TOSHIBA

FILE NO. A03-012

INSTALLATION MANUAL

SUPER
SUPER MODULAR MULTI

HFC
R410A

Indoor Unit

4-way Air Discharge Cassette Type
MMU-AP0091H, AP0121H, AP0151H,
MMU-AP0181H, AP0241H, AP0271H,
MMU-AP0301H, AP0361H, AP0481H
MMU-AP0561H

2-way Air Discharge Cassette Type
MMU-AP0071WH, AP0091WH, AP0121WH,
MMU-AP0151WH, AP0181WH, AP0241WH,
MMU-AP0271WH, AP0301WH, AP0481WH*
*** CHINA market only**

1-way Air Discharge Cassette Type
MMU-AP0071YH, AP0091YH, AP0121YH,
MMU-AP0151SH, AP0181SH, AP0241SH

Slim Duct
MMD-AP0071SPH, AP0091SPH, AP0121SPH,
MMD-AP0151SPH, AP0181SPH,
MMD-AP0071SPH(SH)-C*, AP0091SPH(SH)-C*,
MMD-AP0121SPH(SH)-C*, AP0151SPH(SH)-C*,
MMD-AP0181SPH(SH)-C*, * CHINA market only
MMD-AP0071SPH-K, AP0091SPH-K**,**
MMD-AP0121SPH-K, AP0151SPH-K**,**
MMD-AP0181SPH-K, ** KOREA market only**

Concealed Duct Standard Type
MMD-AP0071BH, AP0091BH, AP0121BH,
MMD-AP0151BH, AP0181BH, AP0241BH,
MMD-AP0271BH, AP0301BH, AP0361BH,
MMD-AP0481BH, AP0561BH

Concealed Duct High Static Pressure Type
MMD-AP0181H, AP0241H, AP0271H,
MMD-AP0361H, AP0481H, AP0721H,
MMD-AP0961H

Under Ceiling Type
MMC-AP0151H, AP0181H, AP0241H,
MMC-AP0271H, AP0361H, AP0481H

High Wall Type
MMK-AP0071H, AP0091H, AP0121H,
MMK-AP0151H, AP0181H, AP0241H,
MMK-AP0072H*, AP0092H*, AP0122H*
*** European market only**

Floor Standing Cabinet Type
MML-AP0071H, AP0091H, AP0121H,
MML-AP0151H, AP0181H, AP0241H

Floor Standing Concealed Type
MML-AP0071BH, AP0091BH, AP0121BH,
MML-AP0151BH, AP0181BH, AP0241BH

Floor Standing Type
MMF-AP0151H, AP0181H, AP0241H,
MMF-AP0271H, AP0361H, AP0481H,
MMF-AP0561H

Outdoor Unit

Cooling Only Model

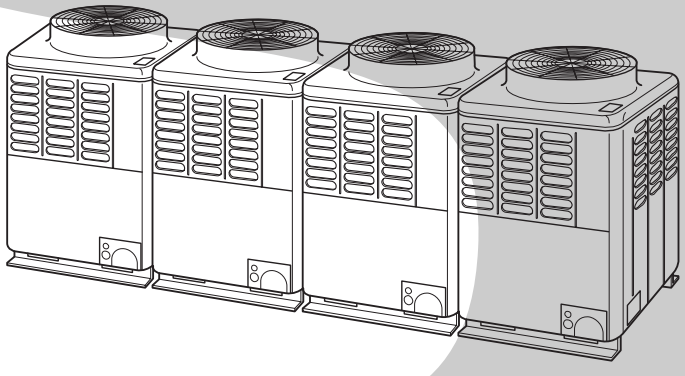
Inverter Unit
MMY-MAP0501T8, MAP0601T8
MMY-MAP0801T8, MAP1001T8
MMY-MAP1201T8

Heat Pump Model

Inverter Unit
MMY-MAP0501HT8, MAP0601HT8
MMY-MAP0801HT8, MAP1001HT8
MMY-MAP1201HT8

Heat Pump Model

Inverter Unit
MMY-MAP0501HT7, MAP0601HT7
MMY-MAP0801HT7, MAP1001HT7
MMY-MAP1201HT7



PRINTED IN JAPAN, Sep, 2004 ToMo

WARNINGS ON REFRIGERANT LEAKAGE

Refrigerant density limit

The room in which the air conditioner is to be installed should be designed or chosen such that in the event of a refrigerant gas leak the density of gas should not exceed a set limit.

The refrigerant R-410A, which is used in the air conditioner product, is intrinsically safe without the toxicity or combustibility of ammonia. R-410A is environmentally friendly and is not restricted by current or pending laws intended to protect the ozone layer.

Risk of suffocation through leakage of R-410A is minimal. However, with the recent increase in the number of high density buildings and use of multi air conditioner systems to ensure effective use of floor space, energy conservation and individual control, installers should ensure it is not possible to exceed density limits in the event of a refrigerant leak. In particular, where a single unit of the multi conditioner system is to be installed into a small room, select a suitable model and installation procedure so that if refrigerant leaks out, density limits are not exceeded. In a room where there is a risk of the density limit being exceeded, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.

The density can be calculated as shown below;

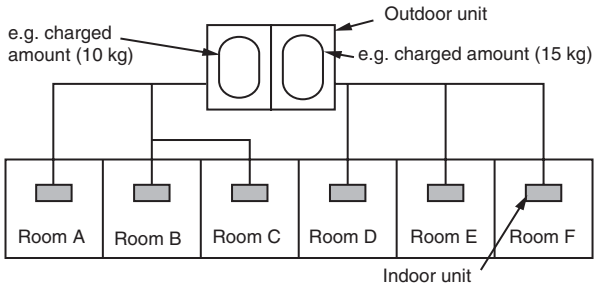
$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} \leq \text{density limit (kg/m}^3\text{)}$$

The density calculation must be carried out in accordance with BS EN 378.

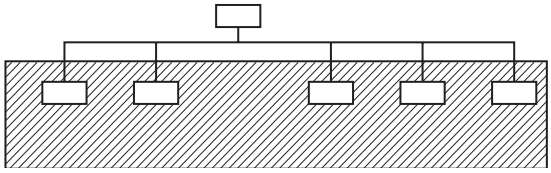
The above procedure must be completed in accordance with local, national and international standards, code of practice and statutory requirements.

Note 1: If there are 2 or more refrigerating systems in a single area, the amount of refrigerant should be charged as required for each individual unit.

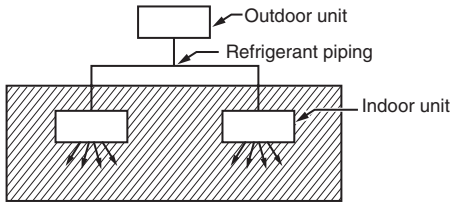
For the amount of charge in this example:
- The possible amount of leaked refrigerant gas in rooms A, B and C is 10 kg.
- The possible amount of leaked refrigerant gas in rooms D, E and F is 15 kg.



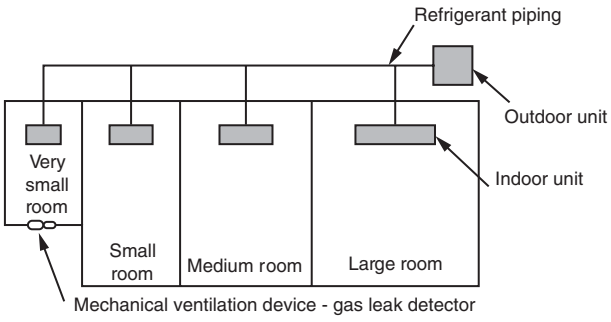
Note 2: The standards for minimum room volume are as follows:
(1) No partition (shaded portion)



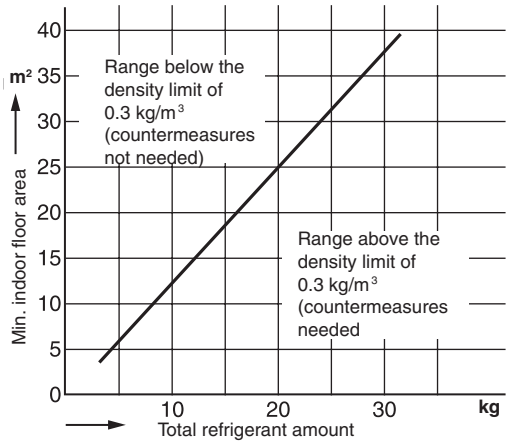
(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).



(3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, attention must be paid to ensure safeguards are in place to avoid density limits being exceeded in each partitioned area. When leak detection is interlocked with mechanical ventilation equipment is installed in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



Note 3: The minimum indoor floor area compared with the amount of refrigerant is roughly as follows (when the ceiling is 2.7 m high):



Super Heat Recovery Modular Multi System

NOTE: Ensure power is isolated from the unit when replacing the high performance filter or when opening the service board.

The standard ducted unit air conditioner utilizes a direct current (DC) indoor fan motor that features current limiting protection. In the event power is not isolated prior to service, the protective control circuit will activate and stop the unit operating. The check code "P12" will be displayed on the remote controller – once service work has been completed, this code can be cleared by switching off then on the electrical isolation device of the indoor unit and pressing the operation stop button on the remote controller to reset the system.

CONTENTS

SAFETY CAUTION

Important safety information is displayed on the product and in this Installation Manual. Please ensure this is read thoroughly and keep for future reference.

Before any repairs or maintenance is carried out an assessment of the potential risks must be undertaken, and appropriate measures taken to ensure the safety of all personnel.

Explanation of indications

Indication		Explanation
⚠	**DANGER**	Indicates contents will cause death or serious injury if used incorrectly.
⚠	**WARNING**	Indicates contents could cause death or serious injury if used incorrectly.
⚠	**CAUTION**	Indicates contents could cause an injury or damage to property, furniture or pets if the instructions are not followed carefully.

Explanation of illustrated marks

Mark	Explanation
⊘	Indicates prohibited items
❗	Indicates mandatory items
△	Indicates cautions (including danger/warnings)

Confirmation of warning label on the main unit

Confirm that labels are present in the specified positions (refer to the outdoor unit parts diagram).

If removing the label during maintenance or service, replace in original position.

	DANGER ⚠
Turn off breaker ❗	**Turn the breaker to the 'Off' position before removing the front panel and the electrical box cover, otherwise an electric shock could be caused by high voltage resulting in death or injury.** • During operation, a high voltage of 400 V or higher is present at the secondary circuit of the high voltage transformer*. • Never permit hands or body to come into close proximity with high voltage, even if insulated. * Refer to the electrical wiring diagram
Execute discharge ❗	**When removing the electrical box cover, ensure that the high voltage capacitors are fully discharged before commencing work.** • If discharge is not executed, an electric shock could be caused by high voltage resulting in death or injury. • After turning the breaker to the 'Off' position, high voltage will still be present within the high voltage capacitor. • Ensure capacitors are fully discharged by using a volt meter, before commencing work.
Prohibition ⊘	**Do not turn the breaker to the 'On' position whilst the front panel or electrical box cover is not fitted.** • An electric shock could occur resulting in death or injury.

	WARNING ⚠
Check earth wires	**Before troubleshooting or repair work, check the earth wire is connected to the earth terminals of the unit, otherwise electric shock could occur.** • If the earth is not correctly connected, turn off the system and contact an electrical engineer.
Prohibition of modification	**Do not modify this product.** • Do not disassemble or modify any part of the system. It may cause a fire, electric shock or injury.
Use only specified parts	**For spare parts, use only those specified in the parts list.** • If unapproved spare parts are used, a fire or electric shock could occur.
Authorised personnel only	**Ensure only competent authorised personnel have access during repair work.** • No unauthorised persons should be in the proximity of the equipment during maintenance or repair work as there is a risk of injury from the equipment, tools or disassembled parts.
Insulating measures	**Ensure correct electrical terminations are used.** • Cut electrical leads should be reconnected using correct specification crimp terminals to avoid the risk of electric shock or fire.
No naked flames	**Extinguish all open flames before maintenance of air conditioning product begins.** • Do not use brazing or welding equipment in an unventilated room as this risks carbon monoxide poisoning. • Ensure the brazing or welding equipment flame does not come into contact with flammable material to avoid risk of fire.
Refrigerant	**Use the correct refrigerant type (R-410A) for the system.** • The refrigerant type will be clearly indicated on the outdoor unit. • Never mix refrigerants as this can cause abnormally high system pressures resulting in failure and potential injury. • Never permit air or nitrogen to mix with the refrigerant. • Use tools and materials appropriate for the refrigerant used in the air conditioner product. • To prevent charging of the system with incorrect refrigerant type, the service port design is different from that used on R-22. • Do not attempt to reclaim the refrigerant into the outdoor unit, serious damage or injury could result. • Do not exceed the recommended charge. Overcharging the system after a refrigerant leak modifies the refrigerant composition resulting in changes to the air conditioning characteristics, which can result in failure and risk of injury. Therefore, if the product develops a refrigerant leak, recover the refrigerant in the air conditioner, execute vacuuming and then charge with the specified amount of liquid refrigerant. • After installation, check the refrigerant gas does not leak.
Assembly/cabling	**Ensure the system is correctly reassembled after installation, maintenance or repair, taking care to install cables correctly.** • Ensure that all cables are correctly connected. • Make sure the cabinet or panels do not catch or damage cables during reassembly. • If incorrectly reassembled or connected, there is a risk of product failure, which could cause a fire or injury.

	WARNING ⚠
Insulation check	**Ensure that the electrical insulation is intact before energising.** • After the installation is complete, carry out an insulation resistance test (using a 500 V DC Megger), to check the resistance is 2 MΩ or more between each electrically charged section (phase) and the metal chassis (Earth). • If the resistance is low, there is a risk of electric shock, fire and injury.
Ventilation	**Ensure adequate ventilation is present when working with refrigerant.** • If the refrigerant gas is mixed with a flame, poisonous gas is generated. • A refrigerant gas leak occurring in a room without ventilation can result in asphyxiation (shortage of oxygen).
Beware electric shock	**Where possible, avoid working on any system connected to live electrical supply.** • Where not possible, ensure suitable insulating gloves and clothing are worn when working on circuits which are powered and insulated tools are used. • Ensure that only electrically qualified personnel have access when working with live electrical equipment.
Obligatory	**If a refrigerant leak occurs, find the source and repair it swiftly.** • Ensure sufficient ventilation is provided if a leak is found. • If the source cannot be found, pump the system down and tighten the service valve to prevent refrigerant leaking into the room. • Poisonous gas can be created when the leaked refrigerant gas comes into contact with heaters, cookers, etc. **When installing equipment which includes a large amount of charged refrigerant such as a multi air conditioner in a small room, it is necessary to ensure that the refrigerant density does not exceed the limit in the event of a leak.** • A refrigerant leak that exceeds the density limit can cause oxygen starvation. **For the installation, movement or reinstallation of a system, refer to installation manual.** • If an installation is not completed correctly, there is the possibility malfunction or failure which could cause leaks, electric shock or fire.
Check after repair	**After maintenance of repair work has been undertaken, check for problems ensuring the power breaker is positioned in the 'Off' position.** • After replacing the electrical box cover or front panel, undertake a test run to ensure there is no generation of smoke, abnormal heat or abnormal sound.
Check after repair	**Check the following items are correct after repair:** 1) The earth wire is correctly connected. 2) The power cord is not trapped in the product. 3) The installation is level and on a stable footing.

	CAUTION ⚠
Wear protective equipment	**Ensure adequate personal protective equipment is used.** • Ensure gloves are worn during repair work to prevent personal injury. • When working with refrigerant ensure eye protection is used. • When brazing or welding wear appropriate gloves, eye/face protection and flame retardant clothing.
Cooling check	**If the equipment has been recently used, ensure it has sufficiently cooled before working on it.**

New refrigerant (R-410A)

This air conditioner features a new HFC type refrigerant (R-410A) which does not deplete the ozone layer.

1. Safety caution concerned with new refrigerant

The pressure of R-410A is 1.6 times higher than that of former refrigerant R-22. The refrigerating oil has also been changed. Therefore be sure that the former refrigerant, refrigerant oil and other contaminants are not mixed into the refrigerating cycle of the air conditioner with the new refrigerant during installation or service work. If incorrect work is performed, there is a possibility of serious accident. Use tools and materials exclusive to R-410A.

2. Cautions on installation/service

- Do not mix other refrigerants or other refrigeration oil with R-410A
- The types of tools and joints, including the service port differ from those of the former refrigerant in order to prevent mistakes.
- The operational pressure of R-410A is high, always use pipes with the correct wall thickness and which are specified for R-410A.
- During installation, ensure pipes are clean and ensure contaminants do not enter the pipes as the system is affected by impurities such as water, oxide scales, dirt, oil, etc.
- Ensure brazing is completed using .owing OFN (Oxygen Free Nitrogen) gas.
- Use a vacuum pump for air purge, not refrigerant.
- R-410A refrigerant is an azeotropic mixture type refrigerant. Therefore use liquid to charge the refrigerant. If gas is used, the composition of refrigerant will change which affects the performance characteristics of the air conditioner.

3. Materials

- For the refrigerant pipes, use copper pipes and keep the number of joints to a minimum.
- When using long copper pipe for R-410A, it is recommended to use seamless copper material which includes bonded oil, of amount 40 mg/10 ml or less.
- Do not use crushed, deformed or discoloured pipes.
- Use material in which the amount of contaminates inside the pipe or joint are kept to an absolute minimum.
- The use of flared joints for joining refrigeration pipes should not be used, except where fitted to the indoor/ outdoor units by the factory.

1. SELECTING A LOCATION FOR INSTALLATION

⚠ WARNING

The installation of the air conditioning unit must be positioned in a location that can sufficiently support its weight and give protection against adverse environmental conditions. Failure to do so may result in unit damage and possible human injury.

All cassette type and concealed duct air conditioner units must be installed at a minimum height of 2.5m or more from the floor. To prevent contact between human and air conditioners moving parts and live electrical components.

Installation Location Selection for Outdoor unit

Obtain permission from the customer to install the unit in a location that satisfies the following requirements :

- A location that permits level installation of the unit.
- A location that provides enough space to service the unit safely
- A location where water draining from the unit will not pose a problem

Avoid installing in the following places.

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighboring house. (For outdoor unit)
- Place where noise of the outdoor unit is easily transmitted.
  (When installing the air conditioner on the boundary with the neighbour, pay due attention to the level of noise.)
- Place with poor ventilation.
  (Especially in Concealed duct type indoor unit, before air ducting work, check whether value of air volume, static pressure and duct resistance are correct.)

Combination of outdoor unit

Cooling Only Model

HP (Capacity code)	Model name MMY-	No. of combined units	Inverter 5HP MMY-	Used Qty	Inverter 6HP MMY-	Used Qty	Inverter 8HP MMY-	Used Qty	Inverter 10HP MMY-	Used Qty	Inverter 12HP MMY-	Used Qty
5HP (5)	MAP0501T8	1	MAP0501T8	1								
6HP (6)	MAP0601T8	1			MAP0601T8	1						
8HP (8)	MAP0801T8	1					MAP0801T8	1				
10HP (10)	MAP1001T8	1							MAP1001T8	1		
12HP (12)	MAP1201T8	1									MAP1201T8	1
14HP (14)	AP1401T8	2			MAP0601T8	1	MAP0801T8	1				
16HP (16)	AP1601T8	2					MAP0801T8	2				
18HP (18)	AP1801T8	2					MAP0801T8	1	MAP1001T8	1		
20HP (20)	AP2001T8	2							MAP1001T8	2		
22HP (22)	AP2201T8	3			MAP0601T8	1	MAP0801T8	2				
22HP (22)	AP2211T8	2							MAP1001T8	1	MAP1201T8	1
24HP (24)	AP2401T8	3					MAP0801T8	3				
24HP (24)	AP2411T8	2									MAP1201T8	2
26HP (26)	AP2601T8	3					MAP0801T8	2	MAP1001T8	1		
28HP (28)	AP2801T8	3					MAP0801T8	1	MAP1001T8	2		
30HP (30)	AP3001T8	3							MAP1001T8	3		
32HP (32)	AP3201T8	4					MAP0801T8	4				
32HP (32)	AP3211T8	3							MAP1001T8	2	MAP1201T8	1
34HP (34)	AP3401T8	4					MAP0801T8	3	MAP1001T8	1		
34HP (34)	AP3411T8	3							MAP1001T8	1	MAP1201T8	2
36HP (36)	AP3601T8	4					MAP0801T8	2	MAP1001T8	2		
36HP (36)	AP3611T8	3									MAP1201T8	3
38HP (38)	AP3801T8	4					MAP0801T8	1	MAP1001T8	3		
40HP (40)	AP4001T8	4							MAP1001T8	4		
42HP (42)	AP4201T8	4							MAP1001T8	3	MAP1201T8	1
44HP (44)	AP4401T8	4							MAP1001T8	2	MAP1201T8	2
46HP (46)	AP4601T8	4							MAP1001T8	1	MAP1201T8	3
48HP (46)	AP4801T8	4									MAP1201T8	4

Heat-pump Model (50Hz)

HP (Capacity code)	Model name MMY-	No. of combined units	Inverter 5HP MMY-	Used Qty	Inverter 6HP MMY-	Used Qty	Inverter 8HP MMY-	Used Qty	Inverter 10HP MMY-	Used Qty	Inverter 12HP MMY-	Used Qty
5HP (5)	MAP0501HT8	1	MAP0501HT8	1								
6HP (6)	MAP0601HT8	1			MAP0601HT8	1						
8HP (8)	MAP0801HT8	1					MAP0801HT8	1				
10HP (10)	MAP1001HT8	1							MAP1001HT8	1		
12HP (12)	MAP1201HT8	1									MAP1201HT8	1
14HP (14)	AP1401HT8	2			MAP0601HT8	1	MAP0801HT8	1				
16HP (16)	AP1601HT8	2					MAP0801HT8	2				
18HP (18)	AP1801HT8	2					MAP0801HT8	1	MAP1001HT8	1		
20HP (20)	AP2001HT8	2							MAP1001HT8	2		
22HP (22)	AP2201HT8	3			MAP0601HT8	1	MAP0801HT8	2				
22HP (22)	AP2211HT8	2							MAP1001HT8	1	MAP1201HT8	1
24HP (24)	AP2401HT8	3					MAP0801HT8	3				
24HP (24)	AP2411HT8	2									MAP1201HT8	2
26HP (26)	AP2601HT8	3					MAP0801HT8	2	MAP1001HT8	1		
28HP (28)	AP2801HT8	3					MAP0801HT8	1	MAP1001HT8	2		
30HP (30)	AP3001HT8	3							MAP1001HT8	3		
32HP (32)	AP3201HT8	4					MAP0801HT8	4				
32HP (32)	AP3211HT8	3							MAP1001HT8	2	MAP1201HT8	1
34HP (34)	AP3401HT8	4					MAP0801HT8	3	MAP1001HT8	1		
34HP (34)	AP3411HT8	3							MAP1001HT8	1	MAP1201HT8	2
36HP (36)	AP3601HT8	4					MAP0801HT8	2	MAP1001HT8	2		
36HP (36)	AP3611HT8	3									MAP1201HT8	3
38HP (38)	AP3801HT8	4					MAP0801HT8	1	MAP1001HT8	3		
40HP (40)	AP4001HT8	4							MAP1001HT8	4		
42HP (42)	AP4201HT8	4							MAP1001HT8	3	MAP1201HT8	1
44HP (44)	AP4401HT8	4							MAP1001HT8	2	MAP1201HT8	2
46HP (46)	AP4601HT8	4							MAP1001HT8	1	MAP1201HT8	3
48HP (46)	AP4801HT8	4									MAP1201HT8	4

Heat-pump Model (60Hz)

HP (Capacity code)	Model name MMY-	No. of combined units	Inverter 5HP MMY-	Used Qty	Inverter 6HP MMY-	Used Qty	Inverter 8HP MMY-	Used Qty	Inverter 10HP MMY-	Used Qty	Inverter 12HP MMY-	Used Qty
5HP (5)	MAP0501HT7	1	MAP0501HT7	1								
6HP (6)	MAP0601HT7	1			MAP0601HT7	1						
8HP (8)	MAP0801HT7	1					MAP0801HT7	1				
10HP (10)	MAP1001HT7	1							MAP1001HT7	1		
12HP (12)	MAP1201HT7	1									MAP1201HT7	1
14HP (14)	AP1401HT7	2			MAP0601HT7	1	MAP0801HT7	1				
16HP (16)	AP1601HT7	2					MAP0801HT7	2				
18HP (18)	AP1801HT7	2					MAP0801HT7	1	MAP1001HT7	1		
20HP (20)	AP2001HT7	2							MAP1001HT7	2		
22HP (22)	AP2201HT7	3			MAP0601HT7	1	MAP0801HT7	2				
22HP (22)	AP2211HT7	2							MAP1001HT7	1	MAP1201HT7	1
24HP (24)	AP2401HT7	3					MAP0801HT7	3				
24HP (24)	AP2411HT7	2									MAP1201HT7	2
26HP (26)	AP2601HT7	3					MAP0801HT7	2	MAP1001HT7	1		
28HP (28)	AP2801HT7	3					MAP0801HT7	1	MAP1001HT7	2		
30HP (30)	AP3001HT7	3							MAP1001HT7	3		
32HP (32)	AP3201HT7	4					MAP0801HT7	4				
32HP (32)	AP3211HT7	3							MAP1001HT7	2	MAP1201HT7	1
34HP (34)	AP3401HT7	4					MAP0801HT7	3	MAP1001HT7	1		
34HP (34)	AP3411HT7	3							MAP1001HT7	1	MAP1201HT7	2
36HP (36)	AP3601HT7	4					MAP0801HT7	2	MAP1001HT7	2		
36HP (36)	AP3611HT7	3									MAP1201HT7	3
38HP (38)	AP3801HT7	4					MAP0801HT7	1	MAP1001HT7	3		
40HP (40)	AP4001HT7	4							MAP1001HT7	4		
42HP (42)	AP4201HT7	4							MAP1001HT7	3	MAP1201HT7	1
44HP (44)	AP4401HT7	4							MAP1001HT7	2	MAP1201HT7	2
46HP (46)	AP4601HT7	4							MAP1001HT7	1	MAP1201HT7	3
48HP (46)	AP4801HT7	4									MAP1201HT7	4

Equipment

1. Outdoor units

Corresponding HP			Inverter unit				
			5 HP	6 HP	8 HP	10 HP	12 HP
Model name	Heat pump	MMY-	MAP0501HT8	MAP0601HT8	MAP0801HT8	MAP1001H8	MAP1201HT8
	Heat pump	MMY-	MAP0501HT7	MAP0601HT7	MAP0801HT7	MAP1001HT7	MAP1201HT7
	Cooling only	MMY-	MAP0501T8	MAP0601T8	MAP0801T8	MAP1001T8	MAP1201T8
Cooling capacity (kW)			14.0	16.0	22.4	28.0	33.5
Heating capacity (kW)			16.0	18.0	25.0	31.5	37.5
Appearance							
							

2. Outdoor units (Combination of outdoor units)

Corresponding HP		5 HP	6 HP	8 HP	10 HP	12 HP	14 HP	16 HP
Combined Model	MMY-	MAP0501HT8	MAP0601HT8	MAP0801HT8	MAP1001HT8	MAP1201HT8	AP1401HT8	AP1601HT8
	MMY-	MAP0501HT7	MAP0601HT7	MAP0801HT7	MAP1001HT7	MAP1201HT7	AP1401HT7	AP1601HT7
	MMY-	MAP0501T8	MAP0601T8	MAP0801T8	MAP1001T8	MAP1201T8	AP1401T8	AP1601T8
Cooling capacity (kW)		14.0	16.0	22.4	28.0	33.5	38.4	45.0
Heating capacity (kW)		16.0	18.0	25.0	31.5	37.5	43.0	50.0
Combined outdoor units		5 HP	6 HP	8 HP	10 HP	12 HP	8 HP	8 HP
		—	—	—	—	—	6 HP	8 HP
		—	—	—	—	—	—	—
		—	—	—	—	—	—	—
No. of connectable indoor units		8	10	13	16	20	23	27

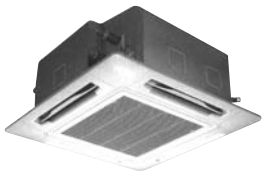
Corresponding HP		18 HP	20 HP	22 HP	22 HP	24 HP	24 HP	26 HP
Combined Model	MMY-	AP1801HT8	AP2001HT8	AP2201HT8	AP2211HT8	AP2401HT8	AP2411HT8	AP2601HT8
	MMY-	AP1801HT7	AP2001HT7	AP2201HT7	AP2211HT7	AP2401HT7	AP2411HT7	AP2601HT7
	MMY-	AP1801T8	AP2001T8	AP2201T8	AP2211T8	AP2401T8	AP2411T8	AP2601T8
Cooling capacity (kW)		50.4	56.0	61.5	61.5	68.0	68.0	73.0
Heating capacity (kW)		56.5	63.0	69.0	69.0	76.5	76.5	81.5
Combined outdoor units		10 HP	10 HP	8 HP	12 HP	8 HP	12 HP	10 HP
		8 HP	10 HP	8 HP	10 HP	8 HP	12 HP	8 HP
		—	—	6 HP	—	8 HP	—	8 HP
		—	—	—	—	—	—	—
No. of connectable indoor units		30	33	37	37	40	40	43

Corresponding HP		28 HP	30 HP	32 HP	32 HP	34 HP	34 HP	36 HP
Combined Model	MMY-	AP2801HT8	AP3001HT8	AP3201HT8	AP3211HT8	AP3401HT8	AP3411HT8	AP3601HT8
	MMY-	AP2801HT7	AP3001HT7	AP3201HT7	AP3211HT7	AP3401HT7	AP3411HT7	AP3601HT7
	MMY-	AP2801T8	AP3001T8	AP3201T8	AP3211T8	AP3401T8	AP3411T8	AP3601T8
Cooling capacity (kW)		78.5	84.0	90.0	90.0	96.0	96.0	101.0
Heating capacity (kW)		88.0	95.0	100.0	100.0	108.0	108.0	113.0
Combined outdoor units		10 HP	10 HP	8 HP	12 HP	10 HP	12 HP	10 HP
		10 HP	10 HP	8 HP	10 HP	8 HP	12 HP	10 HP
		8 HP	10 HP	8 HP	10 HP	8 HP	10 HP	8 HP
		—	—	8 HP	—	8 HP	—	8 HP
No. of connectable indoor units		47	48	48	48	48	48	48

Corresponding HP		36 HP	38 HP	40 HP	42 HP	44 HP	46 HP	48 HP
Combined Model	MMY-	AP3611HT8	AP3801HT8	AP4001HT8	AP4201HT8	AP4401HT8	AP4601HT8	AP4801HT8
	MMY-	AP3611HT7	AP3801HT7	AP4001HT7	AP4201HT7	AP4401HT7	AP4601HT7	AP4801HT7
	MMY-	AP3611T8	AP3801T8	AP4001T8	AP4201T8	AP4401T8	AP4601T8	AP4801T8
Cooling capacity (kW)		101.0	106.5	112.0	118.0	123.5	130.0	135.0
Heating capacity (kW)		113.0	119.5	126.5	132.0	138.0	145.0	150.0
Combined outdoor units		12 HP	10 HP	10 HP	12 HP	12 HP	12 HP	12 HP
		12 HP	10 HP	10 HP	10 HP	12 HP	12 HP	12 HP
		12 HP	10 HP	10 HP	10 HP	10 HP	12 HP	12 HP
		—	8 HP	10 HP	10 HP	10 HP	10 HP	12 HP
No. of connectable indoor units		48	48	48	48	48	48	48

3. Indoor units

*1) China market only *2) European market only *3) Korea market only

Type	Appearance	Model name	Capacity rank	Capacity code	Cooling capacity (kW)	Heating capacity (kW)
4-way Air Discharge Cassette Type		**MMU-AP0091H**	009 type	1	2.8	3.2
		MMU-AP0121H	012 type	1.25	3.6	4.0
		MMU-AP0151H	015 type	1.7	4.5	5.0
		MMU-AP0181H	018 type	2	5.6	6.3
		MMU-AP0241H	024 type	2.5	7.1	8.0
		MMU-AP0271H	027 type	3	8.0	9.0
		MMU-AP0301H	030 type	3.2	9.0	10.0
		MMU-AP0361H	036 type	4	11.2	12.5
		MMU-AP0481H	048 type	5	14.0	16.0
		MMU-AP0561H	056 type	6	16.0	18.0
2-way Air Discharge Cassette Type		**MMU-AP0071WH**	007 type	0.8	2.2	2.5
		MMU-AP0091WH	009 type	1	2.8	3.2
		MMU-AP0121WH	012 type	1.25	3.6	4.0
		MMU-AP0151WH	015 type	1.7	4.5	5.0
		MMU-AP0181WH	018 type	2	5.6	6.3
		MMU-AP0241WH	024 type	2.5	7.1	8.0
		MMU-AP0271WH	027 type	3	8.0	9.0
		MMU-AP0301WH	030 type	3.2	9.0	10.0
		MMU-AP0481WH*1)	048 type	5	14.0	16.0
1-way Air Discharge Cassette Type		**MMU-AP0071YH**	007 type	0.8	2.2	2.5
		MMU-AP0091YH	009 type	1	2.8	3.2
		MMU-AP0121YH	012 type	1.25	3.6	4.0
		MMU-AP0151SH	015 type	1.7	4.5	5.0
		MMU-AP0181SH	018 type	2	5.6	6.3
		MMU-AP0241SH	024 type	2.5	7.1	8.0
		MMU-AP0152SH	015 type	1.7	4.5	5.0
		MMU-AP0182SH	018 type	2	5.6	6.3
		MMU-AP0242SH	024 type	2.5	7.1	8.0
Slim Duct Type		**MMD-AP0071SPH**	007 type	0.8	2.2	2.5
		MMD-AP0091SPH	009 type	1	2.8	3.2
		MMD-AP0121SPH	012 type	1.25	3.6	4.0
		MMD-AP0151SPH	015 type	1.7	4.5	5.0
		MMD-AP0181SPH	018 type	2	5.6	6.3
		MMD-AP0071SPH(SH)-C*1)	007 type	0.8	2.2	2.5
		MMD-AP0091SPH(SH)-C*1)	009 type	1	2.8	3.2
		MMD-AP0121SPH(SH)-C*1)	012 type	1.25	3.6	4.0
		MMD-AP0151SPH(SH)-C*1)	015 type	1.7	4.5	5.0
		MMD-AP0181SPH(SH)-C*1)	018 type	2	5.6	6.3
		MMD-AP0071SPH-K*3)	007 type	0.8	2.2	2.5
		MMD-AP0091SPH-K*3)	009 type	1	2.8	3.2
		MMD-AP0121SPH-K*3)	012 type	1.25	3.6	4.0
		MMD-AP0151SPH-K*3)	015 type	1.7	4.5	5.0
		MMD-AP0181SPH-K*3)	018 type	2	5.6	6.3
Concealed Duct Standard Type		**MMD-AP0071BH**	007 type	0.8	2.2	2.5
		MMD-AP0091BH	009 type	1	2.8	3.2
		MMD-AP0121BH	012 type	1.25	3.6	4.0
		MMD-AP0151BH	015 type	1.7	4.5	5.0
		MMD-AP0181BH	018 type	2	5.6	6.3
		MMD-AP0241BH	024 type	2.5	7.1	8.0
		MMD-AP0271BH	027 type	3	8.0	9.0
		MMD-AP0301BH	030 type	3.2	9.0	10.0
		MMD-AP0361BH	036 type	4	11.2	12.5
		MMD-AP0481BH	048 type	5	14.0	16.0
		MMD-AP0561BH	056 type	6	16.0	18.0
Concealed Duct High Static Pressure Type		**MMD-AP0181H**	018 type	2	5.6	6.3
		MMD-AP0241H	024 type	2.5	7.1	8.0
		MMD-AP0271H	027 type	3	8.0	9.0
		MMD-AP0361H	036 type	4	11.2	12.5
		MMD-AP0481H	048 type	5	14.0	16.0
		MMD-AP0721H	072 type	8	22.4	25.0
		MMD-AP0961H	096 type	10	28.0	31.5

*1) China market only *2) European market only *3) Korea market only

Type	Appearance	Model name	Capacity rank	Capacity code	Cooling capacity (kW)	Heating capacity (kW)
Under Ceiling Type		**MMC-AP0151H**	015 type	1.7	4.5	5.0
		MMC-AP0181H	018 type	2	5.6	6.3
		MMC-AP0241H	024 type	2.5	7.1	8.0
		MMC-AP0271H	027 type	3	8.0	9.0
		MMC-AP0361H	036 type	4	11.2	12.5
		MMC-AP0481H	048 type	5	14.0	16.0
High Wall Type (1 Series)		**MMK-AP0071H**	007 type	0.8	2.2	2.5
		MMK-AP0091H	009 type	1	2.8	3.2
		MMK-AP0121H	012 type	1.25	3.6	4.0
		MMK-AP0151H	015 type	1.7	4.5	5.0
		MMK-AP0181H	018 type	2	5.6	6.3
		MMK-AP0241H	024 type	2.5	7.1	8.0
High Wall Type (2 Series) *2)		**MMK-AP0072H*2)**	007 type	0.8	2.2	2.5
		MMK-AP0092H*2)	009 type	1.0	2.8	3.2
		MMK-AP0122H*2)	012 type	1.25	3.6	4.0
Floor Standing Cabinet Type		**MML-AP0071H**	007 type	0.8	2.2	2.5
		MML-AP0091H	009 type	1	2.8	3.2
		MML-AP0121H	012 type	1.25	3.6	4.0
		MML-AP0151H	015 type	1.7	4.5	5.0
		MML-AP0181H	018 type	2	5.6	6.3
		MML-AP0241H	024 type	2.5	7.1	8.0
Floor Standing Concealed Type		**MML-AP0071BH**	007 type	0.8	2.2	2.5
		MML-AP0091BH	009 type	1	2.8	3.2
		MML-AP0121BH	012 type	1.25	3.6	4.0
		MML-AP0151BH	015 type	1.7	4.5	5.0
		MML-AP0181BH	018 type	2	5.6	6.3
		MML-AP0241BH	024 type	2.5	7.1	8.0
Floor Standing Type		**MMF-AP0151H**	015 type	1.7	4.5	5.0
		MMF-AP0181H	018 type	2	5.6	6.3
		MMF-AP0241H	024 type	2.5	7.1	8.0
		MMF-AP0271H	027 type	3	8.0	9.0
		MMF-AP0361H	036 type	4	11.2	12.5
		MMF-AP0481H	048 type	5	14.0	16.0
		MMF-AP0561H	056 type	6	16.0	18.0

4. Tools

- Required tools for R-410A

  Mixing of different types of oil may cause generation of sludge, clogging of capillary, etc. Accordingly, the tools to be used are classified into the following three types:

  1) Tools exclusively for R-410A, which cannot be used for conventional refrigerant R-22.

  2) Tools exclusively for R-410A, but can also be used for conventional refrigerant R-22.

  3) Tools commonly used for R-410A and for conventional refrigerant R-22.

  The table below shows the tools exclusively for R-410A and their interchangeability.

Tools exclusively for R-410A (the following tools for R-410A are required)

Tools whose specifications are changed for R-410A and their interchangeability

No.	Used tool	Usage	R-410A air conditioner installation		Conventional air conditioner installation
			Existence of new equipment for R-410A	Whether conventional equipment can be used	Whether new equipment can be used with conventional refrigerant
1	Flare tool	Pipe flaring	Yes	See Note 1	Yes
2	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	See Note 1	See Note 1
3	Torque wrench	Connection of flare nut	Yes	No	No
4	Gauge manifold	Evacuating, refrigerant charge, run check, etc.	Yes	No	No
5	Charge hose				
6	Vacuum pump adapter	Vacuum evacuating	Yes	No	Yes
7	Electronic balance for refrigerant charging	Refrigerant charge	Yes	Yes	Yes
8	Refrigerant cylinder	Refrigerant charge	Yes	No	No
9	Leakage detector	Gas leakage check	Yes	No	Yes
10	Charging cylinder	Refrigerant charge	See Note 2	No	No

Note 1: When flaring is carried out for R-410A using the conventional flare tools, adjustment of projection margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary.
Note 2: Charging cylinder for R-410A is currently being developed.

General tools (conventional tools can be used)

In addition to the above exclusive tools, the following equipment which serves also for R-22 is necessary as the general tools:

1. Vacuum pump
   Use vacuum pump by attaching vacuum pump adapter
2. Torque wrench
3. Pipe cutter
4. Reamer
5. Pipe bender
6. Level vial
7. Screwdriver (+, -)
8. Spanner or monkey wrench
9. Hole core drill
10. Hexagon wrench (opposite side 4 mm)
11. Tape measure
12. Metal saw

Also prepare the following equipment for other installation method and run check.

1. Clamp meter
2. Thermometer
3. Insulation resistance tester (Megger)
4. Volt meter

2. SAFETY NOTES

- Ensure that all Local, National and International regulations are satisfied.
- After the installation work has been completed, perform a trial operation to check for possible problems. Follow the owner's manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before any unit maintenance.
- Ensure the customer keeps both the installation and owners manual together.

⚠ WARNING

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
  Inappropriate installation may result in water leakage, a electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
  Make sure all power switches are off. Failure to do so may cause a electric shock.
- **Connect all the installation wiring correctly.**
  If the installation wiring is incorrect, electrical parts may be damaged.
- **During the transportation and installation of the air conditioning unit, ensure that gaseous matter other than the specified refrigerant does not enter into the refrigeration cycle.**
  If a refrigerant becomes contaminated with foreign gases, the gas pressure within the refrigerant cycle will become abnormally high and may result in the fracture of pipework and possible human injury.
- **Do not modify this unit by removing any of the safety guards or by-passing any of the safety interlock switches.**
- **Exposure of the unit to water or moisture before installation may cause a short-circuit of electrical parts.**
  Do not store it in a wet basement or expose to rain or water.
- **After unpacking the unit, examine for possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
  If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas may be generated.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses a designated power supply.**
  An insufficient power supply capacity or inappropriate installation may cause fire.
- **When connecting the installation wiring, be sure that all fixing terminal are securely fixed.**
- **Conform to the regulations of the local electric company when wiring the power supply.**
  Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gases.**
  If a combustible gas leaks within the vicinity of the unit, a fire may occur.

3. CHECK POINTS

Check before operation

- Turn on the main power supply 12 hours or more before starting the operation.
- Check and ensure earth wiring is connected.
- Check and ensure air filter is fitted to indoor unit.

Heating capacity

- During the heating operation the heat pump units absorbs heat from the outside and delivers heat into the room. If the outdoor temperature lowers the heating capacity decreases.
- When the outdoor temperature is low, it is recommended that other forms of heating are used.

Defrost operation in heating operation

- If frost is found on the outdoor unit during heating operation, the defrost operation starts automatically for a period of 2 to 10 minutes. This will increase the heating effect.
- During the defrost operation, both the indoor and outdoor unit fans will stop.

Protection for 3 minutes

- The outdoor unit does not operate for approximately 3 minutes after the air conditioner has been immediately restarted after stop, or power supply has been turned on. This is to protect the system.

Main power failure

- If a power failure occurs during operation, all unit operations will stop.
- When the power is turned on after power failure, the operation lamp on the remote controller will flash.
- When restarting the operation, push ON/OFF button again.

Fan rotation of stopped unit

- When other indoor units are in operation, the fan on the indoor unit which is in stand-by mode will rotate to protect the machine. This occurs once an hour for several minutes.

Protective device (High pressure switch)

When excessive load is applied to the air conditioner the high pressure switch will activate. Upon activation of this protective device the operation lamp will remain on, but the unit operation will stop. When the protective device operates, 'CHECK' characters will be displayed flashing on the remote controller. The protective device may be activated in the following cases.

Cooling

- When air inlet or outlet of the outdoor unit is closed.
- When strong wind blows continuously against the air outlet of the outdoor unit.

Heating

- When excessive dust or dirt is adhered to the air filter of the indoor unit.
- When the air outlet of the indoor unit is blocked.

NOTE

If the protective device activates, turn off the main power supply, remove the cause and restart the operation.

Cooling/ heating operation of Multi system air conditioner

- In a Multi system air conditioner, cooling and heating operation cannot be performed at the same time from indoor units that are connected within a refrigerant cycle to the same outdoor unit or module. Each indoor unit can be operated independently, if both operations (Heat and cool) are performed at the same time, the indoor unit which is in cooling mode, will stop and display [⏻ Operation ready] on the remote controller. The unit in heat mode will continue to operate.

  When cool or heat mode is selected as the prioritized mode of the air conditioner, the other operation mode becomes unavailable. If a mode other than the set mode is selected. [✺ PRE-HEAT] or [⏻ Operation ready] will appear on the remote controller and the operation does not function.

Characteristics of heating operation

- Upon starting the air conditioner, air will not immediately blow out. When the indoor heat exchanger has been heated for 3 to 5 minutes (differs according to the temperature of the indoor/outdoor temperature), hot air starts blowing.
- During the operation, the outdoor unit may stop when the outdoor temperature becomes to high.
- When a unit is in fan only operation and a further unit then demands heating mode, the fan operation maybe stopped temporarily to prevent the discharge of hot air.

4. KEY POINTS FOR AIR CONDITIONER INSTALLATION

In order to prevent problems before they arise, carefully read the Installation Manual provided with the equipment and the Owner's Manual before installing the air conditioner.

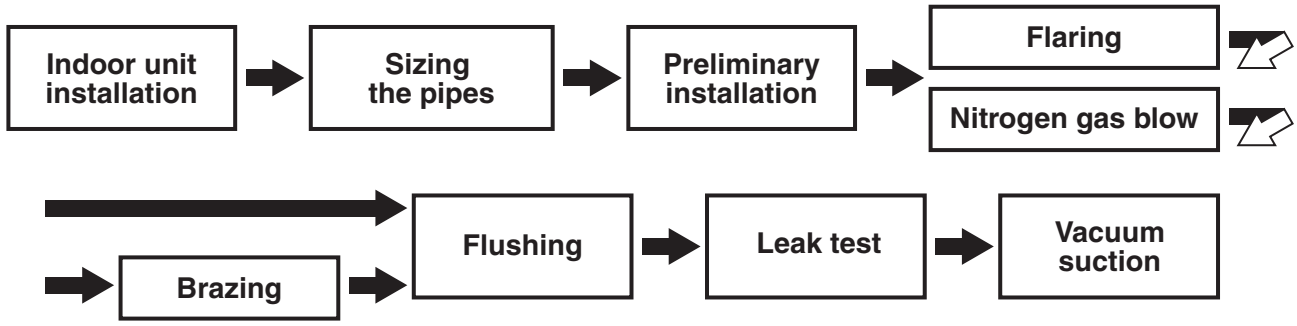
4-1. Flow of Air Conditioner Installation Work

[Step]	[Key Points]
(Prior to Installation)	
Understanding of requirements for installation.	Clearly determine the extent of the installation work.
Drafting of diagrams	Draft : • Control wiring system diagram • Refrigerant line system diagram • Power wiring system diagram
(Installation)	
Sleeve/insert installation	Pay careful attention to the downward slope of the drain pipe.
Indoor unit and flow selector unit installation	Be sure to check the name of the model in order to avoid any installation mistakes. If the model has an installation pattern, attach the pattern to the ceiling to mark the position of the ceiling openings and to keep dust away.
Refrigerant pipe installation	Make sure that the pipe system is dry, clean and airtight. When brazing pipes, blow out the system with nitrogen. Do not forget the system indications.
(to outdoor outlet)	
Drain pipe installation	Pipes should have downward slope (of at least 1/100).
Duct installation	Make sure the duct is large enough to carry the desired volume of air. Be careful not to make any errors in the external static pressure calculations.
Insulation work	Be especially careful to close off all gaps where connections are made to the indoor unit and at joints in the branching kit. Do not forget the drain pipes.
Electrical work (control wires and power wires)	Use two-core shielded wires for the control wires and use separate power supplies for the indoor and outdoor units. For connecting the flow selector unit, be sure to use the supplied cable or connection cable kit sold separately.
Various switch settings	Set the switches correctly, as indicated in the control wiring system diagram.
Outdoor unit base installation	Make sure that the base is level.
Outdoor unit installation	Ensure that there is adequate air flow and service space around the outdoor unit. Indicate the system names clearly.
Outside circulation, refrigerant pipe installation	From the outside outlet of the buliding to the outdoor unit.
Gas-leak test	In the final test, the system must be pressurized at 3.73MPa ($38kg/cm^2G$) for 24 hours with no decrease in pressure.
Vacuum suction	Use a vacuum pump with reverse flow prevention adaptor with a large output volume and that can achieve a high level of vacuum.
Addition of refrigerant	Record the amount of refrigerant that will be added to the system on both the outdoor unit and on the pre-test operation checklist.
Ceiling panel installation	Make sure that the ceiling panel is attached to the ceiling surface leaving no gaps.
Test operation and adjustment	Operate the indoor units one by one, making sure that all wiring and pipes are connected correctly and fill out the checklist.
Owner's Manual transfer	Explain how to operate the system clearly and concisely.

The procedure described above represents only the general sequence of steps; the sequence may have to be altered according to the circumstances of the specific installation job.

5. REFRIGERANT PIPE INSTALLATION

5-1. Work Procedure

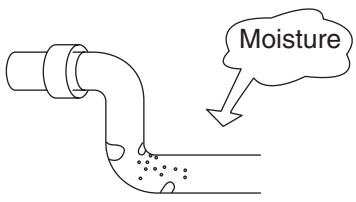
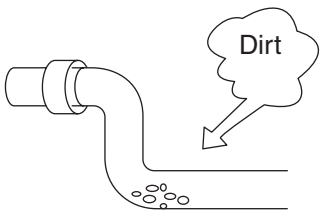
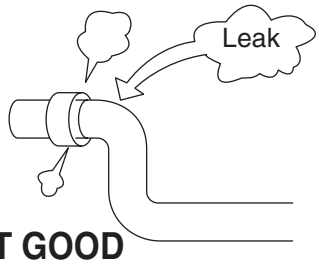


5-2. Three Principles of Refrigerant Pipes

Observe the three principles of refrigerant pipes

	Causes of Problems	Preventing Problems
Dry	• Moisture (in the form of rainwater or water used during installation) getting inside of the pipes • Moisture from condensation forming or seeping into the pipes	Careful handling of pipes → Flushing → Vacuum suction
Clean	• Oxidation inside pipes during brazing • Dirt, dust, or foreign matter getting inside pipes	Nitrogen gas blow Careful handling of pipes → Flushing
Air-tight	• Poor brazing • Poor flaring	Use of suitable materials (copper pipes, solder, etc.) Perform basic work of brazing carefully Perform basic work of flaring carefully → Leak test

Three principles of refrigerant pipes

Dry	Clean	Airtight
Make sure there is no moisture inside of the pipes	Make sure there is no dirt inside of the pipes	Make sure the refrigerant does not leak
 NOT GOOD	 NOT GOOD	 NOT GOOD

5-3. Selecting the Refrigerant pipework Material

• Refrigerant pipes

- **Material: Phosphoric deoxidized seam-less pipe**
- **Capacity code of outdoor unit / indoor unit**
  - For each indoor unit, the capacity code is determined for each capacity rank.
  - For each outdoor unit, the capacity code is determined for each capacity rank. The maximum number of the connectable indoor units and the total capacity code value of the indoor units must also be determined.

Against the capacity code of the outdoor unit, the total capacity codes of the connectable indoor units differ according to the height difference between indoor units.

- When the height difference between indoor units is 15m or less: Up to 135% of capacity of the outdoor unit can be achieved.
- When the height difference between indoor units is 15m or more: Up to 105% of capacity of the outdoor unit can be achieved.

Table 1

Indoor unit capacity rank	Capacity code	
	Equivalent to HP	Equivalent to capacity
007 type	0.8	2.2
009 type	1	2.8
012 type	1.25	3.6
015 type	1.7	4.5
018 type	2	5.6
024 type	2.5	7.1
027 type	3	8
030 type	3.2	9
036 type	4	11.2
048 type	5	14
056 type	6	16
072 type	8	22.4
096 type	10	28

Table 2

Outdoor unit model name	Capacity code		No. of indoor units	Outdoor unit model name	Capacity code		No. of indoor units
	Equivalent to HP	Equivalent to capacity			Equivalent to HP	Equivalent to capacity	
MMY-MAP0501✻	5	14	8	MMY-AP2801✻	28	78.5	47
MMY-MAP0601✻	6	16	10	MMY-AP3001✻	30	84	48
MMY-MAP0801✻	8	22.4	13	MMY-AP3201✻	32	90	48
MMY-MAP1001✻	10	28	16	MMY-AP3211✻			
MMY-MAP1201✻	12	33.5	20	MMY-AP3401✻	34	96	48
MMY-AP1401✻	14	38.4	23	MMY-AP3411✻			
MMY-AP1601✻	16	45	27	MMY-AP3601✻	36	101	48
MMY-AP1801✻	18	50.4	30	MMY-AP3611✻			
MMY-AP2001✻	20	56	33	MMY-AP3801✻	38	106.5	48
MMY-AP2201✻	22	61.5	37	MMY-AP4001✻	40	112	48
MMY-AP2211✻				MMY-AP4201✻	42	118	48
MMY-AP2401✻	24	68	40	MMY-AP4401✻	44	123.5	48
MMY-AP2411✻				MMY-AP4601✻	46	130	48
MMY-AP2601✻	26	73	43	MMY-AP4801✻	48	135	48

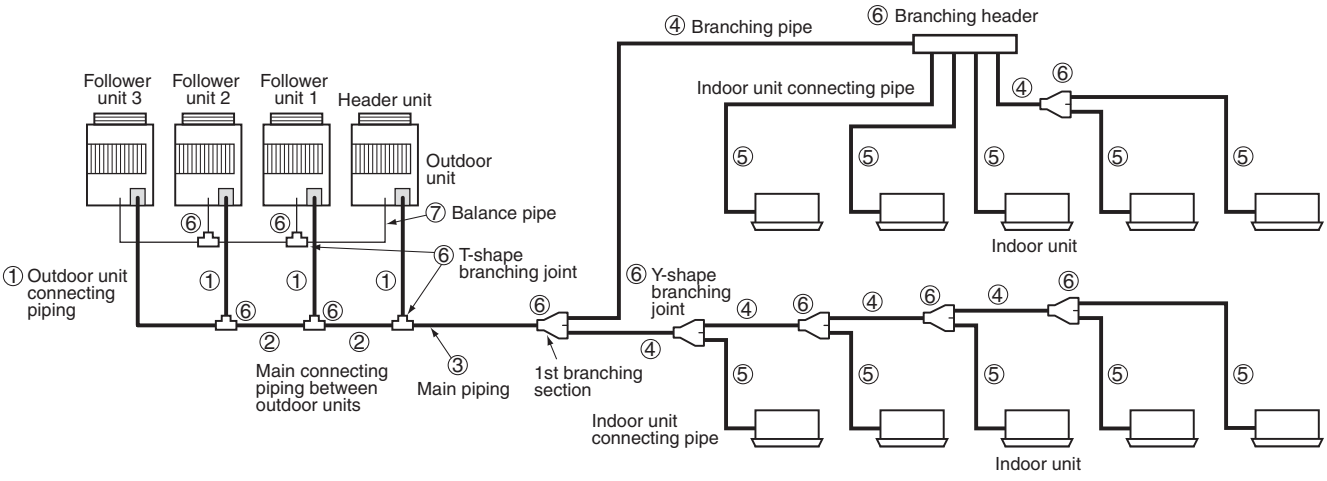
Table 3

<table>
<tr><th>No.</th><th>Piping parts</th><th>Name</th><th>Selection of pipe size</th><th>Remarks</th></tr>
<tr><td>①</td><td>Outdoor unit
↓
T-shape branching joint</td><td>Connecting pipe of outdoor unit</td><td>1) Connecting pipe outdoor unit
<table>
<tr><th>Model</th><th>Gas side</th><th>Liquid side</th></tr>
<tr><td>MMY-MAP0501✻</td><td>Ø15.9</td><td>Ø9.5</td></tr>
<tr><td>MMY-MAP0601✻</td><td>Ø19.1</td><td>Ø9.5</td></tr>
<tr><td>MMY-MAP0801✻</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>MMY-MAP1001✻</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>MMY-MAP1201✻</td><td>Ø28.6</td><td>Ø12.7</td></tr>
</table></td><td>Same to connecting pipe size of outdoor unit</td></tr>
<tr><td>②

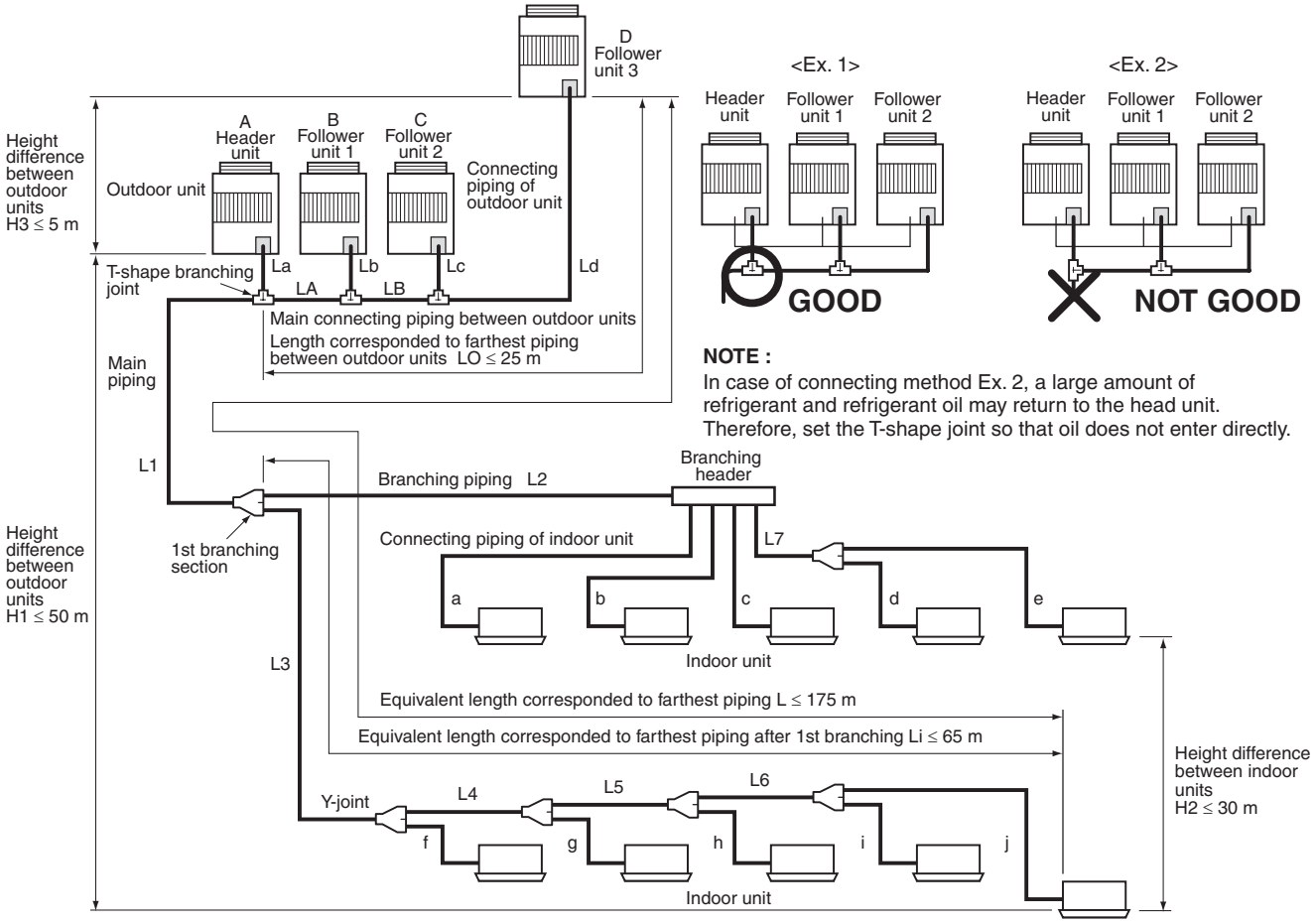
⑦</td><td>Between T-shape branching joints</td><td>Main connecting piping between of outdoor units

Balance pipe</td><td>2) Pipe size for connecting piping between outdoor units
<table>
<tr><th colspan="2">Total capacity codes of outdoor units at downstream side</th><th>Gas side</th><th>Liquid side</th><th>⑦ Balance pipe</th></tr>
<tr><th>Equivalent to capacity</th><th>Equivalent to HP</th><th></th><th></th><th></th></tr>
<tr><td>Below 38.4</td><td>Below 14</td><td>Ø28.6</td><td>Ø12.7</td><td rowspan="5">Ø9.5</td></tr>
<tr><td>38.4 to below 61.5</td><td>14 to below 22</td><td>Ø28.6</td><td>Ø15.9</td></tr>
<tr><td>61.5 to below 73.0</td><td>22 to below 26</td><td>Ø34.9</td><td>Ø15.9</td></tr>
<tr><td>73.0 to below 96.0</td><td>26 to below 36</td><td>Ø34.9</td><td>Ø19.1</td></tr>
<tr><td>Above 101.0</td><td>Above 36</td><td>Ø41.3</td><td>Ø22.2</td></tr>
</table></td><td>Pipe size differs based on total capacity code value of outdoor units at downstream side. (See Table 2.)</td></tr>
<tr><td>③</td><td>T-shape joint of header unit
↓
1st branching section</td><td>Main pipe</td><td>3) Size of main pipe
<table>
<tr><th colspan="2">Total capacity codes of all outdoor units</th><th rowspan="2">Gas side</th><th rowspan="2">Liquid side</th></tr>
<tr><th>Equivalent to capacity</th><th>Equivalent to HP</th></tr>
<tr><td>Below 16.0</td><td>Below 6</td><td>Ø15.9</td><td>Ø9.5</td></tr>
<tr><td>16.0 to below 22.4</td><td>6 to below 8</td><td>Ø19.1</td><td>Ø9.5</td></tr>
<tr><td>22.4 to below 33.5</td><td>8 to below 12</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>33.5 to below 38.4</td><td>12 to below 14</td><td>Ø28.6</td><td>Ø12.7</td></tr>
<tr><td>38.4 to below 61.5</td><td>14 to below 22</td><td>Ø28.6</td><td>Ø15.9</td></tr>
<tr><td>61.5 to below 73.0</td><td>22 to below 26</td><td>Ø34.9</td><td>Ø15.9</td></tr>
<tr><td>73.0 to below 101.0</td><td>26 to below 36</td><td>Ø34.9</td><td>Ø19.1</td></tr>
<tr><td>101.0 to below 130.0</td><td>36 to below 46</td><td>Ø41.3</td><td>Ø22.2</td></tr>
<tr><td>Above 130.0</td><td>Above 46</td><td>Ø41.3✻</td><td>Ø22.2✻</td></tr>
</table>
* Max. equivalent length of main pipe is below 70m.</td><td>Pipe size differs based on capacity code of outdoor unit. (See Table 2.)</td></tr>
</table>

<table>
<tr><th>No.</th><th>Piping parts</th><th>Name</th><th>Selection of pipe size</th><th>Remarks</th></tr>
<tr><td>④</td><td>Branching section
↓
Branching section</td><td>Branching pipe</td><td>4) Pipe size between branching sections
<table>
<tr><th colspan="3">Total capacity codes of indoor units at downstream side</th><th rowspan="2">Gas side</th><th rowspan="2">Liquid side</th></tr>
<tr><th colspan="2">Equivalent to capacity</th><th>Equivalent to HP</th></tr>
<tr><td colspan="2">Below 7.5</td><td>Below 2.8</td><td>Ø12.7</td><td>Ø9.5</td></tr>
<tr><td rowspan="8">*1</td><td>7.5 to below 18.0</td><td>2.8 to below 6.4</td><td>Ø15.9</td><td>Ø9.5</td></tr>
<tr><td>18.0 to below 34.0</td><td>6.4 to below 12.2</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>34.0 to below 56.5</td><td>12.2 to below 20.2</td><td>Ø28.6</td><td>Ø15.9</td></tr>
<tr><td>56.5 to below 70.5</td><td>20.2 to below 25.2</td><td>Ø34.9</td><td>Ø15.9</td></tr>
<tr><td>70.5 to below 98.5</td><td>25.2 to below 35.2</td><td>Ø34.9</td><td>Ø19.1</td></tr>
<tr><td>98.5 to below 118.5</td><td>35.2 to below 42.2</td><td>Ø41.3</td><td>Ø22.2</td></tr>
<tr><td>Above 118.5</td><td>Above 42.2</td><td>Ø41.3</td><td>Ø22.2</td></tr>
</table>
*1: If exceeding the main pipe size, decide the size same to main pipe size.</td><td>Pipe size differs based on total capacity code value of indoor units at downstream side.
If the total value exceeds the capacity code of the outdoor unit, apply capacity code of the outdoor unit.
(See Table 1.2.)</td></tr>
<tr><td>⑤</td><td>Branching section
↓
Indoor unit</td><td>Indoor unit connecting pipe</td><td>5) Connecting pipe size of indoor unit
<table>
<tr><th>Capacity rank</th><th>Gas side</th><th>Liquid side</th></tr>
<tr><td>007 to 012 type (15m or less)</td><td>Ø9.5</td><td>Ø6.4</td></tr>
<tr><td>007 to 012 type (15m or more)</td><td>Ø12.7</td><td>Ø6.4</td></tr>
<tr><td>015 to 018 type</td><td>Ø12.7</td><td>Ø6.4</td></tr>
<tr><td>024 to 056 type</td><td>Ø15.9</td><td>Ø9.5</td></tr>
<tr><td>072 type</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>096 type</td><td>Ø22.2</td><td>Ø12.7</td></tr>
</table></td><td></td></tr>
<tr><td>⑥</td><td>Branching section</td><td>Y-shape branching joint
Branching header
T-shape branching joint</td><td>6) Selection of branching section
<table>
<tr><th rowspan="2"></th><th colspan="2">Total capacity code of indoor units</th><th rowspan="2">Model name</th></tr>
<tr><th>Equivalent to capacity</th><th>Equivalent to HP</th></tr>
<tr><td rowspan="4">Y-shape branching joint</td><td colspan="2">Below 18.0</td><td>Below 6.4</td><td>RBM-BY53E</td></tr>
<tr><td rowspan="3">*1</td><td>18.0 to below 40.0</td><td>6.4 to below 14.2</td><td>RBM-BY103E</td></tr>
<tr><td>40.0 to below 70.5</td><td>14.2 to below 25.2</td><td>RBM-BY203E</td></tr>
<tr><td>Above 70.5</td><td>Above 25.2</td><td>RBM-BY303E</td></tr>
<tr><td rowspan="2">Branching header *2</td><td rowspan="2">For 4 branches</td><td>Below 40.0</td><td>Below 14.2</td><td>RBM-HY1043E</td></tr>
<tr><td>40.0 to below 70.5</td><td>14.2 to below 25.2</td><td>RBM-HY2043E</td></tr>
<tr><td rowspan="2">For 8 branches</td><td>Below 40.0</td><td>Below 14.2</td><td>RBM-HY1083E</td></tr>
<tr><td>40.0 to below 70.5</td><td>14.2 to below 25.2</td><td>RBM-HY2083E</td></tr>
<tr><td rowspan="4">T-shape branching joint (For link of outdoor units)</td><td colspan="3">The following 3 types of T-shape branching joint pipes are made to one set. Arrange the required quantities and combine at the local site</td></tr>
<tr><td colspan="2">• Balance pipe (Corresponding dia. Ø9.5) × 1</td><td rowspan="3">RBM-BT13E</td></tr>
<tr><td colspan="2">• Pipe at liquid side (Ø9.5 to Ø22.1) × 1</td></tr>
<tr><td colspan="2">• Pipe at gas side (Ø15.9 to Ø41.3) × 1</td></tr>
</table>
*1: If exceeding the main pipe size, ensure all other pipework is selected in relation to this change.
*2: Up to a total maximum capacity of 6.0 is connectable to one line after the branching header.</td><td></td></tr>
</table>



5-4. Allowable length/height difference of refrigerant piping



NOTE :
In case of connecting method Ex. 2, a large amount of refrigerant and refrigerant oil may return to the head unit. Therefore, set the T-shape joint so that oil does not enter directly.

• System restrictions

Max. No. of combined outdoor units		4 units
Max. capacity of combined outdoor units		48 HP
Max. No. of connected indoor units		48 units
Max. capacity of combined indoor units	$H_2 \leq 15$	135%
	$H_2 > 15$	105%

Note 1) Combination of outdoor units : Header unit (1 unit) + Follower units (0 to 3 units). Header unit is the outdoor unit nearest to the connected indoor units.

Note 2) Install the outdoor units in order of capacity. (Header unit ≥ Follower unit 1 ≥ Follower unit 2 ≥ Follower unit 3)

Note 3) Refer to outdoor unit combination table.

Note 4) Piping to indoor units shall be perpendicular to piping to the header outdoor unit as Ex.1. Do not connect piping to indoor units in the same direction of header outdoor unit as Ex.2.

• Allowable length and height difference of refrigerant piping

			Allowable value	Piping section
Piping length	Total extension of pipe (Liquid pipe, real length)		300 m	LA + LB + La + Lb + Lc + Ld + L1 + L2 + L3 + L4+ L5 + L6 + L7 + a + b + c + d + e + f + g + h + i + j
	Furthest piping length L	Real length	150 m	LA + LB + Ld + L1 + L3 + L4 + L5 + L6 + j
		Equivalent length	175 m	
	Equivalent length of furthest piping from 1st branching Li (∗1)		65 m	L3 + L4 + L5 + L6 + j
	Equivalent length of furthest piping between outdoor units LO (∗1)		25 m	LA + LB + Ld, (LA + Lb, LA + LB + Lc)
	Max. equivalent length of main piping (∗3)		85 m	L1
	Max. equivalent length of outdoor unit connecting piping		10 m	Ld, (La, Lb, Lc)
	Max. real length of indoor unit connecting piping		30 m	a, b, c, d, e, f, g, h, i, j
Height difference	Height between indoor and outdoor units H1	Upper outdoor unit	50 m	——
		Lower outdoor unit	40 m (∗2)	——
	Height between indoor units H2		30 m	——
	Height between outdoor units H3		5 m	——

∗1 (D) is outdoor unit furthest from 1st branch, and (j) is indoor unit furthest from 1st branch.

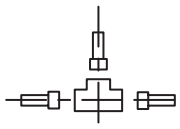
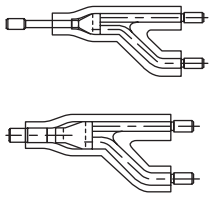
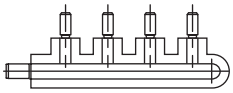
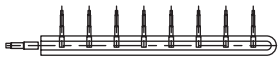
∗2 If height difference of H2 is greater than 3m. Lower outdoor unit H1 must not exceed 30m.

∗3 If the maximum capacity of the combination of outdoor units is 46 HP or more, the maximum equivalent length is restricted up to 70m.

• Brazed couplings and special branches

- Use suitable parts for typical elbow couplings and socket couplings. (Consider the size, material, thickness, etc.)
- Special branches

Use deoxidized parts sold separately.

Branching at outdoor unit side	Branching at indoor unit side		
T-shape branching joint	Branching joint	Branch header	
		4 branching	8 branching
RBM-BT13E	RBM-BY53E RBM-BY103E RBM-BY203E RBM-BY303E	RBM-HY1043E RBM-HY2043E	RBM-HY1083E RBM-HY2083E
			

• Solder

Because only “copper-to-copper” connections are made in the multi type air conditioning system, use the hard solder “phosphor copper solder.”

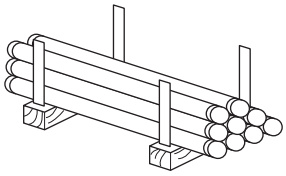
5-5. Careful Handling

Careful handling is the most important step in preventing moisture, dirt, and dust from getting inside of the pipes. Moisture in pipes has caused major problems in numerous instances in the past. Therefore, it is important to be as careful as possible in order to prevent problems before they occur.

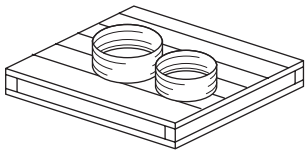
Pipe delivery and storage

When pipes are delivered, care should be taken to prevent them from becoming bent or deformed and the ends of the pipes should be capped in order to prevent dirt, mud, rain, etc. from getting inside. Build a wooden frame to hold the pipes securely and store the pipes in the specified location.

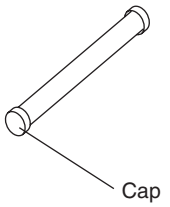
Delivery of copper pipes without caps to a work site is not acceptable.



Frame for careful handling and to prevent rolling



Careful handling on a pallet



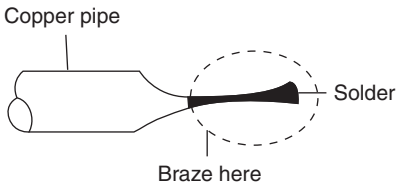
Pipe caps

The ends of all pipes must be sealed. The most reliable method is the “pinch method,” but the taping method can be selected in some circumstances.

Location	Time for installation	Careful handling method
Outdoors	One month or more	Pinch method
	Less than one month	Pinch or taping method
Indoors	Does not matter	Pinch or taping method

■ Pinch method

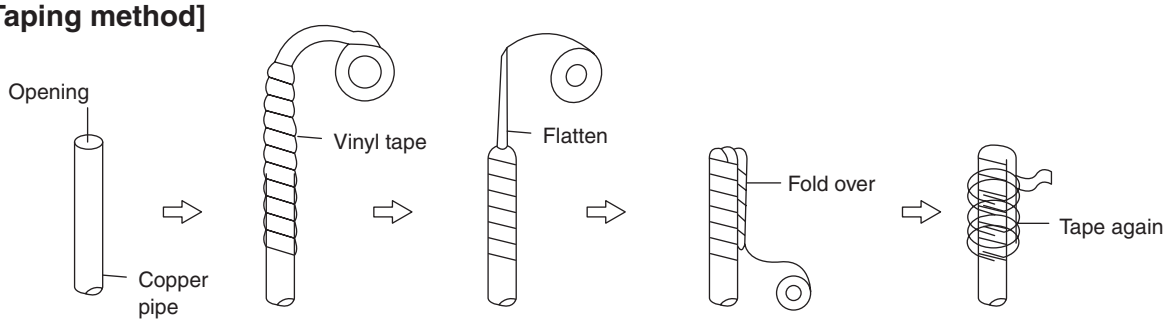
Pinch the end of the copper pipe closed and braze any opening closed.



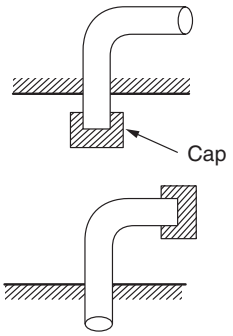
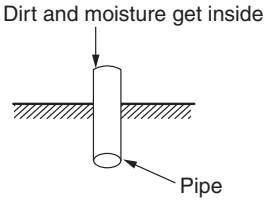
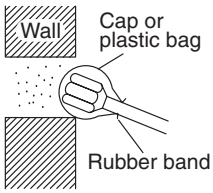
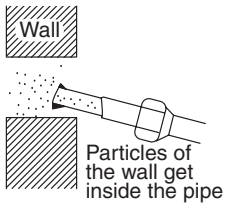
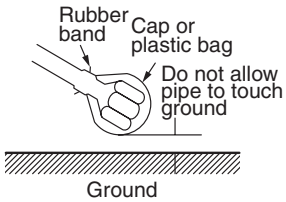
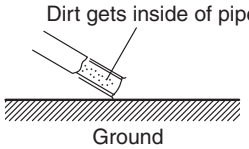
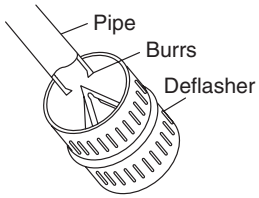
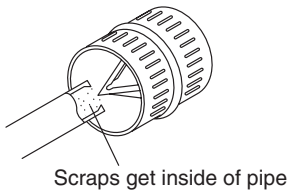
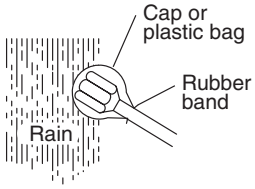
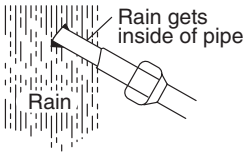
■ Taping method

Cover the end of the copper pipe with vinyl tape.

[Taping method]



CAUTIONS

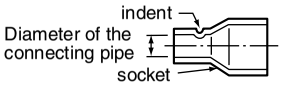
	GOOD	NOT GOOD
1) Do not allow dirt or moisture inside of the pipes. • Keep the open ends of all pipes capped until all pipes have been connected. • Pipe openings should face horizontally or downwards if at all possible.		
2) When passing a pipe through an opening in a wall, always keep the end of the pipe capped.		
3) Do not place pipes directly on the ground. Do not scrape pipes on the ground.		
4) When deflashing (removing burrs) from a pipe, point the opening downwards so that no swarf can fall inside the pipe.		
5) When installing pipes on a rainy day, always keep the ends of the pipes capped.		

5-6. Parts of Branching Header/Joint

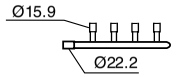
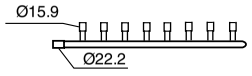
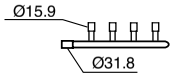
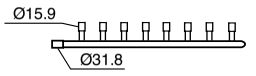
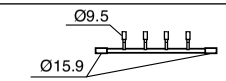
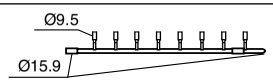
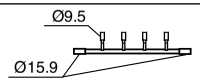
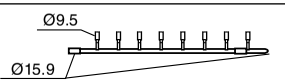
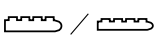
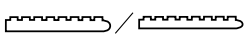
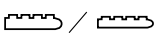
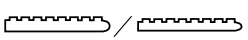
Branching Header : RBM-HY1043E / HY1083E / HY2043E / HY2083E
Branching Joint : RBM-BY53E / BY103E / BY203E / BY303E

- Check the following parts in the package.
- For piping material and size of the refrigerant pipes, refer to the Installation Manual of the Air Conditioner.

NOTE : 1. All dimensions are in millimeters. The following tables shown below indicate both the diameter and the positions of the connecting pipe.
2. Connect pipe to the side with a indent on the socket. (51, 52, 54, 58, 59, 61, 62, 70, 89: without indent)



Branching Header

NAME \ MODEL	RBM-HY1043E	RBM-HY1083E	RBM-HY2043E	RBM-HY2083E
Branching header gas side	 Ø15.9, Ø22.2 — 1pc	 Ø15.9, Ø22.2 — 1pc	 Ø15.9, Ø31.8 — 1pc	 Ø15.9, Ø31.8 — 1pc
Branching header liquid side	 Ø9.5, Ø15.9 — 1pc	 Ø9.5, Ø15.9 — 1pc	 Ø9.5, Ø15.9 — 1pc	 Ø9.5, Ø15.9 — 1pc
Heat insulator (gas side/liquid side)	 — 1pc each	 — 1pc each	 — 1pc each	 — 1pc each

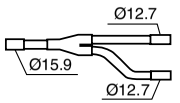
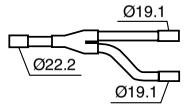
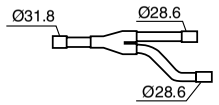
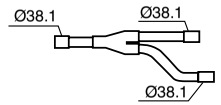
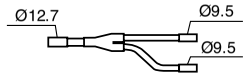
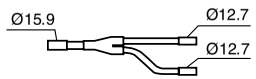
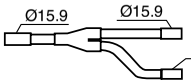
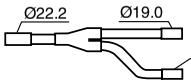
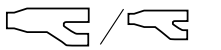
Socket — Gas side (diameter of the connected pipe) / Liquid side (external diameter of socket)

No.	Gas side	No.	Gas side	No.	Gas side	No.	Gas side
14, 18, 70	Ø15.9 x (Ø22.2) 1pc Ø19.1 x (Ø22.2) 1pc Ø28.6 x (Ø22.2) 1pc	06, 09	Ø 9.5 x (Ø15.9) 4pcs Ø12.7 x (Ø15.9) 4pcs	14, 18, 70	Ø15.9 x (Ø22.2) 1pc Ø19.1 x (Ø22.2) 1pc Ø28.6 x (Ø22.2) 1pc	06, 09	Ø 9.5 x (Ø15.9) 8pcs Ø12.7 x (Ø15.9) 8pcs
06, 09	Ø 9.5 x (Ø15.9) 1pc Ø12.7 x (Ø15.9) 1pc	01	Ø 6.4 x (Ø 9.5) 4pcs	06, 09	Ø 9.5 x (Ø15.9) 1ps Ø12.7 x (Ø15.9) 1ps	01	Ø 6.4 x (Ø 9.5) 8pcs

No.	Gas side	No.	Gas side	No.	Gas side	No.	Gas side
27, 59	Ø28.6 x (Ø31.8) 1pc Ø34.9 x (Ø31.8) 1pc	06, 09	Ø 9.5 x (Ø15.9) 2pcs Ø12.7 x (Ø15.9) 2pcs	27, 59	Ø28.6 x (Ø31.8) 1pc Ø34.9 x (Ø31.8) 1pc	06, 09	Ø 9.5 x (Ø15.9) 7pcs Ø12.7 x (Ø15.9) 7pcs
		01	Ø 6.4 x (Ø 9.5) 4pcs			01	Ø 6.4 x (Ø 9.5) 7pcs

Outlet sealed pipe at gas side Header sealed pipe at liquid side		(Ø15.9) 1pc (Ø15.9) 1pc		(Ø15.9) 3pcs (Ø15.9) 1pc		(Ø15.9) 1pc (Ø15.9) 1pc		(Ø15.9) 3pcs (Ø15.9) 1pc
Outlet sealed pipe at liquid side		(Ø 9.5) 1pc		(Ø 9.5) 3pcs		(Ø 9.5) 1pc		(Ø 9.5) 3pcs

Branching Joint

NAME \ MODEL	RBM-BY53E	RBM-BY103E	RBM-BY203E	RBM-BY303E
Branching joint gas side	 Ø12.7, Ø15.9, Ø12.7 — 1pc	 Ø19.1, Ø22.2, Ø19.1 — 1pc	 Ø31.8, Ø28.6, Ø28.6 — 1pc	 Ø38.1, Ø38.1, Ø38.1 — 1pc
Branching joint liquid side	 Ø12.7, Ø9.5, Ø9.5 — 1pc	 Ø15.9, Ø12.7, Ø12.7 — 1pc	 Ø15.9, Ø15.9, Ø15.9 — 1pc	 Ø22.2, Ø19.0, Ø19.0 — 1pc
Heat insulator (gas side/liquid side)	 — 1pc each	 — 1pc each	 — 1pc each	 — 1pc each

Socket — Gas side (diameter of the connected pipe) / Liquid side (external diameter of socket)

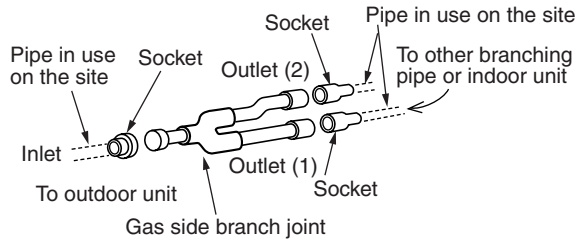
No.	Gas side	No.	Gas side	No.	Gas side	No.	Gas side
09, 51	Ø12.7 x (Ø15.9) 1pc Ø19.1 x (Ø15.9) 1pc	05, 54	Ø 9.5 x (Ø12.7) 2pcs Ø15.9 x (Ø12.7) 2pcs	18, 70	Ø19.1 x (Ø22.2) 1pc Ø28.6 x (Ø22.2) 1pc	07, 10, 13, 52, 89	Ø 9.5 x (Ø19.1) 1pc Ø12.7 x (Ø19.1) 1pc Ø15.9 x (Ø19.1) 2pcs Ø22.2 x (Ø19.1) 2pcs Ø28.6 x (Ø19.1) 1pc
05	Ø 9.5 x (Ø12.7) 1pc	01	Ø 6.4 x (Ø 9.5) 2pcs	06, 09	Ø 9.5 x (Ø15.9) 1pc Ø12.7 x (Ø15.9) 1pc	02, 05, 54	Ø 6.4 x (Ø12.7) 1pc Ø 9.5 x (Ø12.7) 2pcs Ø15.9 x (Ø12.7) 1pc

No.	Gas side	No.	Gas side	No.	Gas side	No.	Gas side
27, 59	Ø28.6 x (Ø31.8) 1pc Ø34.9 x (Ø31.8) 1pc	48, 49, 16, 20, 43, 58	Ø 9.5 x (Ø28.6) 1pc Ø12.7 x (Ø28.6) 1pc Ø15.9 x (Ø28.6) 1pc Ø19.1 x (Ø28.6) 1pc Ø22.2 x (Ø28.6) 2pcs Ø34.9 x (Ø28.6) 1pc			77, 76, 75, 74, 73, 71, 61, 62	Ø 9.5 x (Ø38.1) 1pc Ø12.7 x (Ø38.1) 1pc Ø15.9 x (Ø38.1) 1pc Ø19.1 x (Ø38.1) 1pc Ø22.2 x (Ø38.1) 1pc Ø28.6 x (Ø38.1) 2pcs Ø34.9 x (Ø38.1) 1pc Ø41.3 x (Ø38.1) 1pc
		03, 06, 09	Ø 6.4 x (Ø15.9) 1pc Ø 9.5 x (Ø15.9) 1pc Ø12.7 x (Ø15.9) 2pcs	14, 18	Ø15.9 x (Ø22.2) 1pc Ø19.1 x (Ø22.2) 1pc	04, 07, 10, 13, 52	Ø 6.4 x (Ø19.1) 1pc Ø 9.5 x (Ø19.1) 1pc Ø12.7 x (Ø19.1) 1ps Ø15.9 x (Ø19.1) 2pcs Ø22.2 x (Ø19.1) 1pc

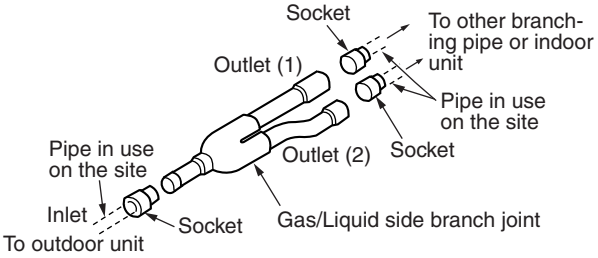
5-7. Branching Kit Connection Method

[1] Branch joint

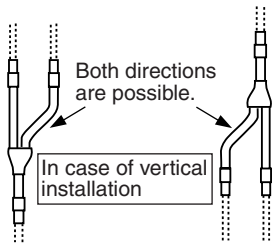
Gas side



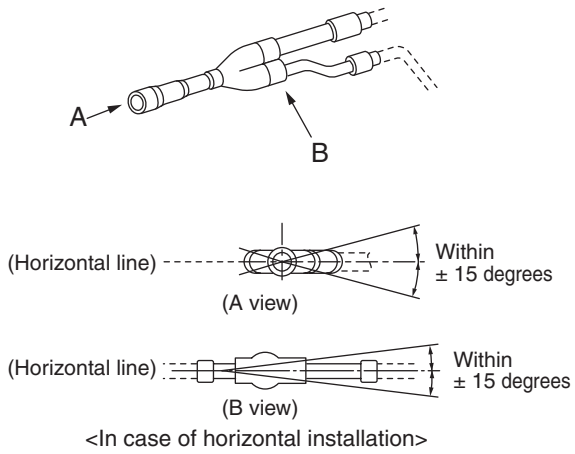
Liquid side



- Installation direction of branch pipe
  Install branching pipes in either a horizontal or vertical position.



Gas/Liquid side



<In case of horizontal installation>

NOTE :

- Install the branch pipes horizontally or vertically so that they are branched evenly.
- Install the branching joint within ±15 degrees.

NOTE :

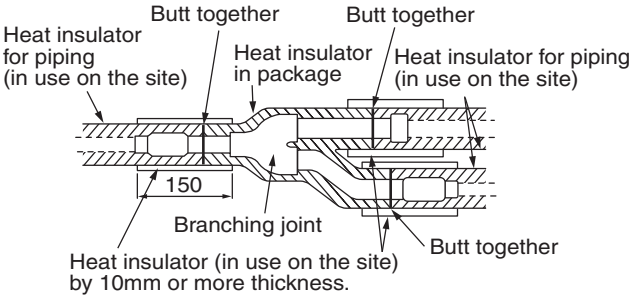
Install the branch pipes horizontally or vertically so that they branch evenly.

Install the branching joint within ± 15 degrees.

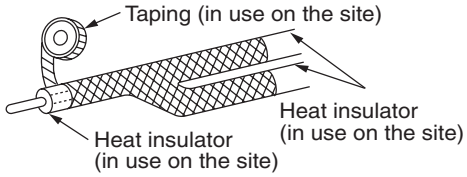
Heat insulating for pipes (Branching Joint)

- In order to prevent dripping at the place where the insulation provided with the branching kit meets the insulating material obtained on the site, butt the two types of insulation up against each other, and then wrap the seam between the two types of insulation in at least 10mm of the insulating material (in use on the site).

Gas/Liquid side



- On the gas-side pipe, use insulation that can withstand heat of 120°C or higher. For the branch pipe, either use a commercially available coupling cover (for T-shape) that is at least 10mm thick, or insulate the pipe as shown in the figure at below.
- After applying insulation as outlined above, tape the insulation in place.

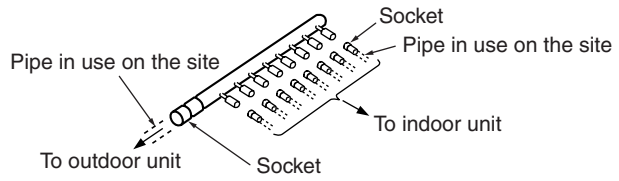


[2] Branch header

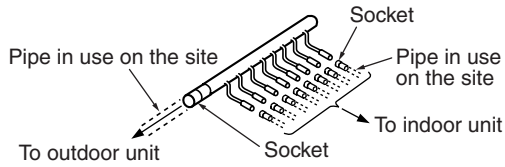
Branching Header

Select and install the socket that matches the diameter of a pipe to be connected to the indoor unit.

Gas-side branch header

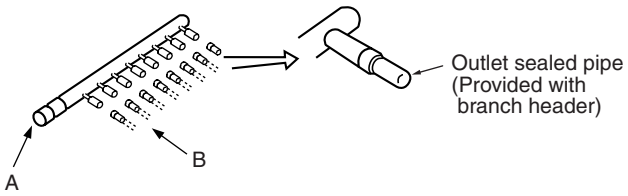


Liquid-side branch header

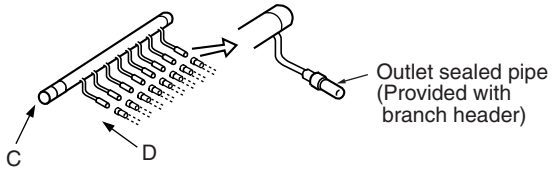


- If the number of indoor units to be connected is fewer than the maximum number of units that can be connected to the branch header, attach a sealed pipe to the unused connectors.

Gas-side branch header

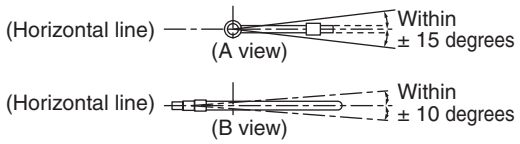


Liquid-side branch header

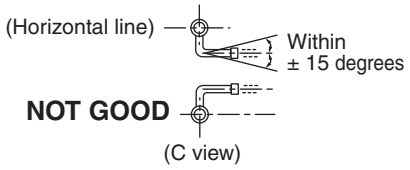


- Install the branch header so that it branches horizontally. It cannot be used in a vertical position.

Gas-side



Liquid-side



When arranging the branching header at the liquid side, attach a header sealed pipe on the sealing side of the header as shown in the figure below below.

Be sure to install the branch pipe downward.

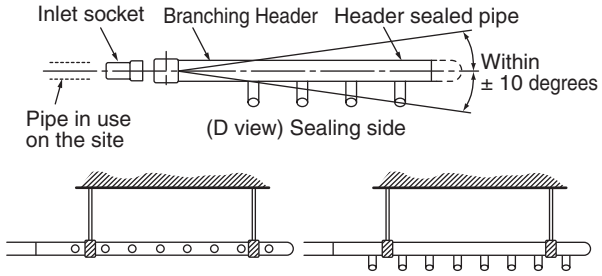
Horizontal viewed from D point should be within ± 10 degrees same as view B.

- Supporting branching header

  After applying the insulation, set the metal hangers as support. (in use on the site).

NOTE :

1. Install the branching header so that it branches horizontally. It cannot be used in a vertical position.
2. Do not use a T-type pipe for the branching section.



CAUTION

1. On the inlet side of a Y-type branch joint or branch header, allow for at least 300mm of straight pipe.
2. A Y-type branch joint can be installed so that it branches either vertically or horizontally; if branching horizontally it should be within an angle of ±15°.
3. A branch header should be installed so that it branches horizontally.
4. Do not use T-type branch joints.

CAUTION

In the multi air conditioning system, because the refrigerant pipes congregate at the rooftop pipeshaft outlet in the vertical position it is necessary to attach “labels” to each pipe in order to make clear to which system a given pipe belongs. This is to prevent pipes from being connected incorrectly.

[3] T-shape branching joint (For connection of outdoor unit)

RBM-BT13FE

Please read "Safety Cautions" described in the Installation Manual of the Air Conditioner.

- Check the following parts in the package.
- For piping material and size of the refrigerant pipes, refer to the Installation Manual of the Air Conditioner.

Parts

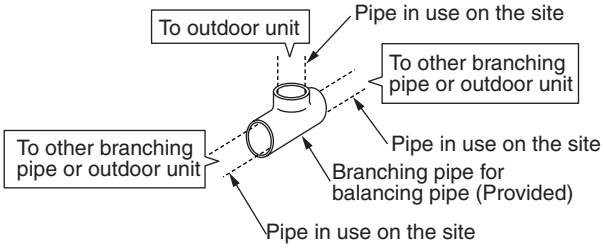
NOTE :

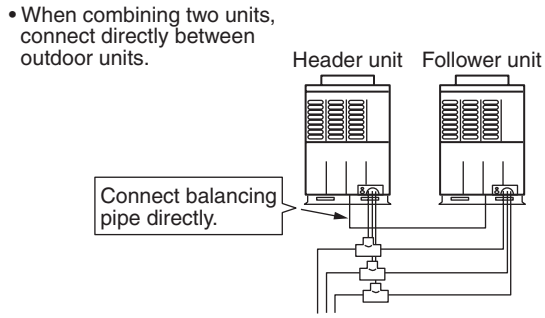
All dimentions are in millimeters.

The following tables shown below indicate both the diameter and the positions of the connecting pipe.

	RBM-BT13E (T-shape branching joint)			
	Branching joint	**Socket**	**No.**	**Diameter**
Suction Gas side	Ø38.1 Ø38.1 Ø38.1 1 pc	Diameter of the connected pipe (external diameter of soket)	(61)	Ø34.9 x (Ø38.1) 1pc
			(71)	Ø28.6 x (Ø38.1) 3pcs
			(73)	Ø22.2 x (Ø38.1) 2pcs
Discharge gas side	Ø28.6 Ø28.6 Ø28.6 1 pc		(20)	Ø19.1 x (Ø28.6) 2pcs
			(43)	Ø22.2 x (Ø28.6) 2pcs
Liquid side	Ø22.2 Ø22.2 Ø22.2 1 pc		(14)	Ø15.9 x (Ø22.2) 1pc
			(18)	Ø19.1 x (Ø22.2) 1pc
			(85)	Ø12.7 x (Ø22.2) 2pcs
For balancing pipe	Ø9.5 Ø9.5 Ø9.5 1 pc	———		———

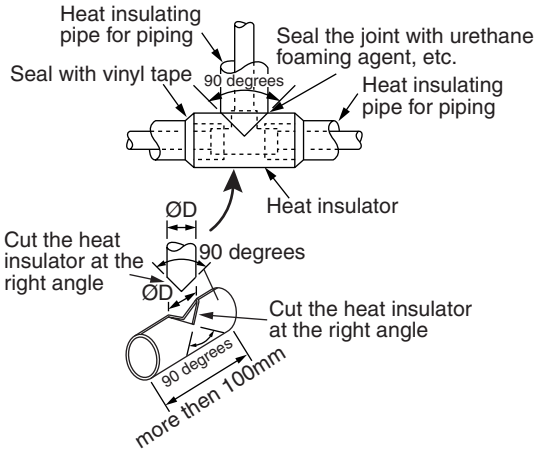
Branching pipe for balancing pipe



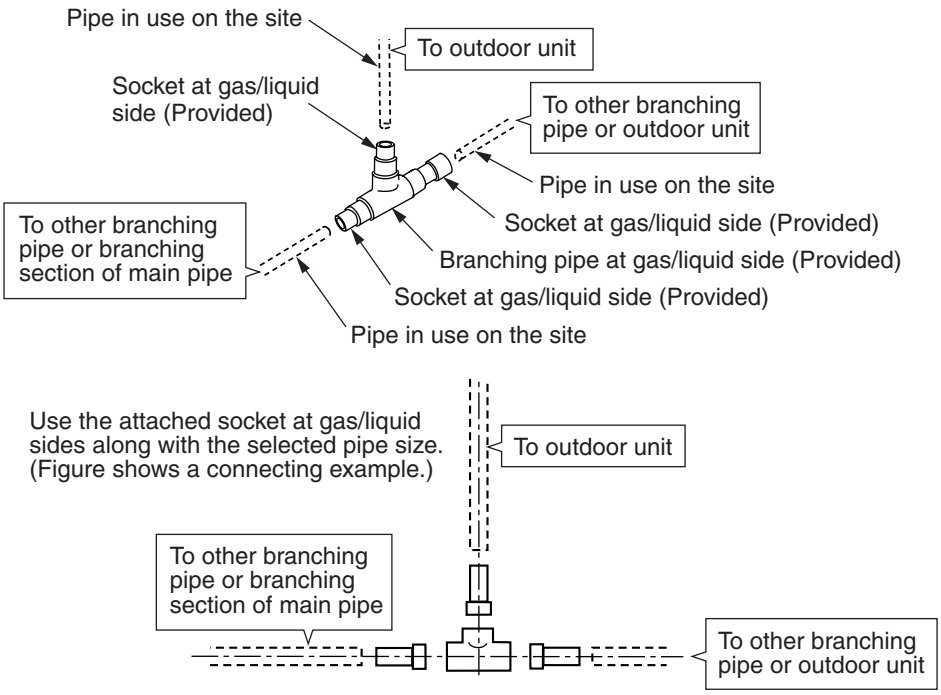


Heat insulating for pipework

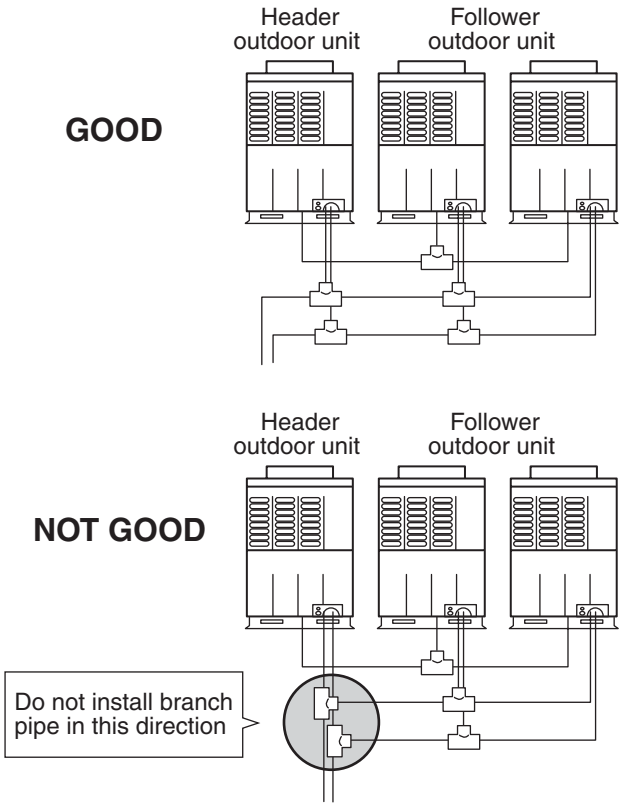
- Be sure to use heat insulation at liquid side, gas side and balancing pipes separately. (Heat insulation for balancing pipe is not provided.)
- Use heat resistant insulation (120°C or more) for all pipes on gas side.
- To insulate the branching pipes, use a joint cover available on the market that is 10mm or more in thickness, or one applied with machining as shown in the figure.
- Seal the branching piping completely without clearance to prevent condensation and falling of water droplets.



Branching pipes at gas side/liquid side

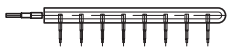


- **Installation of branching pipes to gas/liquid sides.**



5-8. External Dimensions of Branch Connectors

(Outline drawings are shown on the following pages.)

<table>
<tr><th></th><th>Model name</th><th colspan="2">Total capacity codes of indoor unit *1, 2</th><th>External view</th></tr>
<tr><td rowspan="4">*3 Y-shape branching joint</td><td>RBM-BY53E</td><td colspan="2">Below 6.4</td><td rowspan="4">  </td></tr>
<tr><td>RBM-BY103E</td><td colspan="2">6.4 or more and below 14.2</td></tr>
<tr><td>RBM-BY203E</td><td colspan="2">14.2 or more and below 25.2</td></tr>
<tr><td>RBM-BY303E</td><td colspan="2">25.2 or more</td></tr>
<tr><td rowspan="2">*4 4-branching header</td><td>RBM-HY1043E</td><td>Below 14.2</td><td rowspan="2">Max. 4 branching</td><td rowspan="2">  </td></tr>
<tr><td>RBM-HY2043E</td><td>14.2 or more and below 25.2</td></tr>
<tr><td rowspan="2">*4
*5 8-branching header</td><td>RBM-HY1083E</td><td>Below 14.2</td><td rowspan="2">Max. 8 branching</td><td rowspan="2"></td></tr>
<tr><td>RBM-HY2083E</td><td>14.2 or more and below 25.2</td></tr>
<tr><td>T-shape branching joint
(For connecting outdoor unit)</td><td>RBM-BT13E</td><td colspan="3">1 set of 3 types of T-shape joint pipes as described below.
The required quantity is arranged and they are combined at site.
<table>
<tr><th>Connecting pipe</th><th>Corresponding dia</th><th>Q'ty</th></tr>
<tr><td>Balancing pipe</td><td>Ø9.5</td><td>1</td></tr>
<tr><td>Piping at liquid side</td><td>Ø9.5 to Ø22.2</td><td>1</td></tr>
<tr><td>Piping at gas side</td><td>Ø15.9 to Ø41.3</td><td>1</td></tr>
</table></td></tr>
</table>

*1 This code is determined by the capacity rank.

*2 If the total of the capacity codes for the indoor units exceeds the capacity codes of the outdoor units, use the total outdoor capacity code.

*3 When using Y-shape branching joint for 1st branch, select according to capacity code of the outdoor unit.

*4 A maximum total capacity code of 6.0 can be connected to the system downstream of a header branch.

*5 If an outdoor unit with a capacity code of at least 12 but less than 26 is connected on the first branch, use RBM-HY2043E or RBM-HY2083E. Furthermore, an outdoor unit with a capacity code of 26 or higher cannot be used on the first branch.

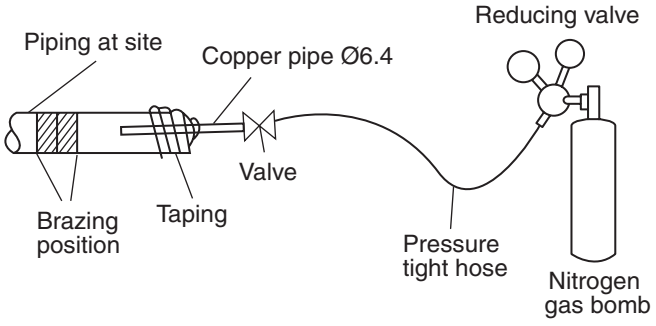
5-9. Nitrogen Gas Blow Method (During Brazing)

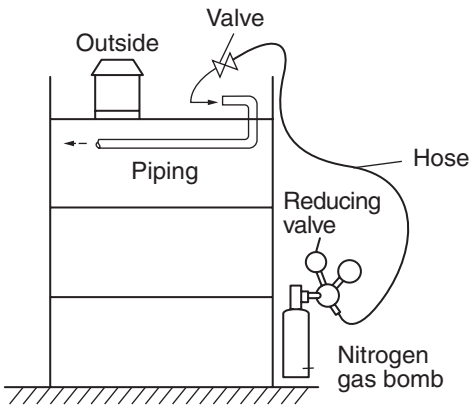
- If nitrogen gas is not passed through the pipes during brazing, a film of oxidized material will form on the inner surfaces of the pipes. The presence of such a film in the system will adversely affect the operation of the valves and compressor in the refrigerant system this will prevent the system from operating normally.
- In order to prevent this from occurring, nitrogen gas is passed through the pipes while brazing is in progress. This process of replacing the air in the pipes with nitrogen is called the "nitrogen gas blow."

  This is the basic method that is used for brazing work.

CAUTION

1. Nitrogen gas must be used. (Oxygen, carbon dioxide, and fluorocarbons cannot be used.)
2. Always be sure to use a pressure-reducing valve.

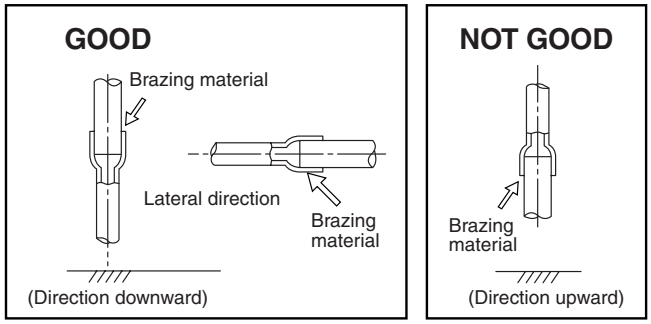




5-10. Brazing Work

1. Brazing work should be performed downwards or sideways. Avoid brazing upwards (in order to avoid incomplete brazing). (Recommendation)
2. Always use the specified piping materials for liquid pipes and gas pipes, and make sure that they are installed in the proper direction and at the proper angle.
3. The "nitrogen gas blow" method should be used when brazing.

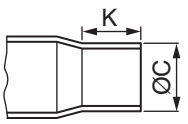
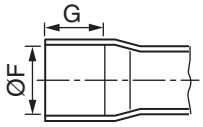
(Recommended brazing)



CAUTIONS

1. Pay attention to fire prevention concerns. (Take preventative measures in the area where brazing work is to be performed, such as keeping a fire extinguisher or water near-by)
2. Be careful not to burn yourself.
3. Make sure that any gaps between pipes and couplings are appropriate. (Ensure all joints are brazed correctly.)
4. Make sure that pipes are adequately supported.
   - The following table provides basic guidelines for the interval between supports for horizontal copper pipe.

Coupling size of brazed pipe

Connected section	
External size	Internal size
	

Spacing between supports for copper pipe

Nominal dia.	20 or less	25 to 40
Max. interval (m)	1.0	1.5

- Avoid securing copper pipes with metal brackets directly.

(Unit: mm)

Standard outer dia. of connected copper pipe	Connected section				Oval value	Min. thickness of coupling
	External size	Internal size	Min. depth of insertion			
	Standard outer dia. (Allowable difference)					
	C	F	K	G		
6.35	6.35 (±0.03)	6.45 $(^{+0.04}_{-0.02})$	7	6	0.06 or less	0.50
9.52	9.52 (±0.03)	9.62 $(^{+0.04}_{-0.02})$	8	7	0.08 or less	0.60
12.70	12.70 (±0.03)	12.81 $(^{+0.04}_{-0.02})$	9	8	0.10 or less	0.70
15.88	15.88 (±0.03)	16.00 $(^{+0.04}_{-0.02})$	9	8	0.13 or less	0.80
19.05	19.05 (±0.03)	19.19 $(^{+0.03}_{-0.03})$	11	10	0.15 or less	0.80
22.22	22.22 (±0.03)	22.36 $(^{+0.03}_{-0.03})$	11	10	0.16 or less	0.82
28.58	28.58 (±0.04)	28.75 $(^{+0.06}_{-0.02})$	13	12	0.20 or less	1.00
34.92	34.90 (±0.04)	35.11 $(^{+0.04}_{-0.04})$	14	13	0.25 or less	1.2
38.10	38.10 (±0.05)	38.31 $(^{+0.08}_{-0.02})$	15	14	0.27 or less	1.26
41.28	41.28 (±0.05)	41.50 $(^{+0.08}_{-0.02})$	15	14	0.28 or less	1.35

* Gas brazing of refrigerant pipes must be performed by personnel qualified to do so under local ordinances.

Minimum wall thickness for R410A application

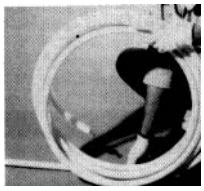
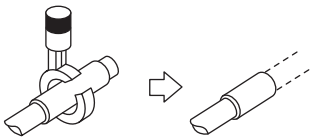
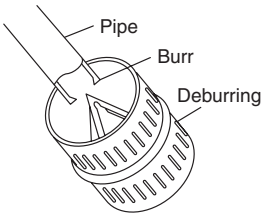
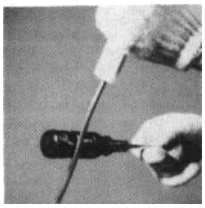
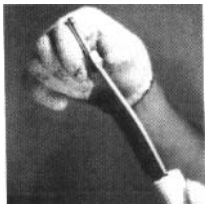
Soft (Coil)	Hard or Half hard	OD (Inch)	OD (mm)	Minium wall thickness
○	○	1/4	6.35	0.80
○	○	3/8	9.52	0.80
○	○	1/2	12.70	0.80
○	○	5/8	15.88	1.00
NG	○	3/4	19.05	1.00
NG	○	7/8	22.20	1.00
NG	○	1.1/8	28.58	1.00
NG	○	1.3/8	34.92	1.10
NG	○	1.5/8	41.28	1.25

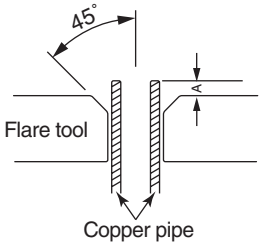
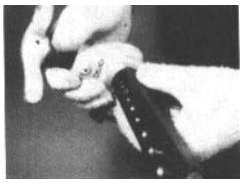
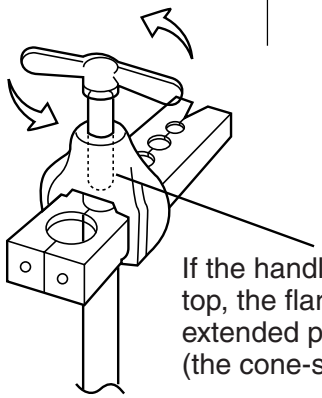
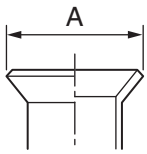
5-11. Flare Processing

Flare processing procedure

Parts and material : Copper pipe and flare nut (Supplied).

Tools : Flare tool (“Rigid” type), reamer and pipe cutter

Work procedure	Key point	(Reason)
Straighten the coiled copper pipe. 	Uncoil the pipe.	• It is difficult to cut the coiled pipe correctly, which increases the chance of failure.
Cut the pipe with the pipe cutter. 	1. Position the blade of the cutter so that it will cut the pipe at a perpendicular angle. 2. Rotate the pipe cutter to the left to cut the pipe. 3. Move the pipe cutter slowly.	• The cut surface will be at an angle. • The cutter will pinch too tight. • The copper pipe will be deformed.
Use the reamer to remove burrs from the cut surface of the pipe. 	1 . Keep the opening of the pipe facing downwards. 2. Be careful not to scratch the inner surface of the pipe.	• Swarf will get inside of the pipe. • A gas leak could occur.
Clear out the inside of the pipe by tapping on the end with a screwdriver. 	Make sure that all swarf is out of the tube by lightly tapping on the tube while the opening is pointing down.	• Metal swarf in the tube can damage the compressor. • If the swarf adheres to the flared region, a gas leak may occur.
Insert the flare nut. 	Be certain to insert the flare nut before beginning the flare process.	• The flare nut will not fit inside the copper pipe after the flare process.

Work procedure	Key point	(Reason)
Attach the ("Rigid") flare tool to the copper pipe. 	1. Make sure that the inner surfaces of the flare tool are clean. 2. Determine the dimensions of the copper pipe in accordance with the flare tool. 	• The copper pipe will slip out while the flaring process is in progress. • The flared dimensions vary. • **Projection margin for flaring : A (Unit : mm)** **Rigid (Clutch type)** **Outer dia. of copper pipe** / **R410A tool used** (R410A, R22) / **Conventional tool used** (R410A, R22) 6.4: 0 to 0.5 / (Same as left) / 1.0 to 1.5 / 0.5 to 1.0 9.5: 0 to 0.5 / (Same as left) / 1.0 to 1.5 / 0.5 to 1.0 12.7: 0 to 0.5 / (Same as left) / 1.0 to 1.5 / 0.5 to 1.0 15.9: 0 to 0.5 / (Same as left) / 1.0 to 1.5 / 0.5 to 1.0 **Imperial (Wing nut type)** **Outer dia. of copper pipe** / **R410A** / R22 6.4: 1.5 to 2.0 / 1.0 to 1.5 9.5: 1.5 to 2.0 / 1.0 to 1.5 12.7: 2.0 to 2.5 / 1.5 to 2.0 15.9: 2.0 to 2.5 / 1.5 to 2.0
Align the punch. (Align the arrow with the line adjacent to the next hole.) 	Align the arrow on the punch with the prescribed position on the flare tool.	• If the "A" dimension is small, the flared contact surface is smaller and a gas leak becomes more likely.
Flare the pipe. 	Slowly and carefully turn the flare tool handle while it clicks, until it turns freely. Turn the handle to the left and raise it to the top.  If the handle is not raised to the top, the flare tool will scratch the extended portion of the pipe (the cone-shaped portion).	• The pipe will not be flared fully. • The extended portion of the pipe (the cone-shaped portion) will be scratched. • **Extruding margin of copper pipe with flare machining : A (Unit: mm)** **Copper pipe outer dia.** / **A** $^{+0}_{-0.4}$ 9.5: 13.2 12.7: 16.6 15.9: 19.7 
Remove the flare tool and check the flared surface. 		**Check list :** • Is the inner surface of the flared portion equal in width and shiny? • Is the thickness of the flared portion equal? • Is the flared portion of a suitable size?

5-12. Flushing

The flushing process uses gas pressure to remove foreign matter from the inside of pipes.

Three major effects

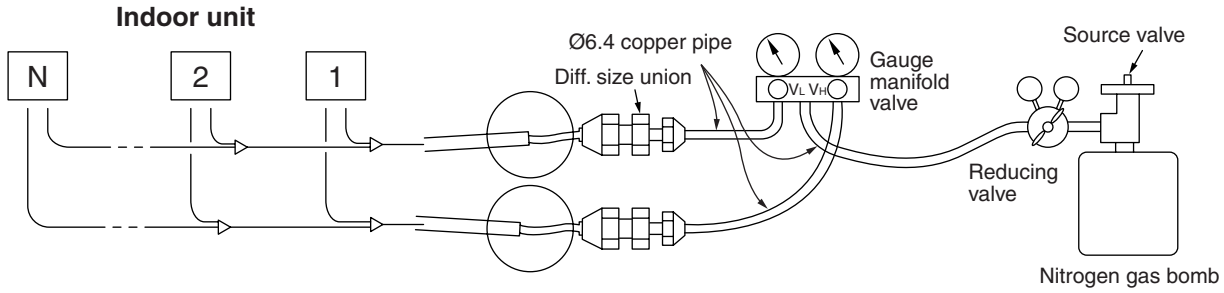
(1) Removes oxidation that is formed on the inside of the pipe during brazing, as a result of an inadequate "nitrogen gas blow" procedure.

(2) Removes foreign matter and moisture that has got inside of the pipes due to improper handling.

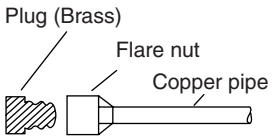
(3) Check the connections in the pipe system between the indoor units and the outdoor units.

[Example work procedure]

1. Install a pressure reducing valve on the nitrogen cylinder. (Fluorocarbon gases and carbon dioxide carry a risk of increasing the likelihood of condensation, while oxygen may causes an explosion.)
2. Connect the pressure reducing valve to a gauge manifold and then connect to the gas-side pipe and the liquid-side pipe on the outdoor unit.



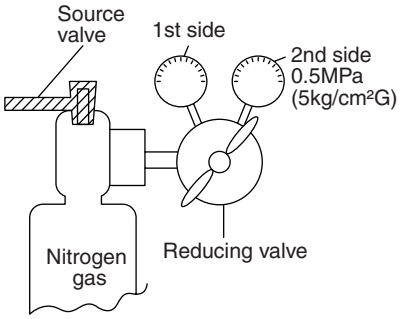
3. On the indoor unit side, plug all gas-side pipes except those for the indoor units that are to be flushed.



4. Open the source valve on the nitrogen cylinder and increase the pressure on the secondary side of the pressure reducing valve until it reaches 0.5MPa (5kg/cm²G) and then open the valve on the gauge manifold connected to the gas-side pipe.

5. Flushing

   Press down on the end of the indoor-side gas pipe with your palm.

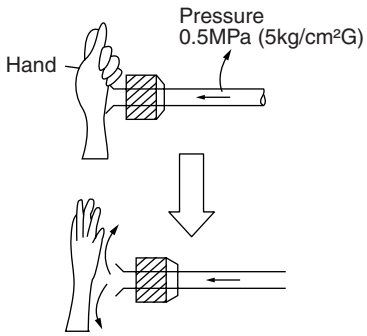


   ⬇

   When the pressure becomes so great that you can no longer hold it against the end of the pipe, remove your hand from the pipe. (This is the first flush.) Repeat this process again.

   ⬇

   Flush the pipe a second time.
   (When flushing, place a piece of gauze, etc. on the end of the pipe and then check the gauze for debris or moisture. Repeat the flushing process until nothing more comes out of the pipe.)



6. Close the gauge manifold valve and repeat the above process for next indoor unit (No. 2 to No. n). Close the gauge manifold valve and open the valve on the gauge manifold that is connected to the liquid-side pipe to allow the nitrogen to flow and flush the liquid-side pipe.

5-13. Pipe Connections to the Indoor Unit

1. Once you remove the flare nut from the pipe on the indoor unit (always use a torque wrench), a small amount of gas will escape, but this is simply nitrogen gas with atmospheric pressure that was sealed inside to prevent corrosion and does not indicate a problem.

2. Flare the pipe according to the procedure described previously.

3. Centering

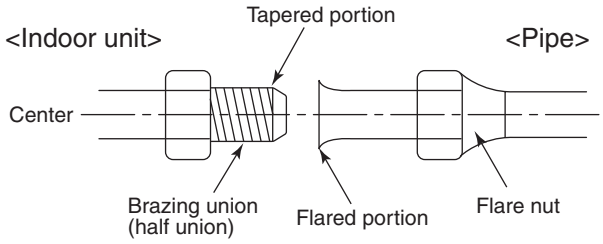
   Position the pipe so that the flared portion of the pipe is sealed centrally on the tapered portion of possible and then use a torque wrench to tighten.

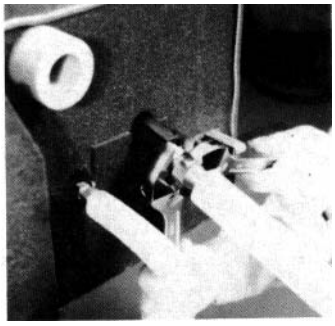
4. Tightening the flare nut

   First hand-tighten the flare nut as much as possible and then use a torque wrench to tighten.

Connecting pipe outer dia. (mm)	Tightening torque (N•m)
Ø6.4	14 to 18 (1.4 to 1.8 kgf•m)
Ø9.5	34 to 42 (3.4 to 4.2 kgf•m)
Ø12.7*	50 to 62 (5.0 to 6.2 kgf•m)
Ø15.9*	68 to 82 (6.8 to 8.2 kgf•m)

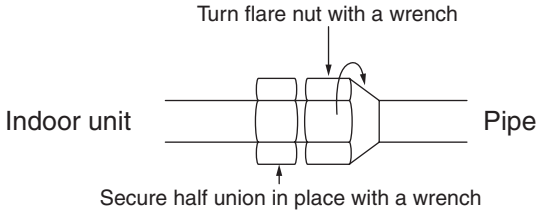
* R410A torque wrench required.





Tightening the flare nut with a torque wrench

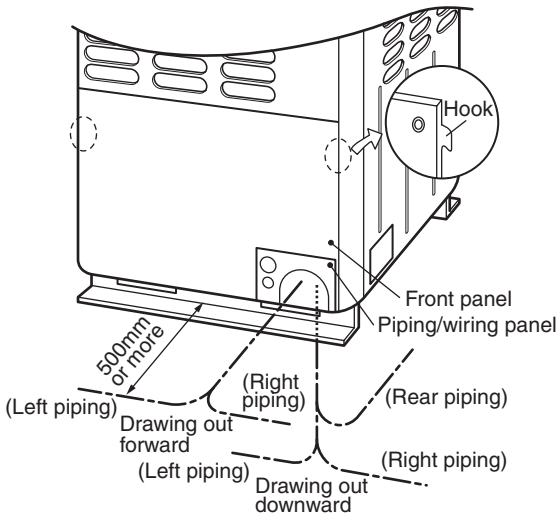
Using two spanners



* Avoid initially tightening the nut with a wrench.
* When tightening a 6.4mm-diameter pipe, tighten the nut lightly with a wrench, and then tighten the nut about 90° to 120° (1.5 to 2 corners of the nut) with a torque wrench.

5-14. Pipe Connection to the Outdoor Unit

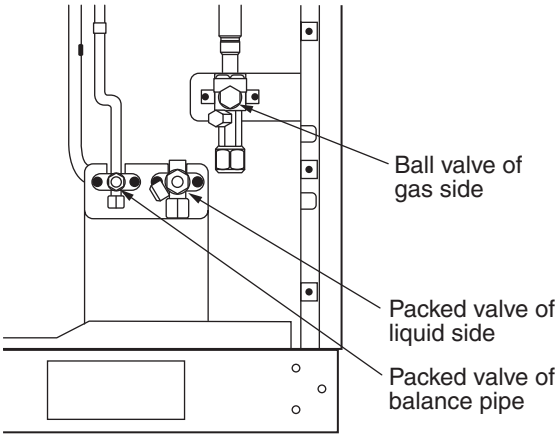
1. The refrigerant pipe connection is inside of the outdoor unit. Remove the front panel and the pipe/wiring panel. (Nine M5 screws)
   - There is one hook on the left and right sides of the front panel. Lift the front panel to release these hooks.
2. The pipe can exit the outdoor unit from the front or from the bottom.
3. When exiting the pipe from the front of the unit, route the pipe out of the unit through the pipe/wiring panel. In order to facilitate servicing of the unit in the future, maintain a clearance of at least 500mm between this pipe and the main pipe connecting the outdoor unit to the indoor unit. (If it should ever be necessary to replace the compressor, at least 500mm of space will be needed.)
4. When exiting the pipe out the bottom of the unit, remove the knockout in the bottom panel of the outdoor unit and route the pipe out of the unit through this opening. Route the pipe to the left, right or rear. Route the pipe no more than 4m below the balance pipe.
5. Use the pipe provided for the gas-side pipe connection. Remove the L-shaped pipe that is connected to the gas-side valve and then connect the gas-side pipe. When routing the pipe out of the front of the unit, cut the pipe to length in accordance with the position of the pipe panel and then direct it forwards with the elbow piece.



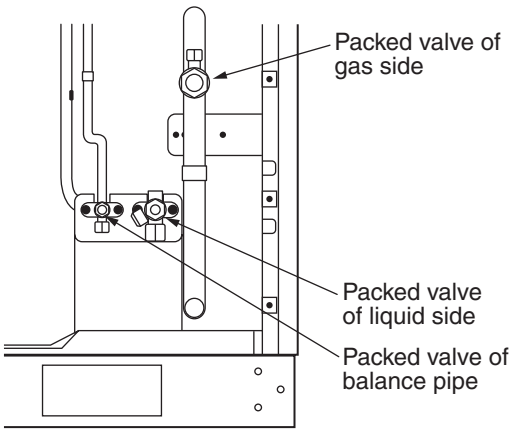
REQUIREMENTS

1. In order to prevent oxidation inside of the pipe, always pass nitrogen through the pipe during brazing.
2. Use clean, new pipes for the refrigerant pipes. Handle the pipes carefully to keep moisture and dirt from getting inside of the pipes.
3. Always use a torque wrench to loosen and tighten flare nuts. It is not possible to tighten the nut adequately with a single wrench. Tighten the nut with the torque indicated in the table below.

Connecting pipe outer dia. (mm)	Tightening torque (N•m)
Ø6.4	14 to 18 (1.4 to 1.8 kgf•m)
Ø9.5	34 to 42 (3.4 to 4.2 kgf•m)
Ø12.7	50 to 62 (5.0 to 6.2 kgf•m)
Ø15.9	68 to 82 (6.8 to 8.2kgf•m)

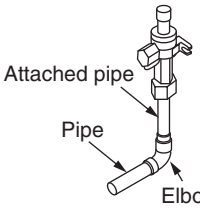
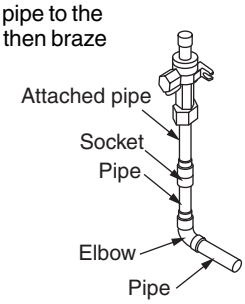
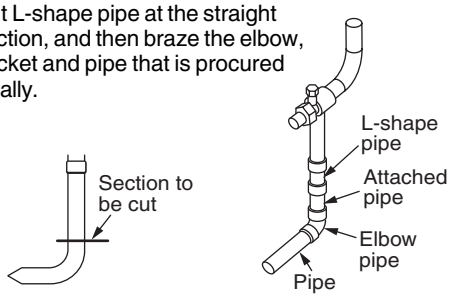
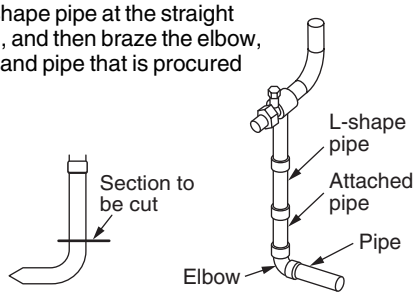
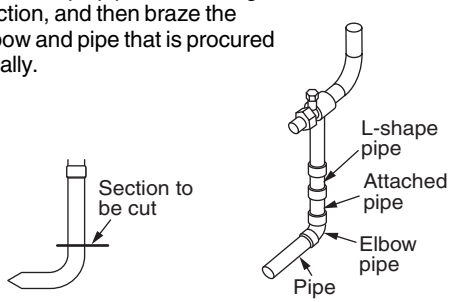
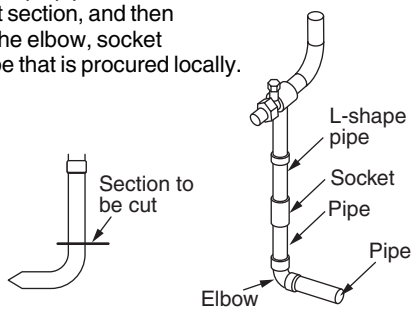


(MMY-MAP0501*, MAP0601*)



(MMY-MAP0801*, MAP1001*, MAP1201*)

Pipe connecting method of valve at gas side (Example)

MMY-	Pipe diameter	Draw-out forward	Draw-out downward
MAP0501∗	Ø15.9	Connect Ø15.9 pipe with flaring.	Connect Ø15.9 pipe with flaring.
MAP0601∗	Ø19.1	Connect the attached pipe to the valve with flaring, and then braze the elbow and pipe that is procured locally. 	Connect the attached pipe to the valve with flaring, and then braze the socket, elbow and pipe that is procured locally. 
MAP0801∗ **MAP1001∗**	Ø22.2	Cut L-shape pipe at the straight section, and then braze the elbow, socket and pipe that is procured locally. 	Cut L-shape pipe at the straight section, and then braze the elbow, socket and pipe that is procured locally. 
MAP1201∗	Ø28.6	Cut L-shape pipe at the straight section, and then braze the elbow and pipe that is procured locally. 	Cut L-shape pipe at the straight section, and then braze the elbow, socket and pipe that is procured locally. 

5-15. Leak Test

A leak test must be performed when connecting pipes to the refrigerant pipes in use at a site.

[1] Leak test pressure

For Super MMS air conditioner systems: 3.73MPa (38kg/cm²G)

[2] Test method

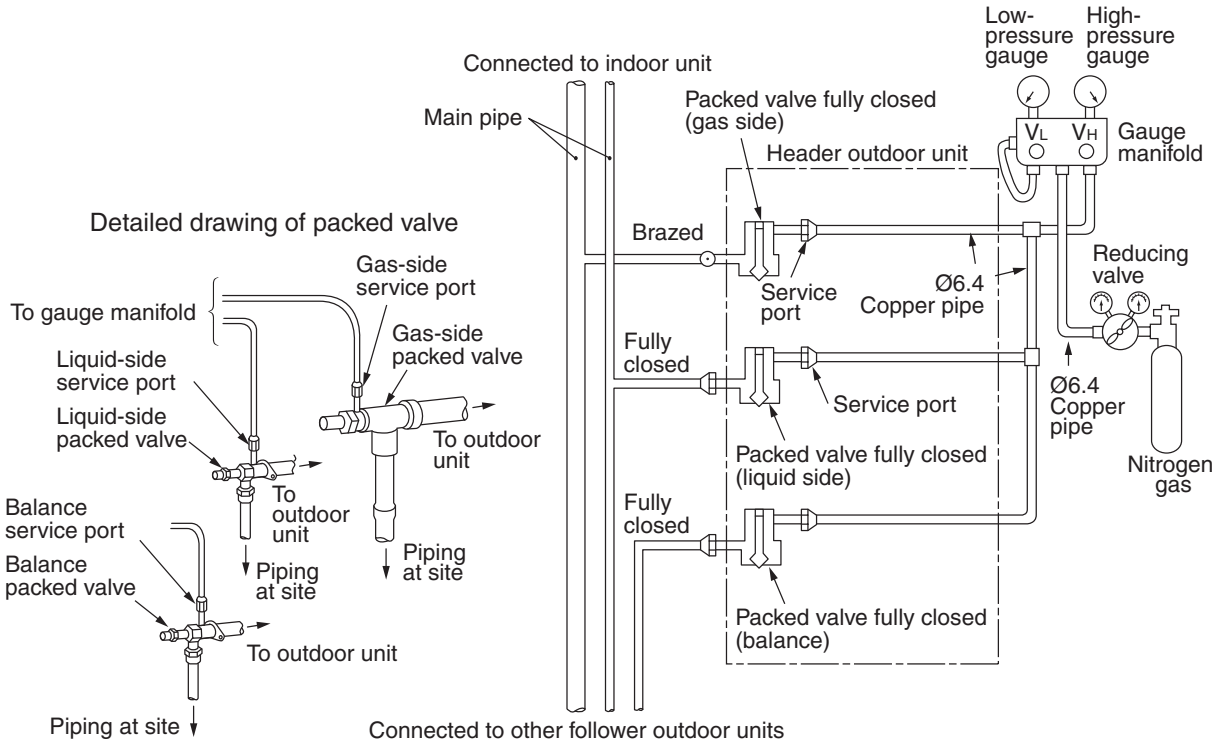
After the refrigerant piping has finished, execute an airtight test. For an airtight test, connect a nitrogen gas charge as shown in the figure below, and apply pressure.

- Be sure to apply pressure from the service ports of the packed valves (or ball valves) at liquid side, gas side, and balance pipe side.
- An airtight test can only be performed on the service ports at liquid side, gas side and balance side of the header unit.
- Close valves fully at liquid side, gas side, and balance side. As there is possibility that nitrogen gas may enter into the refrigerant cycle, re-tighten the valve keys before applying pressure. (Re-tightening of the valve keys is unnecessary for valves on the gas side of the MMY-MAP0501* and MAP0601* as they use ball valves.)
- For each refrigerant line, apply pressure gradually in steps on the liquid side, gas side and balance side.

Be sure to apply pressure to liquid side, gas side and balance side.

REQUIREMENT

Never use “Oxygen”, “Flammable gas” or “Noxious gas” in an airtight test.



STEP 1 : Apply pressure 0.3MPa (3.0kg/cm²G) for 3 minutes or more.
STEP 2 : Apply pressure 1.5MPa (15kg/cm²G) for 3 minutes or more. } To detect a gross leakage

STEP 3 : Apply pressure 3.73MPa (38kg/cm²G) for approx. 24 hours. To detect slow leakage

- Check pressure down.

  No pressure down: Accepted Pressure down: Check the leaked position.

  (However, if there is a difference between the ambient temp, when pressure has been applied and when 24 hours has passed, pressure changes by approx. 0.01MPa (0.1kg/cm²G) per 1°C. Correct the pressure.)

Leaked position check

When a change in pressure is detected in STEP 1, STEP 2 or STEP 3, check for leakage at the connecting points. This can be done with hearing sense, feeler, foaming agent, etc. Perform re-brazing or re-tightening of flare a if leakage is detected.

NOTES

If piping is long, an airtight test is performed for each divided section.

1) Indoor side + vertical pipe
2) Indoor side + vertical pipe + outdoor side

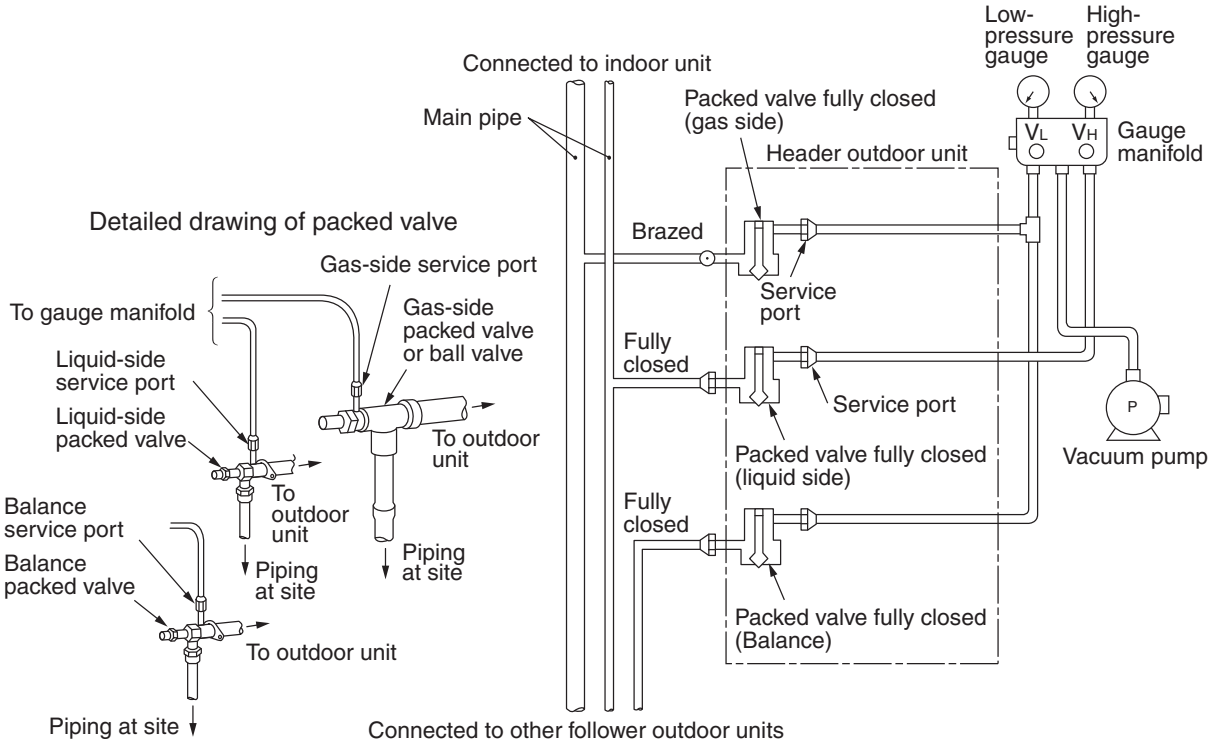
[3] Air purge

For the air purge at installation time (Discharge of air in connecting pipes), use "**Vacuum pump method**" from viewpoint of the protection of the earths environment.

- For protection of the earths environment, do not discharge the refrigerant gas in the air.
- Using a vacuum pump, eliminate the remaining air (nitrogen gas, etc.) in the unit. If gas remains, performance and reliability of the unit maybe reduced.

After the airtight test, discharge the nitrogen gas. Then connect the gauge manifold to the service ports at liquid, gas and balance sides. Connect the vacuum pump as shown in the following figure. Perform vacuuming for liquid, gas and balance sides.

- Be sure to perform vacuuming from both liquid and gas sides.
- Use a vacuum pump with counter-flow preventive function so that oil in the pump does not back up in the pipe of the air conditioner when the pump stopped. (If oil in the vacuum pump enters in to the air conditioner with R410A refrigerant, an error may occur within the refrigeration cycle.)



- Use a vacuum pump has a high vacuum (below -755mmHg) and a large exhaust gas amount (over 40L/minute).
- Perform vacuuming for 2 or 3 hours though time differs due to pipe length. In this time, check all packed valves at liquid gas, and balance sides are fully closed.
- If vacuuming valve amount is not decreased to below -755mmHg even after vacuuming for 2 hours or more, continue vacuuming for 1 hour or more. If -755mmHg or less cannot be obtained by 3 hours or more vacuuming, Detect and repair the leak.
- When the vacuuming valve has reached -755mmHg or less after vacuuming for 2 hours or more, close valves VL and VH on the gauge manifold fully. Stop the vacuum pump, leave it as it is for 1 hour and then check the vacuum does not change. If it does change, there may be a leak within the system.
- After the above procedure for vacuuming has finished, exchange the vacuum pump with a refrigerant cylinder and advance to the additional charging of refrigerant.

5-16. Charging the System with Additional Refrigerant

After the system has been vacuumed, replace the vacuum pump with a refrigerant cylinder and charge the system with additional refrigerant.

Calculating of additional refrigerant charge amount

HFC
R410A

Refrigerant in the system when shipped from the factory

		5HP	6HP	8HP	10HP	12HP
Refrigerant amount charged in factory	Heat pump model	8.5kg	8.5kg	12.5kg	12.5kg	12.5kg
	Cooling only model	8.0kg	8.0kg	11.0kg	11.0kg	11.0kg

When the system is charged with refrigerant at the factory, the amount of refrigerant needed for the pipes at the site is not included. Calculate the additional amount required, and add that amount to the system.

(Calculation)

Additional refrigerant charge amount is calculated from the size of the liquid pipe at site and its real length.

Additional refrigerant charge amount at site =
Real length of liquid pipe × Additional refrigerant charge amount per liquid pipe 1m **(Table 1)** + compensation by system HP **(Table 2)**

Example : Additional charge amount R (kg) = (L1 x 0.025kg/m) + (L2 x 0.055kg/m) + (L3 x 0.105kg/m) + (3.0kg)
L1 : Real total length of liquid pipe Ø6.4 (m)
L2 : Real total length of liquid pipe Ø9.5 (m)
L3 : Real total length of liquid pipe Ø12.7 (m)
System : 20HP

Table 1

Pipe dia. at liquid side	Ø6.4	Ø9.5	Ø12.7	Ø15.9	Ø19.0	Ø22.2
Additional refrigerant amount/1m	0.025kg	0.055kg	0.105kg	0.160kg	0.250kg	0.350kg

Table 2

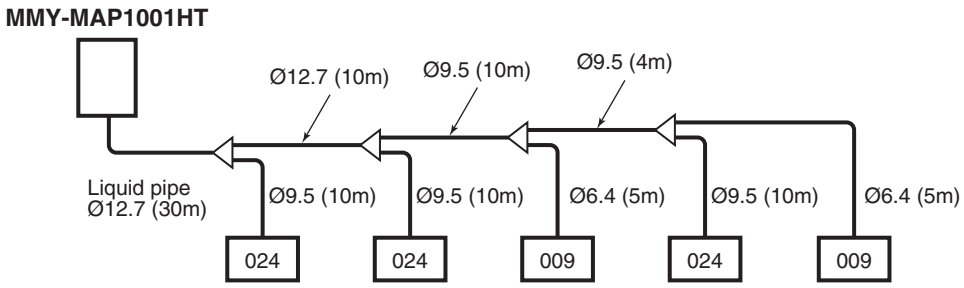
Combined horse power (HP)	**Outdoor combination (HP)**				**C (Compensation) (kg)**
5	5				0.0
6	6				0.0
8	8				1.5
10	10				2.5
12	12				3.5
14	8	6			0.0
16	8	8			0.0
18	10	8			0.0
20	10	10			3.0
22	12	10			5.0
	8	8	6		0.0
24	12	12			7.0
	8	8	8		–4.0
26	10	8	8		–4.0

Combined horse power (HP)	**Outdoor combination (HP)**				**C (Compensation) (kg)**
28	10	10	8		–2.0
30	10	10	10		0.0
32	12	10	10		1.0
	8	8	8	8	–6.0
34	12	12	10		3.0
	10	8	8	8	–6.0
36	12	12	12		4.0
	10	10	8	8	–6.0
38	10	10	10	8	–6.0
40	10	10	10	10	–5.0
42	12	10	10	10	–4.0
44	12	12	10	10	–2.0
46	12	12	12	10	0.0
48	12	12	12	12	2.0

Refrigerant charging

- Keeping the valve of the outdoor unit closed, be sure to charge liquid refrigerant from service port at liquid side.
- If the specified amount of refrigerant cannot be charged, open the valves fully on the outdoor unit at liquid, gas, and balance sides. Perform the cooling operation under such a condition that the valve on the gas side returns to the closed position. (MAP0801∗, MAP1001∗, MAP1201∗ only). Then charge the refrigerant into the service port on the gas side. In this time, restrict the flow of the refrigerant by adjusting the operating valve on the refrigerant charge cylinder. The liquid refrigerant may enter the unit suddenly, therefore ensure to charge the refrigerant gradually.
- If a refrigerant leak occurs there will be a short fall of refrigerant within the system. If this occurs recover the refrigerant and re-charge to the correct level.

Example of calculation



Liquid pipe :

Ø6.4 = 5 + 5 = 10m

Ø9.5 = 10 + 10 + 10 + 10 + 4 = 44m

Ø12.7 = 30 + 10 = 40m

R = (10m x 0.025kg/m) + (44m x 0.055kg/m) + (40m x 0.105kg/m) + 2.5 = 9.37kg

REQUIREMENT

Entry of refrigerant charge amount

- Complete the refrigerant record column found on the wiring diagram, with detail of the additional refrigerant amount and name of service engineer at the time of installation.
- **Note:** The total amount of refrigerant refers to the shipment charge plus any additional refrigerant at the time of installation. The refrigerant amount at shipment is indicated on the unit name plate.

Chart of additional refrigerant charging amount

(Unit: kg)

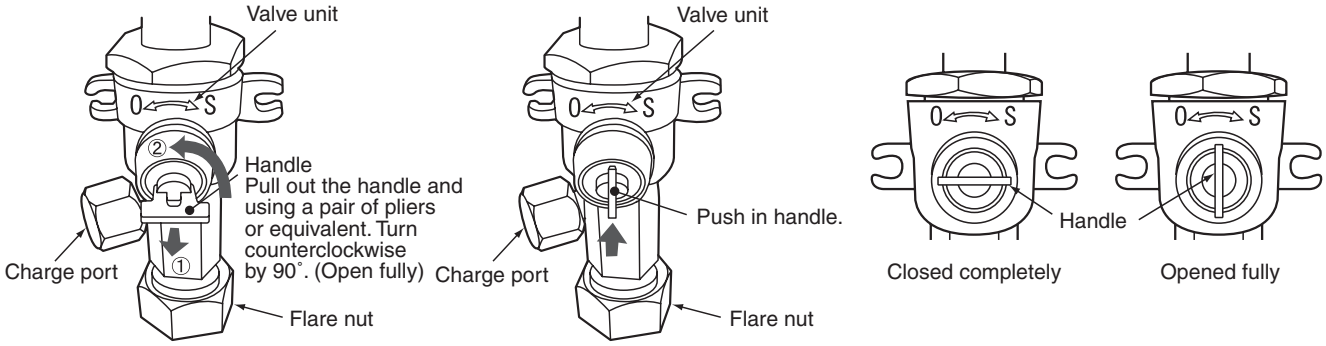
Actual piping length (m)	Pipe size (Liquid pipe)					
	Ø6.4	Ø9.5	Ø12.7	Ø15.9	Ø19.1	Ø22.2
1	0.025	0.055	0.105	0.160	0.250	0.350
2	0.050	0.110	0.210	0.320	0.500	0.700
3	0.075	0.165	0.315	0.480	0.750	1.050
4	0.100	0.220	0.420	0.640	1.000	1.400
5	0.125	0.275	0.525	0.800	1.250	1.750
6	0.150	0.330	0.630	0.960	1.500	2.100
7	0.175	0.385	0.735	1.120	1.750	2.450
8	0.200	0.440	0.840	1.280	2.000	2.800
9	0.225	0.495	0.945	1.440	2.250	3.150
10	0.250	0.550	1.050	1.600	2.500	3.500
11	0.275	0.605	1.155	1.760	2.750	3.850
12	0.300	0.660	1.260	1.920	3.000	4.200
13	0.325	0.715	1.365	2.080	3.250	4.550
14	0.350	0.770	1.470	2.240	3.500	4.900
15	0.375	0.825	1.575	2.400	3.750	5.250
16	0.400	0.880	1.680	2.560	4.000	5.600
17	0.425	0.935	1.785	2.720	4.250	5.950
18	0.450	0.990	1.890	2.880	4.500	6.300
19	0.475	1.045	1.995	3.040	4.750	6.650
20	0.500	1.100	2.100	3.200	5.000	7.000
21	0.525	1.155	2.205	3.360	5.250	7.350
22	0.550	1.210	2.310	3.520	5.500	7.700
23	0.575	1.265	2.415	3.680	5.750	8.050
24	0.600	1.320	2.520	3.840	6.000	8.400
25	0.625	1.375	2.625	4.000	6.250	8.750
26	0.650	1.430	2.730	4.160	6.500	9.100
27	0.675	1.485	2.835	4.320	6.750	9.450
28	0.700	1.540	2.940	4.480	7.000	9.800
29	0.725	1.595	3.045	4.640	7.250	10.150
30	0.750	1.650	3.150	4.800	7.500	10.500

Actual piping length (m)	Pipe size (Liquid pipe)					
	Ø6.4	Ø9.5	Ø12.7	Ø15.9	Ø19.1	Ø22.2
31	0.775	1.705	3.255	4.960	7.750	10.850
32	0.800	1.760	3.360	5.120	8.000	11.200
33	0.825	1.815	3.465	5.280	8.250	11.550
34	0.850	1.870	3.570	5.440	8.500	11.900
35	0.875	1.925	3.675	5.600	8.750	12.250
36	0.900	1.980	3.780	5.760	9.000	12.600
37	0.925	2.035	3.885	5.920	9.250	12.950
38	0.950	2.090	3.990	6.080	9.500	13.300
39	0.975	2.145	4.095	6.240	9.750	13.650
40	1.000	2.200	4.200	6.400	10.000	14.000
41	1.025	2.255	4.305	6.560	10.250	14.350
42	1.050	2.310	4.410	6.720	10.500	14.700
43	1.075	2.365	4.515	6.880	10.750	15.050
44	1.100	2.420	4.620	7.040	11.000	15.400
45	1.125	2.475	4.725	7.200	11.250	15.750
46	1.150	2.530	4.830	7.360	11.500	16.100
47	1.175	2.585	4.935	7.520	11.750	16.450
48	1.200	2.640	5.040	7.680	12.000	16.800
49	1.225	2.695	5.145	7.840	12.250	17.150
50	1.250	2.750	5.250	8.000	12.500	17.500
51	1.275	2.805	5.355	8.160	12.750	17.850
52	1.300	2.860	5.460	8.320	13.000	18.200
53	1.325	2.915	5.565	8.480	13.250	18.550
54	1.350	2.970	5.670	8.640	13.500	18.900
55	1.375	3.025	5.775	8.800	13.750	19.250
56	1.400	3.080	5.880	8.960	14.000	19.600
57	1.425	3.135	5.985	9.120	14.250	19.950
58	1.450	3.190	6.090	9.280	14.500	20.300
59	1.475	3.245	6.195	9.440	14.750	20.650
60	1.500	3.300	6.300	9.600	15.000	21.000

Full opening of valve

- Open the valve of the outdoor unit fully.
- Using a 4mm-hexagonal wrench, open fully the valve rods at liquid and balance sides.
- Using a spanner open fully the valve key on the packed valve (MMY-MAP0801*, MAP1001*, MAP1201*) at gas side.
- Using a pair of pinchers, open fully the handle on the ball valve (MMY-MAP0501*, MAP0601*) at the gas side. Be careful that the handling of the ball valve differs from that of the packed valve.

How to open the ball valve on the gas side



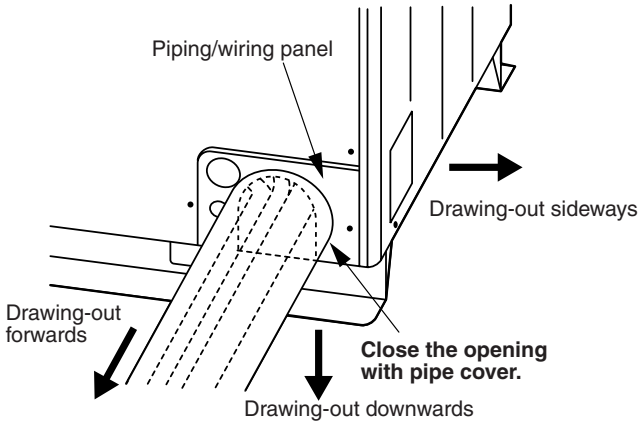
Heat insulation for pipe

- Apply the heat insulation to the pipework separately. (liquid, suction and discharge)
- Use thermal heat insulation which can withstand temperatures of 120°C or more.

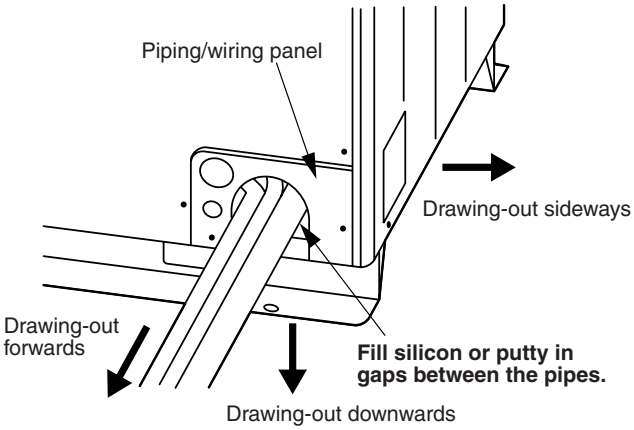
⚠ CAUTION

- Upon completion of the pipework connections fit the piping/wiring panel and the pipe cover. Gaps within the pipes are to be filled using a suitable putty or silicone.
- If the pipework is fitted in the downward or sideways position, ensure that the base plate and side plate are closed and sealed.
- If an opening is left unsealed there is a risk of a fault due to the entering of water or dust.

In case of using pipe cover



In case of using no pipe cover



• Check the additional amount of refrigerant.

Check list

Calculate the additional amount of refrigerant using both the figure and table shown below.

Additional amount of refrigerant = (Real liquid pipe length × Additional amount of refrigerant per liquid pipe 1m) + Corrective amount of refrigerant by system HP

(A) (C)

Enter the total length for each liquid pipe in the following table, and then calculate the additional amount of refrigerant by pipe length.

Additional amount of refrigerant by pipe length

Pipe dia at liquid side	Standard amount of refrigerant kg/m	Total pipe length at each liquid side	Additional amount of refrigerant pipe dia at each liquid side kg
Ø6.4	0.025 ×	=	Kg
Ø9.5	0.055 ×	=	Kg
Ø12.7	0.105 ×	=	Kg
Ø15.9	0.160 ×	=	Kg
Ø19.1	0.250 ×	=	Kg
Ø22.2	0.350 ×	=	Kg
		Additional amount of refrigerant by pipe length (A)	Kg

Refer to the following table for the corrective amount of refrigerant (C) by system HP.

Corrective amount of refrigerant by system HP

System horse power HP	Normal type					System horse power HP	Normal type				
	Unit 1	Unit 2	Unit 3	Unit 4	Corrective amount of refrigerant (C) kg		Unit 1	Unit 2	Unit 3	Unit 4	Corrective amount of refrigerant (C) kg
5	5				0	28	10	10	8		–2.0
6	6				0	30	10	10	10		0
8	8				1.5	32	8	8	8	8	–6.0
10	10				2.5	32	12	10	10		1.0
12	12				3.5	34	10	8	8	8	–6.0
14	8	6			0	34	12	12	10		3.0
16	8	8			0	36	10	10	8	8	–6.0
18	10	8			0	36	12	12	12		4.0
20	10	10			3.0	38	10	10	10	8	–6.0
22	8	8	6		0	40	10	10	10	10	–5.0
22	12	10			5.0	42	12	10	10	10	–4.0
24	8	8	8		–4.0	44	12	12	10	10	–2.0
24	12	12			7.0	46	12	12	12	10	0
26	10	8	8		–4.0	48	12	12	12	12	2.0

Finally add the additional amount of refrigerant by pipe length (A) to the corrective amount of refrigerant by system HP (C). This is the final additional amount of refrigerant.

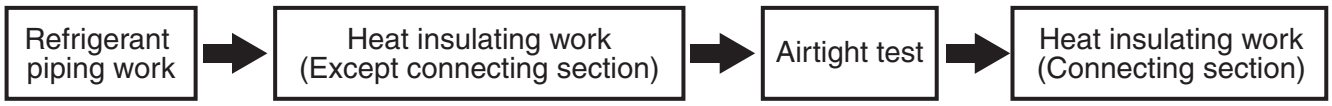
If the additional refrigerant calculation is determined to be negative, do not add any additional refrigerant (=0kg).

Additional amount of refrigerant

Additional amount of refrigerant by pipe length (A)	kg
Corrective amount of refrigerant by system HP (C)	kg
Additional amount of refrigerant (A) + (C)	kg

5-17. Insulation Work

Work procedure



Material

Use heat insulation that can withstand the temperatures of the pipework.

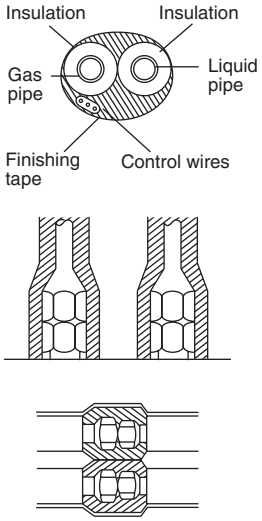
Example : Heat insulating polyethylene foam (Heat insulating 120°C or more)

Insulation guidelines

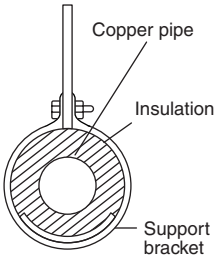
All insulation work for brazed joints, flared joints, etc should be carried out only after successfully passing the leak test. Gas pipes and liquid pipes must be insulated separately throughout the Super MMS air conditioning system.

Examples of Correct Insulation

[Insulating both a gas pipe and a liquid pipe]

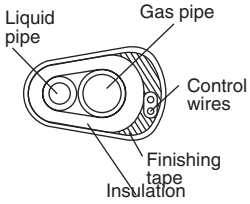


[Insulating supported sections]

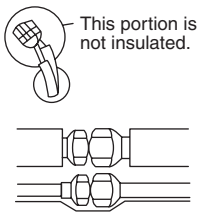


Examples of Incorrect Insulation

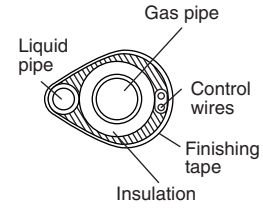
• Gas pipes and liquid pipes cannot be insulated simultaneously.



• Insulate all joints adequately.

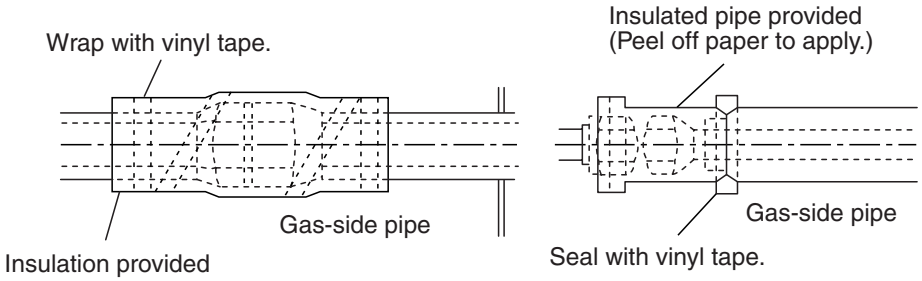


[Insulating just a gas pipe]

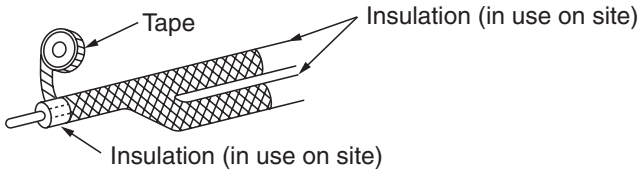


CAUTION

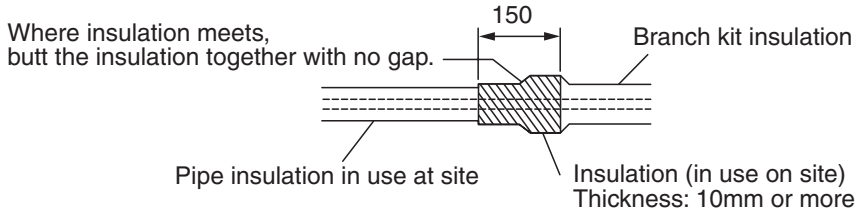
(1) Use the insulating material provided to insulate the indoor units pipe connections (union and flare nut).



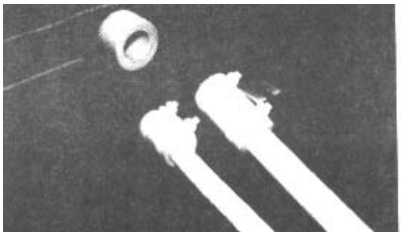
(2) When insulating branch joints, use the insulation provided and ensure that it aligns correctly with the on site pipework insulation.



The provided branch kit insulation must be butted to the on site pipework insulation, ensuring there are no gaps. This is illustrated in the below diagram.



(3) If it is likely that heat will build up in the ceiling for example inside a slate roof or inside a ceiling with an outside ambient temperature. Then refrigerant pipes must be insulated with 8 to 10mm of normal insulation. A suitable roofing insulation must also cover the pipes (16 to 20kg/m^3) with a minimum thickness of 10mm.



Insulating material that is provided for use on pipe connections on the indoor unit.

5-18. Reference for Insulation Work

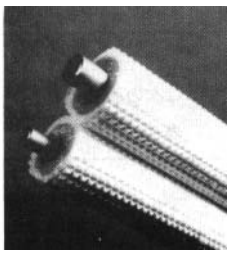
Reference

Sometimes, copper pipe with insulated sheathing is used in order to reduce labour. The following reference applies to this type of pipe.

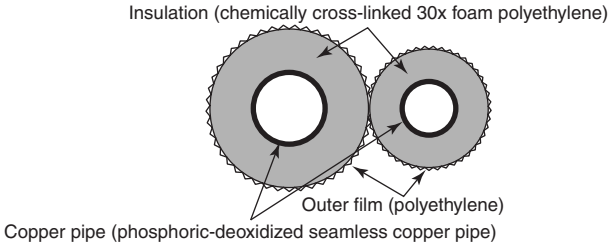
■ Types and Characteristics of Copper Pipe with Insulated Sheathing

- Insulation: 8 to 10mm

Pair coil



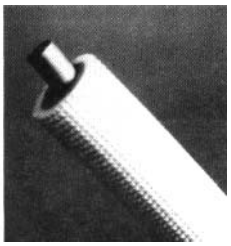
Pair coil

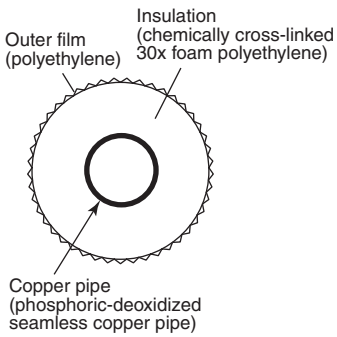


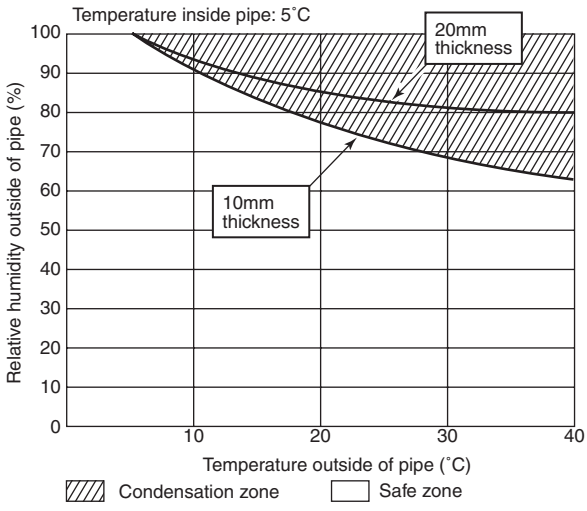
	Copper pipe (mm) (Outer dia. × thickness)	Coil length (m)	Heat insulator (mm)		Heat insulator (mm)	
			Outer dia.	Thickness	Outer dia.	Thickness
Soft Hard Half hard	6.35 × 0.8	20	24	8	48	20
	9.52 × 0.8		27	8	51	20
	6.35 × 0.8	20	24	8		
	12.70 × 0.8		34	10	54	20
	6.35 × 0.8	20	24	8		
	15.88 × 1.0		37	10		
	9.52 × 0.8	20	27	8		
	15.88 × 1.0		37	10	57	20
Hard Half hard	19.05 × 1.0	—	—	—	61	20
	22.22 × 1.0	—	—	—	64	20
	28.6 × 1.0	—	—	—	68	20
	34.9 × 1.1	—	—	—	76	20
	41.3 × 1.25	—	—	—	83	20

■ Condensation characteristics (Temperature inside pipe: 5°C, copper pipe 15.88mm)

- Insulation: 20mm







■ Example uses for different thicknesses of insulation

Insulating material	Example use
10mm	When pipework is indoors, and a small amount of condensation is acceptable
20mm	When pipework is indoors, and condensation is not acceptable.

■ Insulation characteristics

Material	Item	Specifications
Copper pipe	Material	Phosphoric-deoxidized seamless copper pipe
Insulation	Material	Chemically cross-linked 30x foam polyethylene with textured outer covering
	Temperature range	–40°C to 120°C (shrinkage: 1%)

6. INDOOR UNIT INSTALLATION

WARNING

The installation of the air conditioning unit must be positioned in a location that can sufficiently support its weight and give protection against adverse environmental conditions. Failure to do so may result in unit damage and possible human injury. Any incomplete installation may also cause possible risk of human injury.

REQUIREMENT

Strictly comply to the following rules in order to prevent damage to the indoor units and human injury.

- Do not put a heavy item on the indoor unit. (Even when units are packaged)
- When moving indoor unit leave in packaging wherever possible. If moving the indoor unit unpacked is necessary due to restrictions, be sure to use a protective cloth in order not to damage the unit.
- To move the indoor unit only hold by the hanging brackets (4 positions).
  Do not apply force to any other parts (refrigerant pipe, drain pan, foamed parts or resin parts, etc).
- The packaged unit must be carried by two or more persons. Straps should only be used at the positions indicated on the packaging.

6-1. Before Installation

Before unpacking or installation of the air conditioner, check the model name. After unpacking the unit, check that the standard accessories are packed in the plastic bags together with the unit. Be sure not to throw them away with the box by mistake.

6-2. Standard Accessories

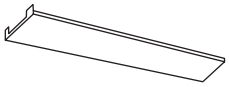
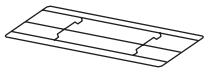
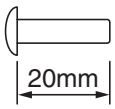
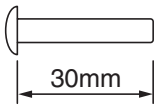
4-way air discharge cassette type

Part name	Qty	Shape	Use	Part name	Qty	Shape	Use
Installation Manual	2	——	(Be sure to hand over to customer)	Heat insulator	1		For heat insulating of drain connecting section
Heat insulating pipe	2		For heat insulating of pipe connecting section	Washer	8		For hanging down unit
Installation pattern	1	——	For confirmation of ceiling opening and main unit position	Hose band	1		For connecting drain pipe
Installation gauge	2		For positioning of ceiling position (united with installation pattern)	Flexible hose	1		For centering the drain pipe
Pattern fixing screw	4	M5 x 16ℓ	For attaching pattern	Heat insulator	1		For sealing the wire connection opening

2-way air discharge cassette type

Part name		Qty	Shape	Use	Part name	Qty	Shape	Use
Installation Manual		1	——	(Be sure to hand this over to customer)	Installation gauge	1		For positioning of ceiling position (United with installation pattern)
Heat insulating pipe		2		For heat insulating pipe connecting section	Pattern fixing screw	6	M5 x 16ℓ	For attaching the installation pattern
Installation pattern	MMU-AP0301WH type or lower	1	——	For checking the position of the ceiling openings and the unit	Fan motor connector	1		For changing fan motor r.p.m. to apply higher ceiling
	MMU-AP0481WH type	2			Heat insulator	1		For seal for wire connecting port

Ceiling panel components (2-way air discharge cassette type)

Name	Ceiling panel	Center panel	Air filter	Screw installing panel	Screw installing panel
Shape (Q'ty)	 (1 set)	 (1 pc)	 • RBC-UW466PG : Attached to indoor unit	 20mm M5×20ℓ (4 pcs)	 30mm M5×30ℓ (2 pcs)
Usage	———	———	Attached to ceiling panel, and removes dust.	For fixing ceiling panel (4 corners)	For tentative hanging and fixing ceiling panel (Center part)

1-way air discharge cassette type

Part name	Qty		Shape	Usage	Part name	Qty		Shape	Usage
	AP0071YH to AP0121SH	AP0151SH to AP0241SH				AP0091SH to AP0121SH	AP0151SH to AP0241SH		
Installation Manual	1	1	——	(Be sure to hand over to customer)	Connector	—	1		For increasing motor speed due to high ceiling installation.
Heat Insulating pipe	2	2		For heat insulating of pipe connecting section	Banding band	—	10		Used to fix drain piping
Installation gauge	—	1		For positioning of ceiling position	Drain-up pipe	—	4		For drain-up of discharge port
Installation pattern	1	—	—	For confirmation of ceiling opening and main unit position	Pattern fixing screw	5	—	M5 x 16ℓ	For attaching pattern

Ceiling panel components (1-way air discharge cassette type)

Part name	Qty	Use
	RBC-US135PG, 165PG, 265PG type	
Ceiling panel	1	———
Intake grille	3	———
Air filter	1	Located in the intake grille and removes dust and dirt from the air.
Panel installation screw (M5 x 20)	7	For securing the ceiling panel
Screw head insulation	1 set	Prevents condensation from forming on screw heads















Concealed duct typ

Part name	Qty	Shape	Use	Part name
Installation Manual	1		——	Washer
Insulated pipe	2		For heat insulating pipe connecting section	

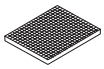
Concealed duct high static pr

Part name	Qty	Shape	Use	Part name
Installation Manual	1		——	Insulation
Insulation	1		For insulating the gas pipe connection	

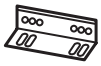
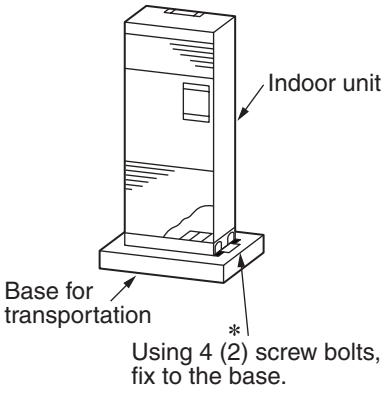
Under ceiling type

Part name	Qty	Shape	Use	Part name
Installation Manual	1	This manual	(Be sure to hand over to the customer)	Heat insulator
Heat insulating pipe	2		For heat insulation of pipe connecting section	Washer
Installation pattern	1	—	For confirmation of ceiling opening and main unit position	Hose band
Banding band	2		For drain hose forming	Drain hose
Bushing	1		For power supply cord protection	Heat insulator

Floor standing concealed type

Part name	Qty	Shape	Use	Part name	Qty	Shape	Use
Installation Manual	1	——	——	Drain receiver fixing screw	1		For fix the drain receiver
Heat insulation	2		For heat insulating the indoor unit pipe connections	Drain hose	1		For water draining (Attaches to the drain receiver.)
Drain pan	1		For water draining	Heat insulated pipe	1		For insulating the drain receiver (Attaches to the drain receiver.)
Drain filter	1		Drain filter (inside the drain receiver)				

Floor standing type

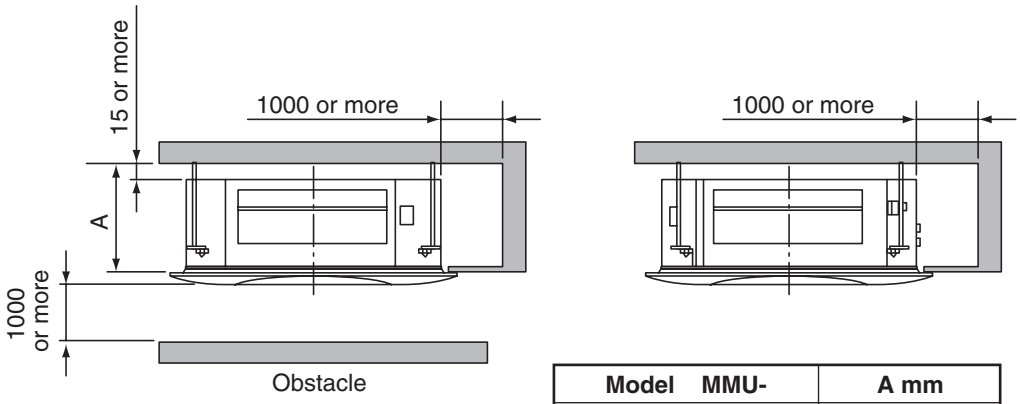
Attached position	Part name	Qty	Shape	Stored position
Upper part of main unit	Bracket for fixing to wall	1		
Accessory bag	Installation Manual	1	These sheets	
	Thermal insulator	2		
	Screw bolt	＊ 4 (2)		
	Thermal insulator	2		
Lower part of main unit	Bracket for fixing to floor	2		

＊ Quantities in the above table are for MMF-AP0361, AP0481 and AP0561 models.
The brackets for fixing to the floor are already mounted on the indoor unit.

6-3. 4-Way Air Discharge Cassette Type

Installation space

Figure below details the required space for installation and servicing.



Model MMU-	A mm
AP0091H to AP0301H	271 or more
AP0361H to AP0561H	334 or more

Selection of installation place

In case of continued operation of the indoor unit under a high-humidity condition as described below, due condensation may form and water may drop.

In a high-humidity atmosphere (dew point temperature : 23°C or more) due may form inside the ceiling.

1. Unit is installed inside the ceiling with a slated roof.
2. Unit is installed in a location inside the ceiling with access to fresh air intake.
3. Kitchen

If installing a unit in such a place, use additional insulating material (glass, wool, etc) on all positions of the indoor unit which come in to contact with a high humidity atmosphere.

Advice

Create a service point opening panel at the right side of the unit (size: 450 x 450mm or more) for piping, maintenance and servicing.

Ceiling height

Model MMU-	Possible installed ceiling height
AP0091H to AP0121H	Up to 2.7 m
AP0151H to AP0301H	Up to 3.8 m
AP0361H to AP0561H	Up to 4.3 m

When the height of the ceiling exceeds the distance as detailed in the above table, the hot air will be unable to reach the floor. Therefore it would be necessary to change the setup value of the high ceiling mode or change the discharge direction.

REQUIREMENT

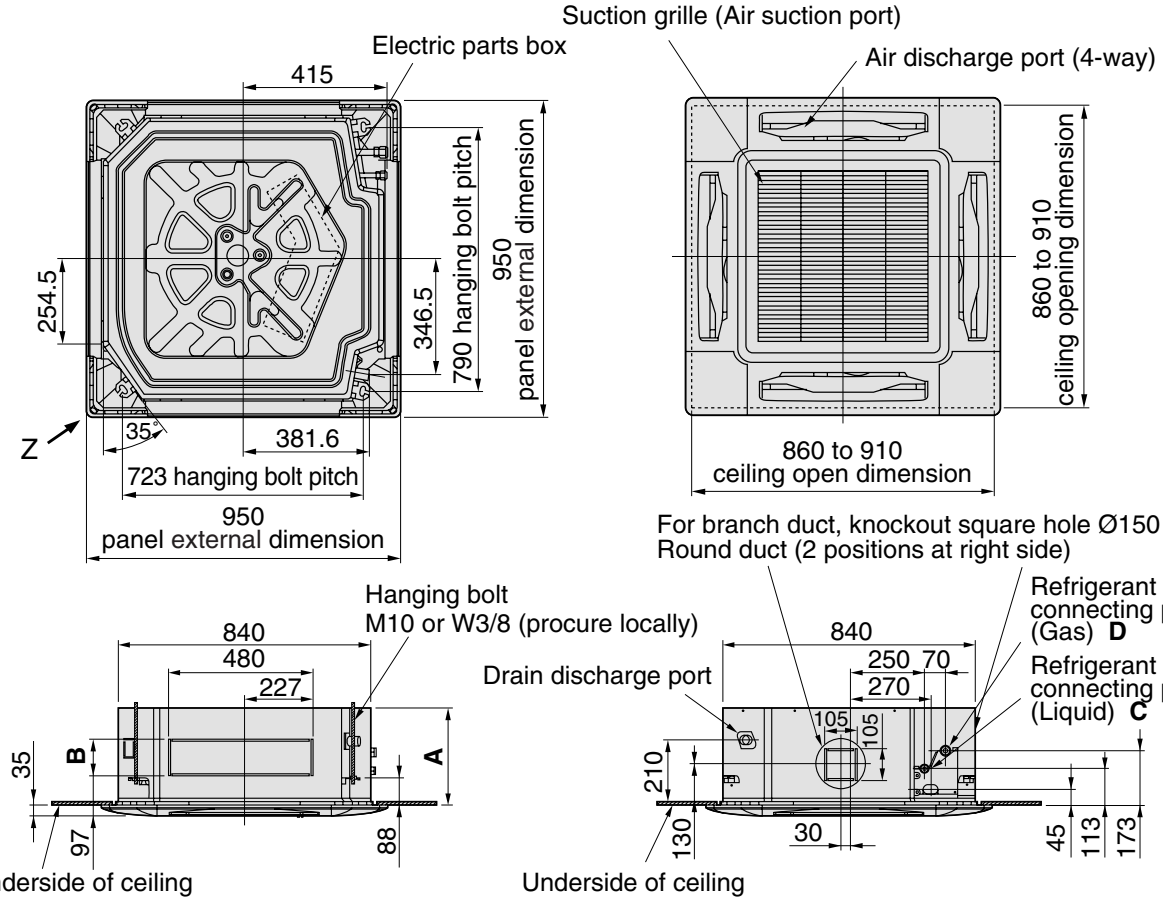
- When using the air conditioner with a 2-way discharge system with the standard settings (as supplied at shipment), it may stop abnormally in heating mode. Therefore change the setting data relevant to the actual ceiling height.
- When using the air conditioner with a 2-way/3-way discharge system, if the unit is installed at a lower ceiling height than standard, this will cause the effect of strong air flow. Therefore change the setting data to match that of the actual ceiling height.
- When using the high ceiling (1) or (2) with 4-way discharge system, the air flow discharge temperature may drop.

Ceiling Height parameters and settings

(Unit : m)

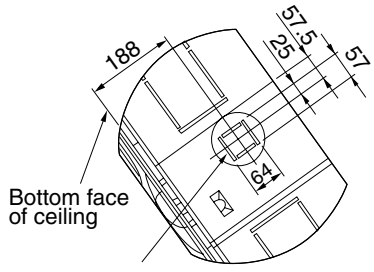
Model MMU-	AP0091H to AP0121H			AP0151H to AP0181H			AP0241H to AP0301H			AP0361H to AP0561H			High ceilong setup
No. of discharge direction	4-way	3-way	2-way	4-way	3-way	2-way	4-way	3-way	2-way	4-way	3-way	2-way	Set data
Standard (at shipment)	2.7	—	3.0	2.8	3.2	3.5	3.0	3.3	3.6	3.6	3.9	4.2	0000
High ceiling (1)	Cannot be installed to a high ceiling			3.2	3.5	3.8	3.3	3.5	3.8	3.9	4.1	4.3	0001
High ceiling (2)				3.5	3.8	—	3.6	3.8	—	4.2	4.3	—	0003

External dimensions

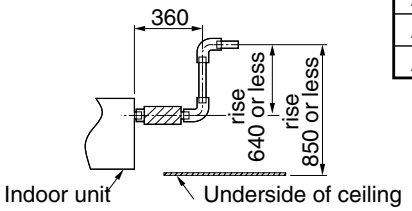


mm

Model	A	B	C	D
AP0091H to AP0121H	256	120	Ø6.4	Ø9.5
AP0151H to AP0181H				Ø12.7
AP0241H to AP0301H			Ø9.5	Ø15.9
AP0361H to AP0561H	319	183		

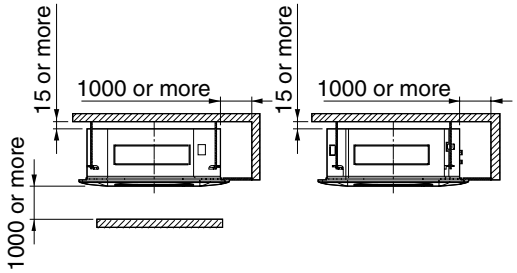


Z view



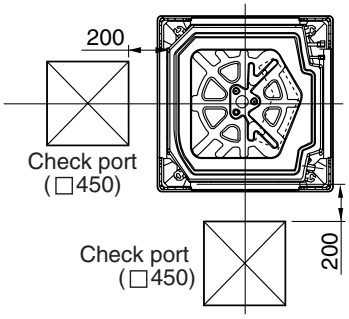
(NOTE)
As ABS is used for the drain discharge port on the main unit, vinyl chloride paste cannot be used.
Use the flexible hose and Band fix included in the package.

Drain-up (Rise dimensions)



Space required for installation and servicing

- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX21U(W)-E
  TCB-AX21U(W)-E2
- **Weekly timer application**
  RBC-AMT31E and
  RBC-EXW21E2



Ceiling opening and installation of hanging bolts

- Evaluate and determine the piping and wiring requirements inside the ceiling prior to the hanging of the unit.
- After installation place of the indoor unit has been determined, create opening in ceiling and install the hanging bolts.
- For the ceiling opening size and the hanging bolt pitch, refer to the dimensional drawing and the enclosed installation pattern supplied with the unit.
- Once the ceiling void has been created, ensure that the drain pipe, refrigerant pipes, inter-connecting wires and all control wires are in place prior to installing the actual indoor unit.

Procure hanging bolts and nuts locally for installation of indoor unit.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces

[How to use the supplied installation pattern]

The installation pattern is enclosed within the packaging of the air conditioner.

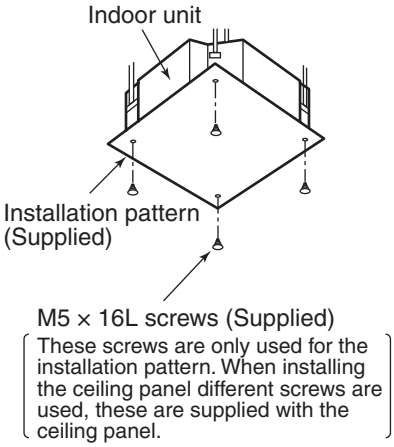
Existing ceiling void

Use the pattern to determine the position and size of the opening and location of the hanging bolts.

New ceiling void

Use the pattern to determine the position of the new ceiling opening.

- Install the indoor unit after installation of the hanging bolts.
- Using the supplied pattern attach it to the indoor unit using the supplied fixing screws (M5 x 16L 4off).
  (Screw pattern to the ceiling panel hanging brackets of the indoor unit)
- When creating the opening ensure it is as per the outer dimensions of the supplied pattern.



Opening a ceiling and installation of hanging bolts

Treatment of ceiling

The ceiling differs according to the structure of the building. For details, consult your architect.

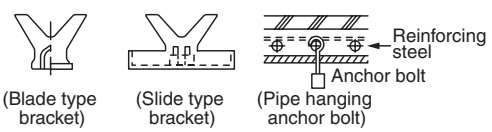
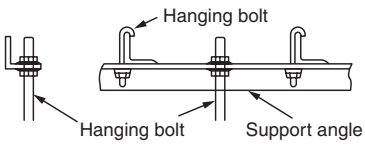
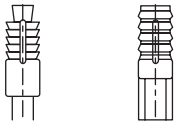
In the process after the ceiling panels have been removed, it is important to reinforce the ceiling construction and panels ensure the ceiling remains in a horizontal position. This is to prevent possible vibration of the ceiling panels.

(1) Cut and remove the ceiling material.

(2) Reinforce the cut surface of the ceiling construction and add support for fixing the end of ceiling panels.

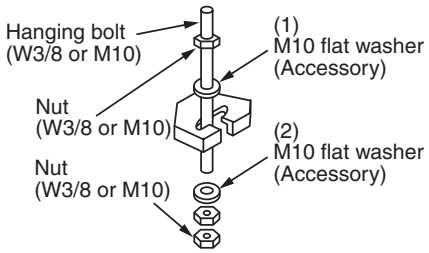
Installation of hanging bolt

Use M10 hanging bolts (4 off, locally procured).
When mounting the unit, set the pitch of the hanging bolts according to the size of the unit as detailed on the dimensional drawing.

New concrete slab	Steel frame structure	Existing concrete slab
Install the bolts with insert brackets or anchor bolts.	Use existing angles or install new support angles.	Use a hole-in anchors, hole-in plugs, or a hole-in bolts.
		

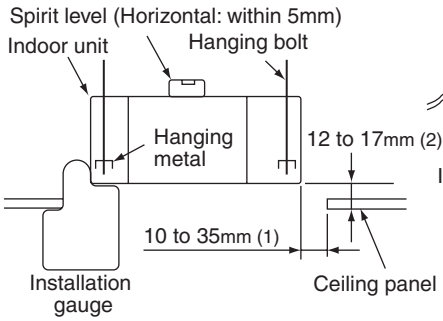
Installation of indoor unit

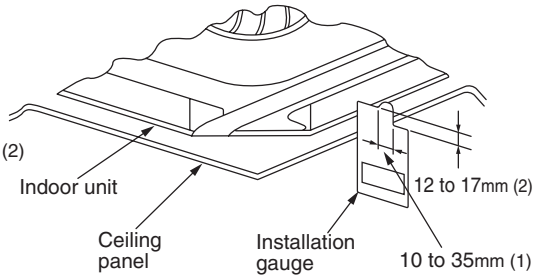
- Attach the nut (M10 or W3/8: Procured locally) and washer (Ø34mm) to the hanging bolt.
- Put washers at either side of the T-groove on the hanging bracket of the indoor unit in order to hang the unit.
- Using a spirit level, check that all four sides are horizontal. (Horizontal positioned within 5mm)
- Cut off the installation gauge from the installation pattern.
- Using the installation gauge check and adjust clearance between the indoor unit and the ceiling opening (1) (10 to 35mm on each side). Ensure that the unit is level to the ceiling and within a distance of (2) 12mm+5mm below.
  The installation gauge has details of how to use printed on it.

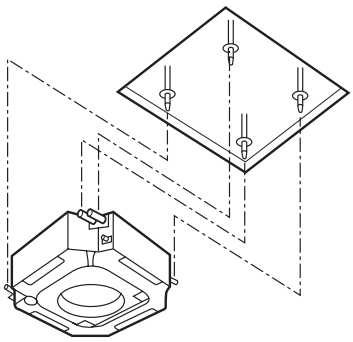


(1) M10 washer supplied, all other material must be procured locally.

(2) To ensure that the unit is mounted safely, the hanging bolt must be positioned just below the hanging bracket as shown in the diagram.

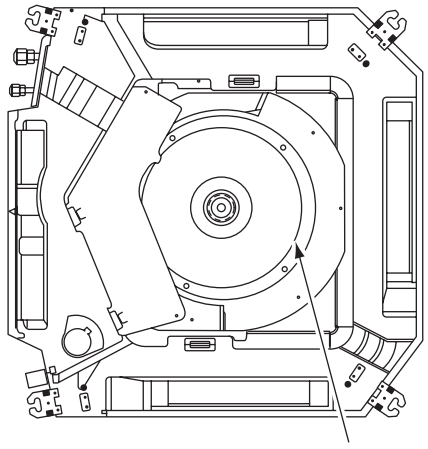






REQUIREMENT

Before installation of the indoor unit be sure to remove the transportation cushion found between the fan and the bell mouth. Running the unit without removing the cushion may damage the fan motor.



Be sure to remove the transportation cushion between the fan and the bell mouth.

REQUIREMENT

Ensure the ceiling panel is mated to the ceiling surface or the indoor unit.

If the panel and unit are not mated together this may result in the formation of dew condensation causing a possible water leak.

First remove the 4 corner caps from the ceiling panel and fit to the indoor unit.

Installation of ceiling panel (Sold separately)

Install the ceiling panel after completion of the installation of the indoor unit, including all piping and wiring.

Install the ceiling panel as per the supplied Installation Manual.

Check the installation dimensions of the indoor unit and the ceiling opening are correct and then install.

Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow the Installation Manual supplied with the remote controller.

- Do not expose remote controller to direct sunlight or excessive heat.
- When using a wireless type remote controller check receiver on the indoor unit receives a signal.
- For a wireless type controller ensure that it is used and mounted a minimum distance of 1m apart from any other electrical devices(TV, Stereo, etc). As this may cause interference with the devices.

6-4. 2-Way Air Discharge Cassette Type

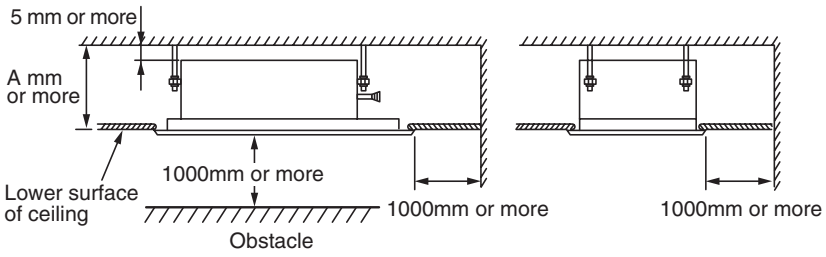
Installation space

Ensure that you have sufficient space to install and service the indoor unit.

Leave a minimum of 5mm clearance between the top plate of the unit and the upper ceiling surface.

Installation space

Model MMU-	Ceiling depth A mm
AP0071WH type to AP0301WH type	398 or more
AP0481WH type	406 or more



Ceiling height

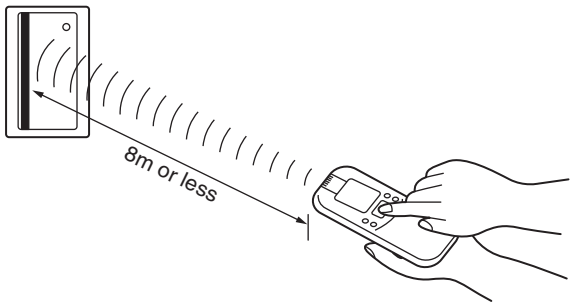
Model MMU-	Installable ceiling height
AP0071WH to AP0121WH type	Up to 2.7m
AP0151WH to AP0301WH type	Up to 3.0m
AP0481WH type	Up to 3.5m

When the ceiling height is greater than 2.7m, the air-flow may not be sufficient to heat the room. It is therefore necessary to fit the fan motor lead supplied separately with the unit, which will increase the fan motor speed.

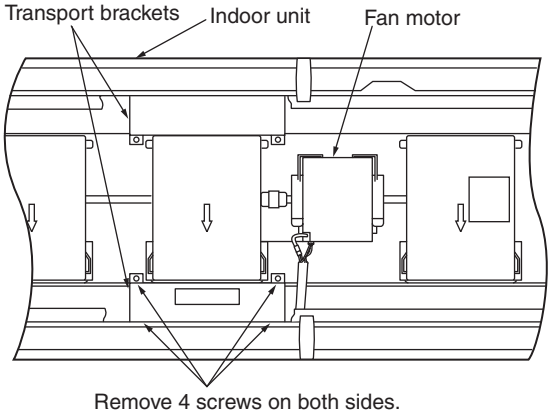
In case of wireless type

The wireless remote control can be operated up to a maximum of 8 metres from the infra-red receiver. Therefore ensure that the remote control will be mounted and used within this stated parameter.

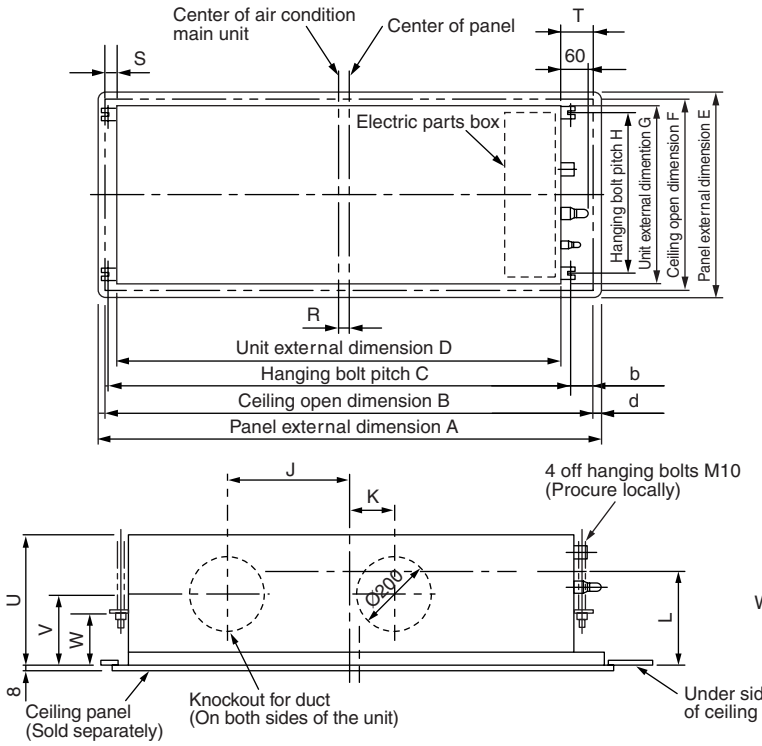
- To prevent malfunction do not mount or operate in a location near to fluorescent lamp or direct sunlight.
- A maximum of 6 indoor units with wireless remote control can be installed in the same room.



- **Removal of transport brackets (MMU-AP0151WH type to MMU-AP0301WH type)**
  - Remove the transport brackets before installation of the indoor unit.
  - The transport brackets cannot be removed after the ceiling panel has been installed.

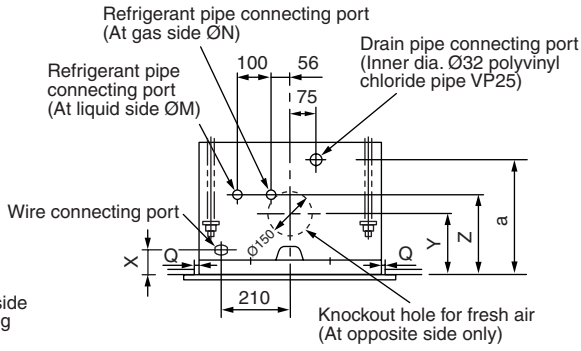


- **External dimensions**



REQUIREMENT

The pitch between the hanging bolt locations are not equally spaced from the center of the unit, therefore refer to the dimensional drawing. If positioned incorrectly the ceiling panel cannot be installed.



- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX21E
  TCB-AX21E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

Model MMU-	A	B	C	D	E	F	G	H	J	K	L	M	N
AP0071WH to AP0121WH type	1000	960	880	830	650	620	550	480	265	—	255	Ø6.4	Ø9.5
AP0151WH to AP0181WH type	1520	1480	1400	1350					295		280		Ø12.7
AP0241WH to AP0301WH type												Ø9.5	Ø15.9
AP0481WH type	1898	1850	1700	1650	680	650	620	510	455	150	288		

Model MMU-	Q	R	S	T	U	V	W	X	Y	Z	a	b	d
AP0071WH to AP0121WH type	35	30	35	95	398	222	156	78	178	242	348	70	20
AP0151WH to AP0181WH type													
AP0241WH to AP0301WH type													
AP0481WH type	15	5	95	105	406	230	166	86	186	250	356	80	24

Ceiling opening and installation of hanging bolts

- Evaluate and determine the piping and wiring requirements inside the ceiling prior to the hanging of the unit.
- After installation place of the indoor unit has been determined, create opening in ceiling and install the hanging bolts.
- For the ceiling opening size and pitch for hanging bolts, refer to the dimensional drawing and the attached installation pattern.
- Once the ceiling void has been created, ensure that the drain pipe, refrigerant pipes, inter-connecting wires and all control wires are in place prior to installing the actual indoor unit.

Procure locally the hanging bolts, washers and nuts for the installation of the indoor unit.

Hanging bolt	M10 or W3/8	4 pcs.
Nut	M10 or W3/8	12 pcs.
Flat washer	M10	8 pcs.

How to use the supplied installation pattern

The installation pattern is enclosed within the packaging of the air conditioner.

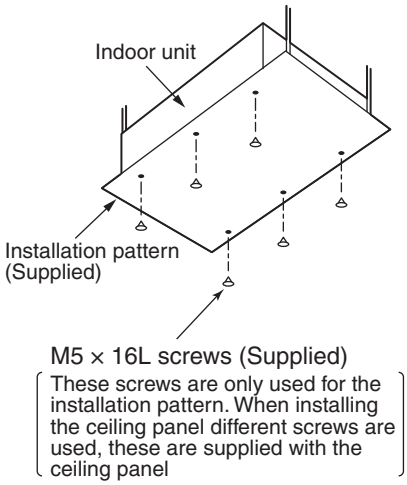
Existing ceiling void

Use the pattern to determine the position and size of the opening and location of the hanging bolts.

New ceiling void

Use the pattern to determine the position of the new ceiling opening.

- Install the indoor unit after installation of the hanging bolts.
- Using the supplied pattern attach it to the indoor unit using the supplied fixing screws (M5 x 16L 6off).
  (Screw pattern to the ceiling panel hanging brackets of the indoor unit)
- When creating the opening ensure it is as per the outer dimensions of the supplied pattern.



Installation of ceiling panel (Sold separately)

Install the ceiling panel after completion of the installation of the indoor unit, including all piping and wiring.
Install the ceiling panel in accordance to the supplied installation manual.
Check the installation dimensions of the indoor unit and the ceiling opening are correct and then install.

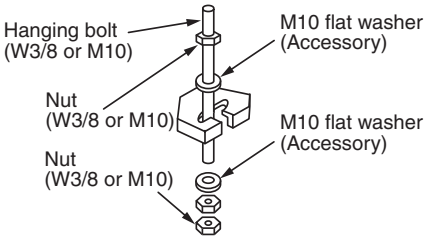
REQUIREMENT

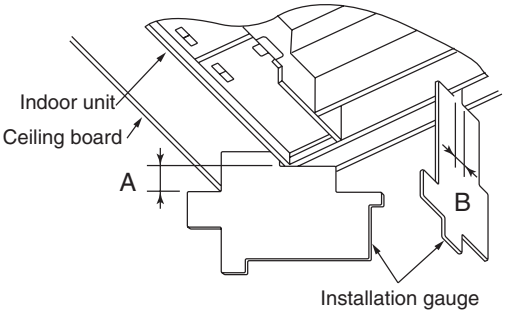
Ensure the ceiling panel is mated to the ceiling surface or the indoor unit.

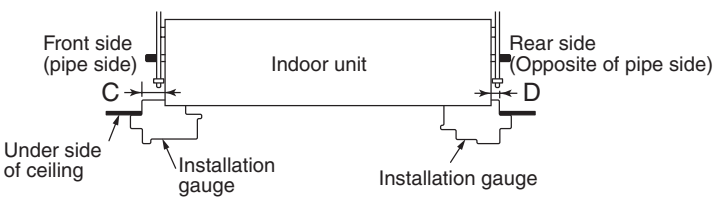
If the panel and unit are not mated together this may result in the formation of dew condensation causing a possible water leak.

Installation of indoor unit

- Fit the nut (M10 or W3/8: Procured locally) and the plain washer (M10: Procured locally) to the hanging bolt.
- Place the washers at either side of the T-groove on the units hanging bracket in order to hang the indoor unit.
- Using a spirit level, check that all four sides are horizontal. (Horizontal position within 5mm)
- Cut off the installation gauge from the installation pattern.
- Using the installation gauge check and adjust clearance between the indoor unit and the ceiling opening. Ensure that the unit is level to the ceiling. The installation gauge has details of how to use printed on it.
  1) Check distance between the bottom surface of the indoor unit and the bottom surface of the ceiling panel is greater in each of the 4 corners than size A.
  2) Check the clearance between both the longitudinal sides of the unit and ceiling panel are as per size B detailed in the below table.
  3) Check the clearance between the shorter side (Pipework side)of the indoor unit and ceiling panel is as per the dimension size C.
     Clearance of opposite side (rear side)to pipework should be as per dimension size D.



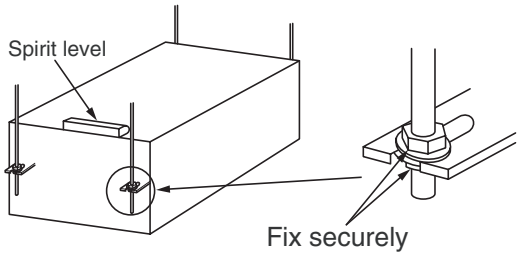




Model MMU-	A	B	C	D
AP0071WH to AP0301WH type	53	35	95	35
AP0481WH type	68	15	105	95

REQUIREMENT

- Use a spirit level to confirm the horizontal level of the indoor unit.
- Tighten all nuts and ensure securely fixed.



Installation of ceiling panel (Sold separately)

Install the ceiling panel after completion of the installation of the indoor unit, including all piping and wiring.
Check that the installation of the indoor unit and ceiling opening are correct and then install.

REQUIREMENT

Ensure the ceiling panel is mated to the ceiling surface or the indoor unit.

If the panel and unit are not mated together this may result in the formation of dew condensation causing a possible water leak.

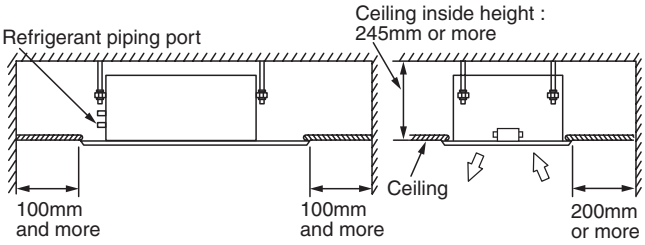
6-5. 1-Way Air Discharge Cassette Type (1 series)

Installation space

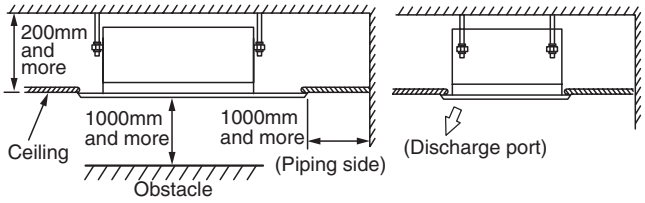
Ensure that you have sufficient space to install and service the indoor unit.

Leave a minimum of 5mm clearance between the top plate of the unit and the upper ceiling surface.

MMU-AP0071YH to AP0121YH



MMU-AP0151SH to AP0241SH



Height of ceiling

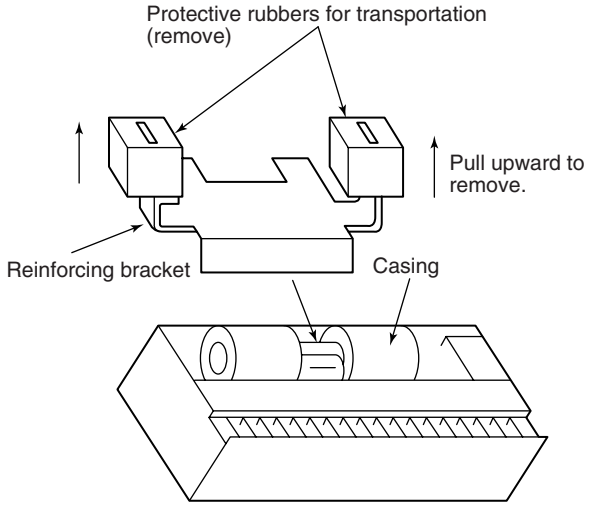
When the ceiling height is greater than 3.0m, the air-flow may not be sufficient to heat the room. It is therefore necessary to fit the fan motor lead supplied separately with the unit, which will increase the fan motor speed.

Ceiling height installation
Up to 3.0m

Removal of transporting rubbers

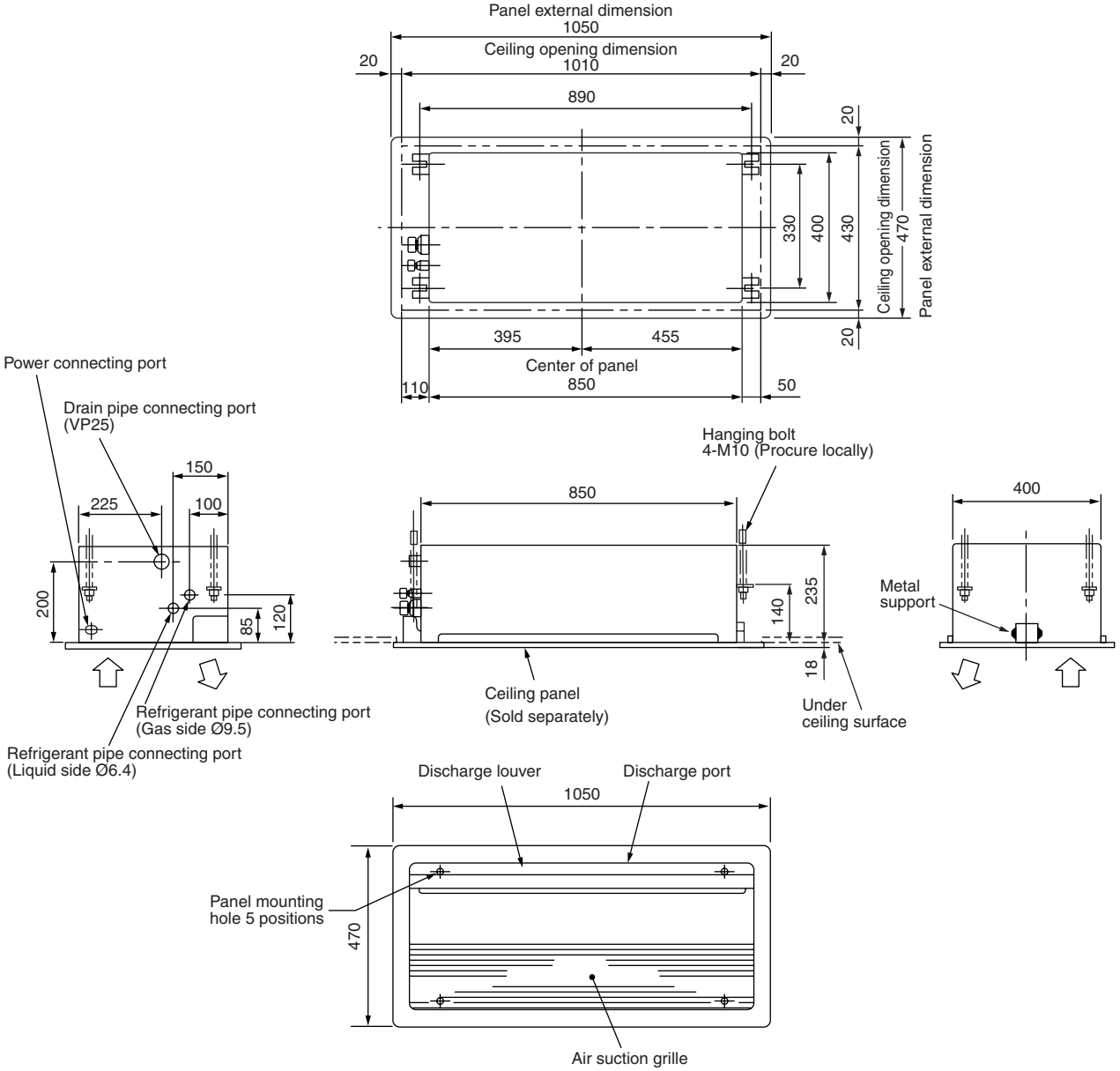
MMU-AP0071YH to AP0121YH

- Before installation of the indoor unit remove the two protective rubbers that are fitted for transportation only. The rubbers are inserted between the fan motors reinforcing bracket and the casing. Ensure customer keeps transportation rubbers to re-use in case of a future re-installation.



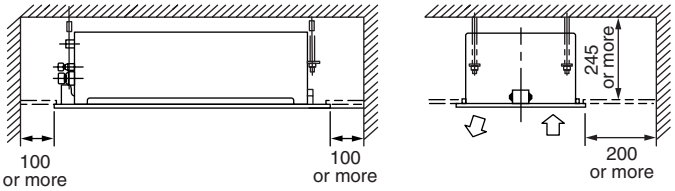
- When a ceiling void exists where the unit is to be installed. Position pipework, drain pipe and all of the electrical wiring where they can easily be connected at the time of hanging the unit.
- Using the supplied installation pattern check the ceiling opening and positioning of the indoor unit will be suitable.
  (The pattern is attached to the bottom surface with five M5 x 20 screws.)

External dimensions MMU-AP0071YH to AP0121YH

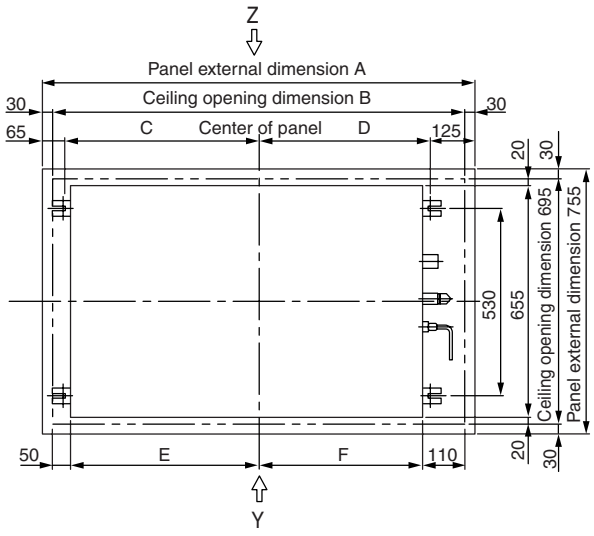


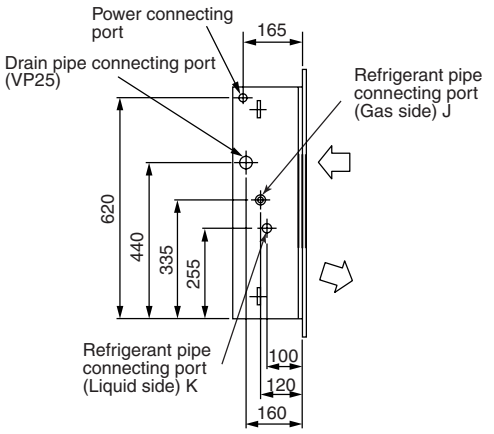
- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX21E
  TCB-AX21 E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

Space necessary for installation and servicing

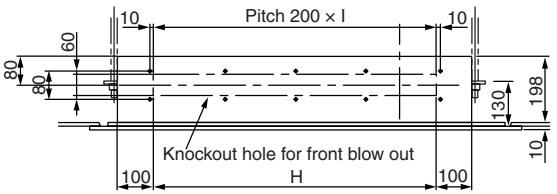


External dimensions MMU-AP0151SH to AP0241SH

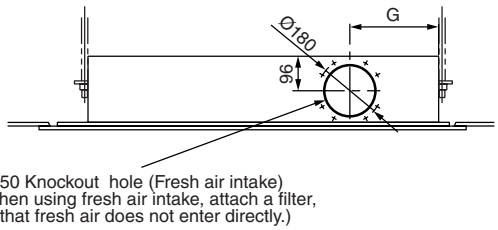


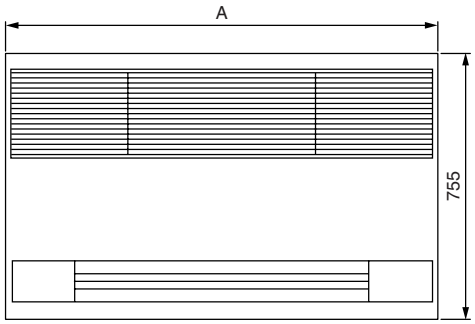


Y view



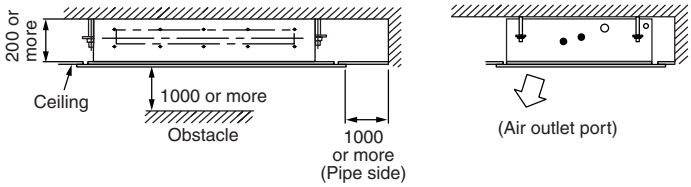
Z view





Note
When using the discharge divided duct and the and the fresh air intake duct consult your dealer about availability.

Space necessary for installation and servicing



- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX22E
  TCB-AX22E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

Model	A	B	C	D	E	F	G	H	I	J	K
AP0151, AP0181	1220	1160	545	485	530	470	254	800	4	Ø12.9	Ø6.4
AP0241	1420	1360	645	585	630	570	460	1000	5	Ø15.9	Ø9.5

Ceiling opening and installation of hanging bolts

- Evaluate and determine the piping and wiring requirements inside the ceiling prior to the hanging of the unit.
- After installation place of the indoor unit has been determined, create opening in ceiling and install the hanging bolts.
- For the ceiling opening size and the hanging bolt pitch, refer to the dimensional drawing and the enclosed installation pattern supplied with the unit.
- Once the ceiling void has been created, ensure that the drain pipe, refrigerant pipes, inter-connecting wires and all control wires are in place prior to installing the actual indoor unit.

Procure hanging bolts and nuts locally for installation of indoor unit.

Procure locally all hanging bolts, nuts and washers for the installation.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces
Flat washer	M10	8 pieces

How to use the supplied installation pattern

The installation pattern is enclosed within the packaging of the air conditioner.

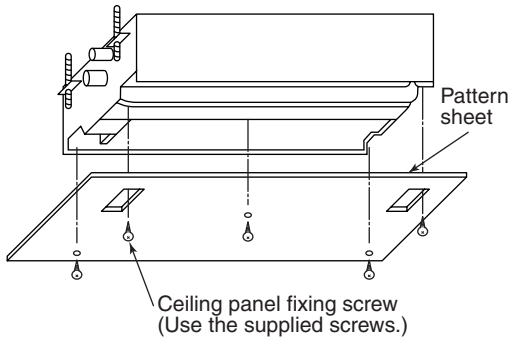
Existing ceiling void

Use the pattern to determine the position and size of the opening and location of the hanging bolts.

New ceiling void

Use the pattern to determine the position of the new ceiling opening.

- Install the indoor unit after installation of the hanging bolts.
- Using the supplied installation pattern attach it to the indoor unit using the supplied fixing screws (M5 x 20L 4off). (Screw pattern to the ceiling panel hanging brackets of the indoor unit)
- When creating the opening ensure it is as per the outer dimensions of the supplied pattern.

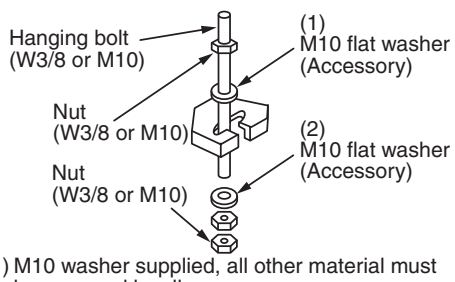


Installation of indoor unit

⚠ CAUTION

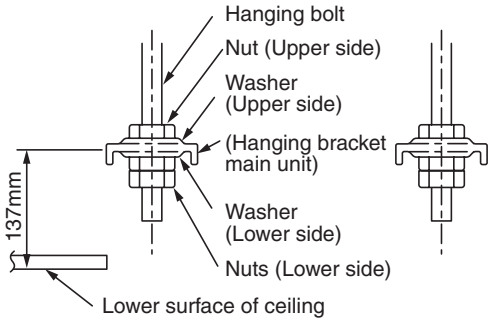
This unit is supplied and fitted with a drain pump and float switch. Ensure that the unit is always mounted in a horizontal position. Otherwise malfunction of the float switch may be caused resulting in water leakage.

- Fit the nut (M10 or W3/8: Procured locally) and washer (Ø34mm) to the hanging bolt.
- Adjust the nut position on the lower side of the hanging bracket until spaced at 137mm between the underside of ceiling panel and the hanging bracket.
- Hang up the unit, locate the T groove of the hanging brackets on to the nut that is fitted to the hanging bolt.
- Using a spirit level check the horizontal position of the unit.
- Use the installation pattern to adjust and position the height of the indoor unit within the ceiling opening.



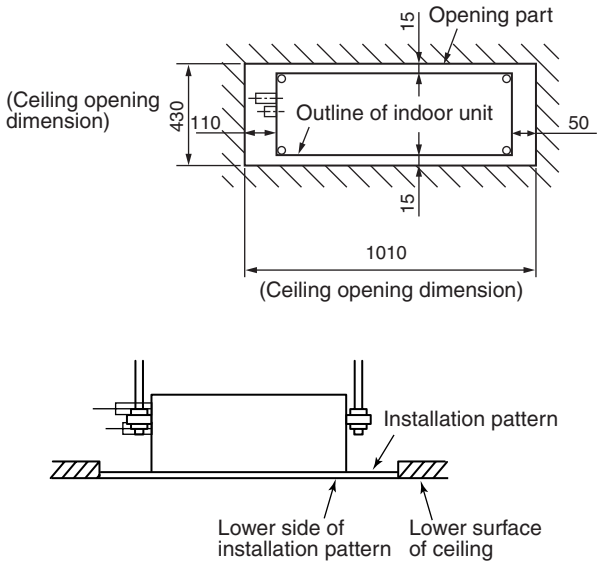
(1) M10 washer supplied, all other material must be procured locally.

(2) To ensure that the unit is mounted safely, the hanging bolt must be positioned just below the hanging bracket as shown in the diagram.



- The screws used for the installation pattern must be re-used when installing the panel.
- Using the ceiling panel fixing screws, fix the installation pattern to the under surface of the indoor unit.
- Ceiling opening size must be the same as the installation pattern.

MMU-AP0071YH to AP0121YH

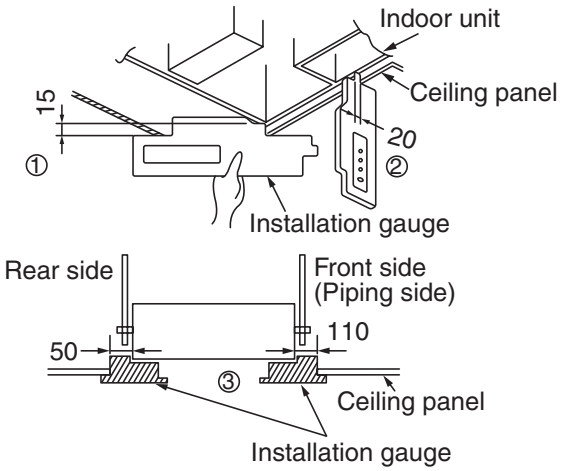


MMU-AP0151SH to AP0241SH

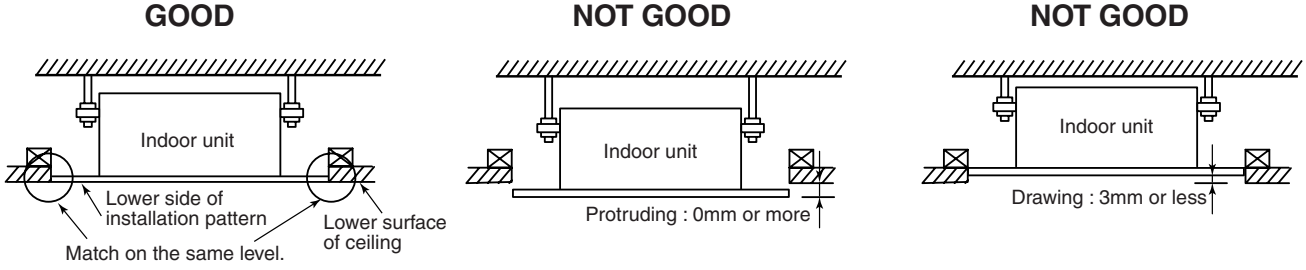
① Check the lower side of the indoor unit locates at a position 15mm higher than the bottom surface of the ceiling panel in each corner.

② Check the clearance between both sides of the indoor unit and the ceiling panel are 20mm.

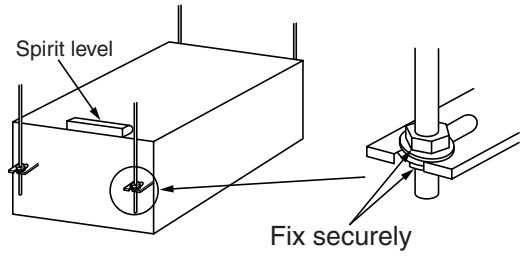
③ Check clearance between the front piping side of the indoor unit and ceiling panel is a 110mm. Clearance between the rear side of the indoor unit and the ceiling panel should be 50mm.



- Match the lower surface of ceiling and the lower side of the installation pattern to the same level as shown below.



- Fix the indoor unit securely by tightening the upper nut on the hanging bolt.



REQUIREMENT

- Using a spirit level confirm the horizontal position of the indoor unit.

Installation of ceiling panel (Sold separately)

Install the ceiling panel after completion of the installation of the indoor unit, including all piping and wiring.

Check that the installation and the height of the indoor unit within the ceiling void are correct and then install.

REQUIREMENT

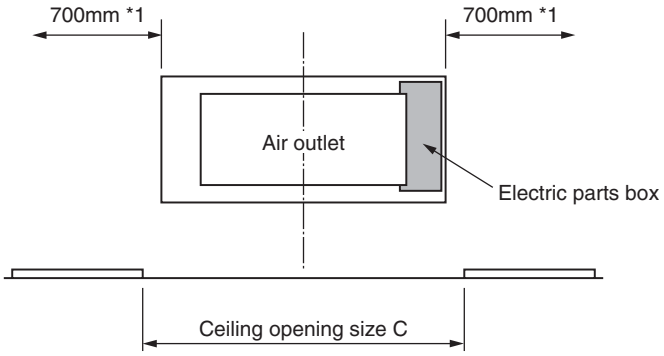
Ensure the ceiling panel is mated to the ceiling surface or the indoor unit.

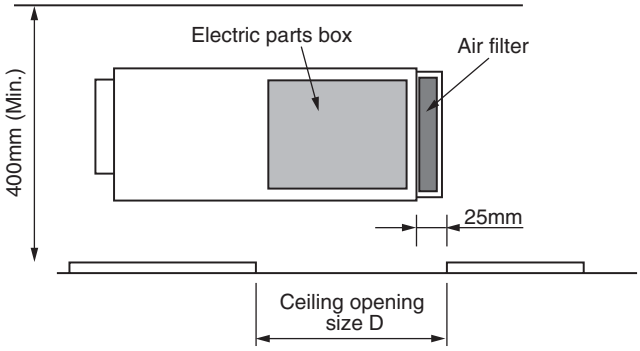
If the panel and unit are not mated together this may result in the formation of dew condensation causing a possible water leak.

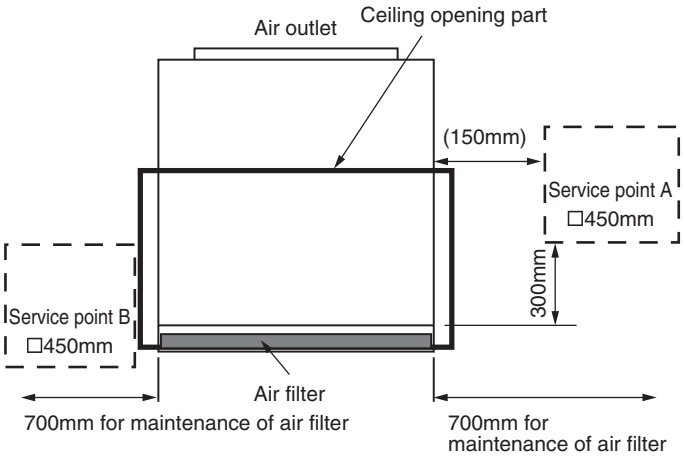
6-6. Concealed Duct Type

Installation space

Ensure that you have sufficient space to install and service the indoor unit.







Notes

*1 Ensure a minimum space of 700mm for the attachment and removal of the air filter.

*2 Be sure to leave a minimum service point (A) as detailed. For refrigerant piping, drain piping, maintenance of drain pan etc. Failure to this would prevent certain devices from be maintained.

*3 If removal of the air filter is to be from the left side. Ensure a suitable check point (B) is available. Failure to this would mean the air filter cannot be removed from this side.

*4 Ensure that there is a ceiling opening for the maintenance of electrical parts.

(Unit: mm)

MODEL MMD-AP	0071BH to 0121BH	0151BH to 0181BH	0241BH to 0301BH	0361BH to 0561BH
Set width (mm)	550	700	1000	1350
Air filter width (mm)	508	655	960 (480*2)	1310 (655*2)
Ceiling opening size C	600	750	1050	1400
Ceiling opening size D	470	470	470	470

Installation under high-humidity atmosphere

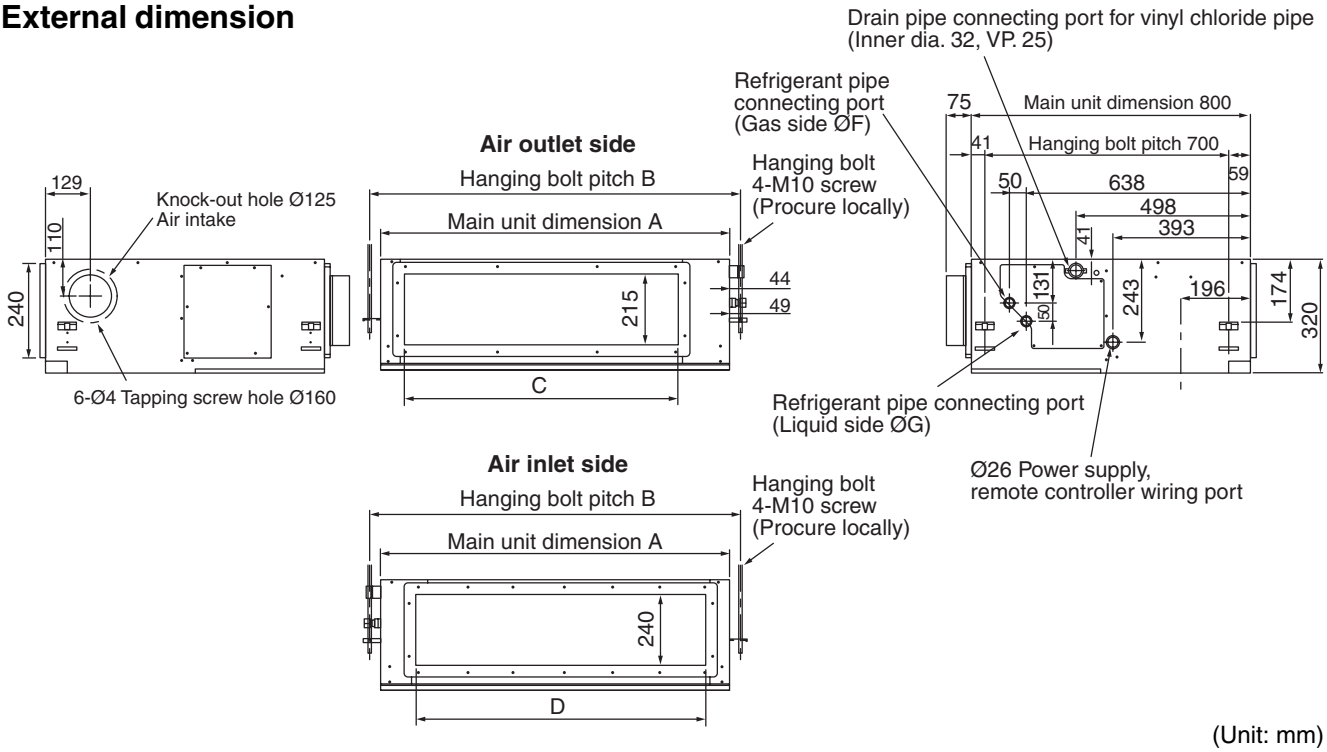
During high humidity conditions (raining season), high humidity may be apparent in the ceiling aperture. (dew point temperature 23°C or more)

1. Insulate the inside of the ceiling with tiles on the roof.
2. Insulate the inside of the ceiling with a slated roof.
3. Insulate inside the roof where fresh air intakes are ducted.

- In the above cases, add additional thermal insulation (Glass wool, etc.) to all areas of the air conditioner, which come in to contact with the high-humidity atmosphere. In such cases position the side plate (Service plate) so that it can be easily removed.
- Apply thermal insulation to the duct and interconnecting parts of the duct.

[Reference] Dewing test conditions
Indoor side: 27°C dry bulb temperature
24°C wet bulb temperature
Air volume: Low air volume, operation time 4 hours

External dimension



(Unit: mm)

Model MMD-	A	B	C	D	F	G
AP0071BH, AP0091BH, AP0121BH	550	616	350	470	9.5	6.4
AP0151BH, AP0181BH	700	766	500	620	12.7	6.4
AP0241BH, AP0271BH, AP0301BH	1000	1066	800	920	15.9	9.5
AP0361BH, AP0481BH, AP0561BH	1350	1416	1150	1270	15.9	9.5

- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX21E
  TCB-AX21E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

Ceiling opening and positioning of hanging bolts

- Before installing the unit consider the piping/wiring position and directions.
- Upon determining the position of the indoor unit, create an opening for the wiring and mount the hanging bolts.
- For the size opening of the ceiling and the hanging bolt pitch refer to the external dimensions.
- If the ceiling is boarded, position and ensure that the drain pipe, refrigerant pipes, inter-connecting wires and all control wires are in place prior to installing the actual indoor unit.

Hanging bolts, nuts and washers are to be procured locally.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces

Setup of outside static pressure

Determine the external static pressure of the duct that is to be connected, and adjust flow settings based on the resistance.

To change the external static pressure, this must be done using a wired remote control using the DN setup code: 5d

For details of this procedure refer to section "**18**".

Change on wired remote controller

Setup data	Outside static pressure	
0000	40Pa	Standard (At shipment)
0001	70Pa *1	High static pressure 1
0003	100Pa *2	High static pressure 2
0006	20Pa	High static pressure

*1: 65Pa for Model AP0481BH, AP0561BH
*2: 90Pa for Model AP0481BH, AP0561BH

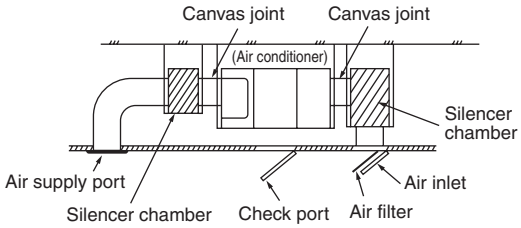
6-7. Concealed Duct High Static Pressure Type

Duct design

1. In order to prevent short circuits design the duct work so that the intake and discharge openings are not adjacent to each other.
2. The indoor unit does not have a built-in air filter. Always install locally procured air filter in a location that permits easy maintenance, such as behind the intake grille. (If no air filter is installed dust will collect in the heat exchanger, which may cause the air conditioner to fail or to leak.)

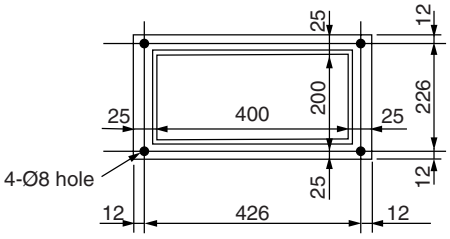
Overview of duct connection

NOTE : All parts other than the actual air conditioner are to be procured locally.

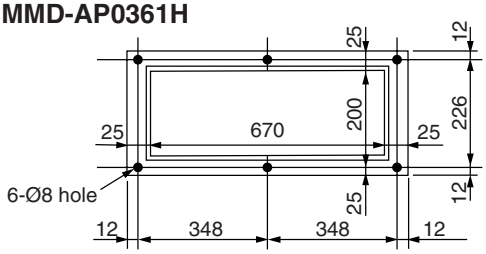


Air supply connecting flange

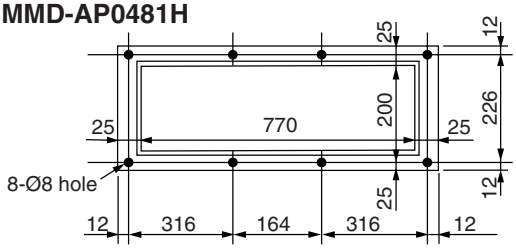
MMD-AP0181H to AP0271H



MMD-AP0361H

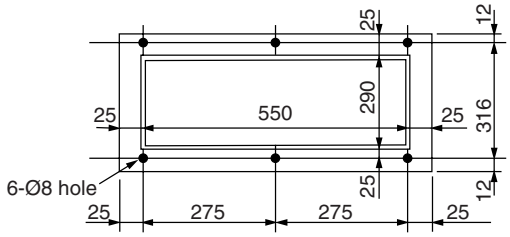


MMD-AP0481H

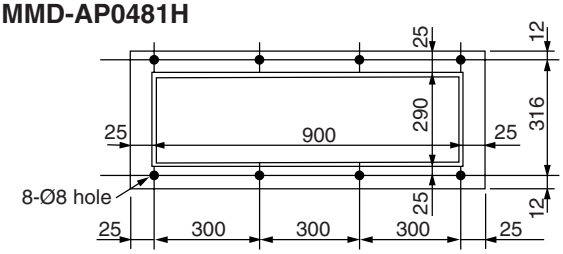


Air return connecting flange

MMD-AP0181H to AP0361H

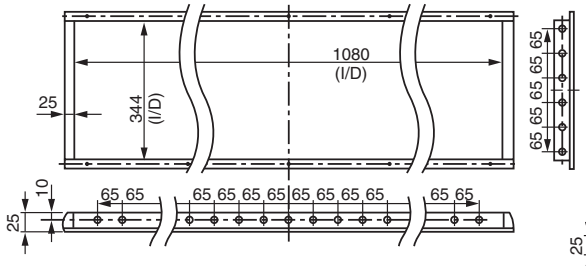


MMD-AP0481H

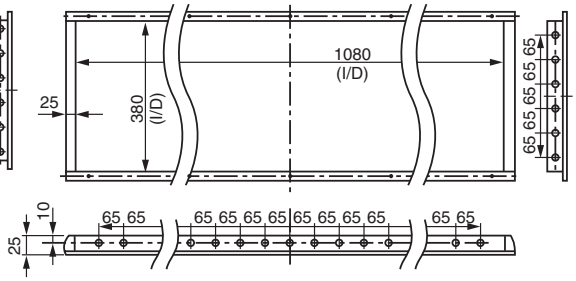


- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

MMU-AP0721H to AP0961H



<Air supply side connecting flange>



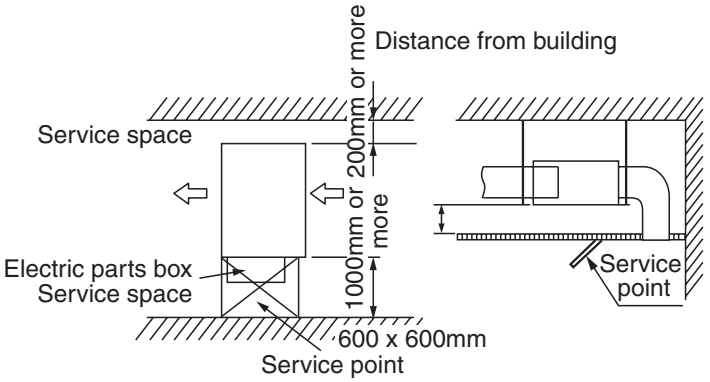
<Return air side connecting flange>

REQUIREMENT

When connecting the canvas joints to the air conditioner do not use rivets, as this will prevent access to checking of the fan assembly and refrigerating cycle. Be sure to use the bolts for tightening the flange. (Fixing bolts M6 × 12 Field-supplied)

Service space

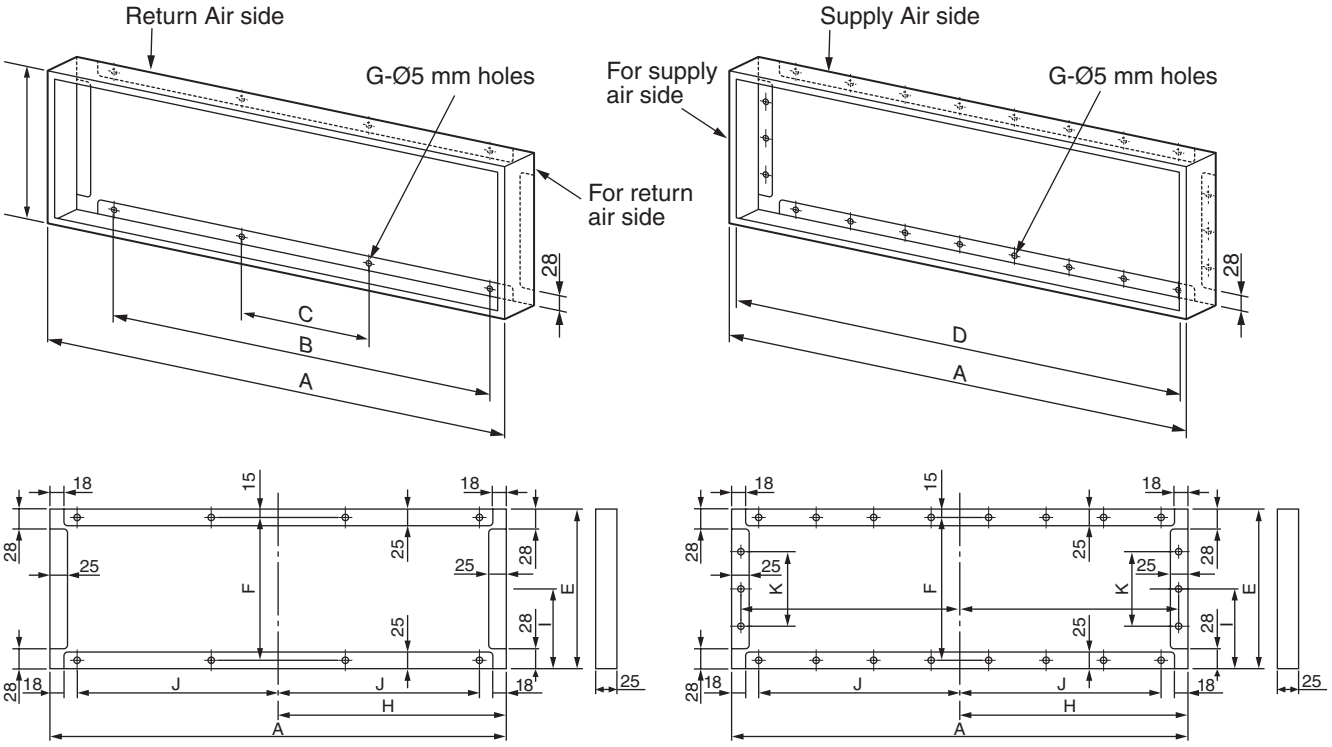
MMD-AP0721H to AP0961H



For reference

Square duct (Procured locally)

MMD-0071BH to 0561BH



(Unit: mm)

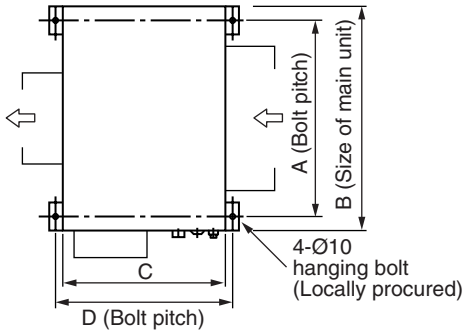
	Model MMD-	A	B	C	D	E	F	G	H	I	J	K
Return Air side (Return filter side)	AP0071BH to AP0121BH											
	AP0151BH to AP0181BH	700	—	400	—	420	390	4	350	195	—	—
	AP0241BH to AP0301BH	1000	700	430	—	420	390	8	500	195	350	—
	AP0361BH to AP0561BH	1350	1050	580	—	420	390	8	675	195	525	—
Supply Air side	AP0071BH to AP0121BH											
	AP0151BH to AP0181BH	550	455 (65 x 7)	65	530	265	245	20	275	132.5	227.5	130
	AP0241BH to AP0301BH	850	715 (65 x 11)	65	830	265	245	28	425	132.5	307.5	130
	AP0361BH to AP0561BH	1200	1105 (65 x 17)	65	1180	265	245	40	600	132.5	552.5	130

External dimensions

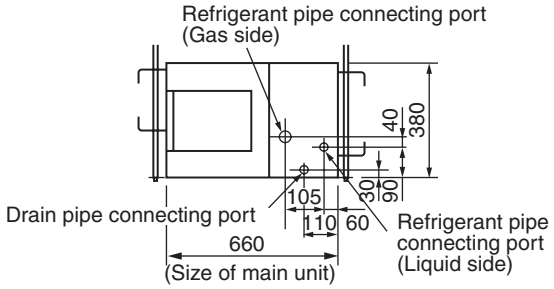
Installing the four 10mm-diameter hanging bolts

- Space the hanging bolts according to the dimensions shown in the diagrams below.
- Use 10mm-diameter hanging bolts (Procured locally).

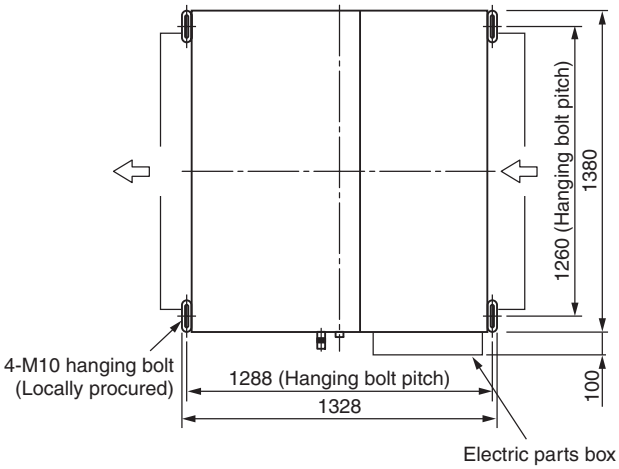
MMD-AP0181H to AP0481H

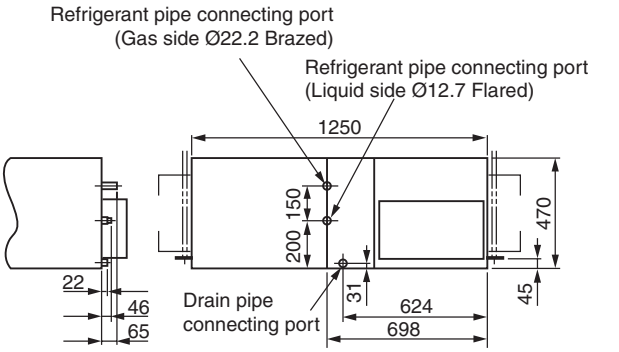


Model MMD-	A	B	C	D
AP0181H to AP0361H	800mm	850mm	660mm	700mm
AP0481H	1060mm	1200mm	1288mm	1328mm



MMD-AP0721H to AP0961H





Treatment of ceiling

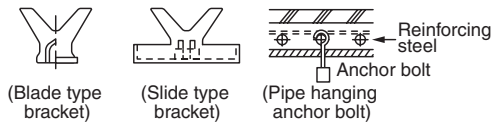
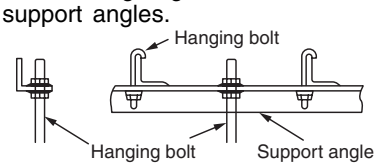
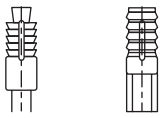
The ceiling differs according to the structure of the building. For details, consult your architect.

In the process after the ceiling panels have been removed, it is important to reinforce the ceiling construction and panels ensure the ceiling remains in a horizontal position. This is to prevent possible vibration of the ceiling panels.

Installation of hanging bolt

Use M10 hanging bolts (4 off to be procured locally).

When mounting the unit, set the pitch of the hanging bolts according to the size of the unit as detailed on the dimensional drawing.

New concrete slab	Steel frame structure	Existing concrete slab
Install the bolts with insert brackets or anchor bolts.  	Use existing angles or install new support angles.  	Use a hole-in anchors, hole-in plugs, or a hole-in bolts. 

Installation of remote controller (Sold separately)

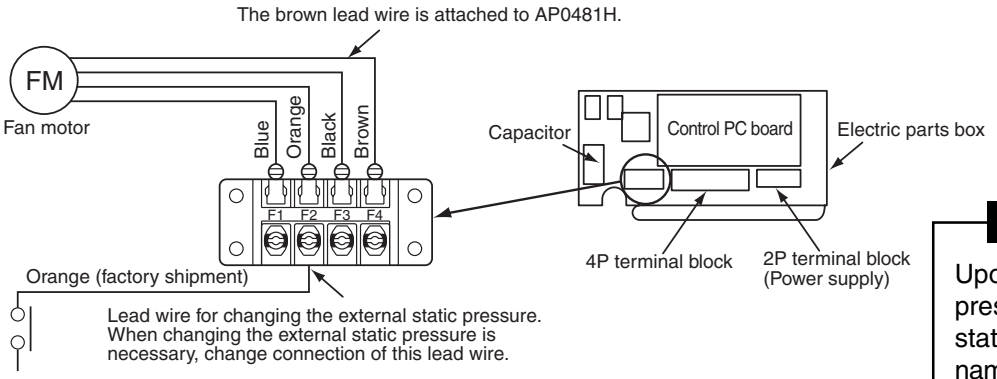
For installation of the remote controller, follow the Installation Manual supplied with the remote controller.

- Do not position remote controller where it is exposed to direct sunlight or excessive heat.

Wire connection change of fan motor

As supplied from the factory the fan motor wire connection is connected to 'F2' (External static pressure 14mmAq (137Pa)].
If it necessary to change the external static pressure, in accordance with the ducting resistance. This is carried out by changing the connection as detailed below.

MMD-AP0181H to AP0481H



REQUIREMENT

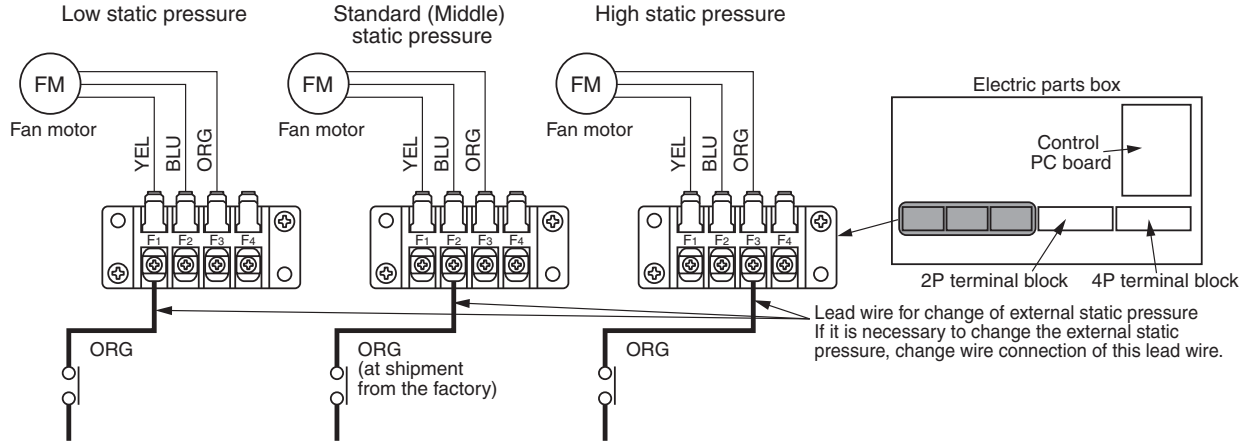
Upon changing external static pressure, write change of static pressure on the unit nameplate.

Terminal clock No.	Fan motor wiring		External static pressure (Pa) mmAq	Remarks
	Model MMD-			
	AP0181H to AP0361H	AP0481H		
F1	Blue (50/60Hz)		(69) 7	——
F2	Orange (50/60Hz)		(137) 14	Setting from factory
F3	Black (50Hz/60Hz)	Black (60Hz)	(196) 20	——
F4		Brown (50Hz)	(196) 20	——

Wiring change of fan motor

The fan motor wire is connected to (F2) [External static pressure 137Pa (14mmAq)] at shipment from the factory.
Requirement to change the external static pressure in accordance to the duct resistance must be done by change of the wiring.

MMD-AP0721H to AP0961H

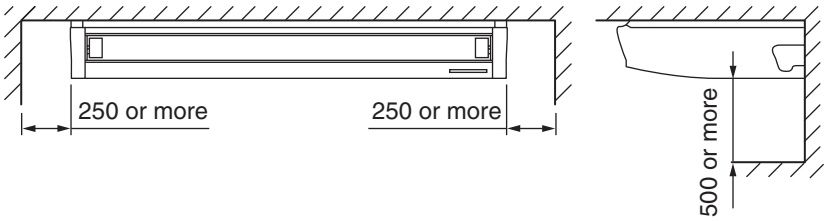


Terminal block No.	Fan motor wiring	External static pressure (Pa) mmAq	Remarks
	MMD-AP0721H, AP0961H		
F1 (Yellow)	(50/60Hz)	(69) 7	
F2 (Blue)	(50/60Hz)	(137) 14	At shipment of factory
F3 (Orange)	(50/60Hz)	(196) 20	

6-8. Under Ceiling Type

Installation space

Ensure that there is sufficient space for the installation as detailed in the figure.



Height of ceiling

The height of the unit must be installed within 4m. Above this height would cause poor air-distribution.

If the height of the ceiling exceeds 3.5m. the air-throw becomes insufficient to reach the floor. It is therefore necessary to adjust the set-up to high ceiling mode.

When using a separately supplied filter it will be necessary to change the setting of the high ceiling mode. This is referred to within the application control manual.

List of installable ceiling heights

Setup data		
0000	Standard (At shipment)	3.5m or less
0001	High ceiling 1	4.0m or less

According to the environmental conditions of the installation, the air filter cleaning indicator can be adjusted.

If installed in an area where it is difficult to maintain heat, there is a setting for adjustment to allow a higher heating temperature.

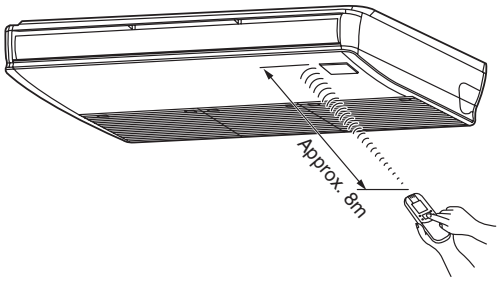
Wireless type control

Determine the position in which the remote controller is to be operated and installed.

Refer to the Installation Manual of the wireless remote controller kit sold separately.

(The signal of the wireless type remote controller can operate up to approximately 8m. This distance may vary according to the battery power, physical obstructions and interference from other electrical devices).

- To prevent possible malfunction, select a location that is not effected by direct sunlight or florescent lighting.
- Up to 6 off wireless type remote controllers may be used in the same room.

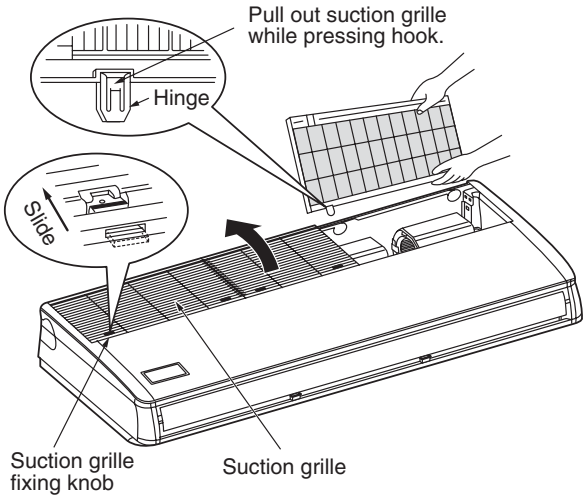


Before installation

1. Removal of suction grille

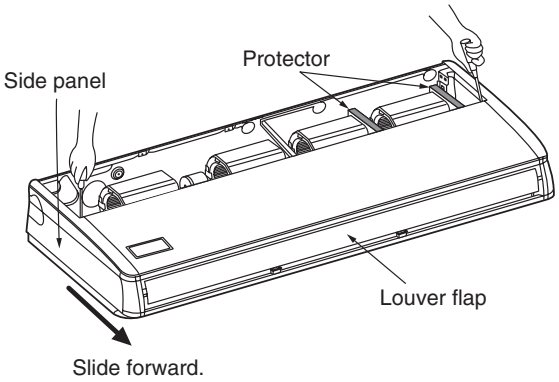
There are two fixings on the suction grille, slide in the direction of the arrow and then open.

When the suction grille is open, press the protrusion on the two hinges and remove the suction grille.



2. Removal of side panel

After removing the side panel fixing screws (1 on each side), slide the side panel forward and then remove.



3. Removal of protective vinyl

Peel off the protective vinyl on the louver flap.

4. Removal of protector

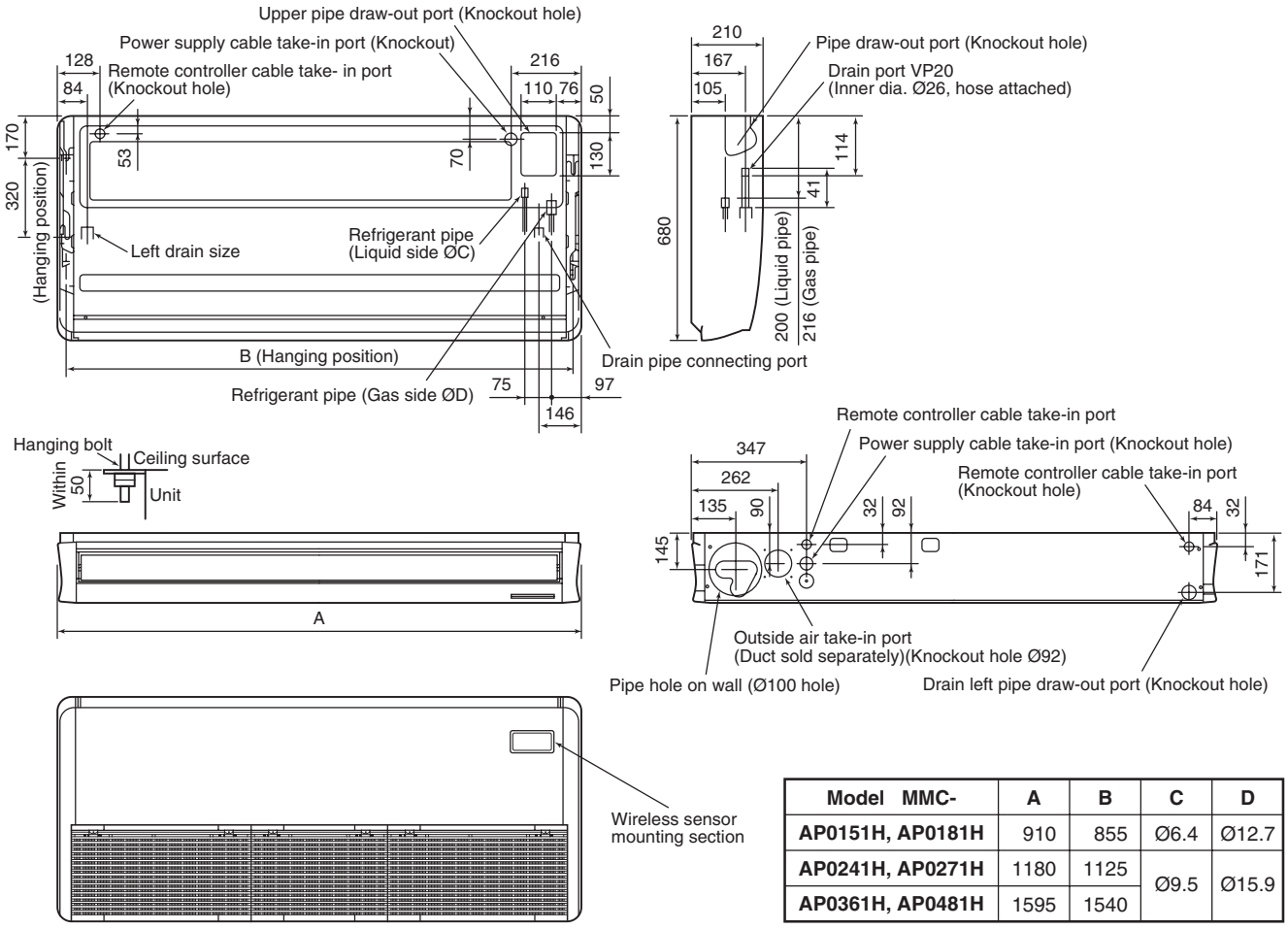
Remove the 2 protectors from the fan. (MMC-AP0241H, AP0271H only)

External dimensions

REQUIREMENT

Strictly comply to the following rules to prevent damage of the indoor units and human injury.

- Do not place a heavy item on the indoor unit. (Even when packaged)
- When moving indoor unit leave in packaging wherever possible. If moving the indoor unit unpacked is necessary due to restrictions, be sure to use a protective cloth in order not to damage the unit.
- Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
- Carry the package by two or more persons, and do not strap at positions other than specified.



Model MMC-	A	B	C	D
AP0151H, AP0181H	910	855	Ø6.4	Ø12.7
AP0241H, AP0271H	1180	1125	Ø9.5	Ø15.9
AP0361H, AP0481H	1595	1540		

- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX22CE
  TCB-AX22CE2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

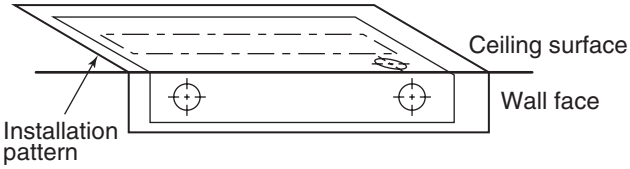
Determine an installation location for the unit, considering the pipework and wiring.

- If the ceiling material is already in place prior to hanging the unit. Prepare and install refrigerant pipes, drain pipe and all electrical wiring and control wiring in a position for ease of connection upon mounting the unit.
- Check the size of the indoor unit and match the size of the indoor unit to the installation pattern.

How to use supplied installation pattern

Using the pattern positioning of the hanging bolts and pipe holes can be determined.

* As the pattern may have a small degree of dimensional change due to temperature and humidity, be sure to confirm the size and location of the hanging bolt and pipe hole accordingly.

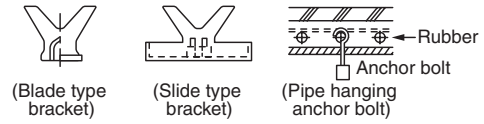


Installation of hanging bolts

Use M10 hanging bolts (4 off locally procured). Matching to the existing structure, set pitch according to the size in detailed on the external dimensions.

New concrete slab

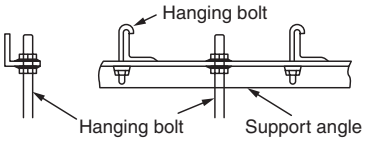
Install the bolts with insert brackets or anchor bolts.



(Blade type bracket) (Slide type bracket) (Pipe hanging anchor bolt)

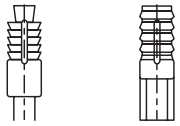
Steel frame structure

Use existing angles or install new support angles.



Existing concrete slab

Use a hole-in anchors, hole-in plugs, or a hole-in bolts.



Draw-out direction of pipe/cable

- Determine installation position of the unit and draw out direction of the pipes and cables.

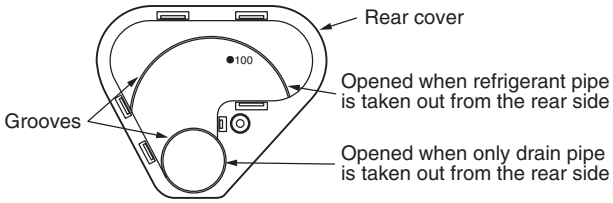
Knockout hole for power cable intake

Remove the knockout for the power cable and fit the supplied bushing.

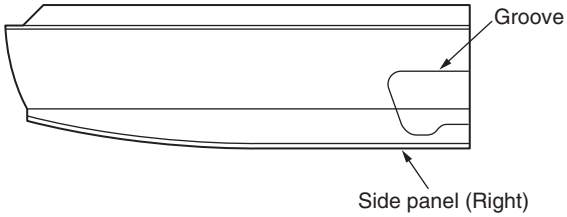
Detailed on the external dimensions.

Pipe knockout hole

- **In case of taking pipe from the rear side**
  * Cut off the groove section using a plastic type cutter.



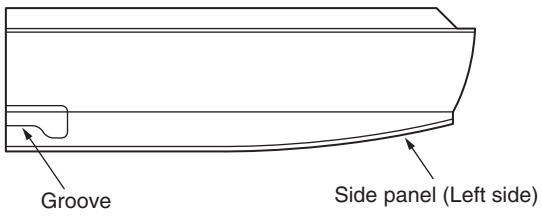
- **In case of pipe entering from the right side**
  * Cut off the groove section with a metal saw or plastic cutter, etc.



- **In case of pipe entering from left side**

  It is only possible to route the drain pipe from the left side.

  The refrigerant pipework cannot enter from the left side.
  * Cut off the grooved section with a metal saw or plastic cutter, etc.



- **In case of pipe entering from the upper side**

  Only the refrigerant pipe may enter from the upper side of the unit.

  If the drain pipe has to enter from the upper side, a drain pump kit must be fitted (Not supplied).

  Remove the upper side knockout hole as detailed on the external dimensions.

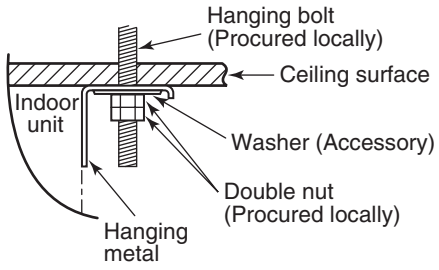
  Upon completing the piping. Remove excess insulation and seal the knockout.

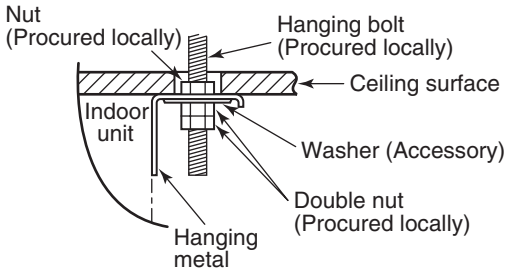
Installation of the indoor unit

- **Preparation before fixing the unit in position.**

  * It is necessary to evaluate the construction of the ceiling as the hanging method will differ. Hanging methods are detailed below:

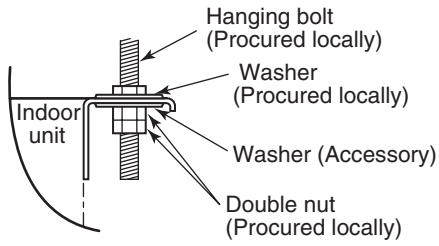
Suitable Ceiling material





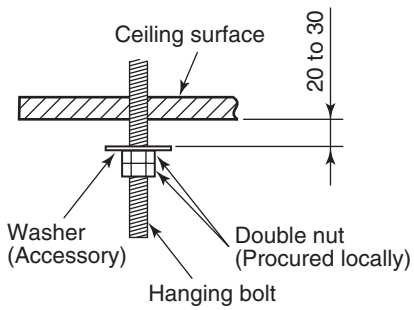
  * Tighten the hanging metal using the upper and lower nuts as shown in the figure.

No ceiling material

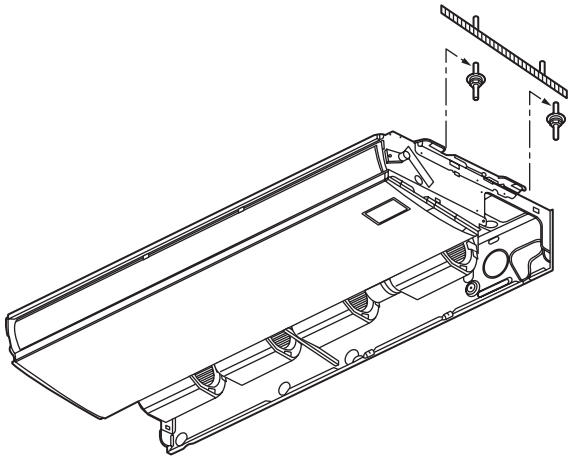


- **Hanging of main unit**

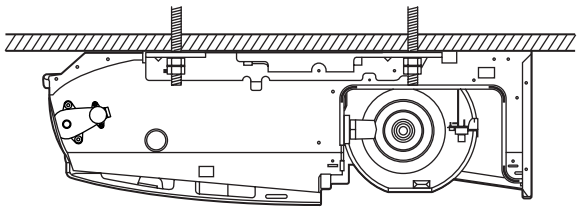
  1) Attach washer and nuts to the hanging bolt.



  2) Hang the unit to the hanging bolt as shown in the figure below.



  3) As shown in the figure below, fix to the ceiling material securely using the double nuts.



REQUIREMENT

- **When mounting to a ceiling surface that may not be horizontal, It is necessary to ensure that the unit is mounted horizontally in both directions.**

Installation of remote controller (Sold separately)

For installation of the wired remote controller, refer to the Installation Manual supplied with the remote controller.

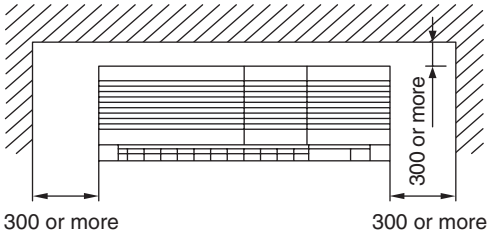
- Route the remote control wiring with the refrigerant pipe and drain pipe.
  Ensure that the remote control wiring is on the upper side of all pipework.
- Do not expose remote controller to direct sunlight or excessive heat.
- For the wireless type remote controller, operate and ensure indoor unit receives signal and then install.
- For a wireless type controller ensure that it is used and mounted a minimum distance of 1m apart from any other electrical devices(TV, Stereo, etc). As this may cause interference with the devices.

6-9. High Wall Type (1 series)

Installation space

Ensure that there is sufficient space for the installation and service work.

Keep a minimum of 300mm as clearance between the top plate of the indoor unit and the ceiling surface.



The unit is supplied fitted with transportation brackets. Referring to the below table remove the relevant brackets according to the direction, in which the pipework is to enter.

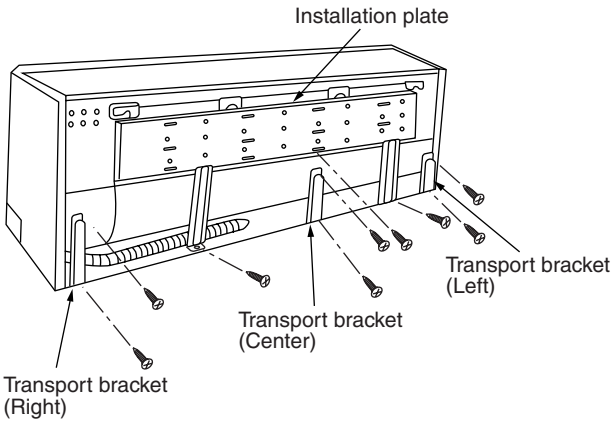
(Left, right and center) (For AP0071H to AP0181H, only left and right transport brackets are fitted.)

Pipe side piping	Parts to be removed
Right side piping	Remove the right transport bracket only.
Rear side piping	
Left side piping	Remove all transport brackets.

REQUIREMENT

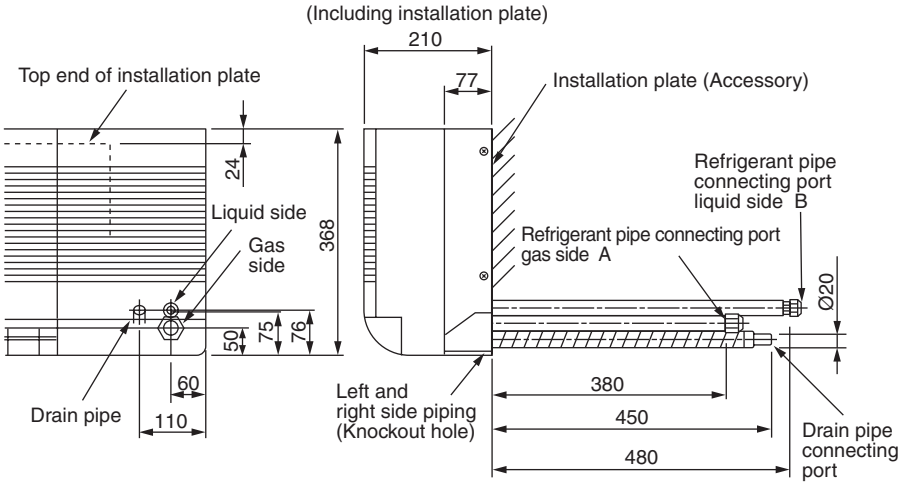
The transport brackets are to prevent deformation or breakage to the unit, therefore after removal do not apply force to the lower cabinet.

- Remove the installation plate.



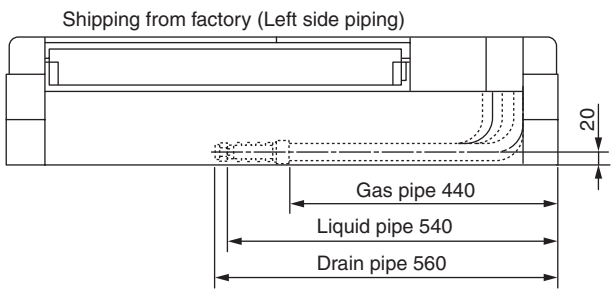
Pipe connecting position

Front view



- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX21E
  TCB-AX21E2
- **Weekly timer application**
  RBC-AMT31E and
  RBC-EXW21E2

<Bottom view>



Model MMK-	A	B
AP0071H to AP0121H	Ø9.5	Ø6.4
AP0151H, AP0181H	Ø12.7	Ø6.4
AP0241H	Ø15.9	Ø9.5

The notification of filter cleaning intervals can be changed on the remote controller, according to the environmental condition of the installation.

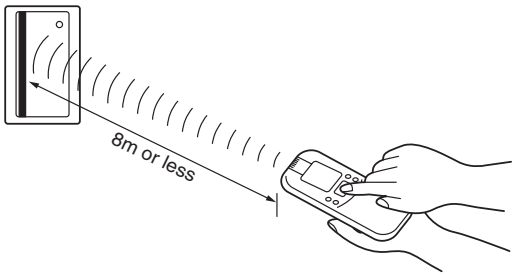
If the room is not heated due to the installation place or construction of the room, the detection temperature of heating can be raised.

To make the above changes refer to the applicable controls within this manual.

In case of wireless type

The wireless remote control can be operated up to a maximum of 8 metres from the infra-red receiver. Therefore ensure that the remote control will be mounted and used within this stated parameter.

- To prevent malfunction do not mount or operate in a location near to florescent or direct sunlight.
- A maximum of 6 indoor units with wireless remote control can be installed in the same room.



Installation of indoor unit

⚠ WARNING

The installation of the air conditioning unit must be positioned in a location that can sufficiently support its weight and give protection against adverse environmental conditions.

Failure to do so may result in unit damage and possible human injury.

Any incomplete installation may also cause possible risk to human injury.

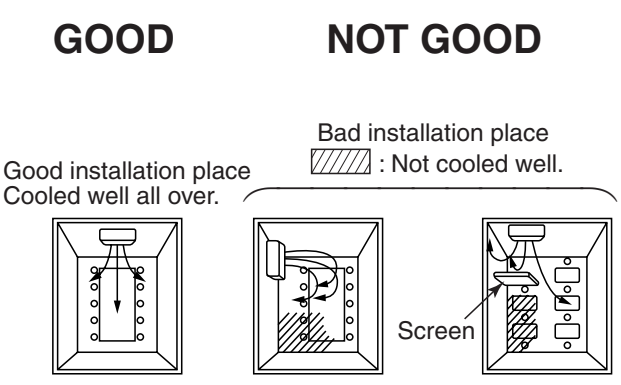
REQUIREMENT

Strictly comply to the following rules in order to prevent damage to the indoor units and human injury.

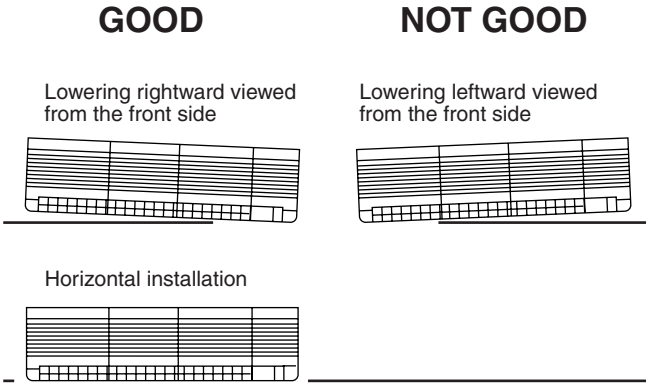
- Do not put a heavy item on the indoor unit. (Even when units are packaged)
- When moving indoor unit leave in packaging wherever possible. If moving the indoor unit unpacked is necessary due to restrictions, be sure to use a protective cloth in order not to damage the unit.
- To move the indoor unit, do not apply force to the refrigerant pipe, drain pan, foamed parts or resin parts, etc.
- The packaged unit must be carried by two or more persons. Straps should only be used at the positions indicated on the packaging.

Caution must be taken when installing in the following conditions.

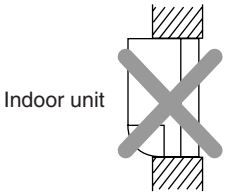
- Consider the air discharge direction, select an installation place where discharge air can circulate evenly with in a room. Refer to figure for GOOD / NOT GOOD positioning.



- To increase the effect of the drain, ensure the unit is positioned horizontally or slightly lower at the right hand side. Figure below is view of front elevation.



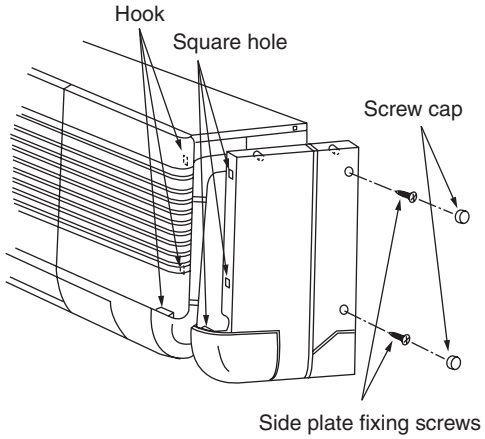
- Do not install the unit by plugging in the wall.



- The weight of the indoor unit including the installation plate is detailed in the following table. Ensure the wall's construction is suitable to withstand the total weight of the unit.

Model MMK-	Mass (kg)
0071H to 0121H	20
0151H to 0181H	22
0241H	29

- When installing the side plate ensure that the unit is located on the installation plate correctly. Mount the side plate ensuring it locates on the unit.



Installation of installation plate

- Using the installation pattern, determine the position of the indoor unit and drill the pipe hole in the position indicated on the installation pattern. When passing the refrigerant pipe through the wall use a metal mesh. Ensure insulation sleeve is used, such as polyvinyl chloride pipe.

■ In case of wooden construction (Partitioned wall)

(1) Check that the vertical dimension between the ceiling and the indoor unit at each end are identical.(Ensuring unit is horizontal)

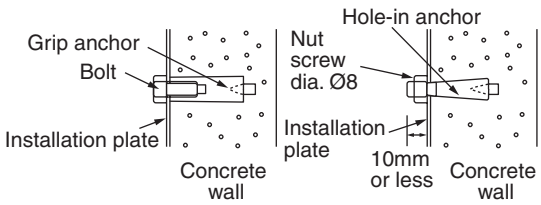
(2) Determine the position so that screw holes of installation plate locates at the center of the pillar or stud by adjusting left/right position without changing height of the installation plate.

(3) Tighten the screws (accessory parts) after pre-drilling the stud, this is to prevent possible cracking of the constructed wall.

■ In case of reinforced concrete construction

(1) After drilling holes at 150mm intervals in the correct position on the concrete wall, hammer in grip anchor or hole-in anchor.

(2) Fix the installation plate to the anchor with bolt or nut.
Note: When using hole-in anchor you will need to adjust drilling depth so that screw thread protrudes a maximum of 10mm.



REQUIREMENT

- Check with the constructor location of conduit, cabling, etc within the wall.
- Before installation of the indoor unit, ensure installation plate is mounted correctly.

■ In case of rear direction piping

Using the installation pattern, determine the pipe hole position and drill a pipe hole at a slight angled downwards position.

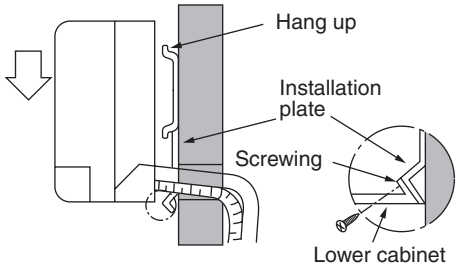
Installation of indoor unit

■ In case of rear and right direction piping

(1) Pass the drain pipe through the hole in the wall and hang the indoor unit at the top of the installation plate.

(2) Check that the top end of the installation plate is inserted by moving the indoor unit to the left and right.

(3) Fix the bottom end of the installation plate and the lower cabinet with screws so that the indoor unit does not move.



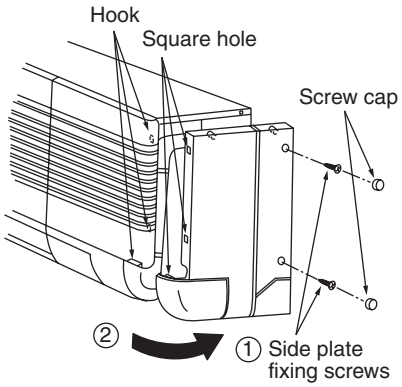
■ Removing of indoor unit right side plate

Remove the right side plate as per the following procedure.

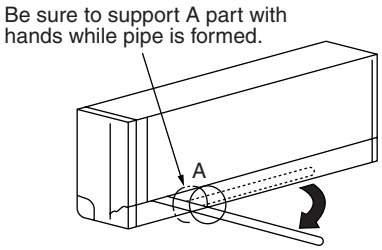
(1) Remove the two side plate fixing screws.

(2) Remove the side plate by turning the grey coloured part counter-clockwise to remove hooks in the square hole of the suction grille.

(3) When piping is entering from the right side, cut off the knockout of the side plate with a knife or similar and finish the end face.



■ In case of rear direction piping



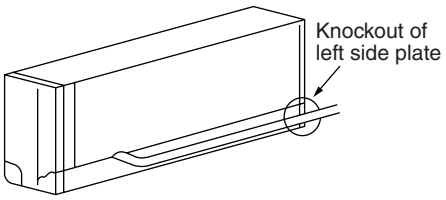
■ In case of left direction piping

Work after removal of the lower cabinet.

(1) Remove the left/right side plates.

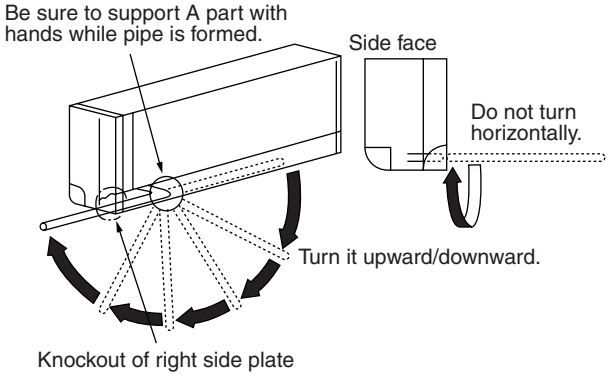
(2) Remove the two screws on the lower cabinet.

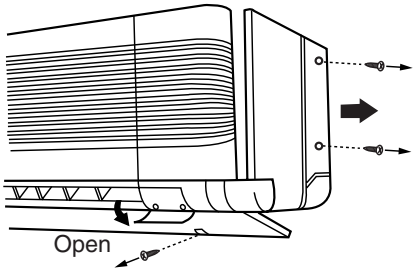
(3) Pull the lower cabinet towards you lowering a little.



■ In case of right direction piping

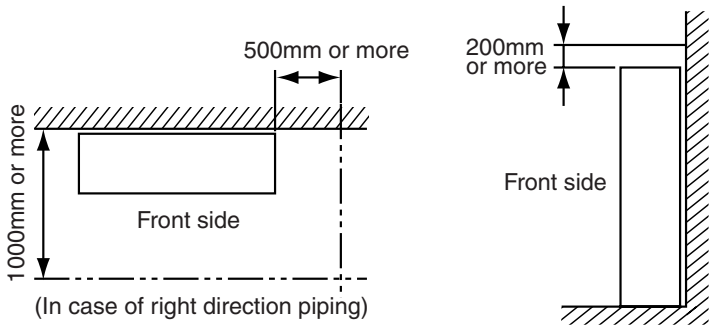
- Insert the right side plate, this will click into position. (Refer to right side plate installation drawing.)
- Fix the side plate and cover the screw heads with the supplied caps.





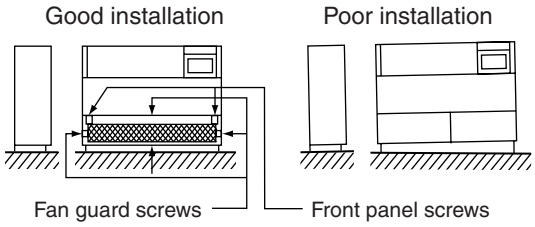
6-10. Floor Standing Cabinet Type

Installation space and service space



Indoor unit

- **Install an indoor unit as described below.**

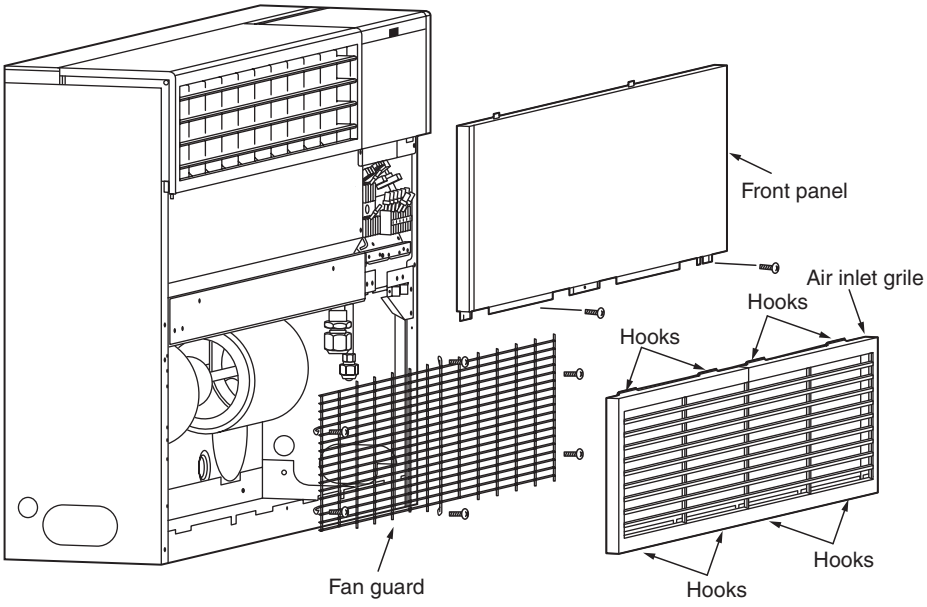


1. Prior to piping or electrical work, remove the air inlet grille. (Push down the upper part slightly and pull it towards you.)
2. Remove the front panel. (Fixing screws at the right and left sides on the lower side)
3. Remove the fan guard. (Fixing screws at right, center and left sides)
4. Start piping and cabling work.
5. Keep space at the front of the indoor unit as wide as possible. A wide space is required for maintenance and service work. It will also give a more effective distribution of hot and cool air.
6. Install the indoor unit horizontally or slightly lower at the right side of the front elevation in the direction of the drain.

How to remove the panel before piping and electrical wiring

1. Remove the air inlet grille (4 hooks at top and bottom) and then remove the fan guard (6 screws) for piping work.
2. Remove the front panel (2 screws) for wiring work

- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX21E
  TCB-AX21E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E

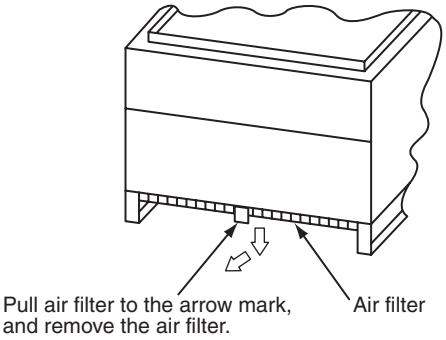


6-11. Floor Standing Concealed Type

Prior to installation

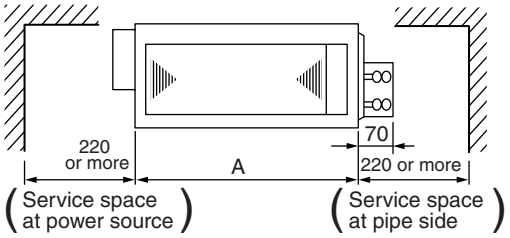
REQUIREMENT

- A drain filter is fitted to the outside of the indoor unit, this is in order to prevent clogging caused by dust or possible foreign matter during operation. Clean filter prior to commissioning and periodically during operation.
- An air filter is fitted to the underside of the unit. Be sure to clean prior to commissioning.



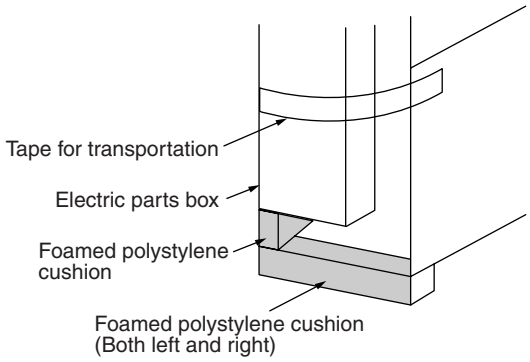
Installation space

Model MML-	A
AP0071BH to AP0121BH	610
AP0151BH to AP0241BH	910



Installation of indoor unit

1. Only remove packaging once unit is near to the position of installation.
2. Remove transportation protection (polystyrene cushion) from under left and right side plate of main unit and the electric box. Remove transportation tape that is adhered to the electrical parts box.
3. Install the indoor unit before lining the wall.



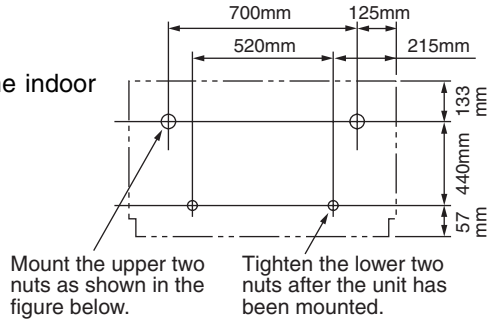
Fixing of unit

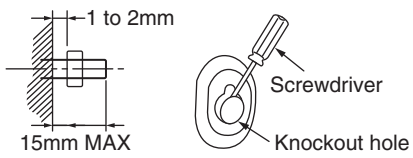
Fix the indoor unit to the floor and wall by attaching two or four M8 anchor bolts in the position as shown in the following figure. Fix and tighten nuts.

For fixing indoor unit to the wall

Fix the indoor unit to the wall as described below.

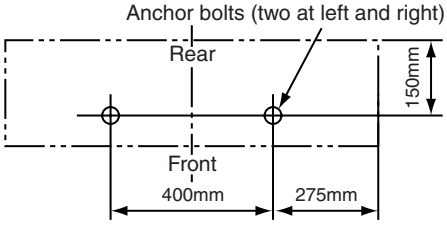
1. Referring to the following figure, fix four M8 anchor bolts to the wall.
2. Attach the nuts to the upper two anchor bolts.
3. Using a screwdriver or similar, remove knockout at the rear side of the indoor unit.
4. Hang the indoor unit on the anchor bolts.
5. Tighten the nuts on the two lower anchor bolts.



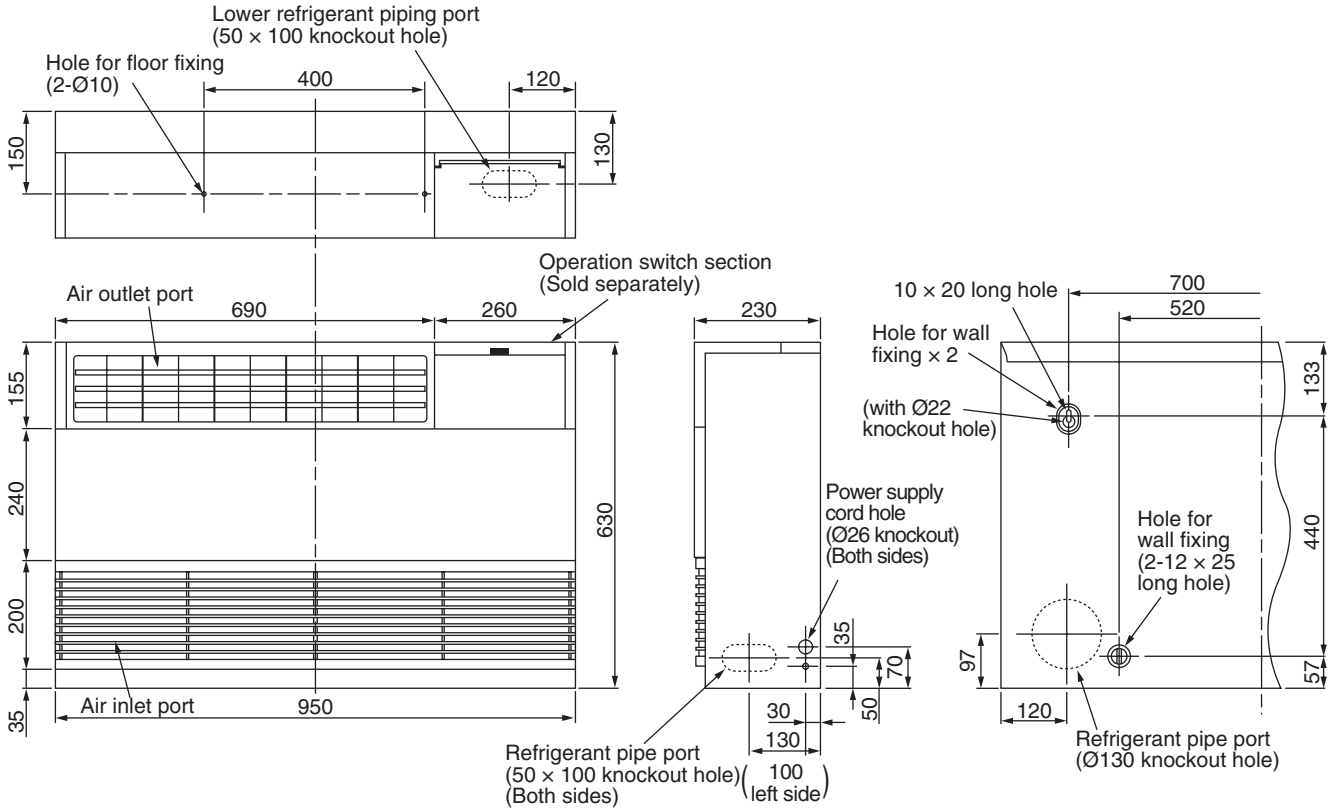


For fixing indoor unit to the floor

Position and fix two anchor bolts to pass through the bottom plate of the indoor unit. Fit nuts and tighten.



External dimensions

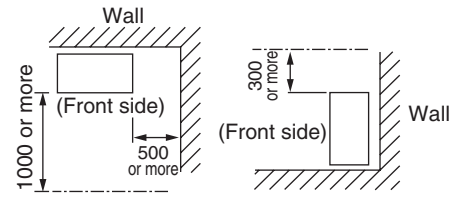


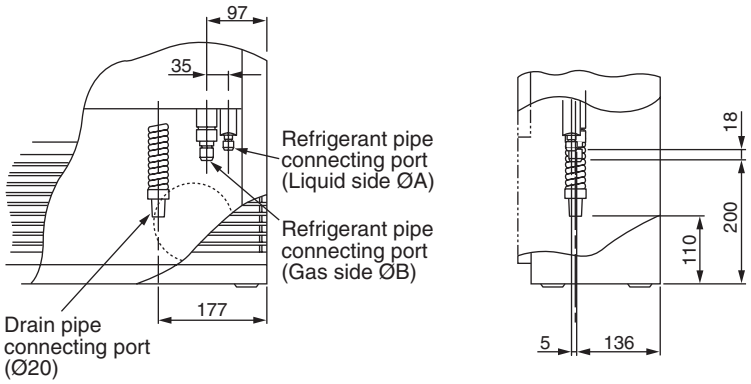
- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

Dimensions

Model MML-	A	B
AP0071H, AP0091H, AP0121H	Ø6.4	Ø9.5
AP0151H, AP0181H	Ø6.4	Ø12.7
AP0241H	Ø9.5	Ø15.9

Space required for service
(Figure shows piping at the right side)





Piping position drawing

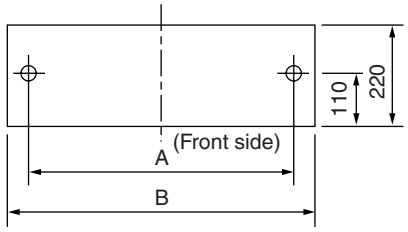
Installation of remote controller (Sold separately)

For installation of the wireless remote controller, follow the Installation Manual supplied with the remote controller.
Do not expose remote controller to direct sunlight or excessive heat.

- when using a wireless type remote controller check receiver on the indoor unit receives a signal and then install.
- For a wireless type controller ensure that it is used and mounted a minimum distance of 1m apart from any other electrical devices(TV, Stereo, etc). As this may cause interference with the devices.

For fixing indoor unit to the floor

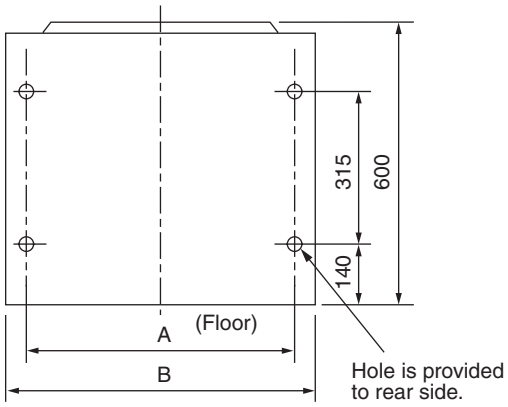
Indoor unit viewed from overhead



Model MML-	A	B
AP0071BH to AP0121BH	580	610
AP0151BH to AP0241BH	880	910

For fixing indoor unit to wall

Indoor unit viewed from front side



Model MML-	A	B
AP0071BH to AP0121BH	580	610
AP0151BH to AP0241BH	880	910

* Attach and fix the electric parts box to the wall under condition that electric parts box to be attached to the side face is removed. Remove the electrical parts box as follows.

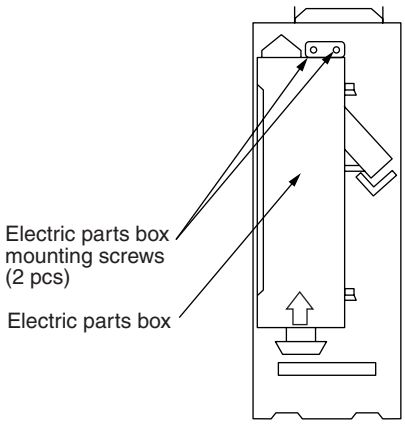
How to remove the electric parts box

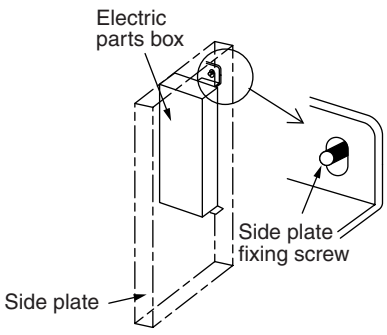
1. Remove two mounting screws at the upper side of the electric parts box.
2. Slide the electric parts box towards the arrow marking and remove.

Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow the Installation Manual attached to the remote controller.

- Route the remote controller wiring together with the refrigerant pipe and drain pipe. Be sure to route the remote controller wiring on the upper side of the refrigerant pipe and drain pipe.

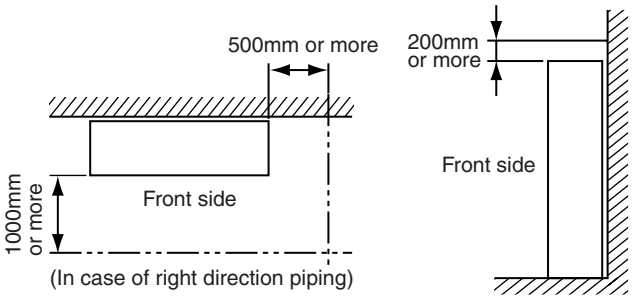




Installation space

REQUIREMENT

When using the air conditioner in a high humidity condition, fit thermal insulation to the side and rear face of the indoor unit.



Unit fixing bolt

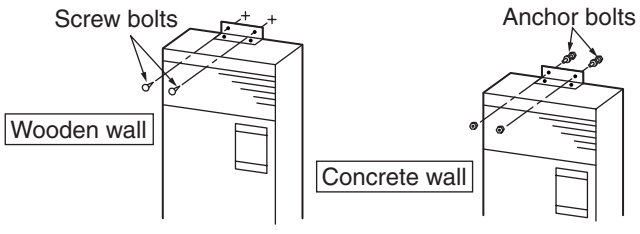
- Fixing to a wooden wall and wooden floor (AP0151 Model to AP0271 Model)
  Use the four screw bolts (M8 × L50) for transportation and the two screw bolts attached to inside of the indoor unit.
- Fixing to a wooden wall and wooden floor (AP0361 Model to AP0561 Model)
  Use the two screw bolts (M8 × L50) for transportation and the four screw bolts attached to inside of the indoor unit.
- Fixing to models other than the above
  Procure locally six anchor bolts. (M8 × L50 or longer)

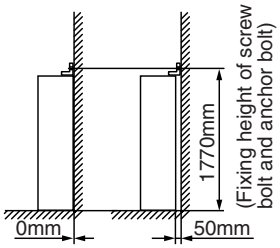
Fixing the indoor unit to the wall surface

Use the supplied wall fixing bracket by inverting it at upper side of the unit. Fix the indoor unit to the wall surface using the supplied screw bolts, anchor bolts etc. in two positions. There are many hole fixings on bracket for mounting on the indoor unit and the wall. Slide the bracket left and right to the required position and then securely fix the unit.

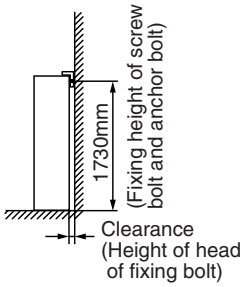
The wall fixing bracket for the indoor unit has an elongated hole, therefore making it possible to fix at any position. Ensure that a clearance of 0 to 50mm is maintained.

As shown below, it is also possible to fix the indoor unit without inverting the bracket. (In such case, keep a clearance between the indoor unit and the wall that is equal to the length of the protruding head on the bolt.)





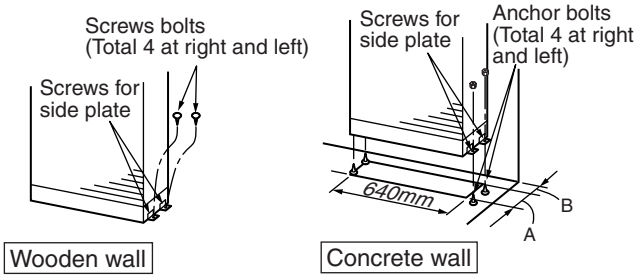
inverted bracket



non-inverted bracket

Fixing the indoor unit to the floor

Use the supplied floor fixing bracket to fix the lower right and left side of the indoor unit to the floor.
To fix to the indoor unit use the side plate screws, screw bolts or anchor bolts for fixing to the floor respectively.
Fix the unit in four positions, two at each side.

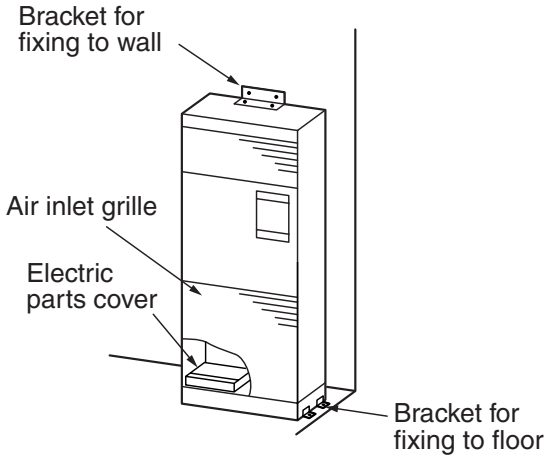


Model MMF-	A mm	B mm
AP0151H to AP0271H type	88	42 to 92
AP0361H to AP0561H type	258	52 to 102

Indoor unit fixing figure (Example)

REQUIREMENT

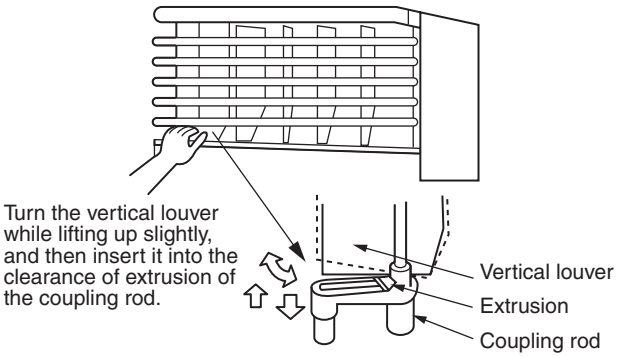
In cases where the unit is to be installed to a material other than wood, six anchor bolts are required (M8 x L50 or longer, locally procured)



Direction of vertical louver

During the transportation, It is possible that the automatic vertical louver may turn. Therefore manually position it in the direction of the plastic coupling rod.

To do this lift the louver in the upwards direction and rotate to the desired angle. Once completed lower and position the louver into the extrusion hole.



Installation of remote controller (Sold separately)

For installation of the wireless remote controller, follow the Installation Manual supplied with the remote controller.

- Do not expose remote controller to direct sunlight or excessive heat.
- When using a wireless type remote controller check receiver on the indoor unit receives a signal.
- For a wireless type controller ensure that it is used and mounted a minimum distance of 1m apart from any other electrical devices(TV, Stereo, etc). As this may cause interference with the devices.

7. OUTDOOR UNIT INSTALLATION

7-1. Selecting a Location for Installation

⚠ CAUTION

Ensure that the unit is placed where there is no risk of flammable gases.

If flammable gases accumulate around the outside of the unit combustion may occur.

Ensure the outdoor unit is fixed to the base, to prevent movement of the unit.

REQUIREMENT

- Avoid locating where a machine is generating a high frequency.
- Using the air conditioner at a specific location where the spray of oil (including machine oil) or steam is possible, salty location such as the seaside, or a place where gas sulfide generates such as a hot spring may cause a problem.

  If doing so, special maintenance is required. For details, contact the dealer where purchased.
- Avoid obstruction of the inlet and outlet port on the outdoor unit so that there is no restriction of air flow.
- Avoid installing the air conditioner in a location where strong wind blows against the inlet or outlet port of the outdoor unit.
- When using the air conditioner in a snowy area, mount a snowfall frame or hood to the outdoor unit.

  For details, contact dealer where purchased.
- Ensure outdoor unit has good drainage.
- Set TV or radio 1m or more apart from the main air conditioner unit and remote controller.

  Quality of picture or sound may be affected.

Operating sound

- Select a location where the operating sound and vibration will not transmit to other devices or cause physical disturbance to others.
- If an object is positioned near to the outlet port of the outdoor unit this may cause an increase in sound.
- Select a position where neighbours are not affected by the discharge air or sound from the outdoor unit.

Electrical wiring

⚠ WARNING

Ensure earthing practice is correctly performed.

Grounding is necessary, If earthing practice is incomplete an electric shock may be caused.

⚠ CAUTION

Ensure a electrical leakage breaker is fitted.

This is to prevent the risk of electric shock.

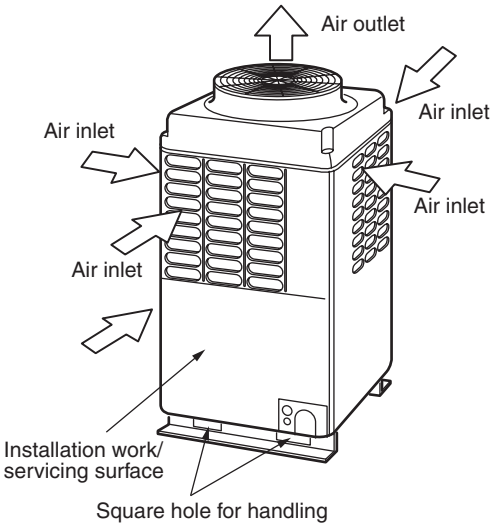
Only use fuses with the correct capacity.

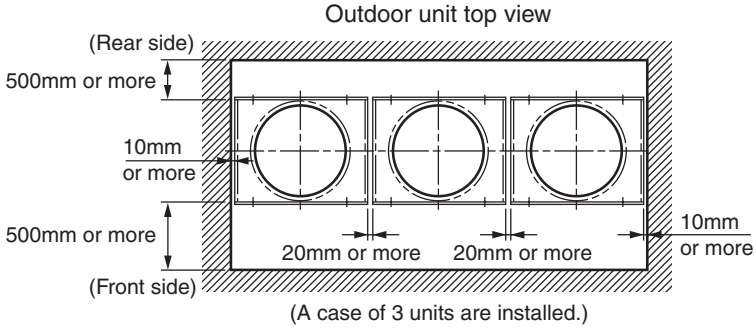
Using wire or copper wire may cause a fire or possible failure.

For the power supply, use a independent power supply for the air conditioner.

Installation space

1. Align the servicing surfaces of the outdoor units and connect them for installation.
2. Considering functions, reserve space necessary for construction and servicing.
   (The figure at lower right side shows a example where 3 units are installed in a module.





NOTES :

(1) If there is an obstacle above the outdoor unit, ensure there is a minimum space of 2000mm or more above the unit.

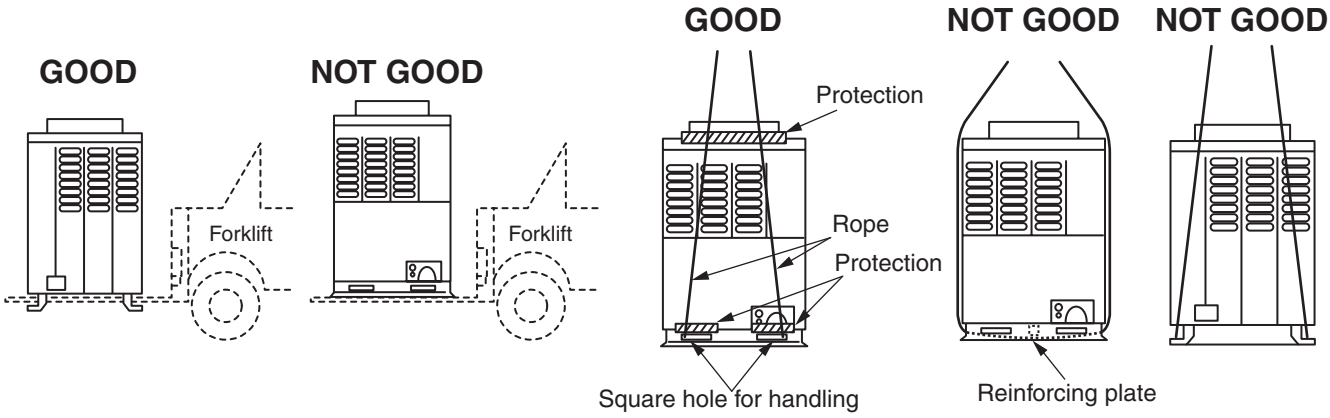
(2) Any obstacle around the perimeter of the outdoor unit must be kept 800mm or less.

(3) If height of the obstacle surrounding the outdoor unit is higher than the outdoor unit, it will be necessary to install discharge ducting.

[1] Outdoor unit carrying in

Care must be taken when handling the outdoor unit. Refer to the following items.

1. When using a forklift for loading/unloading during transportation, insert blade of the forklift into the square hole as shown below.
2. When lifting the unit, insert a harness into the square holes that can withstand the weight of the unit. (Apply a suitable protection to position where harness touches the outdoor unit so that no flaw or deformation is caused to the outer surface of the outdoor unit.)
   (The harness must not be passed under the reinforcing plates.)



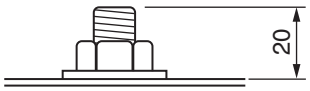
[2] Installation of outdoor unit

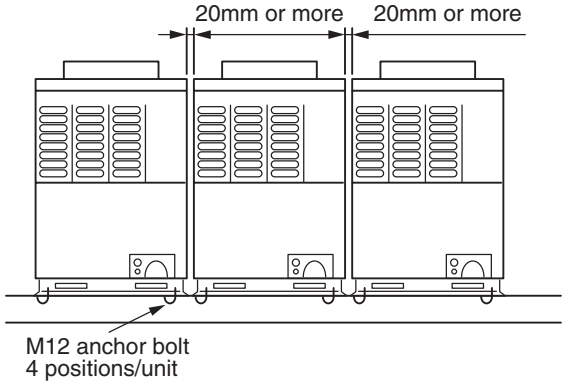
⚠ WARNING

- **The location of the installation must be able to protect from abnormal environmental conditions, such as earthquake and typhoons.**

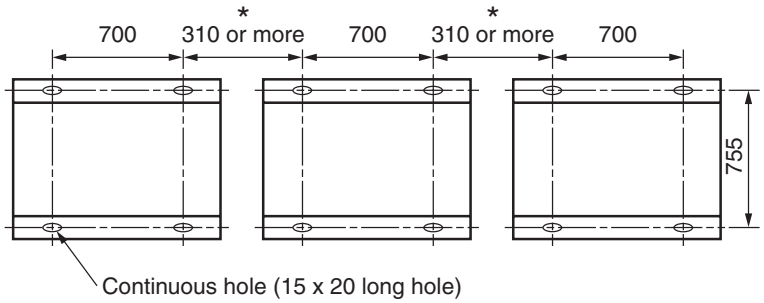
An incorrect installation will cause a risk of unit movement resulting in a possible accident.

1. Arrange the outdoor units with a 20mm or more intervals. Fix the outdoor unit with M12 anchor bolts (4 bolts per unit). 20mm is recommended protrusion of anchor bolt.



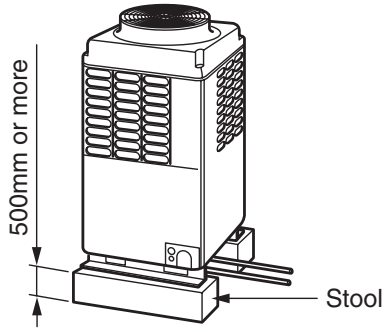


- Anchor bolt pitch is as shown below.

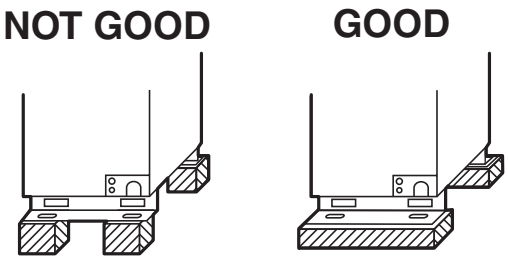


***** Piping equivalent length should not exceed 25m between the outdoor unit nearest to the indoor unit and the furthest outdoor unit from the indoor unit on the piping path with in one refrigerating cycle system.

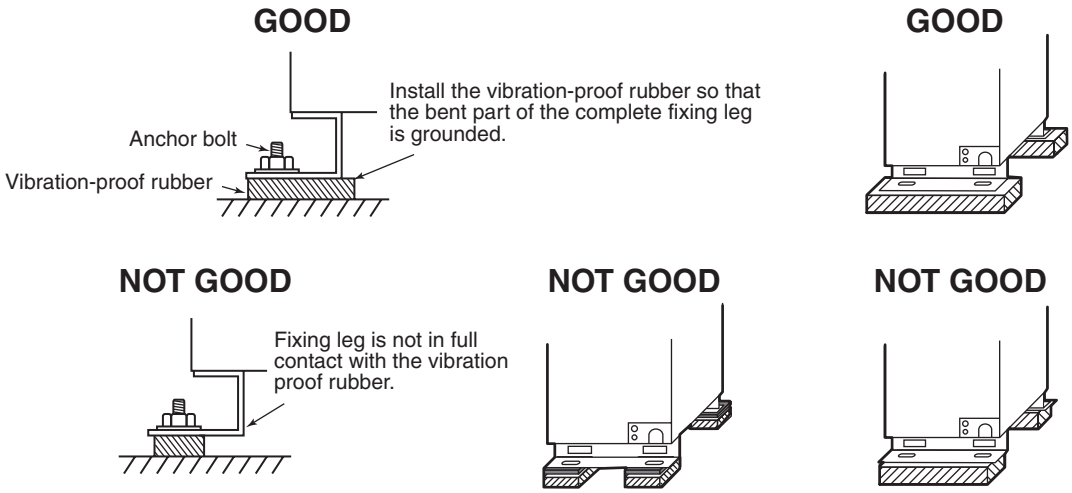
2. When piping the refrigerant pipe from the underside, set the height of the stool at 500mm or more.



3. Do not mount on four individual stools.



4. Mount the vibration-proof rubber (vibration-proof block etc.) between the stool and the fixing leg.



5. Arrange and connect the header and follower units in the correct sequence.
   The units should be set in order of capacity, the largest being the header unit. (A (Header unit) ≥ B ≥ C ≥ D)
6. Note the following conditions when arranging the header and follower units.
   1) Ensure use of header unit for the leading outdoor unit which is to be connected to the main pipe. (Figure 1)
   2) It is possible to connect the main pipe using a T-shape branching joint which can be purchased separately as detailed in figure 2.
   3) Ensure the direction of the T-shape joint is installed correctly, figure 3 shows the joint attached so that the refrigerant of the main pipe will flow directly into the header unit, this is incorrect.

Figure 1 **GOOD**

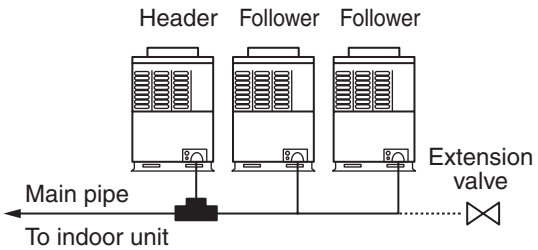


Figure 2 **GOOD**

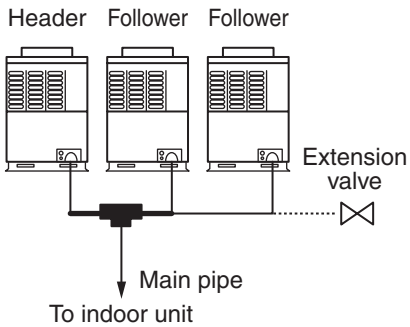
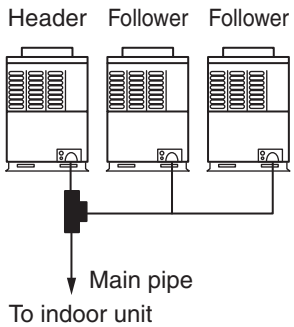


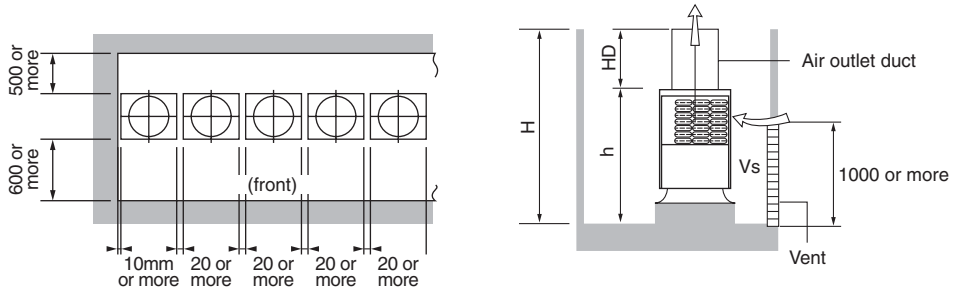
Figure 3 **NOT GOOD**



7-2. Standards for Collective Rooftop Installation

When the outer wall is taller than the outdoor units

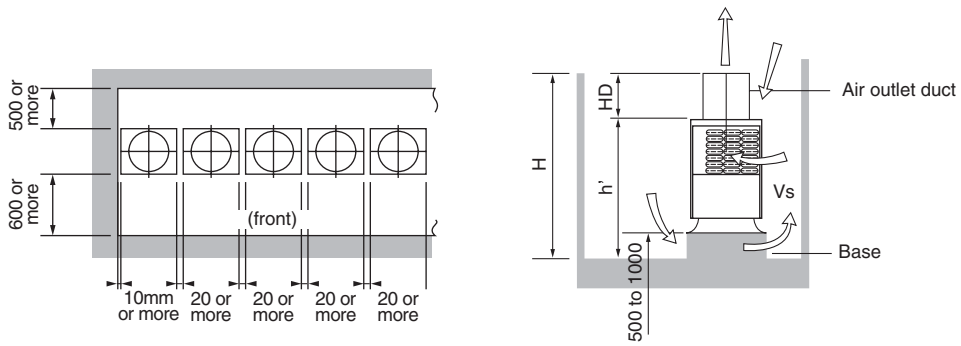
1) When a vent is installed



① The aperture ratio should allow an intake velocity (Vs) through the vent of 1.5m/s.

② The height of the air outlet duct HD = H–h.

2) When a vent cannot be installed

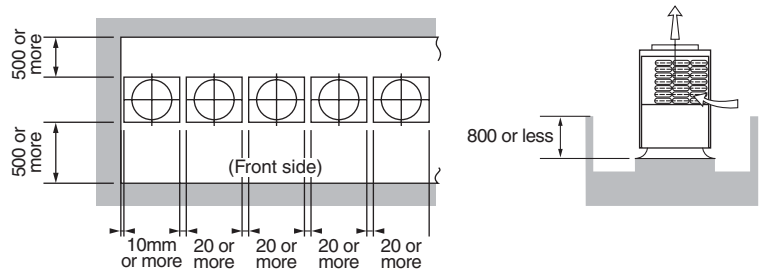


① Install a base so that the height of the wall is the same as that of the air outlet duct.
(Height for a base is 500 to 1000mm.)

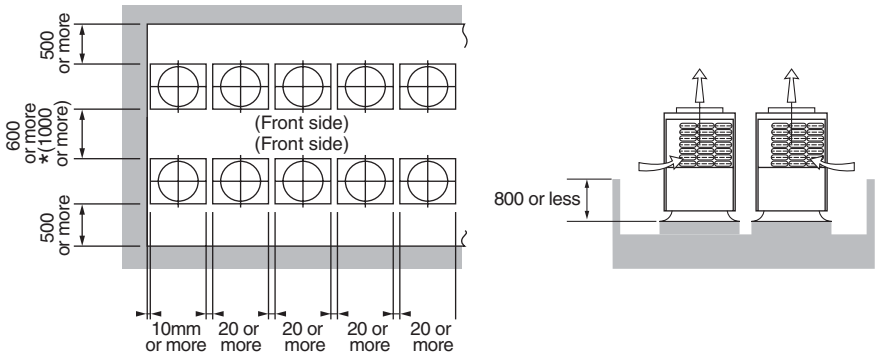
② The height of the air outlet duct HD = H–h'.

When outer wall is shorter than outdoor units

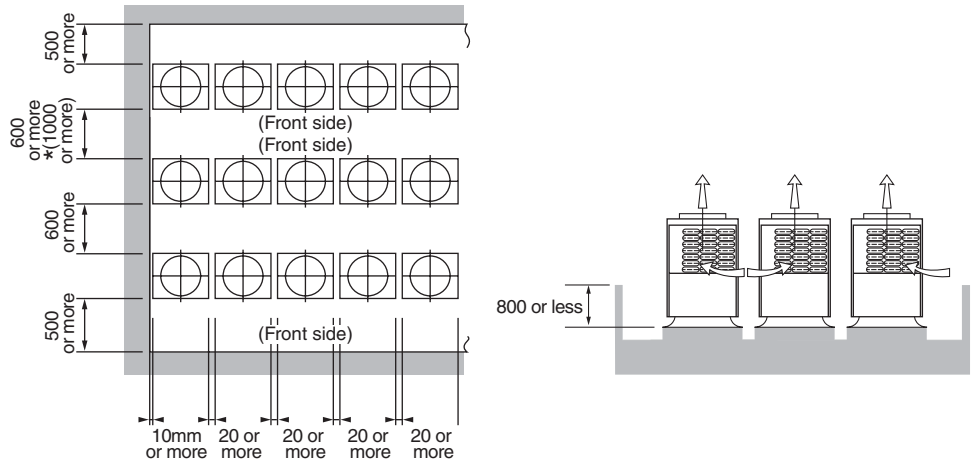
1) One-row installation



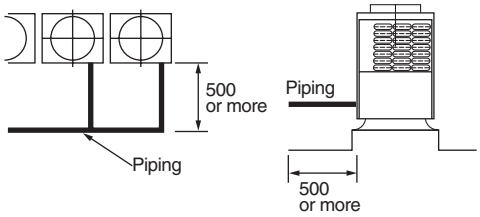
2) Two-row installation



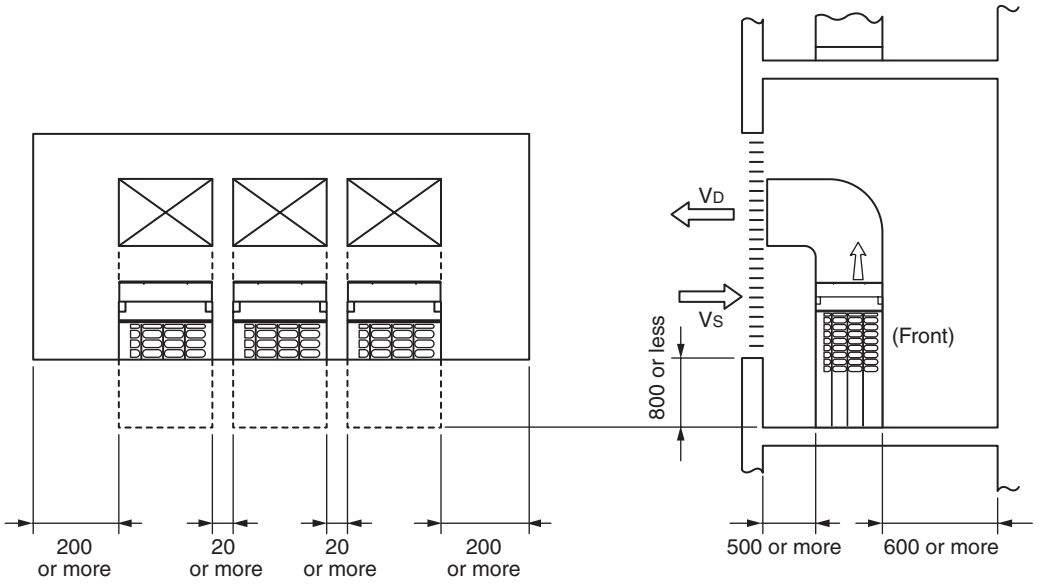
3) Three-row installation



***** These examples assume that the refrigerant lines are routed out of the front of the units. (When pipes on the site are run from the outdoor units to the front horizontally, there should be at least 500mm space between the outdoor units and the horizontal pipes as detailed in figure.)



Floor by floor installation



1) Install a air outlet duct on each of the outdoor units.
   (When a vent is installed, the air outlet duct should be secured to the vent.)
2) Louver angle of the vent is 20 degrees downwards off the horizontal position.
3) Intake velocity (VS) through the vent is 1.5m/s. or less.
   Air discharge velocity (VD) through the vent is 4 - 5m/s. or less.

[NOTE]

The installation method shown above is intended for installations on buildings no higher than ten floors, due to excessive high winds passing through an area with very tall buildings.

7-3. Applied Control of Outdoor Unit

Optional functions are available by adjusting the setting switches on the outdoor interface P.C. board. For details refer to procedure, "**18-2. Applied Control of Outdoor Unit**".

8. ELECTRIC WIRING

⚠ WARNING

Only a qualified electrician may carry out work in accordance to the installation manual and local electrical authorities regulations.

Failure to comply with regulations may cause unit to fail causing possible fire or electric shock.

Use the specified cables only, ensuring that they are fully secured so that upon an external force being applied it does not transmit to the connecting terminal.

If connection or fixing is incomplete, a fire may be caused.

Ensure connection of earth wire.

Grounding work is necessary based upon law. If the earth grounding is incomplete, an electric shock may be caused.

Do not connect the earth wire to a gas pipe, lightning rod, or the earth wire of a telephone.

⚠ CAUTION

Be sure to install an earth leakage breaker; otherwise an electric shock may be caused.

To Disconnect the Appliance from the Main Power Supply.

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

REQUIREMENT

- Perform wiring of the power supply in conformance with the regulations of the local electric authorities.
- For wiring of the power supply in the indoor unit, refer to the Installation Manual of each indoor unit.
- Never connect the 220–240V power supply to the terminal block (U1, U2, U3, U4, U5, U6) for control cables. (Fault is caused)
- Arrange the cables so that the electric wires do not come in to contact with high-temperature parts of the pipe; otherwise the insulation may melt and an accident may occur.
- After connecting the cable to the terminal block, loosen the cable clamp position cable and fix.
- Position the wiring system for the control and refrigerant piping system in the same line.
- Do not turn on power to the indoor unit until the vacuuming of the refrigerant pipework has been completed.

- For wiring of the power supply of the indoor unit and the inter-connecting cabling between the indoor and outdoor units, refer to the Installation Manual of indoor unit.

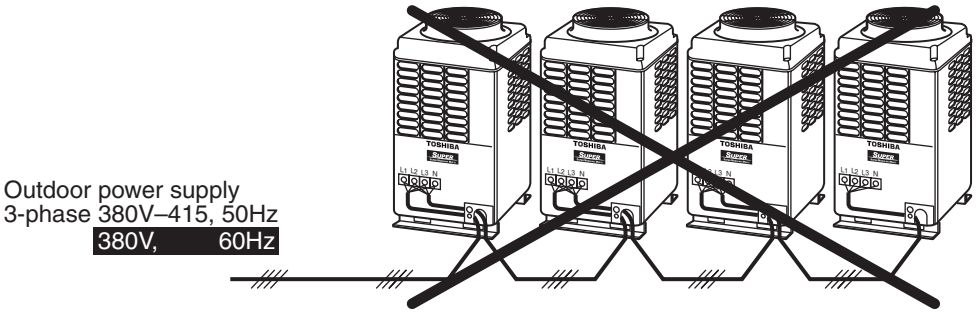
Power supply specifications

- **Power supply specification of outdoor unit**

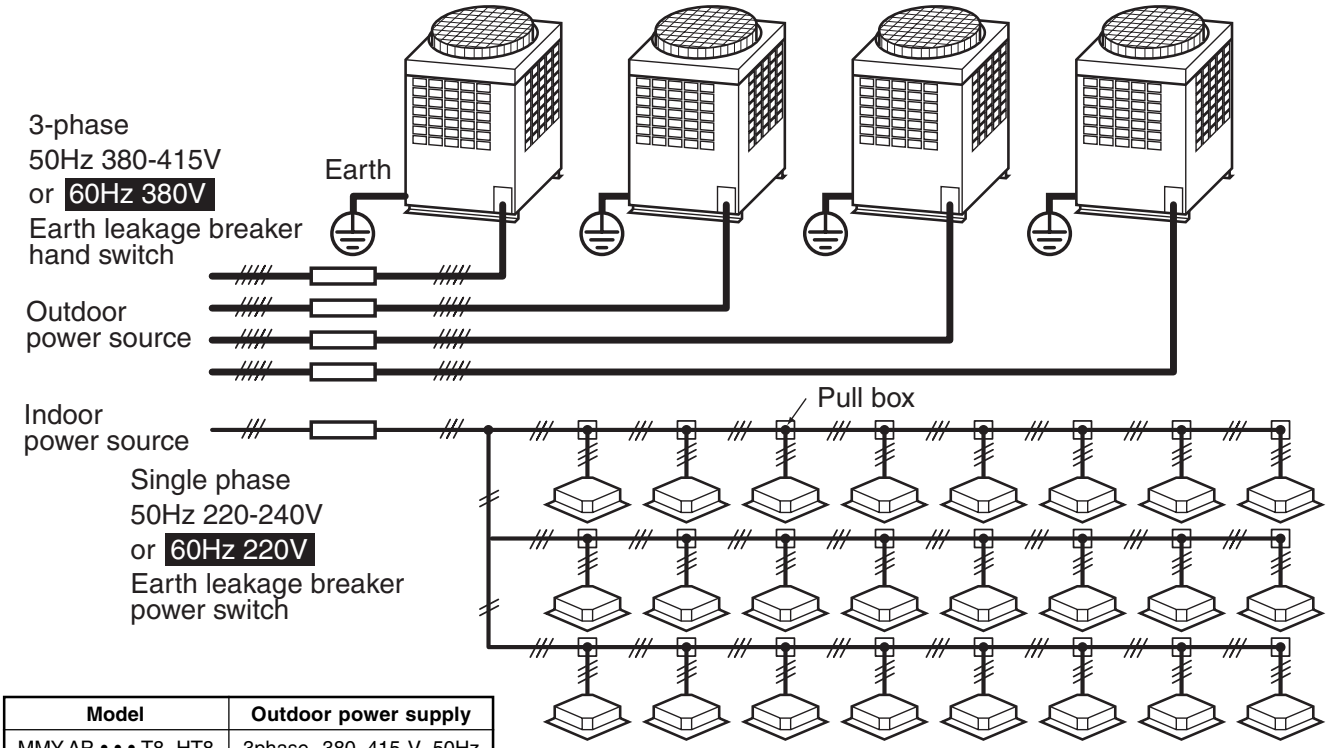
  Select the power supply cabling and fuse for each outdoor unit from the following specifications:

  5 core cable in conformance with Design 60245 IEC 66

- Do not connect them (looping) via the terminal blocks (L1,L2,L3,N) found within each of the outdoor units.



Electrical wiring design



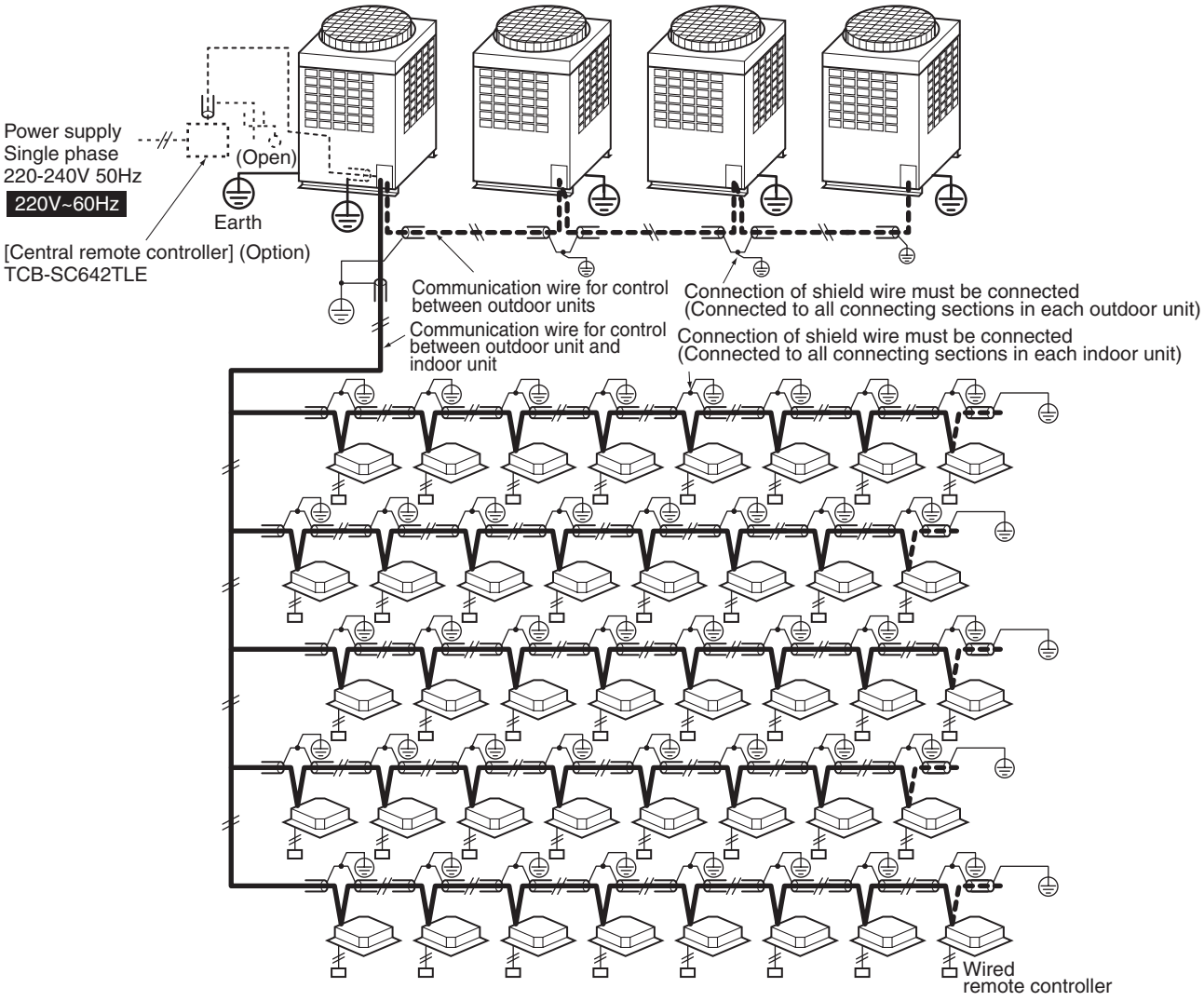
Model	Outdoor power supply
MMY-AP • • • T8, HT8	3phase, 380–415 V, 50Hz
MMY-AP • • • HT7	3phase, 380 V, 60Hz

- Unit capacities and power supply wire sizes (Reference)

Model MMY-			Power supply wiring	
			Wire size	Field fuse
MAP0501T8	MAP0501HT8	MAP0501HT7	3.5 mm² (AWG #12) Max. 26 m	20 A
MAP0601T8	MAP0601HT8	MAP0601HT7	3.5 mm² (AWG #12) Max. 26 m	20 A
MAP0801T8	MAP0801HT8	MAP0801HT7	3.5 mm² (AWG #12) Max. 20 m	30 A
MAP1001T8	MAP1001HT8	MAP1001HT7	5.5 mm² (AWG #10) Max. 28 m	30 A
MAP1201T8	MAP1201HT8	MAP1201HT7	5.5 mm² (AWG #10) Max. 27 m	30 A

- Determine the wire size for the indoor unit according to the number of connected indoor units downstream.
- Observe local regulation regarding the wire size selection and installation.

Design of control wiring



- Wire specification, quantity, size of crossover wiring and remote controller wiring

Name	Qty	Size			Specification
		Up to 500m	Up to 1000m	1000 to 2000m	
Crossover wiring (indoor-indoor / indoor-outdoor / outdoor-outdoor control wiring, central control wiring)	2 cores	1.25mm^2		2.0mm^2	Shield wire
Remote controller wiring	2 cores	0.5 to 2.0mm^2	—	—	—

(1) The crossover wiring and central control wiring uses a 2-core non-polarity communication wires. Use 2-core shield wires to prevent noise issues. In this case, close (connect) the end of the shield wires and ground the end of the shield wires which are connected to both indoor and outdoor units. for the shield wires which are connected between the central remote controller and the outdoor unit, ground at only one end of the control wire.

(2) Use 2-core and non-polarity wire for the remote controller. (A, B terminals)

Use 2-core and non-polarity wire for the wiring of group control. (A, B terminals)

Design of control wiring

1. All control wiring is 2-core and non-polarity.
2. Ensure use of shielded wire to prevent possible noise issues.
   - Outdoor-outdoor / indoor-indoor / outdoor-indoor control wiring, Central control wiring.

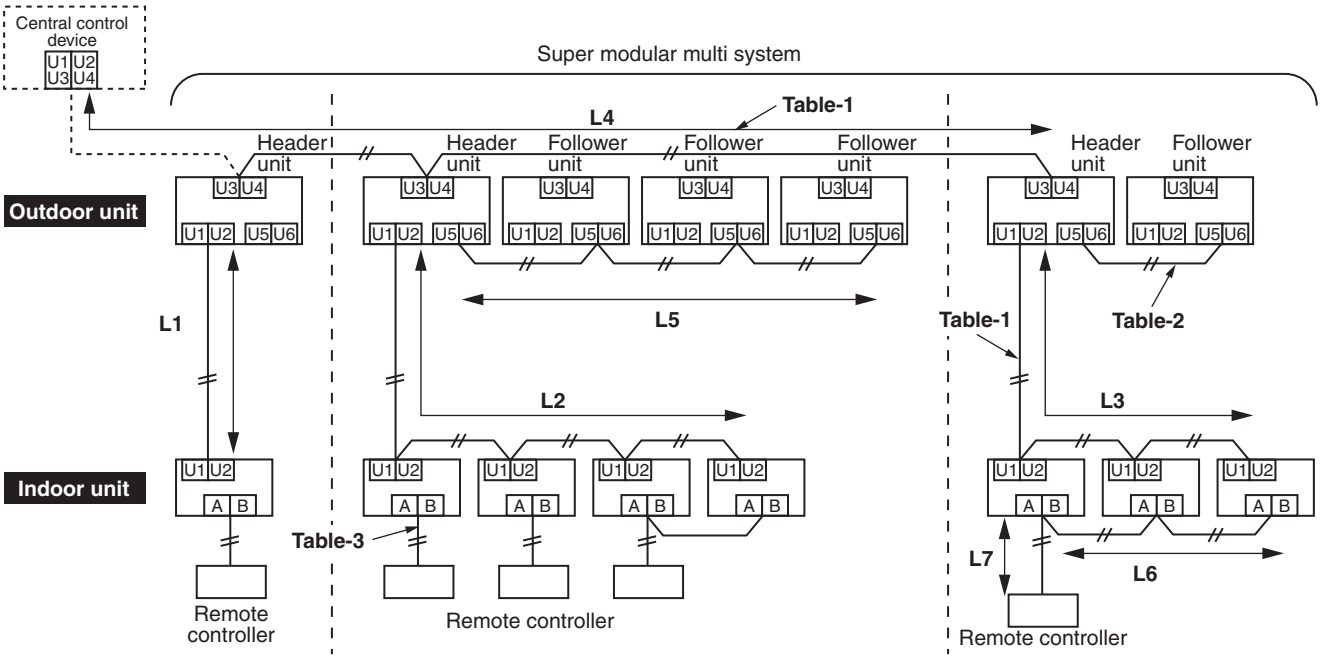


Table-1 Control wiring between indoor and outdoor units (L1, L2, L3), Central control wiring (L4)

Wiring	2-core, non-polarity
Type	Shield wire
Size **Length**	1.25 mm² : Up to 1000 m 2.0 mm² : Up to 2000 m (*1)

Note (*1) : Total length of control wiring for all refrigerant circuits (L1 + L2 + L3 + L4)

Table-2 Control wiring between outdoor units (L5)

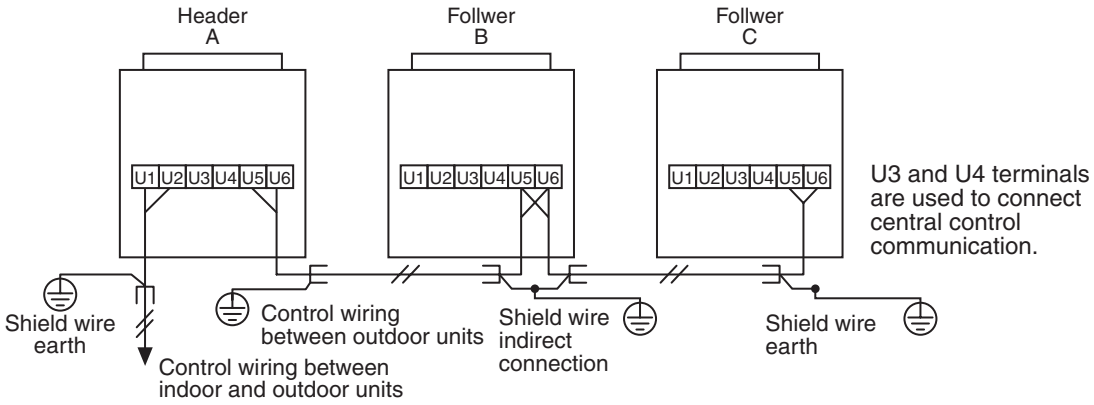
Wiring	2-core, non-polarity
Type	Shield wire
Size **Length**	1.25 mm² to 2.0 mm² Up to 100 m (L5)

Table-3 Remote controller wiring (L6, L7)

Wire	2-core
Size	0.5 mm² to 2.0 mm²
Length	• Up to 500 m (L6 + L7) • Up 400m in case of wireless remote controller in group control. • Up to 200m total length of control wiring between indoor units (L6)

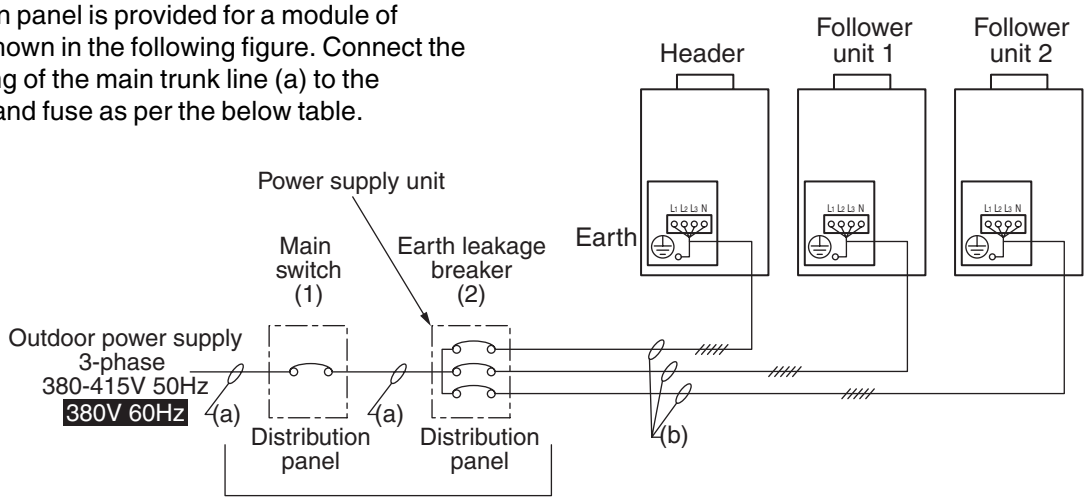
• Control wiring specification

1. Connect each control wire as detailed below.



• Power supply specifications of combined outdoor units

When a distribution panel is provided for a module of outdoor units as shown in the following figure. Connect the power supply wiring of the main trunk line (a) to the distribution panel and fuse as per the below table.



Cooling only model (50Hz)	Heat pump model (50Hz)	Heat pump model (60Hz)	Power supply wiring	
			Wire size	Field fuse
MMY-AP1401T8	MMY-AP1401HT8	MMY-AP1401HT7	14 mm² (AWG #6) Max. 45 m	40 A
MMY-AP1601T8	MMY-AP1601HT8	MMY-AP1601HT7	14 mm² (AWG #6) Max. 39 m	50 A
MMY-AP1801T8	MMY-AP1801HT8	MMY-AP1801HT7	14 mm² (AWG #6) Max. 37 m	50 A
MMY-AP2001T8	MMY-AP2001HT8	MMY-AP2001HT7	14 mm² (AWG #6) Max. 35 m	60 A
MMY-AP2201T8	MMY-AP2201HT8	MMY-AP2201HT7	22 mm² (AWG #4) Max. 45 m	75 A
MMY-AP2211T8	MMY-AP2211HT8	MMY-AP2211HT7	14 mm² (AWG #6) Max. 35 m	60 A
MMY-AP2401T8	MMY-AP2401HT8	MMY-AP2401HT7	22 mm² (AWG #4) Max. 41 m	75 A
MMY-AP2411T8	MMY-AP2411HT8	MMY-AP2411HT7	14 mm² (AWG #6) Max. 34 m	60 A
MMY-AP2601T8	MMY-AP2601HT8	MMY-AP2601HT7	22 mm² (AWG #4) Max. 40 m	75 A
MMY-AP2801T8	MMY-AP2801HT8	MMY-AP2801HT7	38 mm² (AWG #4) Max. 66 m	75 A
MMY-AP3001T8	MMY-AP3001HT8	MMY-AP3001HT7	38 mm² (AWG #1) Max. 64 m	100 A
MMY-AP3201T8	MMY-AP3201HT8	MMY-AP3201HT7	38 mm² (AWG #1) Max. 53 m	100 A
MMY-AP3211T8	MMY-AP3211HT8	MMY-AP3211HT7	38 mm² (AWG #1) Max. 63 m	100 A
MMY-AP3401T8	MMY-AP3401HT8	MMY-AP3401HT7	38 mm² (AWG #1) Max. 52 m	100 A
MMY-AP3411T8	MMY-AP3411HT8	MMY-AP3411HT7	38 mm² (AWG #1) Max. 62 m	100 A
MMY-AP3601T8	MMY-AP3601HT8	MMY-AP3601HT7	38 mm² (AWG #1) Max. 51 m	100 A
MMY-AP3611T8	MMY-AP3611HT8	MMY-AP3611HT7	38 mm² (AWG #1) Max. 61 m	100 A
MMY-AP3801T8	MMY-AP3801HT8	MMY-AP3801HT7	38 mm² (AWG #1) Max. 49 m	100 A
MMY-AP4001T8	MMY-AP4001HT8	MMY-AP4001HT7	60 mm² (AWG #) Max. 76 m	125 A
MMY-AP4201T8	MMY-AP4201HT8	MMY-AP4201HT7	60 mm² (AWG #) Max. 75 m	125 A
MMY-AP4401T8	MMY-AP4401HT8	MMY-AP4401HT7	60 mm² (AWG #) Max. 74 m	125 A
MMY-AP4601T8	MMY-AP4601HT8	MMY-AP4601HT7	60 mm² (AWG #) Max. 73 m	125 A
MMY-AP4801T8	MMY-AP4801HT8	MMY-AP4801HT7	60 mm² (AWG #) Max. 73 m	125 A

*** :** Model name differs according to each wire manufacturer.

■ Single outdoor unit

50Hz

Heat Pump Model MMY-	Cooling Only model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor			Fan Motor		Power Supply		
			Min	Max	RLA	LRA		kW	FLA	MCA	MOCP	ICF
MAP0501HT8	MAP0501T8	400-3-50	342	457	4.0 + 4.0			0.60	0.8	16.5	20	—
MAP0601HT8	MAP0601T8	400-3-50	342	457	4.6 + 4.6			0.60	0.8	16.5	20	—
MAP0801HT8	MAP0801T8	400-3-50	342	457	5.2 + 5.2			0.60	1.0	20.0	30	—
MAP1001HT8	MAP1001T8	400-3-50	342	457	6.5 + 6.5			0.60	1.1	22.5	30	—
MAP1201HT8	MAP1201T8	400-3-50	342	457	9.5 + 9.5			0.60	1.1	24.5	30	—

■ Combination of outdoor unit

Heat Pump Model MMY-	Cooling Only model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor								Fan Motor		Power Supply		
					Unit No.1		Unit No.2		Unit No.3		Unit No.4						
			Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	kW	FLA	MCA	MOCP	ICF
AP1401HT8	AP1401T8	400-3-50	342	457	5.2 + 5.2	—	4.6 + 4.6	—	—	—	—	—	0.6 × 2	1.0 + 0.8	36.5	40	—
AP1601HT8	AP1601T8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	—	—	—	—	0.6 × 2	1.0 + 1.0	40.0	50	—
AP1801HT8	AP1801T8	400-3-50	342	457	6.5 + 6.5	—	5.2 + 5.2	—	—	—	—	—	0.6 × 2	1.0 + 1.1	42.5	50	—
AP2001HT8	AP2001T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	—	—	—	—	0.6 × 2	1.1 + 1.1	45.0	60	—
AP2201HT8	AP2201T8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	4.6 + 4.6	—	—	—	0.6 × 3	1.0 + 1.0 + 0.8	56.5	70	—
AP2211HT8	AP2211T8	400-3-50	342	457	9.5 + 9.5	—	6.5 + 6.5	—	—	—	—	—	0.6 × 2	1.1 + 1.1	47.0	60	—
AP2401HT8	AP2401T8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	5.2 + 5.2	—	—	—	0.6 × 3	1.0 + 1.0 + 1.0	60.0	70	—
AP2411HT8	AP2411T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	—	—	—	—	0.6 × 2	1.1 + 1.1	49.0	60	—
AP2601HT8	AP2601T8	400-3-50	342	457	6.5 + 6.5	—	5.2 + 5.2	—	5.2 + 5.2	—	—	—	0.6 × 3	1.1 + 1.1 + 1.0	62.5	70	—
AP2801HT8	AP2801T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	5.2 + 5.2	—	—	—	0.6 × 3	1.1 + 1.1 + 1.0	65.0	80	—
AP3001HT8	AP3001T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	6.5 + 6.5	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	67.5	80	—
AP3201HT8	AP3201T8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	5.2 + 5.2	—	5.2 + 5.2	—	0.6 × 4	1.0 + 1.0 + 1.0 + 1.0	80.0	90	—
AP3211HT8	AP3211T8	400-3-50	342	457	9.5 + 9.5	—	6.5 + 6.5	—	6.5 + 6.5	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	69.5	80	—
AP3401HT8	AP3401T8	400-3-50	342	457	6.5 + 6.5	—	5.2 + 5.2	—	5.2 + 5.2	—	5.2 + 5.2	—	0.6 × 4	1.1 + 1.0 + 1.0 + 1.0	82.5	100	—
AP3411HT8	AP3411T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	6.5 + 6.5	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	71.5	80	—
AP3601HT8	AP3601T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	5.2 + 5.2	—	5.2 + 5.2	—	0.6 × 4	1.1 + 1.1 + 1.0 + 1.0	85.0	100	—
AP3611HT8	AP3611T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	9.5 + 9.5	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	73.5	90	—
AP3801HT8	AP3801T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 9.5	—	6.5 + 6.5	—	5.2 + 5.2	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.0	87.5	100	—
AP4001HT8	AP4001T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	6.5 + 6.5	—	6.5 + 6.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	90.0	100	—
AP4201HT8	AP4201T8	400-3-50	342	457	9.5 + 9.5	—	6.5 + 6.5	—	6.5 + 6.5	—	6.5 + 6.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	92.0	110	—
AP4401HT8	AP4401T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	6.5 + 6.5	—	6.5 + 6.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	94.0	110	—
AP4601HT8	AP4601T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	9.5 + 9.5	—	6.5 + 6.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	96.0	110	—
AP4801HT8	AP4801T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	9.5 + 9.5	—	9.5 + 9.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	98.0	110	—

Legend

MCA : Minimum Circuit Amps
MOCP : Maximum Overcurrent Protection (Amps)
ICF : Maximum Instantaneous Current Flow Start
RLA : Rated Load Amps
LRA : Locked Rotor Amps
FLA : Full Load Amps
kW : Fan Motor Rated Output (kW)

NOTE :

RLA is based on the following conditions.
Indoor temperature : 27°C DB/19°C WB
Outdoor temperature : 35°C DB

■ Single outdoor unit

60Hz

Heat Pump Model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor			Fan Motor		Power Supply		
		Min	Max	RLA	LRA		kW	FLA	MCA	MOCP	ICF
MAP0501HT7	380-3-60	342	418	4.2 + 4.2			0.60	0.8	16.5	20	—
MAP0601HT7	380-3-60	342	418	4.8 + 4.8			0.60	0.8	16.5	20	—
MAP0801HT7	380-3-60	342	418	5.4 + 5.4			0.60	1.0	20.0	30	—
MAP1001HT7	380-3-60	342	418	6.9 + 6.9			0.60	1.1	22.5	30	—
MAP1201HT7	380-3-60	342	418	10.0 + 10.0			0.60	1.1	24.5	30	—

■ Combination of outdoor unit

Heat Pump Model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor						Fan Motor		Power Supply		
				Unit No.1		Unit No.2		Unit No.3		Unit No.4				
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	kW	FLA	MCA	MOCP	ICF
AP1401HT7	380-3-60	342	418	5.4 + 5.4	—	4.8 + 4.8	—	—	—	—	—	0.6 × 2	1.0 + 0.8	36.5	40	—
AP1601HT7	380-3-60	342	418	5.4 + 5.2	—	5.4 + 5.4	—	—	—	—	—	0.6 × 2	1.0 + 1.0	40.0	50	—
AP1801HT7	380-3-60	342	418	6.9 + 6.9	—	5.4 + 5.4	—	—	—	—	—	0.6 × 2	1.0 + 1.1	42.5	50	—
AP2001HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	—	—	—	—	0.6 × 2	1.1 + 1.1	45.0	60	—
AP2201HT7	380-3-60	342	418	5.4 + 5.4	—	5.4 + 5.4	—	4.8 + 4.8	—	—	—	0.6 × 3	1.0 + 1.0 + 0.8	56.5	70	—
AP2211HT7	380-3-60	342	418	10.0 + 10.0	—	6.9 + 6.9	—	—	—	—	—	0.6 × 2	1.1 + 1.1	47.0	60	—
AP2401HT7	380-3-60	342	418	5.4 + 5.4	—	5.4 + 5.4	—	5.4 + 5.4	—	—	—	0.6 × 3	1.0 + 1.0 + 1.0	60.0	70	—
AP2411HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	—	—	—	—	0.6 × 2	1.1 + 1.1	49.0	60	—
AP2601HT7	380-3-60	342	418	6.9 + 6.9	—	5.4 + 5.4	—	5.4 + 5.4	—	—	—	0.6 × 3	1.1 + 1.1 + 1.0	62.5	70	—
AP2801HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	5.4 + 5.4	—	—	—	0.6 × 3	1.1 + 1.1 + 1.0	65.0	80	—
AP3001HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	6.9 + 6.9	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	67.5	80	—
AP3201HT7	380-3-60	342	418	5.4 + 5.4	—	5.4 + 5.4	—	5.4 + 5.4	—	5.4 + 5.4	—	0.6 × 4	1.0 + 1.0 + 1.0 + 1.0	80.0	90	—
AP3211HT7	380-3-60	342	418	10.0 + 10.0	—	6.9 + 6.9	—	6.9 + 6.9	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	69.5	80	—
AP3401HT7	380-3-60	342	418	6.9 + 6.9	—	5.4 + 5.4	—	5.4 + 5.4	—	5.4 + 5.4	—	0.6 × 4	1.1 + 1.0 + 1.0 + 1.0	82.5	100	—
AP3411HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	6.9 + 6.9	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	71.5	80	—
AP3601HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	5.4 + 5.4	—	5.4 + 5.4	—	0.6 × 4	1.1 + 1.1 + 1.0 + 1.0	85.0	100	—
AP3611HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	10.0 + 10.0	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	73.5	90	—
AP3801HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 9.9	—	6.9 + 6.9	—	5.4 + 5.4	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.0	87.5	100	—
AP4001HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	6.9 + 6.9	—	6.9 + 6.9	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	90.0	100	—
AP4201HT7	380-3-60	342	418	10.0 + 10.0	—	6.9 + 6.9	—	6.9 + 6.9	—	6.9 + 6.9	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	92.0	110	—
AP4401HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	6.9 + 6.9	—	6.9 + 6.9	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	94.0	110	—
AP4601HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	10.0 + 10.0	—	6.9 + 6.9	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	96.0	110	—
AP4801HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	10.0 + 10.0	—	10.0 + 10.0	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	98.0	110	—

Legend

MCA : Minimum Circuit Amps
MOCP : Maximum Overcurrent Protection (Amps)
ICF : Maximum Instantaneous Current Flow Start
RLA : Rated Load Amps
LRA : Locked Rotor Amps
FLA : Full Load Amps
kW : Fan Motor Rated Output (kW)

NOTE :
RLA is based on the following conditions.
Indoor temperature : 27°C DB/19°C WB
Outdoor temperature : 35°C DB

For Indoor unit power supply (The outdoor unit has a separate power supply.)

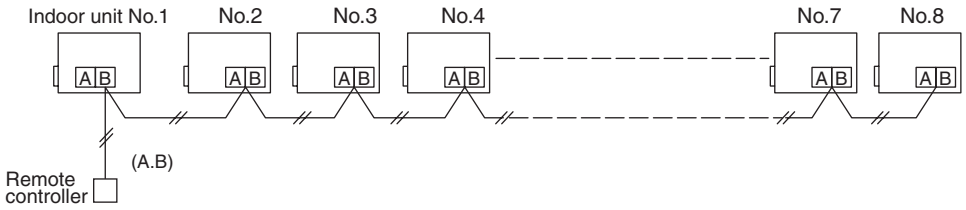
Item / Model	Power supply wiring	
	Wire size	
All models of indoor units	2.0 mm² (AWG#14) Max. 20m	3.5 mm² (AWG#12) Max. 50m

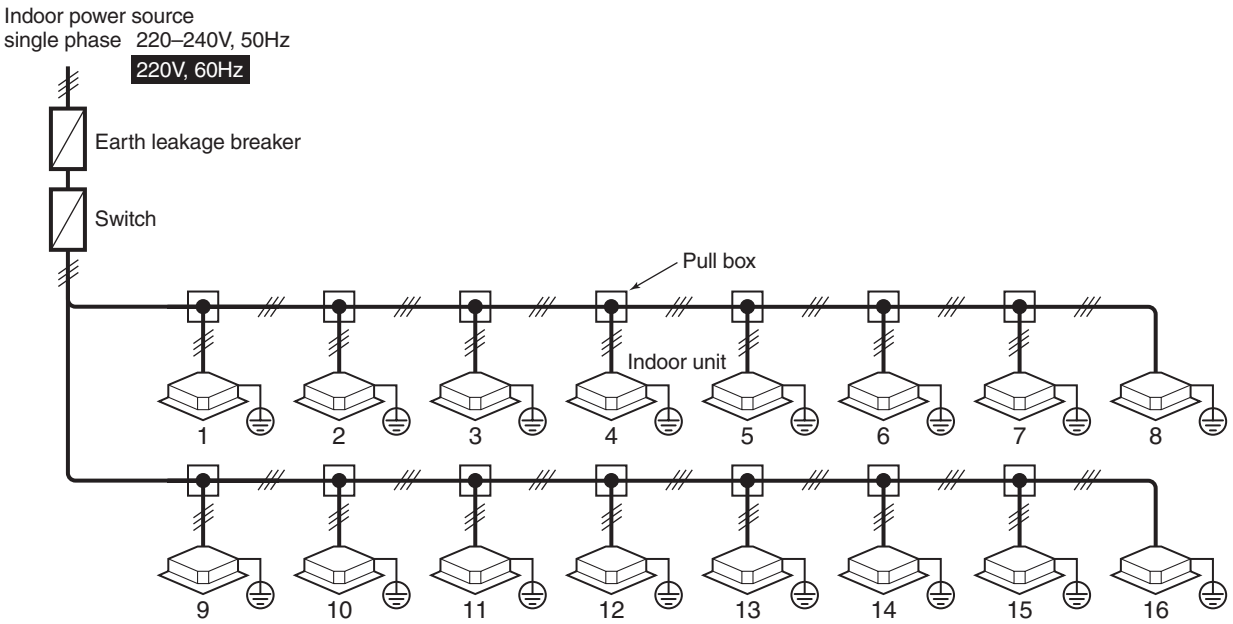
NOTE :

The wiring lengths from the outdoor unit to the indoor units pull box (isolator) when connected in parallel(Below figure) are stated in the above table. This assumes a voltage drop of no more than 2%. If the length exceeds 50m select wire specification in accordance with indoor wiring standards.

- **Group Operation using a Remote Controller Switch**

  Group operation of multiple indoor units (8 units) using a single remote controller



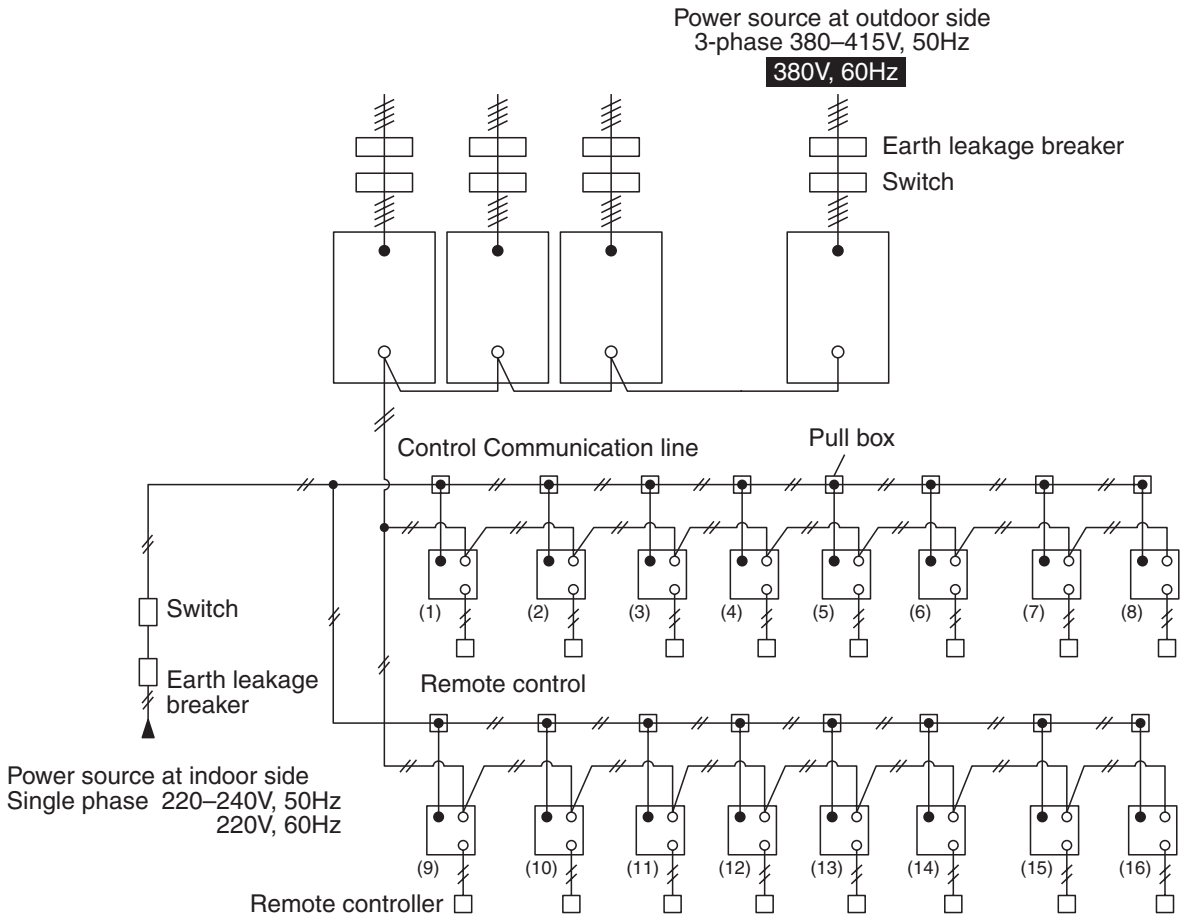


⚠ CAUTION

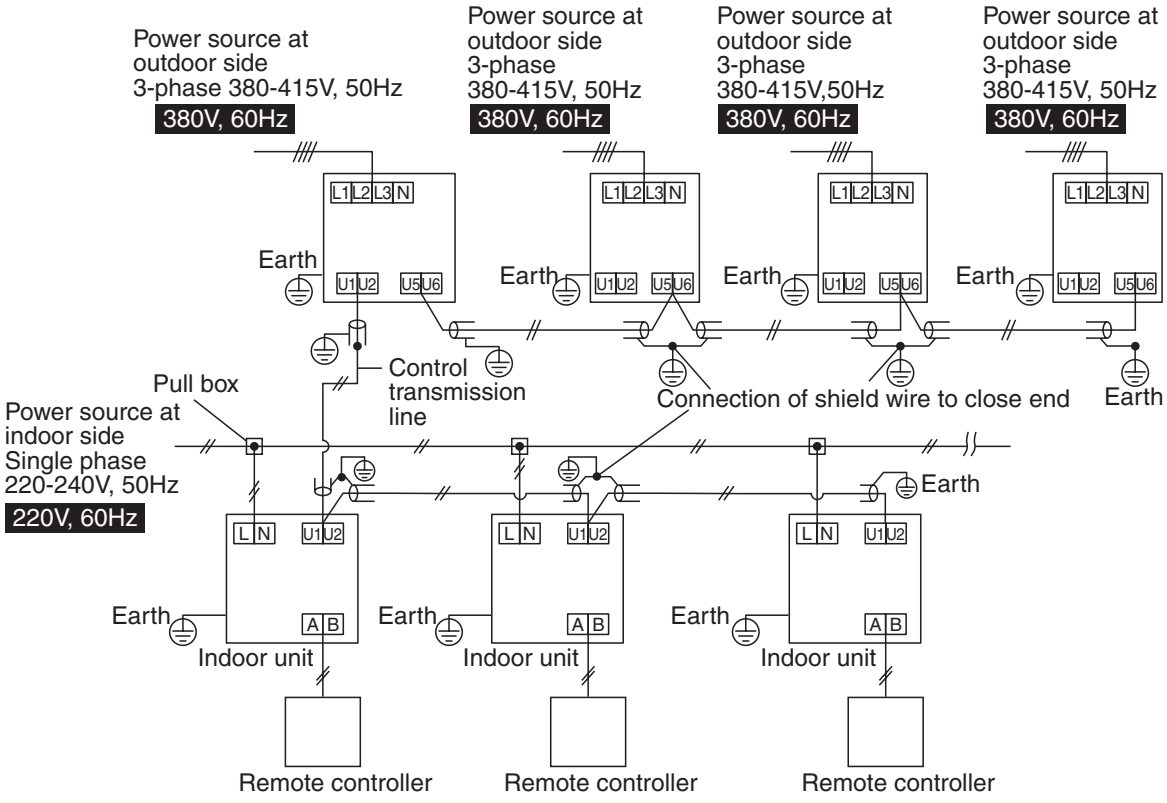
(1) Keep the refrigerant piping system and the indoor-indoor/indoor-outdoor control wiring systems together.

(2) When running power supplies and control wires parallel to each other, run them through separate conduits, or maintain a suitable distance between them.
(Current capacity of power wires: 10A or less for 300mm, 50A or less for 500mm)

■ System wiring diagram

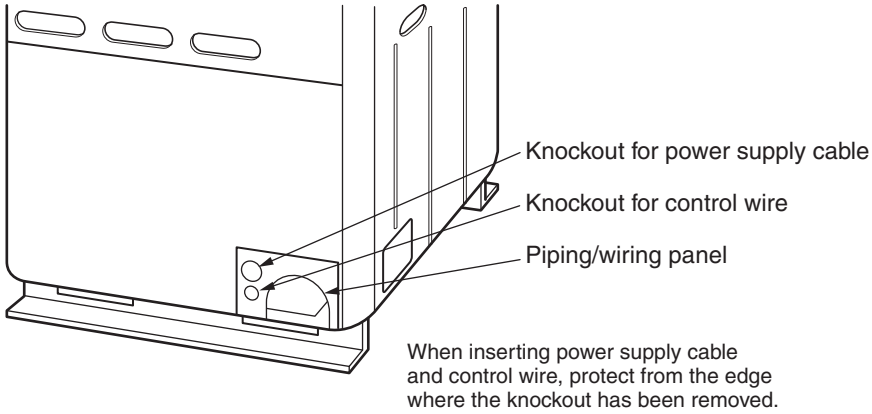


■ Connection summary for indoor unit/outdoor unit



Connection of Power Supply Cable with Control Wire

Insert power supply cable and control wire after removing knockout of the piping/wiring panel at the front side of the outdoor unit.



■ Power supply cable

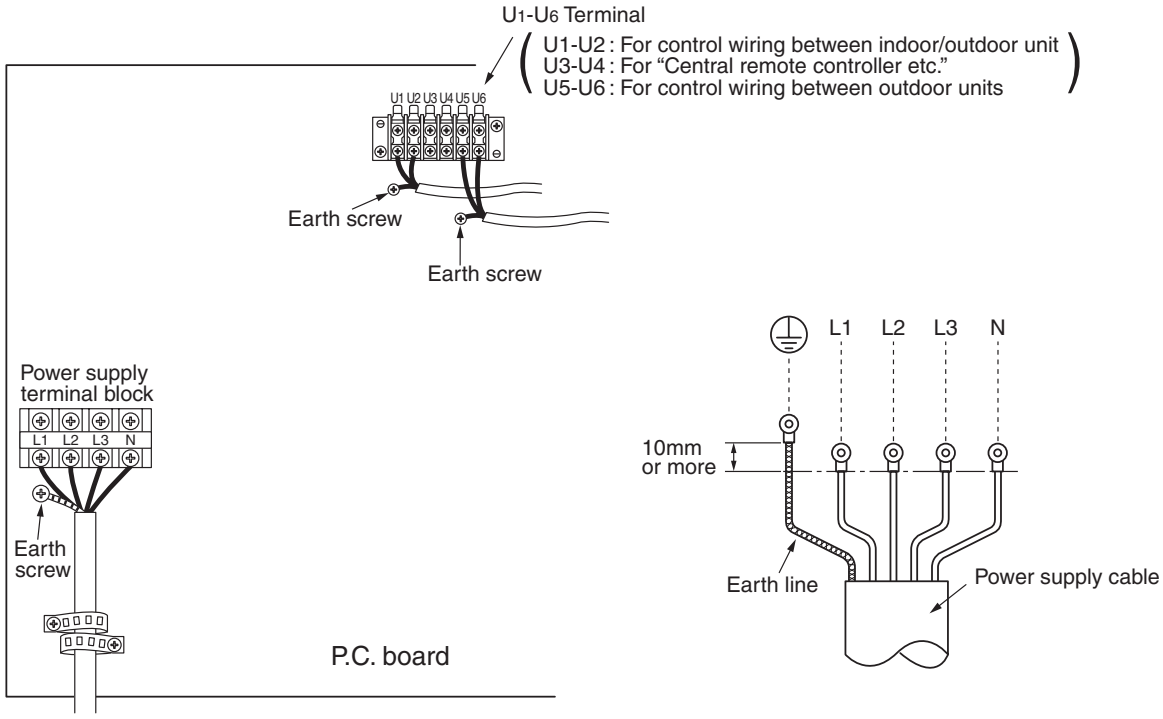
1. Connect the power supply cables and earthing wire to the power supply terminal block. Ensure the cabling passes through the notched section on the side of the electrical parts box and is secured with a clamp.

■ Control wire

1. Connect the control wiring between the indoor and outdoor units (U1, U2, U5, U6). On the outdoor unit ensure wiring is passed through opening at the side of the electrical parts box and secured with a clamp.
2. Use a 2 core shielded wire for control wiring (1.25mm² or more) in order to prevent noise issues. (Non-polarity)

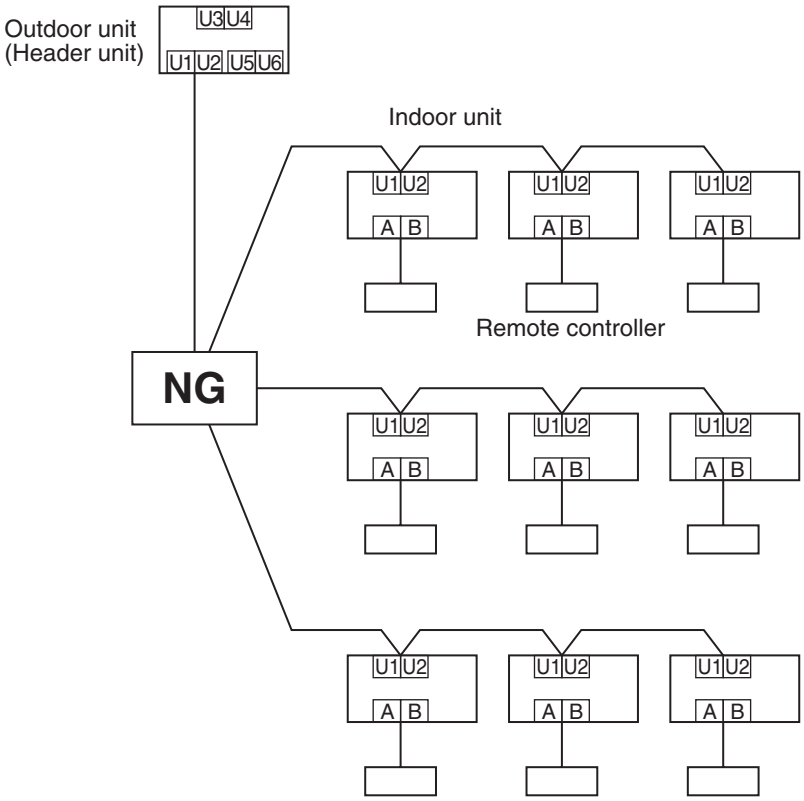
NOTE :

1) Separate the power supply cables and each control cable.
2) Arrange the power supply cables and each control cable so that they do not make contact with the bottom surface of the outdoor unit.
3) Terminal block(U3, U4) are for connecting Central control operation this is located on the inverter unit be careful not to mis-wire.



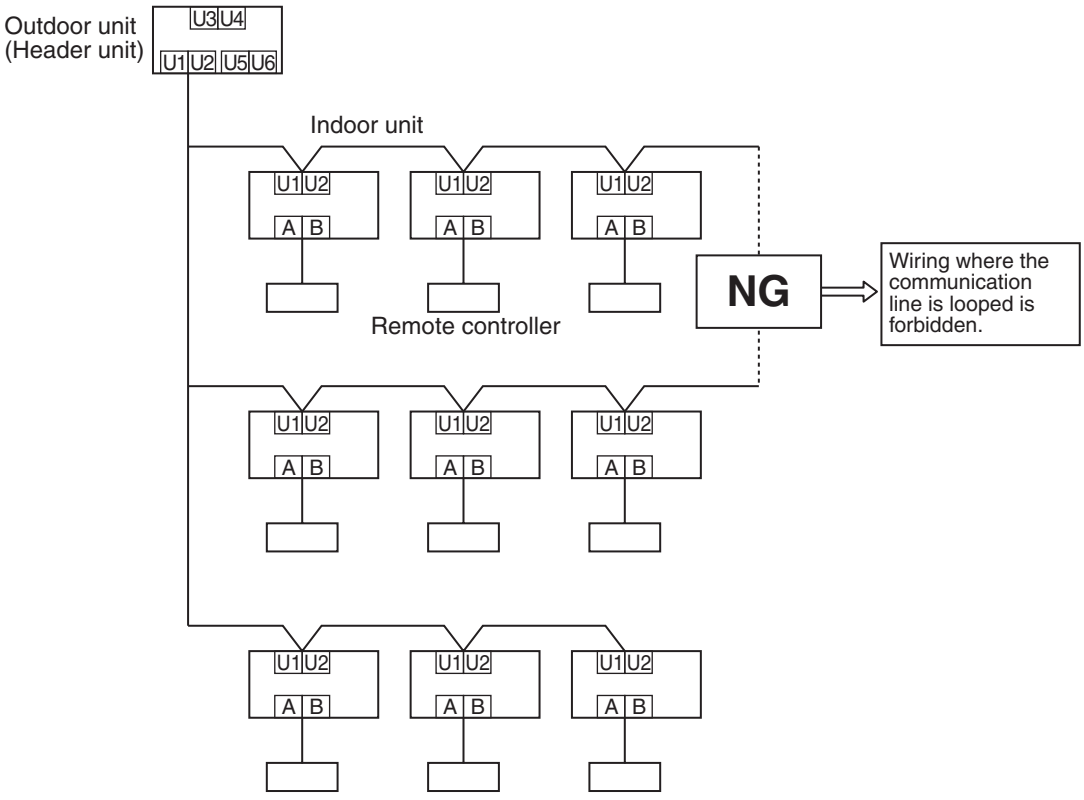
NOTE

4 or more control wires connected to one terminal is prohibited.



NOTE

Loop wiring of control wires is prohibited.



9. INDOOR UNIT ELECTRICAL BOX PLACEMENT AND WIRING

■ 4-way air discharge cassette type

Wiring of the indoor unit

Be sure to connect the wiring so that it matches the terminal numbers. Failure to do so may cause a terminal fault.

Insulation of wiring entrance hole

Using the attached heat insulator, seal the wiring entrance holes, so that no dew condensation forms on the electrical parts.

Wiring of the remote controller

A low-voltage circuit is used for the remote controller.

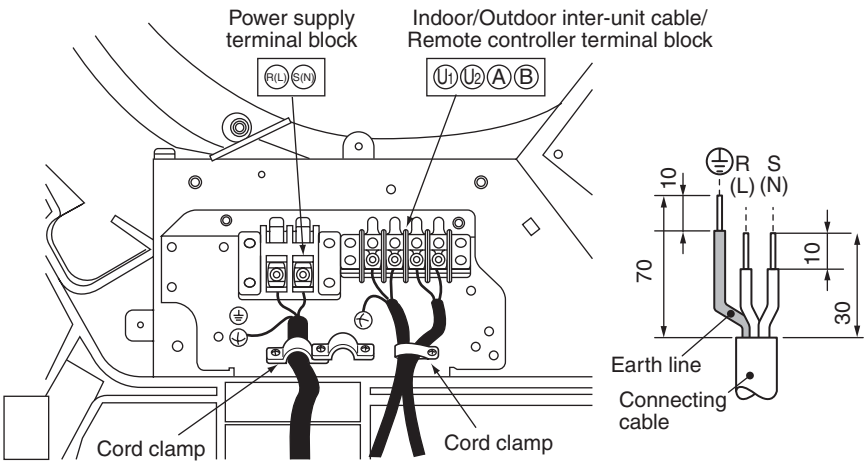
It must not be exposed to a supply voltage of AC 220 / 415V 50Hz. Furthermore the supply must not be routed in the same conduit tube as the main unit voltage.

- For the remote controller wiring, 2-core vinyl cable round cord (0.3mm²) can be used up to a total length of 200m, while the other (0.75mm²) can be used up to a total length of 500m.
- Connect the wires matching the symbols found on the remote controller with the A, B terminals found on the terminal block. Never connect a AC 220–240V, 380–415V 50Hz power source. Failure to do so, may cause a terminal fault.

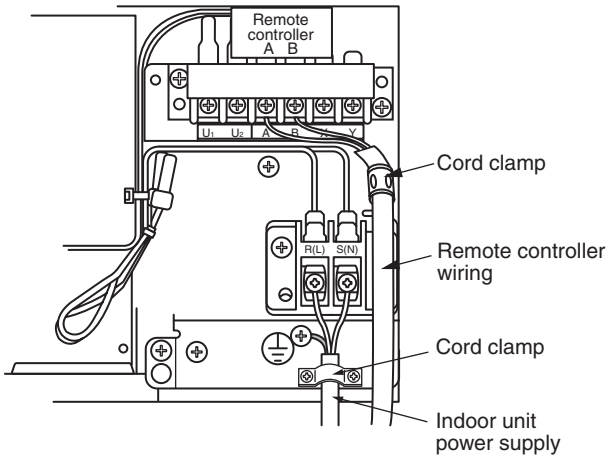
Wiring of ceiling panel

Installation of the ceiling panel with auto louver

Following the Installation Manual for the ceiling panel, connect the connector (2P : Red) which can be found inside the ceiling panel electrical parts box.

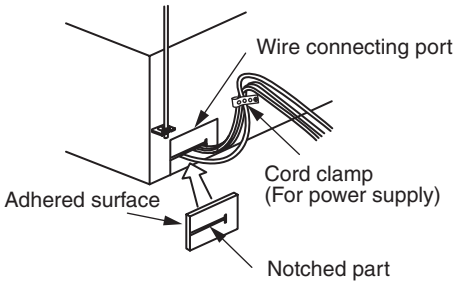


■ 2-way air discharge cassette type



Treating of wiring connecting port

As shown in the figure below, attach the heat insulator, so that the wiring hole is sealed completely. Failure to do so may result in the formation of dew condensation on the electrical parts

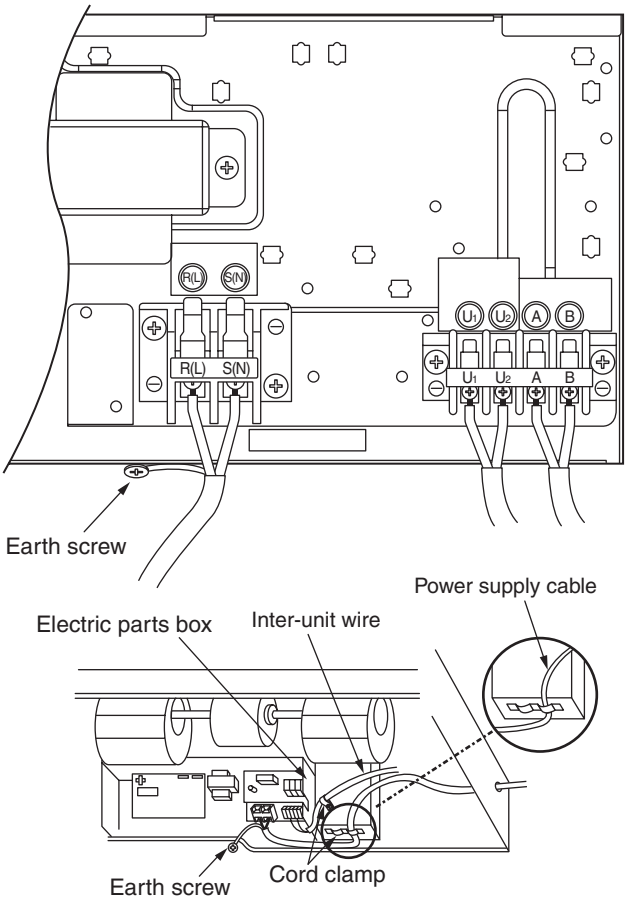


■ 1-way air discharge cassette type

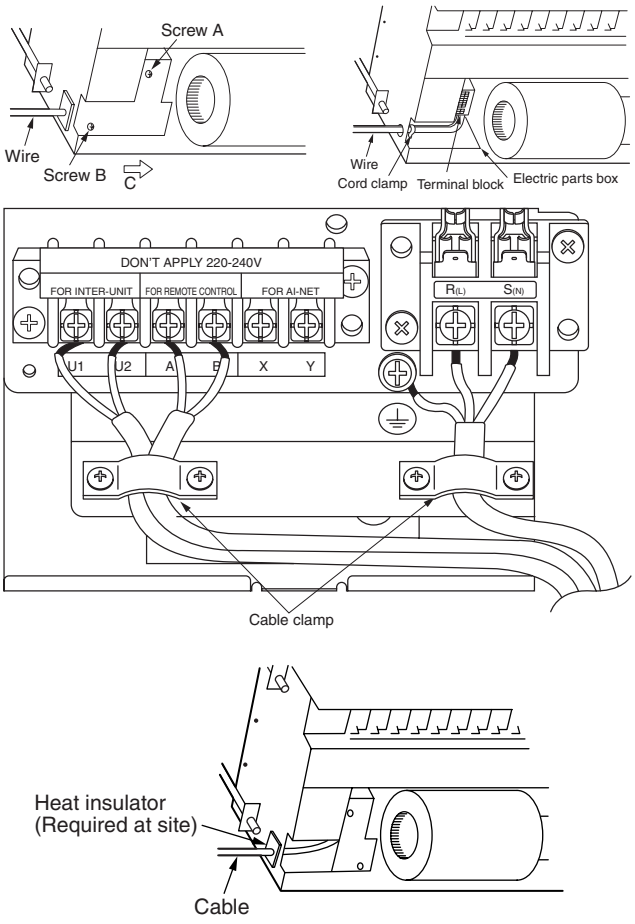
Wiring the indoor unit

Be sure to connect the wires matching the terminal numbers. Incorrect connection may cause a terminal fault.

SH type



YH type



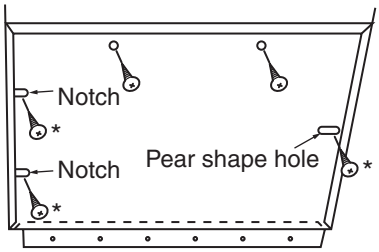
■ Concealed duct type

Wiring the indoor unit

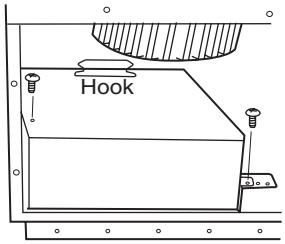
Be sure to connect the wires matching the terminal numbers. Incorrect connection may cause a terminal fault.

Wiring to electric parts box

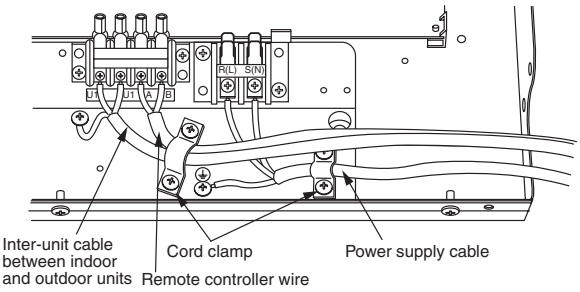
• Connect the wiring to the electric parts box as shown in the following figure



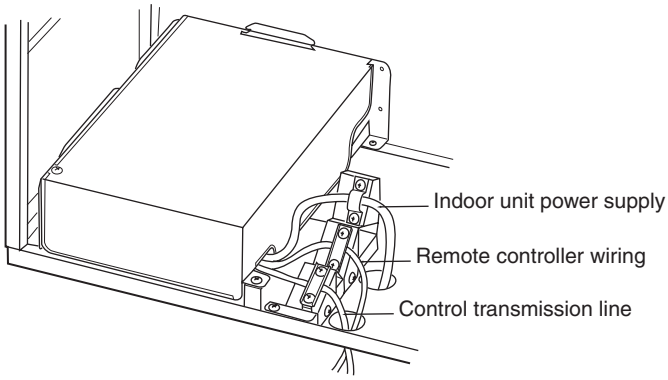
Loosen the three screws (★) at both sides of the e-box. Then remove the final two screws, so that the cover may be slid out and removed.



Remove the two screws and then slide and position the upper cover of the electrical box away from the fixing hook.

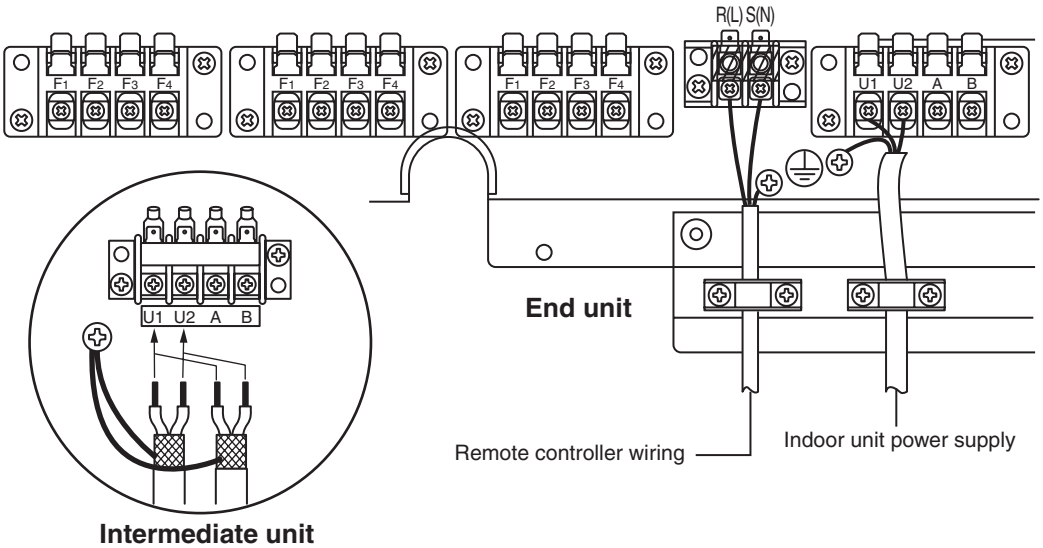


(LN terminal)
Indoor unit power supply
(U1, U2 terminal)
Transmission line for control
(AB terminal)
Remote controller cabling

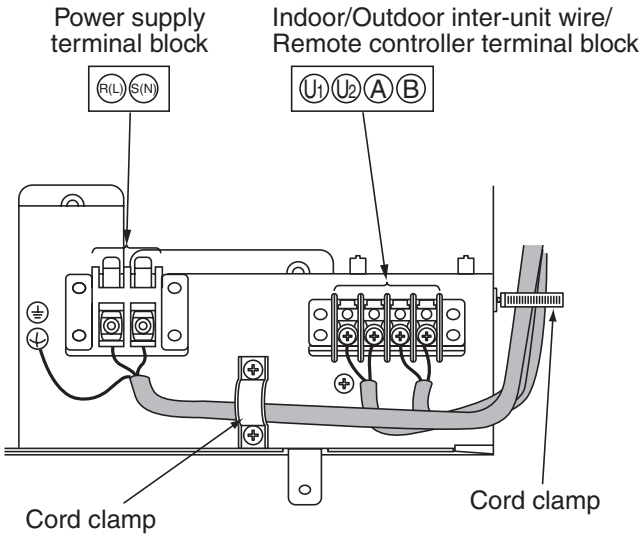


• When connecting the wiring from outside of the indoor unit (power supply etc.), ensure that it matches the figure shown to the left.

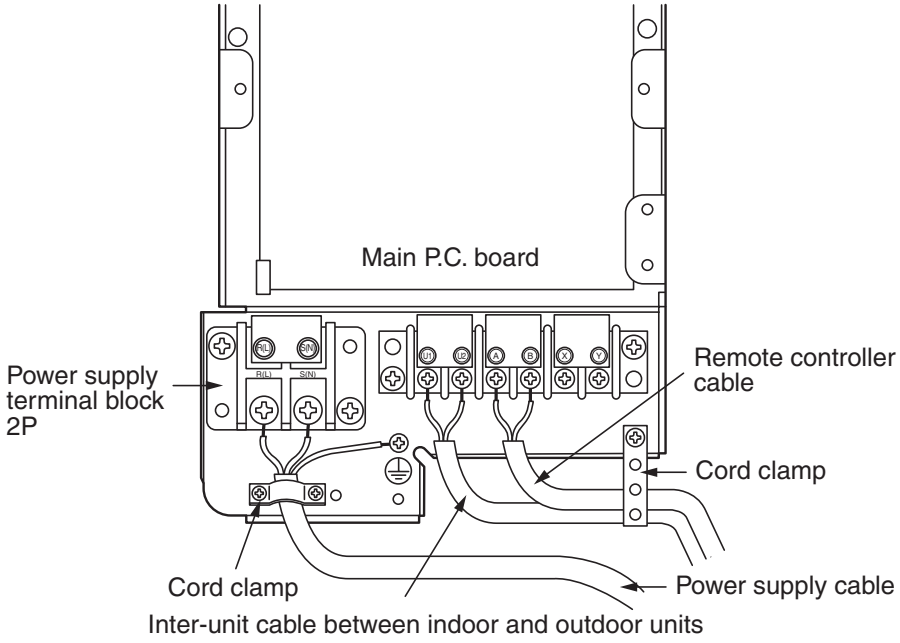
■ Concealed duct high static pressure type



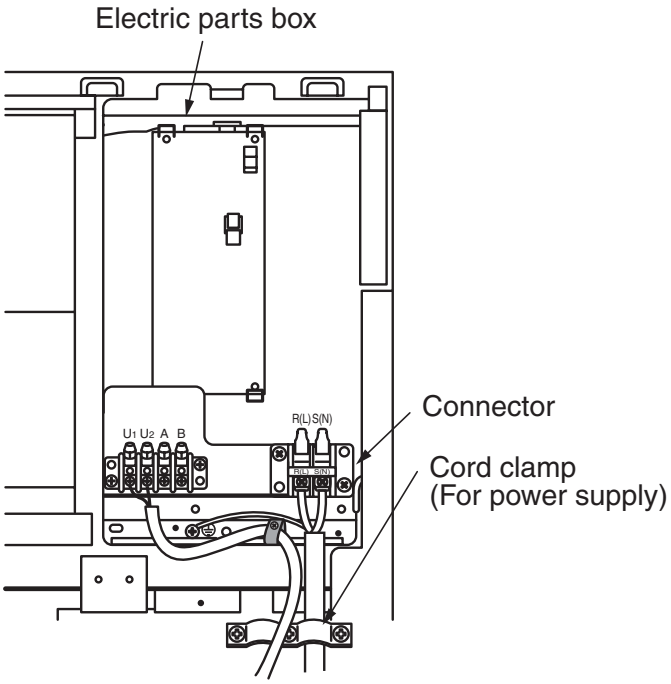
■ Under Ceiling Type



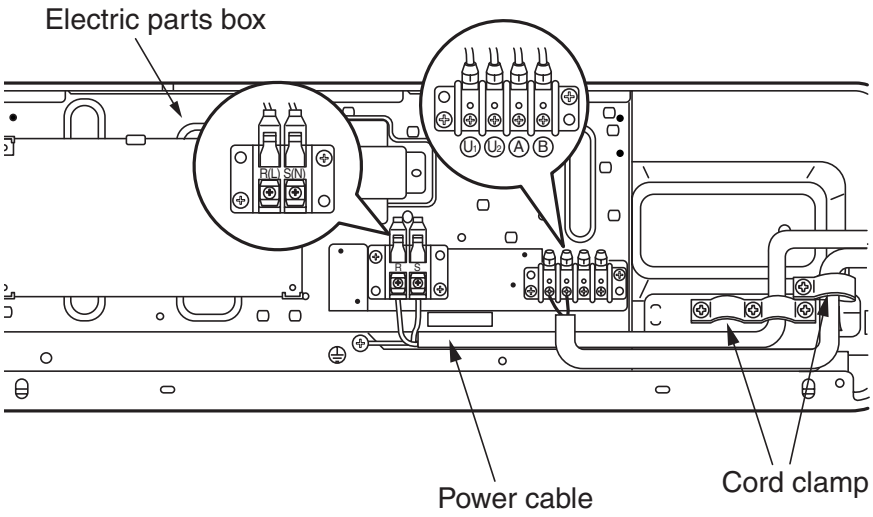
■ High wall type



■ Floor standing cabinet type



■ Floor standing concealed type



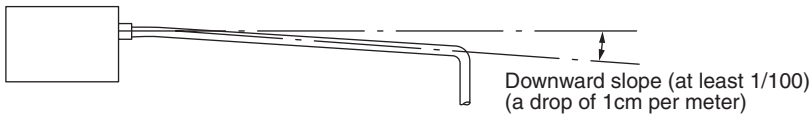
NOTE :

Ensure that the cord clamp used is correct to the wire size.

10. DRAIN PIPE INSTALLATION

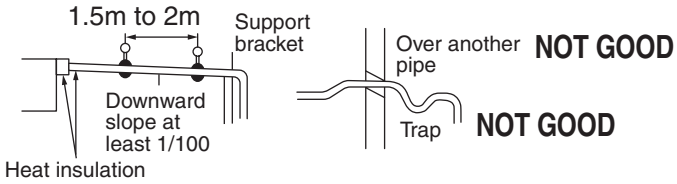
10-1. Natural Draining

1. The drain pipe should have a downward slope of at least 1/100.
2. The drain pipe should be as short as possible and routed so that air pockets will not form.



3. The horizontal run should be as short as possible. However if this is not possible, support it with hanging supports at the prescribed intervals (to prevent undulations in the pipe).

	Nominal diameter	Support bracket interval
Hard polyvinyl chloride pipe	25 to 40mm	Within 1.5 to 2m



CAUTION

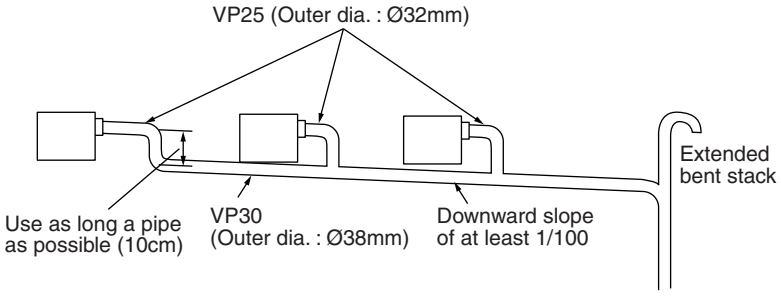
1) The drain pipe should be at least as large as the size of the drain pipe connector on the indoor unit.
2) Insulate the drain pipes completely.
   Failure to insulate the drain pipes will allow condensation to form. Insulate the pipe and the connector on the indoor unit as well.

Insulation	Polyethylene foam with a thickness of 6mm

3) Ensure that all pipe connections are attached securely.
   (When using polyvinyl chloride pipe, do not forget to apply the adhesive for hard polyvinyl chloride.)

10-2. Collective Drain Piping

1. Connections to a horizontal main pipe should be dropped in from above. Furthermore, use pipe with a nominal diameter of at least VP20 (VP30) for the collective drain pipe.
2. Limit as much as possible the number of units that drain into a collective pipe in order to keep the length of the horizontal main pipe to a minimum.
3. Do not connect models with a built-in drain pump and models that use gravity drains to the same horizontal pipe.



10-3. Selecting the Diameter for the Collective Pipe

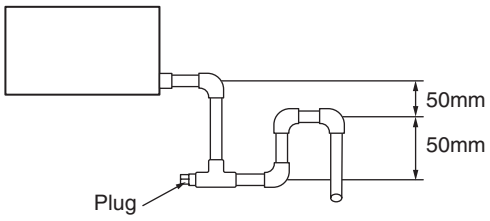
Calculate the amount of drain water based on the number of indoor units that will be connected to the collective drain pipe, then select the pipe diameter accordingly.
Assume 2 liters/hour per horsepower for the amount of drain water produced by an indoor unit.

- The above table is for a horizontal pipe.

Nominal	Inner dia. (mm)	Allowable volume (Grading 1/100)
30	31	88 l/hr
40	40	175 l/hr
50	51	334 l/hr

10-4. Drain Trap

1. When a drain pipe is connected to an indoor unit that will create negative pressure (concealed duct high static pressure type), install a drain trap.
2. Install one drain trap for each indoor unit.
   (A drain trap that is installed downstream of a junction of drain pipes from two or more indoor units will be ineffectual.)
3. Install a drainage plug into the drain trap.



10-5. Drain Check

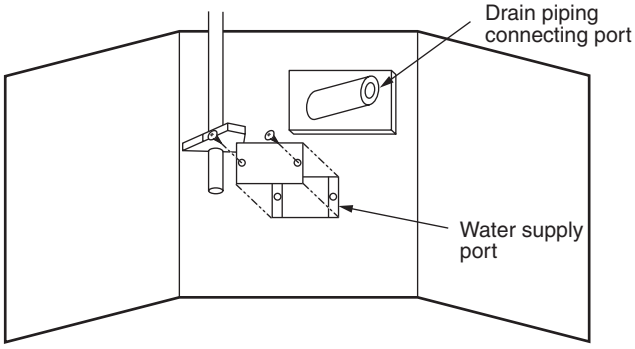
After the drain pipe has been fully installed, place water in the drain pan and confirm that the water drains away correctly.

1) 4-way air discharge cassette type (with built-in drain pump)

Check after all electrical work has been completed

1. While the cooling operation is in action, remove the cover of the water supply opening as illustrated below, then use a water pump or other source to gradually add at least 1500 to 2000cc of water through the water supply opening.

   Check the draining action of the system by listening for the sound of the drain pump. If the drain pump sound changes from a continuous sound to an intermittent sound, the drain system is functioning normally.
2. After checking the system, re-attach the cover to the water supply opening.



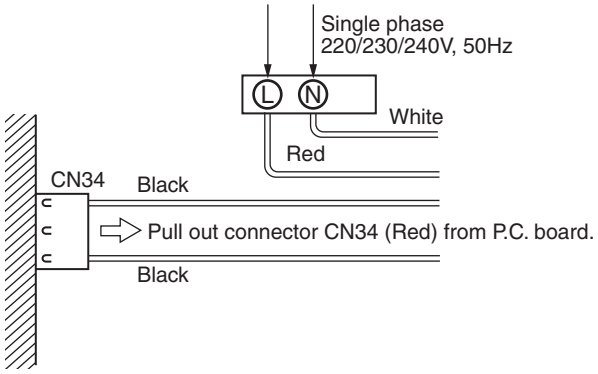
When checking before all electrical work has been completed

1. Firstly, unplug the float switch connector (CN34, 3P Red) in the electronic components box in the indoor unit, then supply a single-phase 220/230/240V, 50Hz power source to Ⓛ and Ⓝ power terminals in the electronic components box. Never apply the voltage to terminals Ⓐ, Ⓑ, Ⓤ1, Ⓤ2.

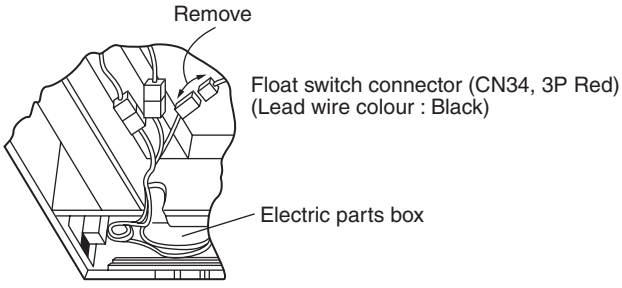
   Note The drain pump will not run if the float switch is not disconnected.

   Following the same procedure as when checking the system after the electrical work has been completed, check the draining action of the system by adding water through the water supply opening and then listening for the sound of the drain pump.
2. When the check of the drain system is completed, do not forget to restore the float switch CN34 connector to its original condition. Also do not forget to re-attach the cover for the water supply opening.

4-Way Air Discharge Cassette Type, Concealed Duct Standard Type



2-Way Air Discharge Cassette Type

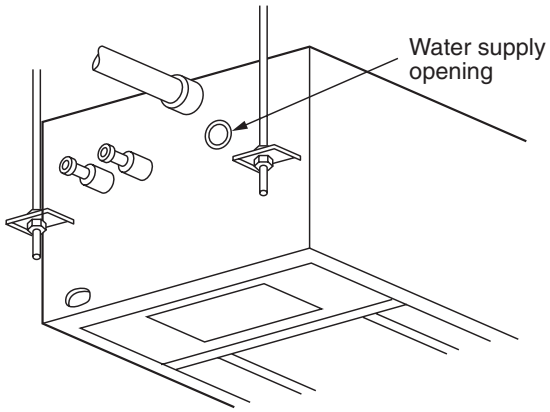


2) 2-way air discharge cassette type (with built-in drain pump)

Check after all electrical work has been completed

1. While the cooling operation is in action, remove the rubber grommet from the water supply opening as illustrated below and then use a water pump or other source to gradually add at least 1200 to 1500cc of water through the water supply opening.

   Check the draining action of the system by listening for the sound of the drain pump. If the drain pump sound changes from a continuous sound to an intermittent sound, the drain system is functioning normally.
2. After checking the system, re-install the rubber grommet in the water supply opening, remembering to attach the circular insulation (provided), so that the rubber grommet is covered.

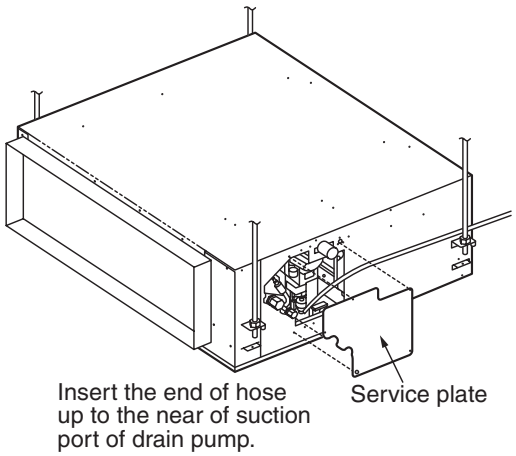


3) Concealed duct standard type (with built-in drain pump)

Check after all electrical work has been completed

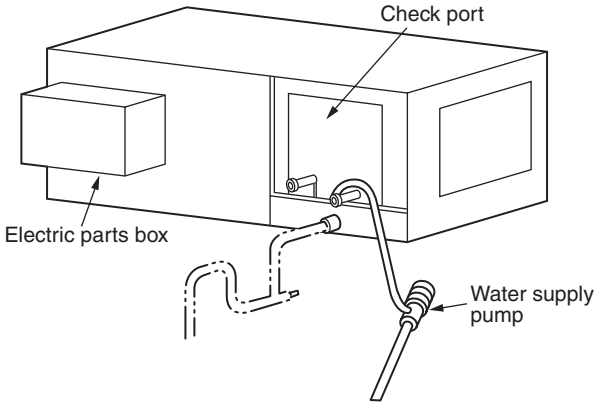
1. While the cooling operation is in action, remove the cover to the water supply opening as illustrated below and then use a water pump or other source to gradually add at least 1500 to 2000cc of water through the water supply opening.

   Check the draining action of the system by listening to the sound of the drain pump. If the drain pump sound changes from a continuous sound to an intermittent sound, the drain system is functioning normally.
2. After checking the system, re-attach the cover for the water supply opening.



4) Concealed duct high static pressure type

Both the concealed duct type and the concealed duct high static pressure type use gravity drains.
After the drain pipes have been installed, use a water pump or other source to place water into the drain pan, ensuring that the water drains away completely.



5) Under ceiling type

Remove the transport brackets before beginning work.

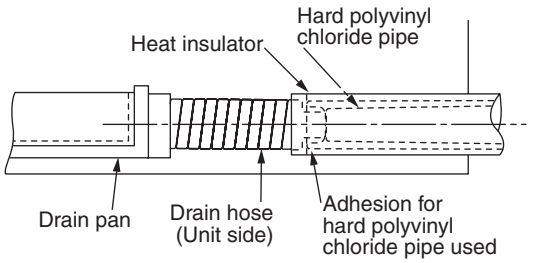
⚠ CAUTION

Insulate the drain pipes completely, including the connections. Failure to insulate the drain pipes will allow condensation to form.

Piping and Insulation

Indoor unit

Piping	Hard polyvinyl chloride pipe ; nominal dia. (inner dia.) : Ø20mm
Heat insulator	Vesicant polyethylene : Thickness ; 6mm or more



Piping methods

1. Installing the drain pipe to the rear

   Fix the drain pipe holding plate with screws at the bottom of the rear knockout hole, then secure the drain pipe in place with a nylon band.
   Make sure that the nylon band's link point is on the inner side of the unit (above the drain pipe holding plate). If only the drain pipe is to be routed out the rear of the unit, use just the drain pipe knockout hole.

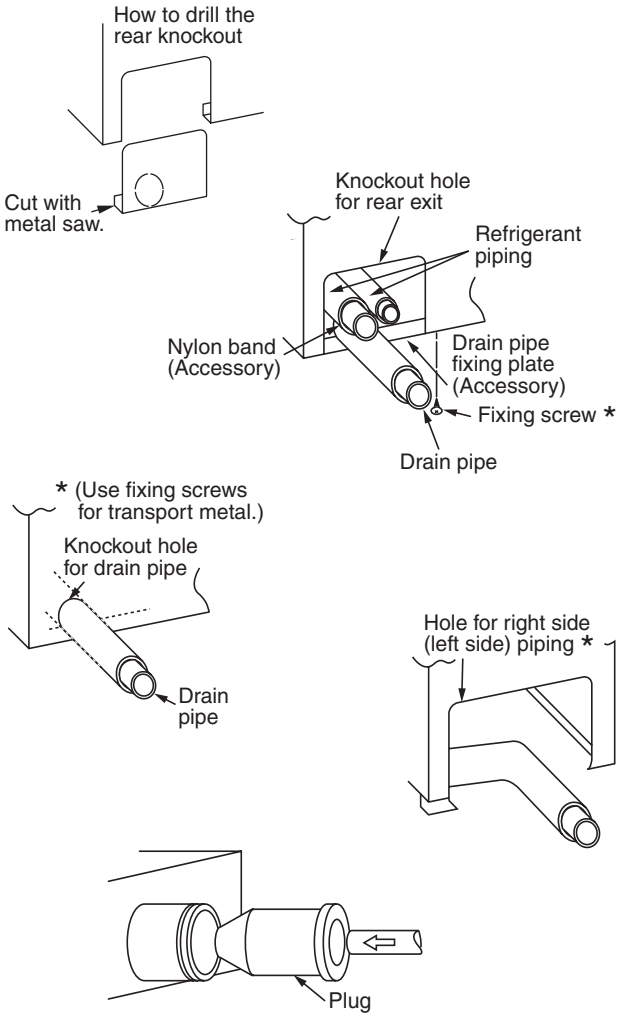
2. Installing the drain pipe to the left or right

   Install the drain pipe so that it is horizontal.

   * When running the drain pipe out of the left side of the unit, open the knockout hole. Also move the drain hose from the right side to the left, then move the plug from the left side to the right. Use a blunt-tipped object to push the plug back into the base, so no water leakage can occur.

   After the piping work has been completed, use the insulation provided to seal all gaps around the knockout.

   (Cut the insulation to the necessary shape.)

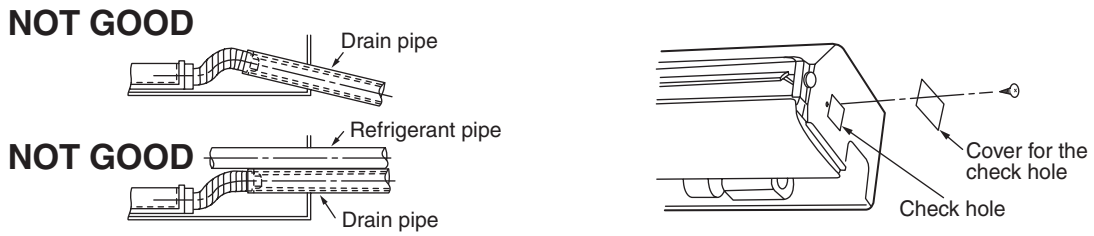


⚠ CAUTION

Do not use excessive force to tighten the nylon band as this will reduce the effectiveness of the insulation. (there should be no deformation of the insulation).

⚠ CAUTIONS

1. As the drainage of the unit is done by gravity, ensure that the pipes outside of the unit have a downward slope.
2. If the piping is installed as shown in the illustrations, it will not drain effectively. Avoid these conditions.
3. Once piping installation is complete, remove the cover for the check hole located on the right side of the unit, add water to the drain pan through the check hole, ensuring that the water drains completely.



6) High wall type

⚠ CAUTIONS

Install the drain pipe in accordance with the Installation Manual so that the water is drained completely Insulate the pipes so that no condensation forms on them.

Improper pipe installation could result in water dripping from the unit onto furniture etc.

⚠ REQUIREMENTS

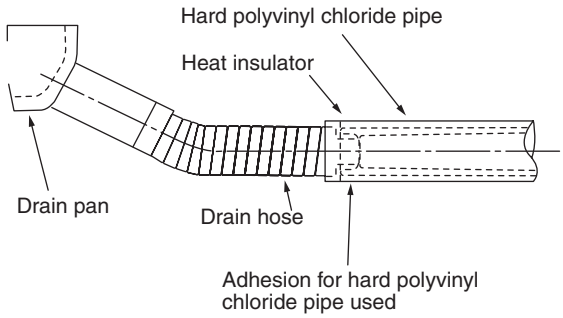
- Insulate indoor drain pipes completely.
- Insulate the connection with the indoor unit.

  Incomplete insulation could result in condensation forming.
- Make sure that the drain pipe slopes downwards at a rate of 1/100. Ensure that the drain pipe is unhindered and does not flow into a drainage point that will not allow the water to escape from the hose.
- Do not apply undue force to the drain pipe connection.

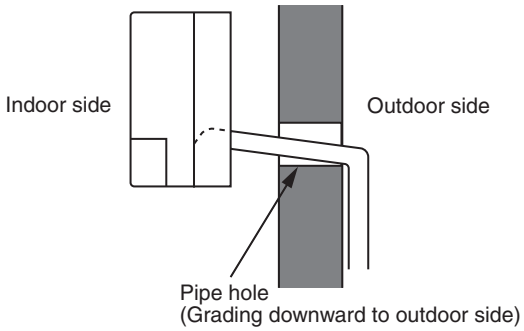
Piping and Insulation

Ensure that the following materials are available during the installation of the unit.

Piping	Hard polyvinyl chloride pipe ; nominal dia. (inner dia.) : Ø20mm
Heat insulator	Vesicant polyethylene : Thickness ; 6mm



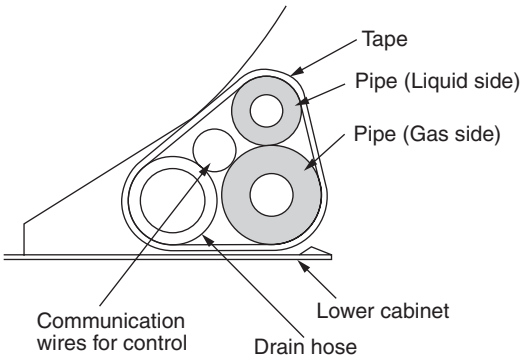
- When extending the drain hose, make the connection as shown in the figure on the right.
- As the drainage of the unit is done by gravity, ensure that the pipes outside of the unit have a downward slope.
- Once the piping work is complete, pour water into the drain pan and make sure that the water drains completely.



Pipe and Drain Hose Formation

The drain pipe can be routed out of the rear, left, or right-hand side of the unit.

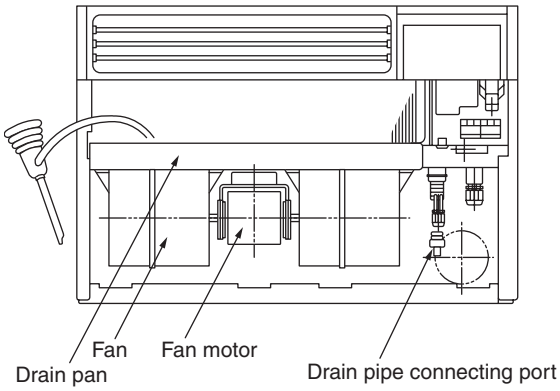
1. When routing the drain pipe out of the left or right side, align the pipe and drain hose as shown in the figure. Make sure that the hose does not stick out of the rear of the unit.
2. When the drain pipe is positioned so that it exits the unit from the rear, firstly fix the installation plate to the wall. Once fixed, drill the exit hole through the wall, ensuring that the refrigeration pipes, drain hose and electrical wiring can all safely be connected to the unit. Once completed arrange the pipes etc., as shown in the figure below.



7) Floor standing cabinet type

Piping	Hard polyvinyl chloride pipe ; nominal dia. (inner dia.) : Ø20mm
Heat insulator	Vesicant polyethylene : Thickness ; 6mm or more

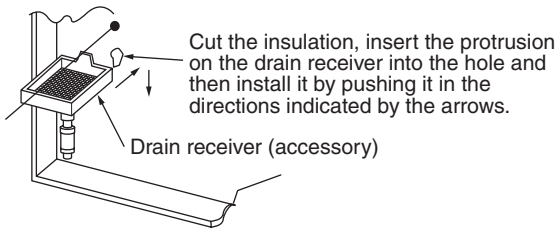
1. As the drainage of the unit is done by gravity, ensure that the pipes outside of the unit have a downward slope.
2. Once the piping work is complete, pour water in the drain pan and make sure that the water drains completely.



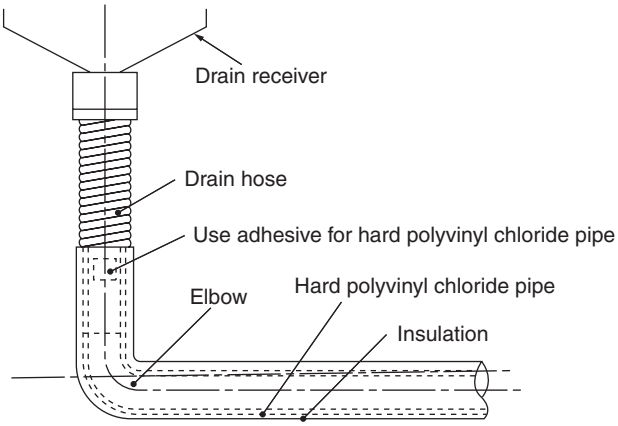
8) Floor standing concealed type

Installation of accessories

Install the drain receiver (accessory) on the pipe side of the indoor unit.



Piping and Insulation



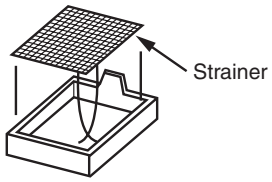
⚠ CAUTIONS

1. Make sure that the drain pipe slopes downwards at a rate of 1/100. Ensure that the drain pipe is unhindered and does not flow into a drainage point that will not allow the water to escape from the hose.
2. Limit horizontal runs of drain pipe to no more than 20m (not including change in height). If a drain pipe is long, prevent undulations in the pipe by installing support brackets along the pipe. Never use an air escape pipe as the drain water may blow out of such a pipe.
3. If using a collective drain pipe, install a VP30 or equivalent pipe with a downward slope of at least 1/100. Apply adequate insulation (at least 6mm of polyethylene foam) to the drain pipe, as in the case of a refrigerant pipe.
4. Once the pipe installation is complete, pour water into the drain receiver and make sure that the water drains. Check for leaks at the hose connection.

CAUTION

Sometimes, debris will accumulate in the drain receiver while installation work is in progress. Remove the strainer from the drain receiver and clean it.

After cleaning the strainer, fit it back into the drain receiver.



10-6. Cautions Concerning High Drains

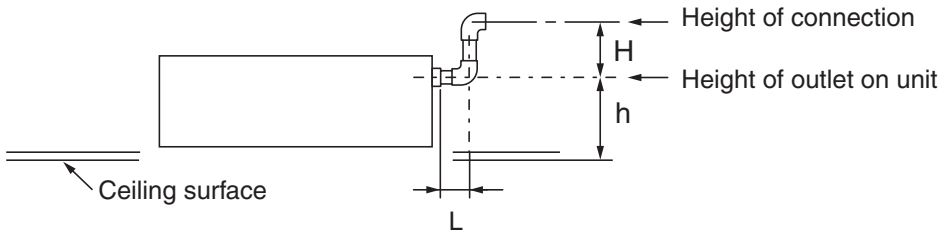
Observe the following cautions when installing a drain pipe to a drain that is higher than the unit.

1) Cautions on drain installation work

1. The unit must be installed horizontally.
2. The height to the drain outside the unit must be within the specified limit.
3. The pipe work that is on a upwards slope must be within 100mm of the drain.
4. The drain pipe must have a downward slope of at least 1/100.
   (After installing the piping, adjust the unit in the vertical direction carefully.)
5. When using a collective pipe, the drain pipe must drop at least 100mm before it empties into the collective pipe.
6. Insulate the drain pipe completely.

2) Height of a high drain outside of the unit

Drain pump bult-in type



Type	Indoor unit type	Allowable height of drain-up outside of unit (Condition)		
		Position of main unit drain port	Allowable height of drain-up (From drain port of main unit)	L
Drain pump incorporated	4-way air discharge cassette type MMU-AP ★★★★ H	h = 210 mm	H = 640 mm	300 mm or less
	2-way air discharge cassette type MMU-AP0071WH to 0301WH	H = 348 mm	H = 160 mm	100 mm or less
	2-way air discharge cassette type MMU-AP481WH	h = 356 mm	H = 160 mm	100 mm or less
	1-way air discharge cassette type MMU-AP0151SH, AP0181SH, AP0241SH	h = 160 mm	H = 340mm	140 mm or less
	1-way air discharge cassette type MMU-AP0071YH, AP0091YH, AP0121YH	h = 200 mm	H = 150 mm	100 mm or less
	Concealed duct standard type MMD-AP ★★★★ BH	h* = 280 mm * From unit bottom surface	H = 270 mm	100 mm or less

11. ADJUSTMENT OF AIR DIRECTION

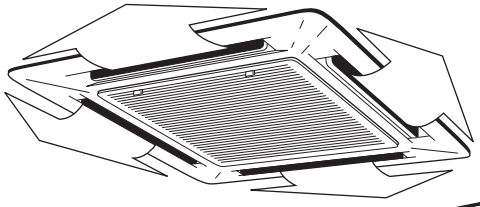
The characteristics of air movement are such that cold air will collect at lower levels, while hot air will collect at higher levels.

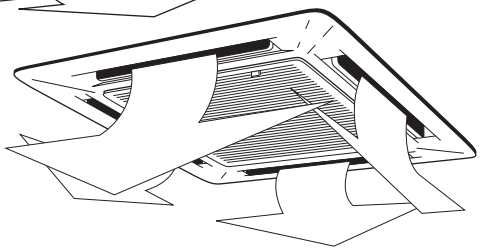
⚠ CAUTION

Set the louver so that the air blows out horizontally.

If cooling operation is performed with the louver blowing air downwards, the air outlet or surface of the louver will be wet with dew and water droplets may fall down.

4-way Air Discharge Cassette Type





♦ In cooling operation

- Use the discharge louver with a horizontal set point.

♦ In heating operation

- Use the discharge louver with a downward set point.

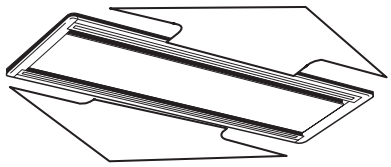
♦ When using a panel with a auto louver

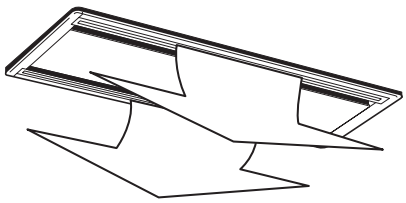
- When using a panel with a auto louver, the discharge louver operates automatically by pushing the louver operation switch. The result of this is that the cooling/heating effect will be increased.
- The louver operation switch can be used only while the operation lamp (Green) goes on.
- Stop the louver operation during defrost operation.
- When “LOUVER” and then “MANUAL” are displayed intermittently on the remote controller, the panel has no auto louver function.

♦ 2-way/3-way air discharge

2-way discharge or 3-way discharge can be selected according to the shape or arrangement of the room. For details, contact your nearest local dealer.

2-way Air Discharge Cassette Type





♦ In cooling operation

Use the discharge louver with a horizontal set point.

♦ In heating operation

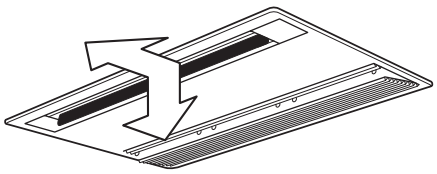
Use the discharge louver with a downward set point.

♦ When using a panel with a auto louver function

- When using a panel with an auto louver, the discharge louver operates automatically by pushing the louver operation switch. This will increase the cooling/heating effect.
- The louver operation switch can be used only while the operation lamp (Green) goes on.
- Stop the louver operation during defrost operation.
- When “LOUVER” and then “MANUAL” are displayed intermittently on the remote controller, the panel has no auto louver function.

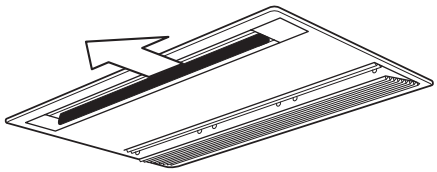
1-way Air Discharge Cassette Type

Up/Down air direction adjustment



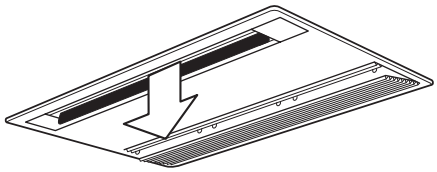
Auto louver :

- When pushing the LOUVER switch, the discharge louver operates automatically.
  This will increases the cooling/heating effect.
- The louver operation switch can be used only while the operation lamp (Green) goes on.
- Stop the louver operation during defrost operation.



♦ In cooling operation

In cooling operation, use the discharge louver with a horizontal set point so that the cool air diffuses the whole room.

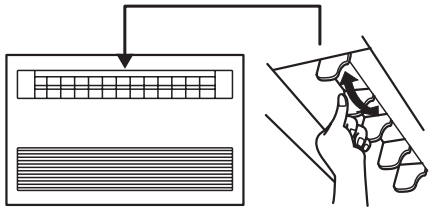


♦ In heating operation

In heating operation, use the discharge louver with a downward set point so that the the hot air is directed towards the floor.

Left/Right air direction adjustment

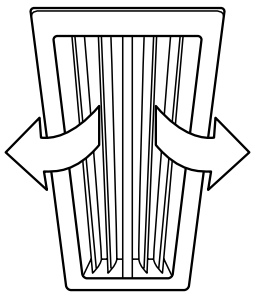
When you change the blowout direction from left to right, direct the vertical grille inside of the discharge louver to the desired direction.



Concealed Duct Type

When using the discharge grille unit, adjust the air direction as follows.

* For procuring the discharge grille locally, contact your nearest sales dealer.



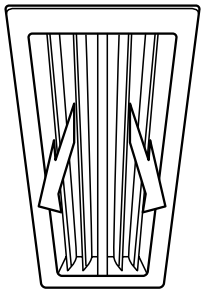
♦ In cooling operation

In cooling operation, use the discharge louver with a horizontal set point so that the cool air diffuses the whole room.

♦ In heating operation

In heating operation, use the discharge louver with a downward set point so that the hot air is directed towards the floor.

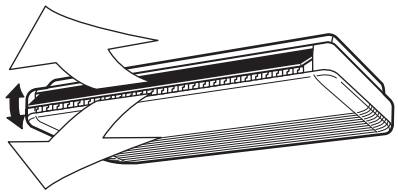
♦ Using the discharge port unit with the auto louver



- When pushing the LOUVER operation switch on the remote control, the discharge louver will operate automatically. This increases the cooling/heating effect.
- The louver operation switch can be used only while the operation lamp (Green) goes on.
- Stop the louver operation during defrost operation.
- When “LOUVER” and then “MANUAL” are displayed intermittently on the remote controller, the panel has no auto louver function.

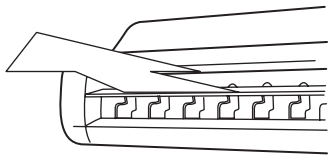
Under Ceiling Type

Up/Down air direction adjustment



Auto louver :

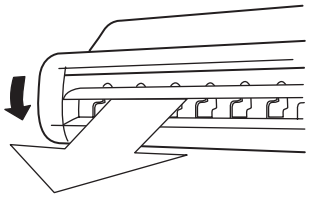
- When pushing the LOUVER operation switch on the remote controller, the discharge louver operates automatically. This will increases the cooling/heating effect.
- The louver operation switch can be used only while the operation lamp (Green) is on.



- Stop the louver operation during defrost operation.

♦ **In cooling operation**

In cooling operation, use the discharge louver with a horizontal set point so that the cool air diffuses the whole room.

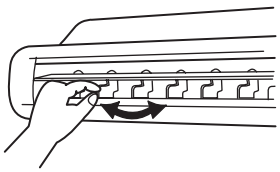


♦ **In heating operation**

In heating operation, use the discharge louver with a downward set point so that the hot air is directed towards the floor.

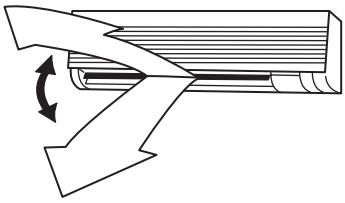
Left/Right air direction adjustment

When you change the blowout direction from left to right, direct the vertical grille inside of the discharge louver the to desired direction.



High Wall Type (1 series)

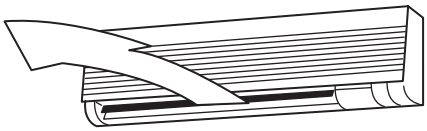
The horizontal louver can operate automatically in order to increase the cooling/heating effect.



Up/Down air direction adjustment

Auto louver :

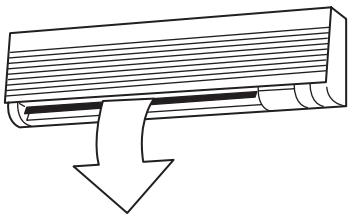
- When pushing the LOUVER operation switch on the remote controller, the discharge louver operates automatically.
- The louver operation switch can be used only while the operation lamp (Green) goes on.



- Stop the louver operation during defrost operation.

♦ **In cooling operation**

In cooling operation, use the discharge louver with a horizontal set point so that the cool air diffuses the whole room.



♦ **In heating operation**

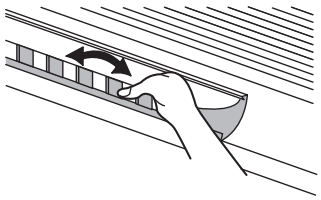
In heating operation, use the discharge louver with a downward set point so that the hot air is directed towards the floor.

REQUIREMENT

- If a cooling operation is performed with the louver blowing air downwards, the surface of the cabinet or discharge louver may become wet with dew and droplets may fall down.
- When a heating operation is performed with a horizontal set point, the room temperature may not be equal i.e. there may be a large variance between one side of the room and the other.
- Do not handle the discharge louver directly with your hands. Select the direction of the discharge louver by pushing the LOUVER operation switch on the remote controller. The discharge louver will not stop immediately even if the switch has been pushed. Note pushing the switch again when the required louver direction has been reached will stop the louver.

Left/Right air direction adjustment

When you wish to change the blowout direction from left to right, direct the vertical grille found inside the discharge louver to the desired direction.



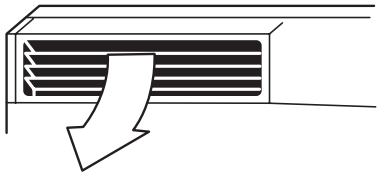
Floor Standing Cabinet Type

♦ In cooling operation

In cooling operation, set the discharge louver with an upward set point so that the cool air diffuses the whole room.

♦ In heating operation

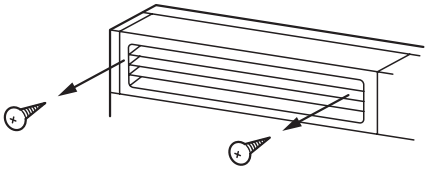
In heating operation, set the discharge louver with an downward set point so that the hot air is directed towards the floor.

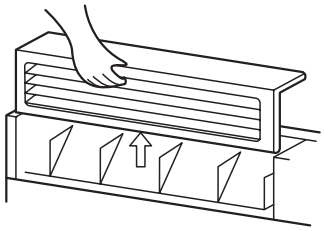


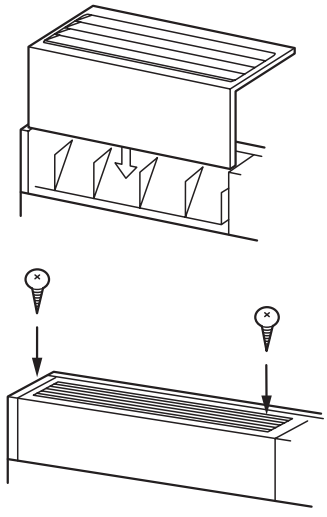
How to change the discharge port

To change the discharge port, follow the procedure below.

1. Remove the two fixing screws from the discharge port. (Fixing screws will be reused.)
2. Remove the discharge port, by pushing up on the rear side, to a point where you can remove it from the rear clip.
3. Lift the discharge port upward, and remove it.
4. Reverse the discharge port and install it to the main unit.
   (During installation, be sure to hang it on clips at the two rear positions and the two lower positions.)
5. Fasten the discharge port with the removed fixing screws so that the discharge port is not out of place.







12. ADDRESS SETUP

In this air conditioner, it is necessary to set up the indoor address before starting the system. Set up the address using the following procedure.

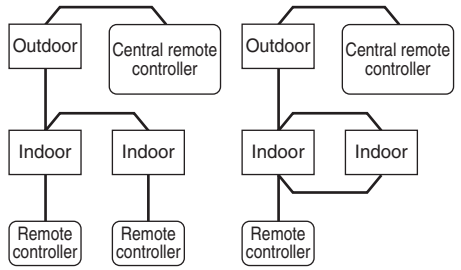
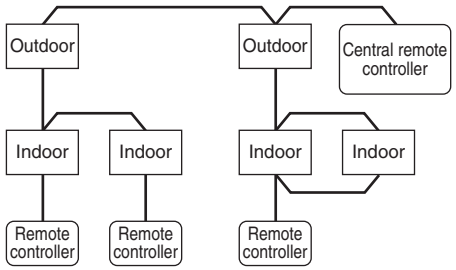
CAUTION

1. Set up the address after the wiring work has been completed.
2. Be sure to turn on the power in order of indoor unit → outdoor unit. If turning on the power in the reverse order, a check code [E19] is displayed. When a check code is displayed, turn on the power again.
3. It requires a maximum of 10 minutes (Usually, approx. 5 minutes) to automatically set-up an address for 1 system.
4. To set up an address automatically, the set-up of the outdoor unit needs to be completed. (Address setup cannot be performed by power-ON only.)
5. To set up an address, the air conditioner does not need to be in operation.
6. Manual address setup is also available besides automatic setup.
   Automatic address : Setup from SW15 on the interface P.C. board of the outdoor unit
   Manual address : Setup from the wired remote controller
   * It is temporarily necessary to set-up the indoor unit as a 1:1 using a wired remote controller.

1. Automatic Address Setup

Without central control : Go to address setup procedure 1
With central control : Go to address setup procedure 2

Note When central control is performed in a single refrigerant system go to procedure 1.

(Example)	In case of central control in a single refrigerant system	In case of central control over refrigerant systems
Address setup procedure	To procedure 1	To procedure 2
Wire systematic diagram		

Address setup procedure 1

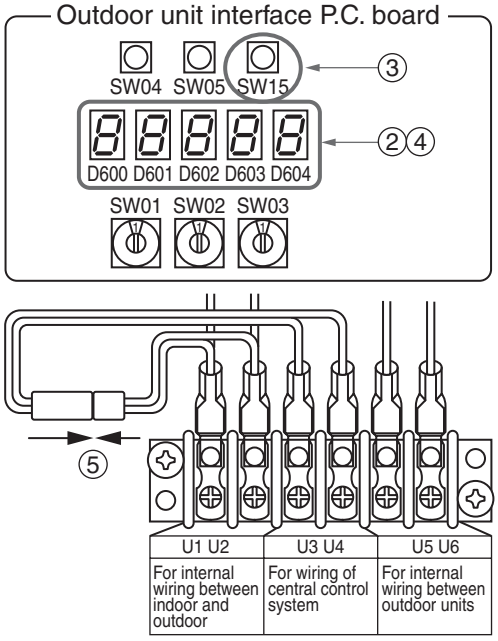
① Turn on the power to the indoor/outdoor units.
(In order of indoor → Outdoor)

② After approximately. 1 minute, check that **U. 1. L08** (U. 1. flash) is displayed in the 7-segment display section on the interface P.C. board of the header outdoor unit.

③ Push SW15 and start the automatic set-up of the address.
(Max. 10 minutes for 1 line (Usually, approx. 5 minutes))

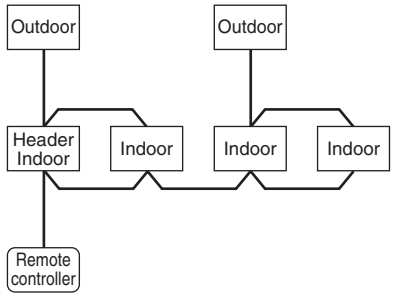
④ When the count Auto 1 → Auto 2 → Auto 3 is displayed in the 7-segment display section and it changes from
U. 1. - - - (U. 1. flash) to
U. 1. - - - (U. 1. light) , the setup has been completed.

⑤ When using a central control, connect a relay connector between U1U2 of the header outdoor unit and U3U4 terminals.



REQUIREMENT

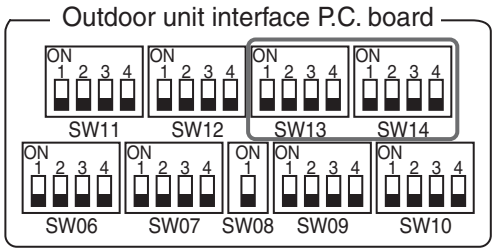
- When a group control is performed over multiple refrigerant systems, be sure to turn on the power supplies to all of the indoor units connected , so that the address set-up can be completed correctly.
- If turning on the power for each refrigerant system to set up the addresses, a header indoor unit must be set for each system. Therefore, an alarm code "L03" (Duplicated header indoor units) will be displayed during in operation after the address setup has been completed. In this case, change the group address using the wired remote controller so that only one header indoor unit is set-up.

(Example)	Group control over multiple refrigerant systems
Wire systematic diagram	

Address setup procedure 2

① Using SW13 and 14 on the interface P.C. board on the header outdoor unit in each system, set up the system address for each system.
(At shipment the address is set to 1 from the factory)

Note) Be careful not to duplicate with any other refrigerant systems or other line (system) addresses.



Line (System) address switch on outdoor interface P.C. board

(○: Switch ON, × : Switch OFF)

Line address	SW13				SW14			
	1	2	3	4	1	2	3	4
1				×	×	×	×	×
2				×	○	×	×	×
3				×	×	○	×	×
4				×	○	○	×	×
5				×	×	×	○	×
6				×	○	×	○	×
7				×	×	○	○	×
8				×	○	○	○	×
9				×	×	×	×	○
10				×	○	×	×	○
11				×	×	○	×	○
12				×	○	○	×	○
13				×	×	×	○	○
14				×	○	×	○	○

Line address	SW13				SW14			
	1	2	3	4	1	2	3	4
15				×	×	○	○	○
16				×	○	○	○	○
17				○	×	×	×	×
18				○	○	×	×	×
19				○	×	○	×	×
20				○	○	○	×	×
21				○	×	×	○	×
22				○	○	×	○	×
23				○	×	○	○	×
24				○	○	○	○	×
25				○	×	×	×	○
26				○	○	×	×	○
27				○	×	○	×	○
28				○	○	○	×	○

: Is not used for setup of line (system) address. Do not change setup.

② Check that the relay connectors between U1U2 and U3U4 terminals are removed from all the header outdoor units to which the central control is connected. (At shipment from factory: No connection exists)

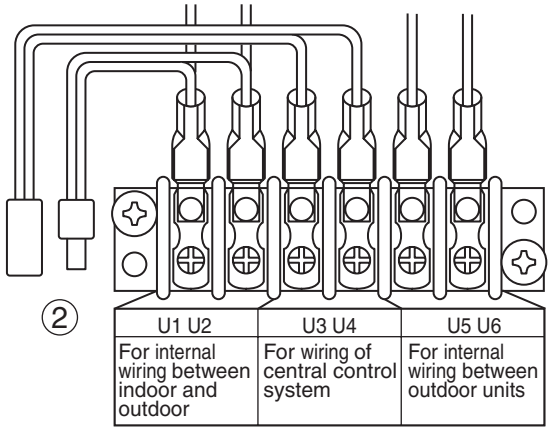
③ Turn on the power to the indoor/outdoor units.
(In order of indoor → outdoor)

④ After approx. 1 minute, check that 7-segment display is [U.1.L08 (U.1. flash)] on the interface P.C. board of the header outdoor unit.

⑤ **Push the SW15 and start the setup of the automatic address.**
(Max. 10 minutes for 1 line (Usually, approx. 5 minutes))

⑥ When the count [Auto 1 → Auto 2 → Auto 3] is displayed in 7-segment display section and it changes from [U. 1. - - - (U. 1. flash)] to [U. 1. - - - (U. 1. light)] , the setup has finished.

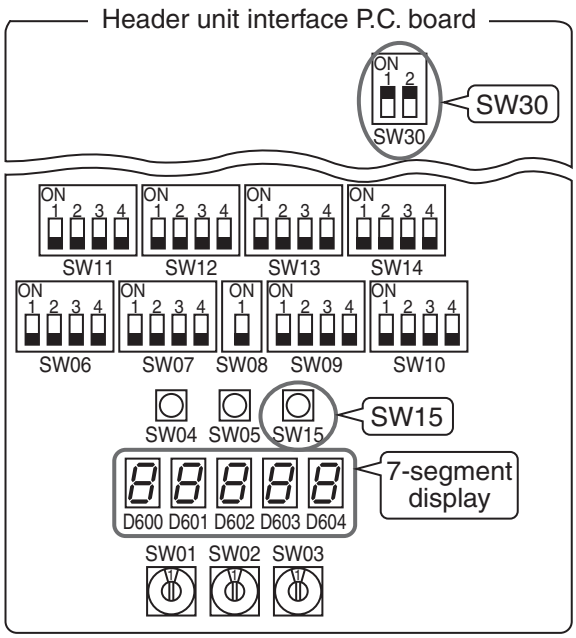
⑦ Procedure ④ to ⑥ are to be repeated in all other refrigerant systems.



⑧ When the address set-up has finished for all of the systems, turn off SW30-2 on the interface P.C. boards for all the header outdoor units of a system that are connected to the central control. However do not include the system with the least amount of address numbers.
(The end terminal resistances of the wires in the central control system of indoor/outdoor are unified.)

⑨ Connect the relay connector between U1U2 and U3U4 for the header outdoor unit for each refrigerant system.

⑩ Then set up the central control address.
(For the central control address setup, refer to the Installation manual of the central control devices.)



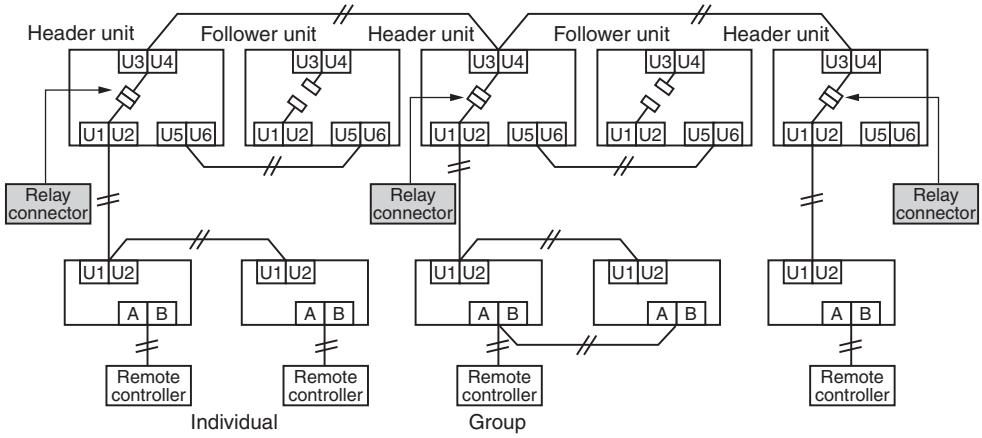
Switch setup

(Example of central control over refrigerant systems)

Outdoor side (Manual setup)

* Manual setup is necessary for the boxes shaded in black.

Outdoor interface P.C. board	Header unit	Follower unit	Header unit	Follower unit	Header unit	Setup at shipment from factory
SW13, 14 (Line address)	1	(Setup is unnecessary.)	**2**	(Setup is unnecessary.)	**3**	1
SW30-2 (End terminal resistance of indoor/outdoor communi cation line/central control communication line	ON	(Setup is unnecessary.)	**OFF after address setup**	(Setup is unnecessary.)	**OFF after address setup**	ON
Relay connector	**Short after address setup**	Open	**Short after address setup**	Open	**Short after address setup**	Open



Indoor side (Automatic setup)

Line address	1	1	2	2	3
Indoor unit address	1	2	1	2	1
Group address	0	0	1	2	0

CAUTION

For relay connector

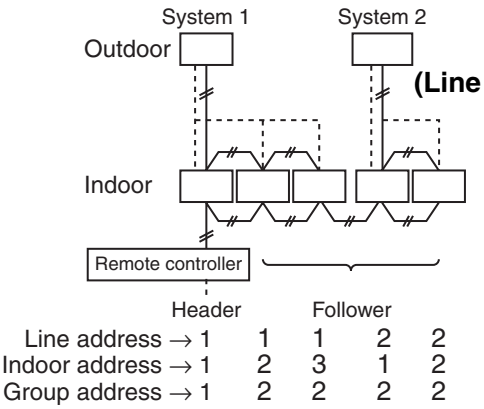
Never connect a relay connector until the address setup for all the refrigerant lines have been completed; otherwise the unit addresses cannot be set-up correctly.

2. Manual address setup from the remote controller

In cases where you have a requirement to address a unit prior to completing the electrical installation and where the outdoor unit has yet to be commissioned. (manual set-up from wired remote controller)

Arrange the indoor unit in which the address is to be set up and set the wired remote controller to 1 : 1.

(Cabling example in 2 systems)



(Line address) →

(Indoor address) →

(Group address) →

In the above example, of no inter-unit wire, set the address after you have individually connected the wired remote controller.

Group address

Individual : 0000
Header indoor unit : 0001
Follower indoor unit : 0002
} In case of group control

Turn on the power.

1 **Push simultaneously the SET + CL + TEST buttons for 4 seconds or more.**
LCD changes to flashing.

2 **Using the TEMP. buttons, set 12 to the item code.**

3 **Using the TIME buttons, set up the line address.**
(Match it with the line address on the interface P.C. board of the header unit in the identical refrigerant system.)

4 **Push the SET button.**
(OK when display goes on.)

5 **Using the TEMP. buttons, set 13 to the item code.**

6 **Using the TIME buttons, set up the indoor address.**

7 **Push the SET button.**
(OK when display goes on.)

8 **Using the TEMP. buttons, set 14 to the item code.**

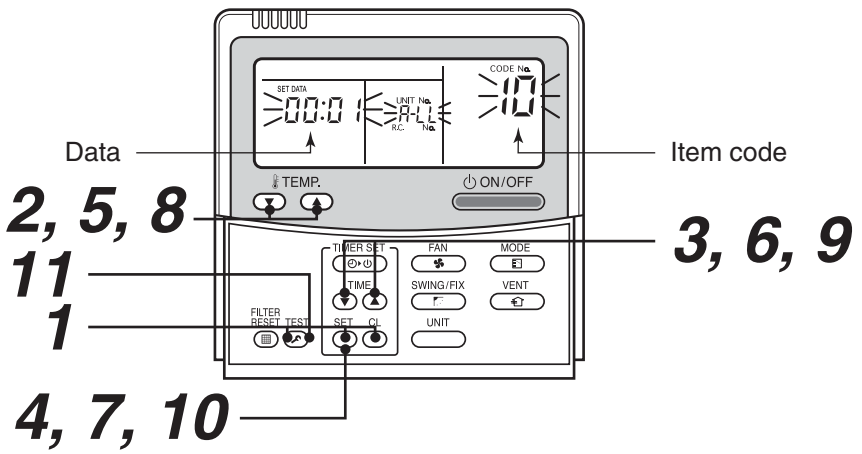
9 **Using the TIME buttons, set Individual = 0000 , Header unit = 0001 , Follower unit = 0002 .**

10 **Push the SET button.**
(OK when display goes on.)

11 **Push the TEST button.**
Setup operation has finished.
(Status of unit will return to normal stop status.)

Operation procedure

1 → 2 → 3 → 4 → 5 → 6 →
7 → 8 → 9 → 10 → 11 **End**



Note 1)

When setting the line address from the wired remote controller, do not use addresses **29** and **30**.

The address **29** and **30** cannot be set up in the outdoor unit. Therefore if they are incorrectly set up, a check code [**E04**] (Indoor/outdoor communication circuit error) will be displayed.

Note 2)

When an address has been manually setup from the wired remote controller and you wish to set up a central control over the refrigeration system and setup the header outdoor unit for each system using the following steps.

- Using SW13 and 14 on the interface P.C. board of the header unit in each system, set up the line address for each system.
- Turn off SW30-2 on all other interface P.C. boards on the header outdoor units that are connected to the same central control, not including the system with the least number of address lines.
  (The terminator resistor of the cables in the central control system of indoor/outdoor are unified.)
- Connect the relay connector between [U1U2] and [U3U4] of the header outdoor unit for each refrigerant system.
- Then set up the central control address.
  (For the central control address setup, refer to the Installation manual of the central control devices.)

3. Confirmation of indoor address and the main unit position on the remote controller

Confirmation of indoor unit No. and position

1. When you wish to know the indoor address and position of a unit within a system.

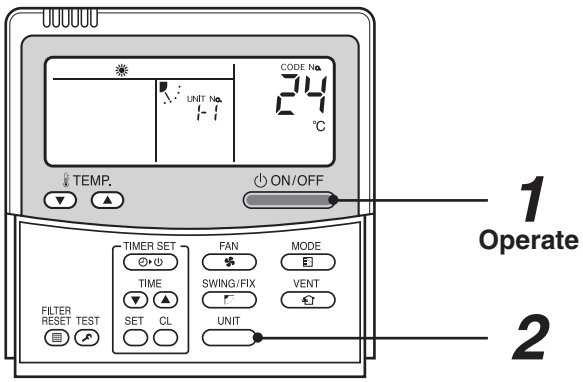
- **In case of individual operation (Wired remote controller : Indoor unit = 1 : 1) or group control**

Procedure (while the air conditioner is in operation)

1 **If the unit stops, push the ON/OFF button.**

2 **Push the UNIT button.**

The unit NO 1 - 1 is displayed on the LCD. (Disappears after several seconds) The displayed unit number indicates the line address and the indoor address. (If there are other indoor units connected to the same remote controller (Group control unit), the unit No is displayed every time you push the UNIT button.)



Operation procedure

1 → 2

2. When you want to know the position of the indoor unit using its address

- To confirm the unit numbers in a group control;

Procedure (while the air conditioner is not in operation)

The indoor unit numbers in a group control will be successively displayed and the corresponding indoor fan is turned on.

1 **Push the VENT + TEST buttons simultaneously for 4 seconds or more.**

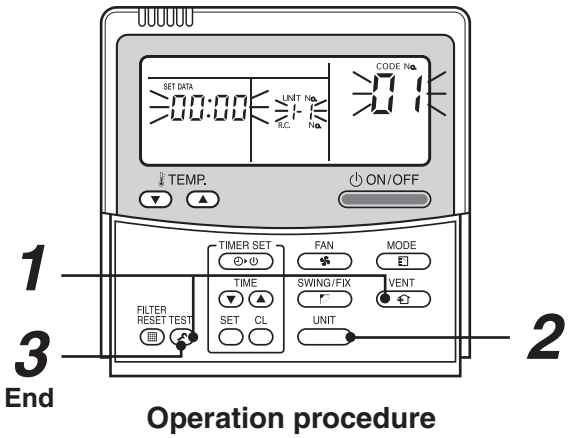
- Unit No ALL is displayed.
- The fans of all the indoor units within the group control are turned on.

2 **For every push of the UNIT button, the indoor unit numbers in the group control are successively displayed.**

- The first unit No. displayed will be the address of the header unit.
- Only the fan of the selected indoor unit will operate.

3 **Push the TEST button to complete the procedure.**

All of the indoor units within the group control will stop.



Operation procedure

1 → ***2*** → ***3*** **End**

• To confirm all the unit numbers from an arbitrary wired remote controller

Procedure (while the air conditioner is not in operation)

All indoor units within the same refrigerant system can be confirmed, once an outdoor unit is selected. The indoor unit numbers are then successively displayed. With each unit display its fan will be turned on.

1 **Push the ▼ + TEST buttons simultaneously for 4 seconds or more.**

line 1, **item code** AC (Address Change) is displayed. (Select the outdoor unit.)

2 **Using the UNIT + SWING/FIX buttons, select the line address.**

3 **Using the SET button, confirm the selected line address.**

- The indoor address, which is connected to the refrigerant system of the selected outdoor unit is displayed and the fan is turned on.

4 **For every push of the UNIT button, the indoor unit numbers in the same refrigerant system are successively displayed.**

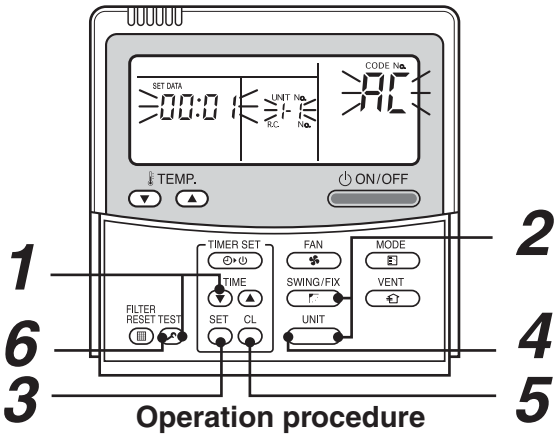
- Only the fan of the selected indoor unit will operate.

[To select another line address]

5 **Push the CL button to return to procedure *2*.**

- The indoor address of another refrigerant system can then be confirmed.

6 **Push the TEST button to complete the procedure.**



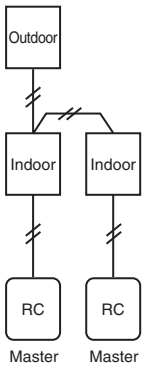
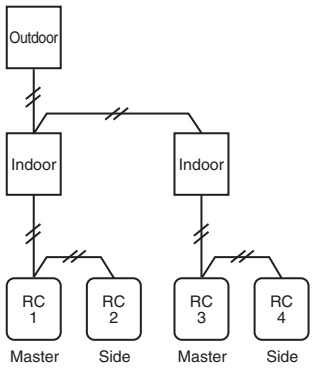
Operation procedure

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** **End**

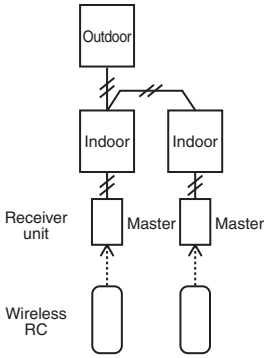
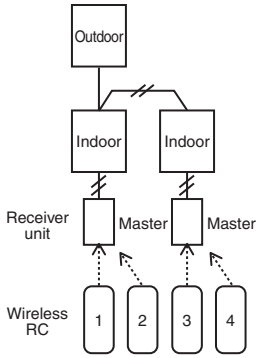
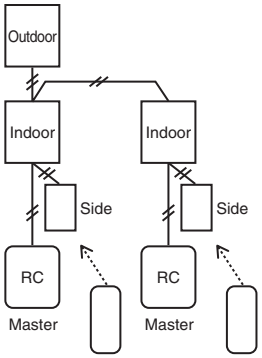
4. Address setup example (VRF system)

Automatic address / Manual address setup example

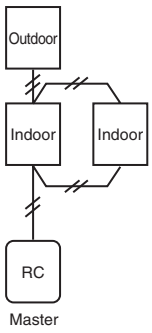
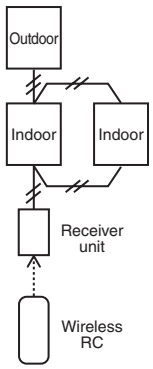
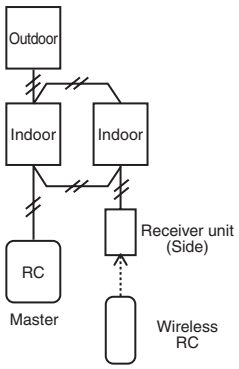
Individual control

Automatic address setting		Available		Available	
Outdoor	Line address	1		1	
					
Indoor	Line address	1	1	1	1
	Indoor unit address	1	2	1	2
	Group address	0	0	0	0

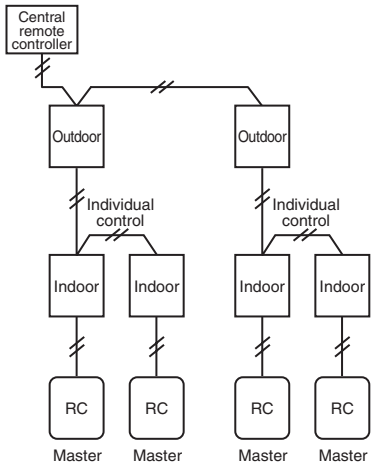
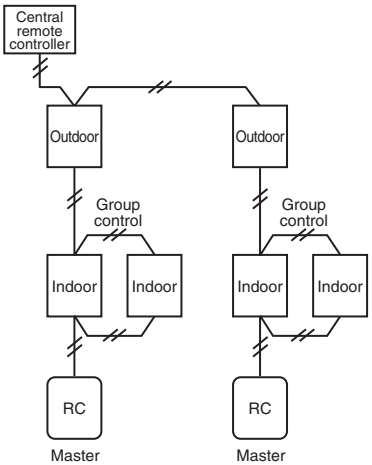
* RC: Remote Controller

Automatic address setting		Available		Available		Available	
Outdoor	Line address	1		1		1	
							
Indoor	Line address	1	1	1	1	1	1
	Indoor unit address	1	2	1	2	1	2
	Group address	0	0	0	0	0	0

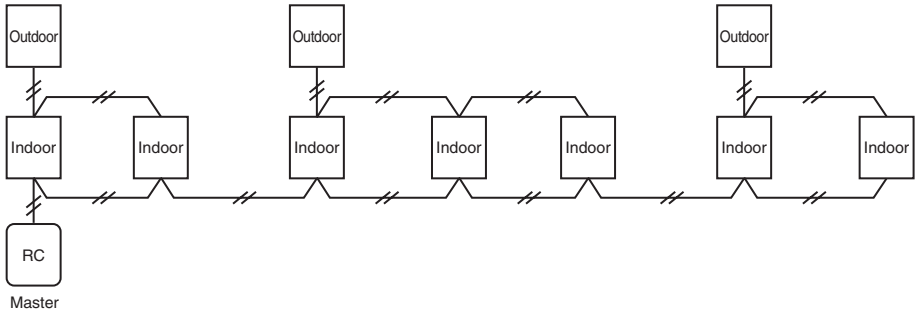
Group control

Automatic address setting		Available		Available		Available	
Outdoor	Line address	1		1		1	
							
Indoor	Line address	1	1	1	1	1	1
	Indoor unit address	1	2	1	2	1	2
	Group address	0	2	1	2	1	2

Central control (Multiple refrigerant systems)

Automatic address setting		Available				Available			
Outdoor	Line address	1		2		1		2	
									
Indoor	Line address	1	1	2	2	1	1	2	2
	Indoor unit address	1	2	1	2	1	2	1	2
	Group address	0	0	0	0	1	2	1	2

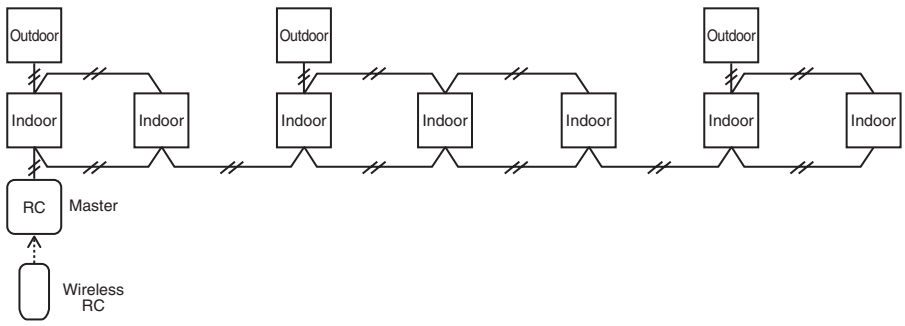
Group control over other refrigerant systems

Automatic address setting		Available						
Outdoor	Line address	1		2			1	
								
Indoor	Line address	1	1	2	2	2	3	3
	Indoor unit address	1	2	1	2	3	1	2
	Group address	1	2	2	2	2	2	2

*1 For group control within a refrigeration system, automatic address setting is available only when all indoor units connected to a group control are turned on during address setting.
If an automatic address setting is conducted under the conditions of power-ON only within the refrigerant system, it may cause the error code “L03” (Duplicated header indoor units) to be displayed. This is because the system believes there is more than one header unit within the group. In this case, change the group address by a wired remote controller so that only one indoor unit becomes the header unit within one group control.

	Group address	1	2	1 → 2*	2	2	1 → 2*	2

→ It is necessary to change the group address as marked with * when an automatic address setting is conducted under the conditions of power-ON only within the refrigerant system in which the address is to be set up.

Automatic address setting		Available						
Outdoor	Line address	1		2			1	
								
Indoor	Line address	1	1	2	2	2	3	3
	Indoor unit address	1	2	1	2	3	1	2
	Group address	1	2	2	2	2	2	2

*1 For group control within a refrigeration system, automatic address setting is available only when all indoor units connected to a group control are turned on during address setting.
If an automatic address setting is conducted under the conditions of power-ON only within the refrigerant system, it may cause the error code “L03” (Duplicated header indoor units) to be displayed. This is because the system believes there is more than one header unit within the group. In this case, change the group address by a wired remote controller so that only one indoor unit becomes the header unit within one group control.

	Group address	1	2	1 → 2*	2	2	1 → 2*	2

→ It is necessary to change the group address as marked with * when an automatic address setting is conducted under the conditions of power-ON only within the refrigerant system in which the address is to be set up.

5. Change of indoor address from wired remote controller

- **To change the indoor address in an individual operation (Wired remote controller : Indoor unit = 1 : 1) or group control** (When the setup operation with automatic address has finished, this change is available.)

Procedure (while the air conditioner is not in operation)

1 **Push simultaneously the SET + CL + TEST buttons for 4 seconds or more.**
(Firstly the unit No. that indicates the header indoor unit within the group control will be displayed)

2 **In group control, select an indoor unit No to be changed by pushing the UNIT button.**
(The fan of the selected indoor unit will turn on.)

3 **Using the TEMP. buttons, set *13* to the item code.**

4 **Using the TIME buttons, change the displayed setup data to your requirements.**

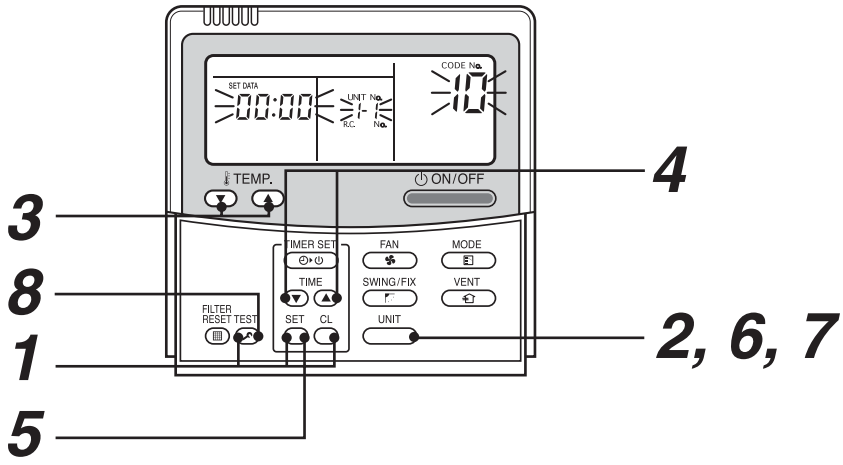
5 **Push the SET button.**

6 **Using the UNIT button, select the next unit No. that is to be.**

Repeat the procedure *4* to *6* and change the indoor address so that they will not be duplicated.

7 **After the above change, push the UNIT button to confirm the changed contents.**

8 **If it is acceptable, push the TEST button to complete.**



Operation procedure

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** → ***7*** → ***8*** **End**

- **To change all the indoor addresses from an arbitrary wired remote controller.**
  (When the setup operation for automatic address has finished, this change is available.)

Contents : Using an arbitrary wired remote controller, the indoor unit address can be changed for each unit within the same refrigerant cycle system.

∗ Change the address in the address check/change mode.

Procedure (while the air conditioner is not in operation)

1 **Push the ▼ + TEST buttons simultaneously for 4 seconds or more.**
(Line 1, **item code** AC (Address Change) will be displayed)

2 **Using the UNIT + SWING/FIX buttons, select the line address.**

3 **Push the SET button.**
- The indoor address, which is connected to the refrigerant system of the selected outdoor unit is displayed and the fan is turned on.

  The current indoor address will be displayed on the setup data. (Line address is not displayed.)

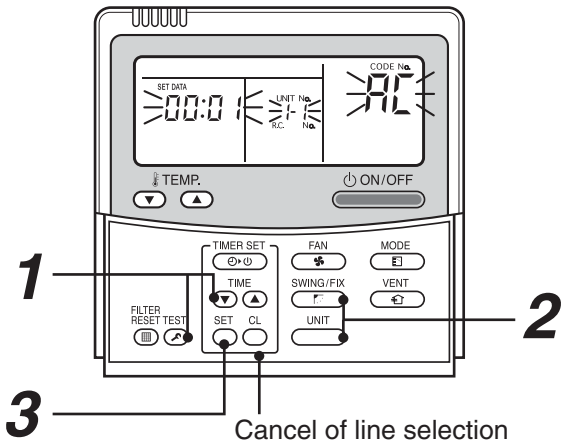
4 **The indoor address of the setup data moves up/down by the TIME ▼ ▲ buttons.**
Change the setup data to the new address.

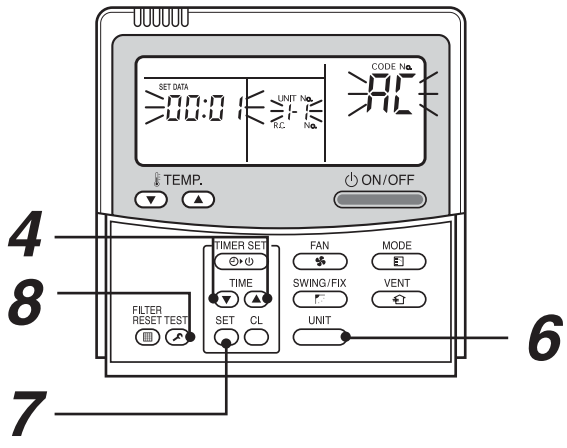
5 **Push the SET button to determine the setup data.**

6 **For every push of the UNIT button, the indoor unit numbers within the same refrigerant system are successively displayed.**
Note Only the fan of the selected indoor unit will operate.
Repeat the procedure ***4*** to ***6*** and ensure that there are no duplications of indoor addresses.

7 **Push the SET button.**
(All of the displays on the LCD will go on)

8 **Push the TEST button to complete the procedure.**





Note. If a unit No. cannot be called up, no outdoor unit exists within the system.
Push the CL button and then select a line according to procedure ***2***.

Operation procedure

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** → ***7*** → ***8*** **End**

6. Clearance of address (Return unit address status to default factory shipment position)

Method 1

An address can be individually cleared from a wired remote controller.

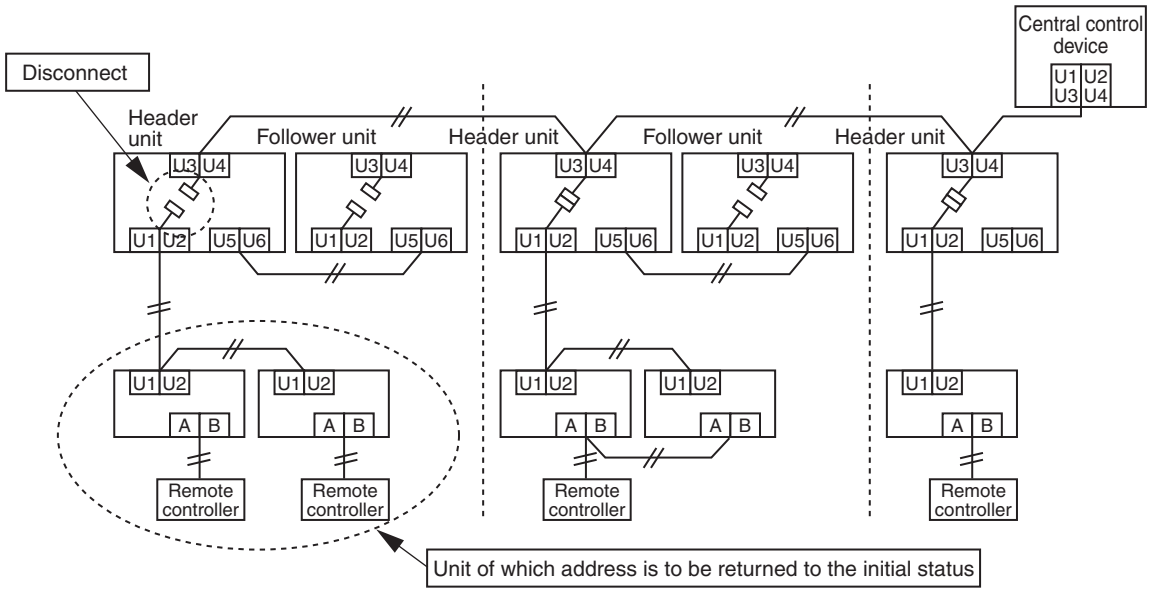
"**0099**" is set up to line address, indoor address and group address data from the wired remote controller.

(For the setup procedure, refer to the above-mentioned address setup from the wired remote controller.)

Method 2

Clear the indoor addresses in the same refrigerant line from the outdoor unit.

1. Turn off the power to the complete refrigerant line that is to be returned to its original factory default address. Then change the header unit to the following status.
   1) Remove the relay connector between **[U1U2] and [U3U4]**. (If it has been already removed, then leave it as it is.)
   2) Turn on SW30-2 on the interface P.C. board of the header unit if it is OFF. (If it is already ON, then leave it as it is.)



2. Turn on the indoor/outdoor power for the refrigeration line whose addresses has just been cleared. After approximately 1 minute, check that "U.1. - - -" is displayed. Then execute the following operation on the interface P.C. board for the header unit who's address is to be cleared in the refrigerant cycle line.

SW01	SW02	SW03	SW04	Address which can be cleared
2	1	2	After checking that "A.d.buS" is displayed on 7-degment display, push SW04 for 5 seconds or more.	Line + Indoor + Group address
2	2	2	After checking that "A.d.nEt" is displayed on 7-degment display, push SW04 for 5 seconds or more.	Central address

3. After "A.d. c.L." has been displayed on 7-degment display, return SW01/SW02/SW03 to 1/1/1.
4. When the address clearing has been completed correctly, "U.1.L08" will be displayed on 7-degment display. If "A.d. n.G." is displayed on 7-degment display, there is a possibility that the refrigeration line is connected with another. Check the relay connector between [U1U2] and [U3U4] terminals again.

   NOTE Warning, Failure to carry out these instructions correctly could result in the erasure of other refrigerant line addresses.
5. After the completion of the above steps, set-up the address/addresses again.

7. Additional and address-undefined units (System extension etc)

In the event that an indoor unit is setup with either an undefined address or additional units are added due to system extension, follow the methods below. Note this method can also be used for replacement PCB's etc.

Method 1

Set up an address individually from a wired remote controller.

(Line address, Indoor address, Group address and, Central address)

For the setup method, refer to the above "Manual address setup from the remote controller".

Method 2

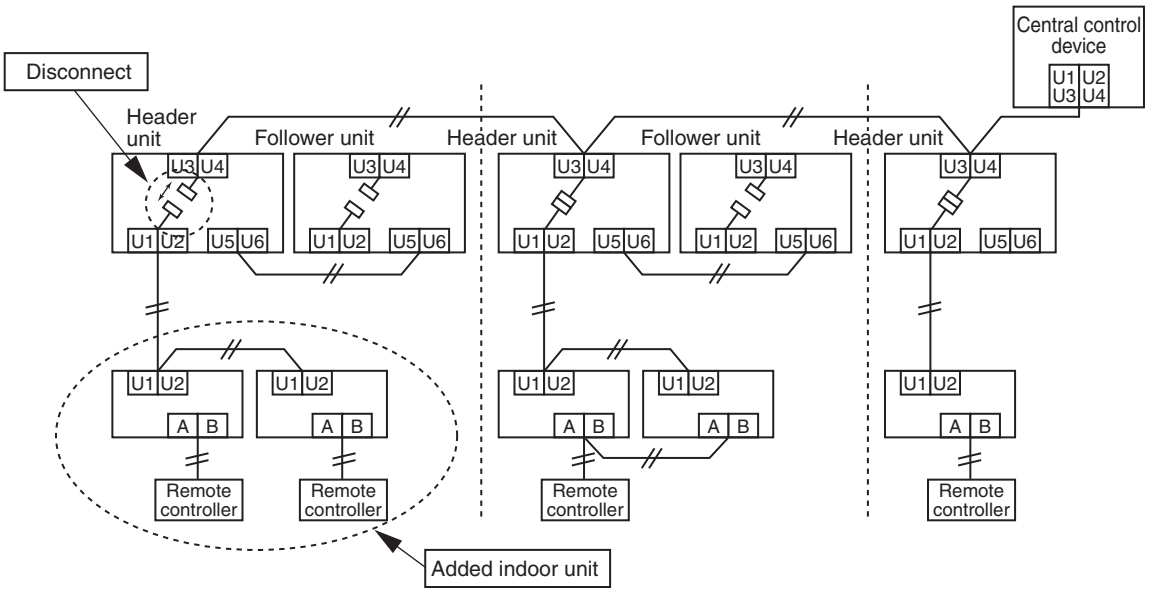
Set up an address from the outdoor unit.

* Do not proceed to change the address of units that are already identified. Set-up only those units whose address is yet undefined. The allocation of the addresses will begin at the lowest available number and then continue upwards.

Setup procedure

Arrange the outdoor header units in the refrigerant line to the which indoor units are to be added. (Figure below)

1. Remove the relay connector between [U1U2] and [U3U4].
2. Turn ON SW30-2 on the interface P.C. board on the outdoor header unit side if it is OFF.
   * Turn off the power and then execute the operation.



3. Turn on the indoor/outdoor power for all additional units, who's address set-up has yet to be completed. After approx. 1 minute, check that "U.1. - - -" is displayed on 7-segment display.
4. Execute the following operation on the interface P.C. board of the header unit.

SW01	SW02	SW03	SW04
2	14	2	After checking that "In.At" is displayed on 7-segment display, push SW04 for 5 seconds or more.

"AUTO1" → "AUTO2" → "AUTO3" … is counted and displayed on 7-degment display.

5. When "U.1. - - -" is displayed on the 7-segment display, the setup operation has finished. Turn off the indoor/outdoor power.
6. Return the following setup as before.
   - Relay connector
   - SW30-2
   - SW01, 02, 03

12-1. Address re-setup for central control of the super-digital inverter and the digital inverter

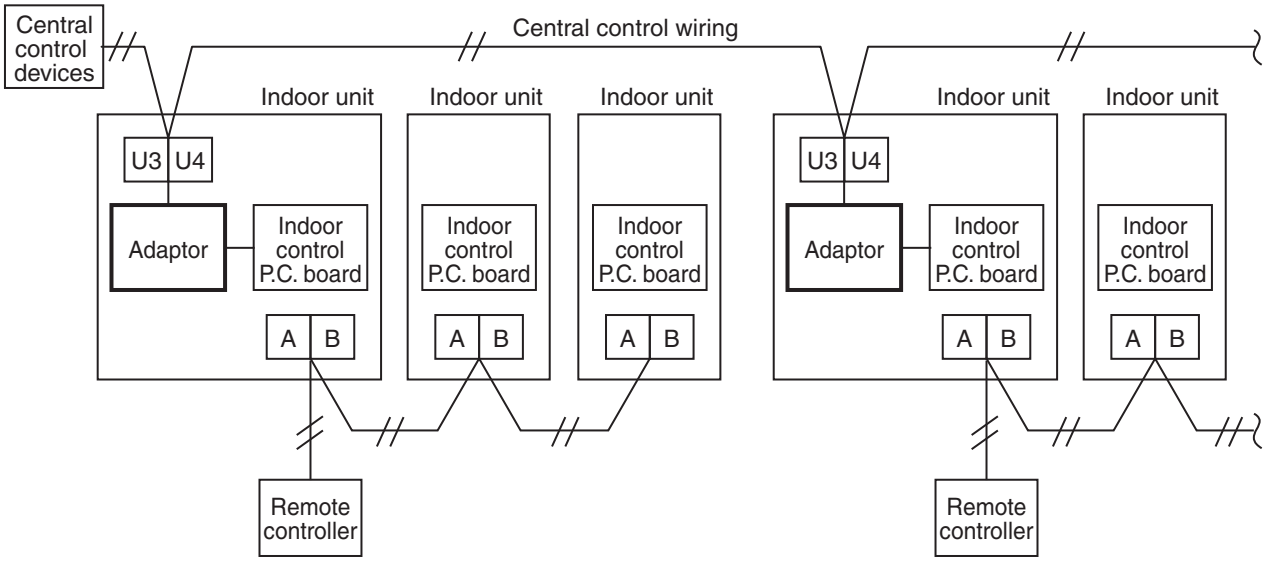
POINT 1

When controlling collectively the super-digital inverter and the digital inverter, the adaptor named “1 : 1 model” connection interface (TCB-PCNT30TLE) is necessary.

1. Wiring connection of control wiring

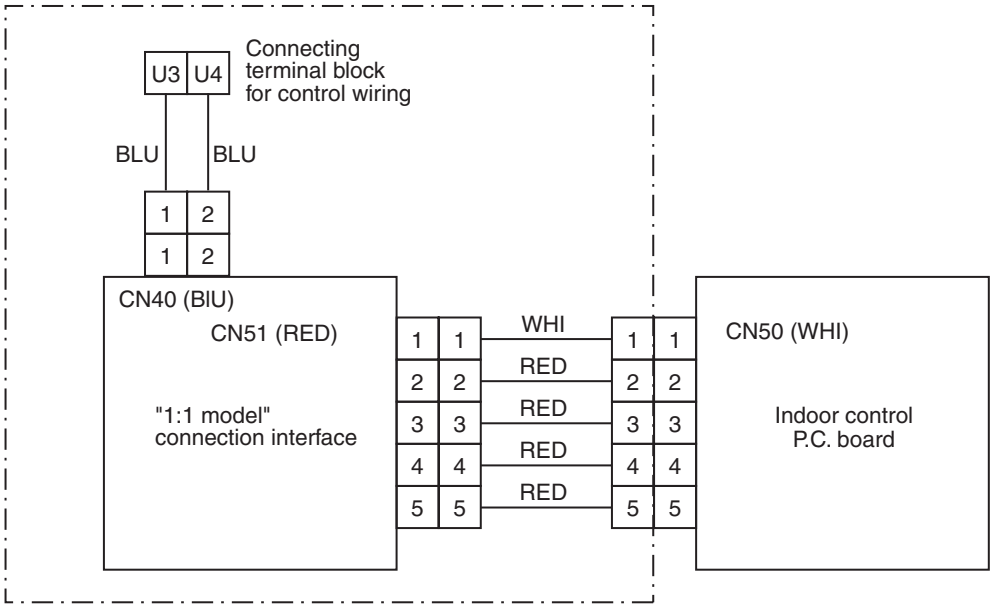
Attach 1 adaptor per group control operation (including individual control).

Connect the adaptor to the header indoor unit of the group control. (For details, see ***POINT 3***.)



2. Wiring connection diagram with indoor control P.C. board

- For details, refer to the Installation Manual.

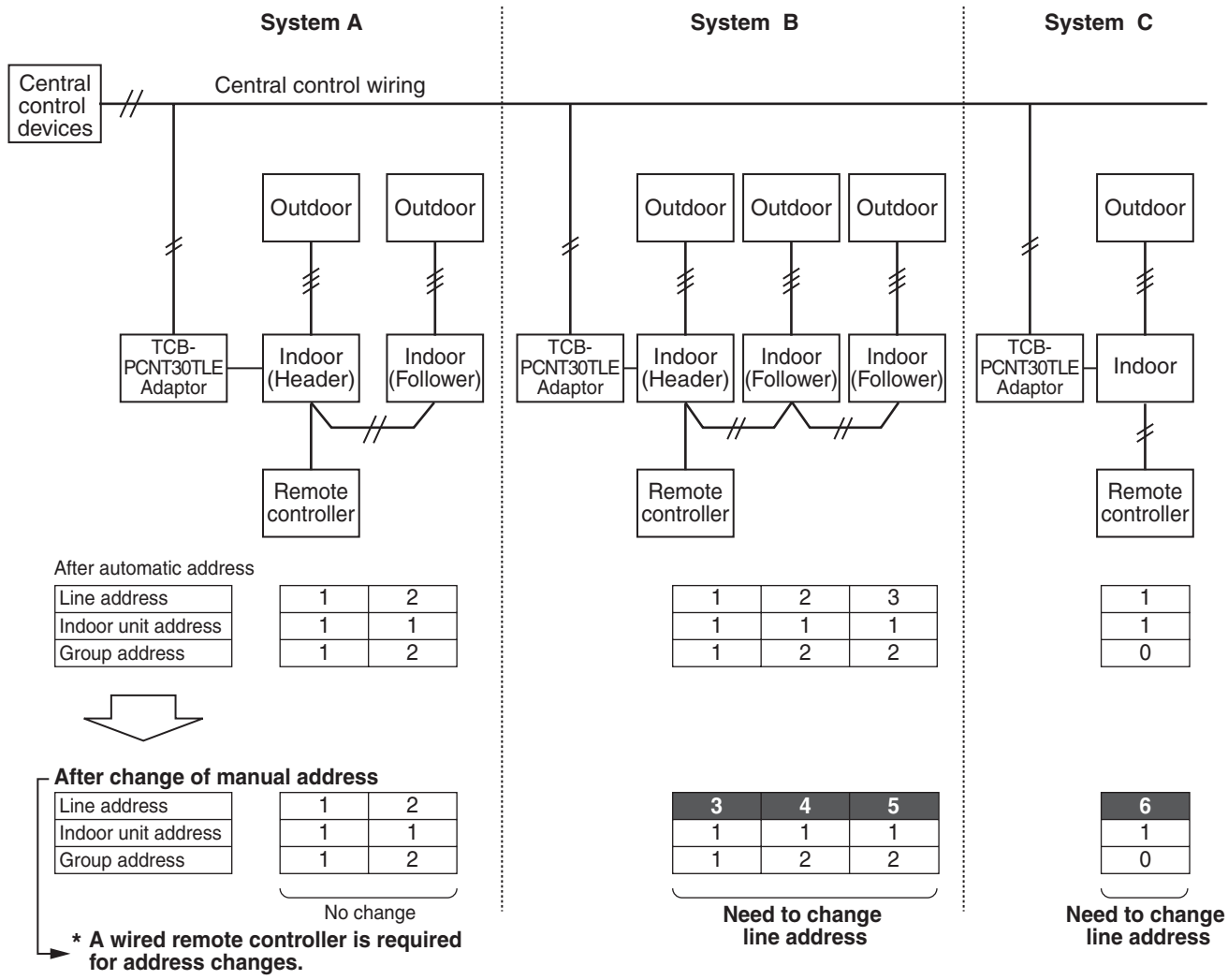


- Parts included in the single-point chain line are optional accessories.
- There is no-polarity on the wires that are connected to U3 and U4 terminals.

POINT 2

After automatic address setup has been completed, it is necessary for each system, to change the line address from the wired remote controller. (Manual re-setup)

Reason : After the automatic address set-up has been completed, the line addresses will become 1. However in group control this will create a duplicate address error “E08” to be displayed.

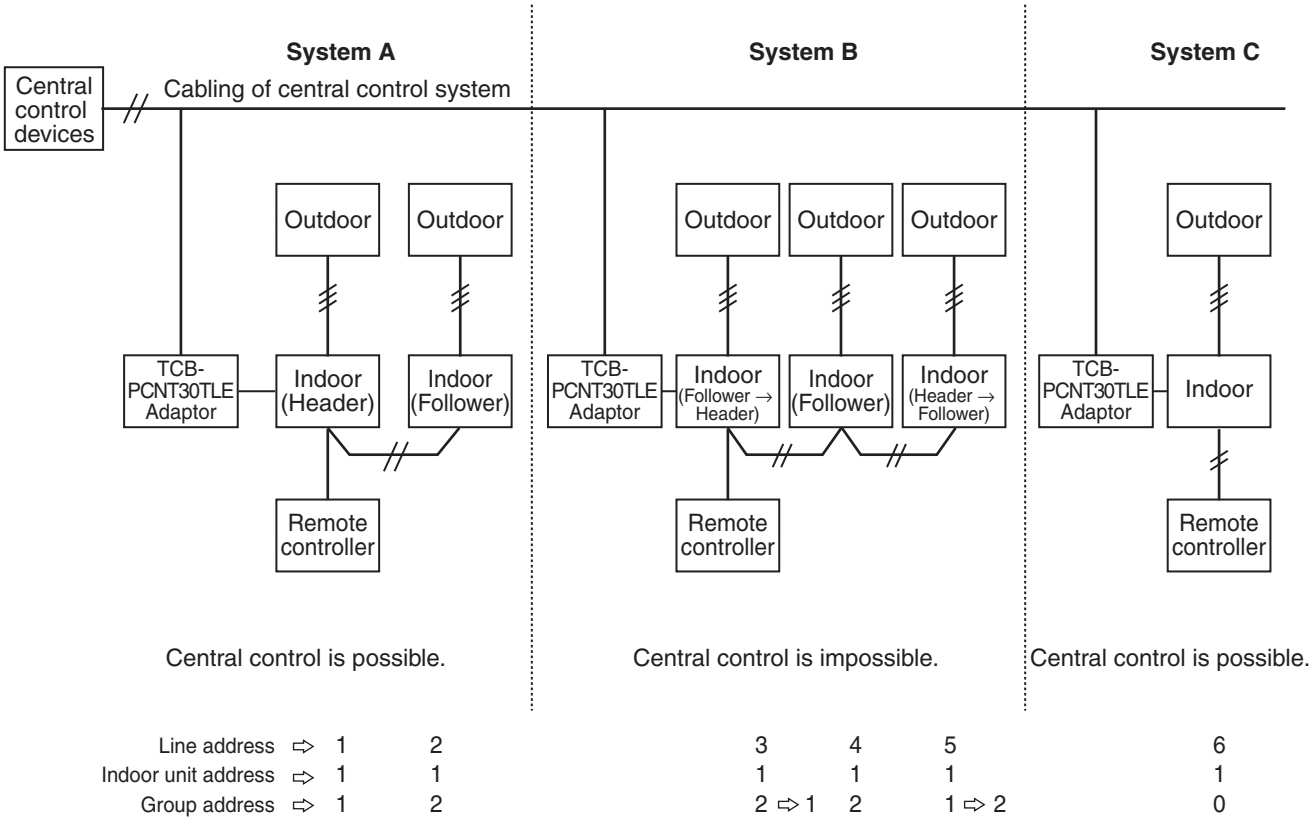


- Set up a line address for each system.
- Set up a line address so that it is not duplicated with other systems.
  (If central control is used with Super MMS, set up the line address so that is is not duplicated with the line address of other Super MMS systems).
- When performing a central control over 30 systems, it is necessary to change the address set-up method, including Super MMS.

POINT 3

When the central control is used for indoor units of twin/triple control in a group control, it may be required to change the group address. (Adaptor is attached to the header unit.)

Reason : The central control device can communicate with either the individual indoor unit, header indoor unit of a group control or the header indoor unit of a twin control. However as the address is automatically setup, the unit that will become the header unit will be made indiscriminately. Therefore if the unit attached with the adaptor is not to become the header indoor unit, the central control function will not be available.



∗ A wired remote controller is required for address change.

How to check the group address (Header/Follower indoor unit setup)

∗ Check the group address after confirming which unit is attached with the adaptor.

Procedure Operation while air conditioner stops.

1 **Push the SET + CL + TEST buttons simultaneously for 4 seconds or more.**

2 **The indoor unit in which the fan is turned on is the header indoor unit.**

⇩

Indoor unit in which the fan is turned on = Indoor unit with the adaptor: Go To ***Case 1***
Indoor unit in which the fan is turned on ≠ Indoor unit with the adaptor: Go To ***Case 2***

Case 1

In cases where the indoor unit in which the fan is turned on and the unit with the adaptor are same use the following procedure

3 **As the central control function is available, push the TEST button. (Setup is determined.)**

When pushing the TEST button, the display disappears and the status back to the normal stop status.

(The operation on the remote controller is not accepted for approximately 1 minute after the TEST button has been pushed.)

If the operation on the remote controller is not accepted for 1 minute or more after TEST button has been pushed, the unit may have an incorrect address.

In this case, automatic address may be required again. After approximately 5 minutes or more, set the group address using **Procedure 1**.

Case 2

In cases where the indoor unit in which the fan is turned on and the unit which is attached with the adaptor are different the central control function will not be evaluable. Therefore to change the address follow the procedure shown below.
As the central control is unavailable, change the address in the following procedure.

Indoor unit without the adaptor = Header indoor unit → Follower indoor unit

3 **Using the TEMP. buttons, select Item code 14.**

4 **Check the setup data is 0001 and then change the setup data from 0001 to 0002 using the**

timer TIME buttons.

5 **Push the TEST button. When the set-up has been completed the light with change from flashing to permeant.**

Indoor unit with the adaptor = Follower indoor unit → Header indoor unit

6 **Push the UNIT button to turn on the fan of the indoor unit which has the adaptor fitted.**

7 **Using the TEMP. buttons, select Item code 14.**

8 **Check the setup data is 0002 and then change the setup data from 0002 to 0001 using the timer TIME buttons.**

9 **Push the TEST button.**

When the set-up has been completed the light with change from flashing to permeant.

10 **When the above setup operation has finished, push the UNIT button to select the indoor unit for which the setup has been changed. Using the TEMP. buttons, specify the Item code 14 and confirm the changed contents.**

Pushing the CL button will clear the set-up changes that have been made up to that point.

(In this case, repeat the procedure from ***1***.)

11 **Push the TEST button. (Setup is determined.)**

When pushing the TEST button, the display disappears and the status returns back to normal stop status.

(The operation on the remote controller is not accepted for approximately 1 minute after the TEST button has been pushed.)

If the operation on the remote controller is not accepted for 1 minute or more after the TEST button has been pushed, the unit may have an incorrect address.

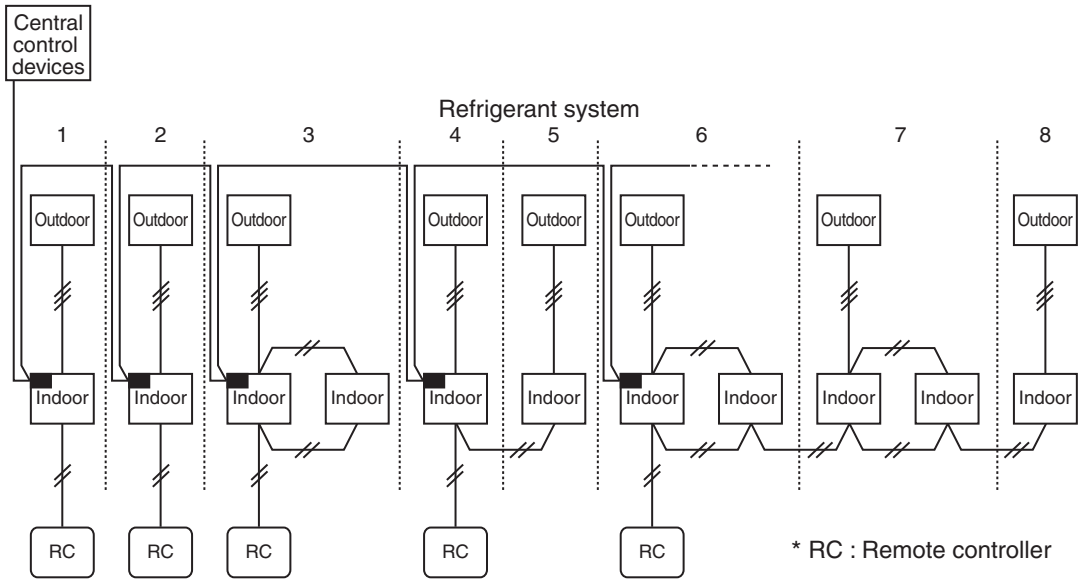
In this case, automatic address may be required again. After approximately 5 minutes or more, set the group address using **Procedure 1**.

Indoor address change example (Super-digital inverter and digital inverter)

1. Central control procedure for up to 29 refrigerant systems (including No. of Super MMS systems)

■ : adaptor
("1 : 1 model" connection interface TCB-PCNT30TLE)

POINT 1) Change the line address for each refrigerant system.



Line address	1	① 1→2	① 1→3	① 1→3	① 1→4	① 2→5	① 1→6	① 2→6	① 2→7	① 2→7	① 3→8
Indoor unit address	1	1	1	2	1	1	1	3→2	1	2	1→2
Group address	0	0	1	2	1	2	1	2	2	2	2

Change the line address on the wired remote controller after the automatic address setting.

Automatic address is impossible. Set up address manually on wired remote controller.

2. In case of central control of over 30 refrigerant systems (including Super MMS systems if any)

* Note The change procedure shown below can be used from system 1 to 29.

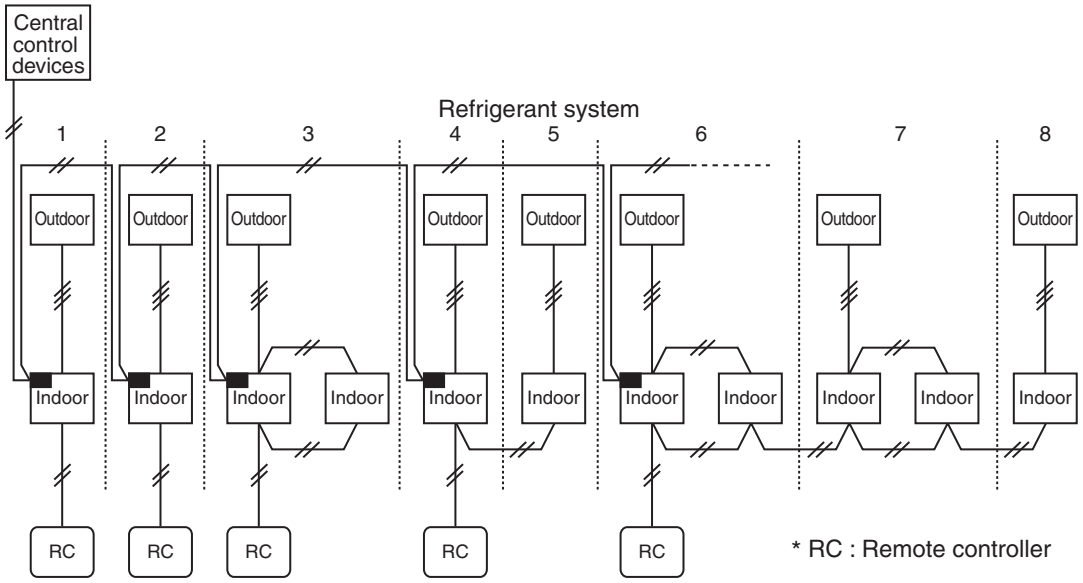
POINT 1 Change the line address for each refrigerant line.

POINT 2 For all indoor units fitted with an adaptor change the line address to 30.

POINT 3 Change the indoor address ensuring that the address numbers are not duplicated.

POINT 4 When the indoor unit with an adaptor is in twin controls, change also the line address of the follower indoor unit to 30.

■ : adaptor
("1 : 1 model" connection interface, TCB-PCNT30TLE)



Line address	① 1→30	① 1→30	① 1→30	③ 1→30	① 1→30	2	① 1→30	① 2→30	2	2	3
Indoor unit address	1	② 1→2	② 1→3	② 1→4	② 1→5	1	② 1→6	② 3→7	1	2	1→2
Group address	0	0	1	2	1	2	1	2	2	2	2

Change the line address on the wired remote controller after the automatic address setting.

Automatic address is impossible. Set up address manually on wired remote controller.

13. TEST OPERATION

Before test operation

⚠ WARNING

In order to protect the compressor, keep the power ON for a period of 12 hours or more before starting the air conditioner.

- Before turning on the power supply, carry out the following procedures.
  1) Using a 500V-megger, check there is 1MΩ or more between the terminal blocks of the power supply and the earth. If 1MΩ or less is detected, do not run the unit.
  2) Check that all the valves of the outdoor unit are in their fully open position.
- Never push in the electromagnetic contactor to carry out a forced test operation.
  (It is very dangerous because a device that is designed to protect the system will be unable to function.)

Check list 1

- Using the “Check list 1” as shown below, check that there are no faults in the installation work.

Is the capacity of the leak breaker appropriate?	Outdoor total capacity ☐ A	Header unit (A) ☐ A Follower unit (B) ☐ A Follower unit (C) ☐ A	Indoor unit ☐ A
Is the diameter of the power cable correct?		Header unit (A) ☐ mm Follower unit (B) ☐ mm Follower unit (C) ☐ mm	Indoor unit ☐ mm
Are the control communication lines correct?		Indoor –outdoor connection terminals (U1, U2) ☐ Outdoor–outdoor connection terminals (U5, U6) ☐ Central control system connection terminals (U3, U4) ☐	
Is the power the of indoor units supplied collectively?			
Is the earth grounded?			
Is the insulation good?		☐ MΩ or more	
Is the main power voltage good?		☐ V	
Is the diameter of connecting pipe correct?			
Is the branch kit correct?			
Is the drain water of the indoor unit arranged so that it flows without accumulation or spillage?			
Is the thermal insulation of the pipes good? (Connecting pipes, Branch kit)			
There is not a short circuit or discharge of air in the indoor/outdoor units?			
Has the pipe work been tested for air leakage?, if ok has the vacuuming of the system and the adding of the refrigerant been completed as per the unit specification?			
Have the valves for all of the outdoor units been fully opened?		Gas side / Liquid side / Balance side	
		Header unit (A) ☐ ☐ ☐	
		Follower unit (B) ☐ ☐ ☐	
		Follower unit (C) ☐ ☐ ☐	

How to execute test operation

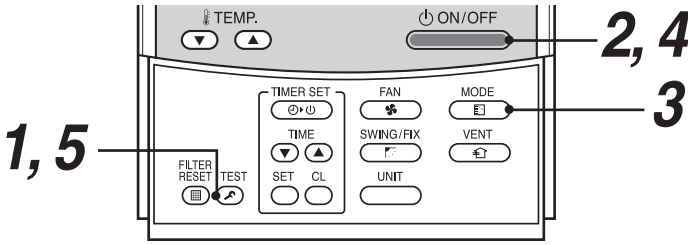
- To carry out a fan operation in a single indoor unit, firstly turn off the power supply to the unit. Then short CN72 found on the P.C. board. Once completed turn the power to the unit back on and start the unit in FAN only mode. Upon completion of the test do not forget to remove the short circuit on CN72.
- Using the remote controller, check the unit (Fan only) as per normal operation. For the operation procedure, refer to the attached Owner's Manual.

  A forced test operation can be executed in the following procedure under condition of thermo-OFF of the room temperature.

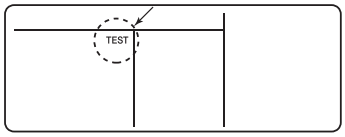
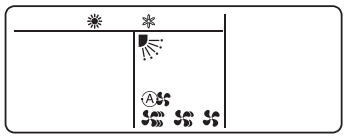
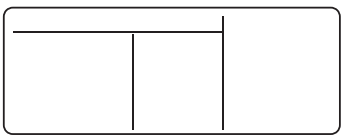
  In order to prevent the test operation from running continuously, the operation will cease after a period of 60 minutes. The unit will then return back to its original operation.

NOTE

Do not use a forced operation in cases other than test operation because it applies an excessive load on to the air conditioner.

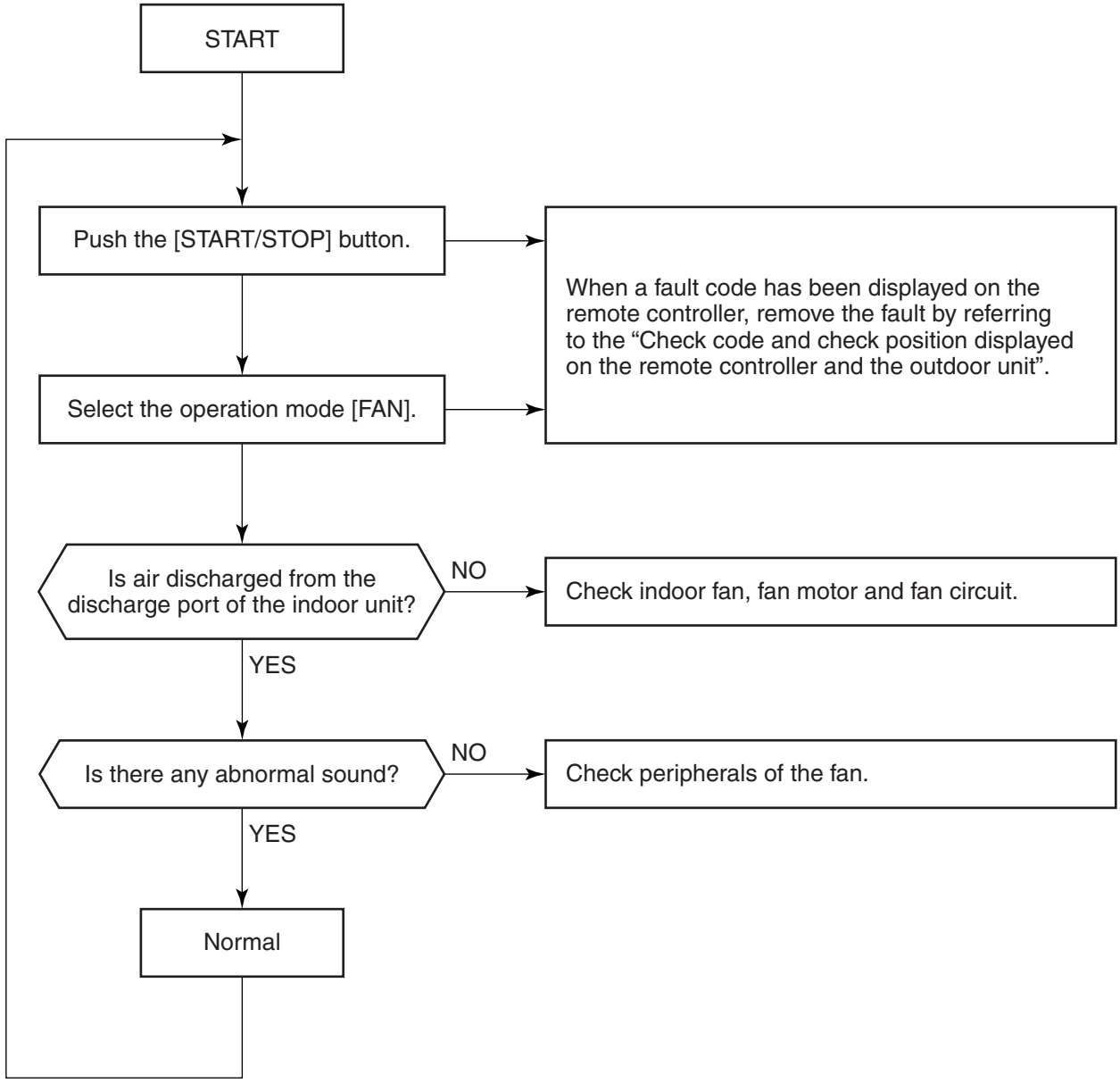


In case of wired remote controller

Procedure	Description	
1	Keep the TEST button pushed down for 4 seconds or more. [TEST] is displayed on the display part and the selection of the test mode is permitted.	
2	Push the ON/OFF button.	
3	Using the MODE button, select the operation mode, [COOL] or [HEAT]. • Do not run the air conditioner in a mode other than [COOL] or [HEAT]. • The temperature controlling function will not work during the test operation. • Fault detection will perform as usual.	
4	After the test operation, push the ON/OFF button to stop the operation. (Display part is the same as procedure *1*)	
5	Push the TEST button to cancel (release from) the test operation mode. ([TEST] disappears on the display part and the status returns to a normal.)	

13-1. Test Operation Check

13-1-1. Fan Check



Check each indoor unit successively.

13-1-2. Cooling/Heating Test Operation Check

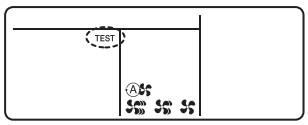
The cooling/heating test operation check can be performed on both the remote controller and the outdoor interface P.C. board.

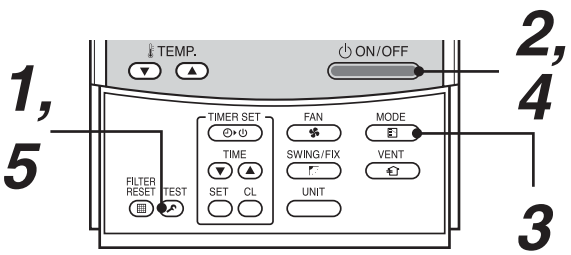
1. Test operation start/stop operation

Test operation for wired and wireless remote controllers

Wired remote controller

1 **When pushing the TEST button for 4 seconds or more the [TEST] symbol will be displayed in the display section and the mode will enter into test operation.**

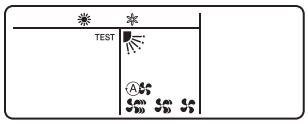




2 **Push the ON/OFF button.**

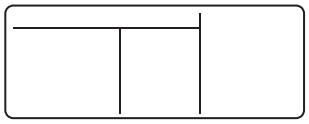
3 **Using the MODE button, select an operation mode [COOL] or [HEAT].**

- Do not use the operation mode in anything other than [COOL] or [HEAT] operations.
- Temperature adjustment is unavailable during test operation.
- Faults will be detected as usual .



4 **When the test operation has finished, push the ON/OFF button to stop the operation.**
(The same display as that shown in procedure 1 will appear in the display section.)

5 **Push the TEST button to clear the test operation mode.**
([TEST] display in the display section will disappear and the operation will return to its normal stop status.)



Wireless remote controller
(Except 4-way Air Discharge Cassette type and Under Ceiling type)

1 **Remove the nameplate from the sensor section by inserting a flat blade screwdriver into the notch at the bottom of the plate. Then set the Dip switch to [TEST ON].**

2 **Execute a test operation with the button on the wireless remote controller.**

- ⏻, ⏲ and ⚙ LED will flash during the test operation.
- Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is unavailable.

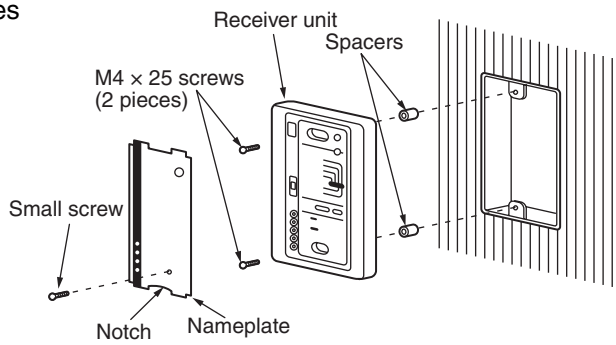
Caution Do not leave the unit in this operation mode for extended periods of time as damage may occur to the unit.

3 **Use either COOL or HEAT operation mode for the test operation.**

* Note the outdoor unit will not operate until after 3 minutes after the power has been switched on.

4 **After the test operation has finished, stop the air conditioner using the wireless remote controller and return the Dip switch of the sensor section back to its original position.**

(Note there is a 60 minute timer function attached to the sensor section that will prevent a test operation from continuing indefinitely.)



Wireless remote controller (4-way Air Discharge Cassette type)

1 **Turn off the power to the air conditioner.**

Remove the corner cap attached with the sensor section from the ceiling panel. For removing method, follow the installation manual attached to the ceiling panel.
(Caution the sensor wires are fitted directly to the cover, so please handle with care.)

Remove the sensor cover from the adjust corner cap. (1 screw)

2 **Change Bit [1: TEST] of the switch [S003] on the sensor P.C. board from OFF to ON.**

Mount the sensor cover and attach the corner cap with sensors to the ceiling panel.

Turn on the power to the air conditioner.

3 **Push the button on the wireless remote controller and select the operation mode [COOL] or [HEAT] with the button. (The display lamps on the wireless remote controller sensor section will flash during the test operation.)**

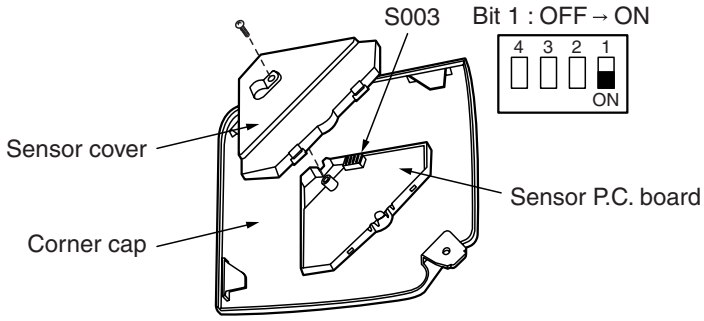
- Do not use operation mode other than [COOL] or [HEAT].
- Faults will be detected as usual.

4 **When the test operation has finished, push the button to stop the operation.**

5 **Turn off the power to the air conditioner.**

Change Bit [1] on the switch [S003] on the sensor P.C. board from ON to OFF.

Attach the corner cap with the sensors to the ceiling panel.

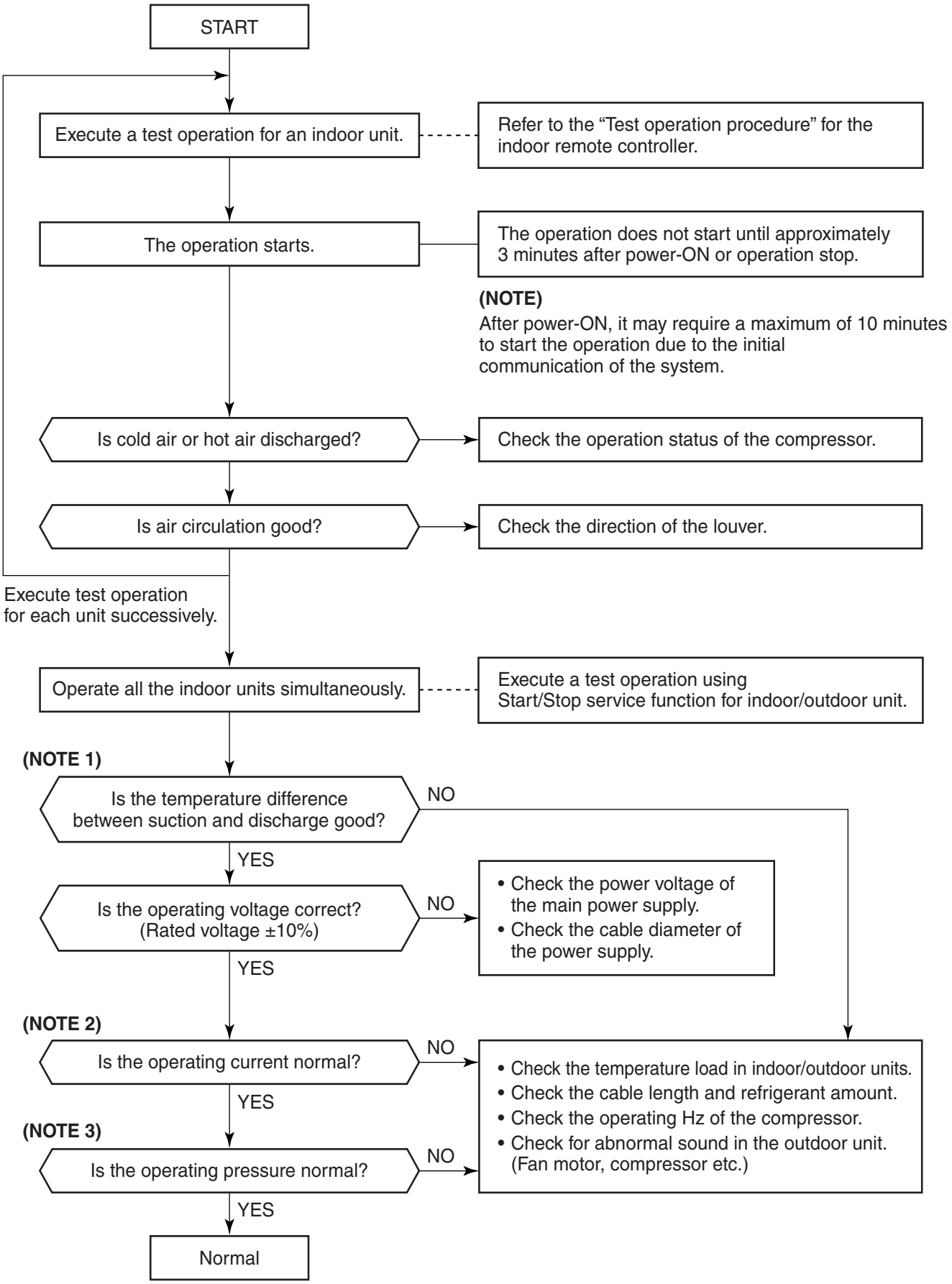


Test operation from the outdoor unit

Refer to the start/stop function of the indoor unit from the outdoor unit.

NOTE The test operation will return to the normal operation after 60 minutes have passed.

2. Test operation



NOTE 1 Criteria for difference between suction and discharge temperature

1. Cooling (All Cooling operation)

   After operating for a minimum of 30 minutes with [COOL] mode, if there is a dry bulb temperature difference △T: 8°C or more between suction port and discharge port of the indoor unit, it is normal.
   (In Max-Hz operation)

2. Heating (All Heating operation)

   After operating for a minimum of 30 minutes with [COOL] mode, if there is the dry bulb temperature difference △T: 15°C or more between suction port and discharge port of the indoor unit, it is normal.
   (In Max-Hz operation)

   Consider that the temperature difference ΓT may diminish in cases of a system in which the connected indoor capacity exceeds 100% and has a long or short pipe length.

NOTE 2 Criteria for operating power current

For a test operation (All the indoor units are operating), the power current is considered to be normal if under the following values.

Outdoor unit	8HP	10HP	12HP
Current value	18	21	22

(Unit: A)

NOTE 3 Criteria for cycle status

1. Refrigerating cycle under standard conditions

   The refrigerating cycle under standard cooling and heating conditions is as follows:

			10HP MMY-MAP1002FT8	
			All cooling standard	**All heating standard**
Pressure (MPa)	High	(Pd)	3.1	2.9
	Low	(Ps)	0.8	0.7
Pipe surface temp (°C)	Discharge	(TD)	86	90
	Suction	(TS1)	6	3
	Indoor heat exchanger	(TC)	8	46
	Outdoor heat exchanger	(TE1)	43	1
	Liquid temp	(TL)	36	36
COMP operation rotation count (rps)	Compressor	1	79	75
	Compressor	2	79	75
Air temp condition (DB/WB) (°C)	Indoor		27/19	20/–
	Outdoor		35/–	7/6

* The compressor is driven with a 4-pole motor. The value of the compressor frequency (Hz) measured by a clamp meter is two times the rotation count (rps) of the compressor.
* This data is the cycle data under conditions of a standard pipe length and with two 4-way Air Discharge Cassette type air conditioners connected. The data will change according to the installed pipe length, combination of indoor units and the connected indoor capacity.
* For a compressor, the left side is 1 and the right side is 2 viewed from the front side.

  Even if two compressors are in operation, the frequency difference may be small and therefore the resonance of the compressor cannot be used as a guide to the compressor operation.
* The temperature of indoor heat exchanger (TC) is indicated by the TCJ sensor during cooling operation and the TC2 sensor during heating operation.

2. Criteria for operating pressure

   General criterion is as follows:

Cooling	High pressure : 2.0 to 3.2MPa	Indoor :18 to 32°C	When all the units operate in cooling mode
	Low pressure : 0.5 to 0.9MPa	Outdoor :25 to 35°C	
Heating	High pressure : 2.5 to 3.3MPa	AIndoor :15 to 25°C	When all the units operate in heating mode
	Low pressure : 0.5 to 0.7MPa	Outdoor : 5 to 10°C	

Using the rotary switch on the outdoor unit I/F, the operating pressure, cycle temperature and compressor rotation count can be checked on the 7-segment display.
Refer to the “Outdoor cycle data display” and “Indoor cycle data display” in the “**Support function in test operation”**.

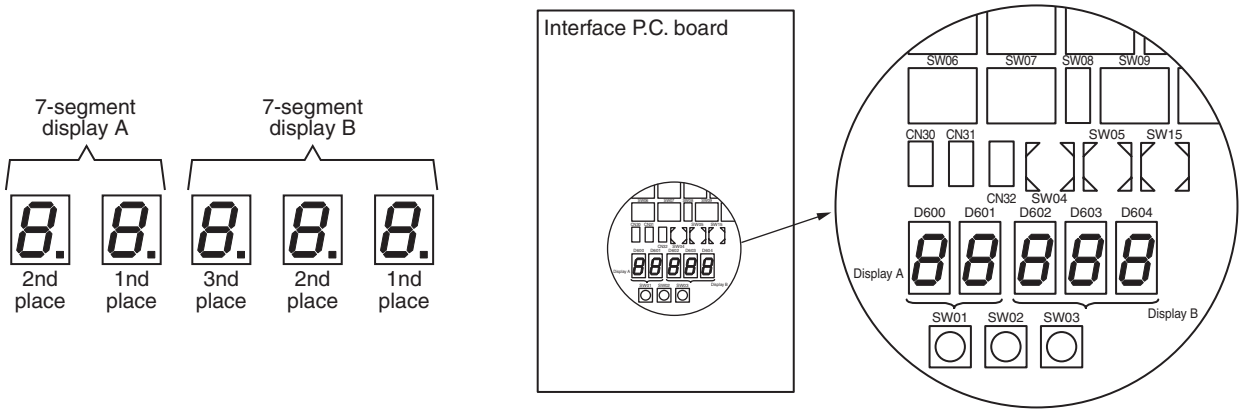
14. SUPPORT FUNCTION IN TEST OPERATION

14-1. 7-segment display function of outdoor unit (I/F P.C. board)

■ 7-segment display on the outdoor unit (Interface P.C. board)

On the interface control P.C. board, the 7-segment LED can be used to check the operating status of the system.

The displayed contents are exchanged by combining the setup numbers of the rotary switches (SW01, SW02 and SW03) on the P.C. board.



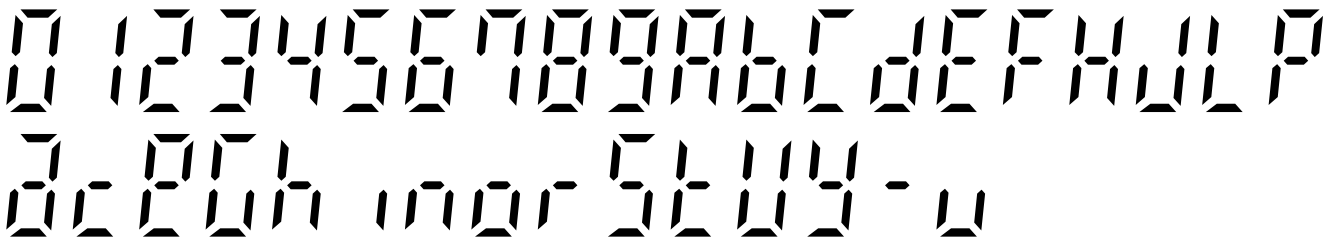
◆ **Check procedure when a fault has occured**

When the system has stopped due to a fault of the outdoor unit, execute a check in the following procedure.

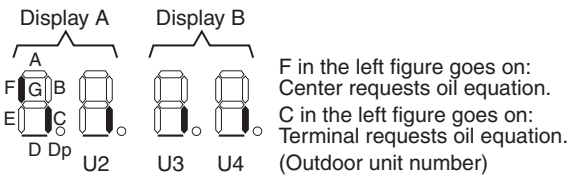
1. Open the panel of the outdoor unit and then check the 7-segment display.
   The check code is displayed at the right side of 7-segment display.
   [U1] [○○○] ([○○○]: Check code)
   The switch setup required for identifying the fault should be set to SW01 [1], SW02 [1], SW03 [1]
   Note the check code [○○○] will be displayed for 3 seconds and the sub-code [○○○] for 1 second. They will be alternately displayed if a sub-code is provided.
2. Confirm the meaning of the check code.
3. Perform the check operation based on the procedure of each check code diagnosis.

How to read the check monitor

7-segment display



1. System information data display (Displayed on the header outdoor unit only)

SW01	SW02	SW03	Display contents				
1	1	3	Used refrigerant	Displays type of used refrigerant.		A	B
				Model with refrigerant R410A		r4	10A
				Model with refrigerant R407C		r4	07C
	2		System capacity	A	[5] to [48] : 5 to 48HP		
				B	[HP]		
	3		No. of outdoor units	A	[1] to [4] : 1 to 4 units		
				B	[P]		
	4		No. of connected indoor units/ No. of units with cooling thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[C0] to [C48] : 0 to 48 units (No. of units with cooling thermo ON)		
	5		No. of connected indoor units/ No. of units with heating thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[H0] to [H48] : 0 to 48 units (No. of units with heating thermo ON)		
	6		Compressor command correction amount	A	Data is displayed with Hexadecimal notation		
				B			
	7		Release control	A	Normal time : [r], During release control: [r1]		
				B	—		
	8		Oil-equation control	A	Normal time : [oiL-0]		
				B	During oil equation : [oiL-1]		
	9		Oil-equation request	A	Displays with segment LED lighting pattern		
				B	 F in the left figure goes on: Center requests oil equation. C in the left figure goes on: Terminal requests oil equation. (Outdoor unit number)		
	10		Refrigerant oil recovery operation	A	During sending of cooling refrigerant oil recovery signal : [C1]. Normal time : [C]		
				B	During sending of heating refrigerant oil recovery signal : [H1]. Normal time : [H]		
	11		Automatic address	A	[Ad]		
				B	Automatic addressing : [FF], Normal time : [ ]		
	12		Demand operation	A	[dU]		
				B	Normal time : [ ]. In 50% to 90% : [50 to 90] When controlling by BUS line input : [E50 to E90]		
	13		Option control (P.C. board input)	Displays option control status		A	B
				Operation mode selection : In heating with priority (Normal time)		h.∗	∗.∗.∗.
					Priority on cooling	c.∗	∗.∗.∗.
					Heating only	H.∗	∗.∗.∗.
					Cooling only	C.∗	∗.∗.∗.
					Priority on No. of operating indoor units	n.∗	∗.∗.∗.
					Priority on specific indoor unit	U.∗	∗.∗.∗.
				Batch start/stop : Normal time		∗.···.	∗.∗.∗.
					Start input	∗.1.	∗.∗.∗.
					Stop input	∗.0.	∗.∗.∗.
				Night low-noise operation : Normal time		∗.∗.	···.∗.∗.
					Operation input	∗.∗.	1.∗.∗.
				Snow fan operation : Normal time		∗.∗.	∗.···.∗.
					Operation input	∗.∗.	∗.1.∗.
	14		Option control (BUS line input)	Same as above			
	15		Unused				
	16		—	A	—		
				B	—		

2. Outdoor unit information data display (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents				
1	1	1	Error data	A	Displays outdoor unit number: [U1] to [U4]		
				B	Displays check code (Latest code only is displayed.) There is no check code: [– – –] There is sub code: Check code [∗ ∗ ∗] for 3 seconds, sub code [– ∗ ∗] for 1 second alternately		
			<SW04> push function: Fan of unit with error only drives. 7-segment A: [E1] <SW04 + SW05> push function: Fan of normal unit only drives. 7-segment A: [E0] <SW05> push function: Interruption of fan operation function				
	2		—	A	—		
				B	—		
	3		Operation mode	A	Stop: [ ] Normal cooling: [C], Normal heating: [H], Normal defrost: [J]		
				B	—		
	4		Outdoor unit HP	A	5HP: [5], 6HP: [6], 8HP: [8], 10HP: [10], 12HP: [12]		
				B	[HP]		
	5		Compressor operation command	A	No.1 compressor operation command is displayed. Data display with hexadecimal : [00 to FF]		
				B	No.2 compressor operation command is displayed. Data display with hexadecimal : [00 to FF]		
				<SW04> push function: Inverter frequency is exchanged to decimal notation. 7-segment display (A/B): [∗ ∗ ∗ ∗ H] (Normal display by pushing <SW05>)			
	6		Outdoor fan mode	A	[FP]		
				B	Mode 0 to 31: [0 to 31]		
	7		Compressor backup	A	Displays No.1 compressor setup status Normal time: [ ], Backup setup: [C1]		
				B	Displays No.2 compressor setup status Normal time: [ ], Backup setup: [C2]		
	8		—	A	—		
				B	—		
	9		Control valve output data	Displays control output status of solenoid valve		A	B
				4-way valve: ON / 4-way valve 2: OFF		H. 1	··· ··· ···
				4-way valve: OFF / 4-way valve 2: ON		H. 0	··· ··· ···
	10			SV2: ON / SV5: OFF		2. 1	··· 5. 0
				SV2: OFF / SV5: ON		2. 0	··· 5. 1
	11			SV3A: ON / SV3B: OFF / SV3C: OFF /SV3D: OFF		3. 1	0 0 0
				SV3A: OFF / SV3B: ON / SV3C: OFF /SV3D: OFF		3. 0	1 0 0
				SV3A: OFF / SV3B: OFF / SV3C: ON /SV3D: OFF		3. 0	0 1 0
				SV3A: OFF / SV3B: OFF / SV3C: OFF /SV3D: ON		3. 0	0 0 1
	12			SV41: ON / SV42: OFF		4. ···	1 0 ···
				SV41: OFF / SV42: ON		4. ···	0 1 ···
	13			—		··· ···	··· ··· ···
				—		··· ···	··· ··· ···
	14		PMV1 /PMV2 opening	Displays opening data (Decimal) (Total opening)		∗∗	∗∗. P
	15		—	—		··· ∗	∗∗. P
	16		Oil level judgment status	A	[oL] <SW05> push SW function: 2 seconds, The following data is displayed. * During determination of shortage in compressor 1: [L ···], during determination of shortage in compressor 2: [··· L]		
				B	Initial display: [··· ··· ···], Oil level judgment result: [A. #. ∗] Judgment result of compressor 1 in [#], compressor 2 in [∗] (0: Correct, 1, 2: Shortage) is displayed.		

3. Outdoor cycle data display (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents					
1	1	2	Pd pressure data	Pd pressure (MPaG) is displayed with decimal data. (MPaG: Approx. 1/10 value of kg/cm²G data)			A	B
							P d.	∗.∗∗
	2		Ps pressure data	Ps pressure (MPaG) is displayed with decimal data.			P S.	∗.∗∗
	3		PL pressure conversion data	PL pressure conversion value (MPaG) is displayed with decimal data.			P L.	∗.∗∗
	4		TD1 sensor data	Temperature sensor data (°C) is displayed with decimal notation. • Symbol display for 1 sec. and data display for 3 sec. are alternately exchanged. • Data is displayed in [∗]. • Negative data is displayed as [– ∗ ∗ ∗ ∗].		Symbol	t d	1
						Data	∗	∗∗.∗
	5		TD2 sensor data			Symbol	t d	2
						Data	∗	∗∗.∗
	6		TS sensor data			Symbol	t S	
						Data	∗	∗∗.∗
	7		TE sensor data			Symbol	t E	
						Data	∗	∗∗.∗
	8		—			Symbol	—	—
						Data	—	—
	9		TL sensor data			Symbol	t L	
						Data	∗	∗∗.∗
	10		TO sensor data			Symbol	t o	
						Data	∗	∗∗.∗
	11		TK1 sensor data			Symbol	F 1	
						Data	∗	∗∗.∗
	12		TK2 sensor data			Symbol	F 2	
						Data	∗	∗∗.∗
	13		TK3 sensor data			Symbol	F 3	
						Data	∗	∗∗.∗
	14		TK4 sensor data			Symbol	F 4	
						Data	∗	∗∗.∗
	15		—	A	—			
				B	—			
	16		—	A	—			
				B				

4. Outdoor cycle data display (Displayed on the header unit)

∗ This method is used when information on the follower unit is displayed on the 7-segment display of the header unit.

SW01	SW02	SW03	Display contents		
1	1	1 to 3	Error data	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	Check code is displayed. (Latest check code only) No check code: [– – –]
	2		Installed compressor type	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	
	3		Outdoor unit HP	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	8HP: [··· ··· 8]. 10HP: [··· 1 0], 5 to 12HP
	4		Compressor operation command	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	No.1 compressor ON: [C10], No.2 compressor ON: [C01] For unconnected compressor, " – " is displayed.
	5		Fan operation mode	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	Stop time: [F ··· 0], Mode 31: [F 3 1]
	6		Release signal	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	Normal time: [r ··· ···], Release received: [r ··· 1]
	7		Oil level judgment	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	Normal time: [··· ··· ···], Oil shortage: [··· ··· L]

NOTE) The follower unit is setup by exchanging SW03.

SW03	1	2	3
7-segment display A	U2	U3	U4

5. Indoor unit information data display (Displayed on the header unit only)

SW01	SW02	SW03	Display contents		
4	1 to 16	1 to 3	Receiving status of indoor BUS communication	B	Receiving time: [··· ··· 1], Not received: [··· ··· ···]
5			Indoor check code	B	No check code: [– – –]
6			Indoor horse power	B	0. 2, 0. 5, 0. 8, ··· 1, 1. 2, 1. 7, ··· 2, 2. 5, ··· 3, 3. 2, ··· 4, ··· 5, ··· 6, ··· 8, 1 0, 1 6, 2 0
7			Indoor request command (S code)	B	Data is displayed with hexadecimal [··· ··· 0 to ··· ··· F]
8			Indoor PMV opening data	B	Data is displayed with hexadecimal
9			Indoor TA sensor data	B	Data is displayed with hexadecimal
10			Indoor TF sensor data	B	Data is displayed with hexadecimal
11			Indoor TCJ sensor data	B	Data is displayed with hexadecimal
12			Indoor TC1 sensor data	B	Data is displayed with hexadecimal
13			Indoor TC2 sensor data	B	Data is displayed with hexadecimal

NOTE) Indoor address No. is set up by exchanging SW02 and SW03.

SW03	SW02	Indoor address	7-segment display A
1	1 to 16	SW02 setup number	[01] to [16]
2	1 to 16	SW02 setup number + 16	[17] to [32]
3	1 to 16	SW02 setup number + 32	[33] to [48]

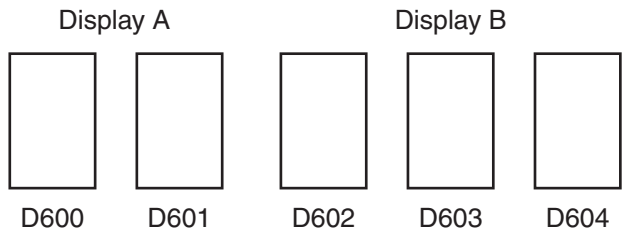
6. Outdoor EEPROM write-in error code display (Displayed on the header unit only)

∗ The latest error code written in the EEPROM of each outdoor unit is displayed.
(It is used when confirming the error code after the power supply has been reset.)

Set SW01 to 03 as shown in the following table, and then push SW04 for 5 seconds or more to display an error code.

SW01	SW02	SW03	Display contents	7-segment display	
				A	B
1	1	16	The latest error code for header unit 1 (U1)	E. r	1. – –
	2		The latest error code for follower unit 1 (U2)	E. r	2. – –
	3		The latest error code for follower unit 2 (U3)	E. r	3. – –
	4		The latest error code for follower unit 3 (U4)	E. r	4. – –

- **7-segment display A, B**



The latest error code of the header unit
The latest error code of the follower unit 1
The latest error code of the follower unit 2
The latest error code of the follower unit 3

14-2. Service Support Function

14-2-1. Check Function for Refrigerant Pipe and Control Communication Line

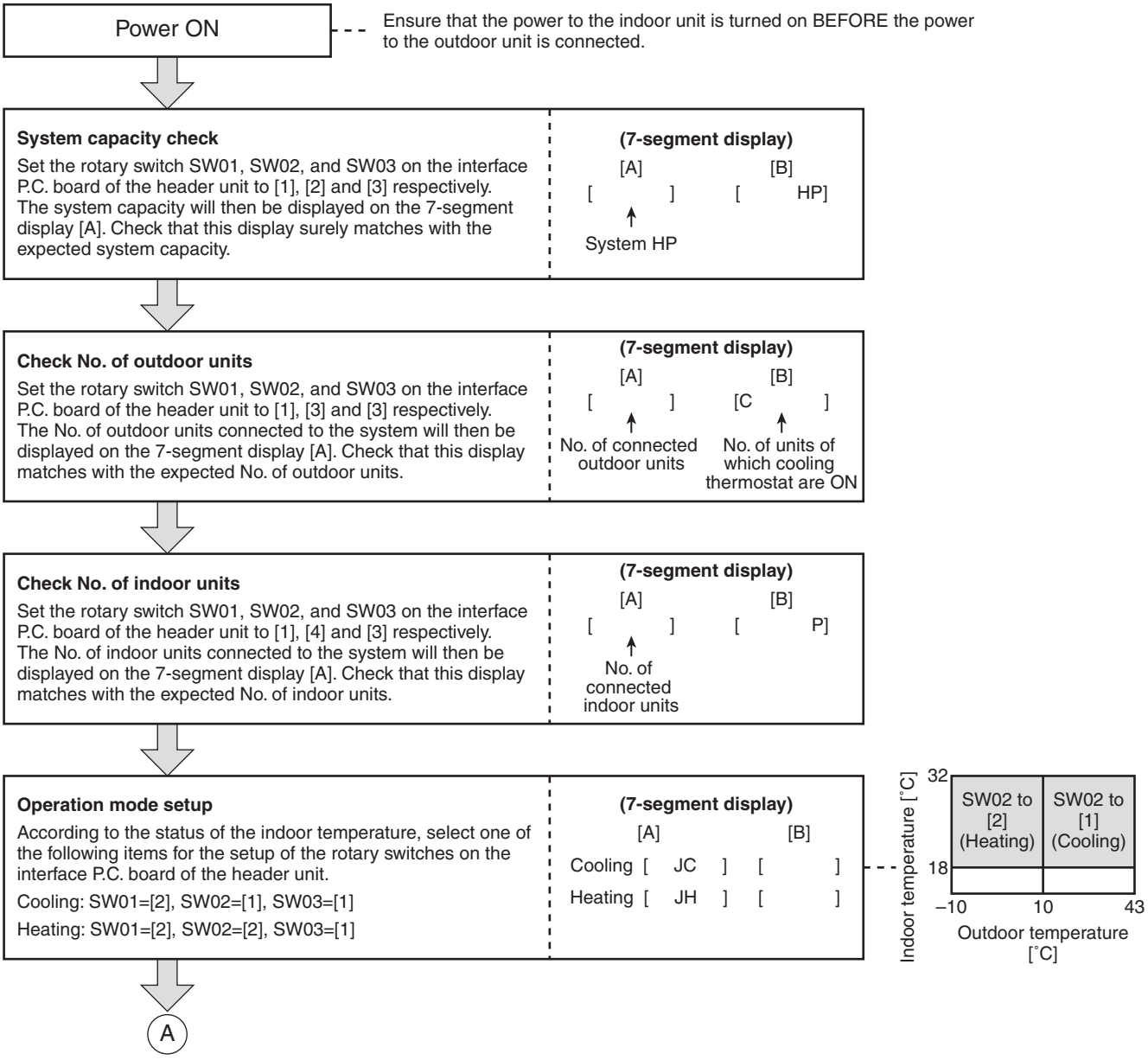
This function is provided to check for misconnection (Wiring over lines) of the refrigerant pipes and the control communication lines between the indoor and outdoor unit by using the switch on the interface P.C. board of the header unit.

However, be sure to check the following items prior to using this function.

1. This function is unavailable when the units are linked together in group control.

2. When using this check system, be sure to check only 1 communication line at a time. If checking the multiple lines misjudgment may be caused.

Check procedure



A

Operation start

Push the push-switch SW04 on the interface P.C. board on the header unit for a period of 2 seconds or more. The operation will begin. Check that cooling is [CC] and heating is [HH] on the 7-segment display [B].

(7-segment display)

	[A]	[B]
Cooling	[C]	[CC]
Heating	[H]	[HH]

Operation

Confirmation of check results (1)

Check that the No. of misconnected indoor units is displayed on the 7-segment display [B] after 15 minutes.
(If there is no misconnection, [00P] is displayed.)

(7-segment display)

[A]	[B]
[ ]	[# # P]
↑ C or H	↑ No. of misconnected indoor units

This check operation requires 15 minutes even if there is no misconnection.

Confirmation of check results (2)

Push the push-switch SW05 on the interface P.C. board on the header unit for a period of 2 seconds or more.
The indoor address in which the error is being detected is displayed on the 7-segment display [B]. If there are multiple indoor addresses in which the error is being detected, they are successively exchanged and displayed.
(When SW05 is turned on again, the display returns to the No. of units.)

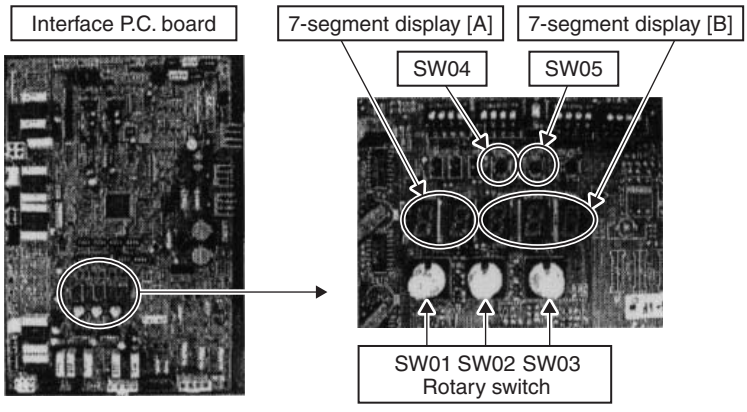
(7-segment display)

[A]	[B]
[ ]	[# #]
↑ C or H	↑ Address display of misconnected indoor unit

After check, set each rotary switch SW01, SW02, SW03 to [1].

(7-segment display)

[A]	[B]
[U1]	[ ]



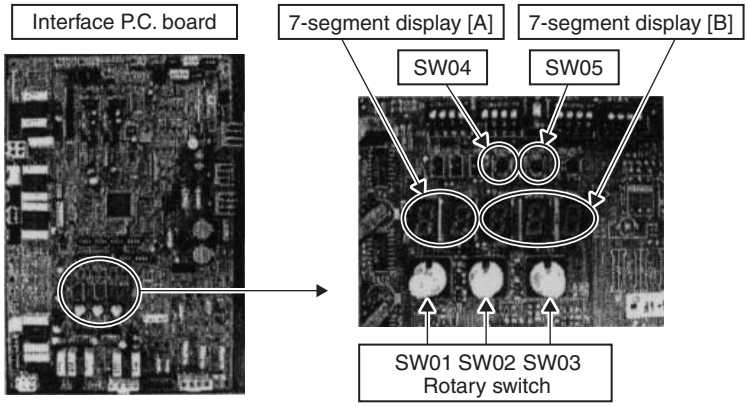
14-2-2. Function to Start/Stop (ON/OFF) Indoor Unit from Outdoor Unit

The following functions of the indoor unit can start or stop by the operation of the switches on the interface P.C. board of the outdoor unit.

No.	Function	Outline	Setup/Release	7-segment display
1	Cooling test operation	Changes the mode of all the connected indoor units collectively to a cooling test operation. **Note** The control operation is as the standard test operation that is performed by using the remote controller.	**Setup** Push SW04 for 2 seconds or more with SW01"2", SW02"5", SW03"1". **Reset** Return SW01, SW02, Sw03 to "1".	**Section A** [C] **Section B** [–C]
2	Heating test operation	Changes the mode of all the connected indoor units collectively to a heating test operation. **Note** The control operation is as per the standard test operation that is performed via the remote controller.	**Setup** Push SW04 for 2 seconds or more with SW01"2", SW02"6", SW03"1". **Reset** Return SW01, SW02, Sw03 to "1".	**Section A** [H] **Section B** [–H]
3	Batch start	Starts all the connected indoor units collectively. **Note** The contents include the setup of the remote controller.	**Setup** Push SW04 for 2 seconds or more with SW01"2", SW02"7", SW03"1". **Reset** Return SW01, SW02, Sw03 to "1".	**Section A** [CH] **Section B** [11] [11] is displayed on Section B for 5 seconds.
	Batch stop	Stops all the connected indoor units collectively.	**Setup** Push SW05 for 2 seconds or more with SW01"2", SW02"7", SW03"1". **Reset** Return SW01, SW02, Sw03 to "1".	**Section A** [CH] **Section B** [00] [00] is displayed on Section B for 5 seconds.
4	Individual start	Starts the specified indoor unit. **Notes** The contents include the setup of remote controller. All other indoor units will remain in their original control state.	**Setup** Set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be started, and then push SW04 for 2 seconds or more **Reset** Return SW01, SW02, Sw03 to "1".	**Section A** [ ] **Section B** [ ] **Section A:** Displays the corresponding indoor address. **Section B:** Displays [11] for 5 seconds from operation-ON.
	Individual stop	Stops the specified indoor unit. **Note** All other indoor units will remain in their original control state.	**Setup** Set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be stopped, and then push SW05 for 2 seconds or more **Reset** Return SW01, SW02, Sw03 to "1".	**Section A** [ ] **Section B** [ ] **Section A:** Displays the corresponding indoor address. **Section B:** Displays [00] for 5 seconds from operation-OFF.
	Individual test operation	Operates the specified indoor unit. **Note** All other indoor units will remain in their original control state.	**Setup** Set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be operated, and then push SW04 for 10 seconds or more **Reset** Return SW01, SW02, Sw03 to "1".	**Section A** [ ] **Section B** [ ] **Section A:** Displays the corresponding indoor address. **Section B:** Displays [FF] for 5 seconds from test operation-ON.

NOTE 1 The start/stop function only sends the signals from the outdoor unit to the indoor unit once. It will not resend the signals again, even if the indoor unit is unresponsive to the command.

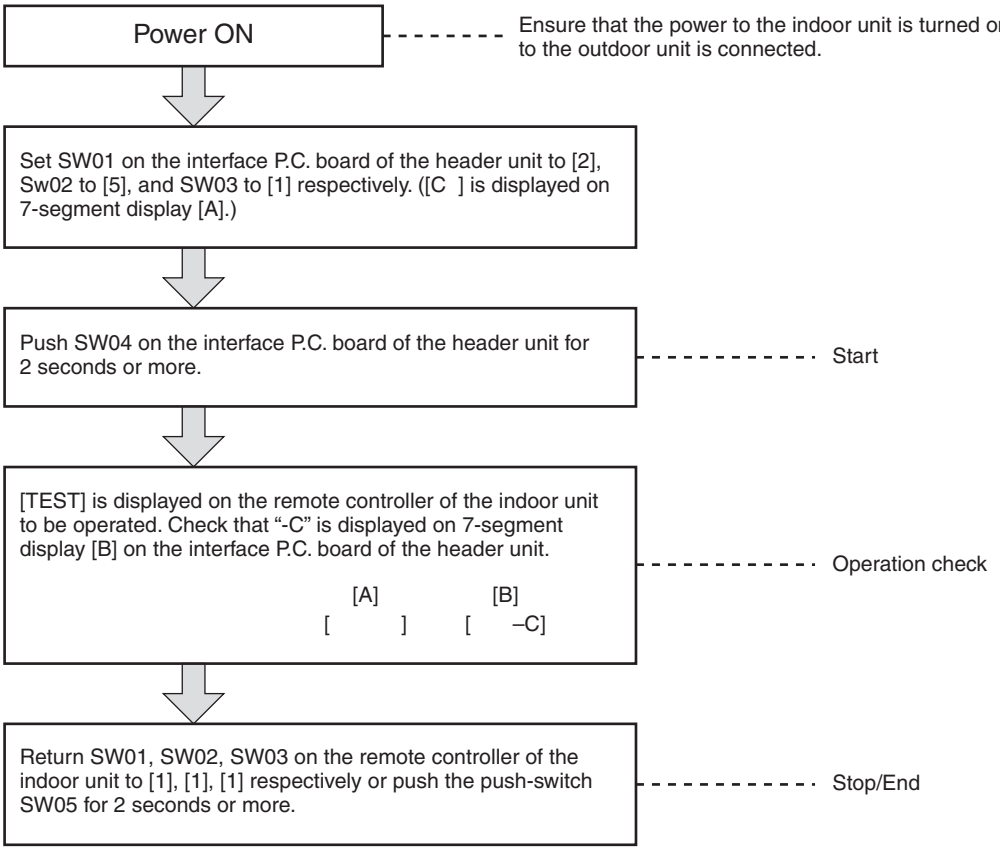
NOTE 2 The above controls should not be used during abnormal stoppages.

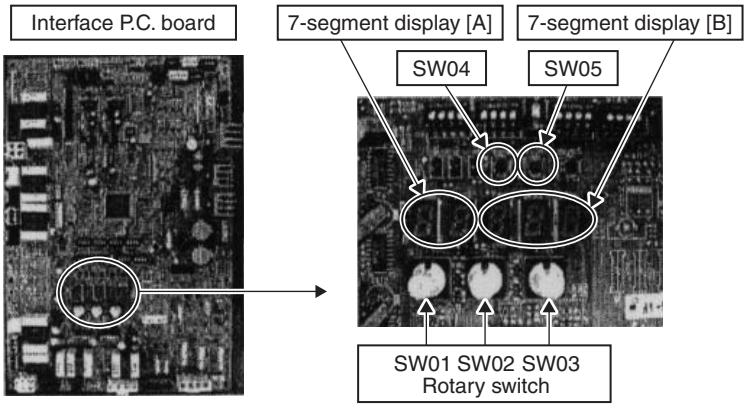


1. Cooling test operation function

This function is provided to change collectively the mode of all the indoor units connected to the same system to the cooling test operation mode by using switches on the interface board of the header unit.

Operation procedure



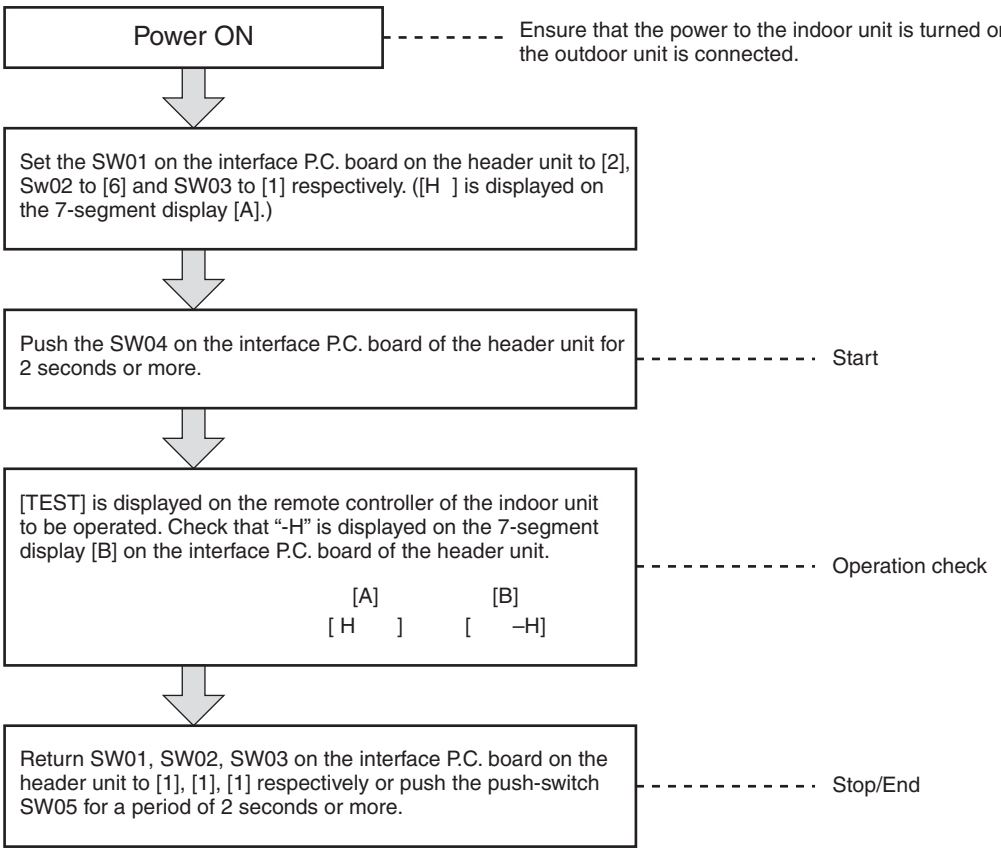


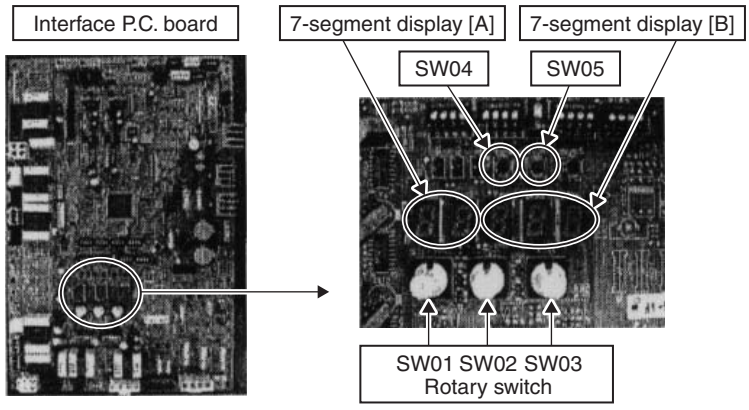
NOTE The test operation will return to normal operation after 60 minutes.

2. Heating test operation function

This function is provided to change collectively the mode of all the indoor units connected to the same system to heating test operation mode by using the switches on the interface P.C. board of the header unit.

Operation procedure





NOTE The test operation will return to normal operation after 60 minutes.

3. Batch start/stop (ON/OFF) function

This function is provided to start/stop collectively all the indoor units connected to the same system by using the switches on the interface P.C. board on the header unit.

Operation procedure

Power ON

Ensure that the power to the indoor unit is turned on BEFORE the power to the outdoor unit is connected.

If an error is already displayed under the condition of SW01 [1], SW02 [1], SW03 [1], return the status to normal according to the troubleshooting guide and then execute a test operation.

Set up the operation mode on the remote controller.
(If it is not set up, the operation starts with the current mode.)
(FAN/COOL/HEAT)

The unit which is not given priority by either heating priority control, cooling priority control, or is not in cooling or heating mode, will not operate. In this case, [⏻] or [ ] will be displayed on the remote controller.

Set the SW01 on the interface P.C. board of the header unit to [2], Sw02 to [7] and SW03 to [1] respectively. ([CH] is displayed on the 7-segment display [A].)

Push the SW04 on the interface P.C. board of the header unit for 2 seconds or more.

Start

The indoor unit to be started will begin operation.

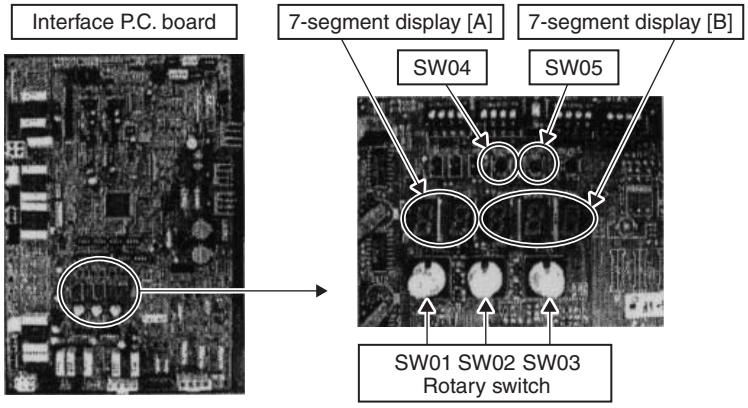
Operation check
(If the discharge temperature does not change, even when Cooling or Heating mode has been selected, check all connections for misalignment.)

Push the push-switch SW05 on the interface P.C. board on the header unit for 2 seconds or more.

Stop

After the test operation has completed, return the rotary switches SW01, SW02 and SW03 on the interface P.C. board of the header unit to [1], [1], [1] respectively.

End



4. Individual start/stop (ON/OFF) individual test operation function

This function is provided to start/stop (ON/OFF) individually each indoor unit connected to the same system by using switches on the interface P.C. board of the header unit.

Set SW01 to [16], SW02 and SW03 to indoor address No. (1 to 64) (Refer to the following table*) - only the setup indoor unit will begin operation.

(In the rotary switches of the indoor unit which operates in a group by the remote controller, the follower unit cannot be individually started or stopped. In this case, [--] is displayed on the 7-segment display [B] on the interface P.C. board of the header unit.)

Operation procedure

Power ON

Ensure that the power to the indoor unit is turned on BEFORE the power to the outdoor unit is connected.

If an error is already displayed under condition of SW01 [1], SW02 [1], SW03 [1], return the unit status to normal, according to troubleshooting guide and then execute a test operation.

Set up the operation mode of the remote controller.
(If it is not set up, the operation will start in its current mode.)

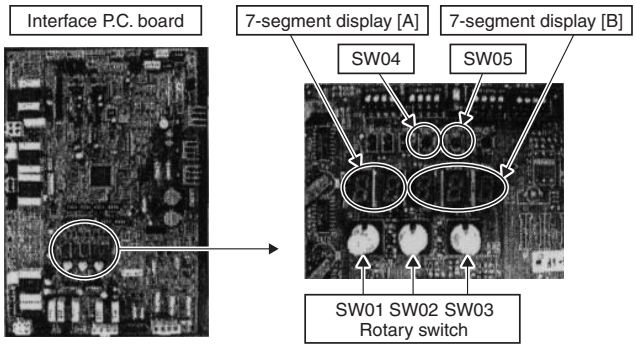
The unit which is not given priority by either heating priority control, cooling priority control or is not in cooling or heating mode, will not operate. In this case, [ ] or [ ] will be displayed on the remote controller.

Match the rotary switch on the interface P.C. board of the header unit with * in the following table.

(7-segment display)

[A] [ ] ↑ Address display of corresponding indoor unit

[B] [ ] ↑ [00] is displayed for 5 seconds after operation-ON.



Push the push-switch SW04 on the interface P.C. board on the header unit for 2 seconds or more.
(If pushing this switch continuously for 10 seconds or more, the operation changes to the individual test operation.)

(7-segment display)

[A] [ ] ↑ Address display of corresponding indoor unit

[B] [ ] ↑ [11] is displayed for 5 seconds after operation-ON.
(For individual test operation,[FF] is displayed.)

Start

The indoor unit to be started will begin operation.

Operation check
(If the discharge temperature does not change, even when Cooling or Heating mode has been selected, check all connections for misalignment.)

Push the push-switch SW05 on the interface P.C. board of the header unit for a period of 2 seconds or more.

(7-segment display)

[A] [ ] ↑ Address display of corresponding indoor unit

[B] [ ] ↑ [00] is displayed for 5 seconds after operation-ON.

After test operation has completed, return the display select switches SW01, SW02 and SW03 on the interface P.C. board of the header unit to [1], [1], [1] respectively.

End

*

SW01	SW02	SW03	Units to be operated
16	1 to 16	1	Address 1 to Address 16 } individually
16	1 to 16	2	Address 17 to Address 32 } individually
16	1 to 16	3	Address 33 to Address 48 } individually
16	1 to 16	4	Address 49 to Address 64 } individually

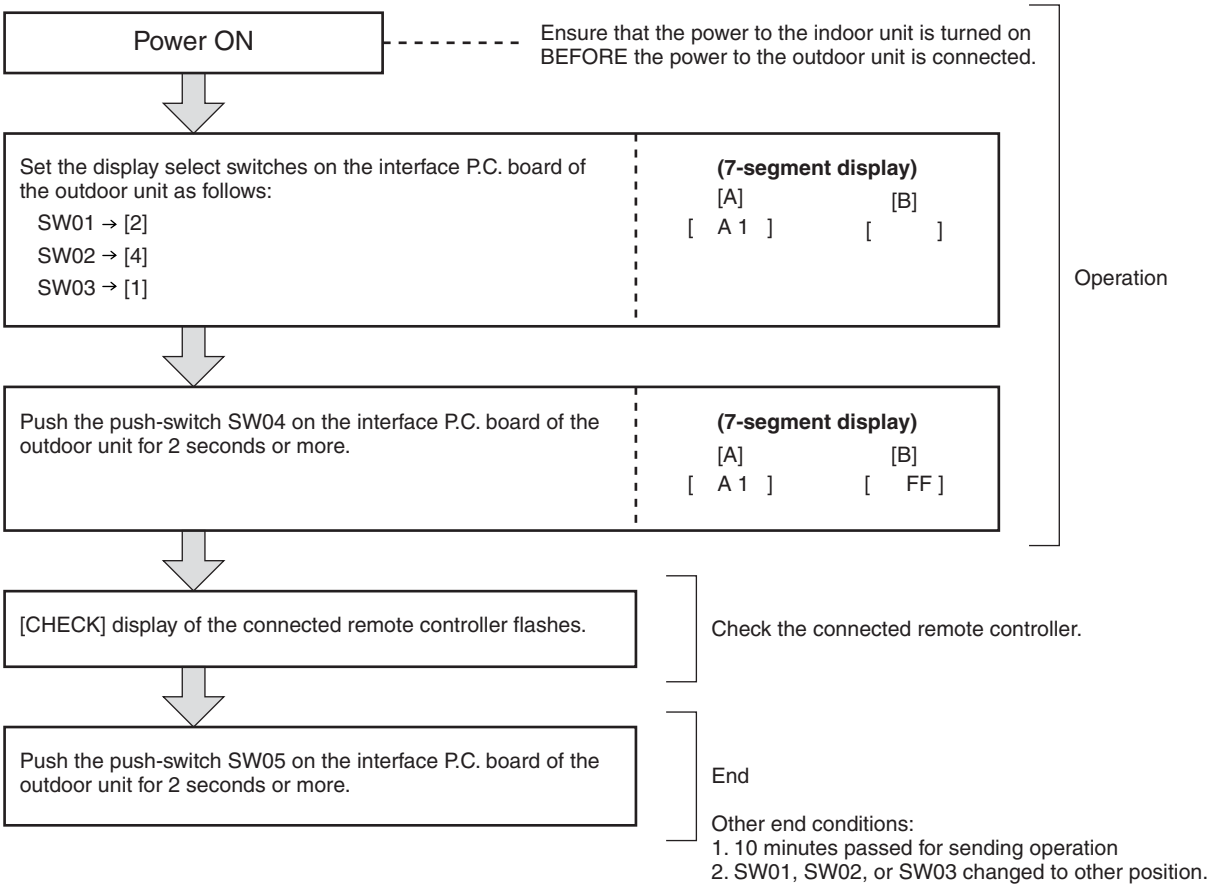
In individual start/stop

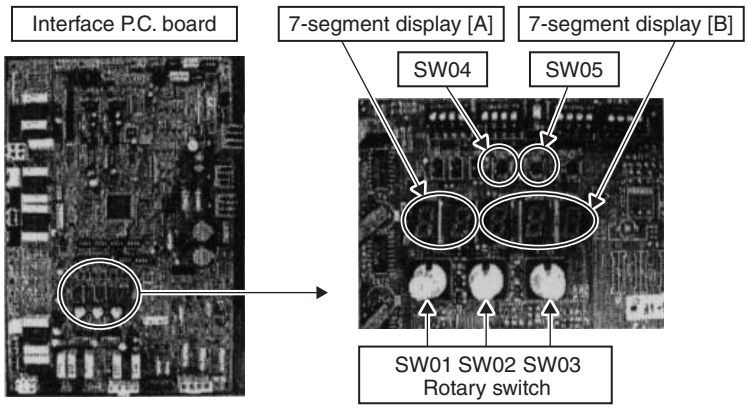
NOTE The individual test operation returns to normal operation after 60 minutes.

14-2-3. Remote Controller Distinction Function

This function is provided to identify the remote controller, which is connected from the outdoor unit to the indoor unit for a refrigerant system, using the switches found on the interface P.C. board of the outdoor unit.

Distinction procedure





14-2-4. Pulse Motor Valve (PMV) Forced Open/Close Function in Indoor Unit

This function is provided to force the PMV in all the indoor units open or closed for a period of 2 minutes. This is achieved through the interface P.C. board in the outdoor unit. This function can also be used to open the PMV fully before turning off the power supply to the unit.

Operation

Open fully

Set the switch SW01 on the interface P.C. board of the outdoor unit to [2], SW02 to [3], SW03 to [1] and push SW04 for 2 seconds or more. The 7-segment display will show [P] and [FF] for a period of 2 minutes.

Close fully

Set the switch SW01 on the interface P.C. board on the outdoor unit to [2], SW02 to [3], SW03 to [1] and push SW05 for 2 seconds or more. The 7-segment display will show [P] and [00] for a period of 2 minutes.

Reset Operation

After a period of 2 minutes (1 minute, when in the fully closed position) has passed the PMV opening will automatically return to it normal opening position.

14-2-5. Pulse Motor Valve (PMV) Forced Open Fully/Close fully Function in Outdoor Unit

This function is used to force the opening and closing (fully) of the PMV (PMV 1, PMV 2 and PMV 3) used in the outdoor unit for a period of 2 minutes.

PMV selection

By setting SW12-1, the PMV that you wish to operate can be selected,. Reference the table shown on the right.

SW12 bit 1	OFF	PMV1/PMV2
	ON	PMV3

Open fully

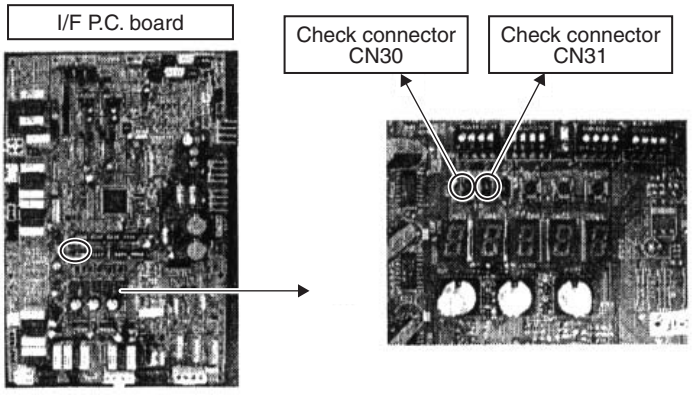
To open the PMV fully, short-circuit CN31 on the outdoor interface P.C. board.

Close fully

To close the PMV fully, short-circuit CN31 on the outdoor interface P.C. board.

Clear

Remove the short-circuit cord and return the interface P.C. board to normal condition. After which the PMV opening will automatically return to its normal opening after a period of 2 minutes.



14-2-6. Solenoid Valve Forced Open/Close Function in Outdoor Unit

This function is provided to force open each solenoid valve that is mounted in the outdoor unit via the interface P.C. board in the outdoor unit. This function should be used to establish if there is refrigerant present within the valve, that may stop the solenoid from functioning correctly.

Operation

1. Set the switch SW01 on the interface P.C. board of the outdoor unit to [2], SW02 to [1], SW03 to [3].
2. When [H. r] is displayed in the 7-segment display [A], keep pushing the switch SW04 for 2 seconds or more.
3. From when [2] is displayed in 7-segment display [B], SV2 is turned on.
4. The solenoid can then be turned ON and OFF by changing the setup number on switch SW02.
   (ON/OFF output pattern of each solenoid valve is as follows.)

NOTE 1 The 7-segment display [B] will change when the number of the SW02 switch has been altered. However there will be a time delay of 5 seconds or more before the solenoid valve output will change.

NOTE 2 The mark [○] in the table indicates the corresponding solenoid valve and forcedly turned on.

NOTE 3 The mark [—] in the table indicates the ON/OFF position of the solenoid valve and is controlled based upon the specifications of the air conditioner.

NOTE 4 The mark [×] in the table indicates the corresponding solenoid valve is forcedly turned off.

NOTE 5 The case heater represents both the compressor and accumulator heaters.

SW02	7-segment display [B]	Operation pattern of solenoid valve									Case heater output relay
		SV2	SV5	SV41	SV42	SV3A	SV3B	SV3C	SV3D	SV3E	
1	[2]	○	—	—	—	—	—	—	—	○	○
2	[5]	—	○	—	—	—	—	—	—	○	○
3	[4–]	—	—	○	○	—	—	—	—	○	○
4	[3A]	—	—	—	—	○	—	—	—	○	○
5	[3b]	—	—	—	—	—	○	—	—	○	○
6	[3C]	—	—	—	—	—	—	○	—	○	○
7	[3d]	—	—	—	—	—	—	—	○	○	○
8	[3E]	—	—	—	—	—	—	—	—	×	○
9	[3–]	—	—	—	—	○	○	○	—	—	○
10 to 15	[ ]	—	—	—	—	—	—	—	—	○	○
16	[ALL]	○	○	○	○	○	○	○	○	○	○

Reset Operation

Return the numbers on SW01, SW02, and SW03 on the interface P.C. board to [1].

NOTE As this function is not to be used for everyday applications, ensure that the air conditioner is returned to its original mode.

14-2-7. Fan Operation Check in Outdoor Unit

This function is provided to force the operation of the fan in the outdoor unit, by using the interface P.C. board switched found within the unit. The frequency of the fan can be controlled by the set-up of the switches. Therefore utilize this function to check for any abnormal sounds within the fan system. Please ensure when using this function that the unit is not in operation.

NOTE Do not use this function while the compressor is in operation as damage to the compressor may result.

Operation

1. Set the switch SW01 on the interface P.C. board on the outdoor unit to [2], SW02 to [1] and SW03 to [4].
2. When [F. d] is displayed on the 7-segment display [A], keep pushing the switch SW04 for a period of 2 seconds or more.
3. From when [31] is displayed in 7-segment display [B], the fan will begin operation. (Super mode operation)
4. The 7-segment display [B] and the fan mode can be changed by changing the setup number on the switches SW02 and SW03.

   (Output pattern of the fan is as follows.)

SW02	SW03	7-segment display [B]	Fan mode	SW02	SW03	7-segment display [B]	Fan mode
1	4	[31]	31	1	5	[15]	15
2		[30]	30	2		[14]	14
3		[29]	29	3		[13]	13
4		[28]	28	4		[12]	12
5		[27]	27	5		[11]	11
6		[26]	26	6		[10]	10
7		[25]	25	7		[9]	9
8		[24]	24	8		[8]	8
9		[23]	23	9		[7]	7
10		[22]	22	10		[6]	6
11		[21]	21	11		[5]	5
12		[20]	20	12		[4]	4
13		[19]	19	13		[3]	3
14		[18]	18	14		[2]	2
15		[17]	17	15		[1]	1
16		[16]	16	16		[0]	0

Clear

This function is cleared by one of the following operations.

1. When SW01 is moved to another position.
2. When Push-switch SW05 is pushed for a period of 2 seconds or more.

14-2-8. Abnormal Outdoor Unit Discrimination Method By Fan Operating Function

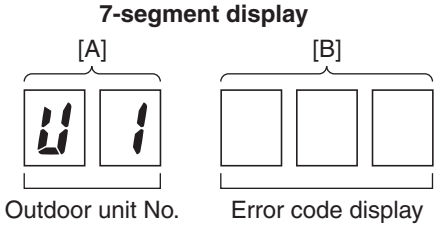
This function is provided to forcibly operate the fan of the outdoor unit in which an error has occurred. This is carried out using the switch functions on the outdoor interface P.C. board in the header unit.

To identify which one of the follower units connected to the system was erroneous, while the system is not in operation due to a unit error (Check code [E28]), use this function.

Operation

Operation of fan in faulty outdoor unit only

1. Check all the switches, SW01, SW02 and SW03 on the interface P.C. board in the header unit are set to [1].



2. Keep pushing the push-switch SW04 for a period of 2 seconds or more.
3. “E 1” is displayed on the 7-segment display [A].
4. The fan of the outdoor unit in which the error has occurred will begin operation within approx. 10 seconds of when “E 1” was displayed.

Operation of fans in working outdoor units

1. Check all the switches, SW01, SW02, and SW03 on the interface P.C. board in the header unit are set to [1].
2. Push the push-switches SW04 and SW05 at the same time for a period of 2 seconds or more.
3. “E 0” is displayed on the 7-segment display [A].
4. The fans of all the normal outdoor units will begin operation within approximately 10 seconds of when “E 0” was displayed.

Clear

Push the push-switch SW05 on the interface P.C. board in the header unit for aperiod of 2 seconds or more.

The outdoor fan which was forced to operated will stop.

* Check [U. 1] is displayed on the 7-segment display [A].

14-2-9. Monitor Function of Remote Controller Switch

When using a remote controller with the model name RBC-AMT31E, the following monitor functions can be used.

Calling of display screen

Contents

The temperature or the operation status of the remote controller, indoor unit or each sensor of the outdoor unit can be known by calling up the service monitor mode from the remote controller.

Procedure

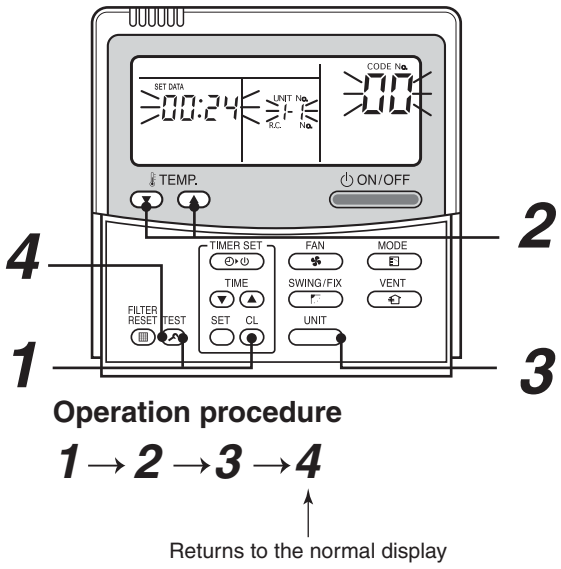
1 **Push the CL + TEST buttons simultaneously for 4 seconds or more to call up the service monitor mode. The temperature of the item code *00* will be displayed firstly.**

2 **Push the TEMP. buttons to select the item number (Item code) to be monitored.**

For displayed codes, refer to the following table.

3 **Push the UNIT button to change the item to the one to be monitored. You will then be able to monitor the indoor unit and sensor temperature or operation status in the corresponding refrigerant line.**

4 **Pushing the TEST button returns the display to its normal display.**



Operation procedure

1 → ***2*** → ***3*** → ***4***

Returns to the normal display

	Item code	Data name	Unit	Display format
Indoor unit data (NOTE 2)	00	Room temp (During control)	°C	
	01	Room temp (Remote controller)	°C	
	02	Indoor suction temp (TA)	°C	× 1
	03	Indoor coil temp (TCJ)	°C	× 1
	04	Indoor coil temp (TC2)	°C	× 1
	05	Indoor coil temp (TC1)	°C	× 1
	06	Indoor discharge temp (Tf) (NOTE 1)	°C	× 1
	08	Indoor PMV opening	pulse	× 1/10
System data	0A	No. of connected indoor units	unit	
	0b	Total HP of connected indoor units	HP	× 10
	0C	No. of connected indoor units	unit	
	0d	Total HP of indoor units	HP	× 10

	Item code	Data name	Unit	Display format
Outdoor unit individual data (NOTE 4, 5)	10	Compressor 1 discharge temp (Td1)	°C	× 1
	11	Compressor 2 discharge temp (Td2)	°C	× 1
	12	High-pressure sensor detention pressure (Pd)	MPa	× 100
	13	Low-pressure sensor detention pressure (Ps)	MPa	× 100
	14	Suction temp (TS)	°C	× 1
	15	Outdoor coil temp (TE)	°C	× 1
	16	Temp at liquid side (TL)	°C	× 1
	17	Outside temp (TO)	°C	× 1
	18	Low-pressure saturation temp (TU)	°C	× 1
	19	Compressor 1 current (I1)	A	× 10
	1A	Compressor 2 current (I2)	A	× 10
	1b	PMV1 + 2 opening	pulse	× 1/10
	1d	Compressor 1, 2 ON/OFF	—	(NOTE 3)
	1E	Outdoor fan mode	—	0 to 31
	1F	Outdoor unit HP	HP	× 1

NOTE 1 Only a small range of units are fitted with a discharge temperature sensor. Therefore it will not be displayed on all units.

NOTE 2 When the units are connected to a group, data of the header indoor unit can only be displayed.

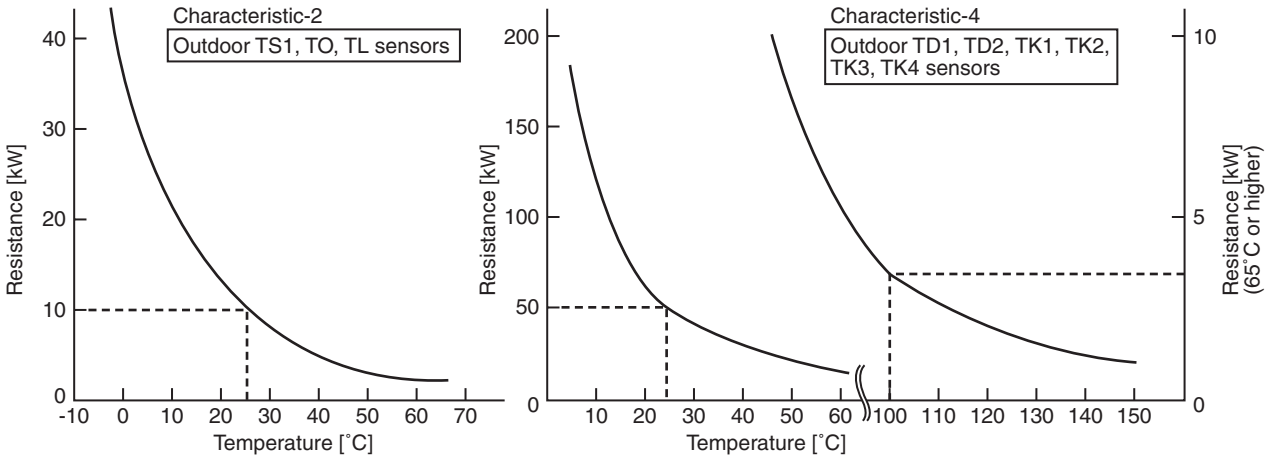
NOTE 3 01 : Compressor 1 only is ON.
10 : Compressor 2 only is ON.
11 : Both compressor 1 and 2 are ON.

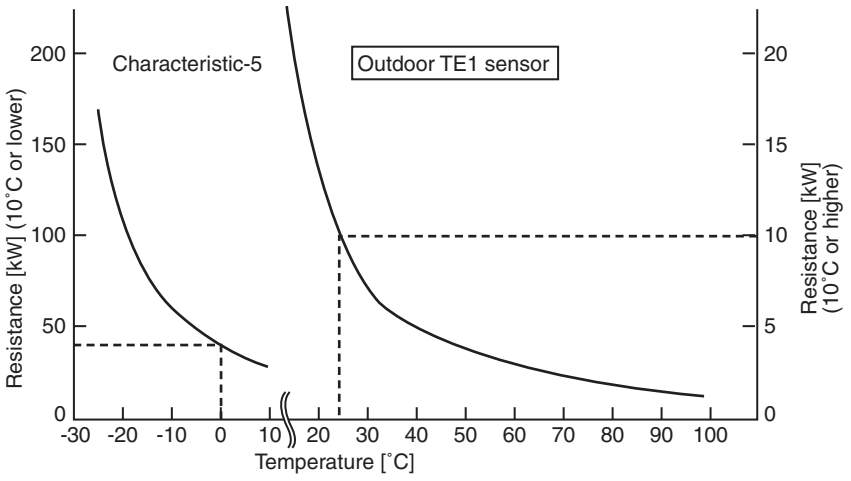
NOTE 4 The upper digit of the item code indicates the outdoor unit No.
1 : Header unit (A)
2 : Follower unit (B)
3 : Follower unit (C)
4 : Follower unit (D)

14-3. Sensor Characteristics

14-3-1. Outdoor Unit

■ Temperature sensor characteristics





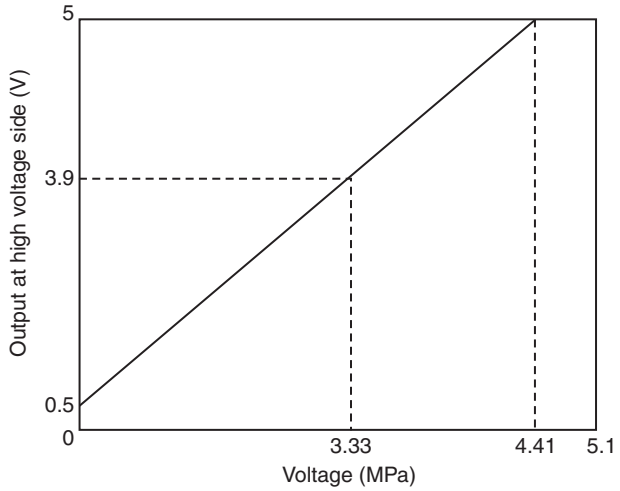
■ Pressure sensor characteristics

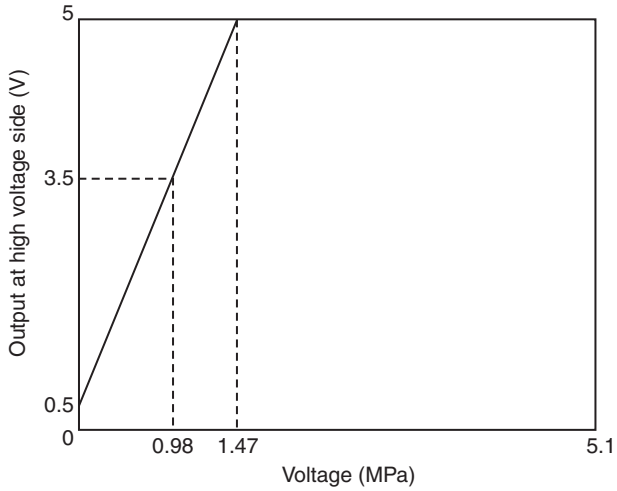
• I/O cable connection table

Pin No.	High pressure side (Pd)		Low pressure side (Ps)	
	I/O name	Lead cable color	I/O name	Lead cable color
1	OUTPUT	White	—	—
2	—	—	OUTPUT	White
3	GND	Black	GND	Black
4	+5V	Red	+5V	Red

• Output voltage — Pressure

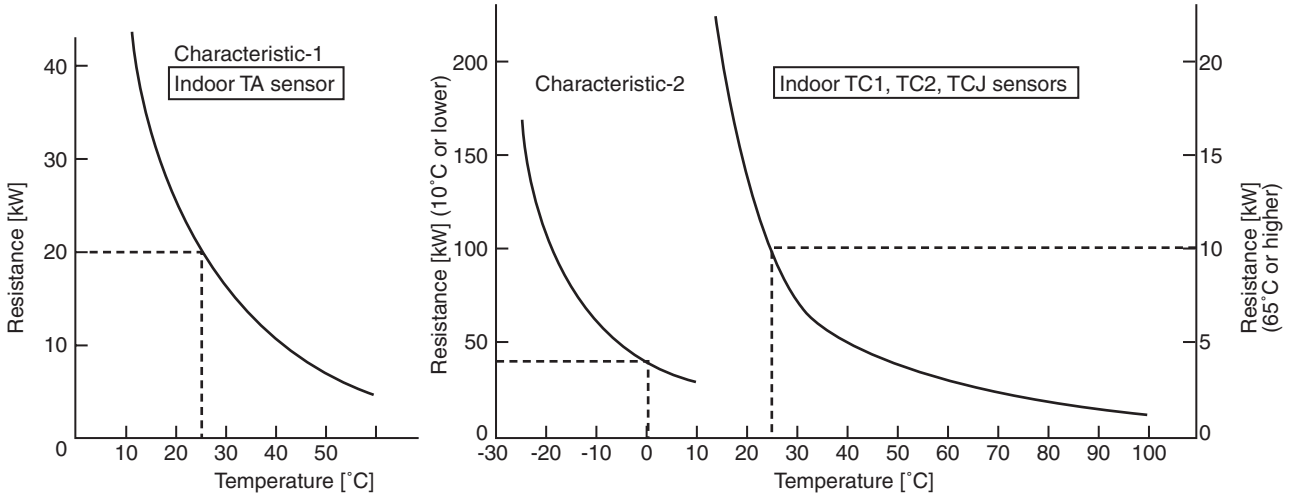
High pressure side (Pd)	Low pressure side (Ps)
0.5 to 3.9 V	0.5 to 3.5 V
0 to 3.33 MPa	0 to 0.98 MPa





14-3-2. Indoor Unit

■ Temperature sensor characteristics



14-4. Pressure Sensor Output Check

14-4-1. Outdoor Unit

■ Pd sensor characteristics

0 to 4.41MPa (0.5 to 5V output with 0 to 4.41MPa)
Voltage check between CN501 ② and ③ pins on the outdoor unit I/F P.C. board (Tester ⊖ rod at ③ pin side)

VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)
0.00	0.00	0.0	1.00	0.49	5.0	1.99	1.46	14.9	2.99	2.44	24.9	3.98	3.42	34.8
0.02	0.00	0.0	1.02	0.51	5.2	2.01	1.48	15.1	3.01	2.46	25.1	4.00	3.44	35.0
0.04	0.00	0.0	1.04	0.53	5.4	2.03	1.50	15.3	3.03	2.48	25.3	4.02	3.45	35.2
0.06	0.00	0.0	1.06	0.54	5.5	2.05	1.52	15.5	3.05	2.50	25.5	4.04	5.48	35.4
0.08	0.00	0.0	1.07	0.56	5.7	2.07	1.54	15.7	3.07	2.52	25.7	4.06	3.49	35.6
0.10	0.00	0.0	1.09	0.58	5.9	2.09	1.56	15.9	3.09	2.54	25.9	4.08	3.51	35.8
0.12	0.00	0.0	1.11	0.60	6.1	2.11	1.58	16.1	3.11	2.56	26.1	4.10	3.53	36.0
0.14	0.00	0.0	1.13	0.62	6.3	2.13	1.60	16.3	3.13	2.57	26.3	4.12	3.55	36.2
0.16	0.00	0.0	1.15	0.64	6.5	2.15	1.62	16.5	3.15	2.59	26.4	4.14	3.57	36.4
0.18	0.00	0.0	1.17	0.66	6.7	2.17	1.64	16.7	3.16	2.61	26.6	4.16	3.59	36.6
0.20	0.00	0.0	1.19	0.68	6.9	2.19	1.66	16.9	3.18	2.63	26.8	4.18	3.61	36.8
0.22	0.00	0.0	1.21	0.70	7.1	2.21	1.67	17.1	3.20	2.65	27.0	4.20	3.63	37.0
0.23	0.00	0.0	1.23	0.72	7.3	2.23	1.69	17.3	3.22	2.67	27.2	4.22	3.65	37.2
0.25	0.00	0.0	1.25	0.74	7.5	2.25	1.71	17.5	3.24	2.69	27.4	4.24	3.67	37.4
0.27	0.00	0.0	1.27	0.76	7.7	2.27	1.73	17.7	3.26	2.71	27.6	4.26	3.69	37.6
0.29	0.00	0.0	1.29	0.77	7.9	2.29	1.75	17.9	3.28	2.73	27.8	4.28	3.70	37.8
0.31	0.00	0.0	1.31	0.79	8.1	2.31	1.77	18.0	3.30	2.75	28.0	4.30	3.72	38.0
0.33	0.00	0.0	1.33	0.81	8.3	2.32	1.79	18.2	3.32	2.77	28.2	4.32	3.74	38.2
0.35	0.00	0.0	1.35	0.83	8.5	2.34	1.81	18.4	3.34	2.79	28.4	4.24	3.76	38.4
0.37	0.00	0.0	1.37	0.85	8.7	2.36	1.83	18.6	3.36	2.80	28.6	4.36	3.78	38.6
0.39	0.00	0.0	1.39	0.87	8.9	2.38	1.85	18.8	3.38	2.82	28.8	4.38	3.80	38.8
0.41	0.00	0.0	1.41	0.89	9.1	2.40	1.87	19.0	3.40	2.84	29.0	4.40	3.82	38.9
0.43	0.00	0.0	1.43	0.91	9.3	2.42	1.89	19.2	3.42	2.86	29.2	4.41	3.84	39.1
0.45	0.00	0.0	1.45	0.93	9.5	2.44	1.90	19.4	3.44	2.88	29.4	4.43	3.86	39.3
0.47	0.00	0.0	1.47	0.95	9.6	2.46	1.92	19.6	3.46	2.90	29.6	4.45	3.88	39.5
0.49	0.00	0.0	1.48	0.97	9.8	2.48	1.94	19.8	3.48	2.92	29.8	4.47	3.90	39.7
0.51	0.01	0.1	1.50	0.99	10.0	2.50	1.96	20.0	3.50	2.94	30.0	4.49	3.92	39.9
0.53	0.03	0.3	1.52	1.00	10.2	2.52	1.98	20.2	3.52	2.96	30.2	4.51	3.93	40.1
0.55	0.05	0.5	1.54	1.02	10.4	2.54	2.00	20.4	3.54	2.98	3.04	4.53	3.95	40.3
0.57	0.07	0.7	1.56	1.04	10.6	2.56	2.02	20.6	3.56	3.00	30.5	4.55	3.97	40.5
0.59	0.08	0.9	1.58	1.06	10.8	2.58	2.04	20.8	3.57	3.02	30.7	4.57	3.99	40.7
0.61	0.10	1.1	1.60	1.08	11.0	2.60	2.06	21.0	3.59	3.03	30.9	4.59	4.01	40.9
0.63	0.12	1.3	1.62	1.10	11.2	2.62	2.08	21.2	3.61	3.05	31.1	4.61	4.03	41.1
0.65	0.14	1.4	1.64	1.12	11.4	2.64	1.10	21.4	3.63	3.07	31.3	4.63	4.05	41.3
0.66	0.16	1.6	1.66	1.14	11.6	2.66	2.12	21.6	3.65	3.09	31.5	4.65	4.07	41.5
0.68	0.18	1.8	1.68	1.16	11.8	2.68	2.13	21.8	3.67	3.11	31.7	4.67	4.09	41.7
0.70	0.20	2.0	1.70	1.18	12.0	2.70	2.15	22.0	3.69	3.13	31.9	4.69	4.11	41.9
0.72	0.22	2.2	1.72	1.20	12.2	2.72	2.17	22.2	3.71	3.15	32.1	4.71	4.13	42.1
0.74	0.24	2.4	1.74	1.21	12.4	2.73	2.19	22.3	3.73	3.17	32.3	4.73	4.15	42.3
0.76	0.26	2.6	1.76	1.23	12.6	2.75	2.21	22.5	3.75	3.19	32.5	4.75	4.16	42.5
0.78	0.28	2.8	1.78	1.25	12.8	2.77	2.23	22.7	3.77	3.21	32.7	4.77	4.18	42.7
0.80	0.30	3.0	1.80	1.27	13.0	2.79	2.25	22.9	3.79	3.23	32.9	4.79	4.20	42.9
0.82	0.31	3.2	1.82	1.29	13.2	2.81	2.27	23.1	3.81	3.25	33.1	4.81	4.22	43.0
0.84	0.33	3.4	1.84	1.31	13.4	2.83	2.29	23.3	3.83	3.26	33.3	4.82	4.24	43.2
0.86	0.35	3.6	1.86	1.33	13.6	2.85	2.31	23.5	3.85	3.28	33.5	4.84	4.26	43.4
0.88	0.37	3.8	1.88	1.35	13.8	2.87	2.33	23.7	3.87	3.30	33.7	4.86	4.28	43.6
0.90	0.39	4.0	1.90	1.37	13.9	2.89	2.35	23.9	3.89	3.32	33.9	4.88	4.30	43.8
0.92	0.41	4.2	1.91	1.39	14.1	2.91	2.36	24.1	3.91	3.34	34.1	4.90	4.32	44.0
0.94	0.43	4.4	1.93	1.41	14.3	2.93	2.38	24.3	3.93	3.36	34.3	4.92	4.34	44.2
0.96	0.45	4.6	1.95	1.43	14.5	2.95	2.40	24.5	3.95	3.38	34.5	4.94	4.36	44.4
0.98	0.47	4.8	1.97	1.44	14.7	2.97	2.42	24.7	3.97	3.40	34.7	4.96	4.38	44.6
												4.98	4.39	44.8

14-4-2. Outdoor Unit

■ Ps sensor characteristics

0 to 1.47MPa (0.5 to 5V output with 0 to 1.47MPa)
Voltage check between CN500 ② and ③ pins on the outdoor unit I/F P.C. board (Tester ⊖ rod at ③ pin side)

VOLT	Ps (MPa)	Ps (kg/cm²)	VOLT	Ps (MPa)	Ps (kg/cm²)	VOLT	Ps (MPa)	Ps (kg/cm²)	VOLT	Ps (MPa)	Ps (kg/cm²)	VOLT	Ps (MPa)	Ps (kg/cm²)
0.00	0.00	0.0	1.00	0.16	1.7	1.99	0.49	5.0	2.99	0.81	8.3	3.98	1.14	11.6
0.02	0.00	0.0	1.02	0.17	1.7	2.01	0.49	5.0	3.01	0.82	8.4	4.00	1.15	11.7
0.04	0.00	0.0	1.04	0.18	1.8	2.03	0.50	5.1	3.03	0.83	8.4	4.02	1.15	11.7
0.06	0.00	0.0	1.06	0.18	1.8	2.05	0.51	5.2	3.05	0.83	8.5	4.04	1.16	11.8
0.08	0.00	0.0	1.07	0.19	1.9	2.07	0.51	5.2	3.07	0.84	8.6	4.06	1.17	11.9
0.10	0.00	0.0	1.09	0.19	2.0	2.09	0.52	5.3	3.09	0.85	8.6	4.08	1.17	11.9
0.12	0.00	0.0	1.11	0.20	2.0	2.11	0.53	5.4	3.11	0.85	8.7	4.10	1.18	12.0
0.14	0.00	0.0	1.13	0.21	2.1	2.13	0.53	5.4	3.13	0.86	8.8	4.12	1.18	12.1
0.16	0.00	0.0	1.15	0.21	2.2	2.15	0.54	5.5	3.15	0.86	8.8	4.14	1.19	12.1
0.18	0.00	0.0	1.17	0.22	2.2	2.17	0.55	5.6	3.16	0.87	8.9	4.16	1.20	12.2
0.20	0.00	0.0	1.19	0.23	2.3	2.19	0.55	5.6	3.18	0.88	8.9	4.18	1.20	12.3
0.22	0.00	0.0	1.21	0.23	2.4	2.21	0.56	5.7	3.20	0.88	9.0	4.20	1.21	12.3
0.23	0.00	0.0	1.23	0.24	2.4	2.23	0.56	5.8	3.22	0.89	9.1	4.22	1.22	12.4
0.25	0.00	0.0	1.25	0.25	2.5	2.25	0.57	5.8	3.24	0.90	9.1	4.24	1.22	12.5
0.27	0.00	0.0	1.27	0.25	2.6	2.27	0.58	5.9	3.26	0.90	9.2	4.26	1.23	12.5
0.29	0.00	0.0	1.29	0.26	2.6	2.29	0.58	6.0	3.28	0.91	9.3	4.28	1.24	12.6
0.31	0.00	0.0	1.31	0.26	2.7	2.31	0.59	6.0	3.30	0.92	9.3	4.30	1.24	12.7
0.33	0.00	0.0	1.33	0.27	2.8	2.32	0.60	6.1	3.32	0.92	9.4	4.32	1.25	12.7
0.35	0.00	0.0	1.35	0.28	2.8	2.34	0.60	6.1	3.34	0.93	9.5	4.34	1.25	12.8
0.37	0.00	0.0	1.37	0.28	2.9	2.36	0.61	6.2	3.36	0.94	9.5	4.36	1.26	12.9
0.39	0.00	0.0	1.39	0.29	3.0	2.38	0.62	6.3	3.38	0.94	9.6	4.38	1.27	12.9
0.41	0.00	0.0	1.41	0.30	3.0	2.40	0.62	6.3	3.40	0.95	9.7	4.40	1.27	13.0
0.43	0.00	0.0	1.43	0.30	3.1	2.42	0.63	6.4	3.42	0.95	9.7	4.41	1.28	13.0
0.45	0.00	0.0	1.45	0.31	3.2	2.44	0.64	6.5	3.44	0.96	9.8	4.43	1.29	13.1
0.47	0.00	0.0	1.47	0.32	3.2	2.46	0.64	6.5	3.46	0.97	9.9	4.45	1.29	13.2
0.49	0.00	0.0	1.48	0.32	3.3	2.48	0.65	6.6	3.48	0.97	9.9	4.47	1.30	13.2
0.51	0.00	0.0	1.50	0.33	3.3	2.50	0.65	6.7	3.50	0.98	10.0	4.49	1.31	13.3
0.53	0.01	0.1	1.52	0.34	3.4	2.52	0.66	6.7	3.52	0.99	10.1	4.51	1.31	13.4
0.55	0.02	0.3	1.54	0.34	3.5	2.54	0.67	6.8	3.54	0.99	10.1	4.53	1.32	13.4
0.57	0.02	0.2	1.56	0.35	3.5	2.56	0.67	6.9	3.56	1.00	10.2	4.55	1.32	13.5
0.59	0.03	0.3	1.58	0.35	3.6	2.58	0.68	6.9	3.57	1.01	10.2	4.57	1.33	13.6
0.61	0.03	0.4	1.60	0.36	3.7	2.60	0.69	7.0	3.59	1.01	10.3	4.59	1.34	13.6
0.63	0.04	0.4	1.62	0.37	3.7	2.62	0.69	7.1	3.61	1.02	10.4	4.61	1.34	13.7
0.65	0.05	0.5	1.64	0.37	3.8	2.64	0.70	7.1	3.63	1.02	10.4	4.63	1.35	13.8
0.66	0.05	0.5	1.66	0.38	3.9	2.66	0.71	7.2	3.65	1.03	10.5	4.65	1.36	13.8
0.68	0.06	0.6	1.68	0.39	3.9	2.68	0.71	7.3	3.67	1.04	10.6	4.67	1.36	13.9
0.70	0.07	0.7	1.70	0.39	4.0	2.70	0.72	7.3	3.69	1.04	10.6	4.69	1.37	14.0
0.72	0.07	0.7	1.72	0.40	4.1	2.72	0.72	7.4	3.71	1.05	10.7	4.71	1.38	14.0
0.74	0.08	0.8	1.74	0.41	4.1	2.73	0.73	7.4	3.73	1.06	10.8	4.73	1.38	14.1
0.76	0.09	0.9	1.76	0.41	4.2	2.75	0.74	7.5	3.75	1.06	10.8	4.75	1.39	14.2
0.78	0.09	0.9	1.78	0.42	4.3	2.77	0.74	7.6	3.77	1.07	10.9	4.77	1.39	14.2
0.80	0.10	1.0	1.80	0.42	4.3	2.79	0.75	7.6	3.79	1.08	11.0	4.79	1.40	14.3
0.82	0.11	1.1	1.82	0.43	4.4	2.81	0.76	7.7	3.81	1.08	11.0	4.81	1.41	14.3
0.84	0.11	1.1	1.84	0.44	4.5	2.83	0.76	7.8	3.83	1.09	11.1	4.82	1.41	14.4
0.86	0.12	1.2	1.86	0.44	4.5	2.85	0.77	7.8	3.85	1.09	11.2	4.84	1.42	14.5
0.88	0.12	1.3	1.88	0.45	4.6	2.87	0.78	7.9	3.89	1.10	11.2	4.86	1.43	14.5
0.90	0.13	1.3	1.90	0.46	4.6	2.89	0.78	8.0	3.89	1.11	11.3	4.88	1.43	14.6
0.92	0.14	1.4	1.91	0.46	4.7	2.91	0.79	8.0	3.91	1.11	11.4	4.90	1.44	14.7
0.94	0.14	1.5	1.93	0.47	4.8	2.93	0.79	8.1	3.93	1.12	11.4	4.92	1.45	14.7
0.96	0.15	1.5	1.95	0.48	4.8	2.95	0.80	8.2	3.95	1.13	11.5	4.94	1.45	14.8
0.98	0.16	1.6	1.97	0.48	4.9	2.97	0.81	8.2	3.97	1.13	11.5	4.96	1.46	14.9
												4.98	1.47	14.9

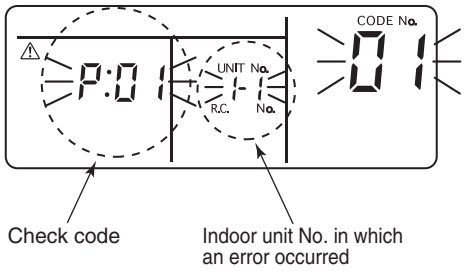
15. TROUBLESHOOTING

Confirmation and check

When a fault or error has occurred in the air conditioner, the check code and the indoor unit No. will appear on the display part of the remote controller.

The check code is only displayed while the unit is in operation.

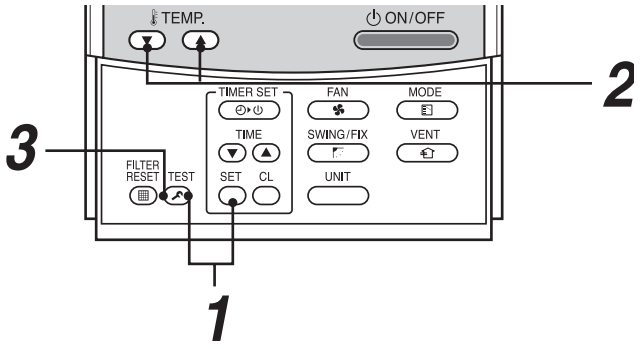
If the display disappears, operate the air conditioner according to the following “Confirmation of error history” for confirmation.

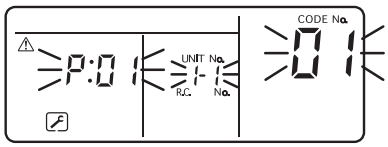


Confirmation of error history

When a fault or error has occurred in the air conditioner, the error history can be confirmed with the following procedure.
(The error history is stored in the memory and can hold up to 4 errors.)

This history can be confirmed while the unit is in either operating status or stop status.



Procedure	Description	
1	When pushing the SET and TEST buttons simultaneously for 4 seconds or more, the display on the right appears. If [Service Check] is displayed, the mode will enter into the history mode. • [01: Order of error history] is displayed in CODE No. window. • [Check Code] is displayed in CHECK window. • [Indoor unit address in which the error has occurred] is displayed in UNIT No.	
2	For every push of the TEMP. buttons, the error history stored in the memory is displayed in order. The numbers in CODE No. indicates CODE No. [01] (Latest) → [04] (Oldest). Do not push the CL button, as all of the error history of the indoor unit will be deleted.	
3	After confirmation, push the TEST button to return to the usual display.	

Check method

On the remote controller (Main remote controller & Central control remote controller) and the interface P.C. board found on the outdoor unit, a check display LCD (Remote controller) or 7-segment display (on the outdoor interface P.C. board) is used to display the operation currently in progress. Therefore the operation status can be known. Using this self-diagnosis function, an error or fault can be identified within the air conditioner, using the table shown below.

Check code list

The following list shows each check code.

- In case of check from the indoor remote controller: See “Main remote controller display” in the list.
- In case of check from the outdoor unit: See “Outdoor 7-segment display” in the list.
- In case of check from the AI-NET central control remote controller: See “AI-NET central control display” in the list.
- In case of check from the indoor unit with wireless remote controller: See “Sensor block display of receiving unit” in the list.

Terminology

IPDU : Intelligent Power Drive Unit
○ : Lighting, ¤ : Flashing, ● : Goes off
ALT. : Flashing is alternately when there are two flashing LED.
SIM : Simultaneous flashing when there are two flashing LED.

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Sub-code		Operation	Timer	Ready	Flash		
E01	—	—	—	¤	●	●		Communication error between indoor and remote controller (Detected at remote controller side)	Remote controller
E02	—	—	—	¤	●	●		Remote controller transmission error	Remote controller
E03	—	—	97	¤	●	●		Communication error between indoor and remote controller (Detected at indoor side)	Indoor
E04	—	—	04	●	●	¤		Communication circuit error between indoor/ outdoor (Detected at indoor side)	Indoor
E06	E06	No. of indoor units in which sensor has been normally received	04	●	●	¤		Decrease of No. of indoor units	I/F
—	E07	—	—	●	●	¤		Communication circuit error between indoor/ outdoor (Detected at outdoor side)	I/F
E08	E08	Duplicated indoor addresses	96	¤	●	●		Duplicated indoor addresses	Indoor / I/F
E09	—	—	99	¤	●	●		Duplicated main remote controllers	Remote controller
E10	—	—	CF	¤	●	●		Communication error between indoor MCU	Indoor
E12	E12	01: Indoor/Outdoor communication 02: Communication between outdoor units	42	¤	●	●		Automatic address start error	I/F
E15	E15	—	42	●	●	¤		Indoor is nothing during automatic addressing	I/F
E16	E16	00: Capacity over 01 ~:No. of connected units	89	●	●	¤		Capacity over / No. of connected indoor units	I/F
E18	—	—	97, 99	¤	●	●		Communication error between indoor units	Indoor
E19	E19	00: Header is nothing 02: Two or more header units	96	●	●	¤		Outdoor header units quantity error	I/F
E20	E20	01: Outdoor of other line connected 02: Indoor of other line connected	42	●	●	¤		Other line connected during automatic address	I/F
E23	E23	—	15	●	●	¤		Sending error in communication between outdoor units	I/F
E25	E25	—	15	●	●	¤		Duplicated follower outdoor addresses	I/F
E26	E26	No. of outdoor units which received signal normally	15	●	●	¤		Decrease of No. of connected outdoor units	I/F
E28	E28	Detected outdoor unit number	d2	●	●	¤		Follower outdoor unit error	I/F
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 error 04: Fan IPDU error 05: IPDU + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	●	●	¤		IPDU communication error	I/F

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Sub-code		Operation	Timer	Ready	Flash		
F01	—	—	0F	¤	¤	●	ALT	Indoor TCJ sensor error	Indoor
F02	—	—	0d	¤	¤	●	ALT	Indoor TC2 sensor error	Indoor
F03	—	—	93	¤	¤	●	ALT	Indoor TC1 sensor error	Indoor
F04	F04	—	19	¤	¤	○	ALT	TD1 sensor error	I/F
F05	F05	—	A1	¤	¤	○	ALT	TD2 sensor error	I/F
F06	F06	—	18	¤	¤	○	ALT	TE1 sensor error	I/F
F07	F07	—	18	¤	¤	○	ALT	TL sensor error	I/F
F08	F08	—	1b	¤	¤	○	ALT	TO sensor error	I/F
F10	—	—	OC	¤	¤	●	ALT	Indoor TA sensor error	Indoor
F12	F12	—	A2	¤	¤	○	ALT	TS1 sensor error	I/F
F13	F13	01: Comp. 1 side 02: Comp. 2 side	43	¤	¤	○	ALT	TH sensor error	IPDU
F15	F15	—	18	¤	¤	○	ALT	Outdoor temp. sensor miscabling (TE, TL)	I/F
F16	F16	—	43	¤	¤	○	ALT	Outdoor pressure sensor miscabling (Pd, Ps)	I/F
F23	F23	—	43	¤	¤	○	ALT	Ps sensor error	I/F
F24	F24	—	43	¤	¤	○	ALT	Pd sensor error	I/F
F29	—	—	12	¤	¤	●	SIM	Indoor other error	Indoor
F31	F31	—	1C	¤	¤	○	SIM	Indoor EEPROM error	I/F
H01	H01	01: Comp. 1 side 02: Comp. 2 side	IF	●	¤	●		Compressor break down	IPDU
H02	H02	01: Comp. 1 side 02: Comp. 2 side	1d	●	¤	●		Magnet switch error Overcurrent relay operation Compressor trouble (lock)	MG-SW Overcurrent relay IPDU
H03	H03	01: Comp. 1 side 02: Comp. 2 side	17	●	¤	●		Current detect circuit system error	IPDU
H04	H04	—	44	●	¤	●		Comp 1 case thermo operation	I/F
H06	H06	—	20	●	¤	●		Low pressure protective operation	I/F
H07	H07	—	d7	●	¤	●		Oil level down detective protection	I/F
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	●	¤	●		Oil level detective temp sensor error	I/F
H14	H14	—	44	●	¤	●		Comp 2 case thermo operation	I/F
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	●	¤	●		Oil level detective circuit error Magnet switch error Overcurrent relay operation	I/F MG-SW Overcurrent relay
L03	—	—	96	¤	●	¤	SIM	Indoor center unit duplicated	Indoor
L04	L04	—	96	¤	○	¤	SIM	Outdoor line address duplicated	I/F
L05	—	—	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in indoor unit with priority)	I/F
L06	L06	No. of indoor units with priority	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in unit other than indoor unit with priority)	I/F
L07	—	—	99	¤	●	¤	SIM	Group line in individual indoor unit	Indoor
L08	L08	—	99	¤	●	¤	SIM	Indoor group/Address unset	Indoor, I/F
L09	—	—	46	¤	●	¤	SIM	Indoor capacity unset	Indoor
L10	L10	—	88	¤	○	¤	SIM	Outdoor capacity unset	I/F
L20	L20	—	98	¤	○	¤	SIM	Duplicated central control addresses	AI-NET, Indoor
L28	L28	—	46	¤	○	¤	SIM	Over No. of connected outdoor units	I/F
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU3 error 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	¤	○	¤	SIM	No. of IPDU error	I/F
L30	L30	Detected indoor address	b6	¤	○	¤	SIM	Indoor outside interlock	Indoor
—	L31	—	—		—			Extended I/C error	I/F

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Sub-code		Operation	Timer	Ready	Flash		
P01	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P03	P03	—	1E	¤	●	¤	ALT	Discharge temp. TD1 error	I/F
P04	P04	01: Comp. 1 side 02: Comp. 2 side	21	¤	●	¤	ALT	High-pressure SW system operation	IPDU
P05	P05	01: Phase-missing detection 02: Phase error	AF	¤	●	¤	ALT	Phase-missing detection /Phase error	I/F
P07	P07	01: Comp. 1 side 02: Comp. 2 side	IC	¤	●	¤	ALT	Heat sink overheat error	IPDU, I/F
P10	P10	Detected indoor address	Ob	●	¤	¤	ALT	Indoor overflow error	Indoor
P12	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P13	P13	—	47	●	¤	¤	ALT	Outdoor liquid back detection error	I/F
P15	P15	01: TS condition 02: TD condition	AE	¤	●	¤	ALT	Gas leak detection	I/F
P17	P17	—	bb	¤	●	¤	ALT	Discharge temp. TD2 error	I/F
P19	P19	Detected outdoor unit number	O8	¤	●	¤	ALT	4-way valve inverse error	I/F
P20	P20	—	22	¤	●	¤	ALT	High-pressure protective operation	I/F
P22	P22	0 ⎵ : IGBT short 1 ⎵ : Fan motor position detective circuit error 3 ⎵ : Fan motor trouble C ⎵ : TH sensor temp. error (Heat sink overheat) D ⎵ : TH sensor error E ⎵ : Vdc output error	1A	¤	●	¤	ALT	Outdoor fan IPDU error	IPDU
P26	P26	01: Comp. 1 side 02: Comp. 2 side	14	¤	●	¤	ALT	G-TR short protection error	IPDU
P29	P29	01: Comp. 1 side 02: Comp. 2 side	16	¤	●	¤	ALT	Comp position detective circuit system error	IPDU
P31	P31	—	47	¤	●	¤	ALT	Other indoor unit error (Group terminal unit error)	Indoor
—	—	—	b7	By alarm device			ALT	Error in indoor group	AI-NET
—	—	—	97	—				AI-NET communication system error	AI-NET
—	—	—	99	—				Duplicated network adaptors	AI-NET

Error detected by TCC-LINK central control device

Check code				Wireless remote controller				Check code name	Judging device
Central control device indication	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Sub-code		Operation	Timer	Ready	Flash		
C05	—	—	—	—				Sending error in TCC-LINK central control device	TCC-LINK
C06	—	—	—	—				Receiving error in TCC-LINK central control device	TCC-LINK
C12	—	—	—	—				Batch alarm of general-purpose equipment control interface	General-purpose equipment I/F
P30	Differs according to error contents of unit with occurrence of alarm							Group control branching unit error	TCC-LINK
	—	—	(L20 is displayed.)					Duplicated central control addresses	

Terminology

TCC-LINK : TOSHIBA Carrier Communication Link.

New check code

1. Difference between the new check code and the current system

The display method for the check code has been changed from this model onwards.

	Check code in current system	New check code
Used characters	Hexadecimal notation, 2 digits	Alphabet + Decimal notation, 2 digits
Characteristics of code classification	limited classification of communication/incorrect setup system	Increased classification of communication/incorrect setup system
Block display	Indoor P.C. board, Outdoor P.C. board, Cycle, Communication	Communication/Incorrect setup (4 ways), Indoor protection, Outdoor protection, Sensor, Compressor protection, etc.

Display on wired remote controller

- [⚠] goes on.
- [UNIT No.] + Check code + Operation lamp (Green) flash

Display on sensor part of wireless

- Block display can show a combination of [⏻] [🕘] [⚙]

Display indicater on wireless remote controller receiver part

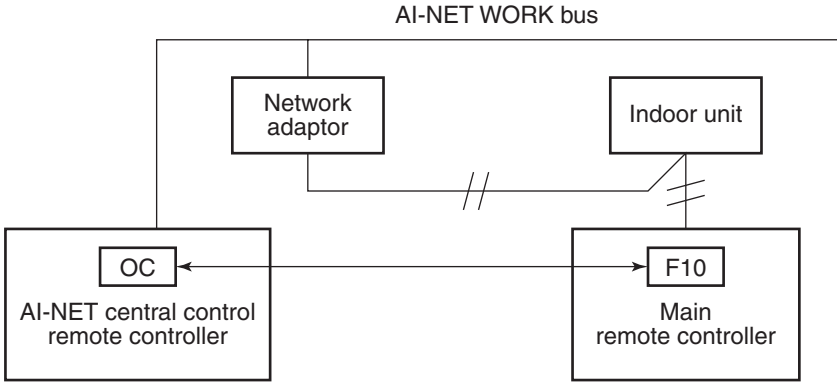
- The Unit No. and check code are displayed.
- In a case of error with auxiliary code, the check code and sub-code are displayed alternately.

Display	Classification
A	Unused
C	Central control system error
E	Communication system error
F	Each sensor error (Failure)
H	Compressor protective system error
J	Unused
L	Setup error, Other errors
P	Protective device operation

2. Special mention

1) If this model is connected to an AI-NET by network adaptor, different check codes will be displayed on the main remote controller (the new check code will be display on the new remote controller) and AI-NET central control remote controller (Current system check code display on the current system central control remote controller).
2) The check code is displayed only while the air conditioner is operating (Remote controller start button is ON).

   When the air conditioner stops and the error has been cleared, the check code display on the remote controller will also disappear. However, if the error continues after the unit has been stopped, the check code is immediately displayed after restarting.

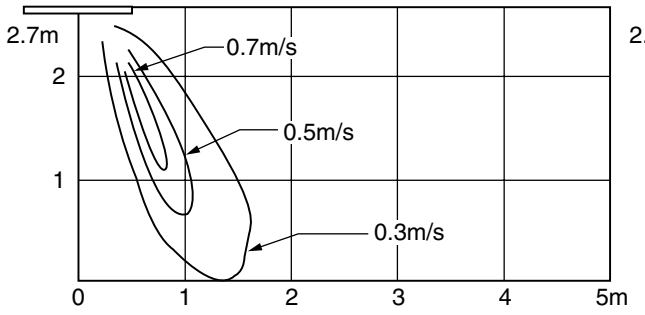


16. AIR SPEED CHARACTERISTICS

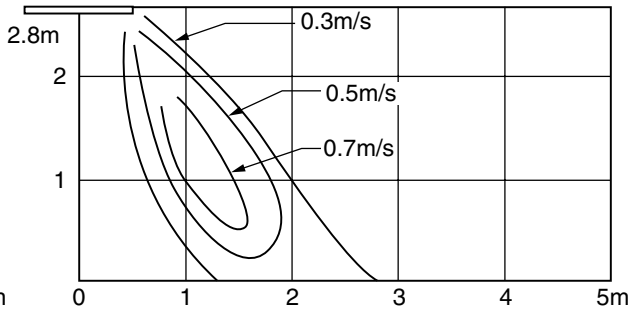
■ Air Speed Distribution

4-way air discharge cassette type

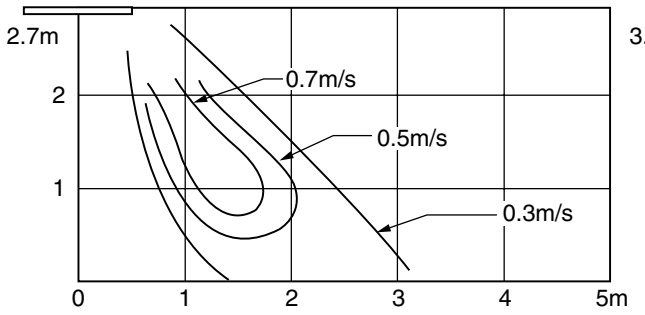
MMU-AP0091H, AP0121H



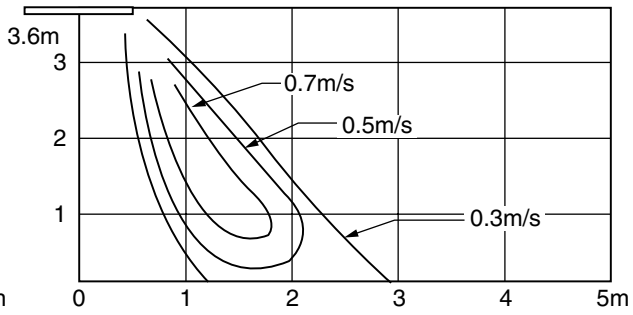
MMU-AP0151H



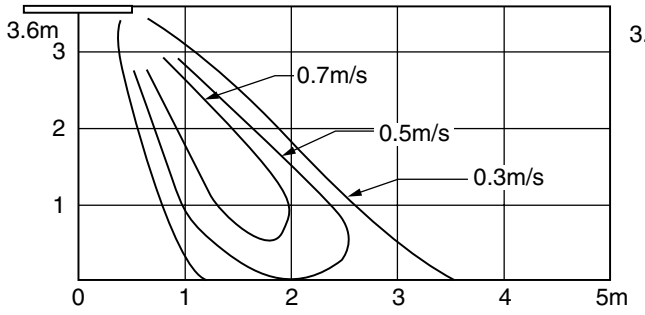
MMU-AP0181H



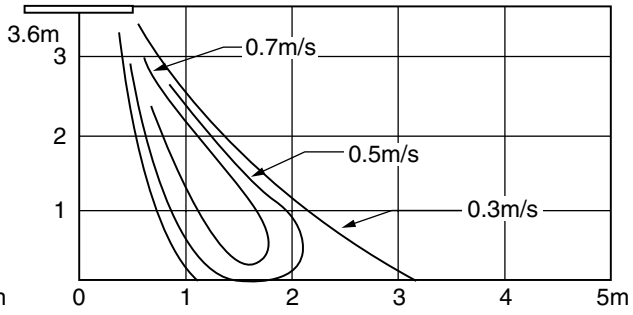
MMU-AP0241H, AP0271H



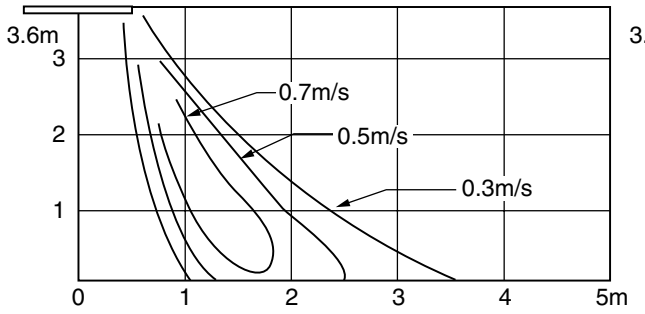
MMU-AP0301H



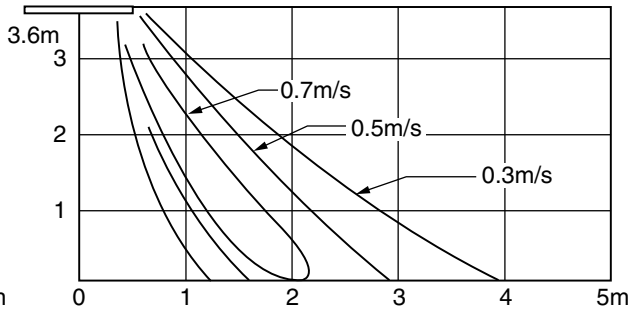
MMU-A0361H



MMU-A0481H



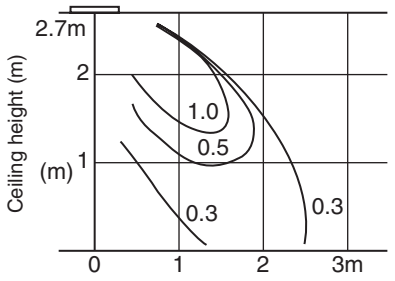
MMU-AP0561H



■ Air Speed Distribution

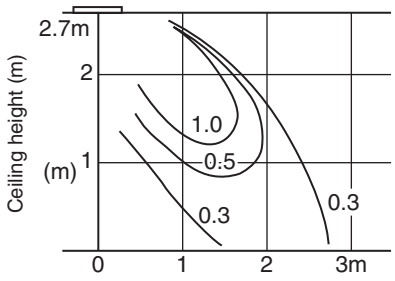
2-way air discharge cassette type

MMU-
AP0071WH, AP0091WH, AP0121WH



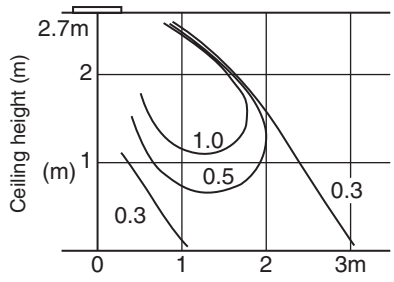
Horizontal distance (m)

MMU-
AP0151WH, AP0181WH



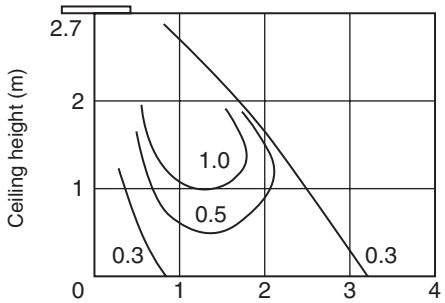
Horizontal distance (m)

MMU-AP0241WH, AP0271WH



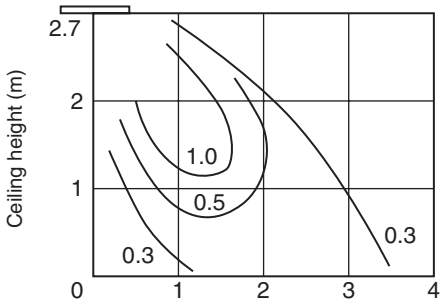
Horizontal distance (m)

MMU-AP0301WH



Horizontal distance (m)

MMU-AP0481WH

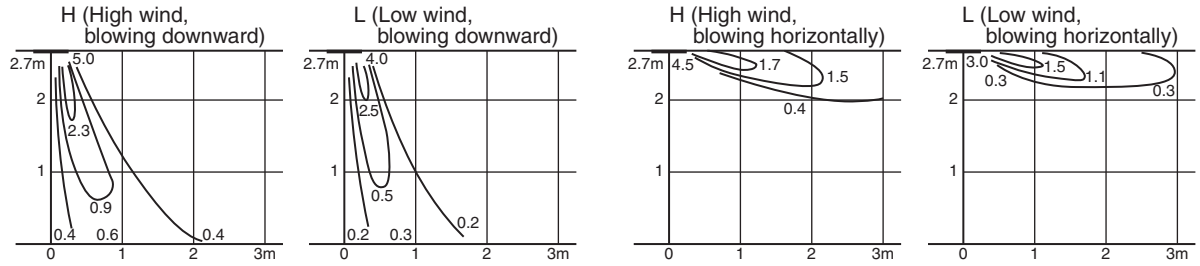


Horizontal distance (m)

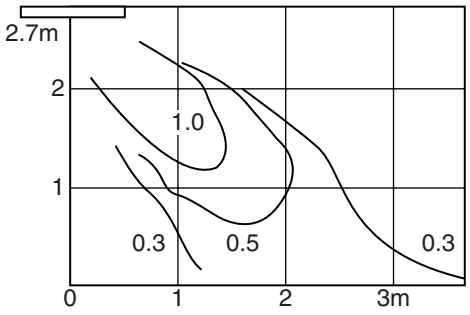
■ Air Speed Distribution

1-way air discharge cassette type

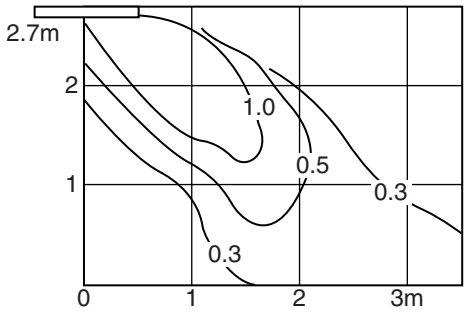
MMU-AP0071YH, AP0091YH, AP0121YH



MMU-AP0151SH,AP0181SH

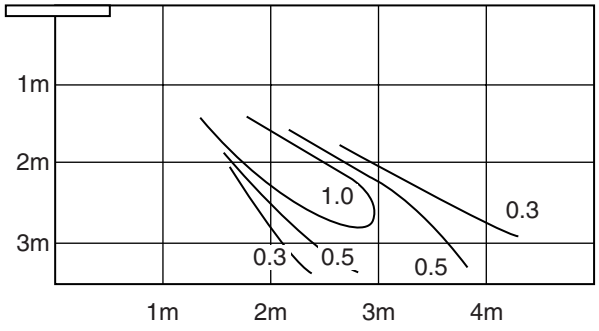


MMU-AP0241SH

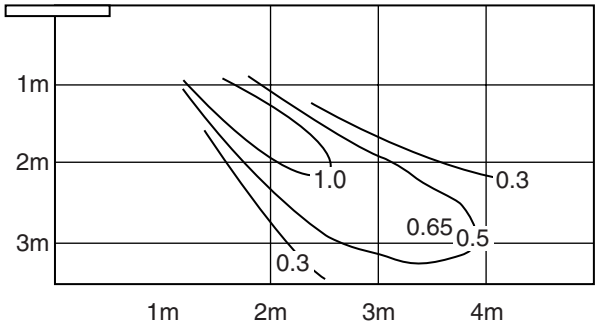


Under ceiling type

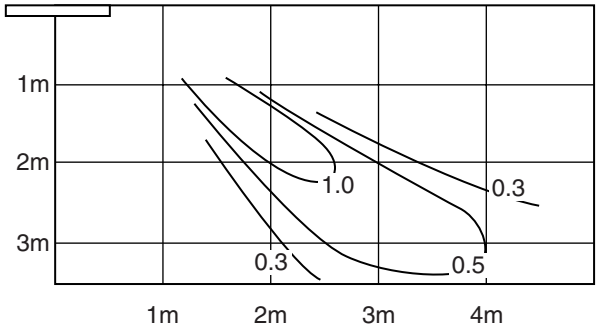
MMC-AP0181H,AP0481H



MMC-AP0361H



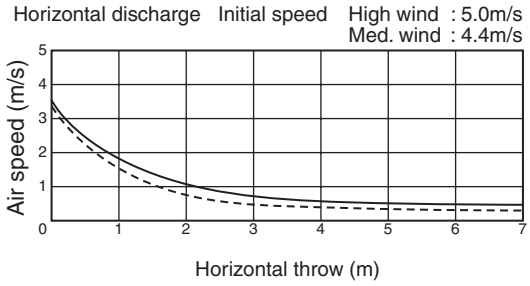
MMC-AP015H,AP0241H,AP0271H



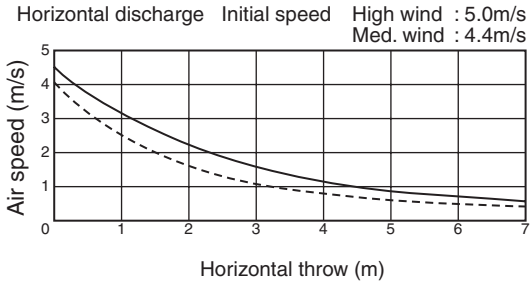
■ Discharge Air Speed and Air Throw

High wall type

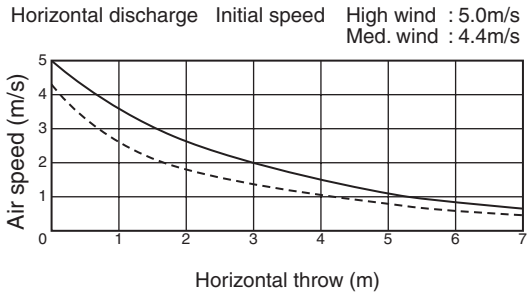
MMK-AP0071H, AP0091H, AP0121H



MMK-AP0151H, AP0181H

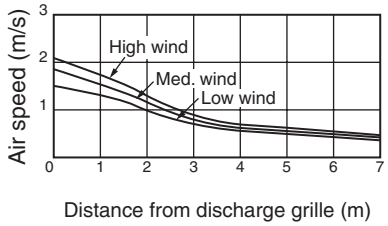


MMK-AP0241H

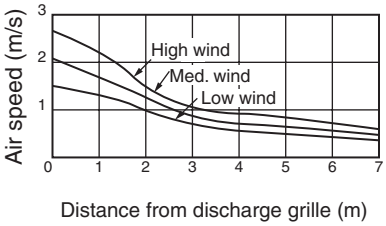


Floor standing cabinet type

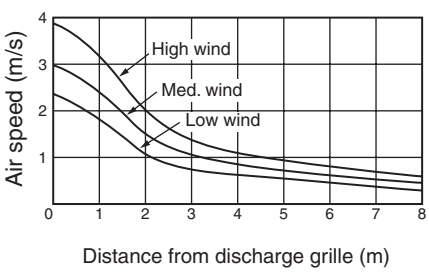
MML-AP0071H, AP0091H



MML-AP0121H, AP0151H



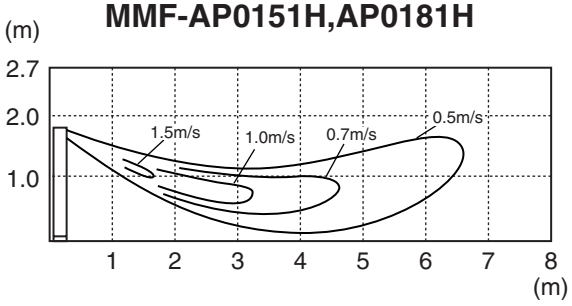
MML-AP0181H, AP0241H



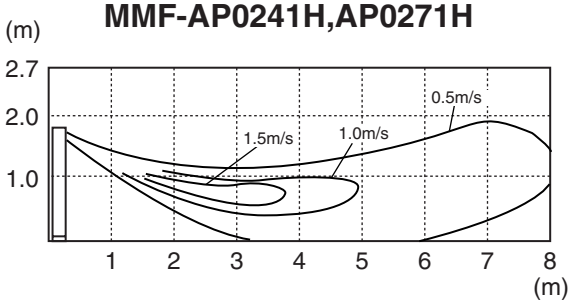
■ Air Speed Distribution

Floor standing type

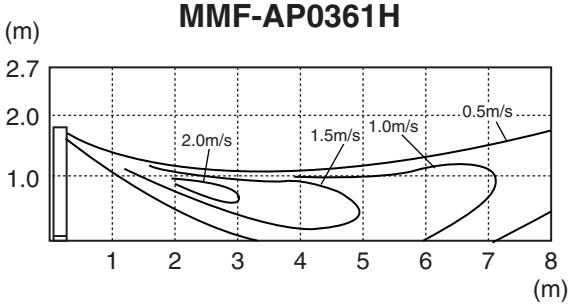
MMF-AP0151H,AP0181H



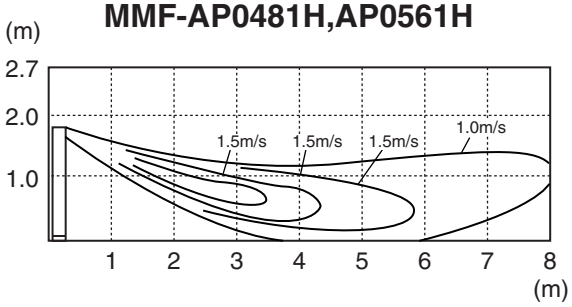
MMF-AP0241H,AP0271H



MMF-AP0361H



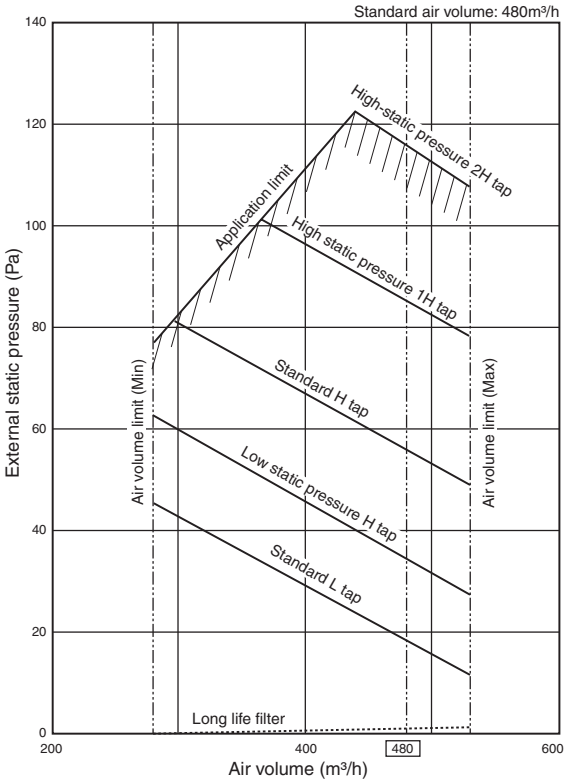
MMF-AP0481H,AP0561H



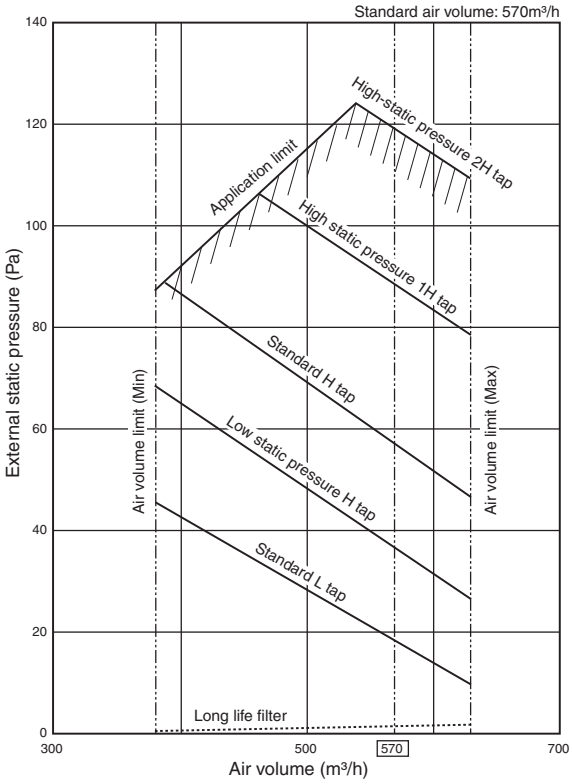
17. FAN CHARACTERISTICS

• Concealed Duct Standard type
In case of square duct flange of discharge section

MMD-AP0071BH, AP0091BH



MMD-AP0121BH



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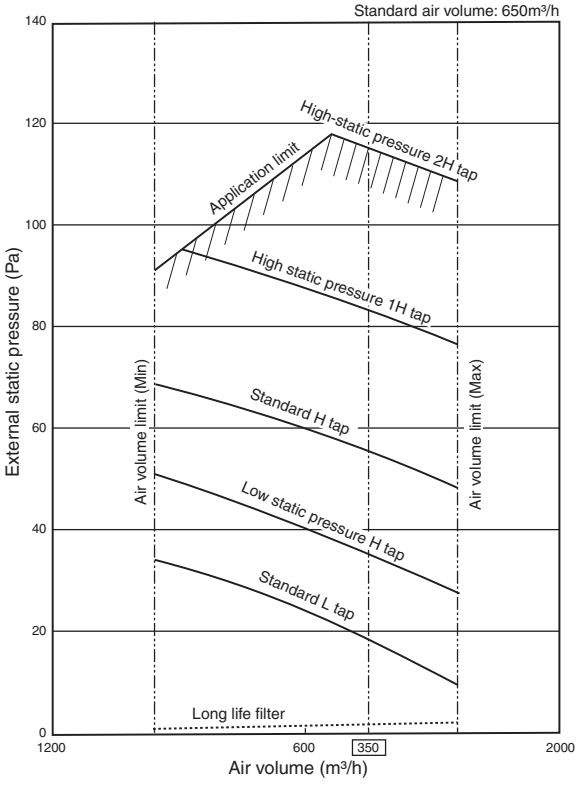
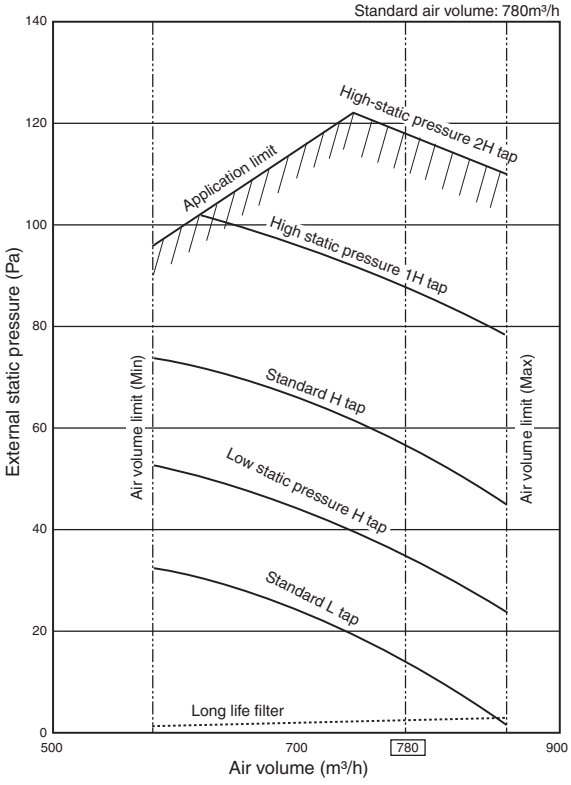
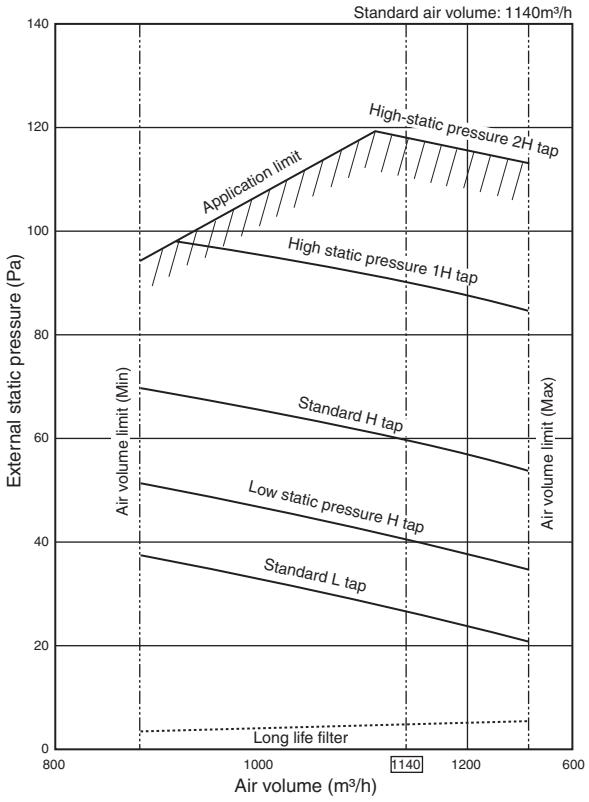


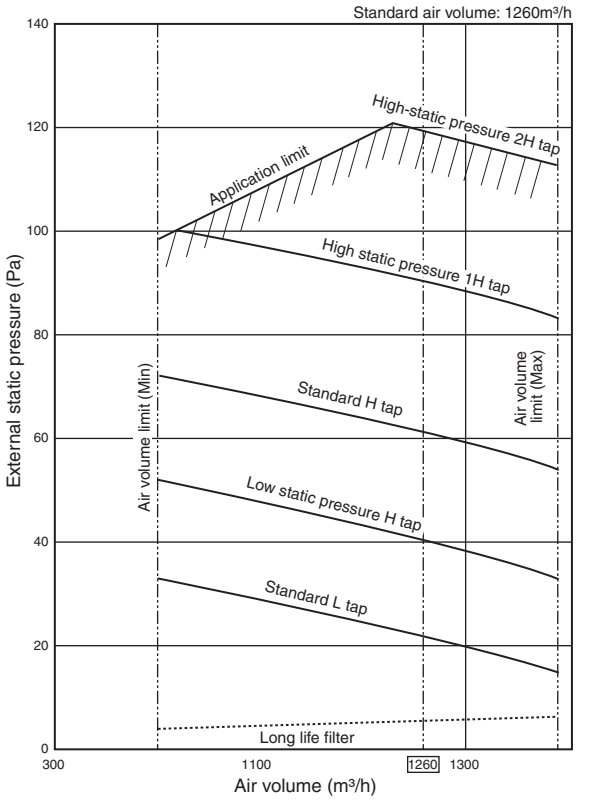
MMD-AP0181BH



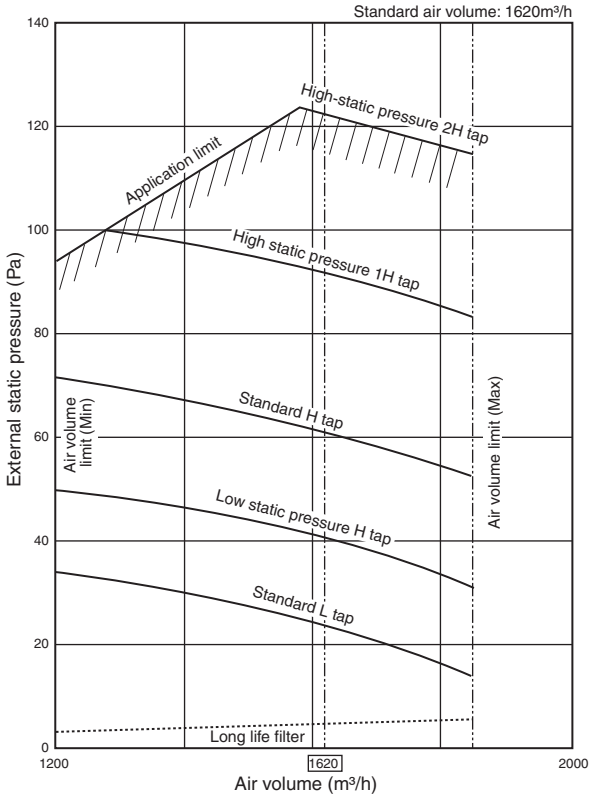
MMD-AP0241BH, AP0271BH



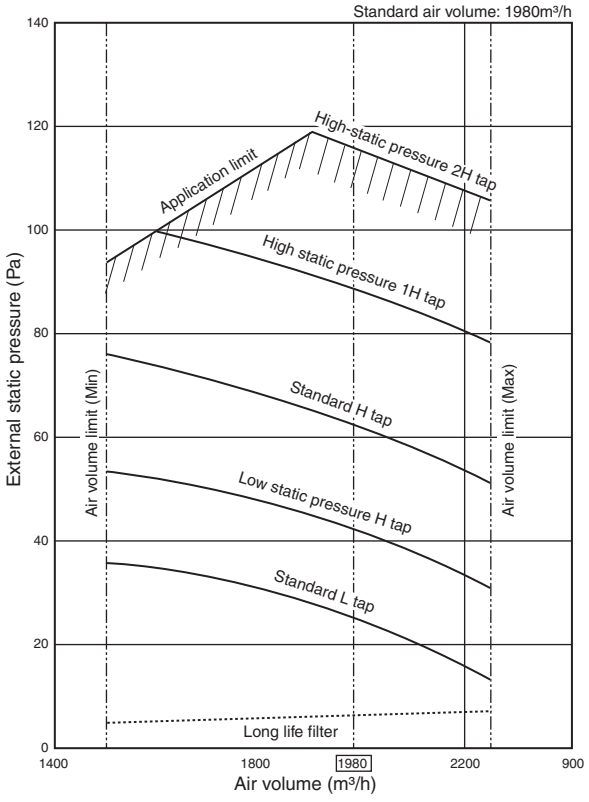
MMD-AP0301BH



MMD-AP0361BH

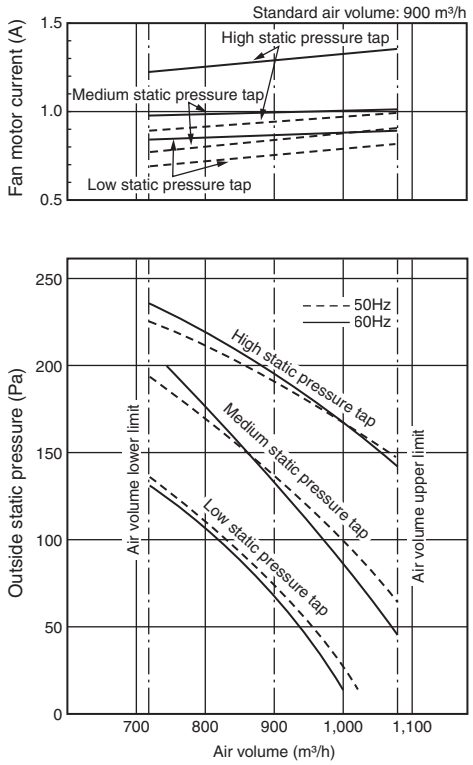


MMD-AP0481BH, AP0561BH

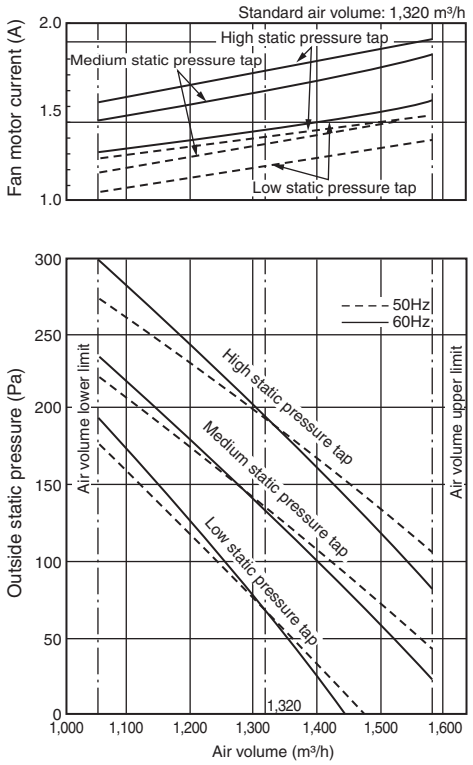


• Concealed Duct High Static Pressure type

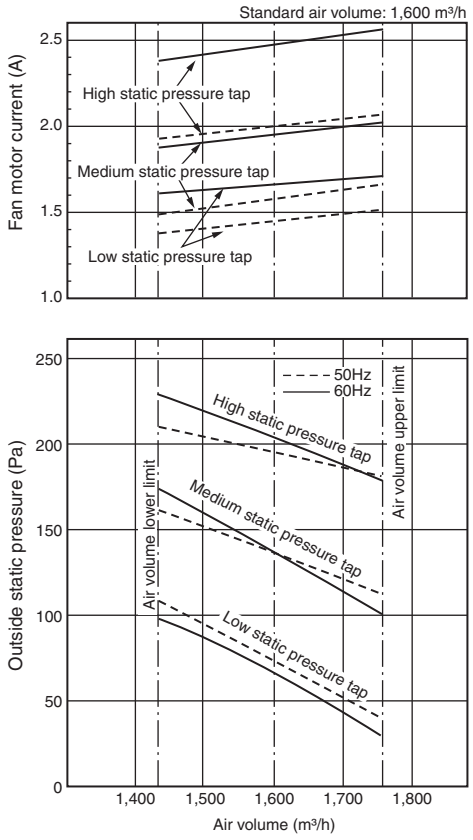
MMD-AP0181H



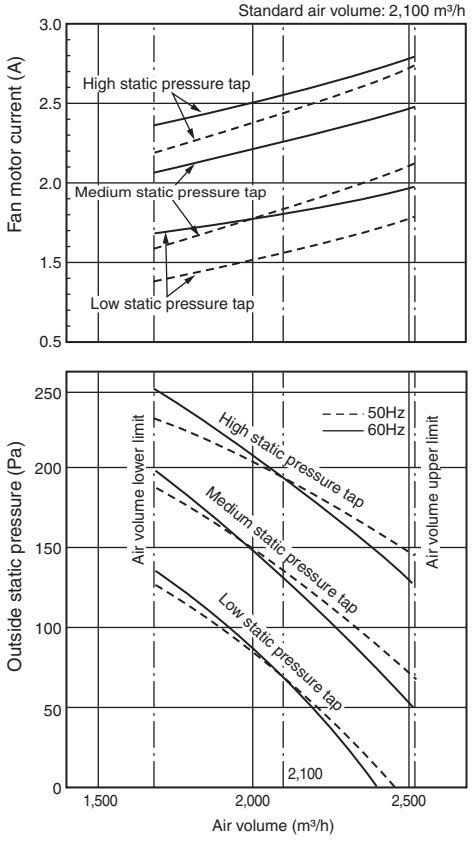
MMD-AP0241H, AP0271H



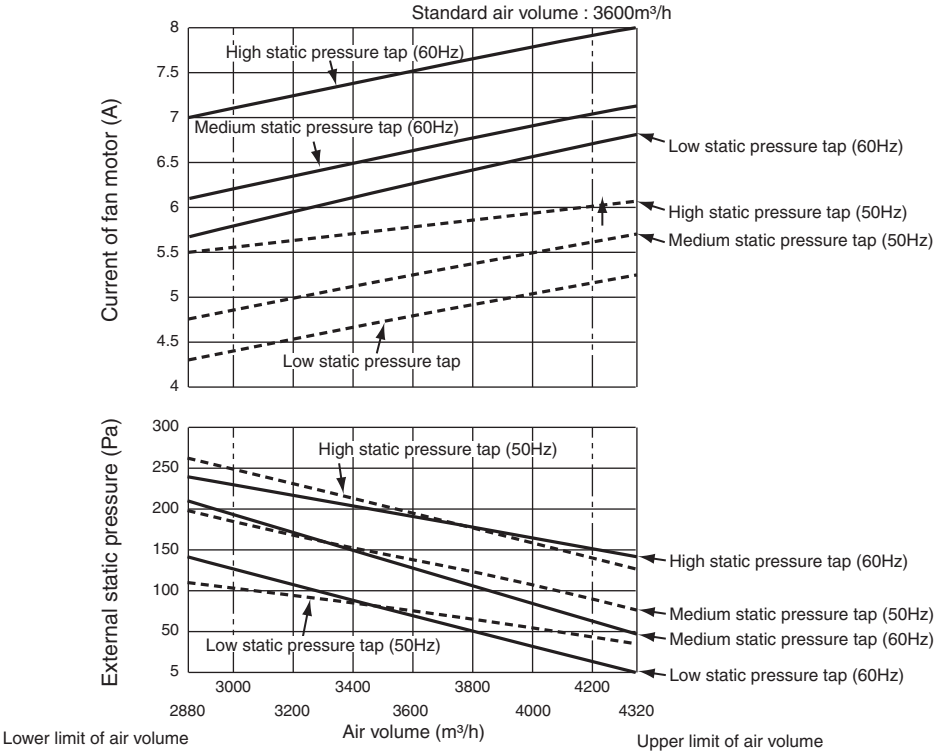
MMD-AP0361H



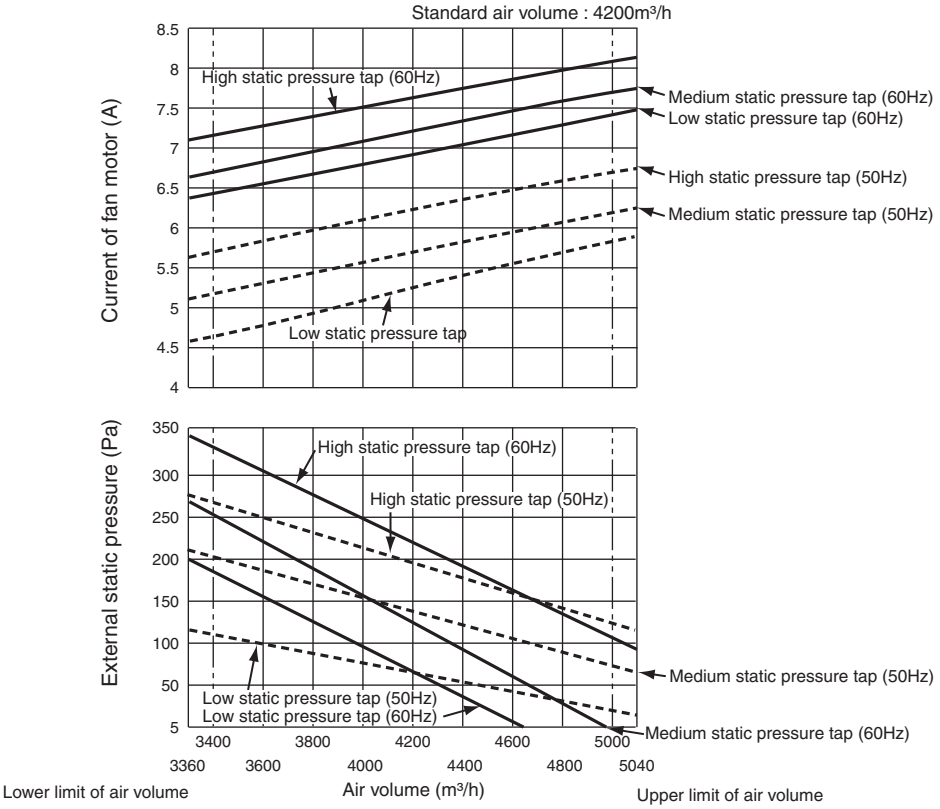
MMD-AP0481H



MMD-AP0721H



MMD-AP0961H



REQUIREMENT

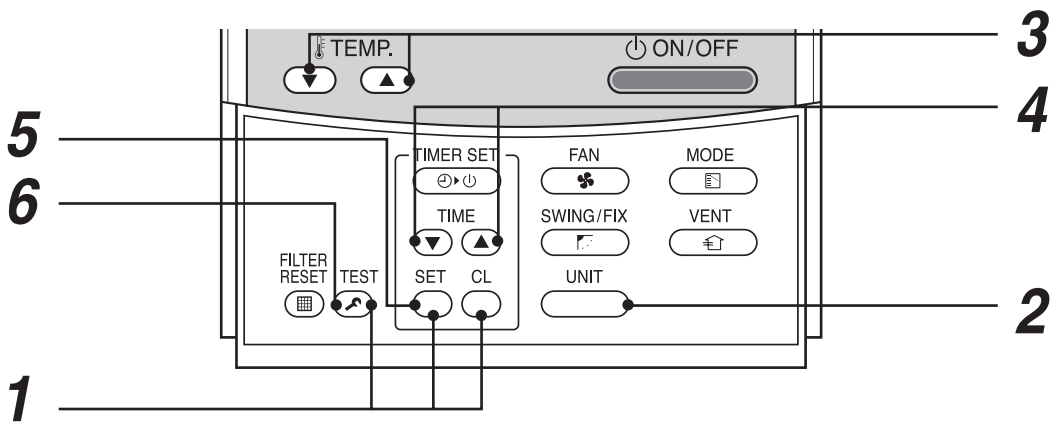
Add a air volume damper to the air supply duct and adjust the air volume in the range from 80% to 120% of the standard air volume.

18. APPLIED CONTROL

18-1. Indoor Unit

18-1-1. How to Set-up the Selection Function for the Indoor Unit, using a Wired Remote Control.

Procedure Execute the setup operation while the unit is not in operation.



1 **Push the SET, CL, and TEST buttons simultaneously for 4 seconds or more.**
The unit number displayed first indicates the header indoor unit address in the group control.
In this time, the fan of the selected indoor unit is turned on.

2 **For every push of the UNIT button, the indoor unit numbers in the group control are successively displayed. In this time, the fan of the selected indoor unit only will be turned on.**

3 **Specify the item code (DN) using the TEMP. buttons.**

4 **Select the setup data using the TIME buttons.**

(When selecting the DN code "33", change the temperature indication of the unit from "°C" to "°F" on the remote controller.)

5 **Push the SET button. (OK if display goes on.)**
- To change the selected indoor unit, return to procedure ***2***.
- To change the item to be set up, return to procedure ***3***.

6 **Pushing the TEST button returns the status to normal stop status.**

Table: Function selecting item numbers (DN)
(Items necessary to perform the applied control at the local site are described below.)

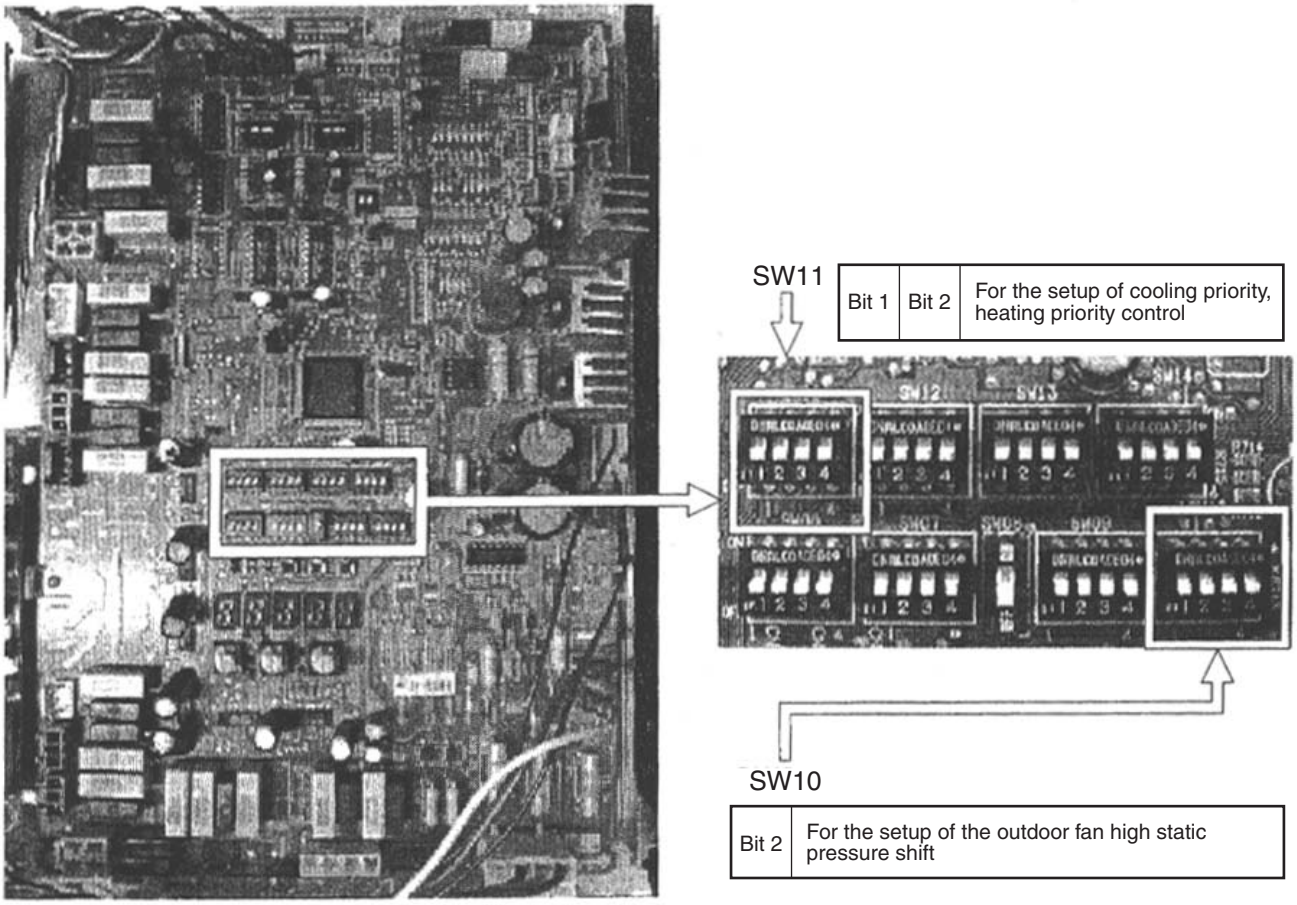
DN	Item	Description	At shipment
01	Filter sign lighting time	0000 : None 0001 : 150H 0002 : 2500H 0003 : 5000H 0004 : 10000H	According to type
02	Dirty state of filter	0000 : Standard 0001 : High degree of dirt (Half of standard time)	0000 : Standard
03	Central control address	0001 : No.1 unit to 0064 : No.64 unit 0099 : Unfixed	0099 : Unfixed
04	Specific indoor unit priority	0000 : No priority 0001 : Priority	0000 : No priority
06	Heating temp shift	0000 : No shift 0001 : +1°C 0002 : +2°C to 0010 : +10°C (Up to +6 recommended)	0002 : +2°C (Floor type 0000: 0°C)
0d	Existence of automatic cool/heat mode	0000 : Provided 0001 : Not provided (Automatic selection from connected outdoor unit)	0001 : Not provided
0F	Cooling only	0000 : Heat pump 0001 : Cooling only (No display of [AUTO] [HEAT])	0000 : Heat pump
10	Type	0000 : (1-way air discharge cassette) 0001 : (4-way air discharge cassette) to 0037	According to model type
11	Indoor unit capacity	0000 : Unfixed 0001 to 0034	According to capacity type
12	Line address	0001 : No.1 unit to 0030 : No.30 unit	0099 : Unfixed
13	Indoor unit address	0001 : No.1 unit to 0064 : No.64 unit	0099 : Unfixed
14	Group address	0000 : Individual 0001 : Header unit of group 0002 : Follower unit of group	0099 : Unfixed
19	Flap type (Adjustment of air direction)	0000 : Not provided 0001 : Swing only 0004 : [4-way Air Discharge Cassette type] and [Under Ceiling type]	According to type
1E	Temp difference of automatic cooling/ heating mode selection COOL → HEAT, HEA →COOL	0000 : 0 deg to 0010 : 10 deg (For setup temperature, reversal of COOL/HEAT by ± (Data value)/2)	0003 : 3 deg (Ts±1.5)
28	Automatic restart of power failure	0000 : None 0001 : Restart	0000 : None
29	Operation condition of humidifier	0000 : Usual 0001 : Condition ignored (Detection control for heat exchanger temperature)	0000 : Usual
2A	Selection of option/ error input (CN70)	0000 : Filter input 0001 : Alarm input (Air washer, etc.) 0002 : Humidifier input	0002 : Humidifier
2E	HA terminal (CN61) select	0000 : Usual 0001 : Leaving-ON prevention control	0000 : Usual (HA terminal)
30	Automatic elevating grille	0000 : Unavailable (Standard, Oil guard panel) 0001 : Available (Auto grille, Oil guard, Auto grille panel)	0000 : Unavailable
31	Ventilating fan control	0000 : Unavailable 0001 : Available	0000 : Unavailable
32	TA sensor selection	0000 : Body TA sensor 0001 : Remote controller sensor	0000 : Body TA sensor
33	Temperature unit select	0000 : °C (at factory shipment) 0001 : °F	0000 : °C
40	Control for humidifier (+ drain pump control)	0000 : None 0001 : Humidifier + Vaporizing system (Pump ON) 0002 : Humidifier + Ultrasonic system (Pump ON after specified time passed) (Unused) 0003 : Humidifier + Natural drain system (Pump OFF)	0003 : Humidifier ON, Pump OFF
5d	High ceiling selection (Air volume selection)	[4-way Air Discharge Cassette type] and [Under Ceiling type] 0000 : Standard filter 0001 : Super-long life [Concealed Duct Standard type] 0000 : Standard static pressure (40Pa) 0001 : High static pressure 1 (70Pa) 0003 : High static pressure 2 (100Pa) 0005 : Correspond to quiet sound 0006 : Low static pressure (20Pa)	0000 : Standard
60	Timer set (Wired remote controller)	0000 : Available (Operable) 0001 : Unavailable (Operation prohibited)	0000 : Available
62	Smudging-proof control clear	0000 : Clear	4- way Air Discharge Cassette type only
92	Outside interlock release condition	0000 : Operation stop 0001 : Release communication signal receive	0000 : Operation stop

18-2. Applied Control in Outdoor Unit

The following functions become available by setting the switches on the outdoor interface P.C. board.

No.	Function	Switch No.	Bit
1	Outdoor fan high static pressure shift	SW10	2
2	Cooling priority, Heating priority control	SW11	1, 2

Interface P.C. board from the outdoor unit



18-2-1. Outdoor Fan High Static Pressure Shift

■ Usage/Features

This function is set when connecting a duct to the discharge port of the outdoor unit.

■ Setup

Turn “Bit 2” on the Dip switch [SW10] on the interface P.C. board on the outdoor unit to the ON side. For outdoor units that are connected with ducts, set this function regardless of the header unit or follower unit.

■ Specifications

Increase the No. of rotations of the propeller fan of the outdoor unit so that a duct with the maximum external static pressure 35Pa (3.5mmAq) can be installed. If installing a discharge duct (Below 35Pa (3.5mmAq)) exceeding the duct resistance of 15Pa (1.5mmAq), execute this setup.

Discharge air volume in each outdoor unit is described in the following table.

Capacity rank (MMY-MAP)	0501, 0601 type	0801 type	1001, 1201 type
Standard air volume of outdoor unit (m^3/min.)	150	165	175

■ Options

35Pa or more as the external static pressure is also available. (ex. 45Pa) For details of adjustment, consult your sales subsidiary.

18-2-2. Cooling Priority, Heating Priority Control

■ Usage/Features

Cooling priority or heating priority can be selected.

There are four patterns in selecting the setup of the priority mode. You should select a priority mode based upon the most common demand of the destination to be installed.

■ Setup

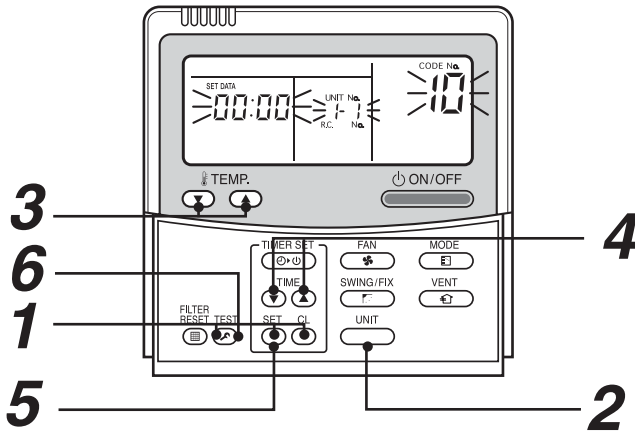
(Note) In “Specific indoor unit priority” mode only, it is necessary to identify and set-up the indoor unit you wish to give priority to.

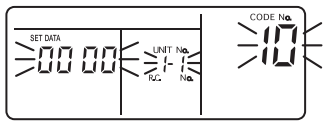
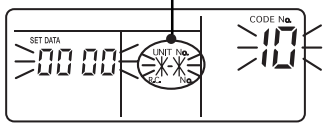
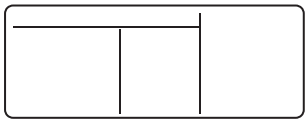
1. Outdoor unit (Header unit only) setup

SW11		**Operation**
Bit 1	**Bit 2**	
OFF	OFF	Heating priority (Setup at shipment)
ON	OFF	Cooling priority
OFF	ON	No. of operating units (Priority is given to the operational mode, which has the largest demand.)
ON	ON	Specific indoor unit priority (Priority is given to the operation mode of the indoor unit to which the operation mode priority has been given.)

2. Indoor unit setup in “Specific indoor unit priority” mode

The setup can only be changed whilst the unit is not operating. (Be sure to stop the system.)



Procedure	Operation contents
1	When pushing the SET + CL + TEST buttons at the same time for 4 seconds or more the display section will flash for a short period of time and will then confirm by displaying the item code [10]. • When the item code is one other than [10], push the TEST button to eliminate the display and then repeat the procedure from the first step. Note the remote controller operation is not accepted for approximately. 1 minute after pushing the TEST button. (In a group control, the indoor unit who's number is displayed first, will be set as the header unit.) 
2	For every push of the UNIT button, the indoor unit numbers in the group control are successively displayed. Select the indoor unit of which the setup is to be changed. At this time, the fan and louver of the selected indoor unit will begin operation. The status of the indoor unit of which the setup is to be changed can then be finalized.
3	Using the TEMP. buttons, specify the item code [04]. 
4	Using the TIME buttons, select the setup data [0001]. Priority: 0001, No priority: 0000
5	Push the SET button. In this time, the setup operation will be completed when the display changes from a flashing light to a fixed light.
6	After setup operation has finished, push the TEST button. (Setup is confirmed.) When pushing the TEST button, the display disappears and the status returns to the usual stop status. Note the remote controller operation is not accepted for approximately. 1 minute. 

(NOTE)

Only one indoor unit can be set to “Priority”. If multiple indoor units are accidentally set to “Priority”, an error code (L05 or L06: Duplicated indoor unit priority) will be displayed.

If "LO5" is displayed, chose and set-up the indoor unit you will give priority to (0001) and then set all other indoor units to (0000) - No priority.

Error code	Error contents
L05	Indoor unit priority duplication ([0001] is set up.)
L06	Indoor unit priority duplication ([0000] is set up.)

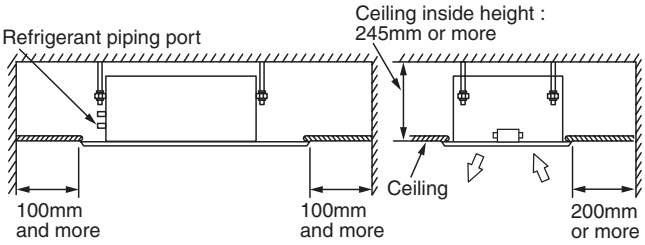
Appendix
1-Way Air Discharge Cassette Type (2 series)

Installation space

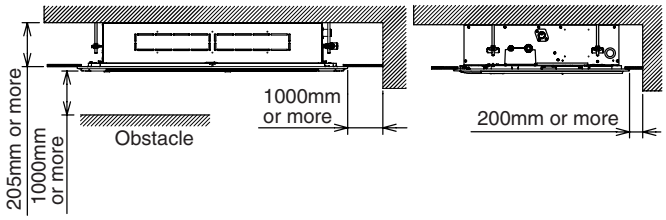
Ensure that you have sufficient space to install and service the indoor unit.

Leave a minimum of 5mm clearance between the top plate of the unit and the upper ceiling surface.

MMU-AP0071YH to AP0121YH



MMU-AP0152SH to AP0242SH



Height of ceiling

MMU-AP0071YH to AP0121YH

When the ceiling height is greater than 3.0m, the air-flow may not be sufficient to heat the room. It is therefore necessary to fit the fan motor lead supplied separately with the unit, which will increase the fan motor speed.

Ceiling height installation
Up to 3.0m

MMU-AP0152SH to AP0242SH

The maximum installation ceiling height of this air conditioner is 4.2m.

If installed at a greater height the air flow distribution becomes poor.

If the ceiling height is greater than the standard value (At shipment) as per the following table, it is necessary to set the unit to high ceiling mode.

To set the high ceiling height refer to the 'Applicable controls' within this manual.

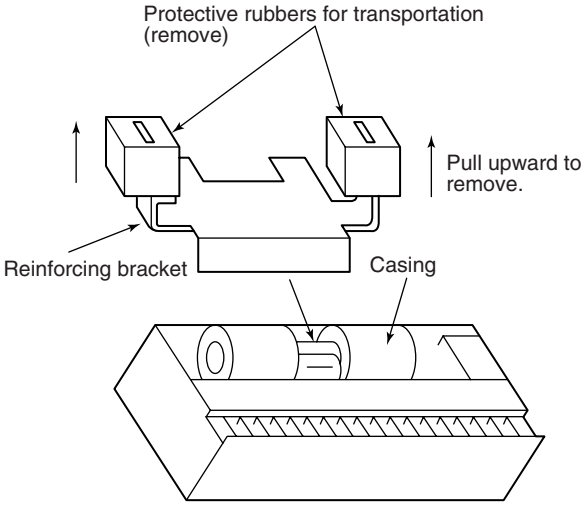
(Unit: m)

Model name MMU-	AP015, 018	AP024	Setup data
Standard (At shipment)	3.5	3.8	0000
High ceiling 1)	4.0	4.0	0001
High ceiling 3)	4.2	4.2	0003

Removal of transporting rubbers

MMU-AP0071YH to AP0121YH

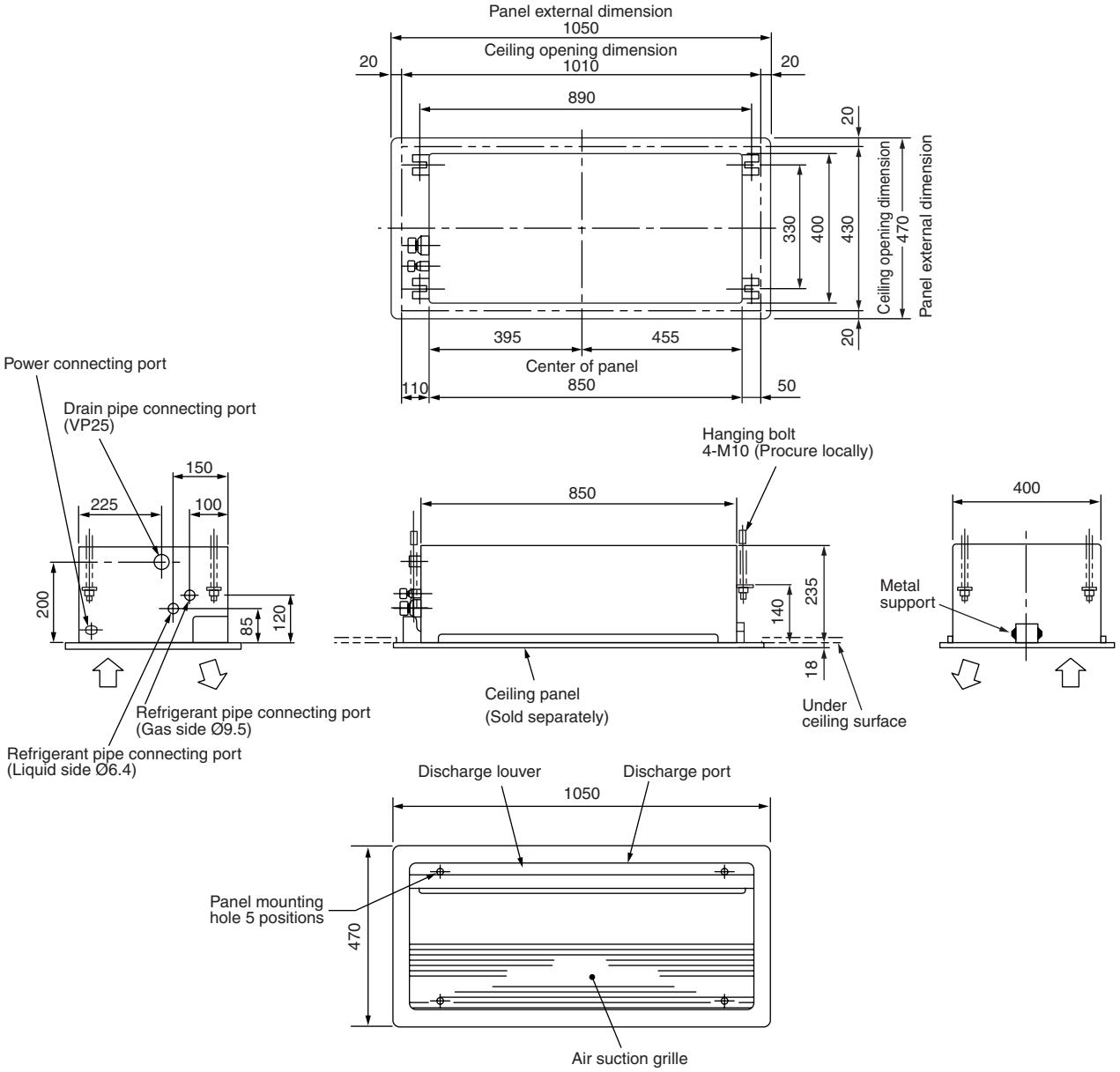
- Before installation of the indoor unit remove the two protective rubbers that are fitted for transportation. The rubbers are inserted between the fan motors reinforcing bracket and the casing.
  Ensure customer keeps transportation rubbers to re-use in case of a future re-installation.



Considering cabling and cable connecting works in the ceiling after hanging the indoor unit, select an installation place and determine drawing direction of the cables.

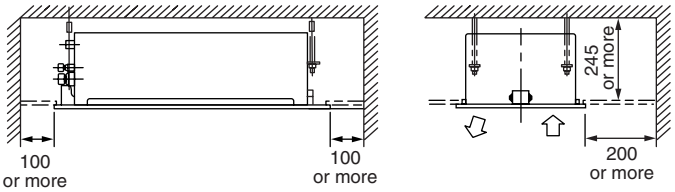
- When a ceiling void exists where the unit is to be installed. Position pipework, drain pipe and all of the electrical wiring where they can easily be connected at the time of hanging the unit.
- Using the supplied installation pattern check the ceiling opening and positioning of the indoor unit will be suitable.
  (The pattern is attached to the bottom surface with five M5 x 20 screws.)

External dimensions MMU-AP0071YH to AP0121YH

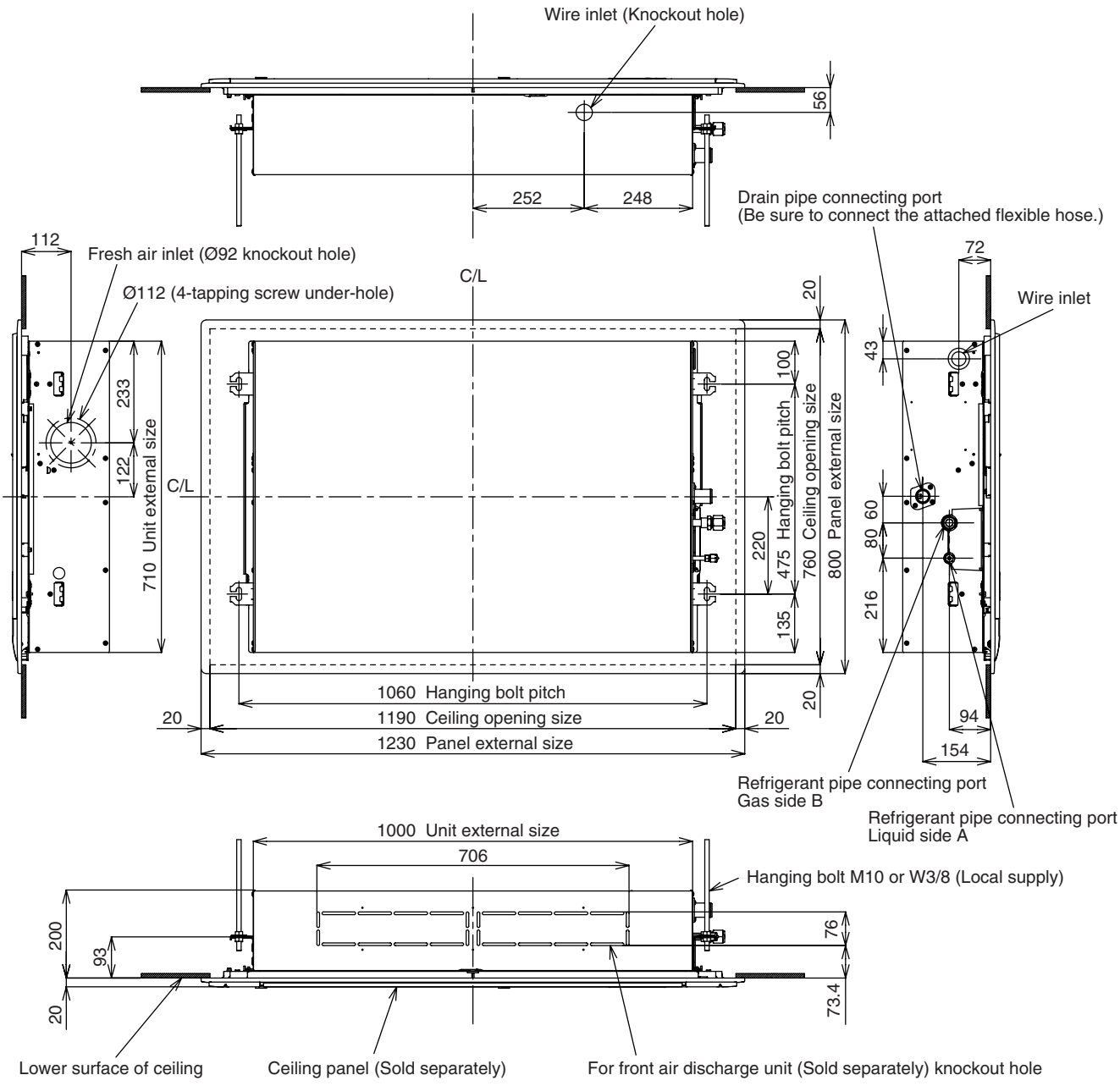


- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX21E
  TCB-AX21E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

Space necessary for installation and servicing



External dimensions MMU-AP0152SH to AP0242SH



- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX22CE
  TCB-AX22CE2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

Model name MMU-	A	B
AP015, AP018 type	Ø6.4	Ø12.7
AP024 type	Ø9.5	Ø15.9

Ceiling opening and installation of hanging bolts

- Evaluate and determine the piping and wiring requirements inside the ceiling prior to the hanging of the unit.
- After installation place of the indoor unit has been determined, create opening in ceiling and install the hanging bolts.
- For the ceiling opening size and the hanging bolt pitch, refer to the dimensional drawing and the enclosed installation pattern supplied with the unit.
- Once the ceiling void has been created, ensure that the drain pipe, refrigerant pipes, inter-connecting wires and all control wires are in place prior to installing the actual indoor unit.

Please procure the hanging bolts and nuts for installation of the indoor unit at local site.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces
Flat washer*1	M10	8 pieces

*1 Only MMY***YH

How to use the supplied installation pattern

The installation pattern is attached inside of the package cap.

Existing ceiling void

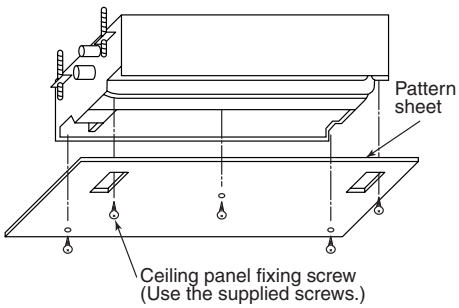
Use the pattern to determine the position and size of the opening and location of the hanging bolts.

New ceiling void

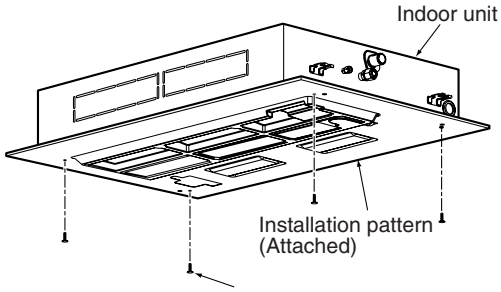
Use the pattern to determine the position of the new ceiling opening.

- Install the indoor unit after installation of the hanging bolts.
- Using the supplied installation pattern attach it to the indoor unit using the supplied fixing screws (M5 x 16L 6off). (Screw pattern to the ceiling panel hanging brackets of the indoor unit)
- When creating the opening ensure it is as per the outer dimensions of the supplied pattern.

MMU-AP0701H to AP0121SH



MMU-AP0152SH to AP0242SH



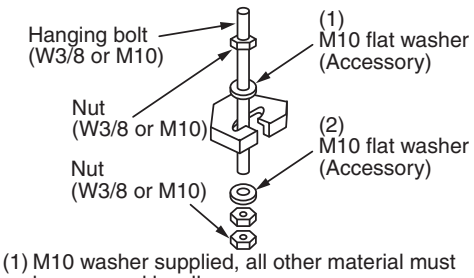
This screw is exclusive to fix the installation pattern.
When installing the ceiling panel, use the exclusive mounting screw attached to the ceiling panel (sold separately).

Installation of indoor unit

⚠ CAUTION

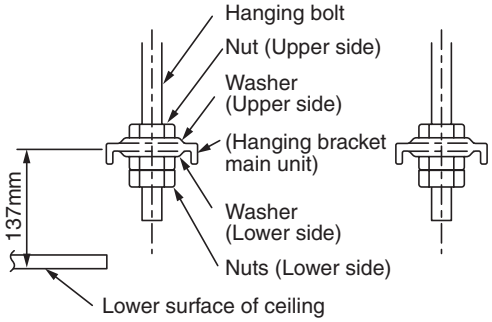
This unit is supplied and fitted with a drain pump and float switch. Ensure that the unit is always mounted in a horizontal position. Otherwise malfunction of the float switch may be caused resulting in water leakage.

- Fit the nut (M10 or W3/8: Procured locally) and washer (Ø34mm) to the hanging bolt.
- Adjust the nut position on the lower side of the hanging bracket until spaced at 137mm between the underside of ceiling panel and the hanging bracket.
- Hang up the unit, locate the T groove of the hanging brackets on to the nut that is fitted to the hanging bolt.
- Using a spirit level check the horizontal position of the unit.
- Use the installation pattern to adjust and position the height of the indoor unit within the ceiling opening.



(1) M10 washer supplied, all other material must be procured locally.

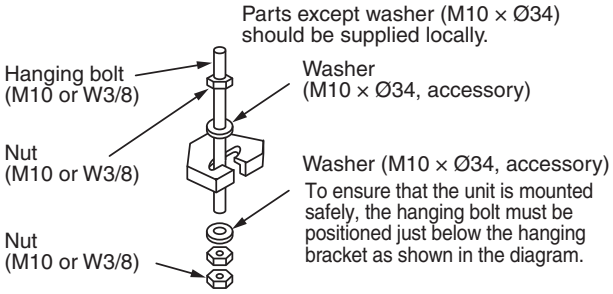
(2) To ensure that the unit is mounted safely, the hanging bolt must be positioned just below the hanging bracket as shown in the diagram.



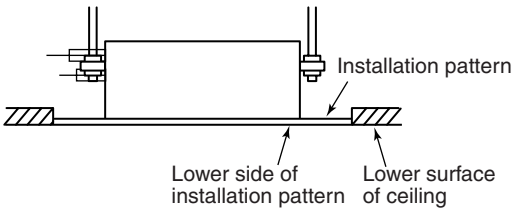
MMU-AP0152SH to AP0242SH

Fix the nut (M10 or W3/8: Supplied locally) and washer (M10 × Ø34) to the hanging bolt.

- Put the washers at either side of the T-groove on the hanging bracket of the indoor unit in order to hang the unit.
- Using a spirit level etc., check that four sides are horizontal. (Horizontal positioned within 5mm)
- Using the installation gauge, check and adjust the clearance between the indoor unit and ceiling opening.



- The screws used for the installation pattern must be re-used when installing the panel.
- Using the ceiling panel fixing screws, fix the installation pattern to the under surface of the indoor unit.
- Ceiling opening size must be the same as the installation pattern.

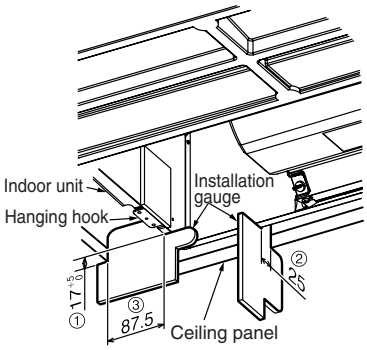


MMU-AP0152SH to AP0242SH

① Check lower side of the indoor unit locates at a position of 17 to 22mm higher than the bottom surface of the ceiling board. (4 corners)

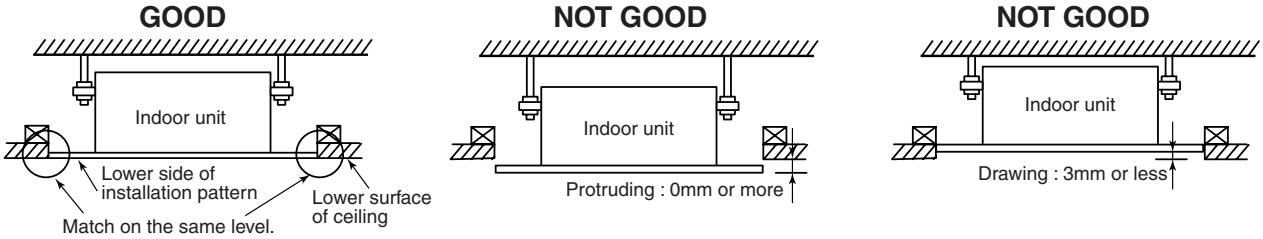
② Check clearance between the side of the indoor unit and the ceiling board is 25mm. (Both left/right)

③ Check clearance between the front side (piping side) of the indoor unit and the ceiling board is 87.5mm.

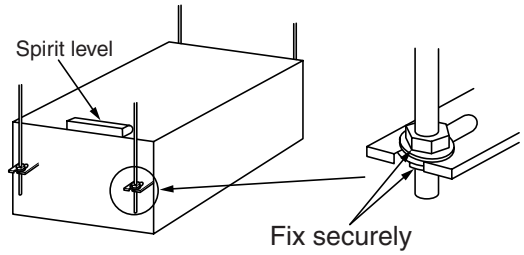


- Size of the side face (longitudinal) of the indoor unit differs according to the position. Therefore be sure to perform a check using an installation gauge on the outside of the hanging hooks to the same level as shown below.

- Match the lower surface of ceiling and the lower side of the installation pattern to the same level as shown below.



- Fix the indoor unit securely by tightening the upper nut on the hanging bolt.



REQUIREMENT

- Using a spirit level confirm the horizontal position of the indoor unit.

Installation of ceiling panel (Sold separately)

Install the ceiling panel after completion of the installation of the indoor unit, including all piping and wiring.

Check that the installation and the height of the indoor unit within the ceiling void are correct and then install.

REQUIREMENT

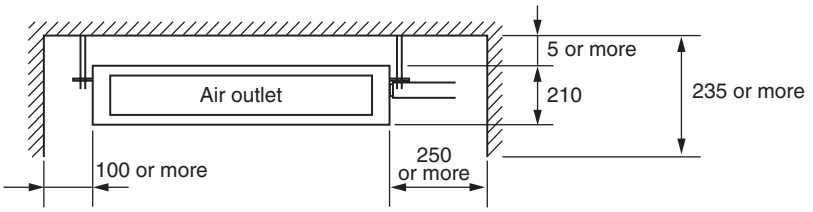
Ensure the ceiling panel is mated to the ceiling surface or the indoor unit.

If the panel and unit are not mated together this may result in the formation of dew condensation causing a possible water leak.

Appendix
Slim Duct Type

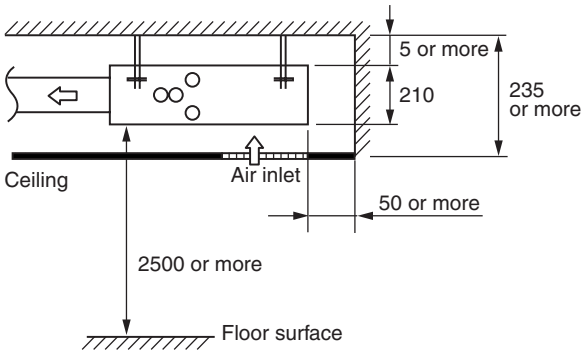
Installation space

Ensure that you have sufficient space to install and service the indoor unit.

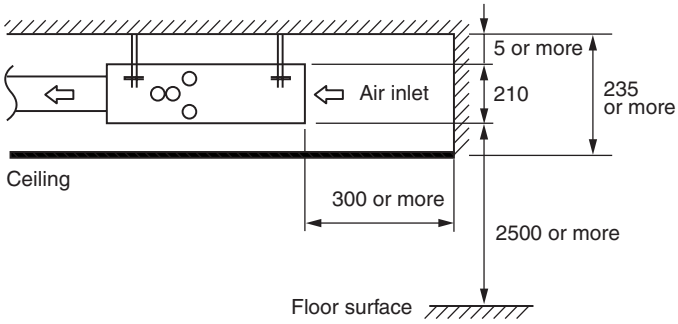


(Unit : mm)

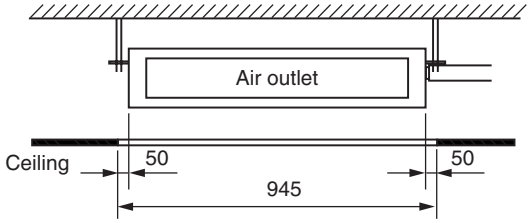
Under air inlet

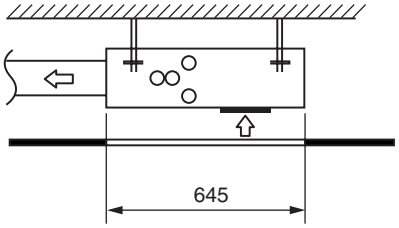


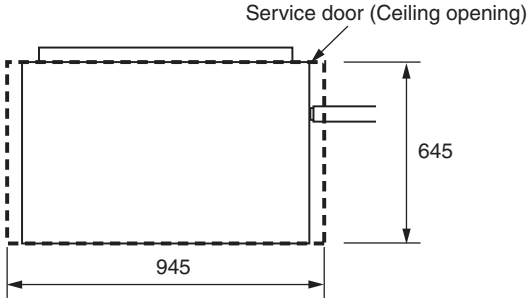
Back air inlet

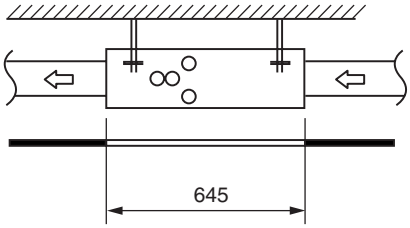


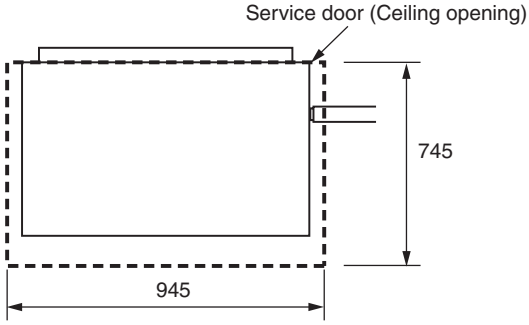
Service space

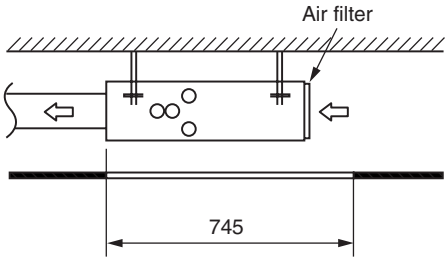




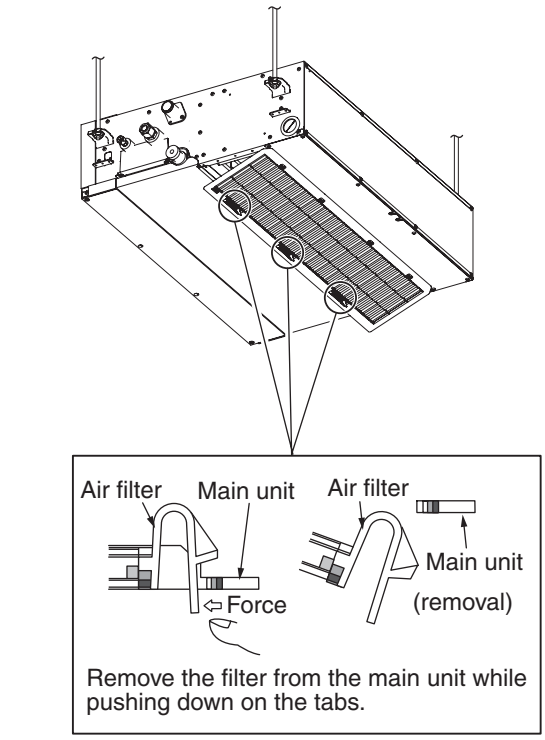




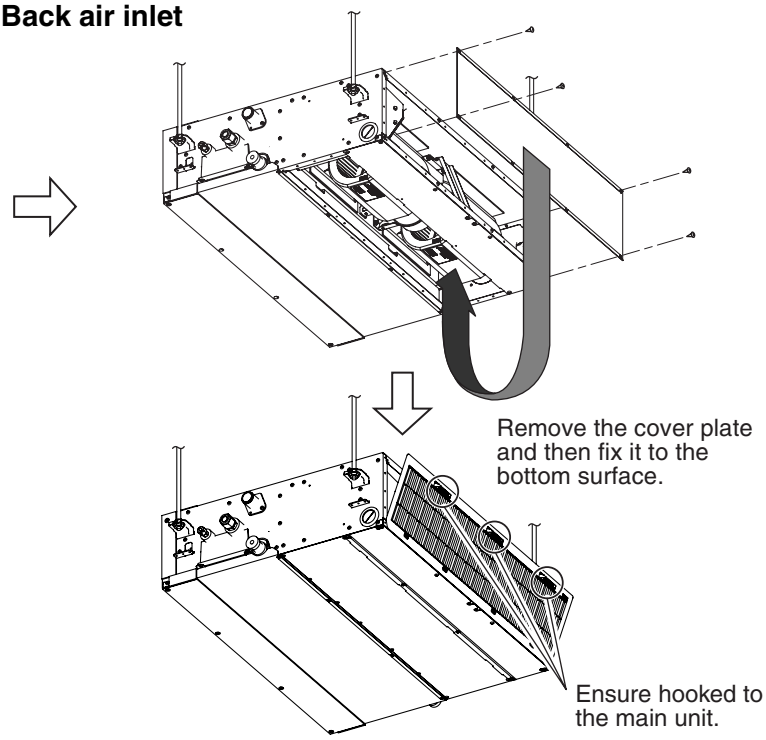




Changing air inlet position

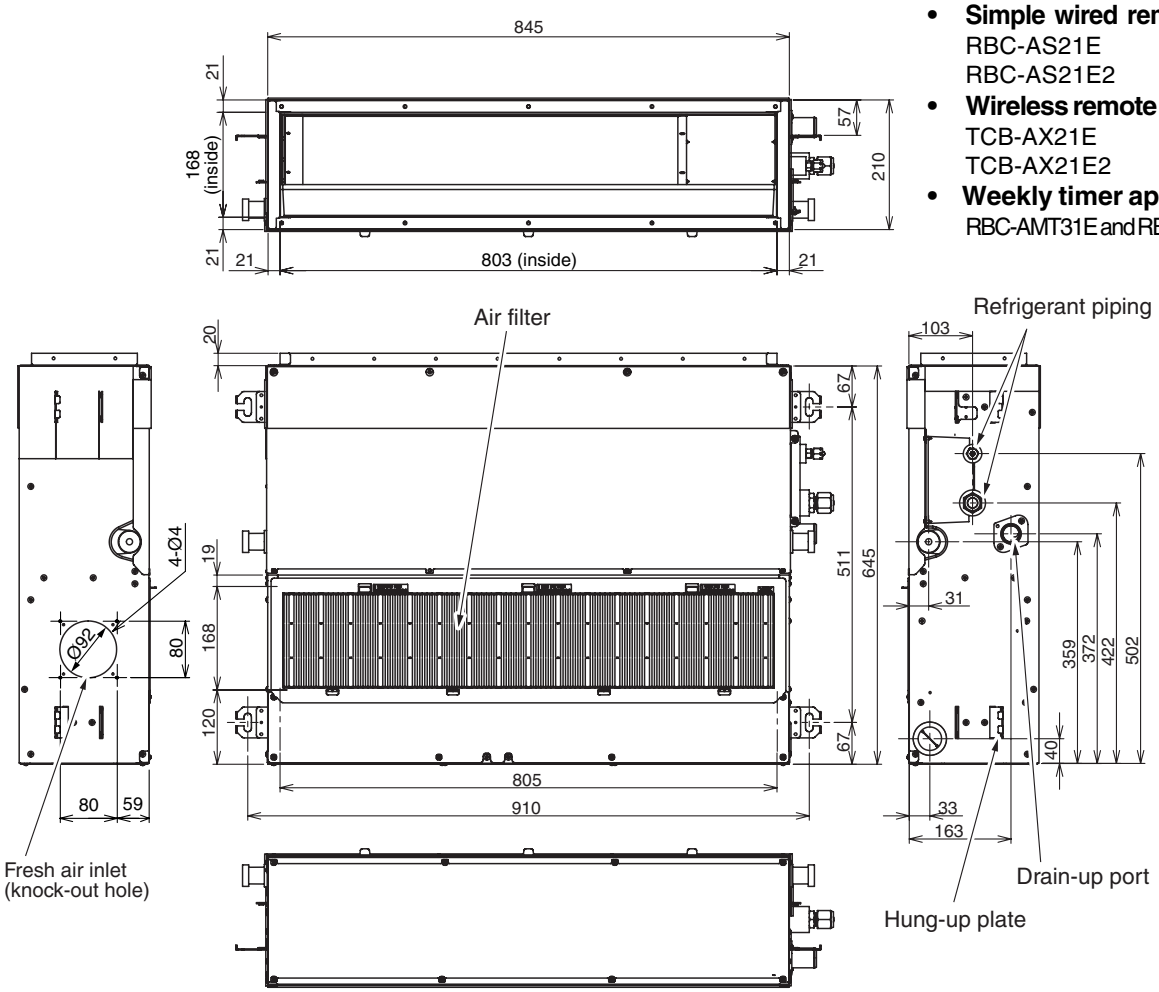


Back air inlet



Dimensional

- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Wireless remote controller kit**
  TCB-AX21E
  TCB-AX21E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2



Opening hole on ceiling and installation of hanging bolts

Evaluate and determine the piping and wiring requirements inside the ceiling prior to the hanging of the unit.

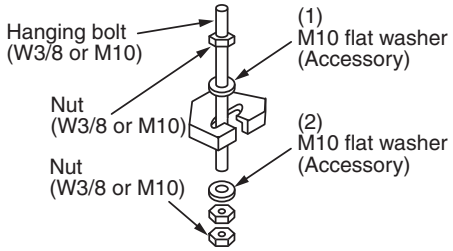
- After installation position of the indoor unit has been determined.
- For opening size of the ceiling and the hanging bolt pitch, refer to the dimensional.
- If the ceiling is installed, installed the drainpipe, refrigerant pipe, inter-connecting wires and all control wiring in a position where they can easily be connected to the indoor unit upon hanging.

The hanging bolts and nuts will are to be procured locally.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces

Installation of indoor unit

- Attach the nuts (M10 or W3/8: Procured locally) and washers (Ø34) to the hanging bolt.
- Put washers at either side of the T-groove on the hanging bracket of the indoor unit to hang down the indoor unit.
- Using a spirit level, check that four sides are horizontal. (Horizontal Within 5mm)



Setup of external static pressure

Change the tap setting based upon the resistance (External static pressure) or the duct to be connected.

To change the external static pressure, setup the item code (DN) from wired remote controller is necessary. (Item code = [5d])

For detailed procedure, refer to "18. APPLIED CONTROL".

Change on wired remote controller

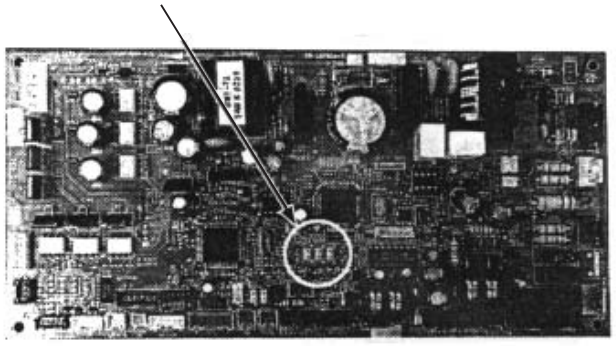
Setup data	External static pressure	
0000	10 Pa	Standard (At shipment)
0001	20 Pa	High static pressure 1
0003	35 Pa	High static pressure 2
0006	50 Pa	High static pressure 3

In case of remote controller-less (Group control)

For setup to the high ceiling, there is selecting method by exchanging the short plugs on the indoor microcomputer PC board as shown in the following table other than selecting method by standard wired remote controller (sold separately). Utilize this method for remote controller-less (Group control) case.

* However, when the setup to high ceiling has been once exchanged, it is required for returning it to 0000 to change the short plug to the standard (at shipment) position and rewrite data to the setup data 0000 from the wired remote controller sold separately though setup to 0001, 0003 or 0006 are freely available.

- **Short plug position (CN112, CN111, CN110 from the left)**



- **Selection can be made by the changing of the short plugs.**

Short plug position Short Open	Set data	External static pressure
CN112 CN111 CN110	**0000**	10 Pa (At shipment)
CN112 CN111 CN110	**0001**	20 Pa
CN112 CN111 CN110	**0003**	35 Pa
CN112 CN111 CN110	**0006**	50Pa

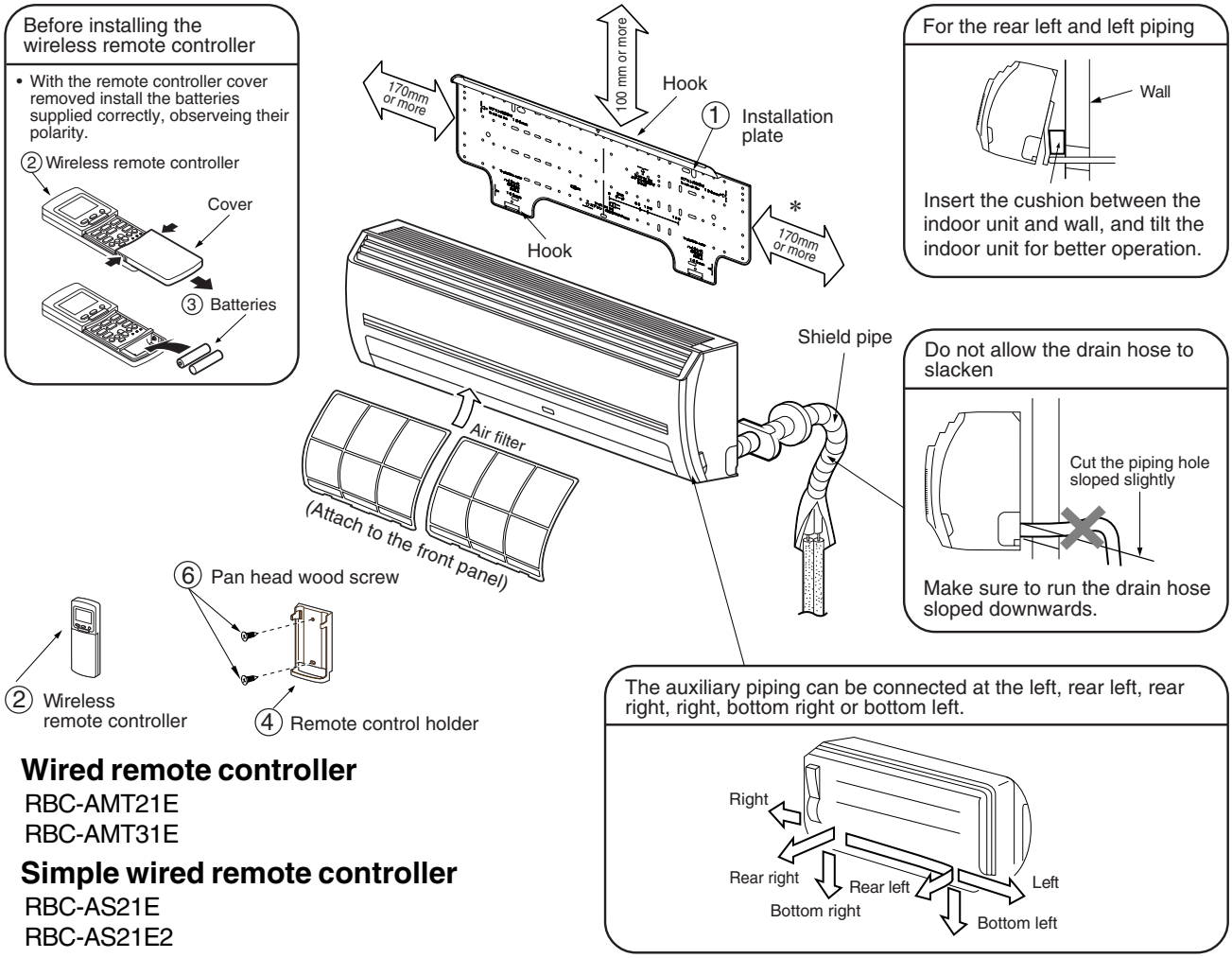
Appendix
High Wall Type (2 series)

Installation space

Ensure that there is sufficient space for the installation and service work.

Keep a minimum of 100mm for clearance between the top plate of the indoor unit and the ceiling surface.

Installation diagram of Indoor and outdoor units



- **Wired remote controller**
  RBC-AMT21E
  RBC-AMT31E
- **Simple wired remote controller**
  RBC-AS21E
  RBC-AS21E2
- **Weekly timer application**
  RBC-AMT31E and RBC-EXW21E2

* When installing the Flow Selector Unit (FS Unit), Maintain a minimum space of 300mm for wiring work.

Installation position

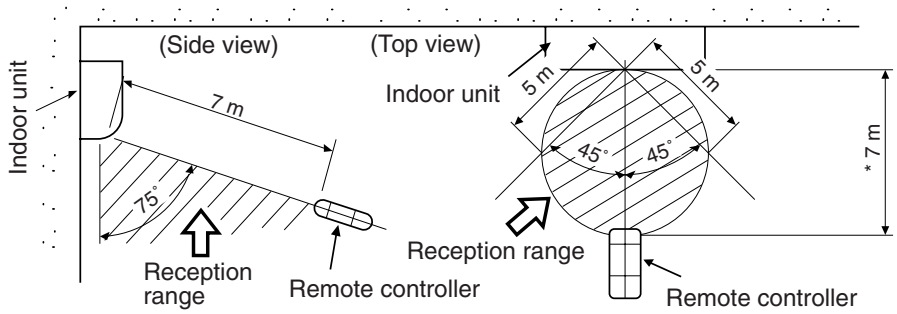
- A position which provides the sufficient space around the indoor unit as shown in the above diagram.
- A position where there is no obstacle near the air inlet and outlet.
- A position that allows easy installation of the piping to the outdoor unit.
- A position which allows the front panel to be opened.

⚠ CAUTION

- Avoid direct sunlight to the indoor units wireless receiver.
- The microprocessor in the indoor unit should not be too close to RF noise sources.

Remote controller

- Should be positioned where there are no obstacles that may block the signal from the remote controller.
- Do not install the remote controller in a place exposed to direct sunlight or close to an excessive heat source.
- Keep the remote controller at least 1m apart from the nearest TV set or stereo equipment. (This is necessary to prevent image disturbances or noise interference.)
- The location of the remote controller should be determined as shown below.



* : Axial distance

⚠ WARNING

The installation of the air conditioning unit must be positioned in a location that can sufficiently support its weight and give protection against adverse environmental conditions. Failure to do so may result in unit damage and possible human injury. Any incomplete installation may also cause possible risk of human injury.

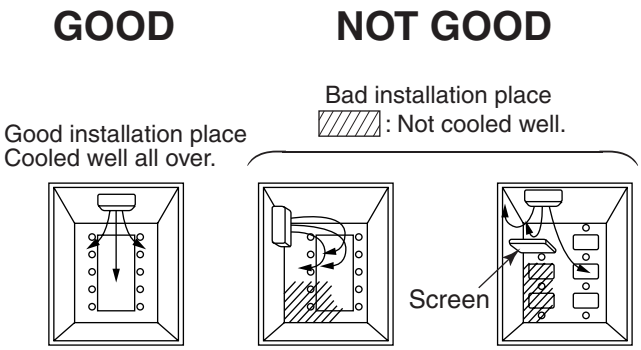
REQUIREMENT

Strictly comply to the following rules in order to prevent damage to the indoor units and human injury.

- Do not put a heavy item on the indoor unit. (Even when units are packaged)
- When moving indoor unit leave in packaging wherever possible. If moving the indoor unit unpacked is necessary due to restrictions, be sure to use a protective cloth in order not to damage the unit.
- To move the indoor unit, do not apply force to the refrigerant pipe, drain pan, foamed parts or resin parts, etc.
- The packaged unit must be carried by two or more persons. Straps should only be used at the positions indicated on the packaging.

Consider the following items when installing the unit.

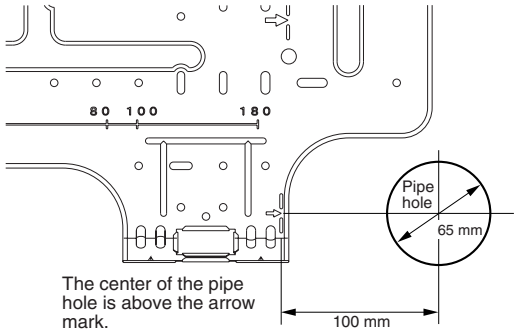
- Air discharge direction, select an installation place where the discharge air can circulate evenly in a room. Refer to the figure, do not install in an area detailed as "**NOT GOOD**".



Cutting a hole

Installing the refrigerant pipes from the rear:

1. Determine the hole position for the piping at 100mm from the arrow mark (⇨) on the installation plate. Drill a hole Ø65mm at a slight downward slant towards the outdoor unit side.

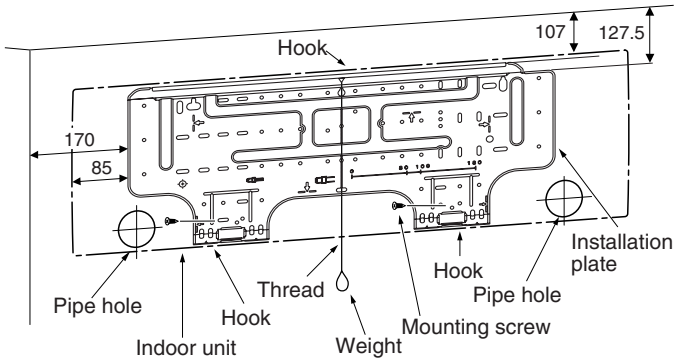


NOTE

- When drilling a wall that contains a metal lath, wire lath or metal plate, be sure to use suitable tooling.

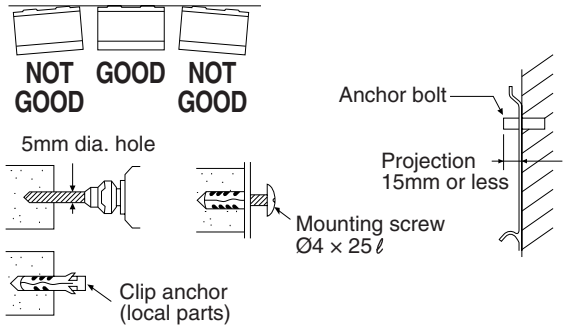
Mounting the installation plate

For installation of the indoor unit,
use the paper pattern in the accessory parts.



When the installation plate is directly mounted on the wall

1. Securely fit the installation plate onto the wall by screwing it in the upper and lower parts to hook up the indoor unit.
2. To mount the installation plate on a concrete wall with anchor bolts, ensure the anchor must seat in the wall as illustrated in the figure with a projection of 15mm or less.
3. Install the installation plate horizontally on the wall.



⚠ CAUTION

When installing the installation plate with a mounting screw, ensure drilled hole is of a suitable size for the screw.
Failing to secure the unit correctly may result in personal injury and property damage.

- In case of block, brick, concrete or similar type walls, make 5mm dia. holes in the wall.
- Use the appropriate size clip anchors (wall plugs) for the mounting screws that fix the installation plate to the wall.

NOTE

- Fix the installation plate at the lower part and in each corner using up to six mounting screws.

TOSHIBA CARRIER CORPORATION
2 CHOME 12-32, KONAN, MINATOKU, TOKYO, 108-0075, JAPAN