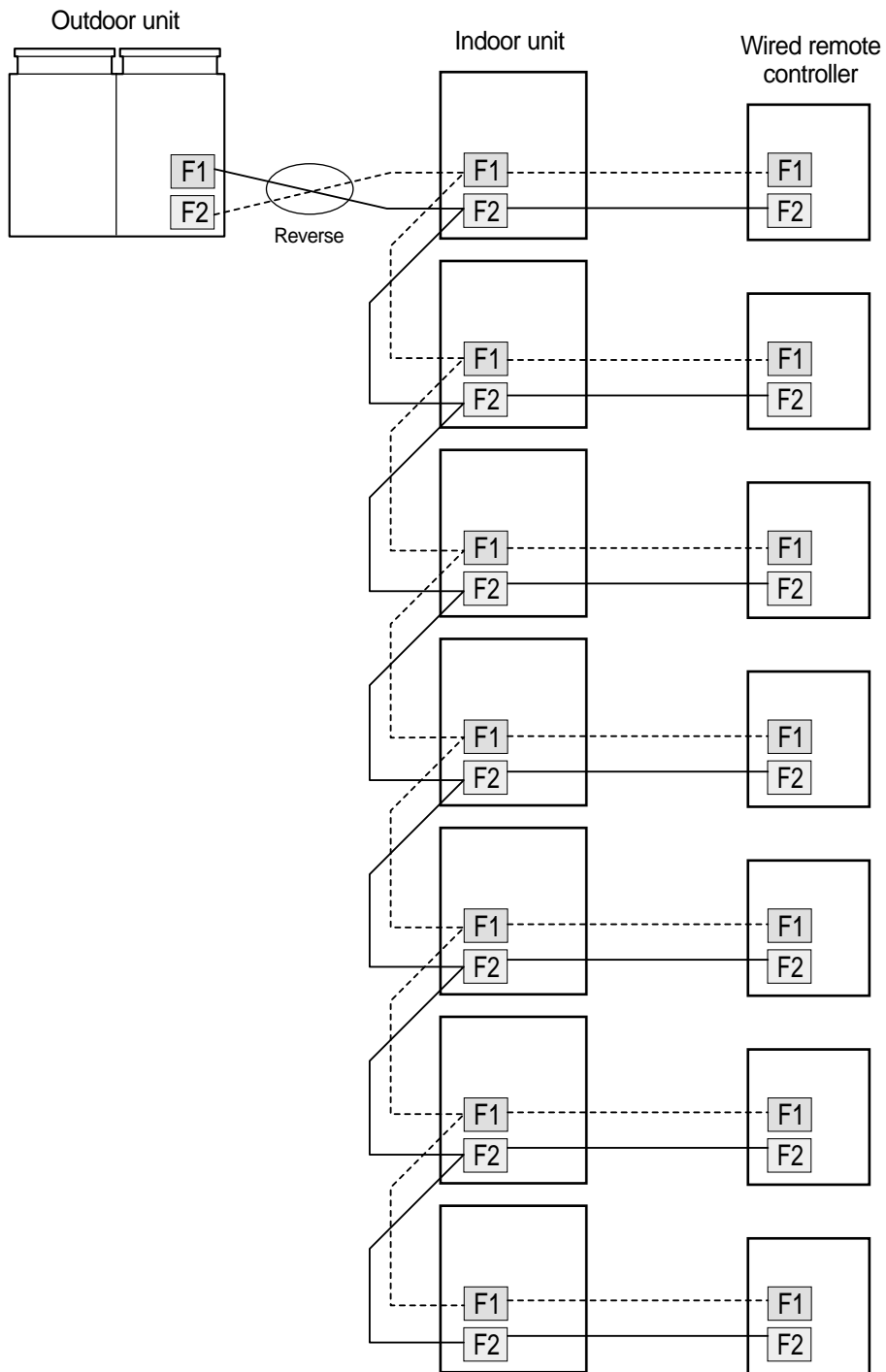


8. Wiring

2) Star wiring connection to every indoor units



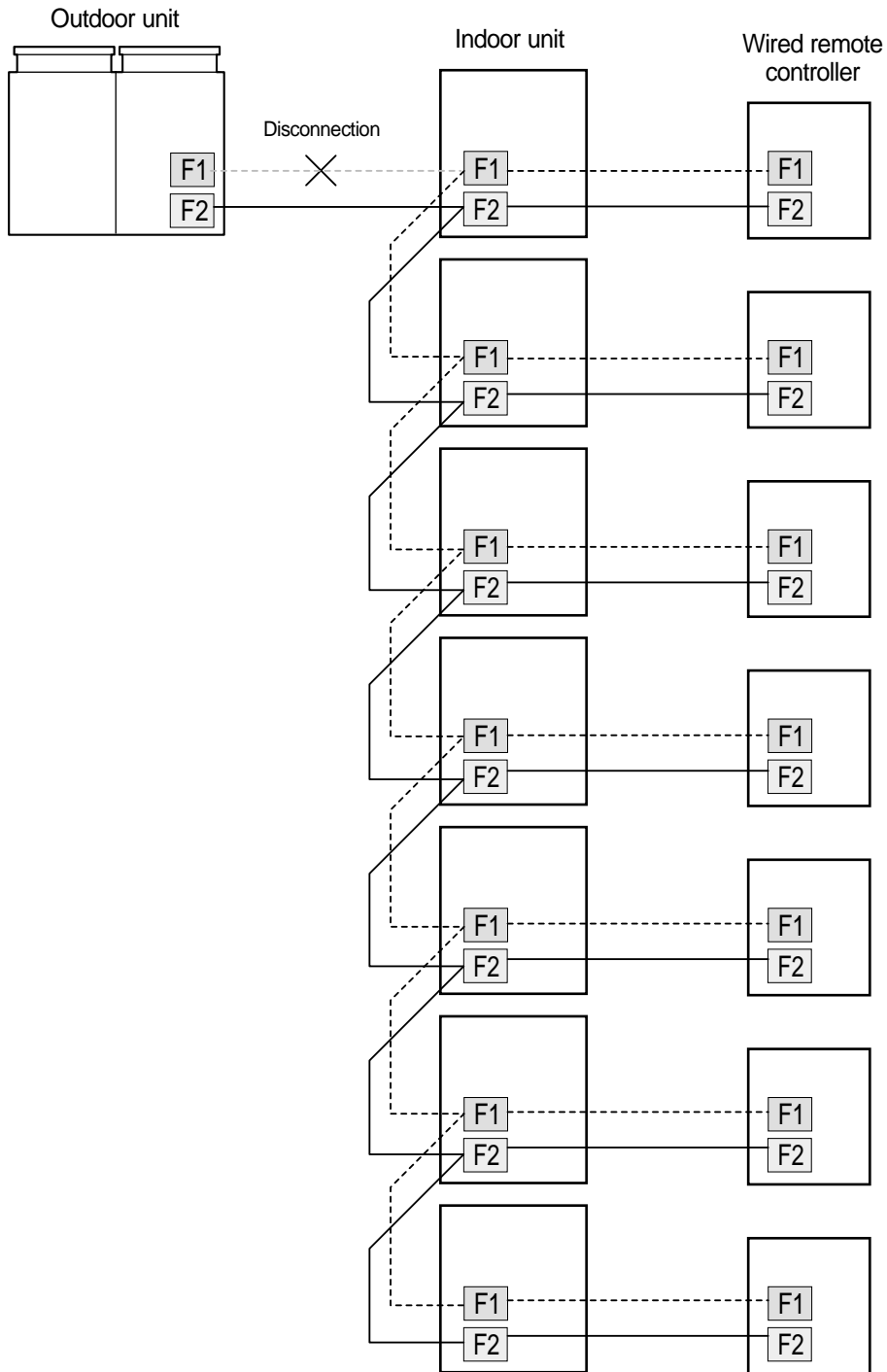
3) Reverse wiring between indoor and outdoor units



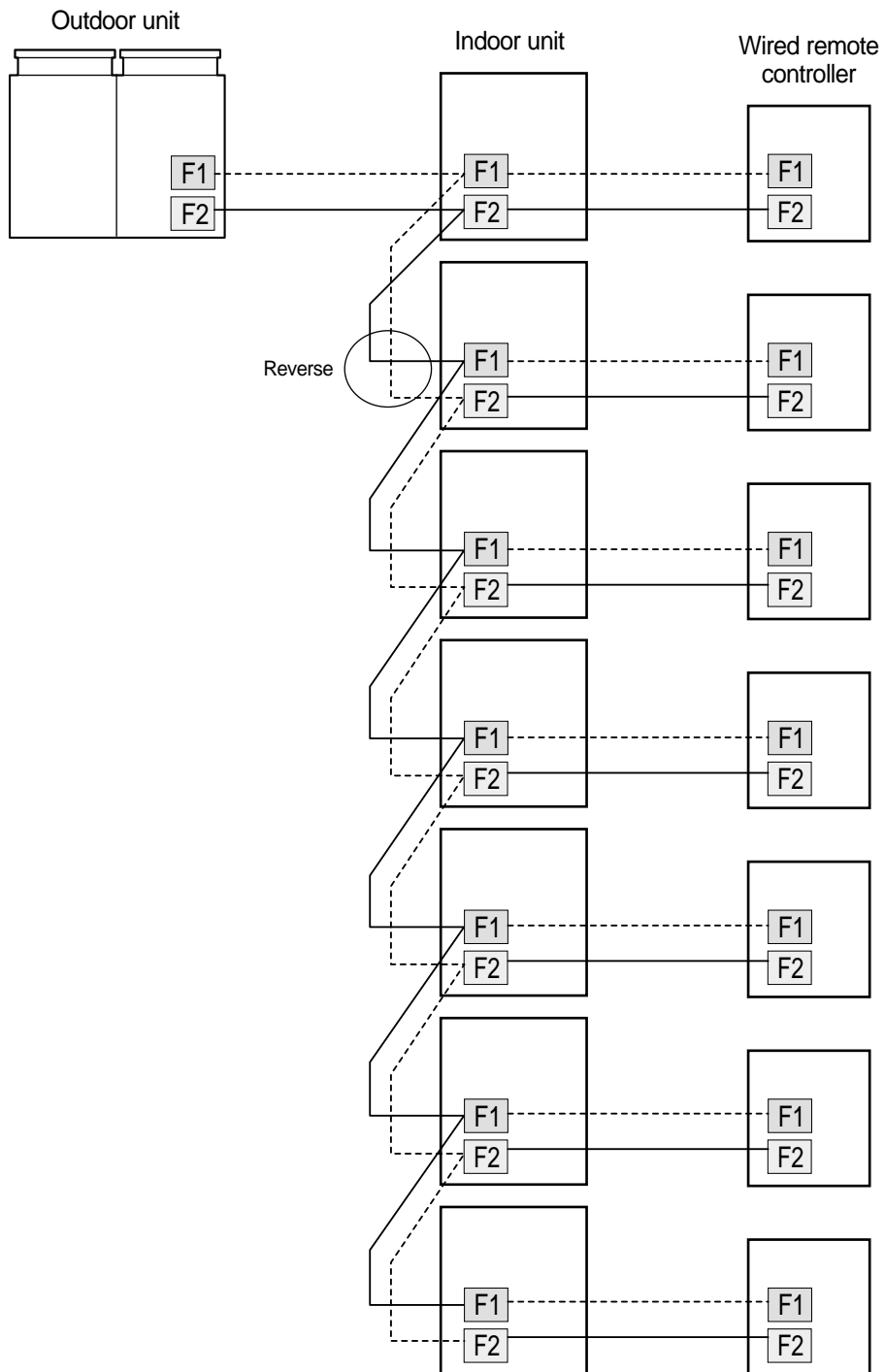


8. Wiring

4) Disconnection between indoor and outdoor units



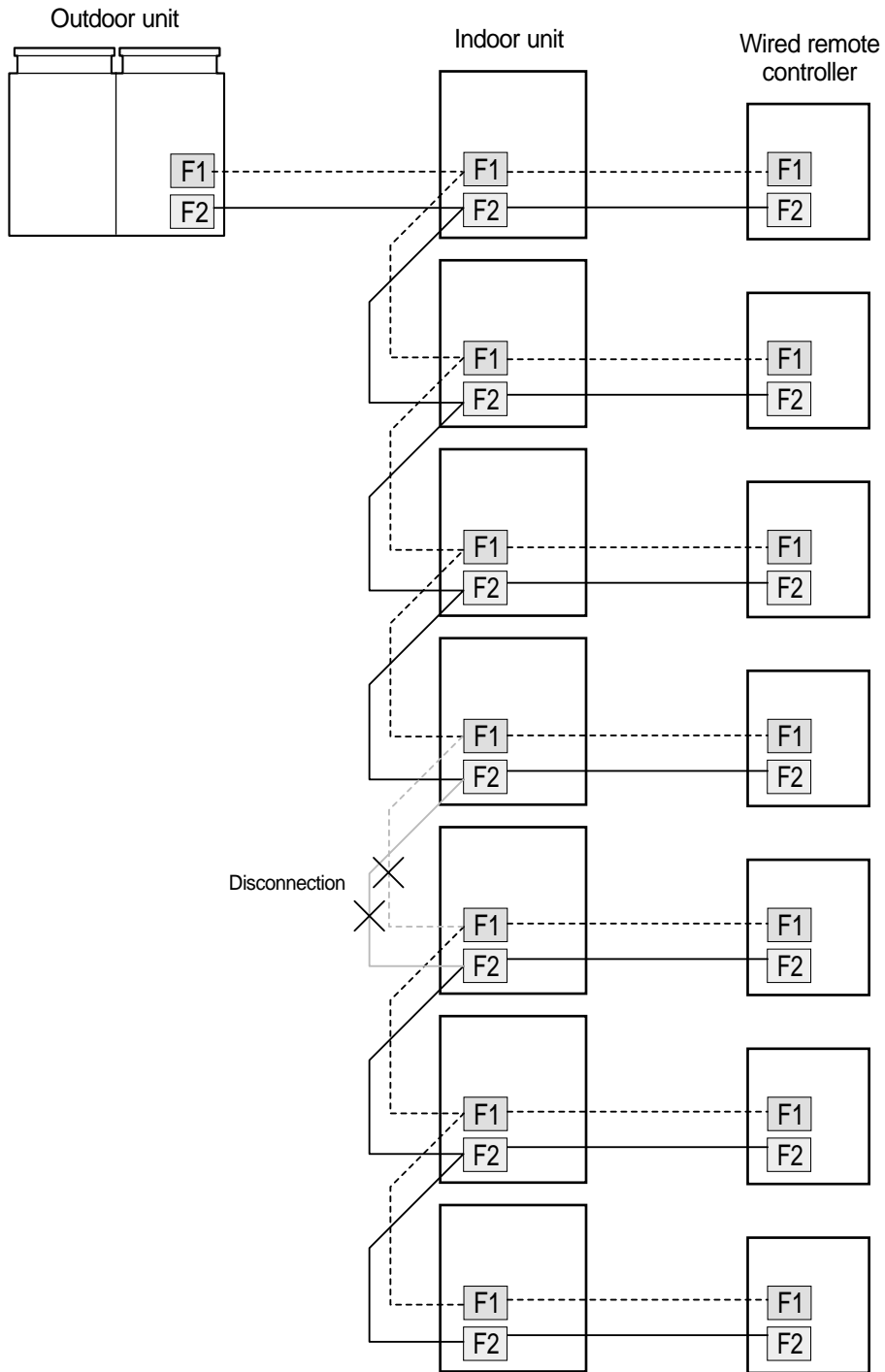
5) Reverse wiring between indoor units





8. Wiring

6) Disconnection between indoor units



9. Charge/recovery of refrigerant

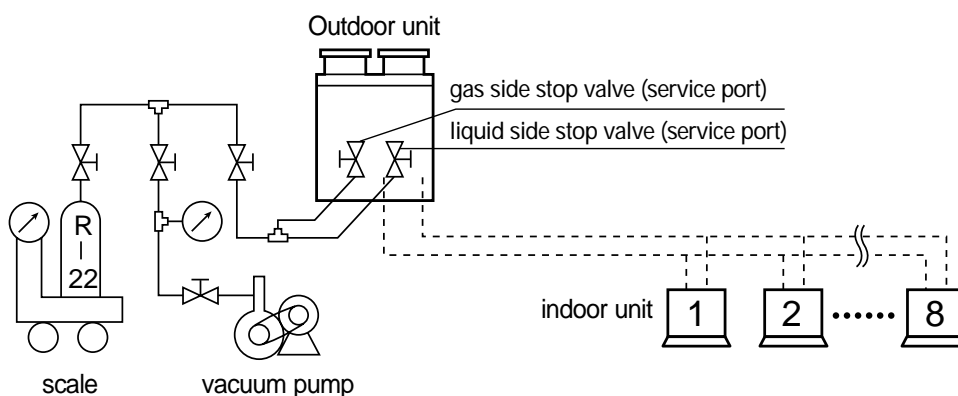
9-1. Refrigerant charging

(1) Outdoor unit is charged with refrigerant when being delivered but additional refrigerant shall be charged for some part of system.

(2) After completion of vacuum, keep the following instructions to fill the refrigerant into the service port.

- 1) Check whether the stop valve of liquid and gas side are completely closed.
- 2) Fill the specified amount of refrigerant from the liquid stop valve service port at the compressor stopped.

- *Caution***
- If the length of refrigerant piping is longer than specified, be sure to charge the refrigerant.
 - Do not charge the refrigerant from the gas side service port.
 - If the refrigerant charging is not done in the above method, press the refrigerant charging button *1) on outdoor unit PCB to operate the unit. After approximately 30 minutes, charge the specified amount of refrigerant to the service port of gas stop valve. If unavoidable, check the pressure table as per the outdoor temperature to charge the refrigerant.



* 1) MUF-***

Key 1	Key 2	Key 3	Key 4
Pump down	Refrigerant charge	Reset	Test-operation

RVMH(C)-***

Press times	Key 1	Key 2	Key 3	Key 4
1	Heating refrigerant charge	Cooling refrigerant charge	Reset	View Mode
2	Heating test operation	Cooling test operation		
3		Pump down		

- *Caution***
- When refrigerant is charged with cooling operation, the refrigerant charge through port of the stop valve in gas pipe is possible, but refrigerant charge port separately available should be used to input the refrigerant operation heating operation. If the outdoor temperature is more than 15°C, it is better to charge in cooling operation, and if the temperature is below that, it is better to charge in heating operation.



9. Charge/recovery of refrigerant

9-2. Recovery of refrigerant

- (1) Close the service valve of liquid side and then press the refrigerant recovery button on outdoor PCB * 1).
- (2) When the low pressure is getting lower enough, close the service valve to press the refrigerant recovery button again or press key 3. Pressing the button stops the compressor.
- (3) When total amount of refrigerant in the pipe is more than 15kg, the refrigerant may not be recovered completely even though the refrigerant recovery (pump down) is performed. So care must be taken.
- (4) The pump down time shall not exceed 5 minutes.
- (5) Do not operate until the low-pressure progress to the vacuum state when pump is down. You should operate while checking pressure after connecting the gauge to the low-pressure side.

* 1) Refrigerant recovery button

MUF-***

Key 1	Key 2	Key 3	Key 4
Pump down	Refrigerant charge	Reset	Test-operation

RVMH(C)-***

Press times	Key 1	Key 2	Key 3	Key 4
1	Heating refrigerant charge	Cooling refrigerant charge	Reset	View Mode
2	Heating test operation	Cooling test operation		
3		Pump down		

10. Testing operation

■ Cautions for operation

- Put the power 6 hours before initial operation so that the crank case heater may be heated.
- When doing the retry of initial operation after main power off, start the operation 2 and half hours after power on.
- If the heater is not heated, the operation can not be started for 2 hours after power on for the protection of compressor. (Ch displays on the PCB display part at the time.)

(1) Check the power between outdoor unit and distribution board.

(3 phase tester recommended)

- Compressor power : T1(R), T2(S), T3(T) - red white black (Care must be taken so that the color and order may not be changed.)
- 220V power: L N

(2) Check the indoor unit

- ① Check whether the power source of each indoor unit and the communication cables are correctly connected.
(Communication cable marked as F1, F2)
 - If the communication cable is changed each other with the power cable, it might cause the damage to PCB.
 - There is no color marking on the power supply cable but be sure to check the color of communication cable since the cable has the polarity.
- ② Check whether the addresses are correctly assigned to each indoor unit.
 - The address switch is available from "0".
 - The address of each indoor unit shall be assigned differently.
- ③ Check whether the connections for temperature sensor, electronic expansion valve and drain pumps are all connected.

(3) Check the outdoor unit

- ① Set the numbers of indoor unit on the outdoor unit PCB.
 - If there are all 3 outdoor units, set so that the arrow mark is shown on "3".
- ② Check on the outdoor unit PCB whether the outdoor unit capacity code and Dip switch are correct.
(It is delivered with the setting in factory and so there is not necessary to set separately).

(4) Once the check of power supply, indoor and outdoor unit is completed, connect to the outdoor unit the PC in which the A/S program is installed, and then put the power of the outdoor unit on.

(5) Once the power is on to the outdoor unit, the outdoor performs the tracking to check the connected indoor unit and options.

- At the time the left side of outdoor unit PCB display part shows the detection of communication response with 0 - F address and if there comes the response, the address of indoor unit responded displays on the right side display.

(6) Once the tracking of approximately 20 seconds is completed, the following steps are proceeded when comparing the numbers of indoor units set in PCB and those responded through communication, if they are same, but if they are not same, E2 Error displays on the PCB display.

- For E2 error, check whether the indoor unit set switch on PCB is correct or whether the installation and address setting is correct if there is an indoor unit not responding.
- Press Key3 after check and retry the Tracking.

(7) If Ch displays on the PCB display after tracking, it is the state of compressor not preheated, which means the operation is possible after 2 and half hours. (Supply the power and preheat the compressor).



10. Testing operation

(8) If the preheating of compressor is completed, the communication is performed between indoor unit connected and options. It is the normal at the time when the address on the right display is shown as many as shown on the left side display.

(9) Check through the PC connected with outdoor unit whether the data is correct from temperature sensor and electronic expansion valve.

(10) Once the above process is all completed, press the test operation button on PCB.

- Check before pressing key whether all the service valves are open.

(11) Check the high and low pressure by using the S-net or a manifold gauge.

- Use a manifold gauge for cooling only models whose capacity is 7.5HP or less, and use the S-NET for the other models.

- Refer to the pressure table separately provided as per the outdoor temperature and piping length.

- Since the high pressure and low pressure varies at the initial operation, take the input data 20 minutes after the start of compressor at least.

- Since the compressor may reciprocate if there is loud noise or if the low and high pressure do not vary, check the power T1(R)-T2(S)-T3(T) from (1). If there is not trouble in the power but the problems continues to occur, check the wire connected to the compressor.



● Neglect the RCS on the compressor power incoming and check the order of cables.

- Three phase : T1-L1(R)-red T2-L2(S)-white T3-L3(T)-black

- Single phase : R-red S-white C-black

(12) Check through the PC connected to the outdoor unit.

- Check the temperature, RPM, power and opening of electronic expansion valve for each indoor unit.

● The proper opening of electronic expansion valve when under the air cooling operation:
Between 250 and 160 step when the outdoor temperature is 35°C. (The lower the outdoor air temperature, the larger the opening of electronic expansion valve.)

● The proper opening of electronic expansion valve when under the air heating operation:
Between 1100 and 700 step when the outdoor temperature is 7°C. (The lower the outdoor air temperature, the smaller the opening of electronic expansion valve.)

- Check whether the compressor discharge, condenser outlet temperature, outdoor fan are operated.

(13) During the test operation, check whether error is shown on the outdoor PCB.

- Test operation shall be continued for more than 2 hours continuously at least.

- After the long initial operation of outdoor unit, check whether the condensate is well treated.

**(14) Press the Reset button to complete the test operation.
(Operation completion of whole rooms)**

(15) If the test operation mode is completed, operate one indoor unit only in cooling mode.

- The operation shall be continued for more than 30 minutes for one unit and then check the temperature of indoor unit connected through PC to check the leak of electronic expansion valve. If there is no problem, put off the indoor unit which is operating and operate another indoor unit to check the electronic expansion valve leak as in the above manner.

■ KEY functions

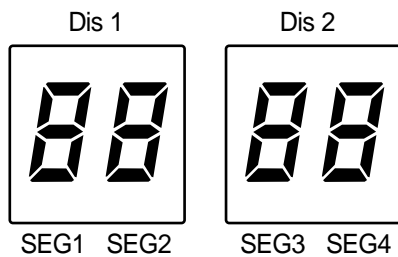
(1) MUF-****

Key 1	Key 2	Key 3	Key 4
Pump down	Charging refrigerant	Reset	Test operation

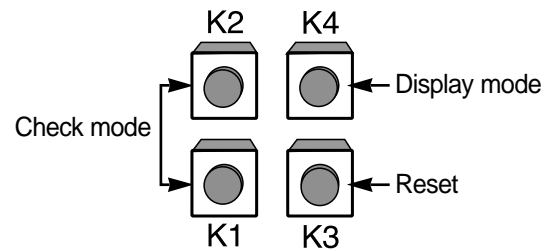
(2) RVMH(C)***

Press times	Key 1	Key 2	Key 3	Key 4
1	Heating refrigerant charge	Cooling refrigerant charge	Reset	View Mode
2	Heating test operation	Cooling test operation		
3		Pump down		

1) Display



2) Key



3) Description of KEY functions

KEY Input times	Key 1 SEG 3, 4 display	Key 2 SEG 3, 4 display	Key 3 SEG 3, 4 display	Key 4 SEG 3, 4 display
1 time	Filling the heating refrigerants	Filling the cooling refrigerants	Reset	Data display
2 time	Test operation (heating)	Test operation (cooling)		
3 time	Exit	Recovery of refrigerants pump down		
4 time		Exit		



10. Testing operation

4) VIEW mode

According to the number of pushes on KEY 4, displays the proper data, and if the model contains no content to display, display only the number of pushes on SEG 1.

4-1 Input 1 time: Displays the data of high pressure (displays down to three decimal places)

Ex.) In the case of the high pressure is 21.2kg/cm²

SEG 1: 1 flickers SEG 2, 3, 4: each of them, displays 2, 1, 2

4-2 Input 2 times: Displays the data of low pressure (displays down to one decimal places)

Ex.) In the case of the low pressure is 8.2kg/cm²

SEG 1: 2 flickers SEG 2, 3, 4: each of them (None), displays 8, 2

4-3 Input 3 times: Displays the discharge temperature of PWM compressor (Internal PWM sensor)

Ex.) When the discharge temperature of compressor is 101°C

SEG 1: 3 flickered SEG 2, 3, 4: each of them, displays 1, 0, 1

4-4 Input 4 times: display the condensation temperature

Ex.) When the condensation temperature is 101°C

SEG 1: 4 flickered SEG 2, 3, 4: each of them, displays 1, 0, 1

4-5 Input 5 times: Displays outdoor temperature

Ex.) When the temperature is 30°C

SEG 1: 5 flickered SEG 2, 3, 4: each of them (None), displays 3, 0

4-6 Input 6 times: Displays the STEP of electronic expansion valve

(shows the STEP/10, and the rest would be omitted)

Ex.) When the STEP of electronic expansion valve is 1002

SEG 1: 6 flickered SEG 2, 3, 4: each of them, displays 1, 0, 0

4-7 Input 7 times: Displays the temperature of COND OUT

Ex.) When the discharge temperature of condenser is -10

SEG 1: 7 flickers SEG 2, 3, 4: each of them, displays -, 1, 0

4-8 Input 8 times: Displays the temperature of oil

Ex.) When the temperature of oil is 22°C

SEG 1: 8 flickers SEG 2, 3, 4: each of them(Nothing), displays, 2, 2

4-9 Input 9 times: Displays the temperature of SUCTION

Ex.) When the temperature of SUCTION is 22°C

SEG 1: 9 flickers SEG 2, 3, 4: each of them(Nothing), displays 2, 2

4-10 Input 10 times: Displays STEP of outdoor fan

Ex.1) When the STEP of outdoor fan is 12 in SSR fan controlling(20 step)

SEG 1: A flickers SEG 2, 3, 4: each of them(Nothing), displays 1, 2

Ex.2) When the STEP of outdoor fan is 4 in RELAY fan controlling(5 step)

SEG 1: A flickers SEG 2, 3, 4: each of them(Nothing), displays 0, 4

4-11 Input 11 times: B flickers in SEG 1

4-12 Input 12 times: Stops VIEW mode, and display the communication data

SEG 1, 2: Display the communication data

SEG 3, 4: Display the STEP of outdoor fan (total 20 step)

V

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