

DESIGN MANUAL



Heat Recovery Type

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**

<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**

<Under Ceiling Type>

**MMC-AP0151H, AP0181H, AP0241H,
MMC-AP0271H, AP0361H, AP0481H**

<High Wall Type>

**MMK-AP0071H, AP0091H, AP0121H,
MMK-AP0151H, AP0181H, AP0241H**

<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**

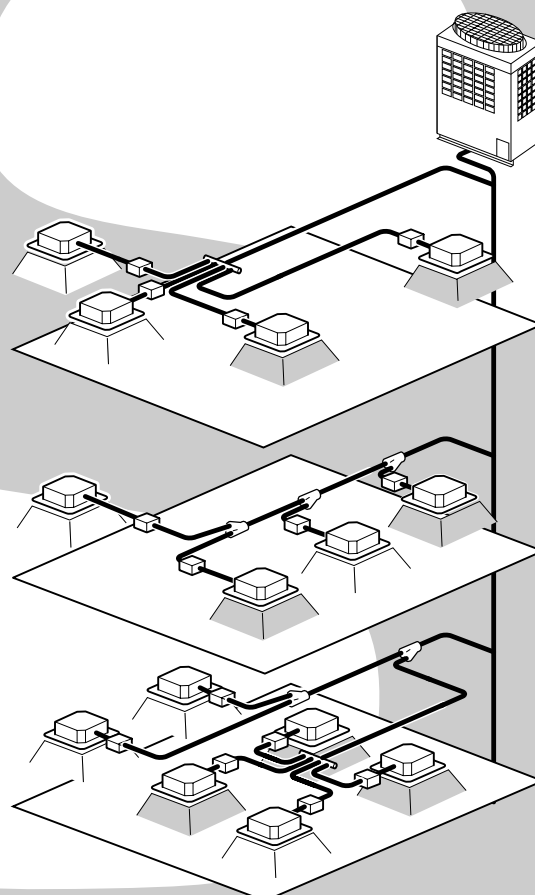
Outdoor Unit

<Inverter Unit>

**MMY-MAP0801FT8
MMY-MAP1001FT8
MMY-MAP1201FT8**

FS unit

**RBM-Y1121FE
RBM-Y1801FE**



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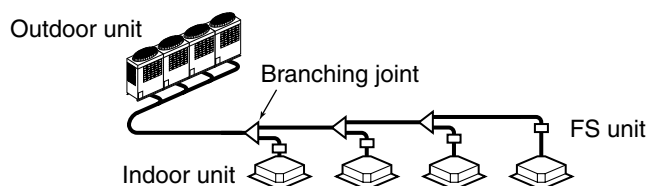
DESIGN MANUAL

1. OUTLINE OF TOSHIBA SUPER HRM (Super Heat Recovery Multi System)

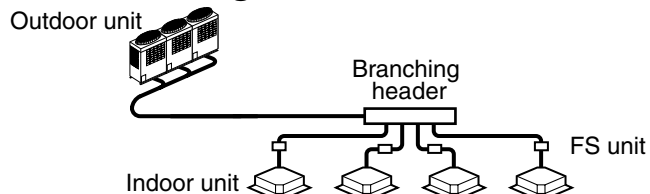
◆ Shortest route design by free branching

Combination of line and header branching is highly flexible. This follows for the shortest design route possible, thereby saving on installation time and cost. Line/header branching after header branching is only available with TOSHIBA Super HRM.

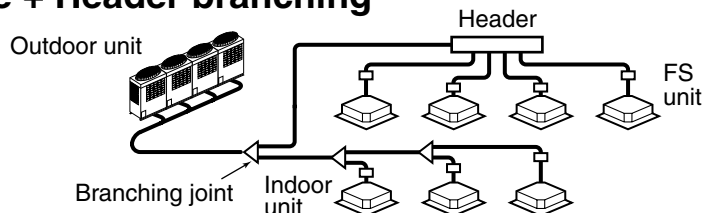
Line branching



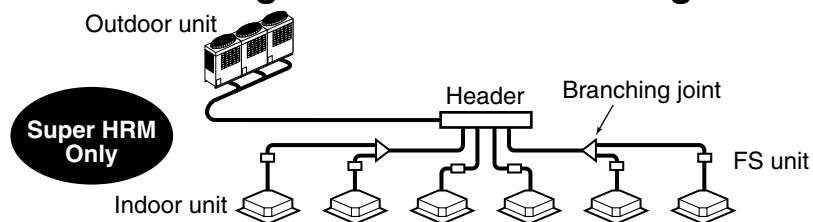
Header branching



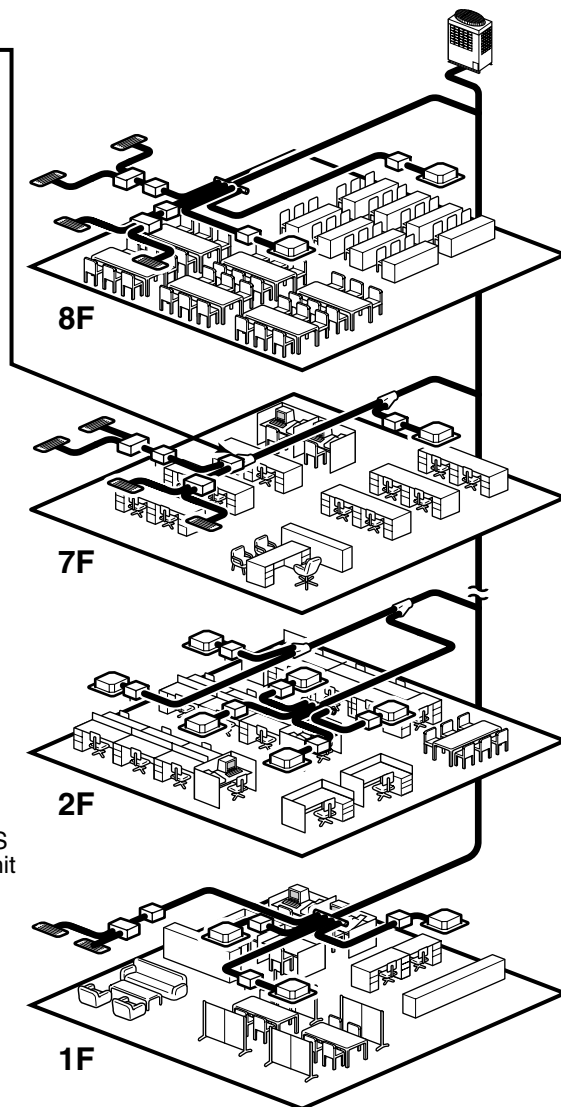
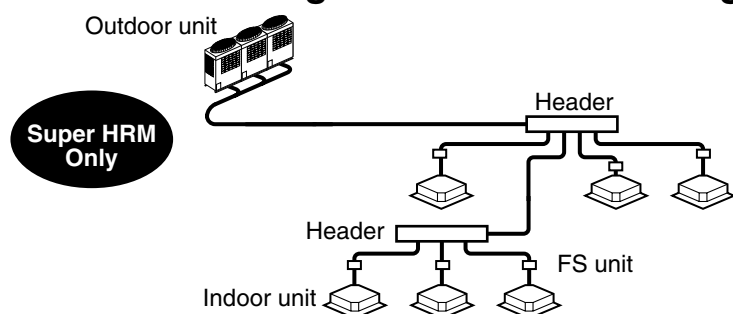
Line + Header branching

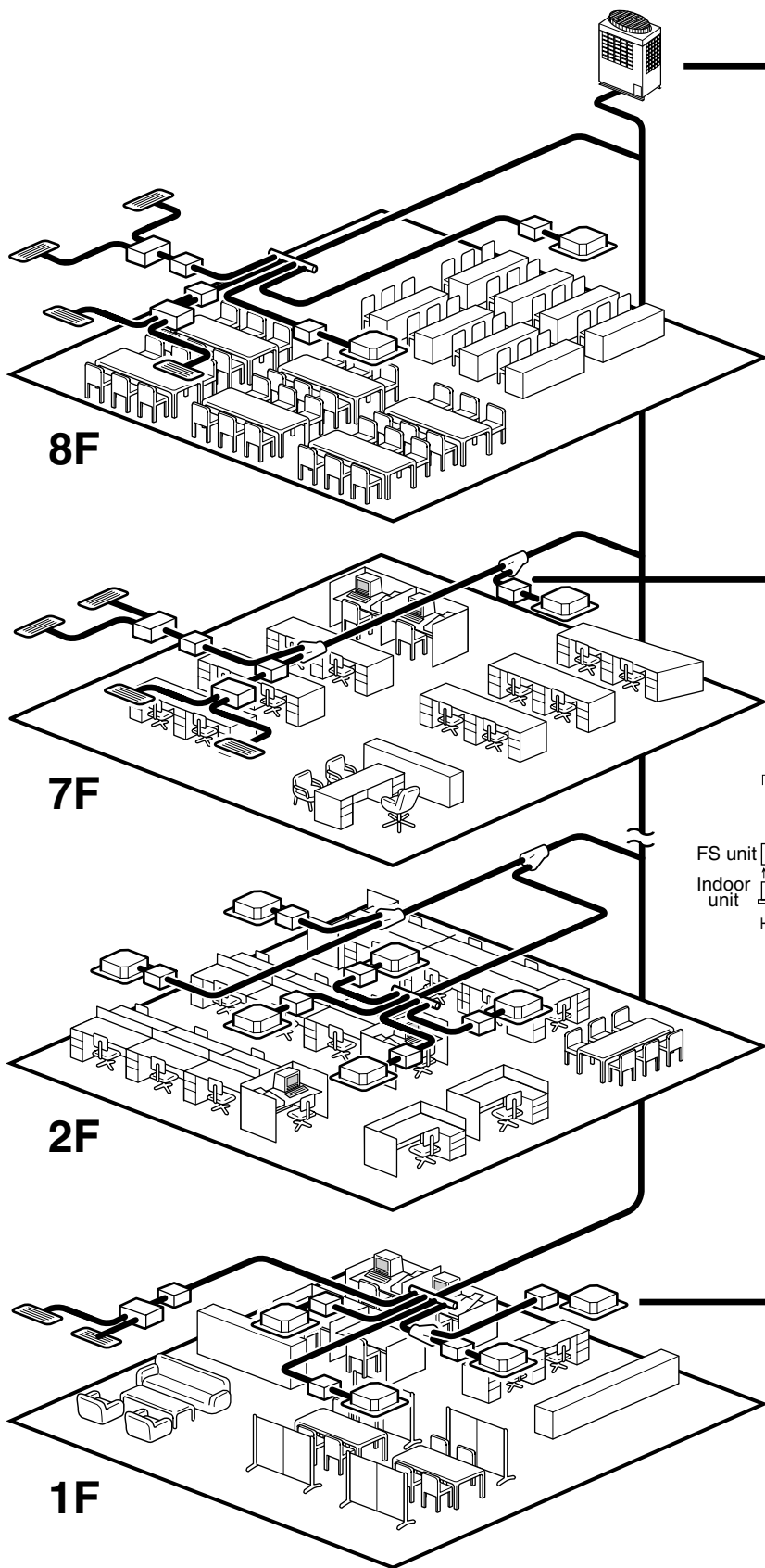


Line branching after header branching

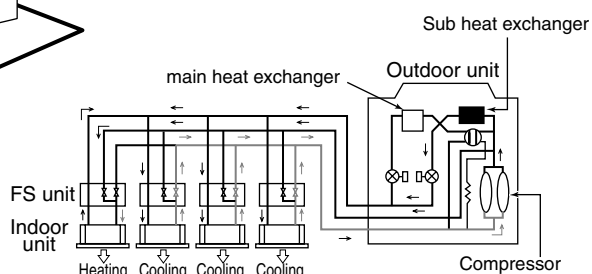
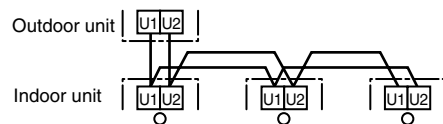


Header branching after header branching

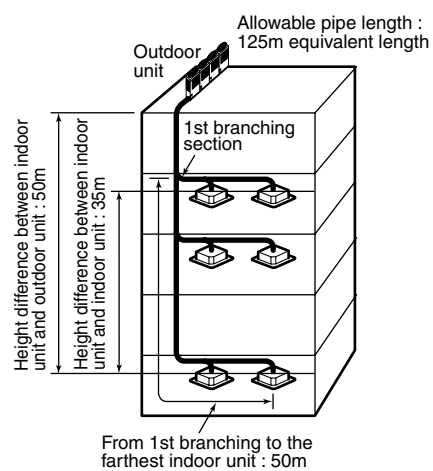




- Non-polarized control wiring between outdoor and indoor units



- Simultaneous operation



◆ **Energy saving**

No. 1 COP in heat recovery VRF industry. Compared with the conventional chiller fan coil system, a large energy saving can be realized.

◆ **Advanced bus communication system**

Wiring between indoor and outdoor unit is a simple 2 wire system.
Communication address is also automatically configured.
A default test mode operation is available.

◆ **Self diagnostics system**

Comprehensive troubleshooting code allows for timely identification of problems arising.

◆ **High lift design**

Equivalent pipe length of 125m and vertical lift of 50m is made possible with TOSHIBA Super HRM.
Vertical lift between indoor units of 35m is the highest in the industry.
This allows for greater flexibility in the location of the system.

◆ **Simultaneous operation**

By controlling the FS unit, Super HRM enables freely simultaneous operation of cooling and heating.
This operation meets the various needs of modern buildings that has highly airtight or an increasing heat load due to use of computers. Also, Super HRM improves energy efficiency by recycling exhaust heat.

◆ **Compact FS unit design**

The compact and light weight design of the FS unit (Flow selector unit) allows it to be easily installed in limited spaces.

◆ **Intelligent control**

TOSHIBA Super HRM intelligent controls and modulating valves deliver the required capacity, according to the load variation from 50% to 100%.
The intelligent controls and modulating valves limit or increase the cooling capacity dynamically so humidity and temperature are kept in the comfort zone.

◆ **Conforms to building control law**

IAQ (Indoor Air Quality) is also achieved by combining various accessories required by the Building Control Law.

◆ **Wide control applications**

Artificial Intelligence Network system

- Central control and monitoring system available
- Weekly schedule operation through weekly timer

Integration with Building Management System (BMS) is available.

2. SUMMARY OF SYSTEM EQUIPMENTS

Equipments

1. Outdoor units

Corresponding HP	Inverter unit			Appearance
	8HP	10HP	12HP	
Model name MMY-	MAP0801FT8	MAP1001FT8	MAP1201FT8	
Cooling capacity (kW)	22.4	28.0	33.5	
Heating capacity (kW)	25.0	31.5	35.5	

2. FS units (Flow selector units)

Model name	Usage	Appearance
RBM-Y1121FE	Capacity rank for indoor unit : Type 007 to 030	
RBM-Y1801FE	Capacity rank for indoor unit : Type 036 to 056	

* Accessory part (Sold separately): Connection cable kit (RBC-CBK15FE), up to 15m.

3. Branching joints and headers

	Model name	Usage		Appearance
Y-shape branching joint (*3)	RBM-BY53FE	Indoor unit capacity code (*1) Total below 6.4	For 3 piping	
	RBM-BY103FE	Indoor unit capacity code (*1) Total below 14.2		
	RBM-BY53E	Indoor unit capacity code (*1) Total below 6.4	For 2 piping (*5)	
	RBM-BY103E	Indoor unit capacity code (*1) Total below 14.2		
4-branching header (*4)	RBM-HY1043FE	Indoor unit capacity code (*1) Total below 14.2	For 3 piping	
	RBM-HY1043E	Indoor unit capacity code (*1) Total below 14.2	For 2 piping (*5)	
8-branching header (*4)	RBM-HY1083FE	Indoor unit capacity code (*1) Total below 14.2	For 3 piping	
	RBM-HY1083E	Indoor unit capacity code (*1) Total below 14.2	For 2 piping (*5)	

*1 "Capacity code" can be obtained from page 8. (Capacity code is not actual capacity)

*2 If total capacity code value of indoor unit exceeds that of outdoor unit, apply capacity code of outdoor unit.

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

*4 Max. 6.0 capacity code in total can be connected.

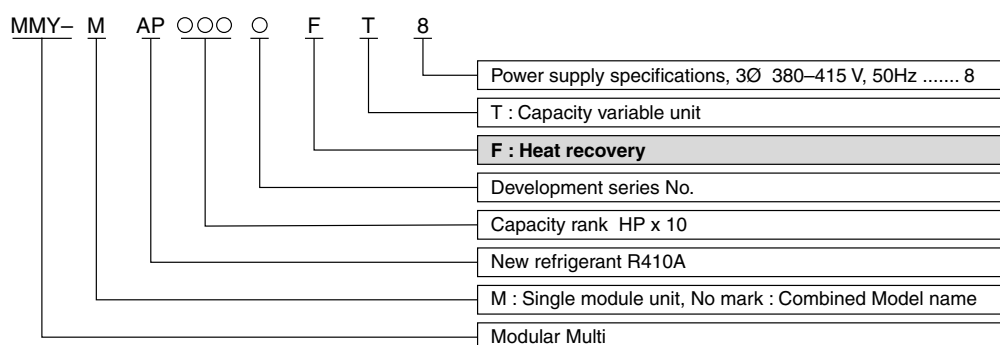
*5 This is used for branching to "cooling only" indoor unit.

*6 Model names for outdoor and indoor units described in this guide are shortened because of the space constraint.

Super Heat Recovery Multi System Outdoor Unit

HP (Capacity code)	Model name MMY-	No. of combined units	Inverter 8 HP MMY-	Used Q'ty	Inverter 10 HP MMY-	Used Q'ty	Inverter 12 HP MMY-	Used Q'ty
8HP (8)	MAP0801HT8	1	MAP0801FT8	1				
10HP (10)	MAP1001HT8	1			MAP1001FT8	1		
12HP (12)	MAP1201HT8	1					MAP1201FT8	1

1. Allocation standard of model name

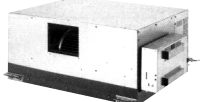
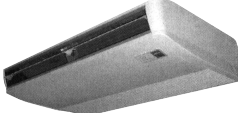
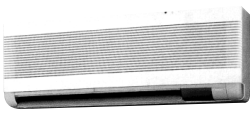
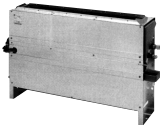
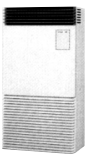


2. Rated conditions (Rated mode : Condition)

Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB

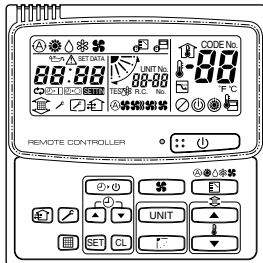
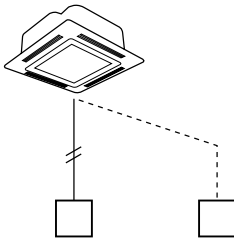
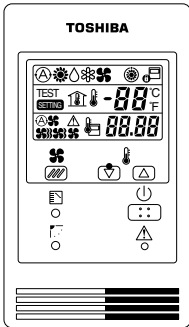
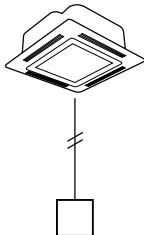
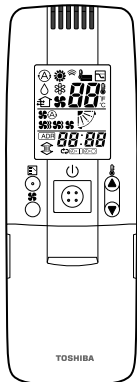
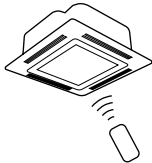
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB

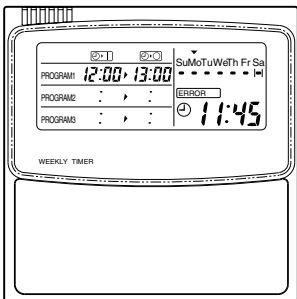
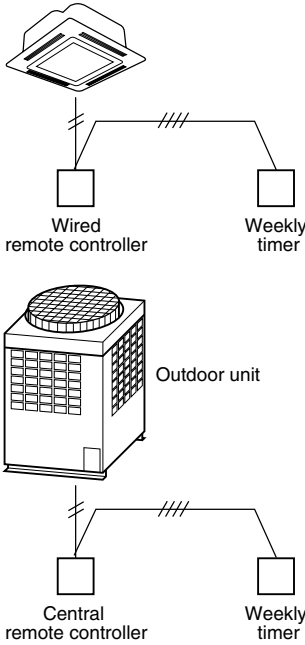
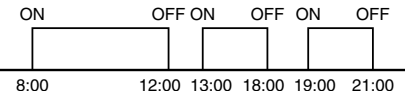
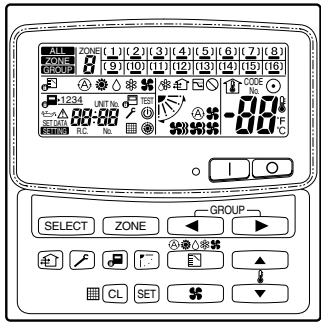
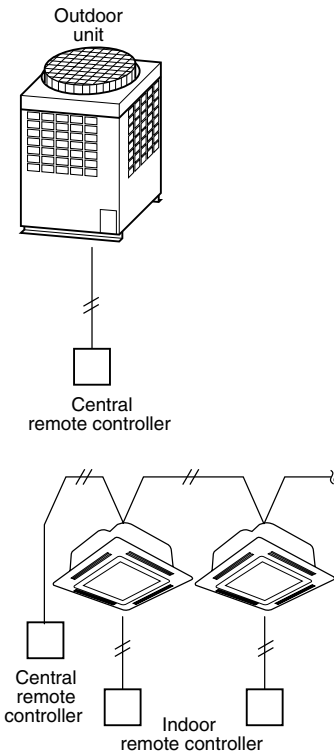
4. Indoor unit

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
2-way Air Discharge Cassette Type		MMU-AP0561H	056 type	6	16.0	18.0
		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
1-way Air Discharge Cassette Type		MMU-AP0481WH ^{*1)}	048 type	5	14.0	16.0
		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
Concealed Duct Standard Type		MMU-AP0241SH	024 type	2.5	7.1	8.0
		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
Concealed Duct High Static Pressure Type		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
		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
Under Ceiling Type		MMD-AP0361H	036 type	4	11.2	12.5
		MMC-AP0481H	048 type	5	14.0	16.0
		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
High Wall Type		MMC-AP0361H	036 type	4	11.2	12.5
		MMK-AP0481H	048 type	5	14.0	16.0
		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
Floor Standing Cabinet Type		MMK-AP0181H	018 type	2	5.6	6.3
		MMK-AP0241H	024 type	2.5	7.1	8.0
		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
Floor Standing Concealed Type		MML-AP0181H	018 type	2	5.6	6.3
		MML-AP0241H	024 type	2.5	7.1	8.0
		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
Floor Standing Type		MML-AP0181BH	018 type	2	5.6	6.3
		MML-AP0241BH	024 type	2.5	7.1	8.0
		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

*1) China only

5. Remote controller

Name	Model name	Appearance	Application	Function
Wired remote controller	RBC-AMT21E		Connected to indoor unit  Wired remote controller Wired remote controller (In case of control by 2 remote controllers)	- Start / Stop - Changing mode - Temperature setting - Air flow changing - Timer function ① Either "ON" time or "OFF" time or "CYCLIC" can be set how many 30 min. later ON or OFF is operated. ② Combined with the weekly timer, weekly schedule operation can be operated. - Filter sign Displays automatically maintenance time of indoor filter. Filter sign flashes. - Self-diagnosis function Pressing "CHECK" button displays cause of trouble on the check code. - Control by 2 remote controllers is available. Two remote controllers can be connected to one indoor unit. The indoor unit can be separately operated from the isolated places.
Simple remote controller	RBC-AS21E		Connected to indoor unit  Simple remote controller	- Start / Stop - Temperature setting - Air flow changing - Check code display
Wireless remote controller kit	TCB-AX21U (W)-E		Connected to indoor unit 	- Start / Stop - Changing mode - Temperature setting - Air flow changing - Timer function - Either "ON" time or "OFF" time or "CYCLIC" can be set how many 30 min. later ON or OFF is operated. - Control by 2 remote controllers is available. Two wireless remote controllers can operate one indoor unit. The indoor unit can be separately operated from the isolated places. - Check code display
	RBC-AX22CE			TCB-AX21U (W)-E (For 4-way air discharge cassette)
	TCB-AX21E			RBC-AX22CE (For under ceiling)
				TCB-AX21E (For others except concealed duct high static pressure)

Name	Model name	Appearance	Application	Performance
Weekly timer	RBC-EXW21E		Connected to central remote controller, wired remote controller 	- Weekly schedule operation - Setting different start / stop time for each day of the week - ON / OFF can be easily set 3 times a day.  "CHECK" "PROGRAM" "DAY" button make setting copy easy. - Two patterns of schedule for a week can be specified. (Summer schedule and winter schedule, etc.) "CANCEL" "DAY" button make holiday setting easy. - If power supply fails, the setting contents are stored in memory, for 100 hours.
Central remote controller	TCB-SC642TLE		Connected to outdoor unit, indoor unit 	- Individual control up to 64 indoor units. - Individual control for max. 64 indoor units divided 1 to 4 zone. (Up to 16 indoor units for each zone) - Up to 16 outdoor header units are connectable. 4 type central control setting to inhibit individual operation by remote controller can be selected. - Setting for one of 1 to 4 zone is available. - Usable with other central control devices (Up to 10 central control devices in one control circuit) - Two control mode selectivity (Central controller mode Remote controller mode) - Setting of simultaneous ON/OFF 3 times for each day of the week combined with weekly timer.

3. BASIC SYSTEM CONFIGURATION

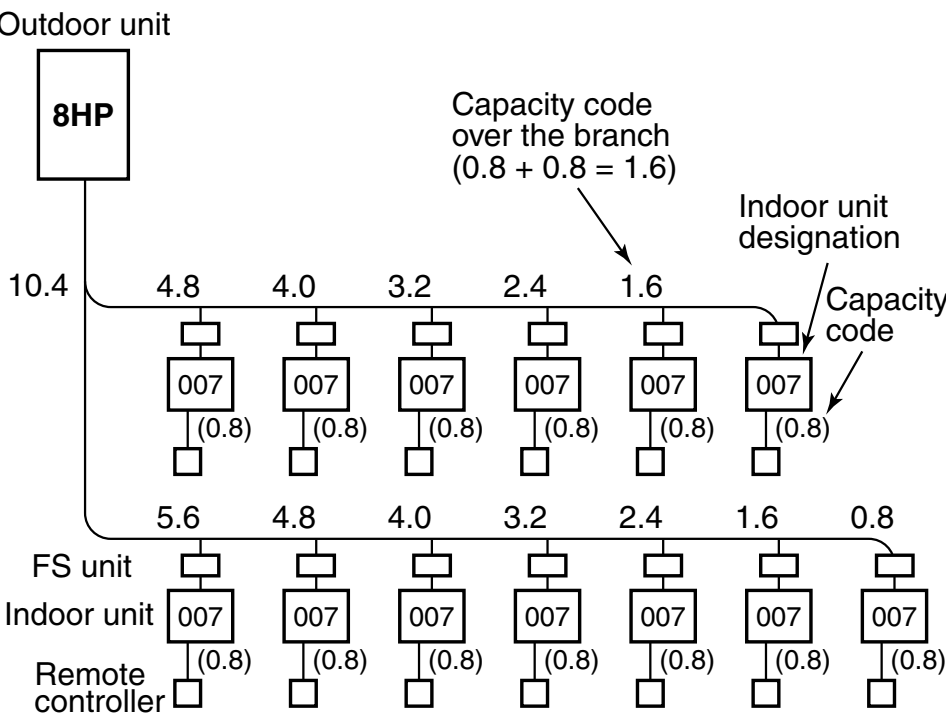
System legend (ex.)

- Max. indoor unit : 13 units
- Capacity code of indoor unit :

Min. : 5.6

Max. : 10.8

Capacity code
Total 10.4
No. of total units
13

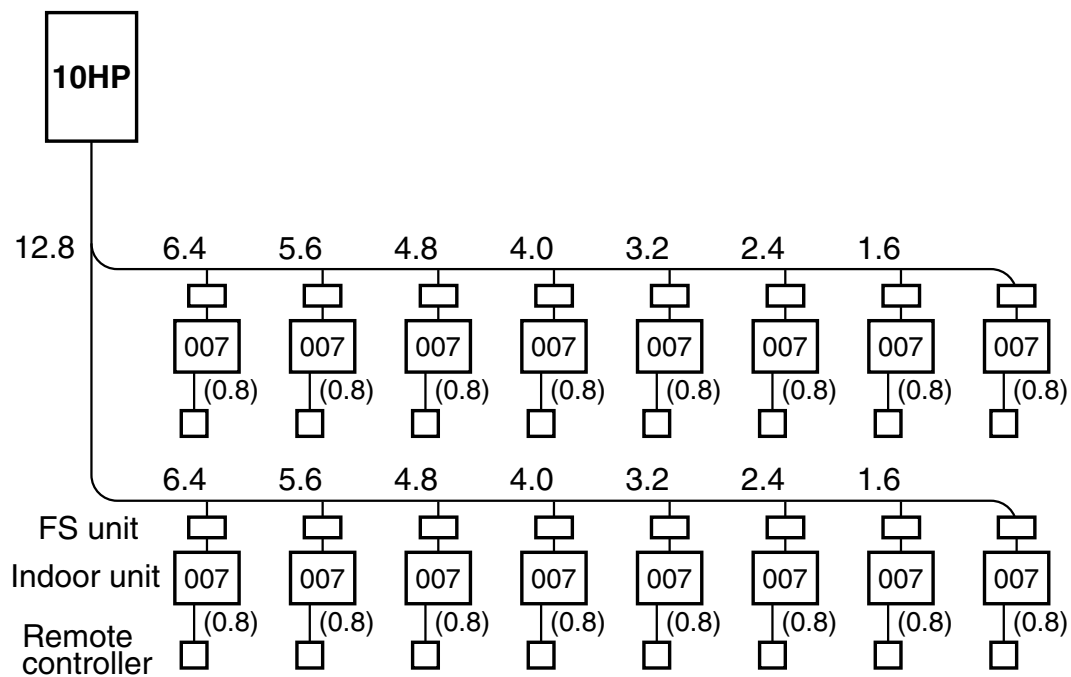


10 HP system

- Max. indoor unit : 16 units
- Capacity code of indoor unit : $\left(\begin{array}{l} \text{Min. : 7} \\ \text{Max. : 13.5} \end{array} \right.$

Capacity code
Total 12.8
No. of total units
16

Outdoor unit

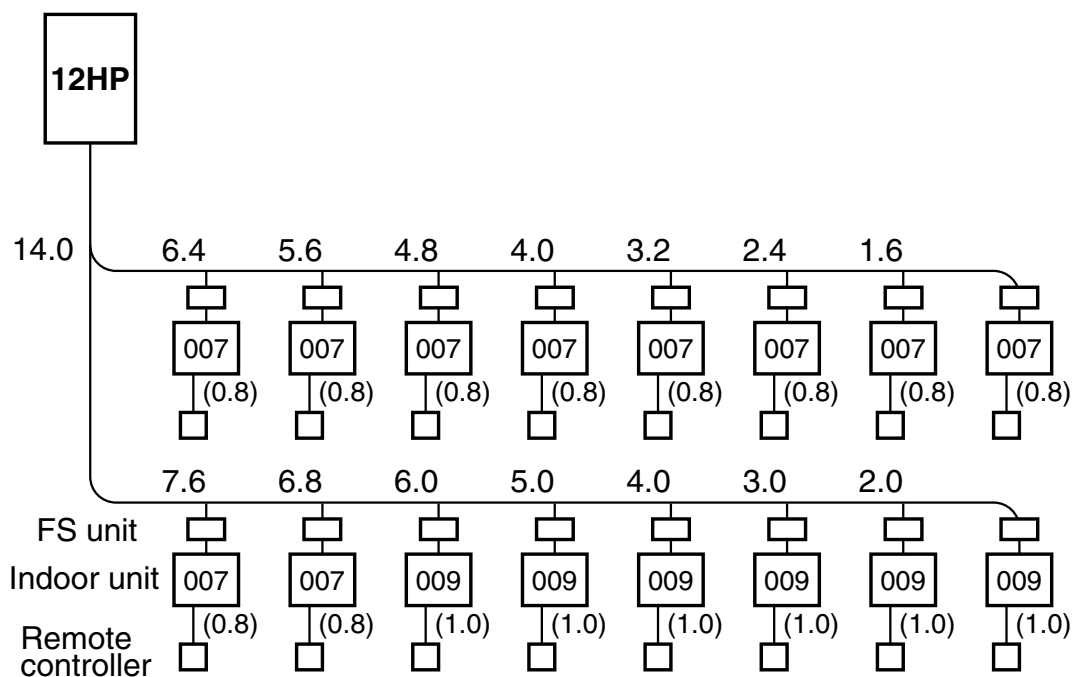


12 HP system

- Max. indoor unit : 16 units
- Capacity code of indoor unit : $\left(\begin{array}{l} \text{Min. : 8.4} \\ \text{Max. : 14.4} \end{array} \right.$

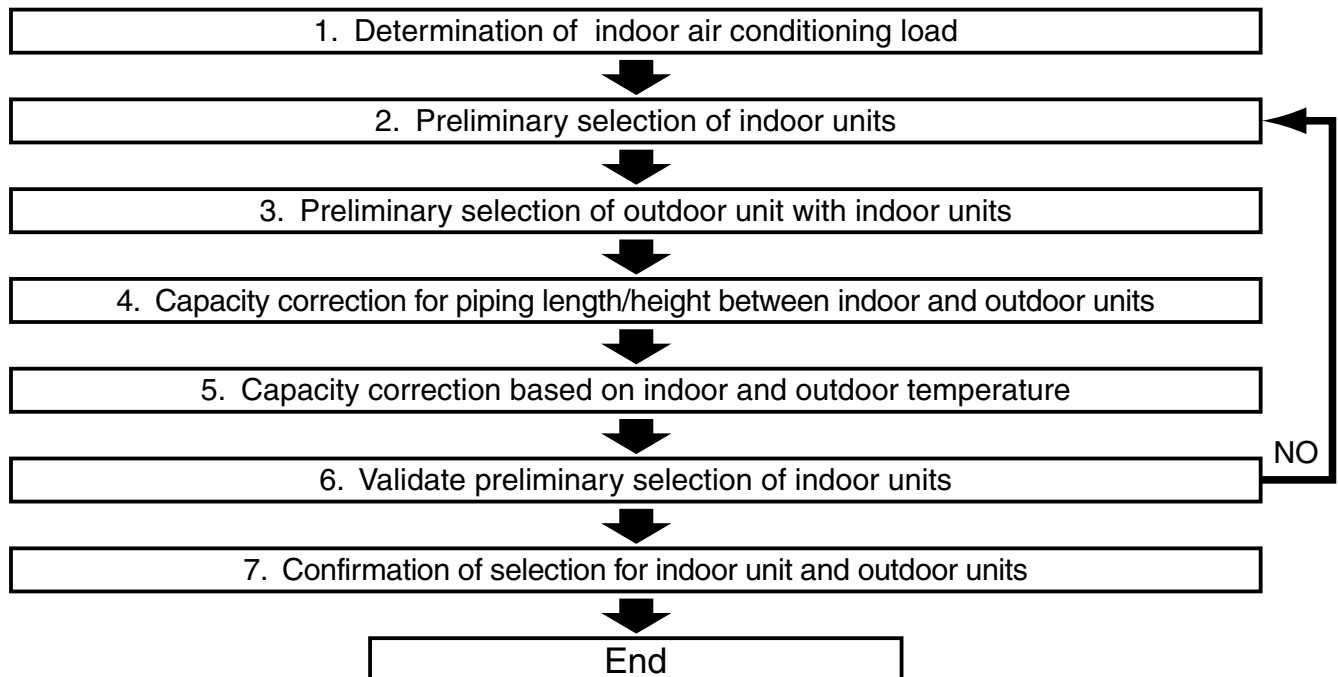
Capacity code
Total 14.0
No. of total units
16

Outdoor unit



4. EQUIPMENT SELECTION PROCEDURE

1. Selection flow chart



2. Combination conditions for indoor unit and outdoor unit

1. For indoor unit, the capacity code is decided for each capacity rank.

Capacity rank type	007	009	012	015	018	024	027	030	036	048	056
Capacity code	0.8	1	1.25	1.7	2	2.5	3	3.2	4	5	6

NOTE :

Capacity rank : Correspondence to Btu/h. Capacity code : Correspondence to Horsepower.

2. For outdoor unit, maximum No. of connectable indoor units and total capacity code of indoor units are decided.

Outdoor unit (Heat recovery)	Capacity code of outdoor unit	Max. No. of indoor units	Total capacity code of indoor units
MMY-MAP0801FT8	8	13	5.6 to 10.8
MMY-MAP1001FT8	10	16	7.0 to 13.5
MMY-MAP1201FT8	12	16	8.4 to 14.4

70 to 135% of outdoor unit capacity for 8, 10HP
70 to 120% of outdoor unit capacity for 12HP

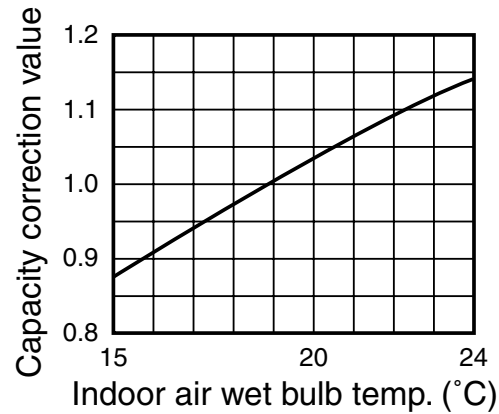


3. Cooling/heating capacity characteristics

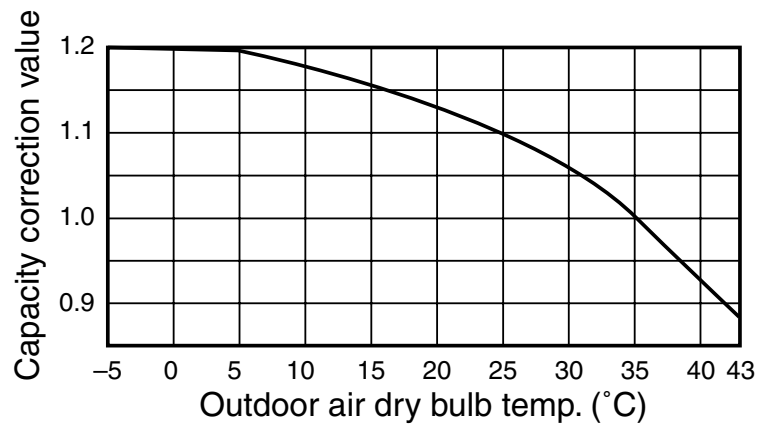
1. Cooling capacity calculation method :

Required cooling capacity = Cooling capacity x Factor (①, ②, ③, ④, ⑤*1) kW

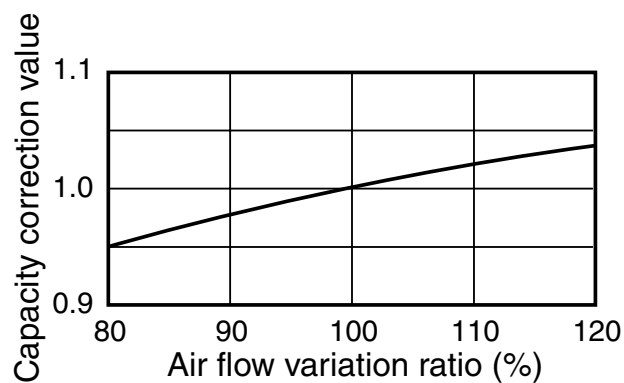
① Indoor air wet bulb temperature vs. capacity correction value



② Outdoor air dry bulb temperature vs. capacity correction value

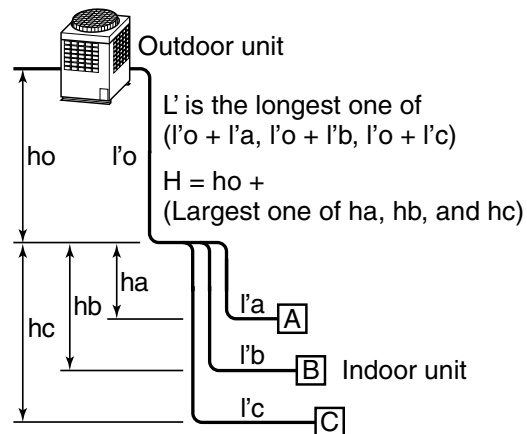
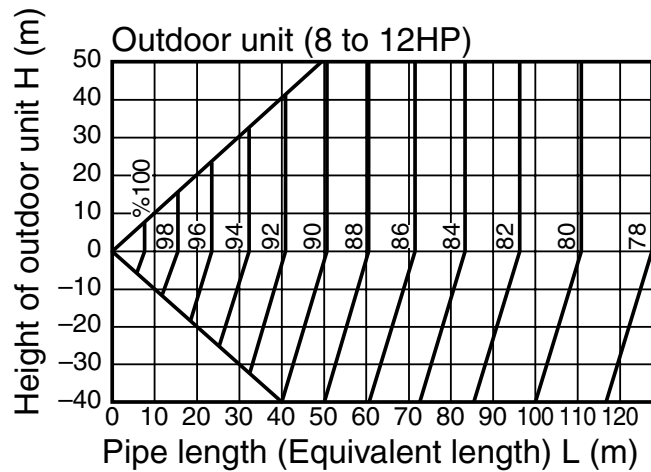


③ Air flow variation ratio of indoor unit vs. capacity correction (For concealed duct type only)

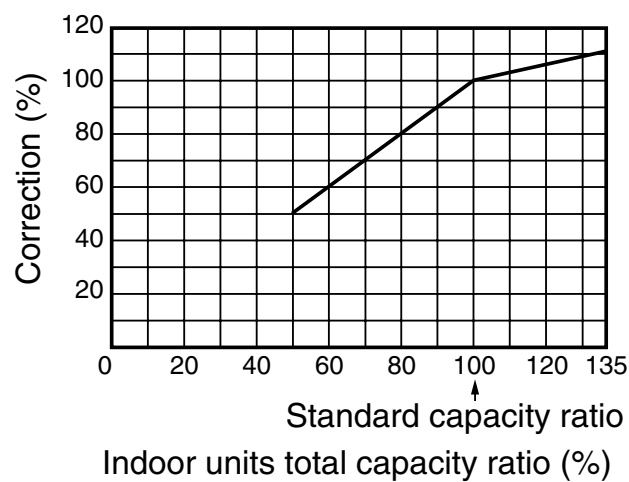


*1 : Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

④ Connecting pipe length and lift difference between indoor and outdoor units vs. capacity correction value



⑤ Correction of outdoor unit diversity

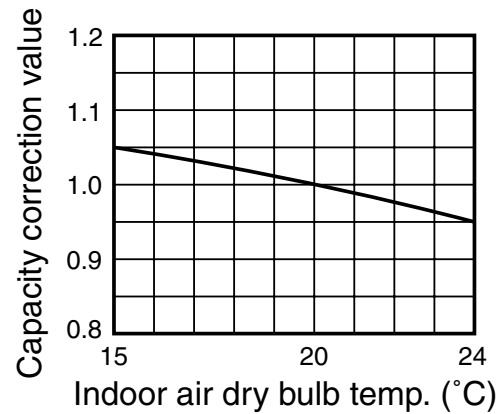


*1 : Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

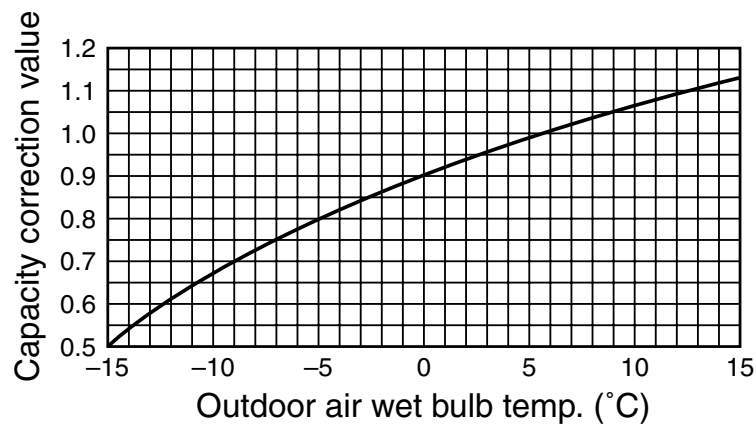
2. Heating capacity calculation method :

Required heating capacity = Heating capacity x Factor (①, ②, ③, ④, ⑤*¹, ⑥*²) kW

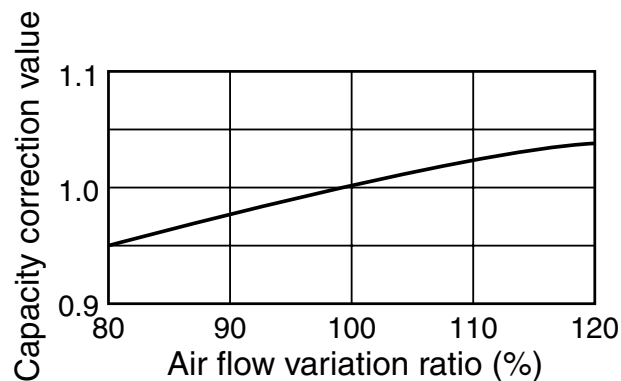
① Indoor air dry bulb temperature vs. capacity correction value



② Outdoor air wet bulb temperature vs. capacity correction value



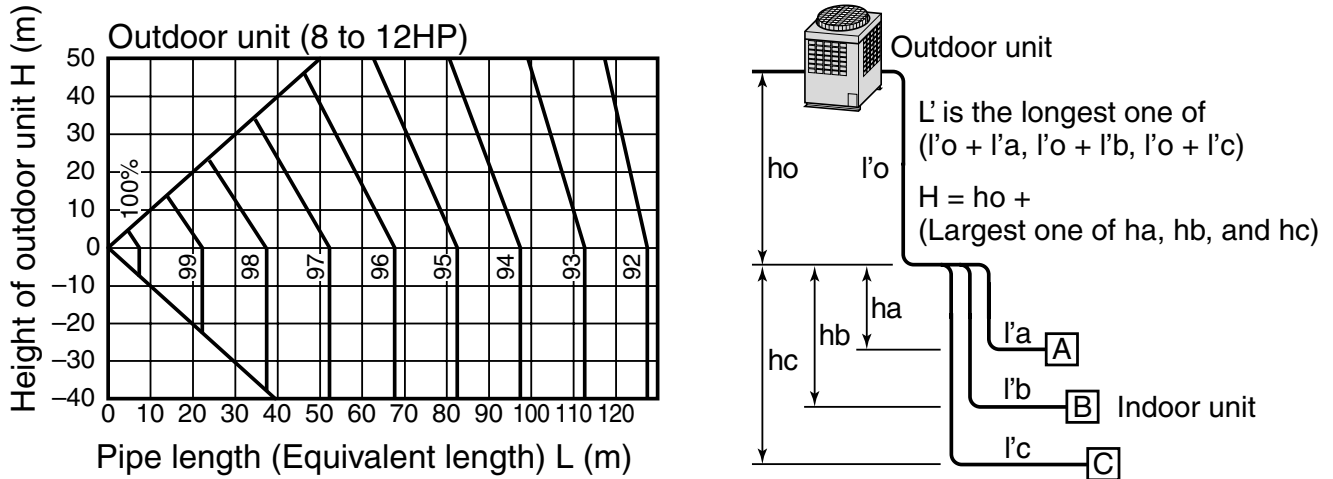
③ Air flow variation ratio of indoor unit vs. capacity correction (For concealed duct type only)



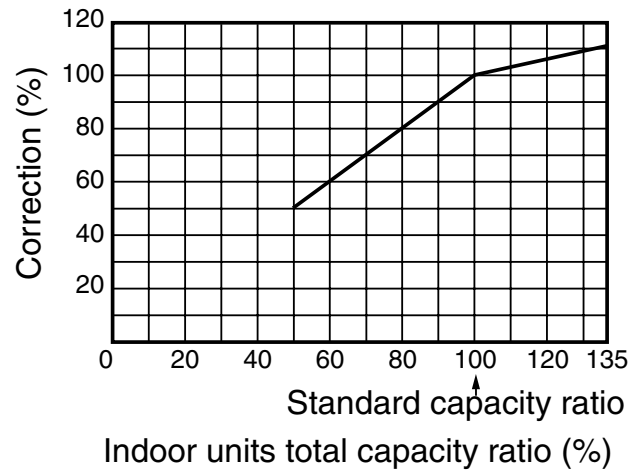
*1 : Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

*2 : Refer to item 3 in page 18.

④ Connecting pipe length and lift difference between indoor and outdoor units vs. capacity correction value



⑤ Correction of outdoor unit diversity



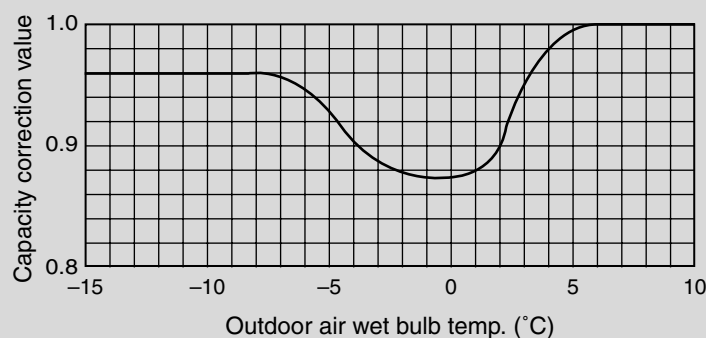
*1 : Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

3. Capacity correction in case of frost on the outdoor heat exchanger in heating

Correct the heating capacity when frost was found on the outdoor heat exchanger.

Heating capacity = Capacity after correction of outdoor unit × Correction value of capacity resulted from frost
(Capacity after correction of outdoor unit : Heating capacity calculated in the above item 2.)

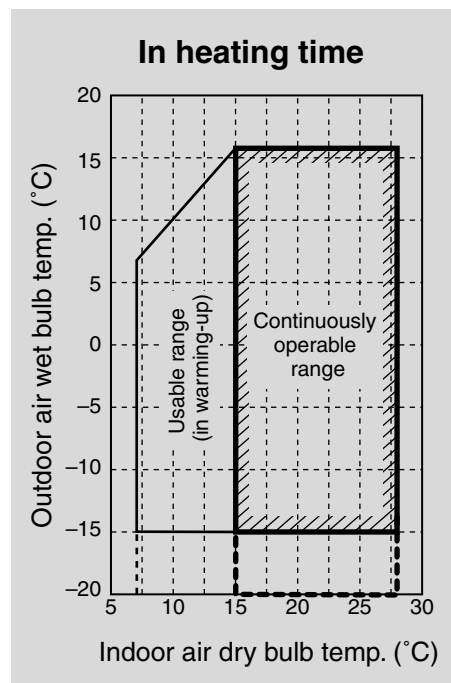
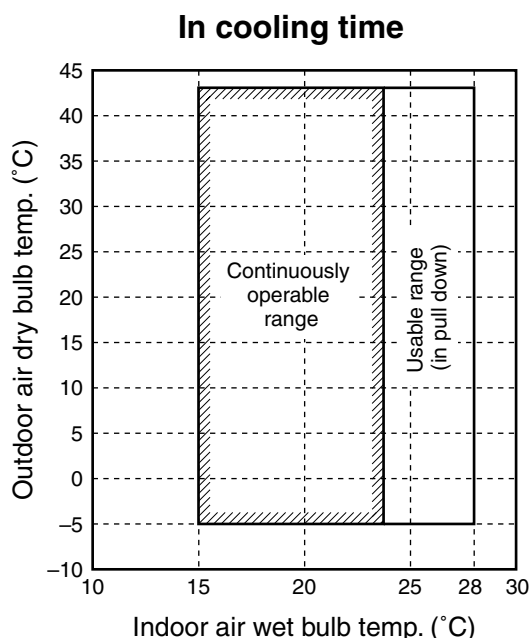
⑥ Capacity correction in case of frost on the outdoor heat exchanger



4. Capacity calculation for each indoor unit

$$\begin{aligned} &\text{Capacity for each indoor unit} \\ &= \text{Capacity after correction of outdoor unit} \times \frac{\text{Required standard capacity of indoor unit}}{\text{Total value of standard indoor unit capacity}} \end{aligned}$$

5. Operating temperature range



- * The unit can be operated even if outdoor temperature gets down to -20°C, however note that the warranty covers only up to -15°C because operation beyond that temperature is out of specification.
- * When outdoor air temperature falls to under -15°C, it may cause shortening the product lifetime.
- * When outdoor temperature goes out of specified range “❄️” or “🔥” mark is indicated on the remote controller display and required operation will stop.

“❄️ & 🔥”: When heating operation

“❄️”: When cooling operation

[Notice]

- This indication is not failure.
- When outdoor temperature goes back to specified range, “❄️” or “🔥” disappear and start normal operation.
- Operation stops because concurrent operation can not be kept in the condition of out of specification for Super HRM.

(Outdoor temp.(DB) <-5°C: Cooling,
 >21°C: Heating)

- * Do not use “Super HRM” for other than personal usage where the ambient temperature may go down below -5°C. (For example, OA equipment/Electric device/Food/Animals and plants/Art object)

6. Rated conditions

Cooling :

Indoor air temperature 27°C DB/19.0°C WB, Outdoor air temperature 35°C DB

Heating :

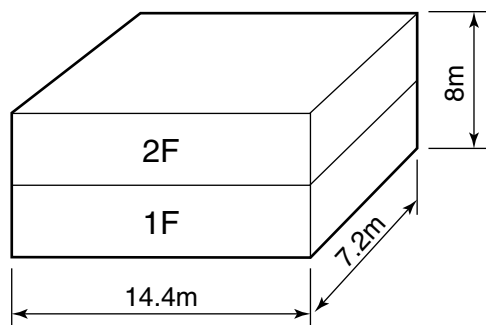
Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB

4. Example of equipment selection

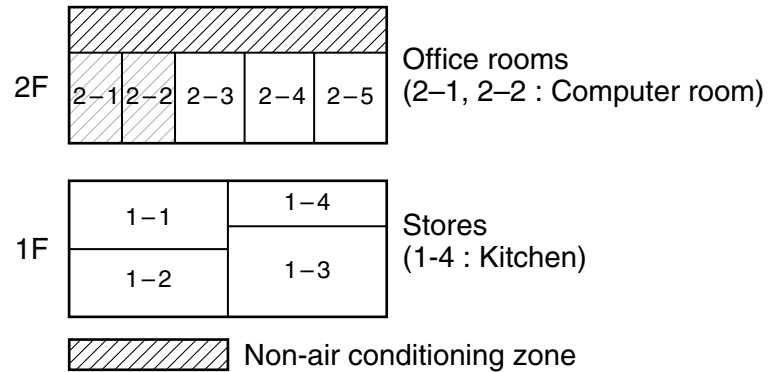
The following shows an example of equipment selection based upon a building model

Fig. 1 Overview of building model

<Outside view>



<Stories configuration>



- Steel frame, reinforced concrete building, four stories above ground. Total floor area : 207m²
Outdoor unit is installed on the roof.
- Design indoor conditions
Cooling : 27.0/19.0°C DB/WB, Heating : 20°C DB
- Design outdoor conditions
Cooling : 35°C DB (Standard condition), Heating : 3°C WB (Standard condition : 6°C WB)



Selection Criteria for Each Floor

2F : Outdoor capacity exactly matches the total indoor capacity.

Total indoor HP = Outdoor unit HP Indoor : 2.5 HP x 2 units + 1.25 HP + 2 HP x 2 = 10.25 HP
Outdoor : 10 HP Same capacity

Heat load of room 2-1 and 2-2 is higher than other rooms.

1F : Consider the increasing heat load in the specific room.

- Total indoor units HP > Outdoor unit HP
- Select each indoor unit based on individual peak room load.
Indoor : 2.5HP + 2.5HP + 3.2HP + 2.0HP =
10.2HP ← → Outdoor : 10HP (Same capacity)
- The room "1-4" is designed for "cooling only" because of its high heat load.
- The outdoor module should have sufficient capacity to cover the peak demand of the indoor unit connected.

Procedure and result of equipment selection

1. Procedure of equipment selection

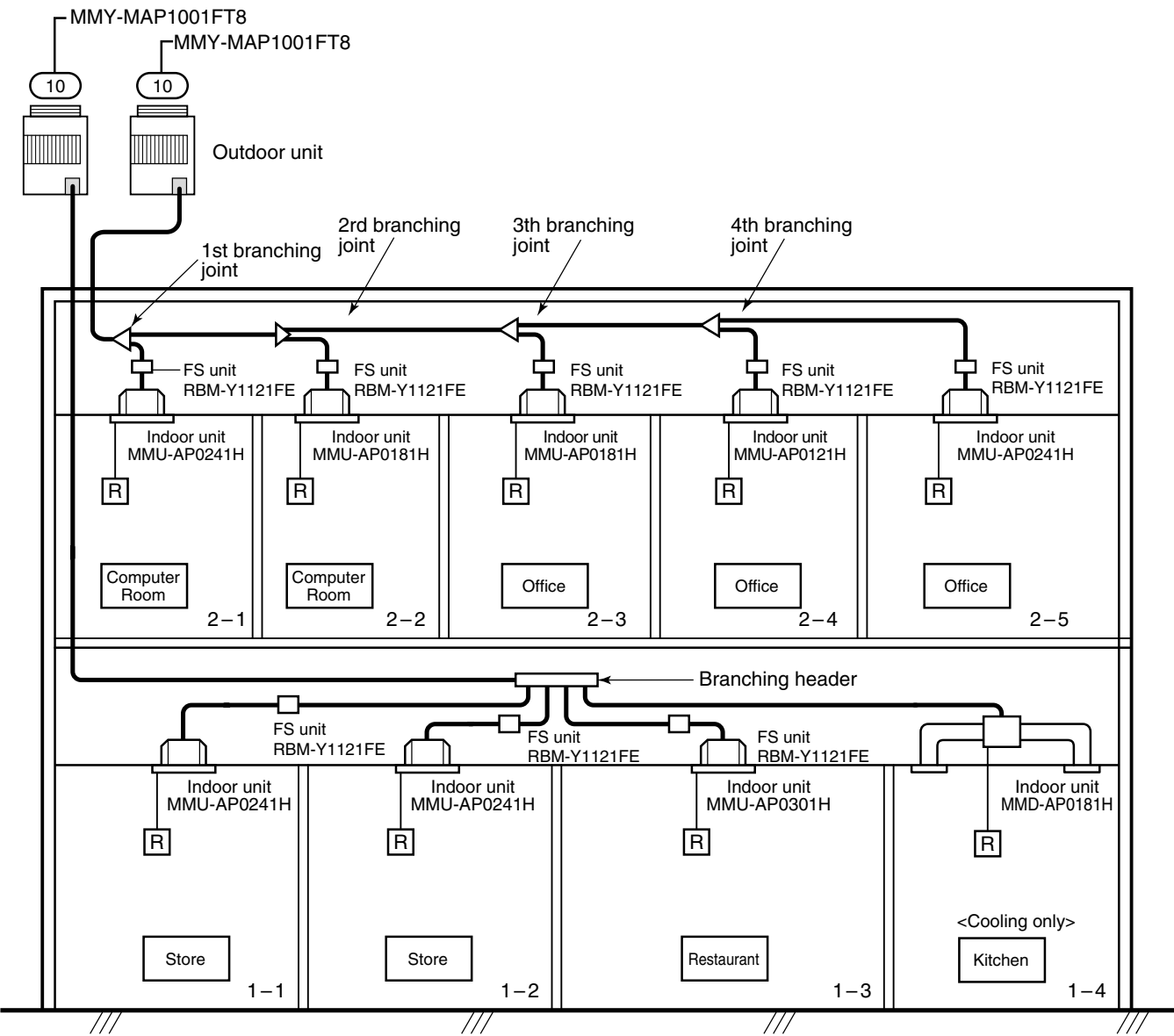
- Calculate cooling for every rooms.
- Select an indoor unit to match the cooling load for every room from the table in pages 8.
- Choose a tentative outdoor module that will match with the indoor units. Perform capacity correction based on the pipe length, system lift, indoor set temperature, outdoor temperature.
Then, make sure the corrected system cooling capacity satisfies the cooling load.

2. Equipment selection and capacity check

Air conditioning load				Equipment selection					
Floor	Room No.	Indoor air conditioning load (kW)		Indoor unit			Outdoor unit		
				Model	Capacity (kW)		Model MMY-	Capacity (kW)	
		Cooling	Heating		Cooling	Heating		Cooling	Heating
2F	4-1	6.0	3.4	MMU-AP0241H	7.1	8.0	MAP1001FT8	28.0	31.5
	4-2	5.2	2.2	MMU-AP0181H	5.6	6.3			
	4-3	5.0	4.2	MMU-AP0181H	5.6	6.3			
	4-4	3.2	2.7	MMU-AP0121H	3.6	4.0			
	4-5	6.4	5.4	MMU-AP0241H	7.1	8.0			
1F	1-1	6.1	6.0	MMU-AP0241H	7.1	8.0	MAP1001FT8	28.0	31.5
	1-2	6.3	6.3	MMU-AP0241H	7.1	8.0			
	1-3	7.2	7.0	MMU-AP0301H	9.0	10.0			
	1-4	5.1	—	MMD-AP0181H	5.6	6.3			

Piping distance				Capacity correction		Capacity check after correction		
Floor	Room No.	Equivalent length (m)	Height difference (m)	Pipe correction x temp. correction		Capacity		Judgment
						Capacity (kW)		
				Cooling	Heating	Cooling	Heating	
2F	4-1	25	1.5	1.0 × 1.0 × 0.956 = 0.956	1.0 × 0.95 × 0.988 × 0.95 = 0.892	6.3	3.8	good
	4-2					5.4	2.5	
	4-3					5.2	4.7	
	4-4					3.4	3.0	
	4-5					6.7	6.1	
1F	1-1	34	5	1.0 × 1.0 × 0.936 = 0.936	1.0 × 0.95 × 0.98 × 0.95 = 0.884	6.5	6.8	good
	1-2					6.7	7.1	
	1-3					7.7	7.9	
	1-4					5.4	—	

Schematic diagram



5. REFRIGERANT PIPING DESIGN

1. Warnings on refrigerant leakage

Important

Check of Concentration Limit

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.

The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively. Suffocation from leakage of R410A is almost non-existent. With the recent increase in the number of high concentration buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.

Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air conditioners. If a single unit of the multi conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.

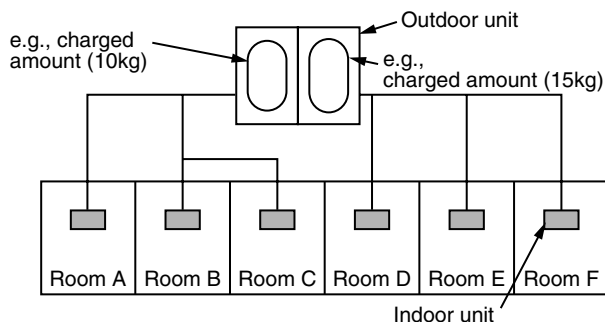
The concentration is as given below.

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

The concentration limit of R410A which is used in multi air conditioners is 0.3kg/m³.

NOTE 1 :

If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.



For the amount of charge in this example:

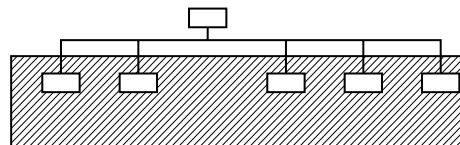
The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg.

The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

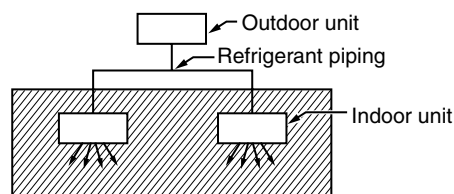
NOTE : 2

The standards for minimum room volume are as follows.

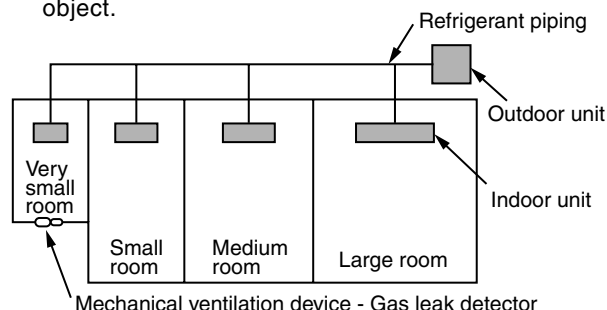
(1) No partition (shaded portion)



(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).

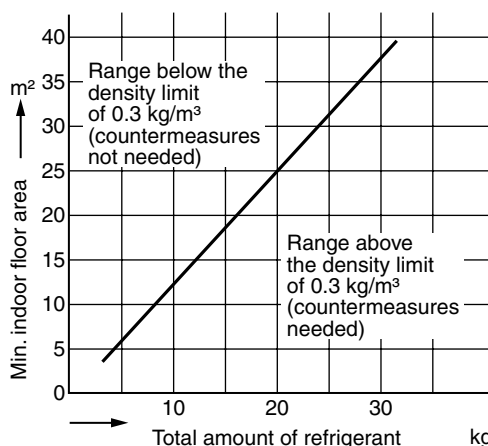


(3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



NOTE 3 :

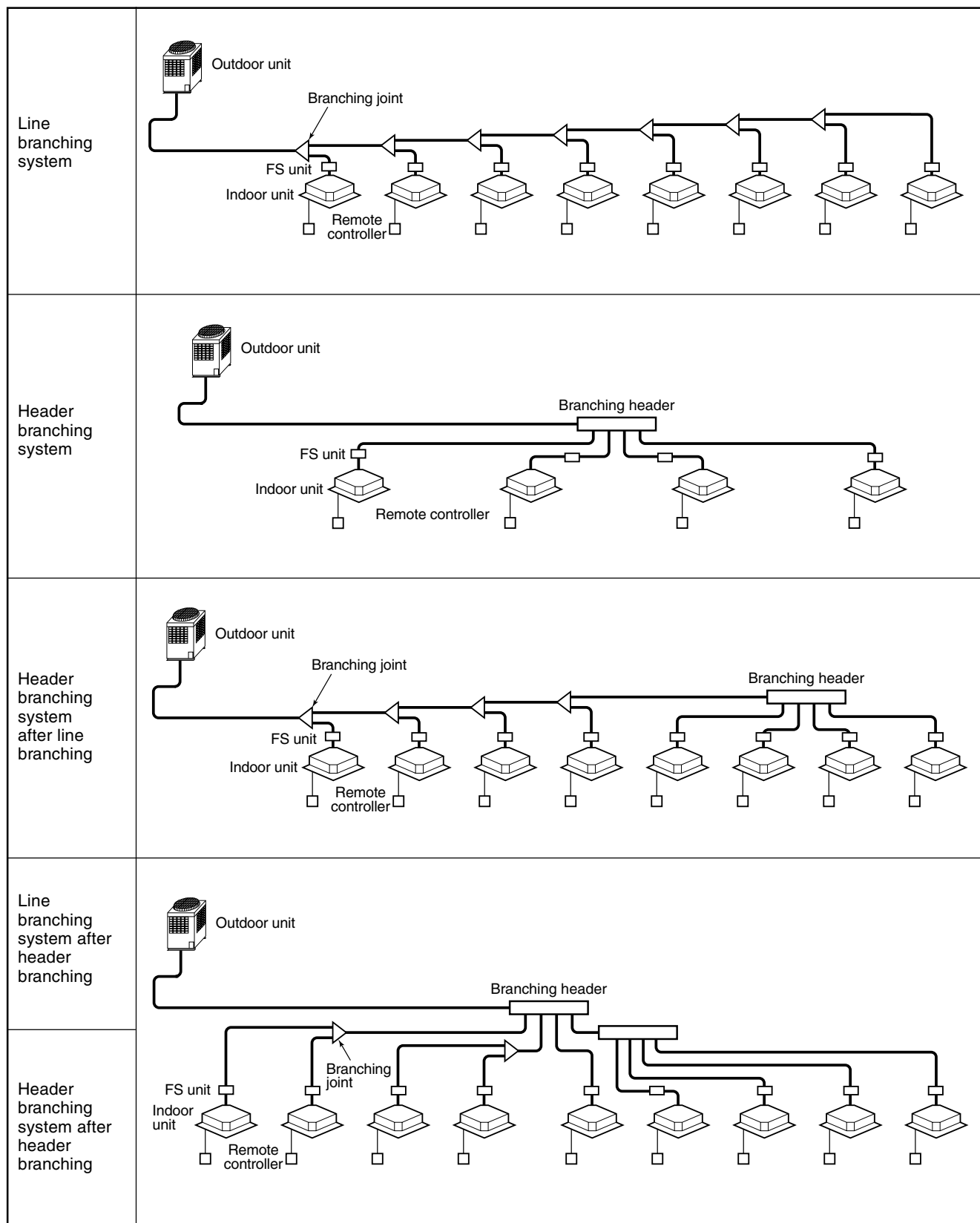
The minimum indoor floor area compared with the amount of refrigerant is roughly as follows: (When the ceiling is 2.7m high)



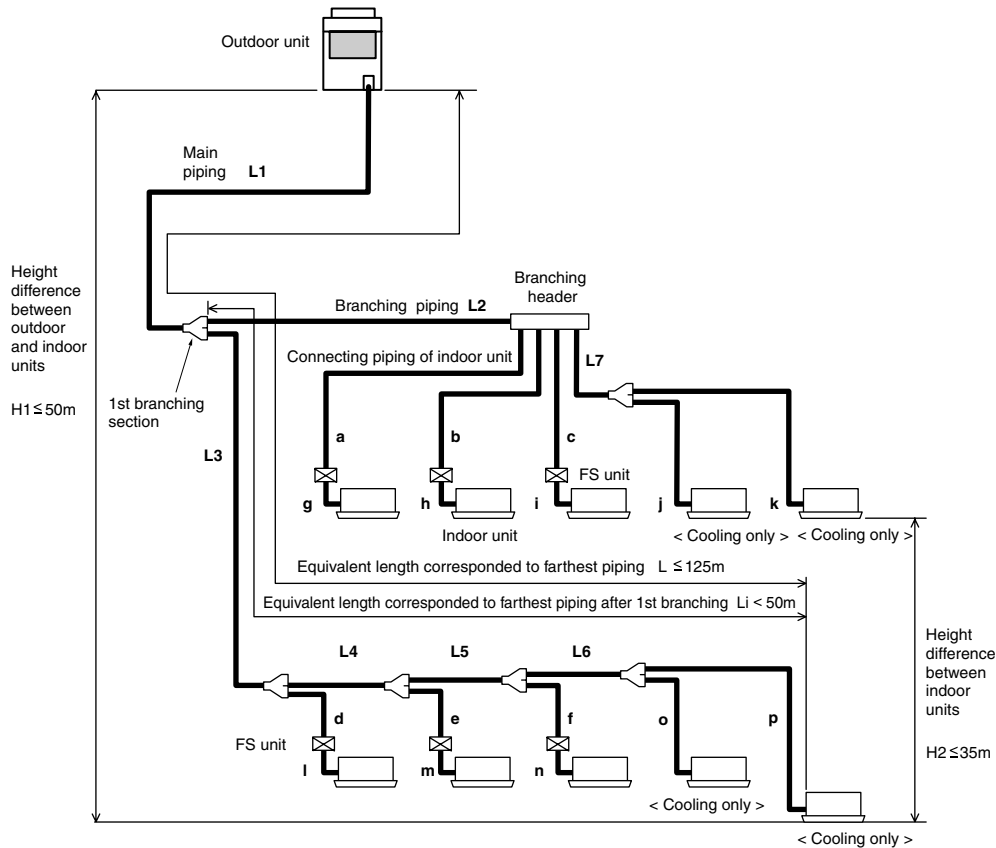
2. Free branching system

- ① Line branching system
- ② Header branching system
- ③ Header branching system after line branching
- ④ Line branching system after header branching
- ⑤ Header branching system after header branching

The above five branching systems are available to dramatically increase the flexibility of refrigerant piping design.



3. Allowable length/height difference of refrigerant piping

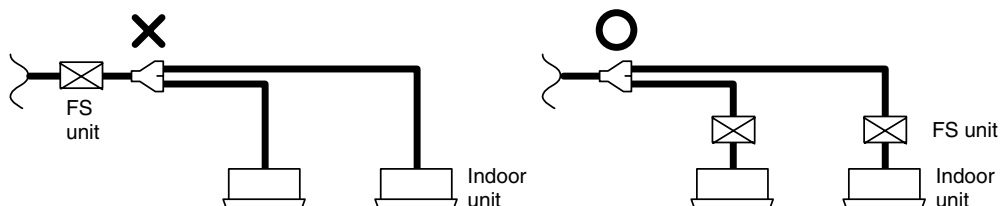


• Allowable length and height difference of refrigerant piping

			Allowable value	Piping section
Pipe Length	Total extension of pipe (Liquid pipe, real length)		250 m	$L1 + L2 + L3 + L4 + L5 + L6 + L7 + a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p$
	Farthest piping length L (*1)	Real length	100 m	$L1 + L3 + L4 + L5 + L6 + p$
		Equivalent length	125 m	
	Max. equivalent length of main piping		85 m	$L1$
	Equivalent length of farthest piping from 1st branching L_i (*1)		50 m	$L3 + L4 + L5 + L6 + p$
	Max. real length of indoor unit connecting piping		30 m	$a + g, b + h, c + i, d + l, e + m, f + n, j, k, o, p$
	Max. real length between FS unit and indoor unit L_i (*1) (*2)		15 m	g, h, i, l, m, n
Height difference	Height between indoor and outdoor units $H1$	Upper outdoor unit	50 m	—
		Lower outdoor unit	30 m	—
	Height between indoor units $H2$	Upper outdoor unit	35 m	—
		Lower outdoor unit	15 m	—

*1 The farthest indoor unit from the 1st Branch to be named as (p).

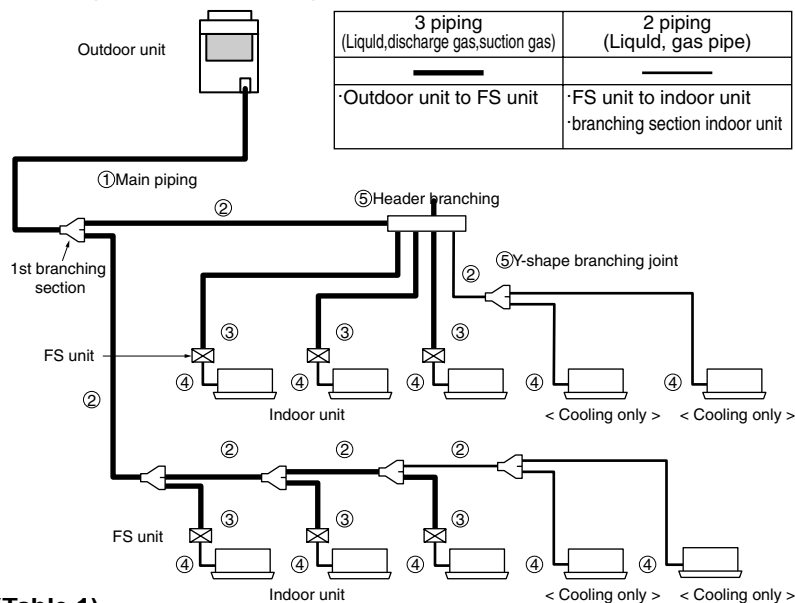
*2 Attached connection cable can be used up to 5 m in pipe length between indoor and FS unit. When the pipe length between indoor and FS unit exceeds 5 m, be sure to use the connection cable kit (RBC-CBK15FE). (Sold separately)



[NOTE]:

Don't connect two or more indoor units to one FS unit. Arrange one indoor unit and one FS unit set to 1 by 1.

4. Selection of refrigerant piping



① Size of main pipe (Table 1)

Model name	Suction gas side	Discharge gas side	Liquid side
MMY-MAP0801FT8	Ø 22.2	Ø 19.1	Ø 12.7
MMY-MAP1001FT8	Ø 22.2	Ø 19.1	Ø 12.7
MMY-MAP1201FT8	Ø 28.6	Ø 19.1	Ø 12.7

② Pipe size between branching joints (*1,*2) (Table 2)

Total capacity code of indoor units at downstream side	Suction gas side	Discharge gas side	Liquid side
Below 6.4	Ø 15.9	Ø 12.7	Ø 9.5
6.4 to below 12.2	Ø 22.2	Ø 19.1	Ø 12.7
12.2 to below 16.2	Ø 28.6	Ø 22.2	Ø 15.9

③ Pipe size between the end of branch and FS unit (Table 3)

Total capacity code of indoor units at downstream side *1	Suction gas side	Discharge Gas Pipe	Liquid Pipe
Below 1.7	Ø 12.7	Ø 9.5	Ø 6.4
1.7 to below 6.4	Ø 15.9	Ø 12.7	Ø 9.5

④ Piping of indoor unit (Table 4)

Capacity rank of indoor unit	Gas side	Liquid side
007 type to 012 type (15m or less)	Ø 9.5	Ø 6.4
007 type to 012 type (15m or more) *7	Ø 12.7	Ø 6.4
015 type to 018 type	Ø 12.7	Ø 6.4
024 type to 056 type	Ø 15.9	Ø 9.5

⑤ Selection for branching section (Table 5)

	Total capacity code of indoor unit *1	Model name	
		For 3 Piping	For 2 Piping
Y-shape branching joint *3 *4	Below 6.4	RBM-BY53FE	RBM-BY53E
	6.4 to below 14.2	RBM-BY103FE	RBM-BY103E
Branching header *3 *4 *5	Below 14.2	RBM-HY1043FE	RBM-HY1043E
	Below 14.2	RBM-HY1083FE	RBM-HY1083E

⑥ Selection for FS unit (Table 6)

Model name	Capacity rank for indoor unit
RBM-Y1121FE	007 type to 030 type
RBM-Y1801FE	036 type to 056 type

⑦ Minimum wall thickness for R410A application (Table 7)

Soft	Half hard or hard	OD (Inch)	OD (mm)	Minimum wall thickness (mm)
OK	OK	1/4"	6.35	0.80
OK	OK	3/8"	9.52	0.80
OK	OK	1/2"	12.70	0.80
OK	OK	5/8"	15.88	1.00
NG	*6	3/4"	19.05	1.00
NG		7/8"	22.20	1.00
NG		1.1/8"	28.58	1.00

- *1 In case the pipe size between branches exceeds the size of main pipe, it should be as same as the size of main pipe.
- *2 2 pipes for cooling only indoor unit shall be used with liquid pipe and suction gas pipe.
- *3 Branching pipe on the 1st branch should be selected according to the capacity code for outdoor unit.
- *4 In case total capacity code for indoor units shall be exceeded to capacity code for outdoor unit, the pipe size should be selected with capacity code for outdoor unit.
- *5 For 1 line after header branching, indoor units with a maximum of 6.0 capacity code in total can be connected.
- *6 If the pipe size exceeds Ø19.0, use half hard or hard type for material of the pipe.
- *7 If the pipe length between the branch section and "cooling only" indoor unit exceeds 15m, use the Ø12.7 pipe as the gas side.

5. Charging requirement 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 the amount of additional refrigerant required



Refrigerant in the system when shipped from the factory

		8HP	10HP	12HP
Refrigerant amount charged in factory	Heat recovery model	14.0kg	14.0kg	14.0kg

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 needed, and add that amount to the system.

(Calculation)

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

$$[\text{Additional refrigerant charge amount at site}] = [\text{Real length of liquid pipe}] \times \left[\frac{\text{Additional refrigerant charge amount per liquid pipe 1m (Table 1)}}{1} \right] \times 1.3$$

Example : Additional charge amount R (kg) = $\{(L1 \times 0.025\text{kg/m}) + (L2 \times 0.055\text{kg/m}) + (L3 \times 0.105\text{kg/m})\} \times 1.3$

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 : 10HP

Table 1

Pipe dia. at liquid side	Ø6.4	Ø9.5	Ø12.7
Additional refrigerant amount/1m	0.025kg	0.055kg	0.105kg

6. WIRING DESIGN

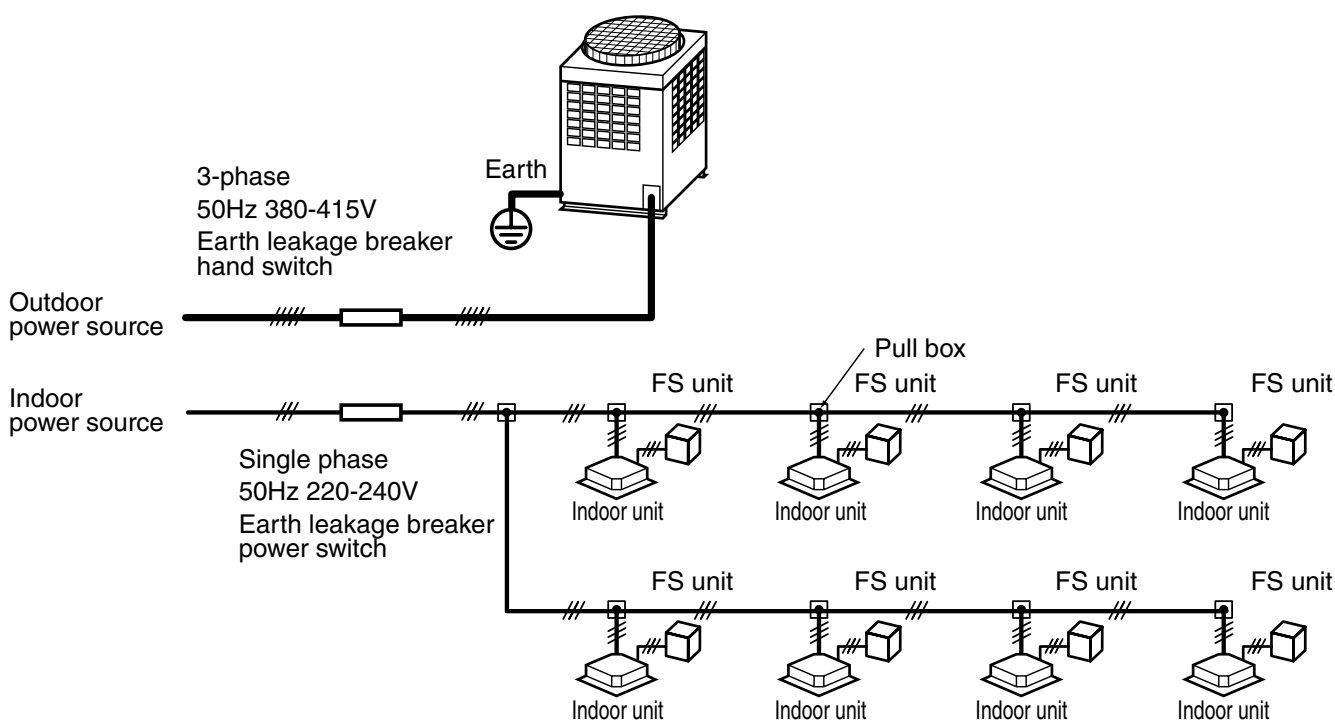
1. General

- (1) Perform wiring of the power supply in conformance with the regulations of the local electric company.
- (2) For the control wires connecting indoor units, and between indoor and outdoor units, use of double-core shield wires is recommended to prevent noise trouble.
- (3) Be sure to set the earth leakage breaker and the switches to the power supply section of the indoor unit.
- (4) Supply power to each outdoor unit and provide an earth leakage breaker or hand switch for each outdoor unit.
- (5) Never connect the 220–240V power to the terminal block (U1, U2, U3, U4, U5, U6) for control cables.
(Trouble is caused.)
- (6) Store wiring system for control and refrigerant piping system in the same line.
- (7) Arrange the cables so that the electric wires do not come to contact with high-temperature part of the pipe ; otherwise coating melts and an accident may be caused.
- (8) Do not turn on power of the indoor unit until vacuuming of the refrigerant pipe will finish.

2. For outdoor unit power supply

- Select the power supply cabling and fuse of each outdoor unit from the following specifications:
Cable 5-core, in conformance with Design 60245 IEC 66

3. Electrical wiring design



- Unit capacities and power supply wire sizes (Reference)

Model MMY-	Power supply wiring	
	Wire size	Field fuse
MAP0801FT8	3.5 mm ² (AWG #10) Max. 20 m	30 A
MAP1001FT8	5.5 mm ² (AWG #10) Max. 28 m	30 A
MAP1201FT8	5.5 mm ² (AWG #10) Max. 27 m	30 A

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

4. For Indoor unit power supply (Must be independent from outdoor unit power.)

Model \ Item	Power supply wiring		
	Wire size		Field fuse
All models of indoor units	2.0mm ² (AWG#14) Max. 20m	3.5mm ² (AWG#12) Max. 50m	15A
FS unit	Be sure to use the attached cable. If the length between indoor and FS unit exceeds 5 m, connect by using the connection cable kit (RBC-CBK15FE). (Sold separately)		

NOTE :

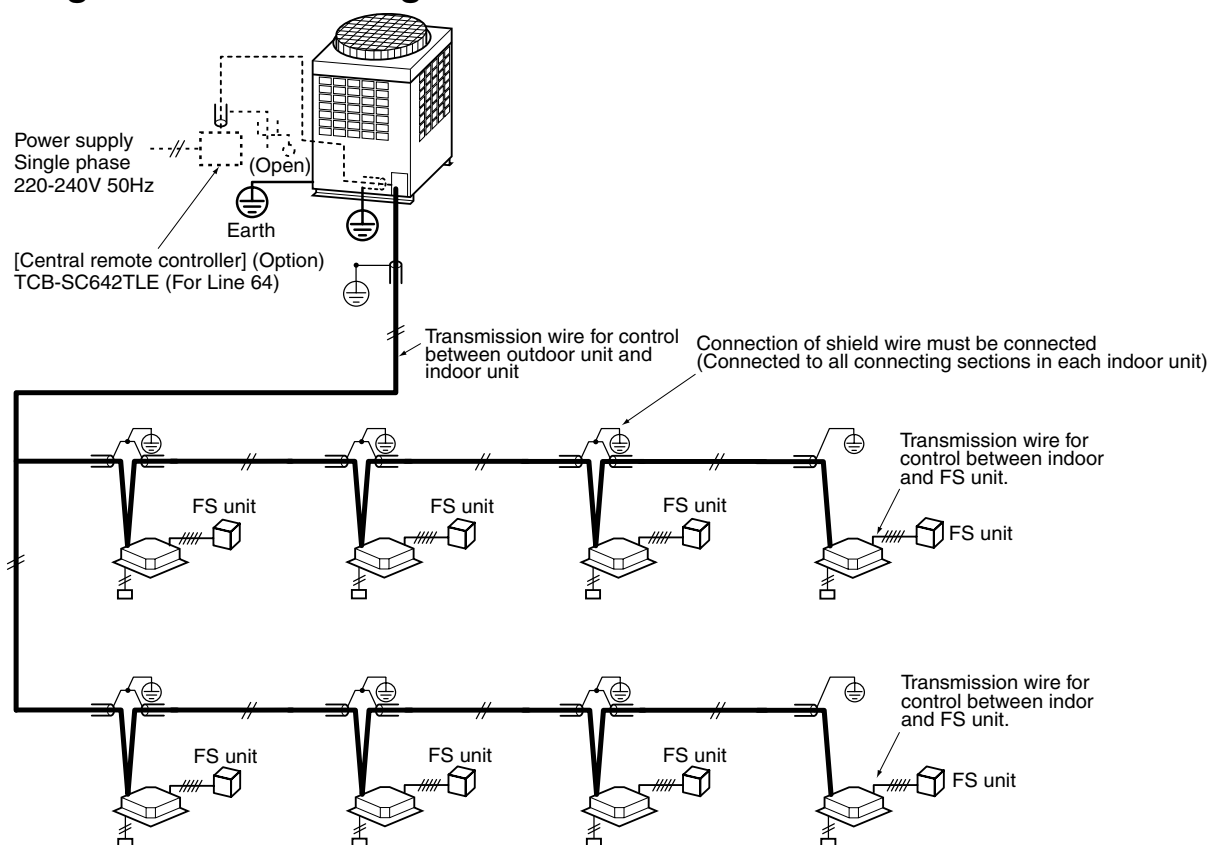
The connecting length indicated in the table represents the length from the pull box to the outdoor unit when the indoor units are connected in parallel for power, as shown in the above illustration. A voltage drop of no more than 2% is also assumed. If the connecting length will exceed the length indicated in the table, select the wire thickness in accordance with local wiring standards.



CAUTIONS

- (1) Keep the refrigerant piping system and the indoor-indoor/indoor-outdoor control wiring systems together.
- (2) When running power wires and control wires parallel to each other, either run them through separate conduits, or maintain a suitable distance between them.
(Current capacity of power wires: 10A or less for 300m, 50A or less for 500m)

5. Design of control wiring

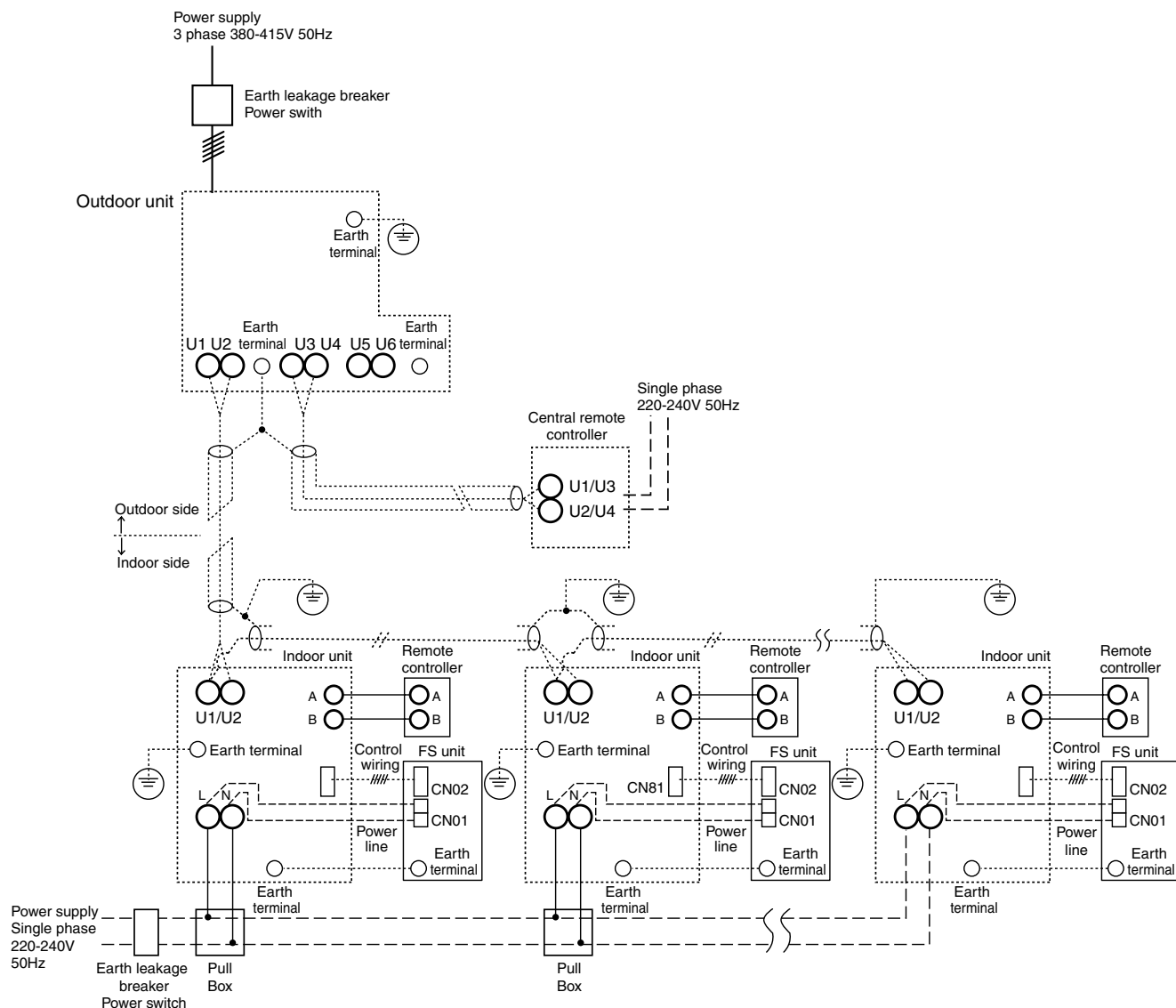


- Wire specification, quantity, size of crossover wiring and remote controller wiring

Name	Q'ty	Size			Specification
		Up to 500m	Up to 1000m	1000 to 2000m	
Crossover wiring (indoor-indoor / indoor-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	—	—	—
Control wiring between indoor and FS unit	Be sure to use the attached connection cable. If the length between indoor and FS unit exceeds 5 m, connect by using the connection cable kit (RBC-CBK15FE). (Sold separately)				

- (1) The crossover wiring and central control wiring use 2-core non-polarity transmission wires. Use 2-core shield wires to prevent noise trouble. In this case, close (connect) the end of shield wires, and perform the functional grounding for 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, perform the functional grounding at only one end of central control wiring.
- (2) Use 2-core and non-polarity wire for remote controller. (A, B terminals)
Use 2-core and non-polarity wire for wiring of group control. (A, B terminals)

6. System Wiring Design



NOTE :

Control wire and power line wire between FS unit and indoor unit are the accessory parts of FS unit. (Wire length : 6m)
If the length between indoor and FS unit exceeds 5m, connect by using the connection cable kit sold separately (RBC-CBK15FE).

7. Design

■ Outdoor unit

50Hz

Model name MMY-	Voltage Range		Compressor		Fan Motor		Power Supply		
	Min	Max	RLA	LRA	kW	FLA	MCA	MOCP	ICF
MAP0801FT8	342	457	5.2 + 5.2	—	0.60	1.0	20.0	30	—
MAP1001FT8	342	457	6.5 + 6.5	—	0.60	1.1	22.5	30	—
MAP1201FT8	342	457	9.5 + 9.5	—	0.60	1.1	24.5	30	—

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

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

■ Indoor unit

50Hz

Type	Model	Nominal Voltage (V-Ph-Hz)	Voltage Range		Fan Motor		Power Supply	
			Min	Max	kW	FLA	MCA	MOCP
4-Way Air Discharge Cassette Type	MMU-AP0091H	230-1-50	198	264	0.060	0.20	0.25	15
	MMU-AP0121H	230-1-50	198	264	0.060	0.20	0.25	15
	MMU-AP0151H	230-1-50	198	264	0.060	0.22	0.28	15
	MMU-AP0181H	230-1-50	198	264	0.060	0.24	0.30	15
	MMU-AP0241H	230-1-50	198	264	0.060	0.28	0.35	15
	MMU-AP0271H	230-1-50	198	264	0.060	0.28	0.35	15
	MMU-AP0301H	230-1-50	198	264	0.060	0.40	0.50	15
	MMU-AP0361H	230-1-50	198	264	0.090	0.68	0.85	15
2-Way Air Discharge Cassette Type	MMU-AP0481H	230-1-50	198	264	0.090	0.93	1.16	15
	MMU-AP0561H	230-1-50	198	264	0.090	0.95	1.19	15
	MMU-AP0071WH	230-1-50	198	264	0.053	0.36	0.45	15
	MMU-AP0091WH	230-1-50	198	264	0.053	0.36	0.45	15
	MMU-AP0121WH	230-1-50	198	264	0.053	0.36	0.45	15
	MMU-AP0151WH	230-1-50	198	264	0.039	0.37	0.46	15
	MMU-AP0181WH	230-1-50	198	264	0.039	0.37	0.46	15
	MMU-AP0241WH	230-1-50	198	264	0.053	0.53	0.66	15
1-Way Air Discharge Cassette Type	MMU-AP0271WH	230-1-50	198	264	0.053	0.53	0.66	15
	MMU-AP0301WH	230-1-50	198	264	0.053	0.54	0.68	15
	MMU-AP0481WH	220-1-50	198	242	0.092	1.33	1.67	15
	MMU-AP0071YH	230-1-50	198	264	0.022	0.28	0.35	15
	MMU-AP0091YH	230-1-50	198	264	0.022	0.28	0.35	15
	MMU-AP0121YH	230-1-50	198	264	0.022	0.28	0.35	15
Concealed Duct Type	MMU-AP0151SH	230-1-50	198	264	0.034	0.55	0.69	15
	MMU-AP0181SH	230-1-50	198	264	0.034	0.55	0.69	15
	MMU-AP0241SH	230-1-50	198	264	0.034	0.63	0.79	15
	MMD-AP0071BH	230-1-50	198	264	0.120	0.33	0.41	15
	MMD-AP0091BH	230-1-50	198	264	0.120	0.33	0.41	15
	MMD-AP0121BH	230-1-50	198	264	0.120	0.39	0.49	15
	MMD-AP0151BH	230-1-50	198	264	0.120	0.39	0.49	15
	MMD-AP0181BH	230-1-50	198	264	0.120	0.50	0.62	15
	MMD-AP0241BH	230-1-50	198	264	0.120	0.60	0.75	15
	MMD-AP0271BH	230-1-50	198	264	0.120	0.60	0.75	15
Concealed Duct High Static Pressure Type	MMD-AP0301BH	230-1-50	198	264	0.120	0.70	0.88	15
	MMD-AP0361BH	230-1-50	198	264	0.120	0.96	1.20	15
	MMD-AP0481BH	230-1-50	198	264	0.120	1.13	1.41	15
	MMD-AP0561BH	230-1-50	198	264	0.120	1.13	1.41	15
	MMD-AP0181H	230-1-50	198	264	0.160	0.93	1.16	15
Under Ceiling Type	MMD-AP0241H	230-1-50	198	264	0.160	1.55	1.94	15
	MMD-AP0271H	230-1-50	198	264	0.160	1.55	1.94	15
	MMD-AP0361H	230-1-50	198	264	0.260	1.87	2.34	15
	MMD-AP0481H	230-1-50	198	264	0.260	2.12	2.65	15
	MMC-AP0151H	230-1-50	198	264	0.030	0.33	0.41	15
	MMC-AP0181H	230-1-50	198	264	0.030	0.37	0.46	15
Hige Wall Type	MMC-AP0241H	230-1-50	198	264	0.040	0.48	0.60	15
	MMC-AP0271H	230-1-50	198	264	0.040	0.48	0.60	15
	MMC-AP0361H	230-1-50	198	264	0.080	0.90	1.13	15
	MMC-AP0481H	230-1-50	198	264	0.080	0.96	1.20	15
	MMK-AP0071H	230-1-50	198	264	0.030	0.35	0.44	15
	MMK-AP0091H	230-1-50	198	264	0.030	0.35	0.44	15
Floor Standing Cabinet Type	MMK-AP0121H	230-1-50	198	264	0.030	0.35	0.44	15
	MMK-AP0151H	230-1-50	198	264	0.030	0.37	0.46	15
	MMK-AP0181H	230-1-50	198	264	0.030	0.37	0.46	15
	MMK-AP0241H	230-1-50	198	264	0.030	0.40	0.50	15
	MML-AP0071H	230-1-50	198	264	0.045	0.30	0.37	15
Floor Standing Concealed Type	MML-AP0091H	230-1-50	198	264	0.045	0.30	0.37	15
	MML-AP0121H	230-1-50	198	264	0.045	0.49	0.62	15
	MML-AP0151H	230-1-50	198	264	0.045	0.49	0.62	15
	MML-AP0181H	230-1-50	198	264	0.070	0.54	0.68	15
	MML-AP0241H	230-1-50	198	264	0.070	0.54	0.68	15
Floor Standing Type	MML-AP0071BH	230-1-50	198	264	0.019	0.29	0.36	15
	MML-AP0091BH	230-1-50	198	264	0.019	0.29	0.36	15
	MML-AP0121BH	230-1-50	198	264	0.019	0.29	0.36	15
	MML-AP0151BH	230-1-50	198	264	0.070	0.52	0.65	15
	MML-AP0181BH	230-1-50	198	264	0.070	0.52	0.65	15
	MML-AP0241BH	230-1-50	198	264	0.070	0.53	0.66	15
	MMF-AP0151H	230-1-50	198	264	0.037	0.77	0.96	15
Floor Standing Type	MMF-AP0181H	230-1-50	198	264	0.037	0.77	0.96	15
	MMF-AP0241H	230-1-50	198	264	0.063	1.01	1.27	15
	MMF-AP0271H	230-1-50	198	264	0.063	1.01	1.27	15
	MMF-AP0361H	230-1-50	198	264	0.110	1.48	1.85	15
	MMF-AP0481H	230-1-50	198	264	0.160	1.84	2.30	15
Floor Standing Type	MMF-AP0561H	230-1-50	198	264	0.160	1.84	2.30	15

Legend

MCA : Minimum Circuit Amps
MOCP : Maximum Overcurrent Protection (Amps)

FLA : Full Load Amps
kW : Fan Motor Rated Output (kW)

7. CONTROLS

Enabling a range of controls to meet various system needs

As the size of the building increases so does the number of air-conditioning units required. The multiple air-conditioning system Super HRM ensures energy-saving and comfort by allowing a control of multiple units requiring different loads.

The Super HRM provides a range of functions to enable an integrated, centralized control of multiple units. Design an optimal system that best suits the application and scale of your project.

1. Control via indoor remote controller

1-1. Remote controller

Individual air-conditioning units can be controlled remotely.

1-2. Group control

One remote controller can control a maximum of 8 indoor units in group.

1-3. Two remote controller

The units can be controlled from two locations using two remote controllers.

1-4. Weekly timer

The units can be run on a weekly schedule using a "remote controller with weekly timer".

2. Control via the central remote controller

2-1. Central control + individual control

Up to 64 units can be controlled using the central remote controller and/or indoor remote controllers. Central control with Super MMS system is also available.

2-2. Weekly timer controller

The central remote controller can be connected to a weekly timer to set a weekly running schedule.

2-3. Control without indoor remote controller

The units can be operated from the central remote controller only, without the use of indoor remote controllers.

2-4. Control control with 1 by 1 model

Additionally, 1 by 1 model as Digital Inverter or Super Digital Inverter can be joined into the Super MMS and Super HRM central control scheme.

3. Network control

The Super HRM control system can realize flexible centralized network control facility according to customer's various requirements, for both open network building control in combination with other building apparatus like elevator, fire alarm, lighting, etc., and also for stand-alone air conditioning central control.

These central control scheme is mainly established by advanced local server platform.

3-1. Open network control

Super HRM open network facility is applicable for major building management global standards.

3-1-1. LONWORKS

The LONWORKS interface manages the Super HRM air conditioning system as a LON device to command a building computer message and to monitor the operation status.

3-1-2. BACnet

The local server serves air conditioning sub-system in a building control BACnet system.

3-2. Stand-alone central control

Simple stand-alone type exclusive air conditioning central control with less system integration work.

3-2-1. Touch screen controller

Combination of touch screen and local server enables easy operation and comfortable display.

3-2-2. Windows based Plug-in central controller

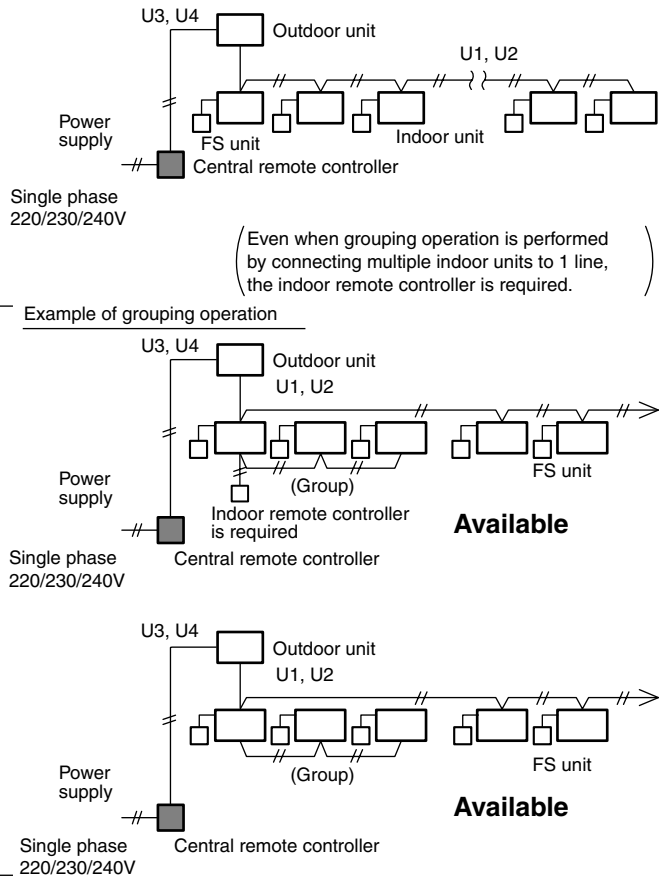
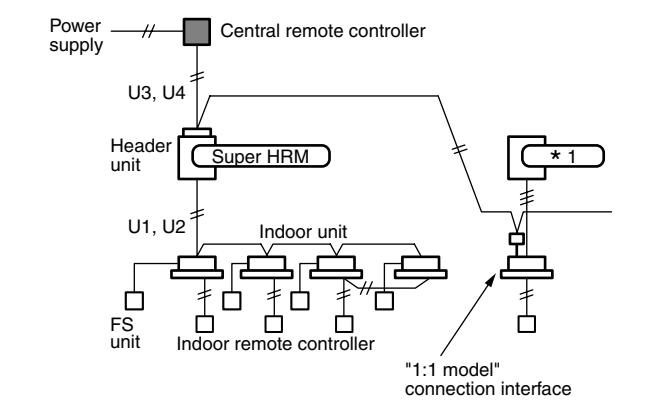
The local server serves central control function only by Plug-in into a customer's computer.

1. Applications for indoor remote controller

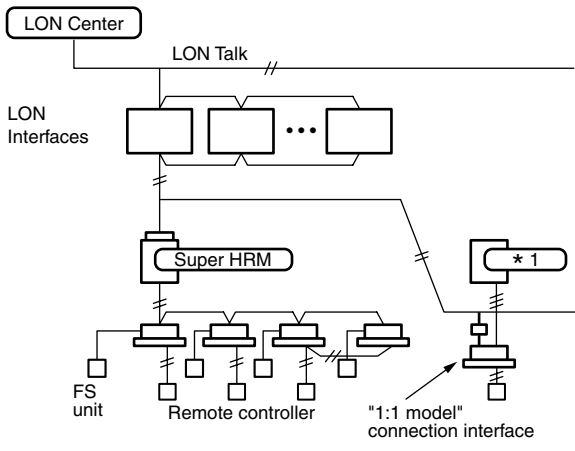
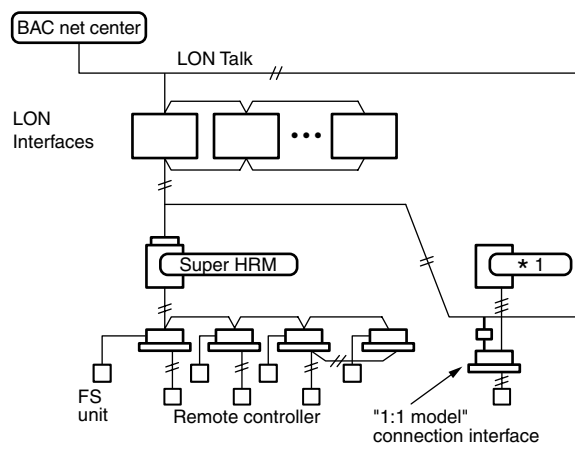
	Basic function	System diagram	Model
1-1	Individual control (Air conditioner is individually operated at a distance.)	Main remote controller Wireless remote controller Possible up to Max. total length 500m	- Wired remote controller RBC-AMT21E - Simple remote controller RBC-AS21E - Wireless remote controller kit TCB-AX21U(W)-E RBC-AX22CE TCB-AX21E
1-2	GROUP control (One remote controller can control group of Max. 8 indoor units. Operating on the same setting)	Max. 8 indoor units Possible up to Max. total length 500m	- Wired remote controller RBC-AMT21E - Simple remote controller RBC-AS21E
1-3	Two remote control (Air conditioner is controlled by two remote controllers at two places.)	Wired system Wireless system Possible up to Max. total length 500m Wired & Wireless combination control (Either controller should be set as side controller)	- Wired remote controller RBC-AMT21E - Simple remote controller RBC-AS21E - Wireless remote controller kit TCB-AX21U(W)-E RBC-AX22CE TCB-AX21E
1-4	Control by weekly timer (Weekly schedule operation)	Weekly timer function - Setting of ON-OFF 3 times par day - Timer time is displayed. - Designation of holiday	- Wired remote controller RBC-AMT21E + - Weekly timer RBC-EXW21E

2. Application controls for central remote controller

	Basic function	System diagram	Model
2-1	Central management controller for 64 units	Function of central remote controller • Individual control up to 64 indoor units. • Individual control for max. 64 indoor units divided 1 to 4 zone. (Up to 16 indoor units for each zone.) • Up to 16 outdoor header units are connectable. • 4 type central control setting to inhibit individual operation by remote controller can be selected. • Setting for one of 1 to 4 zone is available. • Usable with other central control devices (Up to 10 central control devices in one control circuit) • Two control mode selectivity Central controller mode/Remote controller mode • Setting of simultaneous ON/OFF 3 times for each day of the week combined with weekly timer.	• Central remote controller TCB-SC642TLE <Indoor remote controller> • Wired remote controller RBC-AMT21E • Simple remote controller RBC-AS21E
2-2	Central remote controller + Weekly timer (Weekly operation schedule can be set by connecting a weekly timer to the central remote controller)		• Central remote controller TCB-SC642TLE + • Weekly timer RBC-EXW21E <Indoor remote controller> • Wired remote controller RBC-AMT21E - or • Simple remote controller RBC-AS21E

	Basic function	System diagram	Model
2-3	Remote central control without indoor remote controller	 U3, U4 Outdoor unit Power supply FS unit Indoor unit U1, U2 Central remote controller Single phase 220/230/240V (Even when grouping operation is performed by connecting multiple indoor units to 1 line, the indoor remote controller is required.) Example of grouping operation U3, U4 Outdoor unit U1, U2 Power supply FS unit Indoor remote controller is required Central remote controller Single phase 220/230/240V Available U3, U4 Outdoor unit U1, U2 Power supply FS unit Central remote controller Single phase 220/230/240V Available	- Central remote controller TCB-SC642TLE <Indoor remote controller> - Wired remote controller RBC-AMT21E
2-4	Central management control with "1 : 1 model"	 Power supply Central remote controller U3, U4 Header unit Super HRM U1, U2 Indoor unit FS unit Indoor remote controller "1:1 model" connection interface * TOSHIBA Digital Inverter System and Super Digital Inverter System	- Central remote controller TCB-SC642TLE "1 : 1 model" connection interface TCB-PCNT30TLE (RAV-SM560KRT-E, SM800KRT-E are not available) <Indoor remote controller> - Wired remote controller RBC-AMT21E - Simple remote controller RBC-AS21E

3. Application control for network

	Basic function	System diagram	Model
3-1-1	LONWORKS	 *1 TOSHIBA Digital Inverter System and Super Digital Inverter System The LONWORKS interface shall be connected between a building management computer and the Super HRM and Super MMS system.	• LON Gateway TCB-IFLN**** • “1 : 1 model” connection interface TCB-PCNT30TLE (RAV-SM560KRT-E, SM800KRT-E are not available) <Indoor remote controller> • Wired remote controller RBC-AMT21E or • Simple remote controller RBC-AS21E
3-1-2	BACnet	 *1 TOSHIBA Digital Inverter System and Super Digital Inverter System The local server shall be connected under the BACnet network, and shall be connected the Super HRM and Super MMS system through the interface.	• BACnet local server BMS-LSV***** • TCS-Net Relay Interface BMS-IFLSV1E • “1 : 1 model” connection interface TCB-PCNT30TLE (RAV-SM560KRT-E, SM800KRT-E are not available) <Indoor remote controller> • Wired remote controller RBC-AMT21E • Simple remote controller RBC-AS21E

	Basic function	System diagram	Model
3-2-1	Touch screen controller	*1 TOSHIBA Digital Inverter System and Super Digital Inverter System Combination of touch screen and local server.	• Touch screen controller BMS-TP5120ACE • Intelligent server BMS-LSV2E BMS-STC01E • TCS-Net Relay Interface BMS-IFLSV1E • Energy Monitoring Relay Interface BMS-IFWH3E • Digital I/O Relay Interface BMS-IFDD01E • "1 : 1 model" connection interface TCB-PCNT30TLE (RAV-SM560KRT-E, SM800KRT-E are not available) <Indoor remote controller> • Wired remote controller RBC-AMT21E • Simple remote controller RBC-AS21E
3-2-2	Windows based central controller	*1 TOSHIBA Digital Inverter System and Super Digital Inverter System The local server shall be "Plug-in" into a customer's personal computer.	• WINDOWS based central controller BMS-LSV** • TCS-Net Relay Interface BMS-IFLSV1E • Intelligent server BMS-LSV2E BMS-STC01E • Energy Monitoring Relay Interface BMS-IFWH3E • Digital I/O Relay Interface BMS-IFDD01E • "1 : 1 model" connection interface TCB-PCNT30TLE (RAV-SM560KRT-E, SM800KRT-E are not available) <Indoor remote controller> • Wired remote controller RBC-AMT21E • Simple remote controller RBC-AS21E

8. ACCESSORIES

Accessories parts for indoor unit

- Remote controller

Indoor unit type	Accessory parts name	Model	Applicable model
4-way Air Discharge Cassette Type	Wired remote controller	RBC-AMT21E	Common parts for all type model
2-way Air Discharge Cassette Type	Central remote controller	TCB-SC642TLE	
1-way Air Discharge Cassette Type	Weekly timer	RBC-EXW21E	
Concealed Duct Type	Simple remote controller	RBC-AS21E	
Concealed Duct, High Static Pressure Type	Wire-less remote controller kit *1	TCB-AX21U(W)-E	4-way Air Discharge Cassette Type
Under Ceiling Type		RBC-AX22CE	Under Ceiling Type
High Wall Type			
Floor Standing Cabinet Type		TCB-AX21E	Universal Type (Except concealed duct high static pressure type)
Floor Standing Concealed Type			
Floor Standing Type			

*1: For handling the Wireless Remote Controller kit, consult your dealer about availability.

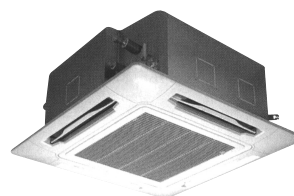
• Panels

Indoor unit type		Accessory parts name	Model	Application model	Remarks
4-way Air Discharge Cassette Type	Required accessory	Ceiling panel	RBC-U21PG(W)-E		
	Optional	Super Long Life Filter	TCB-UF1601UE		
		High Efficiency Filter 65	TCB-UFM1601UE		
		High Efficiency Filter 90	TCB-UFH1601UE		
		Filter Frame	TCB-DF21UKE		Be necessary for first using
		Fresh air and Filter Chamber	TCB-GFC1601UE		
		Fresh air inlet Box	TCB-GB1601UE		Be used with TCB-GFC1601UE
		Auxiliary fresh air Flange	TCB-FF101URE		
		Spacer for height adjustment	TCB-SP1601UE TCB-SP1601U-KW50E		
		Air discharge direction kit	TCB-BC1601UE		Three-piece group
2-way Air Discharge Cassette Type	Required accessory	Ceiling panel	RBC-UW136PG	AP0071-0121	
			RBC-UW266PG	AP0151-0301	
			RBC-UW466PG	AP0361-0561	
1-way Air Discharge Cassette Type	Required accessory	Ceiling panel	RBC-US165PG	AP0151-0181	
			RBC-US265PG	AP0241	
			RBC-UY135PG	AP0071-0121	
Concealed Duct Type	Optional	High Efficiency Filter 65	TCB-UFM11BFCE	AP0071-0121/AP0241-0301	AP0241-AP0301 use two piece
			TCB-UFM21BFCE	AP0151-0181/AP0361-0561	AP0361-AP0581 use two piece
			TCB-UFM11BE	AP0071-0121	
			TCB-UFM21BE	AP0151-0181	
			TCB-UFM31BE	AP0241-0301	
			TCB-UFM41BE	AP0361-0561	
		High Efficiency Filter 90	TCB-UFH51BFCE	AP0071-0121/AP0241-0301	AP0241-AP0301 use two piece
			TCB-UFH61BFCE	AP0151-0181/AP0361-0561	AP0361-AP0581 use two piece
			TCB-UFH51BE	AP0071-0121	
			TCB-UFH61BE	AP0151-0181	
			TCB-UFH71BE	AP0241-0301	
			TCB-UFH81BE	AP0361-0561	
		Ceiling panel	RBC-UD281PE(W)	AP0071-0121	
			RBC-UD501PE(W)	AP0151-0181	
			RBC-UD801PE(W)	AP0241-0301	
			RBC-UD1401PE(W)	AP0361-0561	
		Suction Canvas	TCB-CA281BE	AP0071-0121	
			TCB-CA501BE	AP0151-0181	
			TCB-CA801BE	AP0241-0301	
			TCB-CA1401BE	AP0361-0561	
		Filter Chamber	TCB-FC281BPE	AP0071-0121	
			TCB-FC501BPE	AP0151-0181	
			TCB-FC801BPE	AP0241-0301	
			TCB-FC1401BPE	AP0361-0561	
		Filter kit for underside	TCB-FK281BE	AP0071-0121	
			TCB-FK501BE	AP0151-0181	
			TCB-FK801BE	AP0241-0301	
			TCB-FK1401BE	AP0361-0561	
Concealed Duct High Static Pressure Type	Optional	High Efficiency Filter 65	TCB-UFM1D-1E	AP0181-0481	AP0481 use two piece
			TCB-UFM2D-1E	AP0241-0361	Use two piece
		High Efficiency Filter 90	TCB-UFH5D-1E	AP0181-0481	AP0481 use two piece
			TCB-UFH6D-1E	AP0241-0361	Use two piece
		Long Life Pre Filter	TCB-PF1D-1E	AP0181-0481	AP0481 use two piece
			TCB-PF2D-1E	AP0241-0361	Use two piece
		Filter Chamber	TCB-FCY21DE	AP0181	
			TCB-FCY31DE	AP0241-0361	
			TCB-FCY51DE	AP0481	
Under Ceiling Type	Optional	Drain pump kit	TCB-DP21DE	AP0181-0481	* Required accessory when using Drain Pump Kit
			TCB-DP22CE	AP0151-0481	
			TCB-KP12CE	AP0151-0181	
			TCB-KP22CE	AP0241-0481	

Note 1 : Concerning the Wire-less Remote Controller Kit and other optional equipments out of the table, consult your dealer about availabilities.

9. TECHNICAL SPECIFICATIONS

Indoor unit (50Hz specifications)



50Hz

• 4-way Air Discharge Cassette Type

Model name			MMU-	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H	AP0271H	AP0301H	AP0361H	AP0481H	AP0561H
Cooling/Heating capacity (Note 1)			(kW)	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	9.0/10.0	11.2/12.5	14.0/16.0	16.0/18.0
Electrical characteristics	Power supply			1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)									
	Running current (A)			0.17		0.19	0.21	0.24		0.35	0.59	0.81	0.83
	Power consumption (kW)			0.020		0.022	0.026	0.032		0.048	0.070	0.110	0.112
	Starting current (A)			0.30		0.33	0.36	0.42		0.59	0.87	1.23	1.26
Appearance	Main unit			Heat-insulating material attached Zinc hot dipping steel plate									
	Ceiling Panel	Model			RBC-U21PG (W)-E								
		Panel color			Moon white (Munsell/2.5GY 9.0/0.5)								
Outer dimension	Main unit	Height (mm)	256								319		
		Width (mm)	840										
		Depth (mm)	840										
	Ceiling panel	Height (mm)	35										
		Width (mm)	950										
		Depth (mm)	950										
Total weight	Main unit (kg)			20		22		23			28		
	Ceiling panel (kg)			4.5									
Heat exchanger				Finned tube									
Soundproof/Heat-insulating material				Non-flammable insulation									
Fan unit	Fan			Turbo fan									
	Standard air flow High (Mid./Low) (m³/h)			800 (730/680)		930 (830/790)	1,050 (920/800)	1,200 (920/820)		1,320 (1,110/850)	1,680 (1300/1,070)	2,040 (1,430/1,130)	2,090 (1,520/1,230)
	Motor (W)			60							90		
Air filter				Standard filter attached (Long life filter)									
Controller				Remote controller									
Connecting pipe	Gas side (mm)			Ø9.5		Ø12.7		Ø15.9					
	Liquid side (mm)			Ø6.4				Ø9.5					
	Drain port (Nominal dia.)			25 (Polyvinyl chloride tube)									
Sound level(Note 2) High (Mid./Low) (dB(A))			30/29/27		31/29/27	32/29/28	34/31/28		37/33/30	40/36/33	44/38/34	45/40/34	

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
 Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB


50Hz

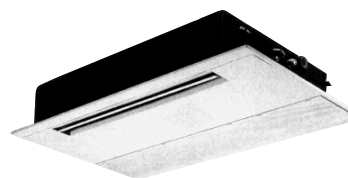
• 2-way Air Discharge Cassette Type

Model name			MMU-	AP0071WH	AP0091WH	AP0121WH	AP0151WH	AP0181WH	AP0241WH	AP0271WH	AP0301WH	AP0481WH China only	
Cooling/Heating capacity			(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	9.0/10.0	14.0/16.0	
Electrical characteristics	Power supply		1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)									1 phase 50Hz 220V	
	Running current (A)		0.31			0.32		0.46		0.47		1.16	
	Power consumption (kW)		0.070			0.072		0.105		0.106		0.250	
	Power factor (%)		97						99		98		98
	Starting current (A)		0.47			0.60		0.89		0.98		1.33	
Appearance	Main unit		Heat-insulating material attached Zinc hot dipping steel plate										
	Ceiling panel	Model	RBC-UW136PG				RBC-UW266PG				RBC-UW466PG		
		Panel color	Light ivory (Munsell 10Y 9/0.5)										
Outer dimension	Main unit	Height (mm)	398									406	
		Width (mm)	830				1,350				1,650		
		Depth (mm)	550									620	
	Ceiling panel	Height (mm)	8										
		Width (mm)	1,000				1,520				1,898		
		Depth (mm)	650									680	
Total weight	Main unit (kg)		33			44		48			52		
	Ceiling panel (kg)		8			11					18		
Heat exchanger				Finned tube									
Soundproof/Heat-insulating material				Non-flammable insulation									
Fan unit	Fan		Centrifugal fan										
	Standard air flow (High/Mid./Low) (m³/h)		570/510/450				780/700/600		1140/960/720		1260/1140/960	1920/1500/1050	
	Motor (W)		53			39		53			92		
Air filter				Standard filter attached (Long life filter)									
Controller				Remote controller									
Connecting pipe	Gas side (mm)		Ø9.5			Ø12.7		Ø15.9					
	Liquid side (mm)		Ø6.4					Ø9.5					
	Drain port (Nominal dia.)		25 (Polyvinyl chloride tube)										
Sound level (Note 2) (High/Mid./Low) (dB(A))			34/32/30				35/33/30		38/35/33		40/37/34	45/42/39	

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB


50Hz

• 1-way Air Discharge Cassette Type

Model name			MMU-	AP0071YH	AP0091YH	AP0121YH	AP0151SH	AP0181SH	AP0241SH
Cooling/Heating capacity (Note 1)			(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0
Electrical characteristics (Note 2)	Power supply			1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)					
	Running current (A)			0.24			0.48		0.55
	Power consumption (kW)			0.053			0.103		0.115
	Power factor (%)			95			93		91
	Starting current (A)			0.6			0.8		1.1
Appearance	Main unit			Heat-insulating material attached Zinc hot dipping steel plate					
	Ceiling panel	Model			RBC-UY135PG		RBC-US165PG		RBC-US265PG
		Panel color			W : Silky shade (1Y8.5/0.5)				
Outer dimension	Main unit	Height (mm)	235			198			
		Width (mm)	850			1,000		1,200	
		Depth (mm)	400			655			
	Ceiling panel	Height (mm)	18			10			
		Width (mm)	1,050			1,220		1,420	
		Depth (mm)	470			755			
Total weight	Main unit (kg)			22			27		31
	Ceiling panel (kg)			3.5			8		9
Heat exchanger				Finned tube					
Soundproof/Heat-insulating material				Non-flammable insulation					
Fan unit	Fan			Centrifugal fan					
	Standard air flow (High/Mid./Low) (m³/h)			540/480/420			780/720/660		1,200/1,140/1,020
	Motor (W)			22			34		
Controller				Remote controller					
Room thermostat				Attached					
Air filter				Standard filter attached (Long life filter)					
Connecting pipe	Gas side (mm)			Ø9.5			Ø12.7		Ø15.9
	Liquid side (mm)			Ø6.4					Ø9.5
	Drain port (Nominal dia.)			25 (Polyvinyl chloride tube)					
Sound level (Note 2) (High/Mid./Low) (dB(A))				42/39/34			42/39/35		43/41/37

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB


50Hz

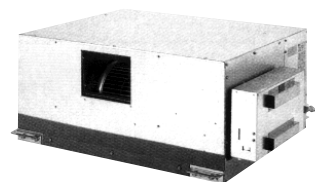
• Concealed Duct Type

Model name			MMD-	AP0071BH	AP0091BH	AP0121BH	AP0151BH	AP0181BH	AP0241BH	AP0271BH	AP0301BH	AP0361BH	AP0481BH	AP0561BH				
Cooling/Heating capacity (Note 1)			(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	9.0/10.0	11.2/12.5	14.0/16.0	16.0/18.0				
Electrical characteristics	Power supply		1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)															
	Running current (A)		0.29		0.34		0.43		0.52		0.61		0.83		0.98			
	Power consumption (kW)		0.033		0.039		0.050		0.060		0.071		0.107		0.128			
	Starting current (A)		0.5		0.59		0.75		0.90		1.05		1.44		1.70			
Appearance	Main unit		Zinc hot dipping steel plate															
Outer dimension	Main unit	Height (mm)	320															
		Width (mm)	550			700			1,000			1,350						
		Depth (mm)	800															
	Suction ceiling panel	Height (mm)	9															
		Width (mm)	630			780			1,080			1,430						
		Depth (mm)	500															
Total weight	Main unit (kg)		28			32			43			55						
	Ceiling panel (kg)		3.5			4			6			7						
Heat exchanger				Finned tube														
Soundproof/Heat-insulating material				Non-flammable insulation														
Fan unit	Fan		Centrifugal fan															
	Standard air flow High (Mid./Low) (m³/h)		480 (420/340)		570 (490/400)		650 (540/480)		780 (660/540)		1,140 (990/870)		1,260 (1080/870)		1,620 (1410/1200)		1,980 (1710/1490)	
	Motor (W)		120															
	External static pressure (factory setting) (Pa)		50 (4 mmAq)															
	External static pressure (Pa)		110 (10 mmAq)															
Air filter				Standard filter attached (Long life filter)														
Controller				Remote controller														
Connecting pipe	Gas side (mm)		Ø9.5				Ø12.7				Ø15.9							
	Liquid side (mm)		Ø6.4								Ø9.5							
	Drain port (Nominal dia.)		25 (Polyvinyl chloride tube)															
Sound level (Note 2) (High/Mid./Low) (dB(A))			30/28/26			31/29/27			32/30/28		33/31/29		34/32/29		36/34/32		38/36/32	

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB



50Hz

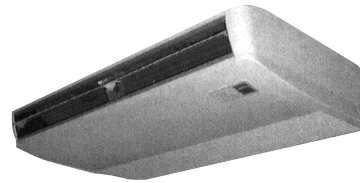
• **Concealed Duct High Static Pressure Type**

Model name		MMD-	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H
Cooling/Heating capacity (Note 1)		(kW)	5.6/6.3	7.1/8.0	8.0/9.0	11.2/12.5	14.0/16.0
Electrical characteristics	Power supply		1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)				
	Running current (A)		0.81	1.35		1.63	1.84
	Power consumption (kW)		0.184	0.299		0.368	0.414
	Power factor (%)		99	96		98	98
	Starting current (A)		1.3	3.5		4.1	4.8
Appearance			Zinc hot dipping steel plate				
Outer dimension	Height x Width x Depth (mm)		380 x 850 x 660				380x1200x660
Total weight (kg)			50	52		56	67
Heat exchanger			Finned tube				
Soundproof/Heat-insulating material			Non-flammable insulation				
Fan unit	Fan		Centrifugal fan				
	Standard air flow (m³/h)		900	1,320		1,600	2,100
	Motor (W)		160			260	
	External static pressure (Factory setting) (Pa)		137				
	External static pressure (Pa)		68.6-137-196				
	Air flow limit Lower limit/Upper limit (m³/h)		720/1,080	1,060/1,580		1,280/1,920	1,680/2,520
Air filter			Option or field supply				
Controller			Remote controller				
Connecting pipe	Gas side (mm)		Ø12.7	Ø15.9			
	Liquid side (mm)		Ø6.4	Ø9.5			
	Drain port (Nominal dia.)		25 (One side of male screw)				
Sound level (Note 2) (High/Mid./Low) (dB(A))			37	40			

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB


50Hz

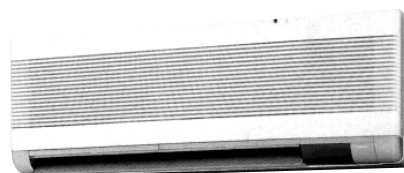
• Under Ceiling Type

Model name		MMC-	AP0151H	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H
Cooling/Heating capacity (Note 1)		(kW)	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	11.2/12.5	14.0/16.0
Electrical characteristics	Power supply		1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)					
	Running current (A)		0.29	0.32	0.42		0.78	0.84
	Power consumption (kW)		0.033	0.038	0.050		0.091	0.110
	Starting current (A)		0.43	0.48	0.62		1.17	1.25
Appearance			White (Munsell 10Y 9.3/0.4)					
Outer dimension	Height x Width x Depth (mm)		210 x 910 x 680		210 x 1,180 x 680		210 x 1,595 x 680	
Total weight (kg)			22		26		34	
Heat exchanger			Finned tube					
Soundproof/Heat-insulating material			Non-flammable insulation					
Fan unit	Fan		Centrifugal fan					
	Standard air flow (High/Mid./Low) (m³/h)		720/600/540	780/660/540	1,110/900/840		1,650/1,380/1,200	1,800/1,560/1,320
	Motor (W)		30		40		80	
Controller			Remote controller					
Room thermostat			Attached					
Air filter			Standard filter attached (Long life filter)					
Connecting pipe	Gas side (mm)		Ø12.7		Ø15.9			
	Liquid side (mm)		Ø6.4		Ø9.5			
	Drain port (Nominal dia.)		20 (Polyvinyl chloride tube)					
Sound level (Note 2) (High/Mid./Low) (dB(A))			35/32/30	36/33/30	38/36/33		41/38/35	43/40/37

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB


50Hz

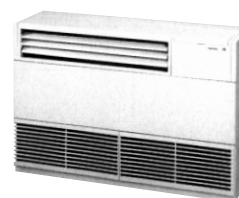
• High Wall Type

Model name		MMK-	AP0071H	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H
Cooling/Heating capacity (Note 1)		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0
Electrical characteristics	Power supply		1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)					
	Running current (A)		0.30			0.32		0.35
	Power consumption (kW)		0.035			0.037		0.040
	Starting current (A)		0.36			0.42		0.47
Appearance	Suction grille and side panel		Silky mist (Munsell 1Y 8.9/0.5)					
	Discharge grille		City gray (Munsell N6.5)					
	Bottom surface		Silky mist (Munsell 1Y 8.9/0.5)					
Outer dimension	Height x Width x Depth (mm)		368 x 895 x 210			368 x 1,055 x 210		368 x 1,430 x 210
Total weight		(kg)	18			19		25
Heat exchanger			Finned tube					
Soundproof/Heat-insulating material			Non-flammable insulation					
Fan unit	Fan		Cross-flow fan					
	Standard air flow (High/Mid./Low) (m³/h)		600/540/480			780/660/600		1,200/1,020/900
	Motor outlet (W)		30					
Air filter			Standard filter attached (Simple filter)					
Controller			Remote controller					
Connecting pipe	Gas side (mm)		Ø9.5			Ø12.7		Ø15.9
	Liquid side (mm)		Ø6.4					Ø9.5
	Drain port (Nominal dia.)		20 (Polyvinyl chloride tube)					
Sound level (Note 2) (High/Mid./Low)		(dB(A))	39/34/31			42/38/35		42/38/35

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
 Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB


50Hz

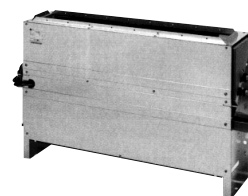
• Floor Standing Cabinet Type

Model name		MML-	AP0071H	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H
Cooling/Heating capacity (Note 1)		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0
Electrical characteristics	Power supply		1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)					
	Running current (A)		0.26		0.43		0.47	
	Power consumption (kW)		0.056		0.092		0.102	
	Power factor (%)		94		93		94	
	Starting current (A)		0.60		0.80		1.10	
Appearance			Silky shade (1Y8.5/0.5)					
Outer dimension	Height x Width x Depth (mm)		630 x 950 x 230					
Total weight (kg)			37				40	40
Heat exchanger			Finned tube					
Soundproof/Heat-insulating material			Non-flammable insulation					
Fan unit	Fan		Centrifugal fan					
	Standard air flow (High/Mid./Low) (m³/h)		480/420/360		900/780/650		1,080/930/780	
	Motor outlet (W)		45				70	
Air filter			Standard filter attached (Simple filter)					
Controller			Remote controller					
Connecting pipe	Gas side (mm)		Ø9.5			Ø12.7		Ø15.9
	Liquid side (mm)		Ø6.4					Ø9.5
	Drain port (Nominal dia.)		20 (Polyvinyl chloride tube)					
Sound level (Note 2) (High/Mid./Low) (dB(A))			39/37/35		45/41/38		49/44/39	

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB



50Hz

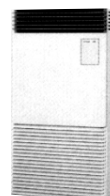
• Floor Standing Concealed Type

Model name		MML-	AP0071BH	AP0091BH	AP0121BH	AP0151BH	AP0181BH	AP0241BH
Cooling/Heating capacity (Note 1)		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0
Electrical characteristics	Power supply		1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)					
	Running current (A)		0.25			0.45		0.46
	Power consumption (kW)		0.056			0.090		0.095
	Power factor (%)		97			87		90
	Starting current (A)		0.60			0.80		1.00
Appearance			Zinc hot dipping steel plate					
Outer dimension	Height x Width x Depth (mm)		600 x 745 x 220			600 x 1,045 x 220		
Total weight (kg)			21			29		
Heat exchanger			Finned tube					
Soundproof/Heat-insulating material			Non-flammable insulation					
Fan unit	Fan		Centrifugal fan					
	Standard air flow (High/Mid./Low) (m³/h)		460/400/300			740/600/490		950/790/640
	Motor (W)		19			70		
	Static pressure range (kPa)		0					
Air filter			Standard filter attached (Simple filter)					
Controller			Remote controller					
Connecting pipe	Gas side (mm)		Ø9.5			Ø12.7		Ø15.9
	Liquid side (mm)		Ø6.4					Ø9.5
	Drain port (Nominal dia.)		20 (One side of male screw)					
Sound level (Note 2) (High/Mid./Low) (dB(A))			36/34/32					42/37/33

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
 Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB



50Hz

• Floor Standing Type

Model name		MMF-	AP0151H	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H	AP0561H
Cooling/Heating capacity (Note 1)		(kW)	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	11.2/12.5	14.0/16.0	16.0/18.0
Electrical characteristics	Power supply		1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)						
	Running current	(A)	0.67		0.88		1.29	1.60	
	Power consumption	(kW)	0.150		0.190		0.280	0.350	
	Power factor	(%)	97		94			95	
	Starting current	(A)	0.90		1.10		1.70	2.10	
Appearance			W : Silky shade (1Y 8.5/0.5)						
Outer dimension	Height x Width x Depth	(mm)	1750 × 600 × 210				1750 × 600 × 390		
Total weight		(kg)	48		49		65		
Heat exchanger			Finned tube						
Soundproof/Heat-insulating material			Non-flammable insulation						
Fan unit	Fan		Centrifugal fan						
	Standard air flow (High/Mid./Low)	(m³/h)	900/780/660		1,200/1,020/840		1,920/ 1,680/ 1,380	2,160/1,860/1,560	
	Motor	(W)	37		63		110	160	
Air filter			Standard filter attached (Simple filter)						
Controller			Remote controller						
Connecting pipe	Gas side	(mm)	Ø12.7		Ø15.9				
	Liquid side	(mm)	Ø6.4		Ø9.5				
	Drain port	(Nominal dia.)	20 (One side of male screw)						
Sound level (Note 2) (High/Mid./Low)		(dB(A))	46/43/38		49/45/40		51/48/44	54/50/46	

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping. The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 meter height.

Note 2 : The sound level are measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
 Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB


50Hz

Outdoor unit (50Hz)

Equivalent HP			Equivalent to 8HP	Equivalent to 10HP	Equivalent to 12HP	
Model name		MMY-	MAP0801FT8	MAP1001FT8	MAP1201FT8	
Outdoor unit type			Inverter unit			
Cooling capacity (★ 1)		(kW)	22.4	28.0	33.5	
Standard heating capacity (★ 1)		(kW)	25.0	31.5	35.5	
Power supply (★ 2)			3 phase 50Hz 400V (380 – 415V)			
Electrical characteristics (★ 1)	Cooling	Running current	(A)	9.25	13.15	19.85
		Power consumption	(kW)	6.07	8.54	12.90
		Power factor	(%)	95	96	94
		EER (Energy Efficiency Ratio)	(kW/kW)	3.69	3.28	2.60
		Starting current	(A)	1.0	1.0	1.0
	Heating	Running current	(A)	9.55	13.40	14.85
		Power consumption	(kW)	6.29	8.73	9.65
		Power factor	(%)	95	96	94
		EER (Energy Efficiency Ratio)	(kW/kW)	3.97	3.61	3.68
Starting current	(A)	1.0	1.0	1.0		
External dimension		(mm)	Height 1,800 x Width 990 x Depth 750			
Total weight		(kg)	263			
Color			Silky shade (Munsell 1Y8.5/0.5)			
Compressor	Type		Hermetic type			
	Motor output		(kW)	2.3 × 2	3.1 × 2	4.2 × 2
Fan unit	Fan		Propeller fan			
	Motor output		(kW)	0.60		
	Air volume		(m³/h)	9,900	10,500	
Heat exchanger			Finned tube			
Refrigerant R410A (Charged refrigerant amount) (★ 3)		(kg)	14.0			
High-pressure switch		(MPa)	OFF : 2.90 ON : 3.73			
Protective devices			(★ 5)			
Refrigerant piping specifications (★ 4)	Connecting port dia	Discharge gas side	(mm)	Ø19.1		
		Suction gas side	(mm)	Ø22.2		Ø28.6
		Liquid side	(mm)	Ø12.7		
		Balance pipe (★ 6)	(mm)	Ø9.5		
	Connecting method	Discharge gas side		Brazing		
		Suction gas side		Brazing		
		Liquid side		Flare		
		Balance pipe (★ 6)		Flare		
	Max. equivalent length		(m)	125		
	Max. real length		(m)	100 (However, if equivalent bend length is longer, equivalent length is the standard.)		
	Max. total pipe length (Real length)		(m)	250		
	Max. height difference		(m)	Outdoor unit is higher than indoor unit : 50		
				Outdoor unit is lower than indoor unit : 30		
Control wiring			Shield wire 1.25mm² x 2 cores. up to 2000m			
Central remote controller			When connecting to outdoor unit : (Shield wire) 1.25mm² x 2 cores. up to 1000m and (Shield wire) 2.0mm² x 2 cores. up to 2000m			
Max. No. of connected indoor units			13	16	16	
Sound level		(dB(A))	57	58	59	

*1 : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB

Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB

The standard piping means that main pipe length is 5 m, branching pipe length 2.5 m of branch piping connected with a 0 meter height.

*2 : The source voltage must not fluctuate more than ±10%.

*3 : The amount does not consider extra piping lengths. Refrigerant must be added on site in accordance with the actual piping length.

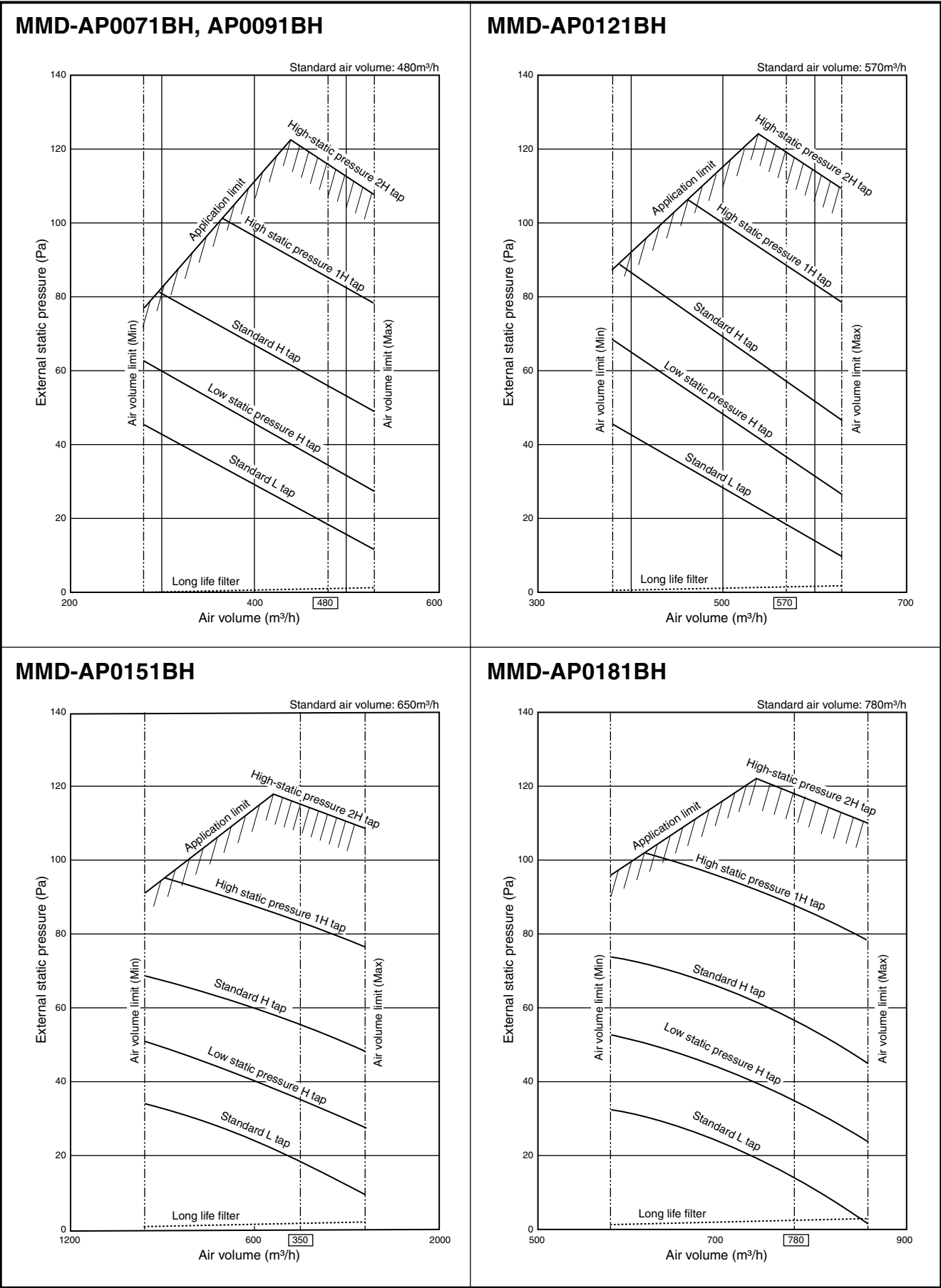
*4 : The maximum total piping length indicates the sum of one-way piping lengths on the liquid side or gas side.

*5 : Discharge temp. sensor, Suction temp. sensor, Compressor case thermostat, High-pressure switch, Over-current sensor, High-pressure sensor, Low pressure sensor, Over-current relay.

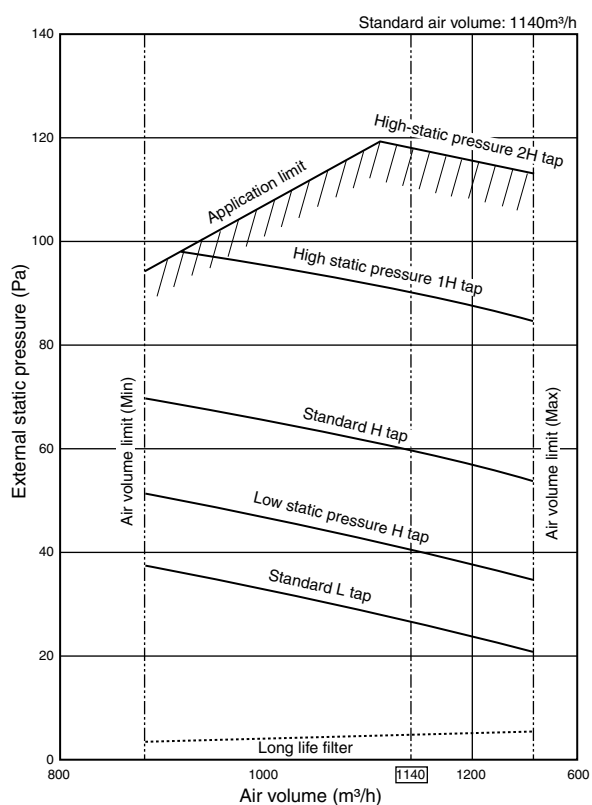
*6 : Balance pipe is not used in this model.

10. FAN CHARACTERISTICS

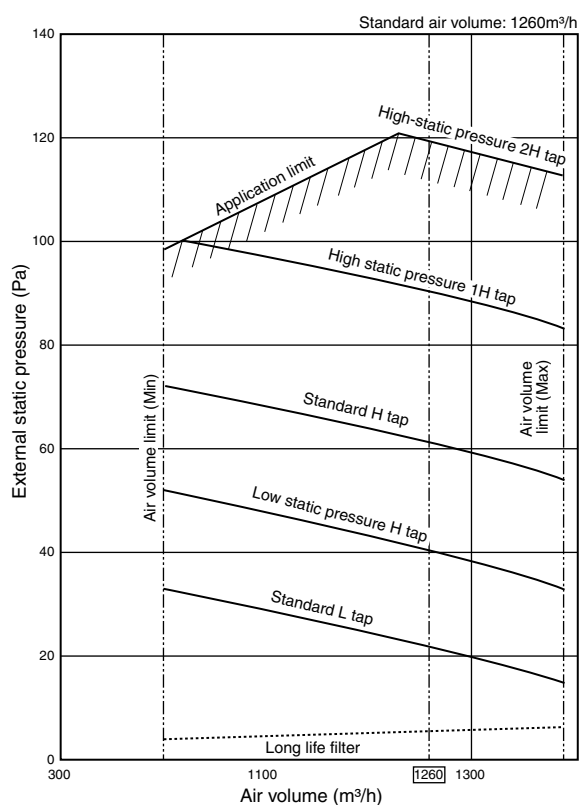
- In case of square duct flange of discharge section



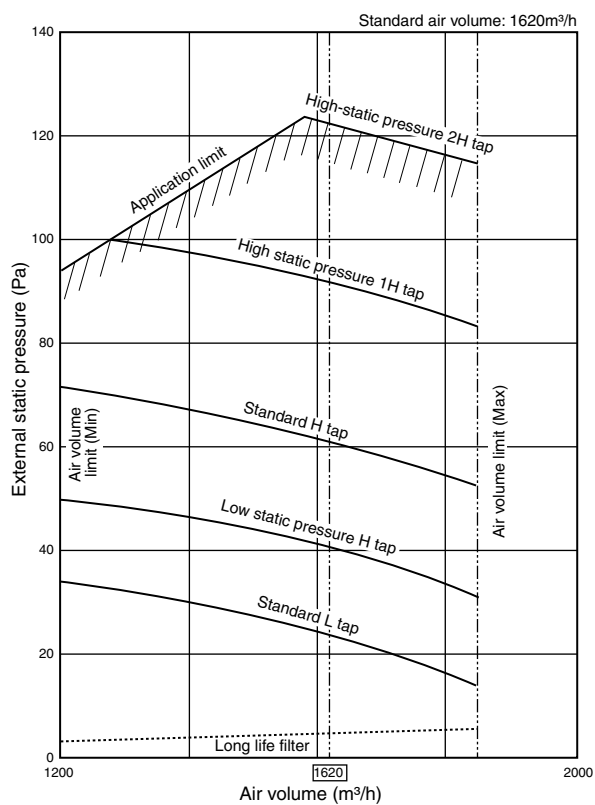
MMD-AP0241BH, AP0271BH



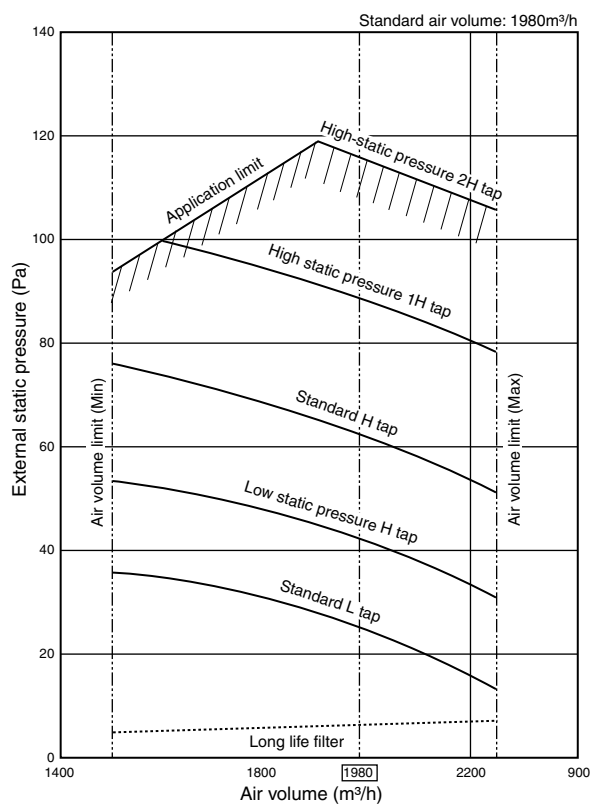
MMD-AP0301BH



MMD-AP0361BH

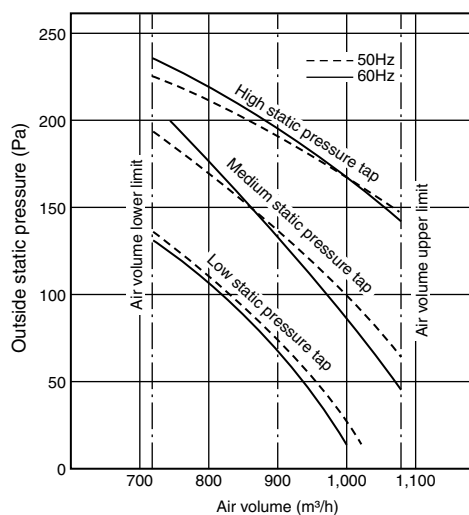
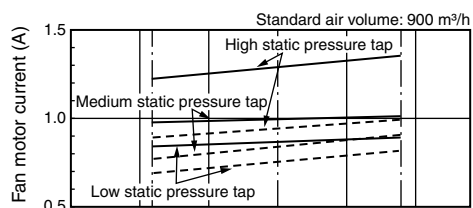


MMD-AP0481BH, AP0561BH

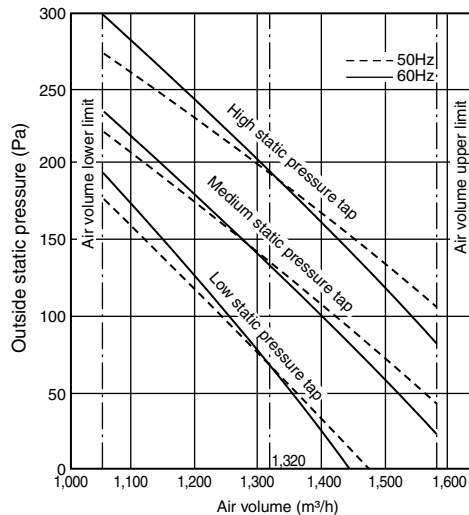
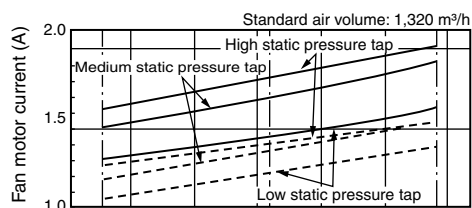


- **Concealed Duct High Static Pressure type**

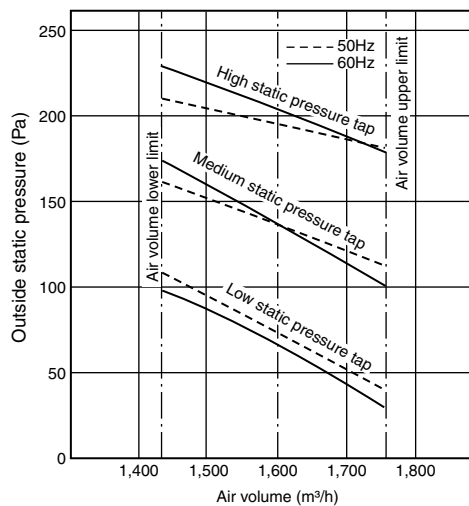
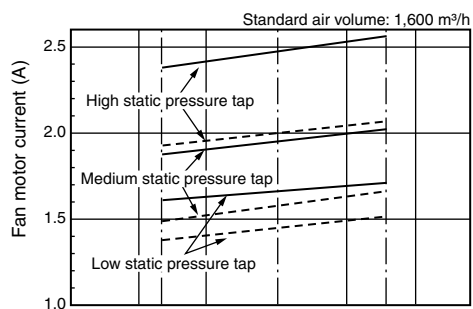
MMD-AP0181H



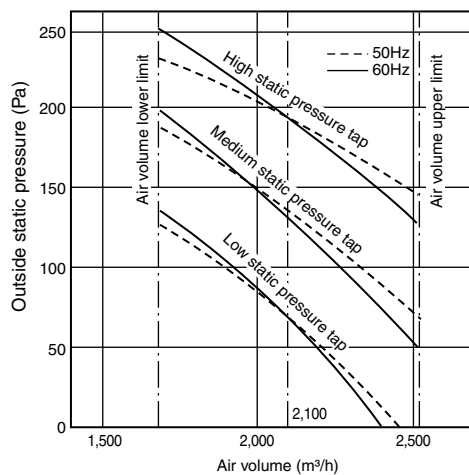
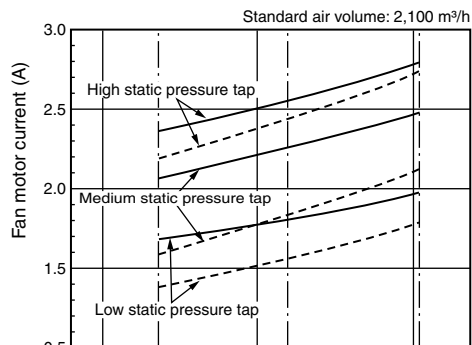
MMD-AP0241H, AP0271H



MMD-AP0361H



MMD-AP0481H

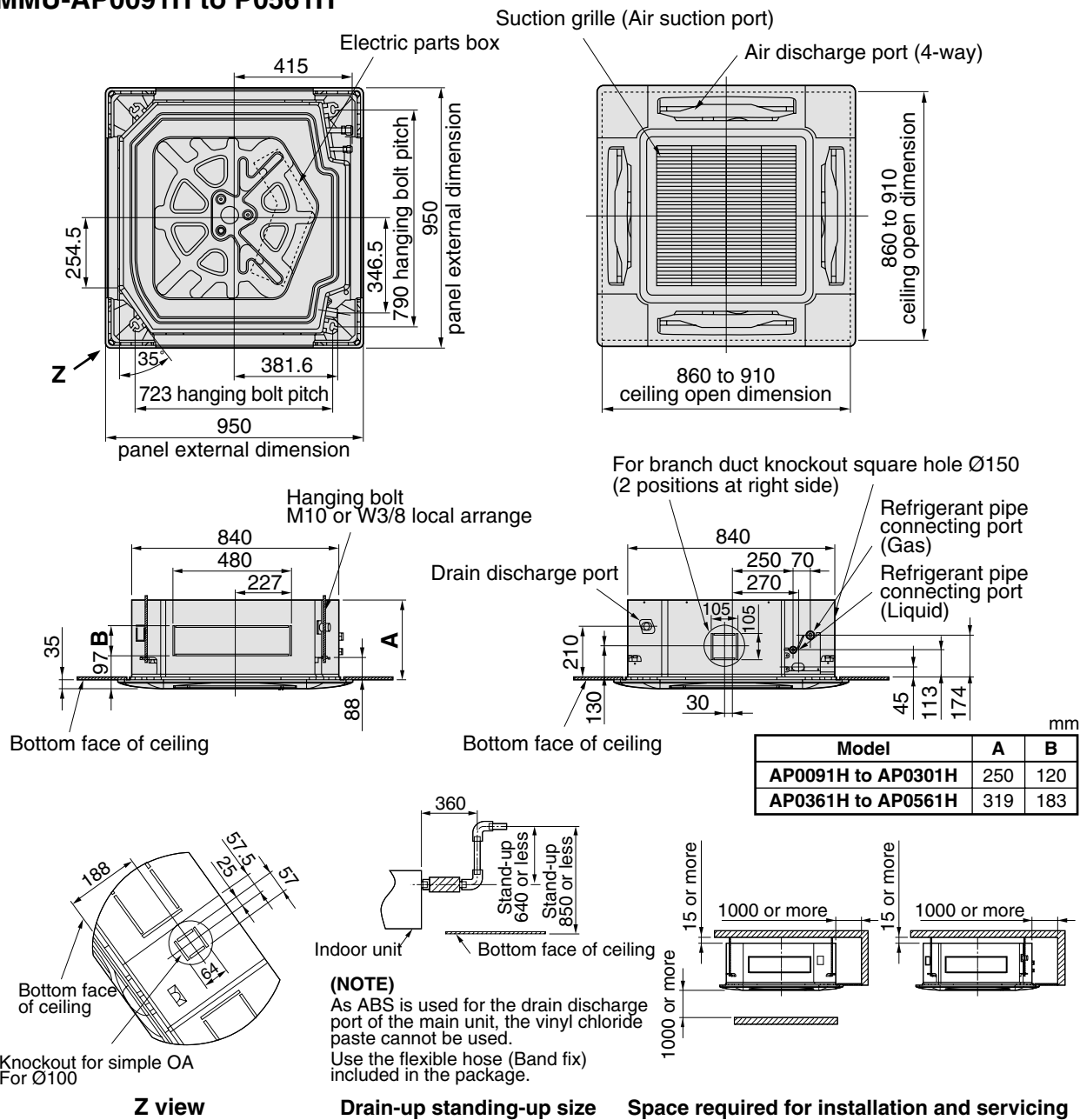


11. DIMENSIONAL DRAWINGS

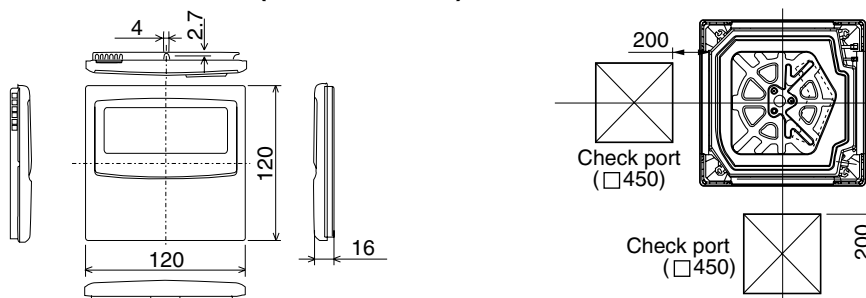
Indoor unit

• 4-way Air Discharge Cassette Type

MMU-AP0091H to P0561H

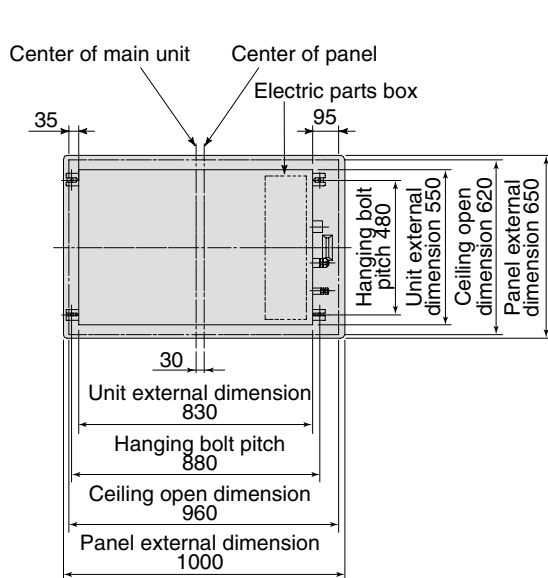


• Wired remote controller (RBC-AMT21E)

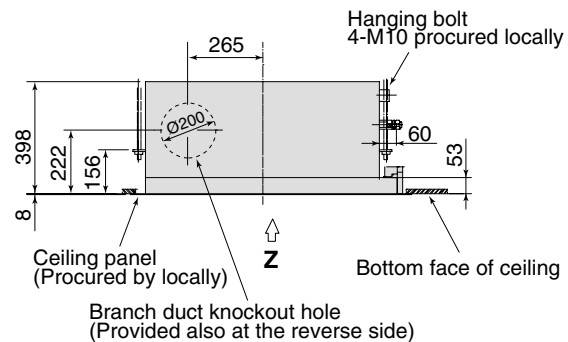
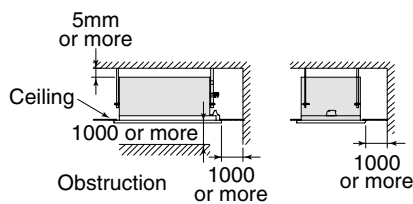
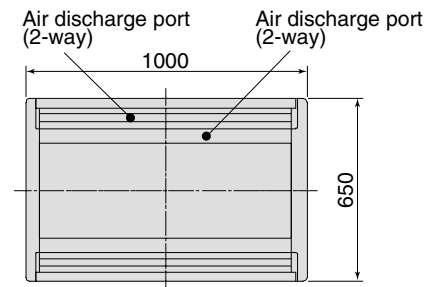


• 2-way Air Discharge Cassette Type

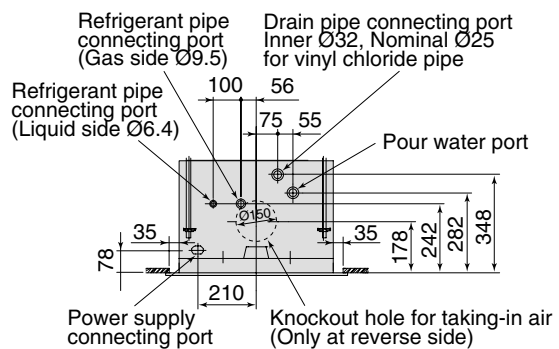
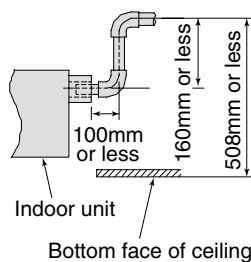
MMU-AP0071WH, AP0091WH, AP0121WH



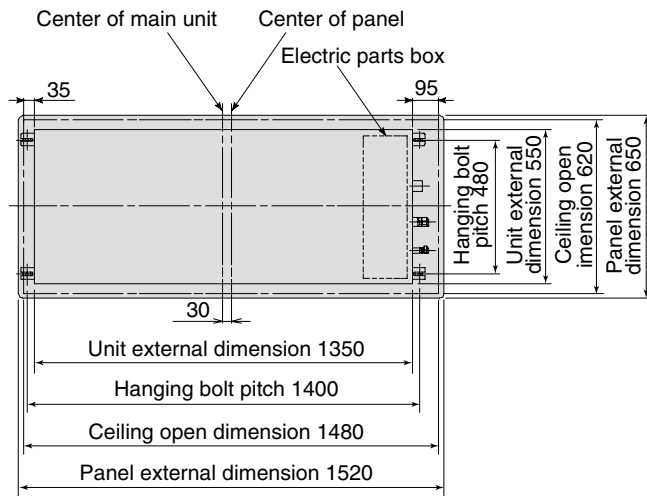
Z view



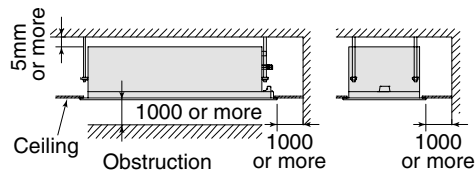
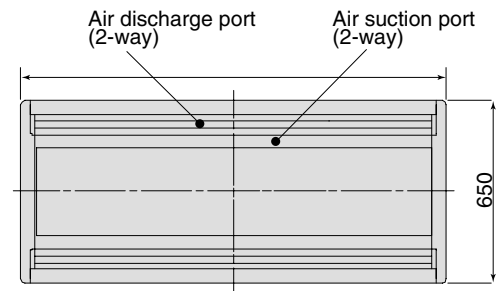
Space required for installation and servicing



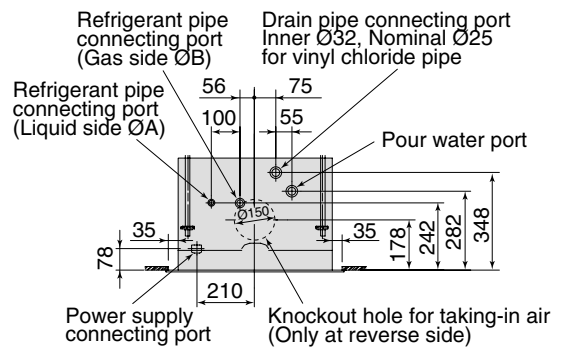
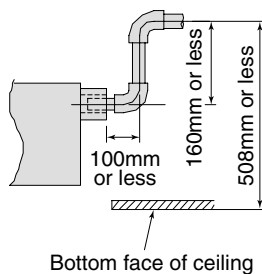
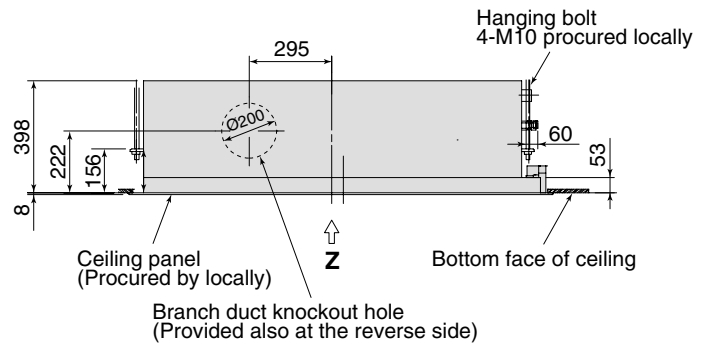
MMU-AP0151WH, AP0181WH, AP0241WH, AP0271WH. AP0301WH



Z view

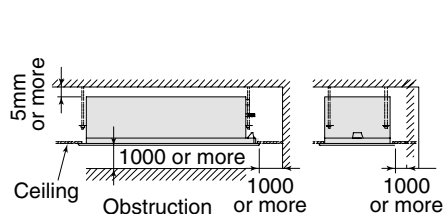
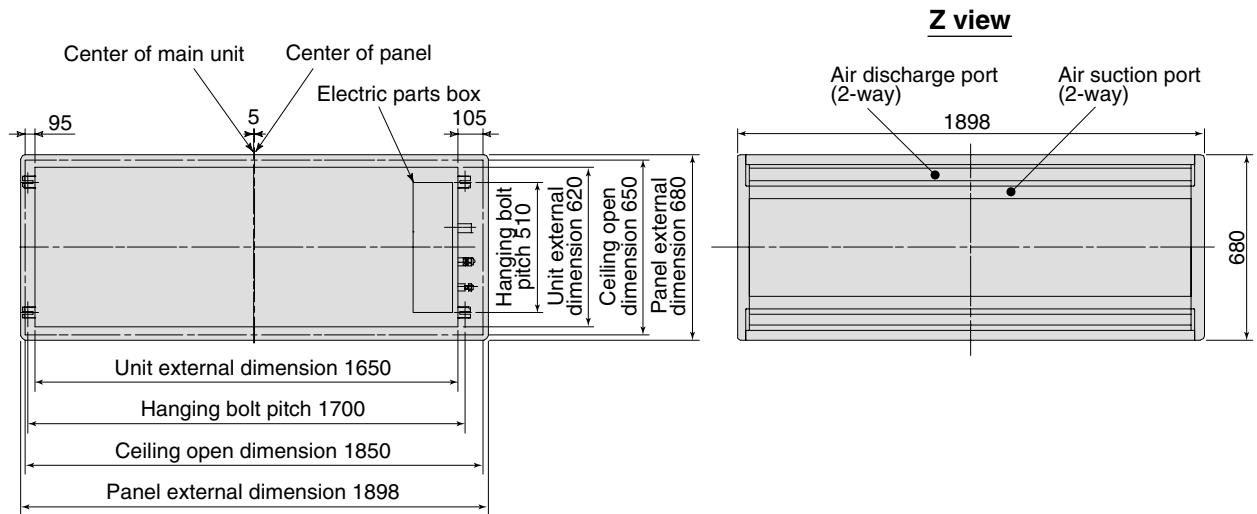


Space required for installation and servicing

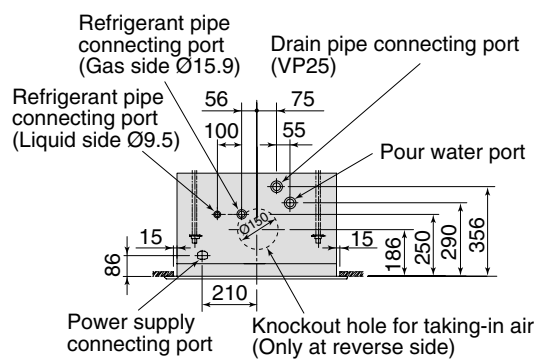
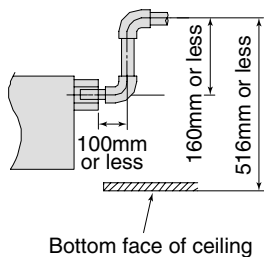
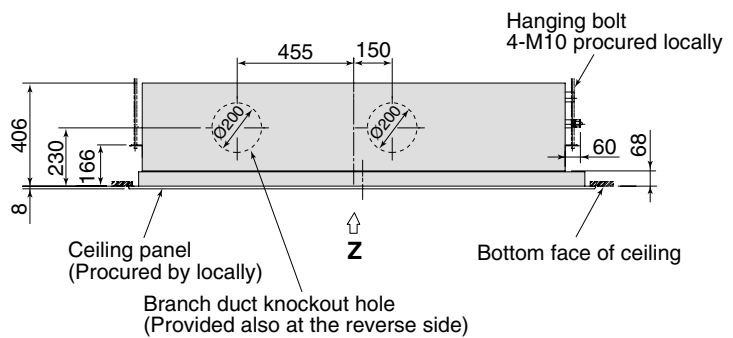


Model	A	B
MMU-AP0151WH to AP0181WH	Ø6.4	Ø12.7
MMU-AP0241WH to AP0301WH	Ø9.5	Ø15.9

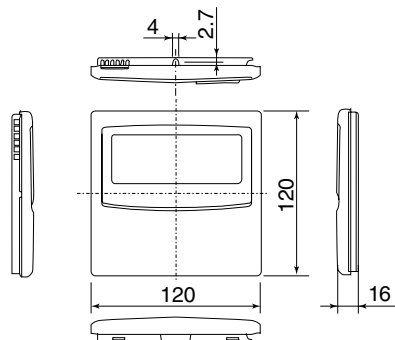
MMU-AP0481WH



Space required for installation and servicing

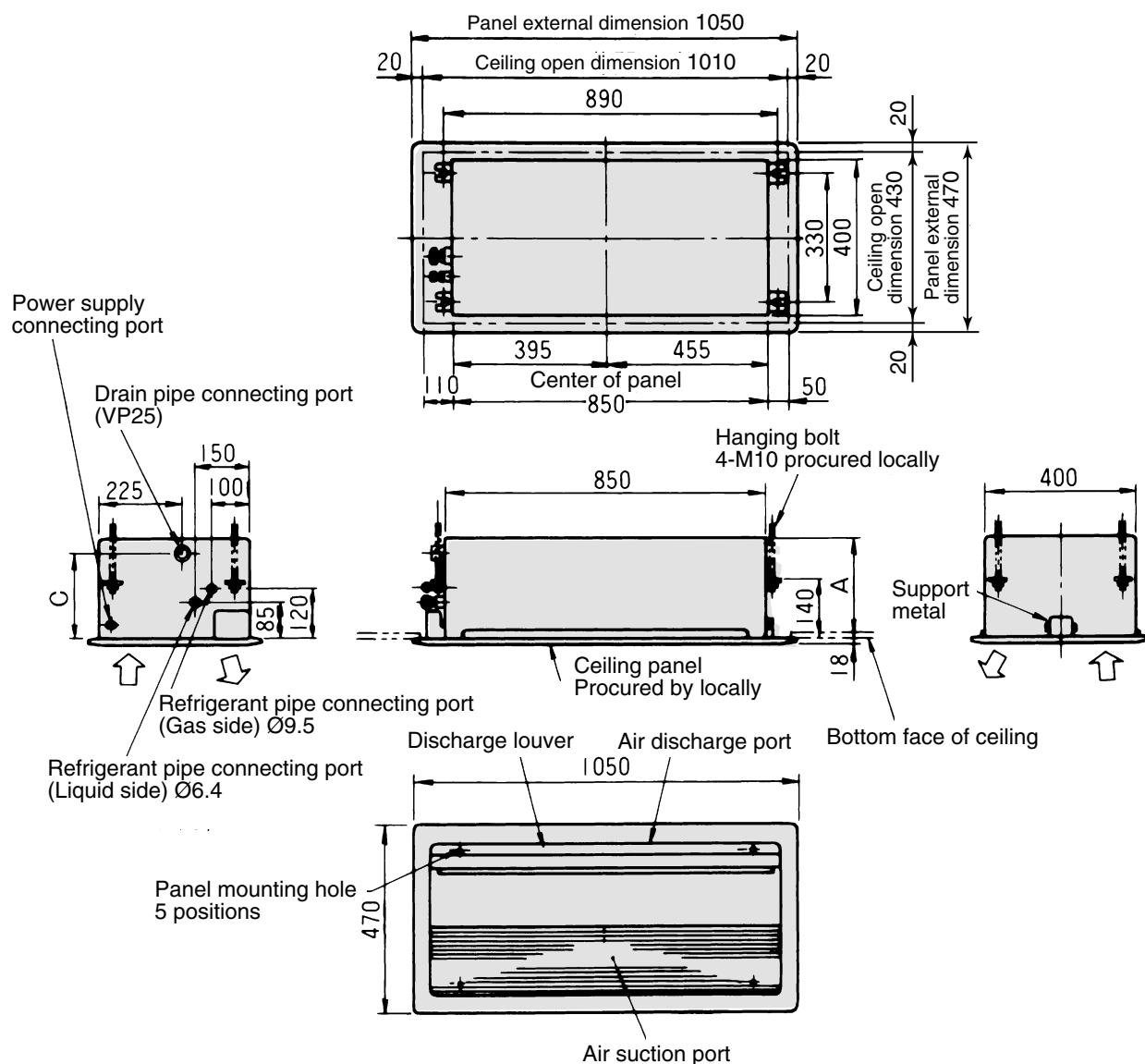


• Wired remote controller (RBC-AMT21E)



• 1-way Air Discharge Cassette Type

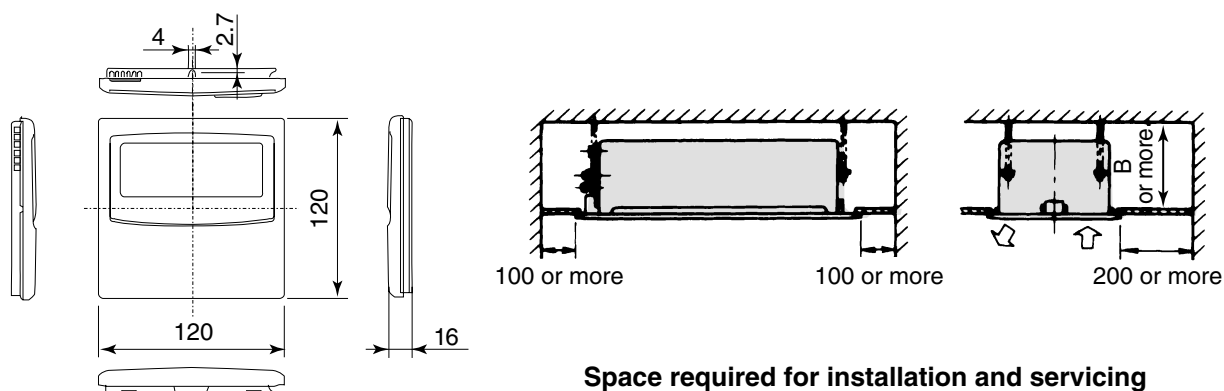
MMU-AP0071SH, AP0091SH, AP0121SH



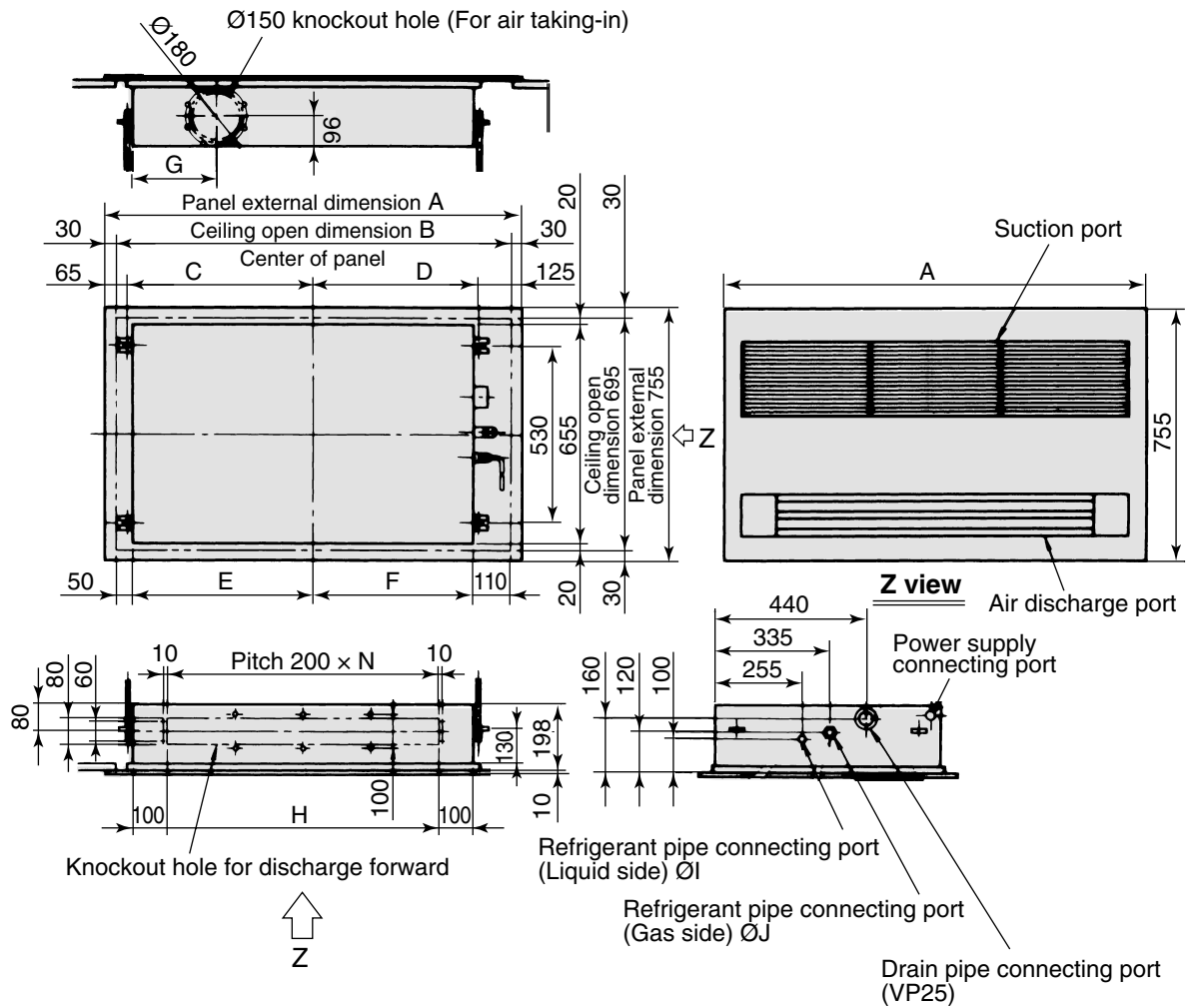
• Wired remote controller (RBC-AMT21E)

Dimensions

Model MMU-	A	B	C
AP0071SH, AP0091SH, AP0121SH	235	245	200



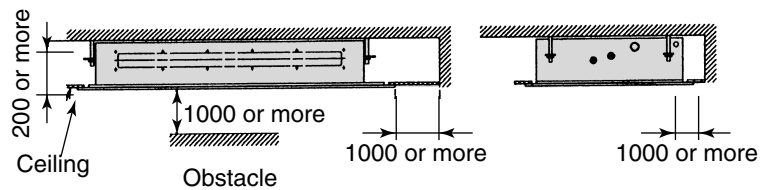
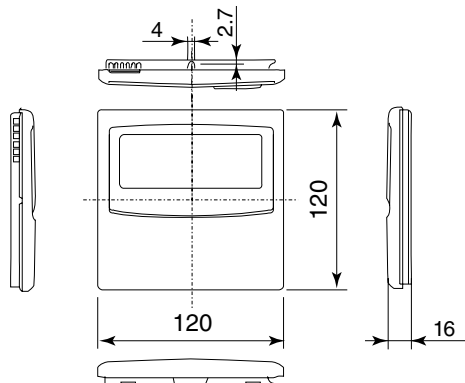
MMU-AP0151SH, AP0181SH, AP0241SH



Dimensions

Model	MMU-	A	B	C	D	E	F	G	H	I	J	N
AP0151SH, AP0181SH		1220	1160	545	485	530	470	254	800	6.4	12.7	4
AP0241SH		1420	1360	645	585	630	570	460	1000	9.5	15.9	5

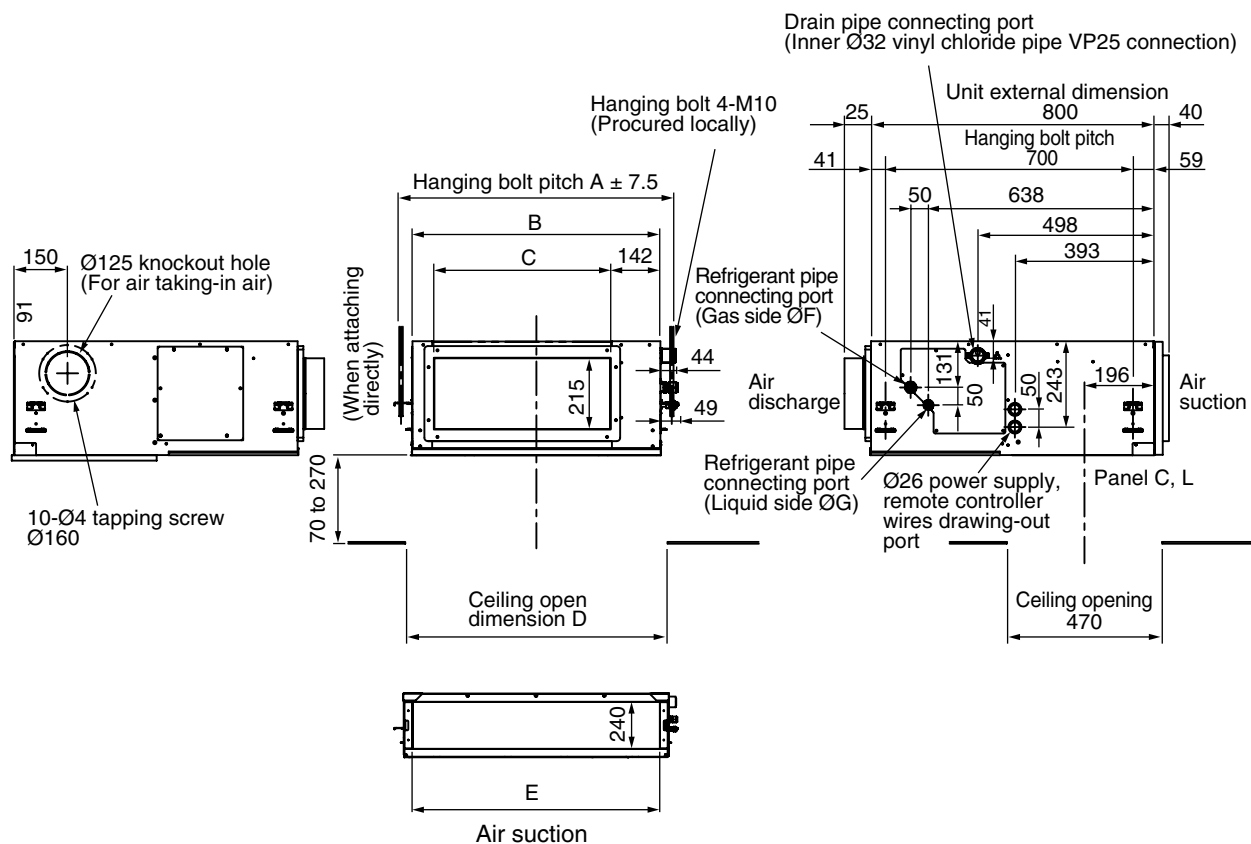
• Wired remote controller (RBC-AMT21E)



Space required for installation and servicing

• Concealed Duct Standard Type

MMD-AP0071BH, AP0091BH, AP0121BH, AP0151BH, AP0181BH, AP0241BH, AP0271BH, AP0301BH, AP0361BH, AP0481BH



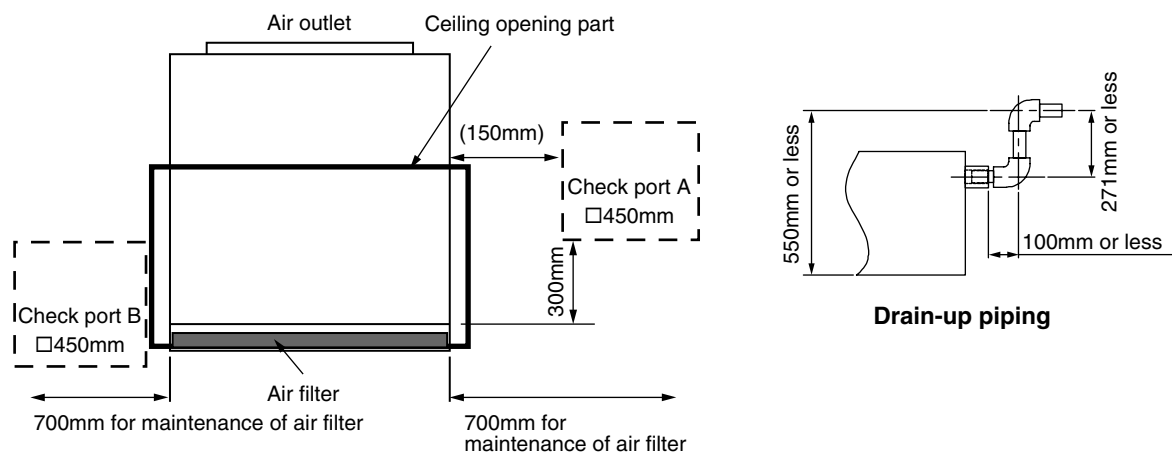
Model	MMD-	A	B	C	D	D	E	F	G
AP0071BH, AP0091BH, AP0121BH		616	550	350	600	600	470	9.5	6.4
AP0151BH, AP0181BH		766	700	500	750	750	620	12.7	9.4
AP0241BH, AP0271BH, AP0301BH		1066	1000	800	1050	1050	920	15.9	9.5
AP0361BH, AP0481BH		1416	1350	1150	1400	1400	1270	15.9	9.5

(Note)

Two of high efficiency filter and deodorant filter cannot applied.

(Note)

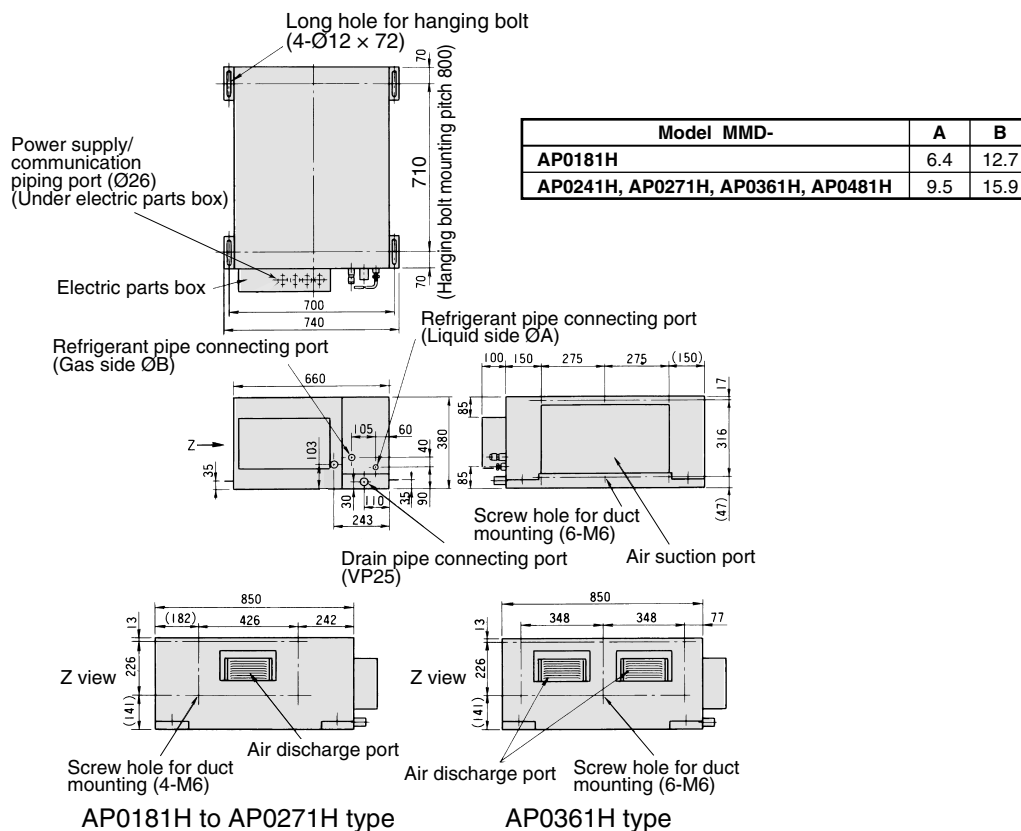
Be sure to place a check port A at the position indicated in the following figure for maintenance of the equipment.



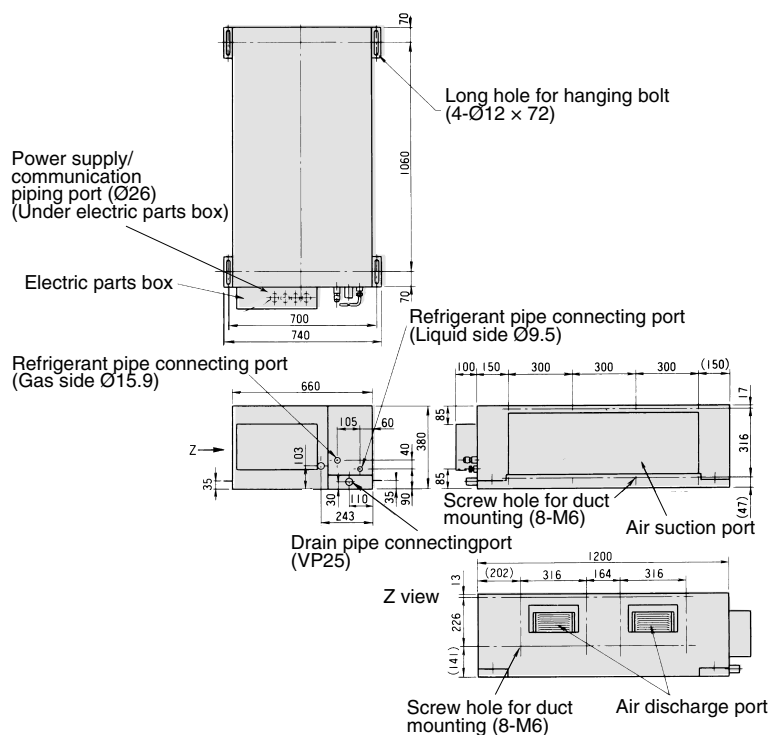
- **Concealed Duct High Static Pressure Type**

MMD-AP0181H, AP0241H, AP0271H, AP0361H, AP0481H, AP0721H, AP0961H

MMD-AP0181H to AP0361H

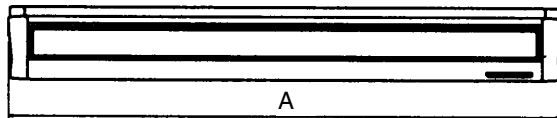
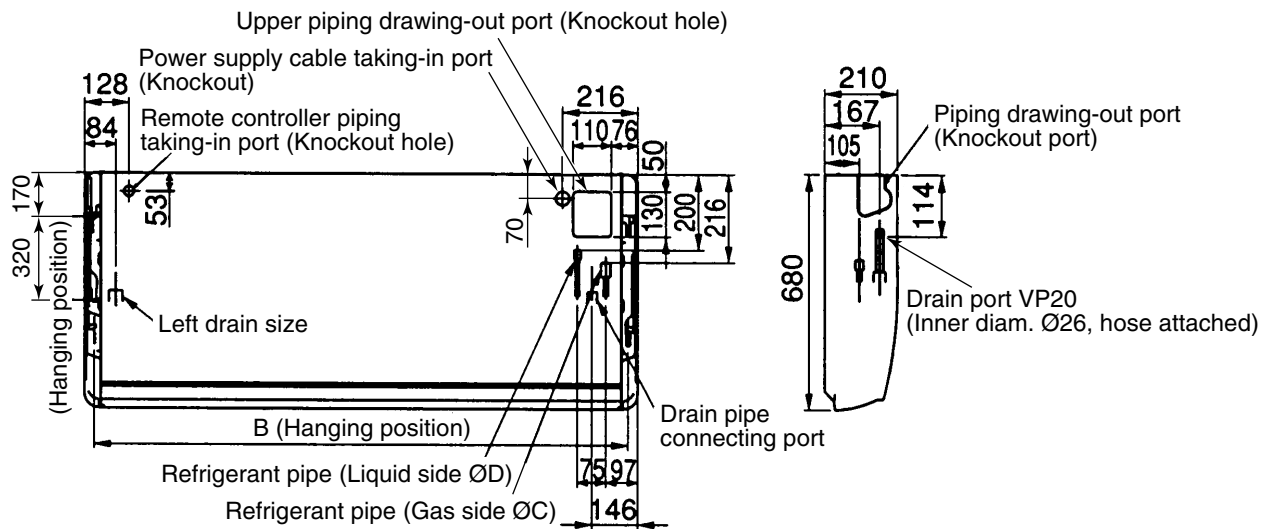


MMD-AP0481H

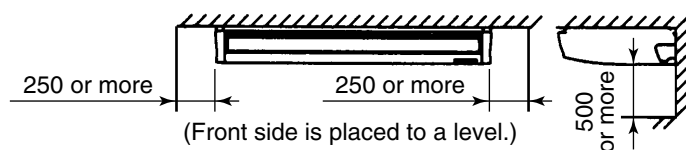
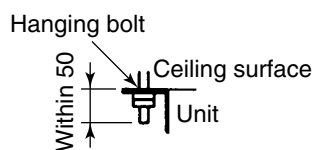
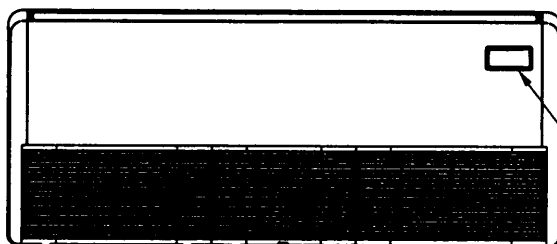


• Under Ceiling Type

MMC-AP0151H, AP0181H, AP0241H, AP0271H, AP0361H, AP0481H

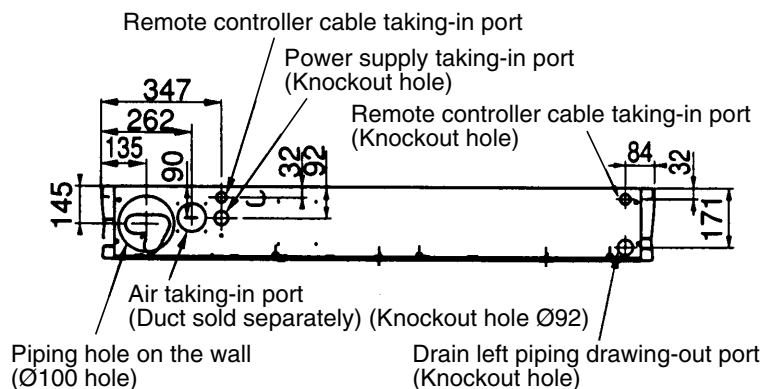
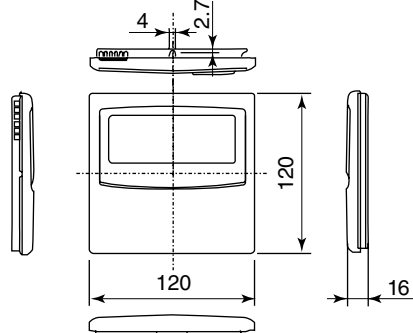


Model	MMC-	A	B	C	D
AP0151H		910	855	12.7	6.4
AP0241H to AP0271H		1180	1125	15.9	9.5
AP0361H, AP0481H		1595	1540	15.9	9.5



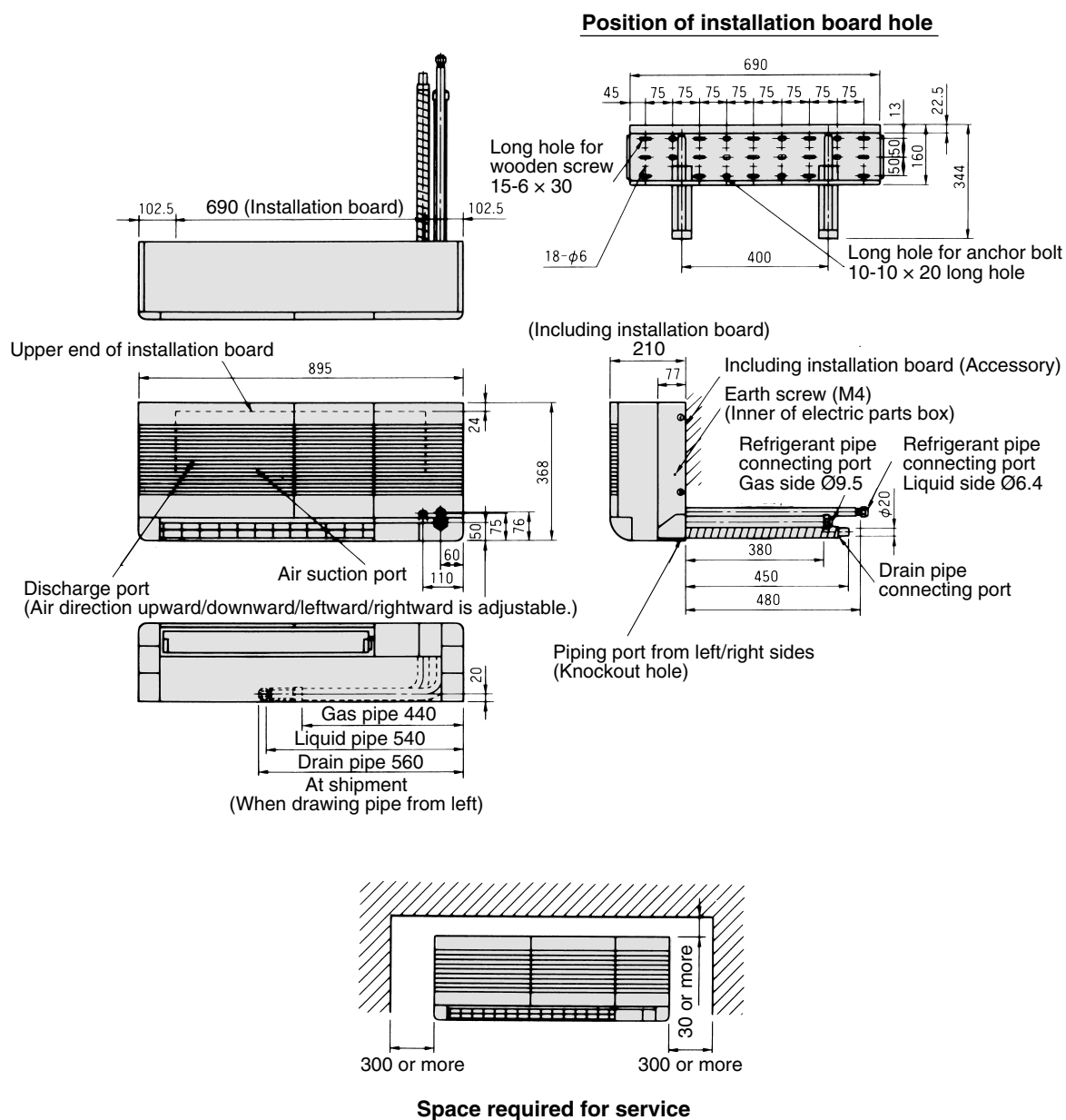
Space required for installation and servicing

• Wired remote controller (RBC-AMT21E)

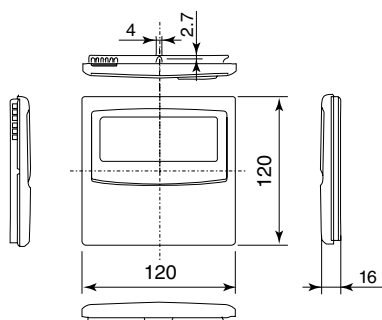


- High Wall Type

MMK-AP0071H, AP0091H

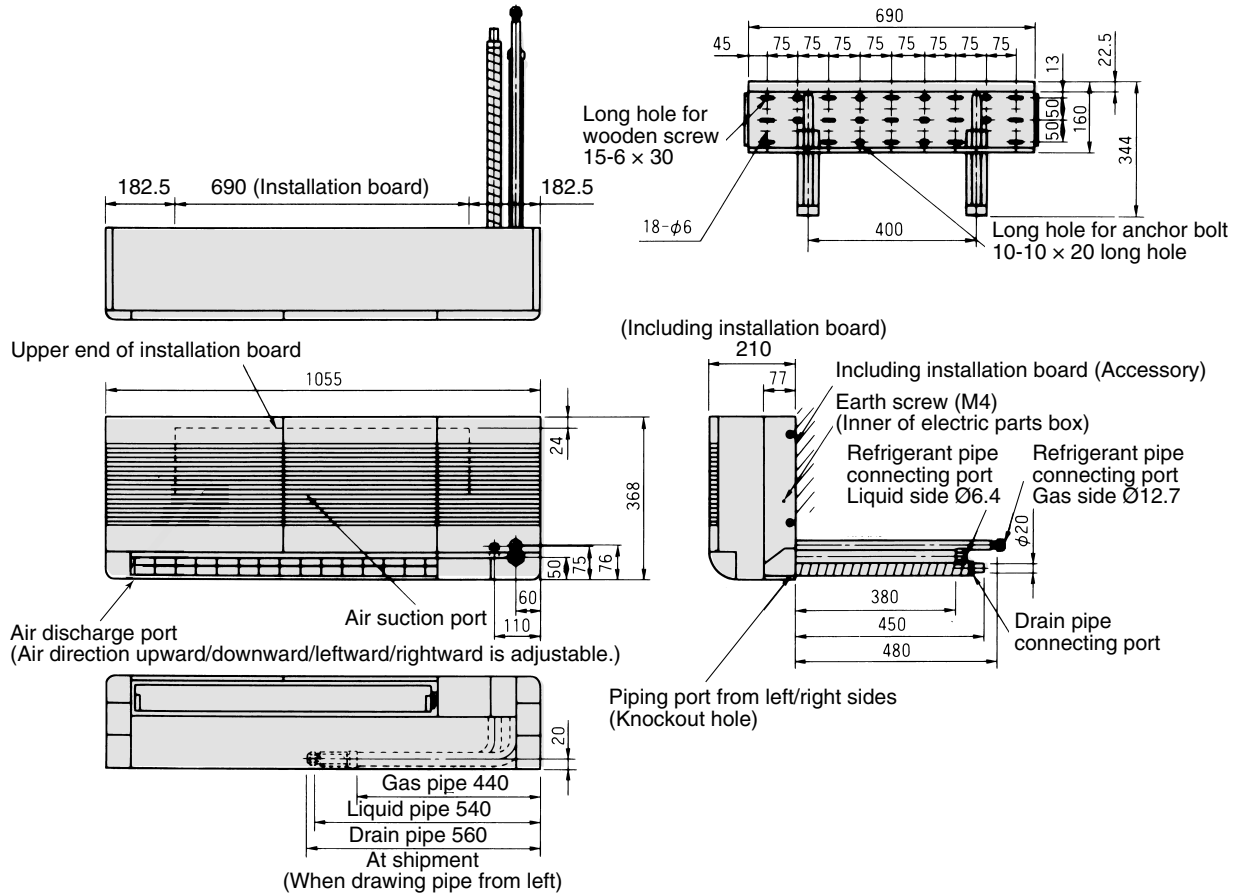


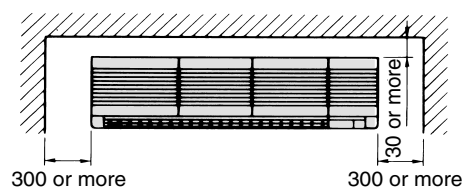
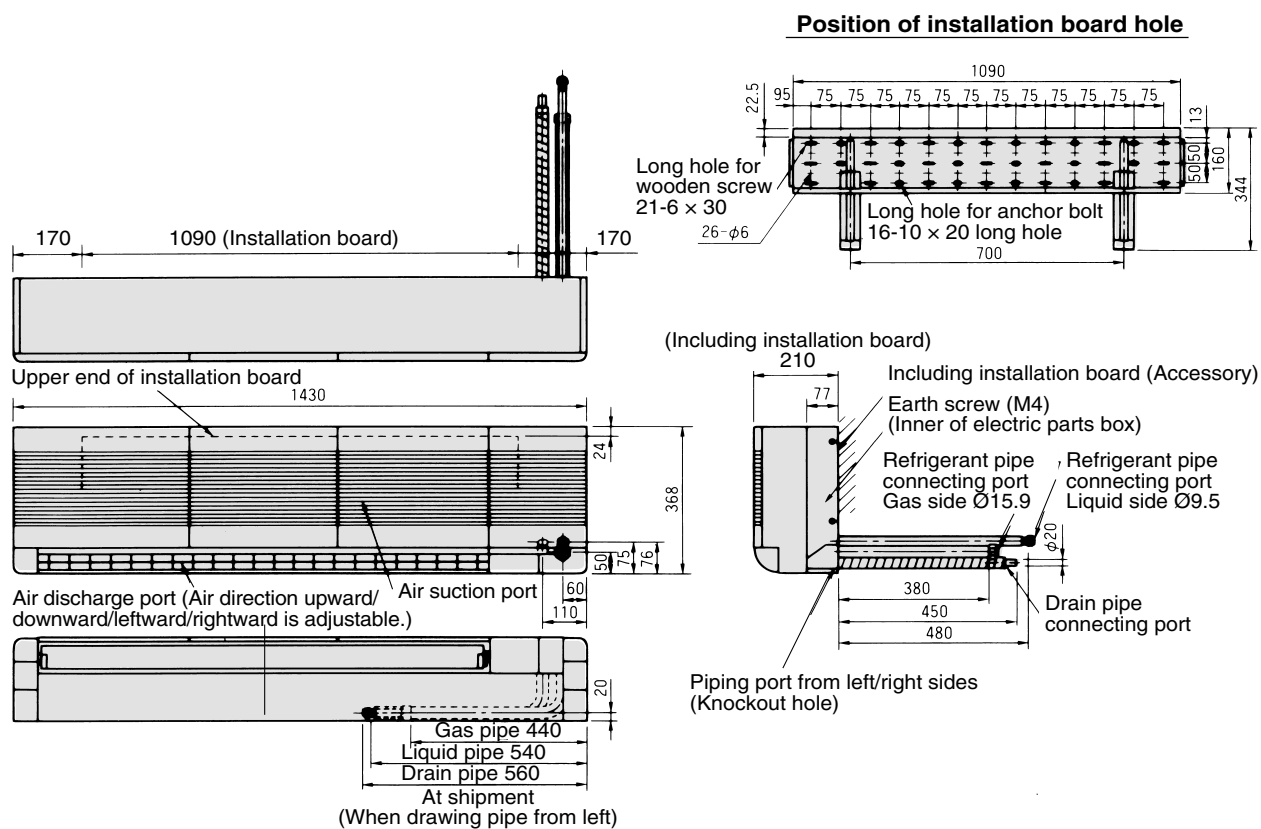
- Wired remote controller (RBC-AMT21E)



MMK-AP0121H, AP0151H, AP0181H

Position of installation board hole

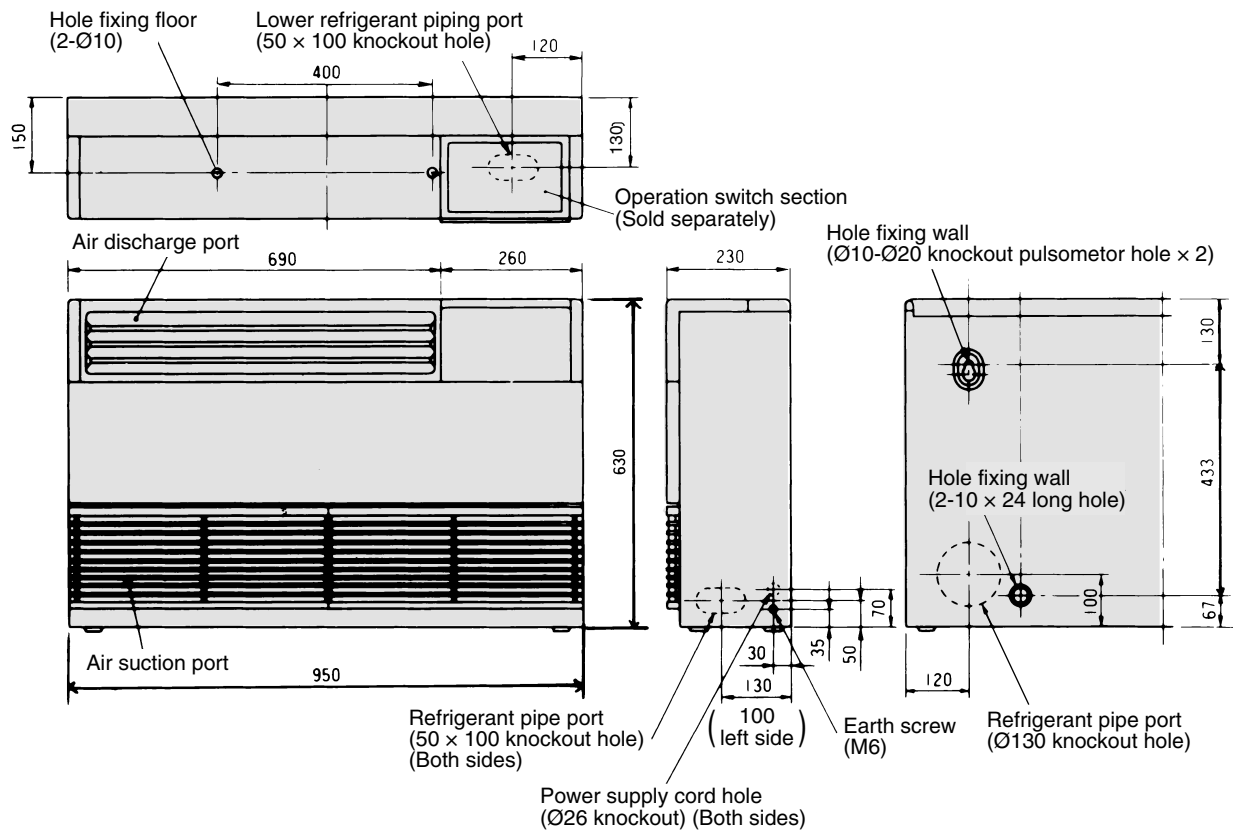


MMK-AP0241H

Space required for service

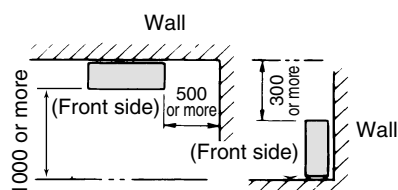
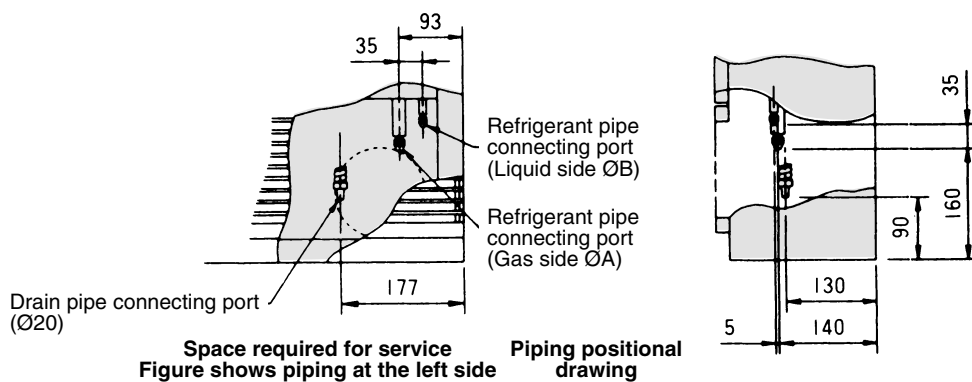
• Floor Standing Cabinet Type

MML-AP0071H, AP0091H, AP0121H, AP0151H, AP0181H, AP0241H



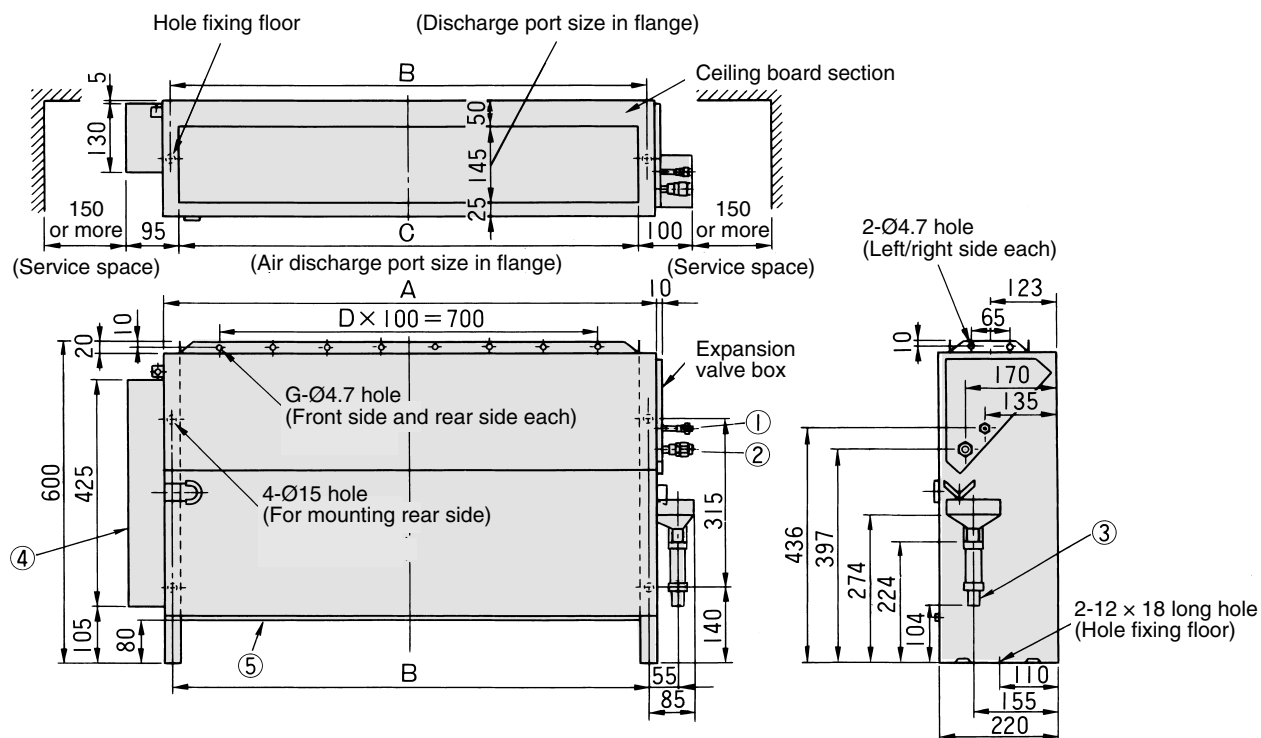
Dimensions

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



• Floor Standing Concealed Type

MML-AP0071BH, AP0091BH, AP0121BH, AP0151BH, AP0181BH, AP0241BH

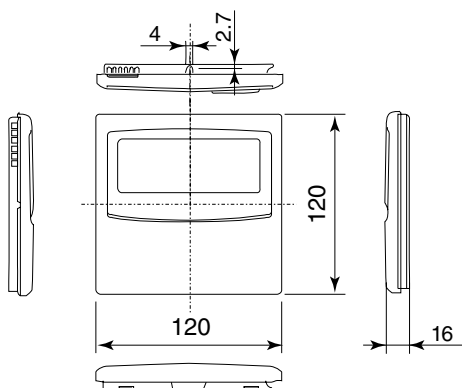


No.	Name
①	Pipe connecting port at liquid side (ØE)
②	Pipe connecting port at gas side (ØF)
③	Drain pipe connecting port (20A)
④	Electric parts box (Earth terminal is provided in inner side.)
⑤	Air filter

Dimensions

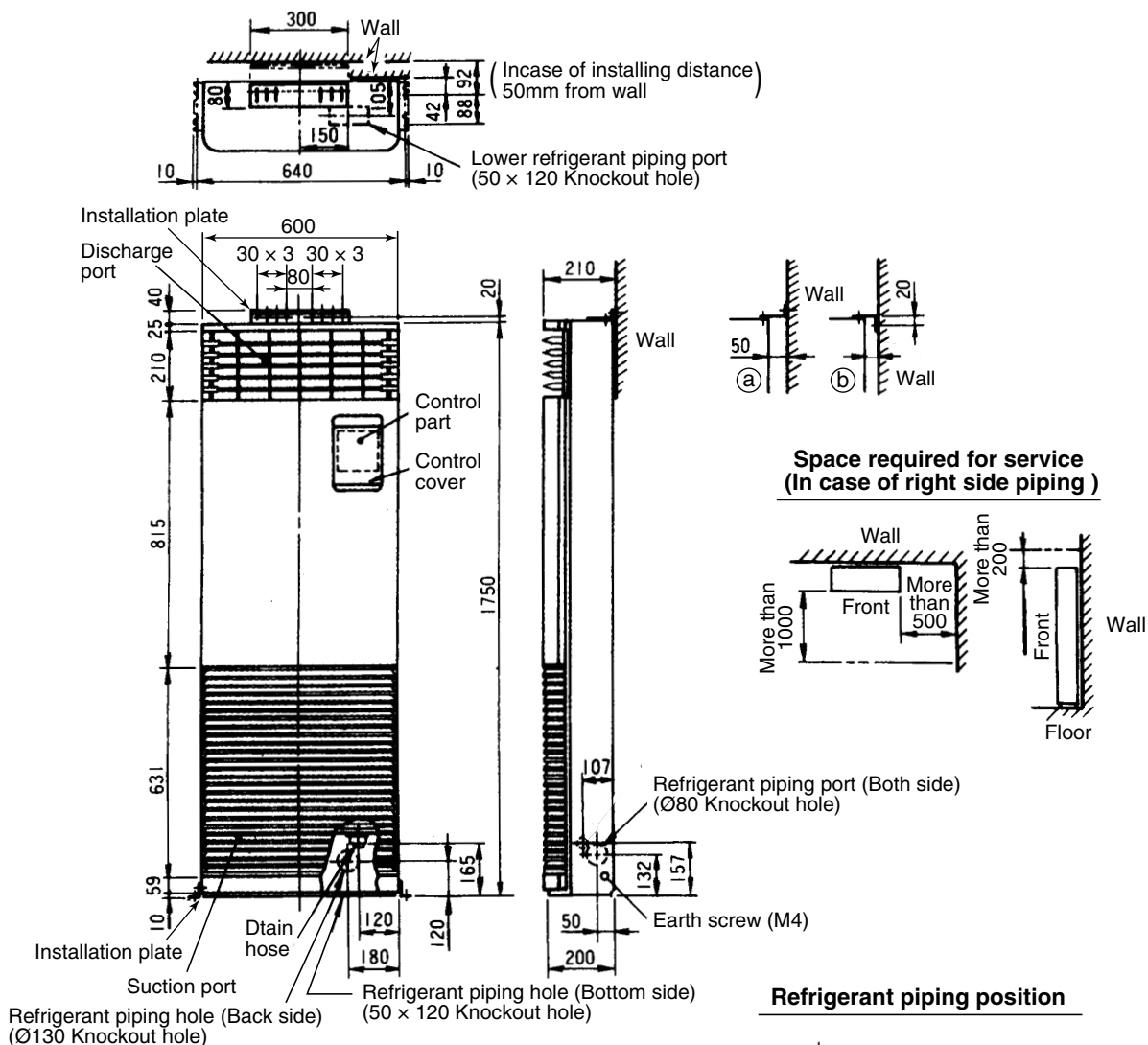
Model MML-	A	B	C	D	E	F	G
AP0071BH, AP0091BH, AP0121BH	610	580	550	4	6.4	9.5	5
AP0151BH, AP0181BH	910	880	850	7	12.7		8
AP0241BH					9.5	15.9	

• Wired remote controller (RBC-AMT21E)



- **Floor Standing Type**

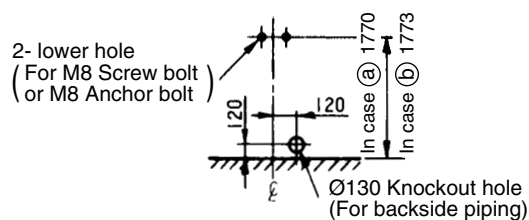
MMF-AP0151H, AP0181H, AP0241H, AP0271H



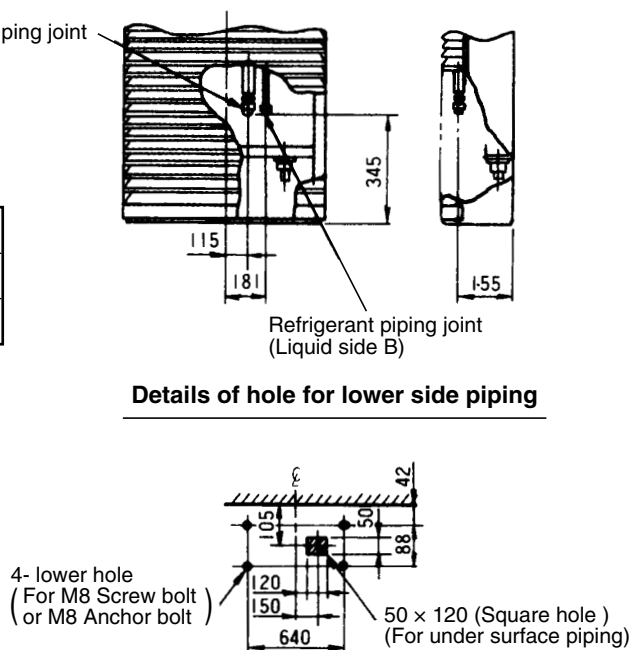
Dimensions

Model	A	B
MMF-AP0151H, AP0181H	Ø12.7	Ø6.4
MMF-AP0241H, AP0271H	Ø15.7	Ø9.5

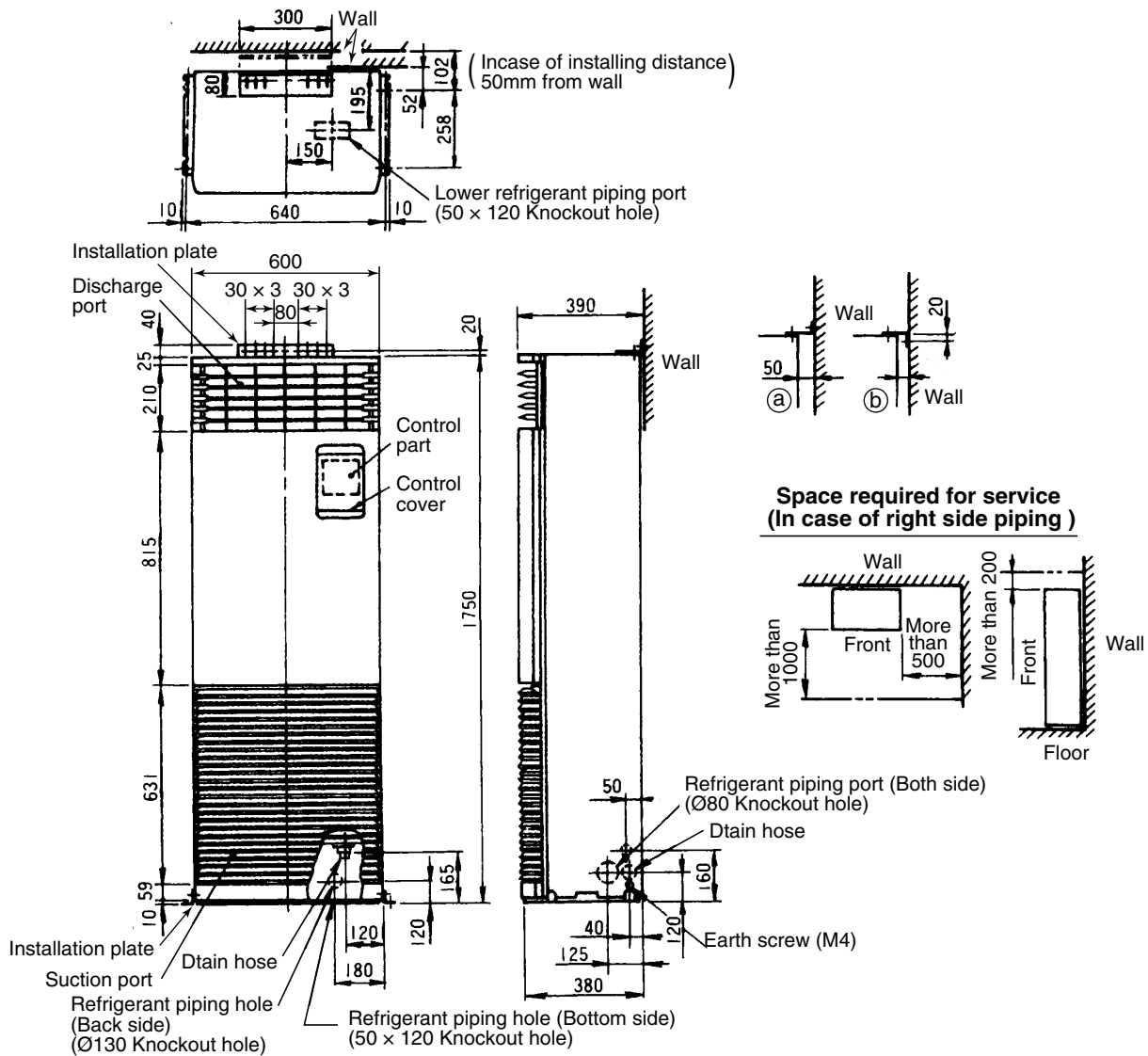
Details of hole for back side piping



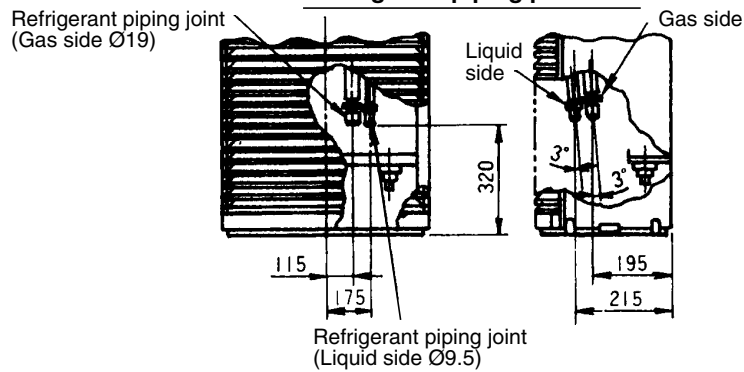
Details of hole for lower side piping



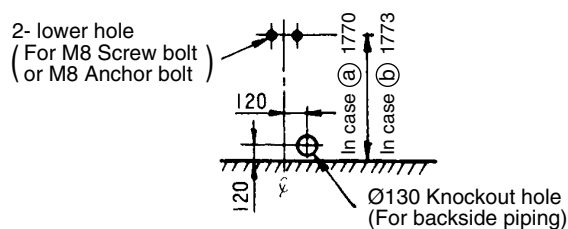
MMF-AP0361H, AP0481H, AP0561H



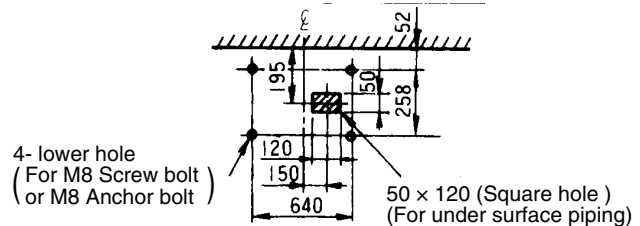
Refrigerant piping position



Details of hole for back side piping



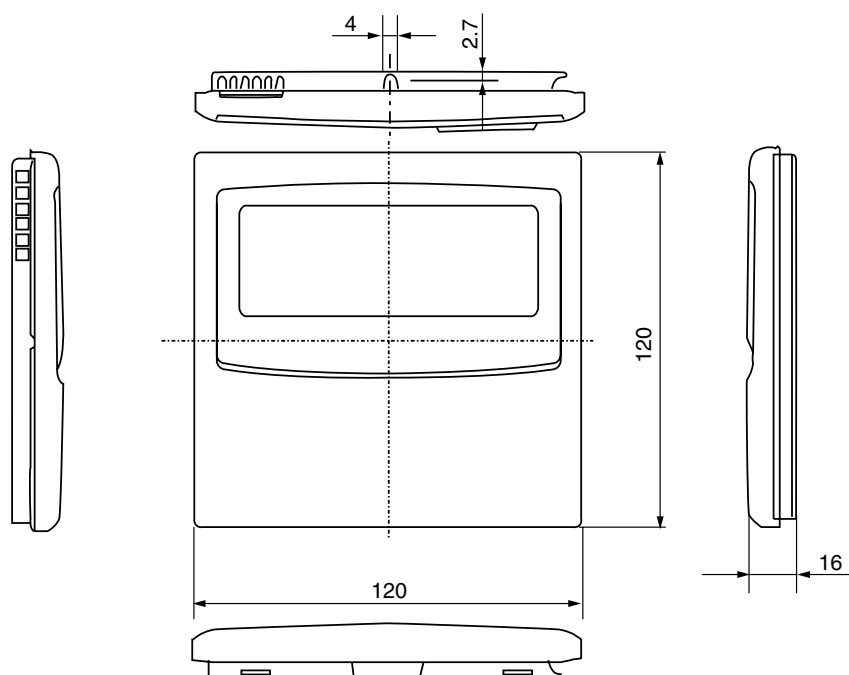
Details of hole for lower side piping



Remote controller

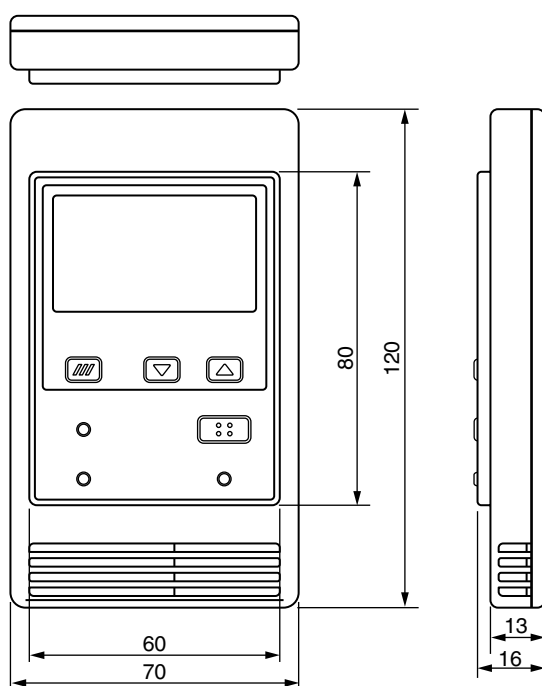
- Wired remote controller

RBC-AMT21E



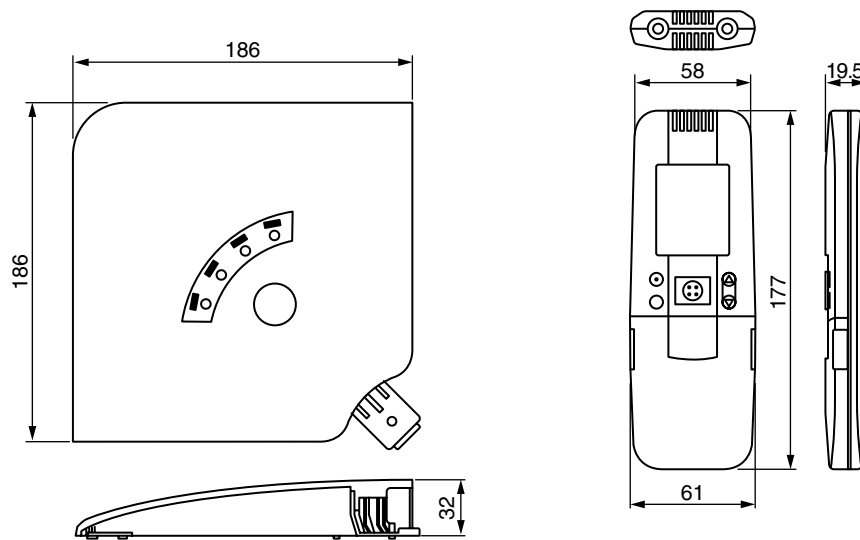
- Simple remote controller

RBC-AS21E



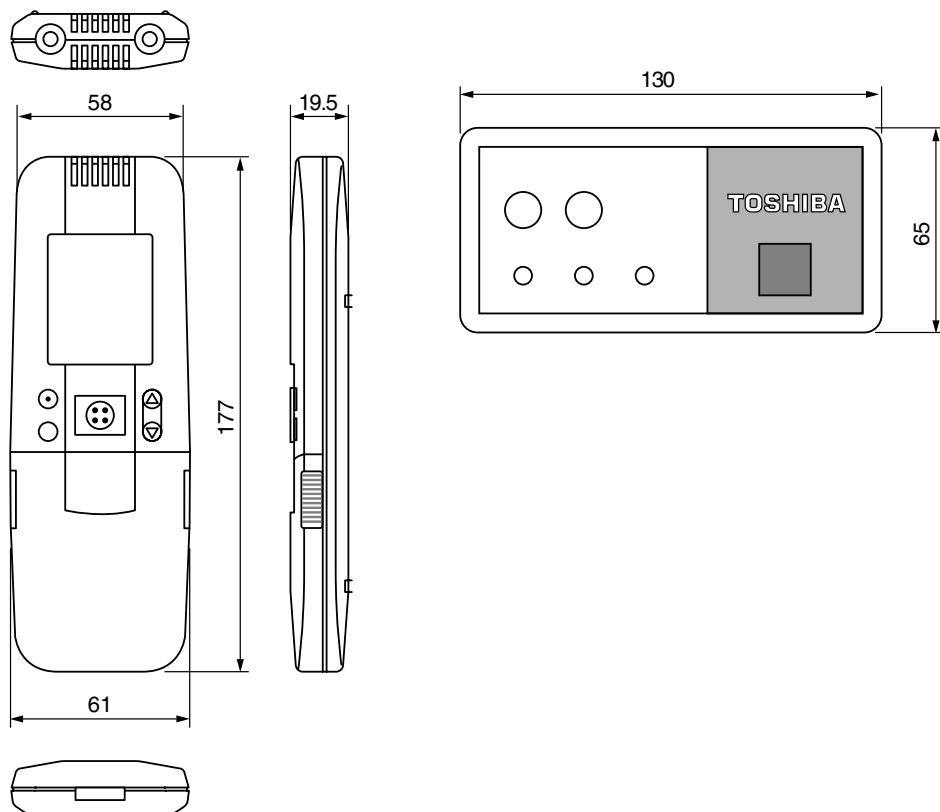
- **Wireless remote controller**

TCB-AX21U (W)-E

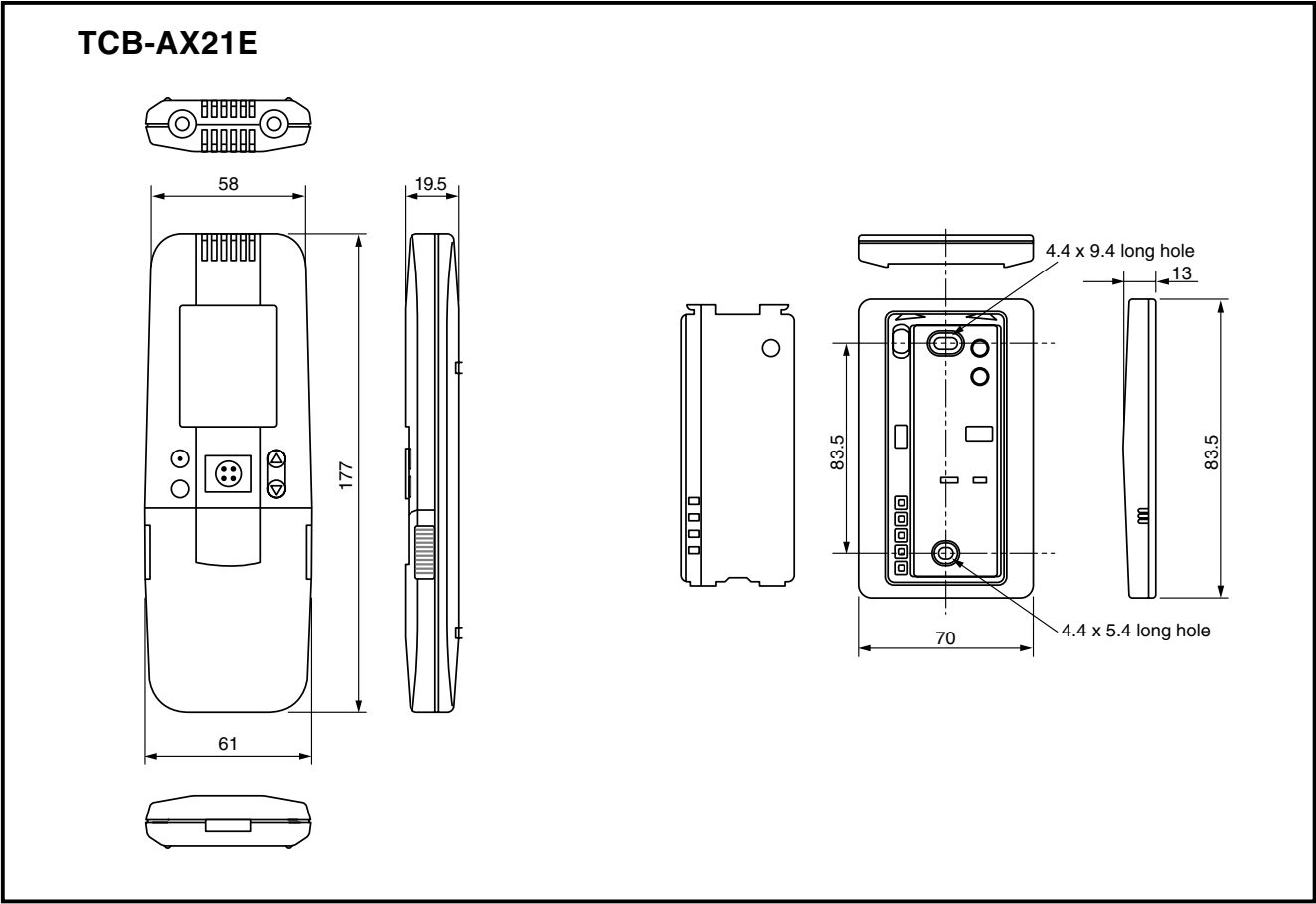


- **Wireless remote controller kit**

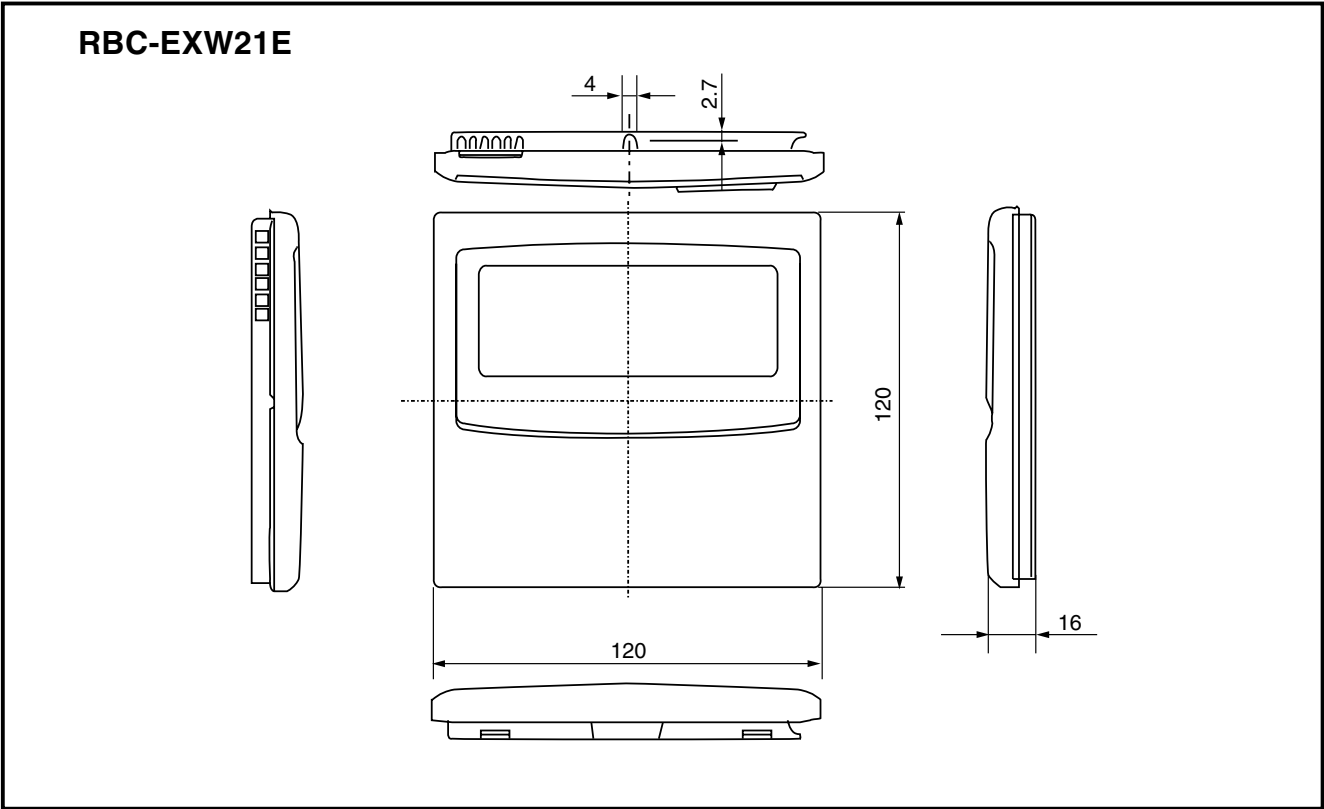
RBC-AX22CE



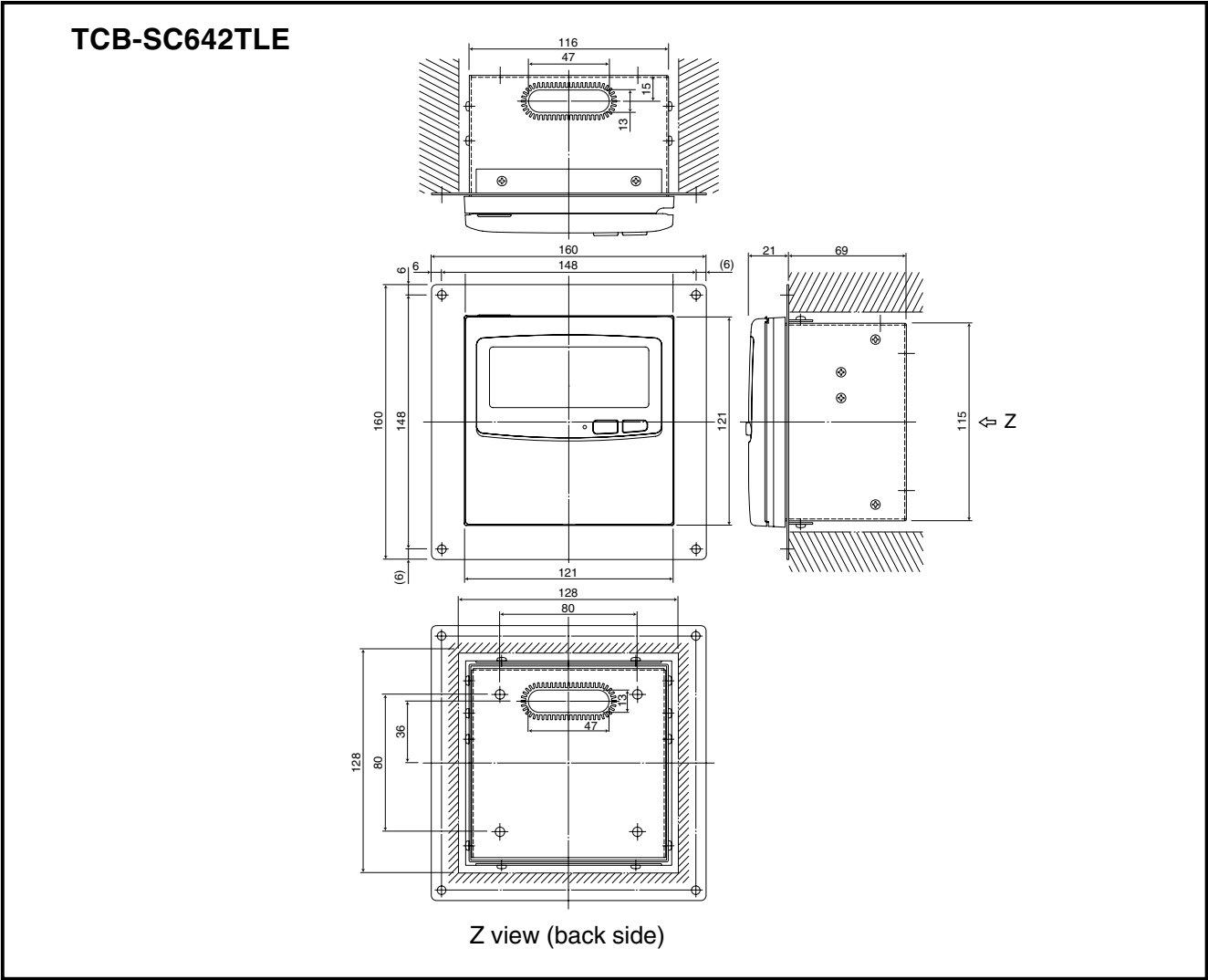
• **Wireless remote controller kit**



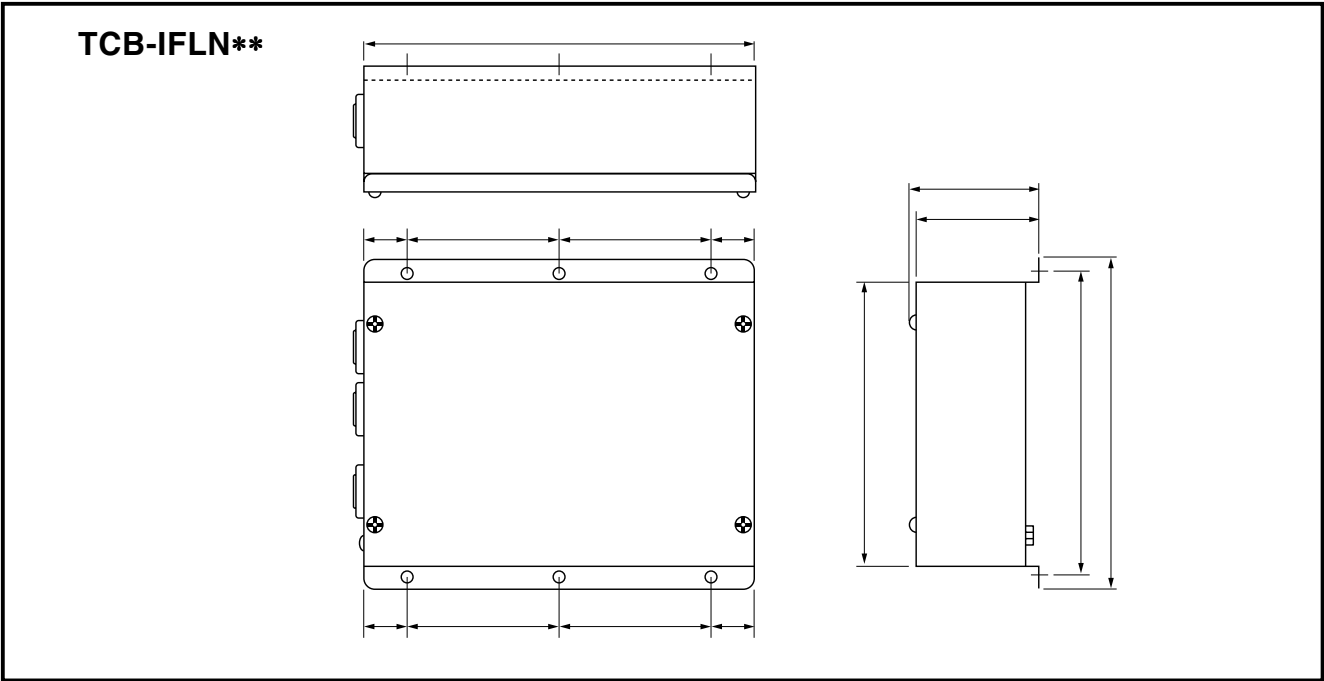
• **Weekly timer**



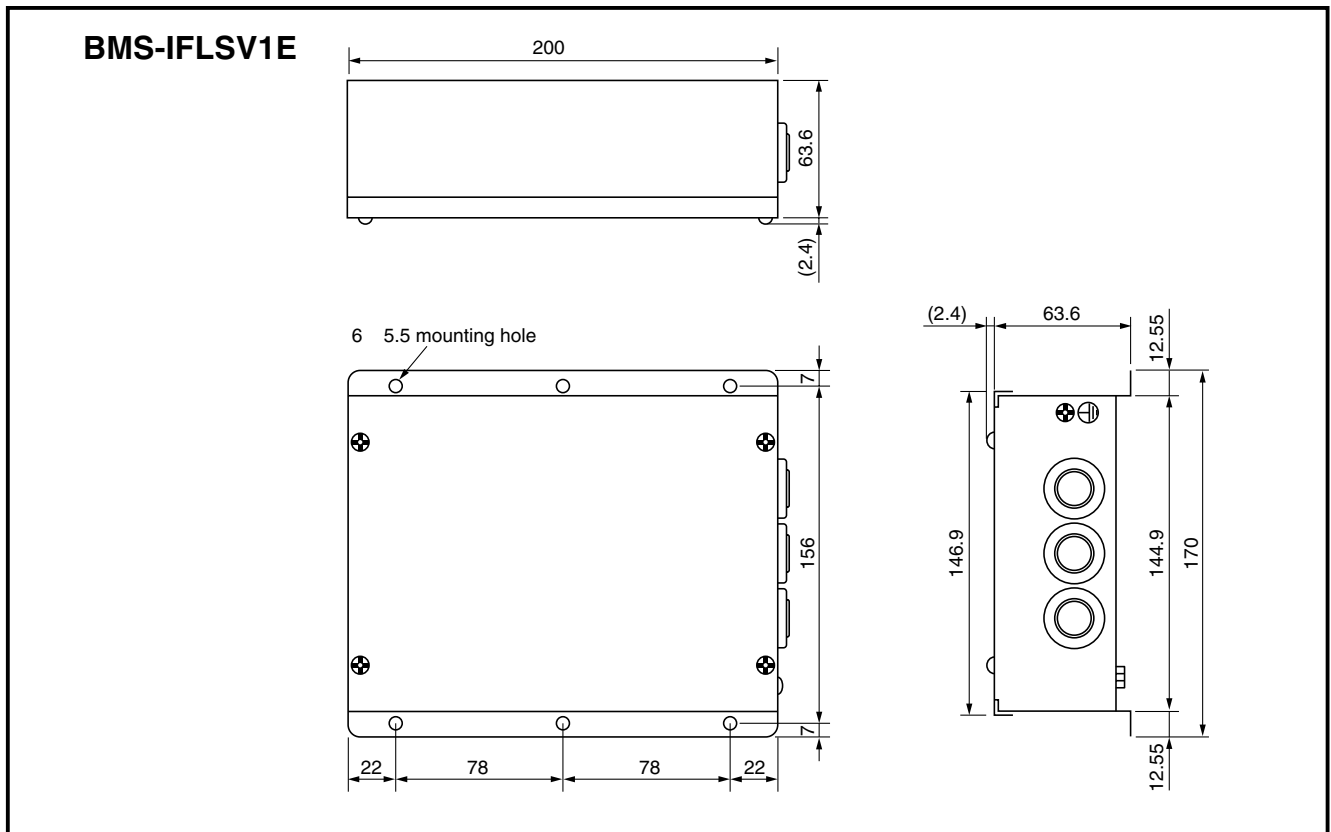
- Central remote controller



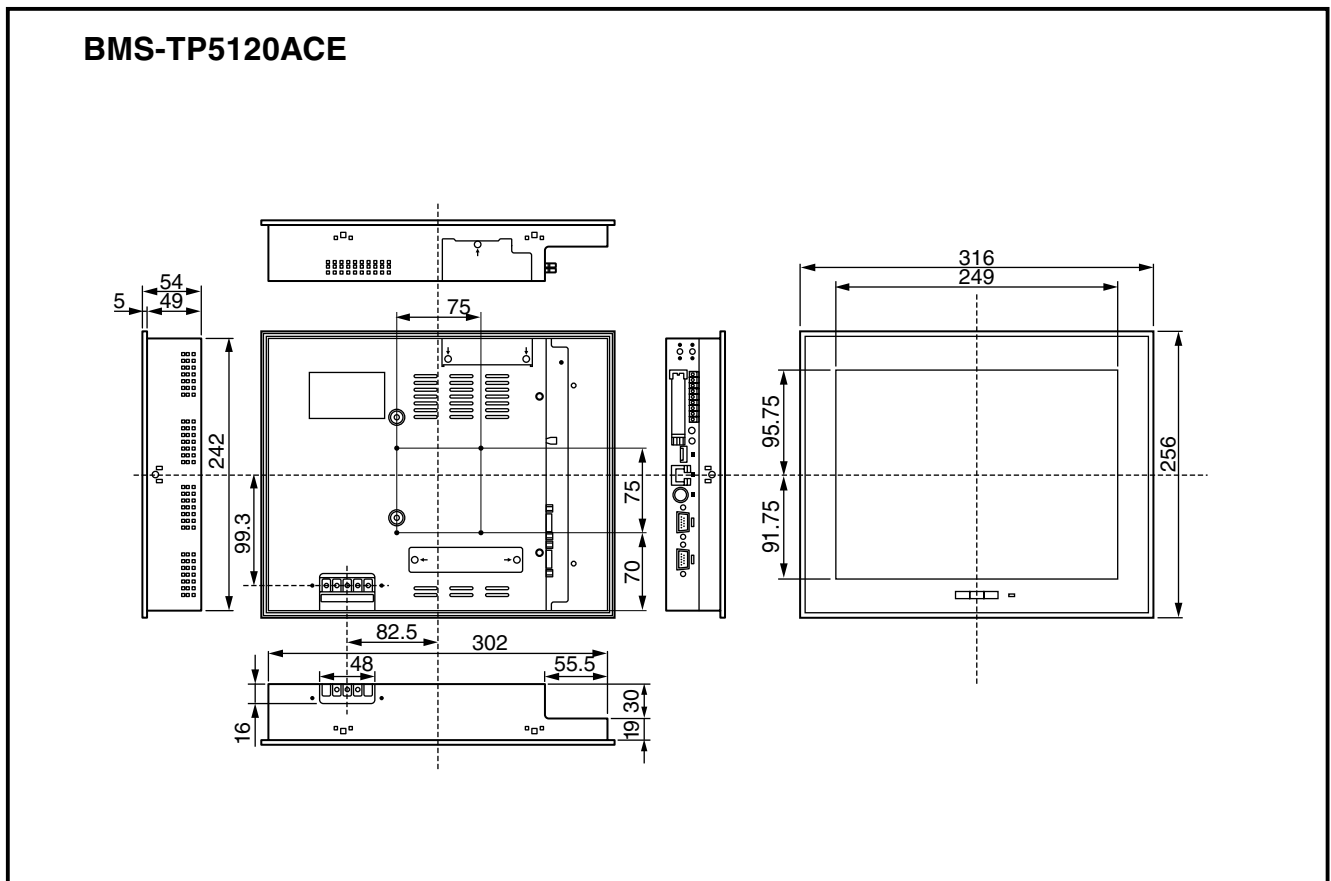
- LON Gateway



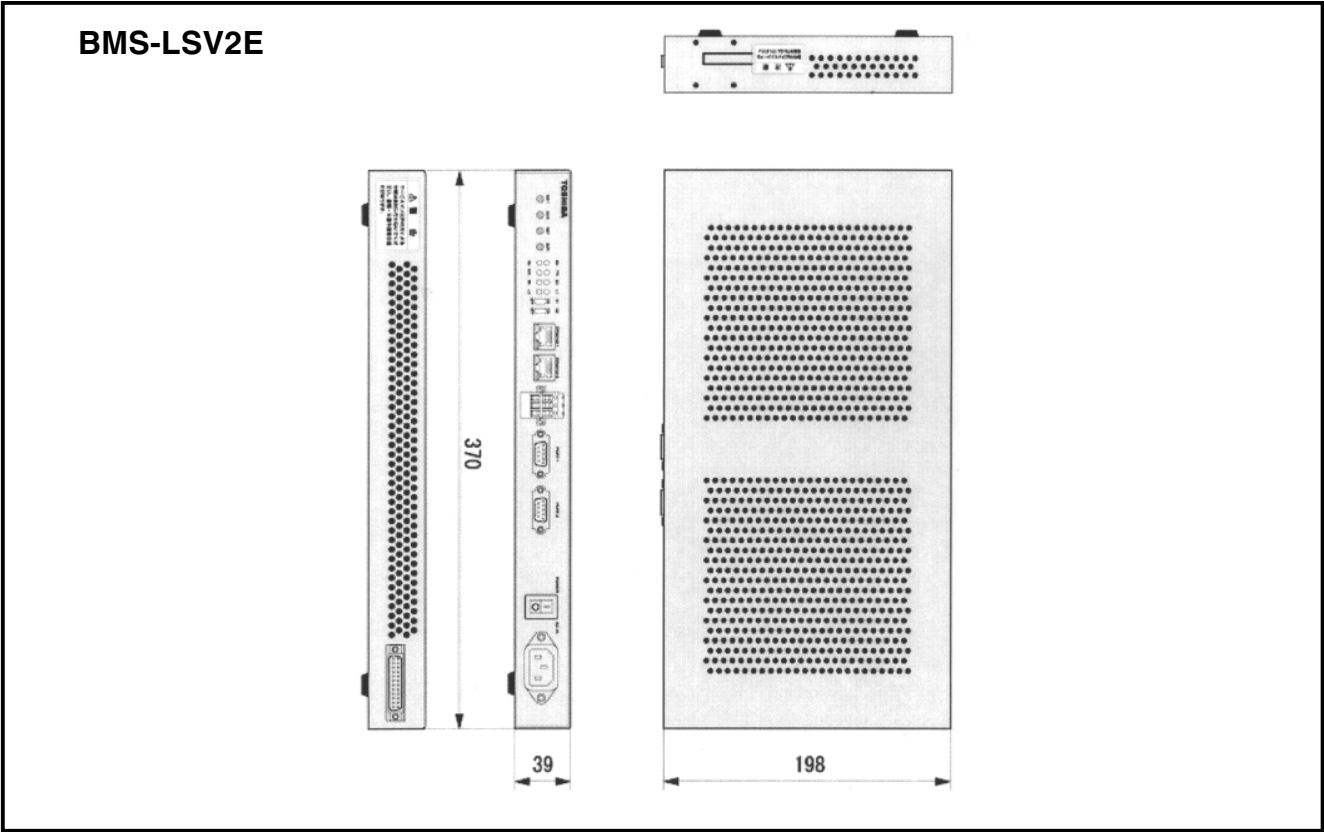
- TCS-Net relay interface



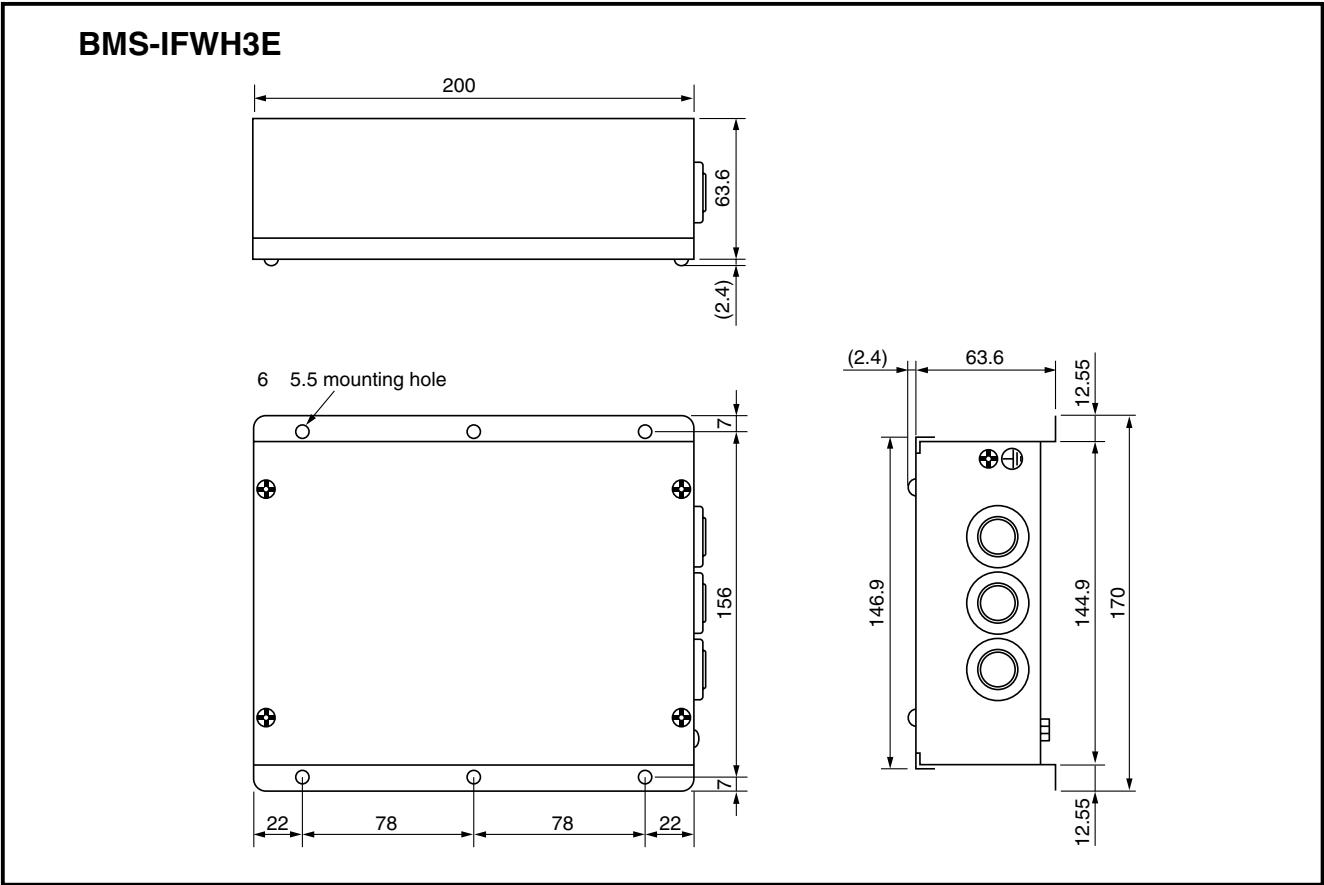
- Touch screen controller



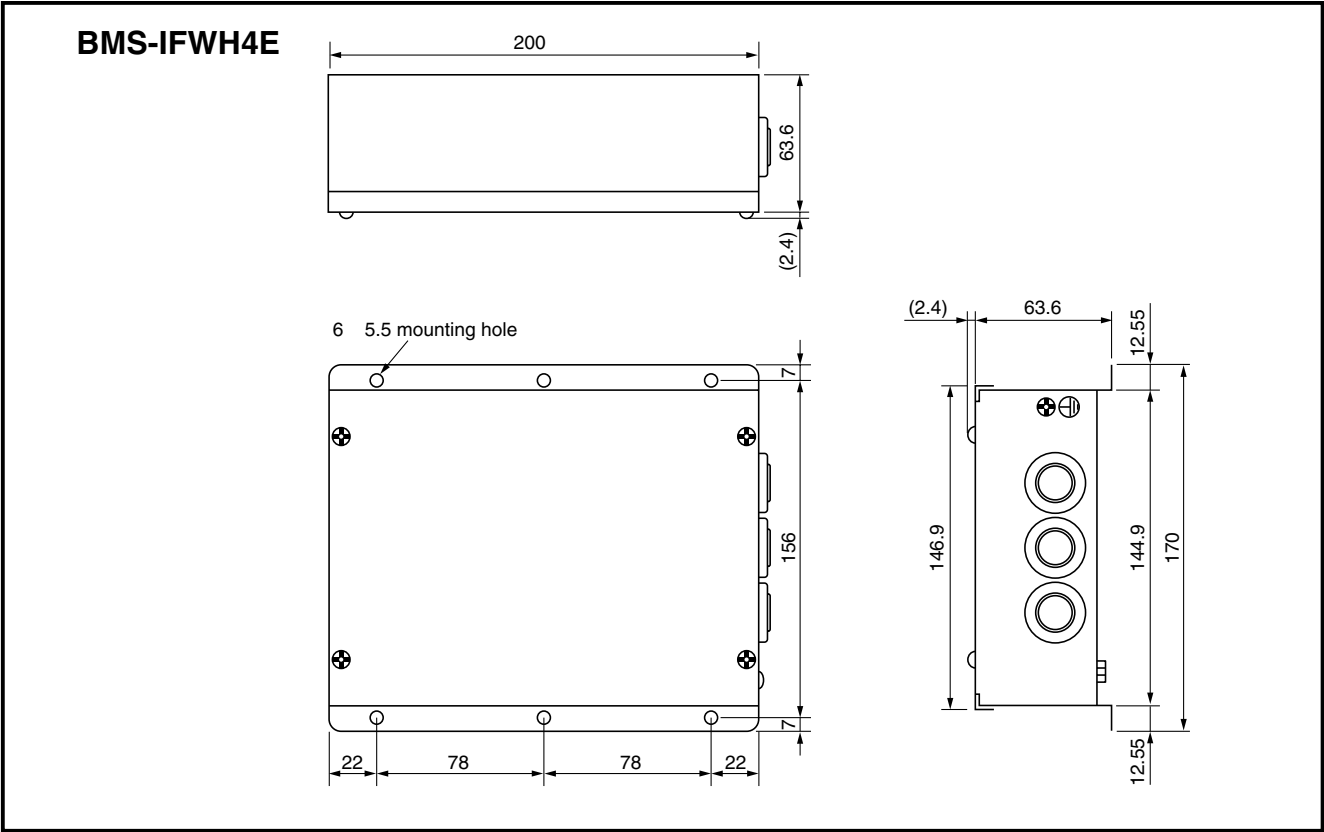
- Intelligent server



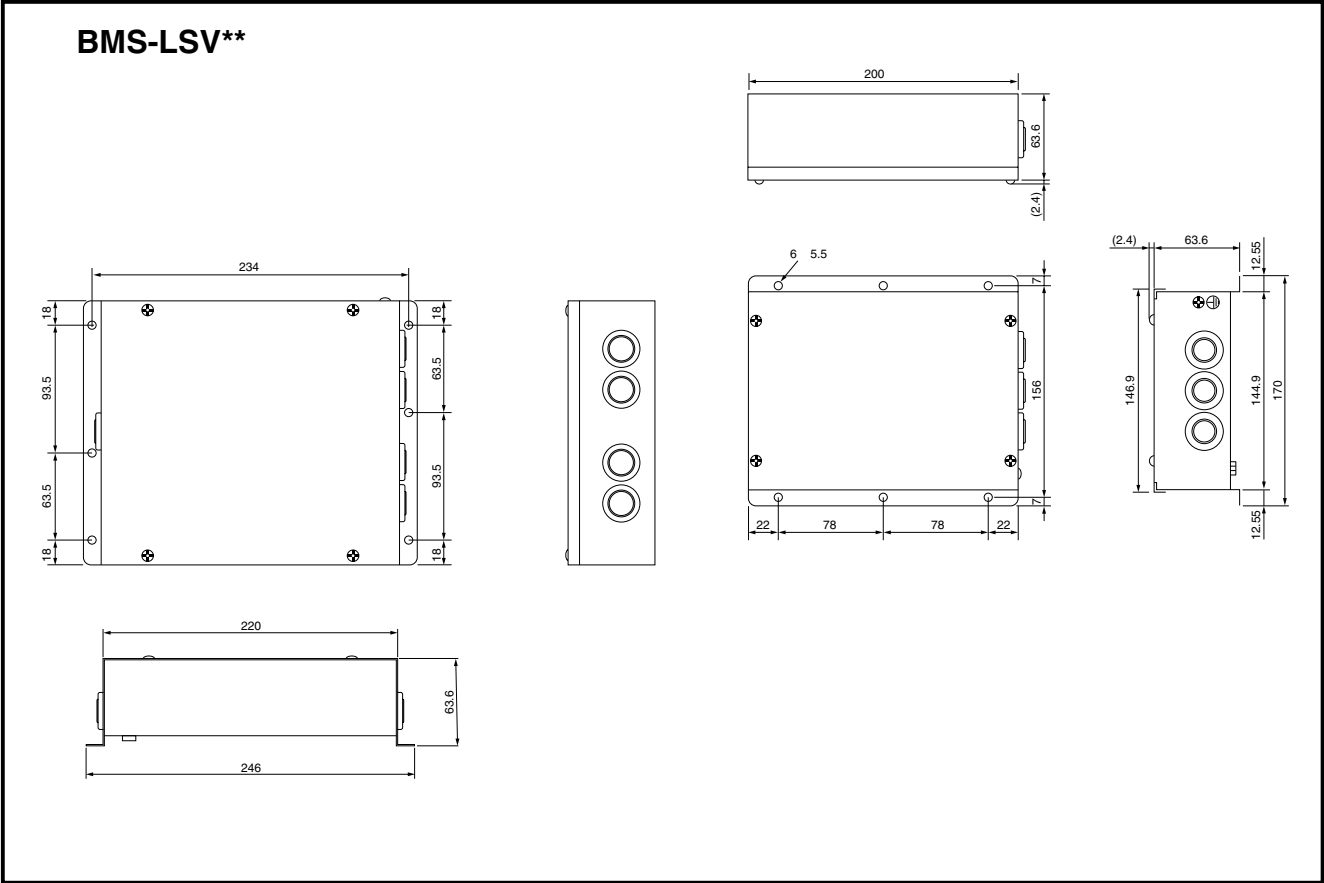
- Energy mounting relay interface



- Digital I/O relay interface

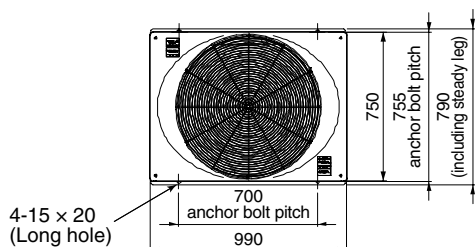


- WINDOWS based central controller



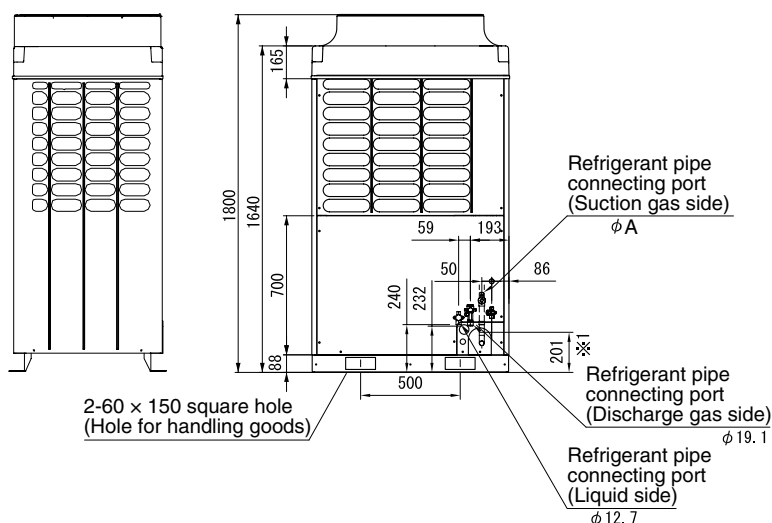
Outdoor unit

MMY-MAP0801FT8, MAP1001FT8, MAP1201FT8



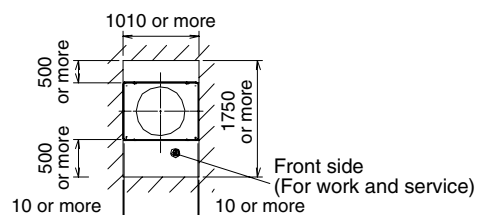
(NOTES)

1. If there is an obstacle at the upper side of the outdoor unit, set the top end of the outdoor unit 2000mm apart from the obstacle.
2. Limit the height of the obstacle surrounding the outdoor unit to 800mm or less from the bottom end of the outdoor unit.
3. Draw out the pipe procured locally to the front of the outdoor unit horizontally, and keep 500mm or more between the outdoor unit and traversing pipe if placing pipe transversely.

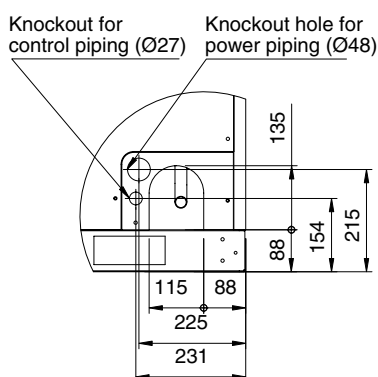
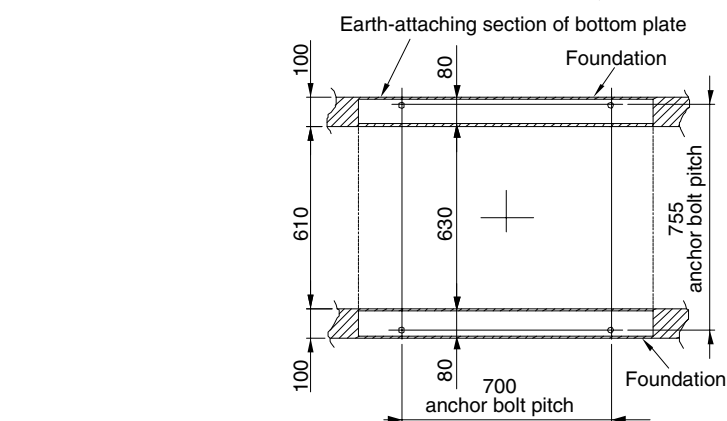
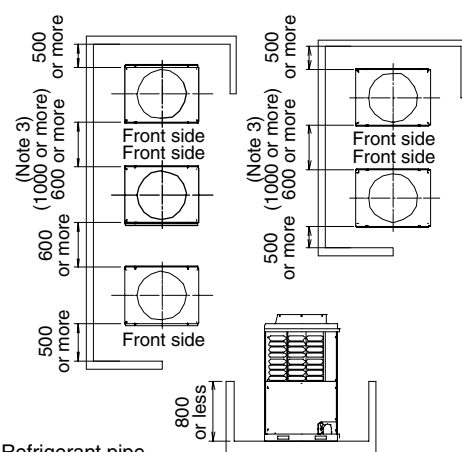


Model name	ØA
MMY-MAP0801FT8	22.2
MMY-MAP1001FT8	22.2
MMY-MAP1201FT8	28.6

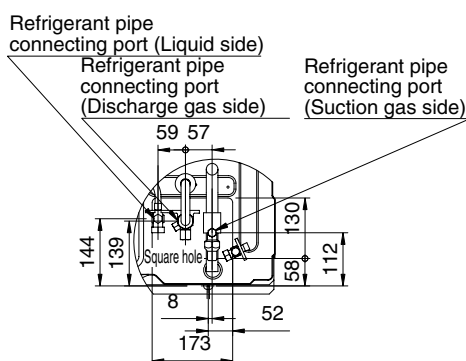
※1 Cutting position of L-shape pipe when pipe at gas side is connected
(Recommended pipe connecting position)



Space required for service



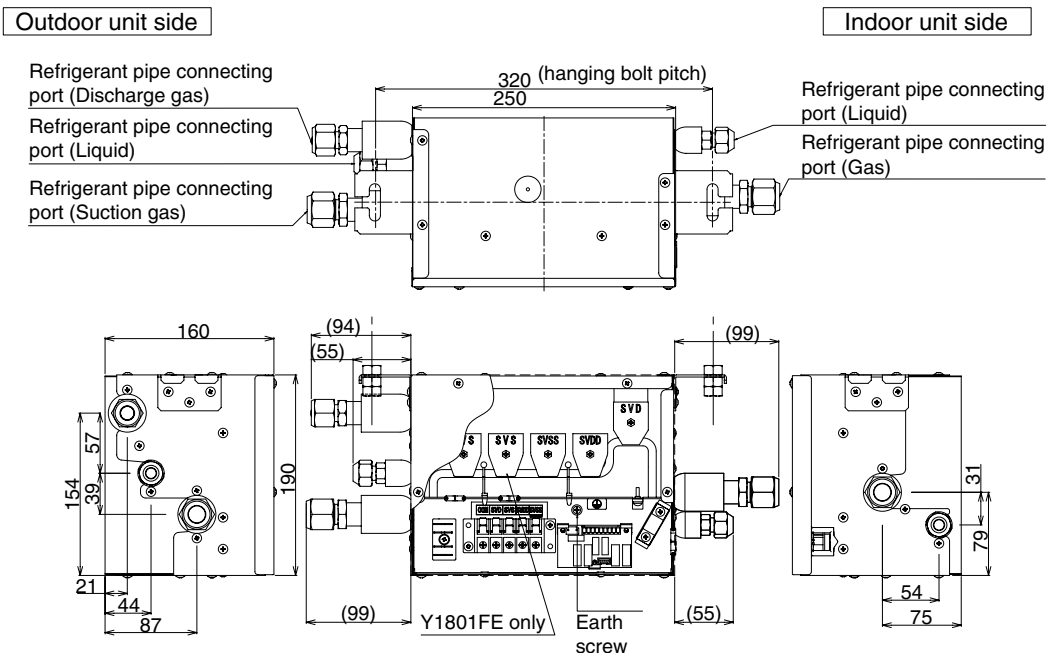
Details of front pipe/cabling holes



Details of hole for piping at lower side (Plane view)

FS unit (Flow Selector Unit)

RBM-Y1121FE, Y1801FE



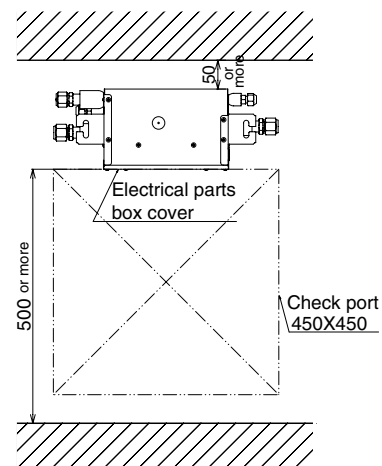
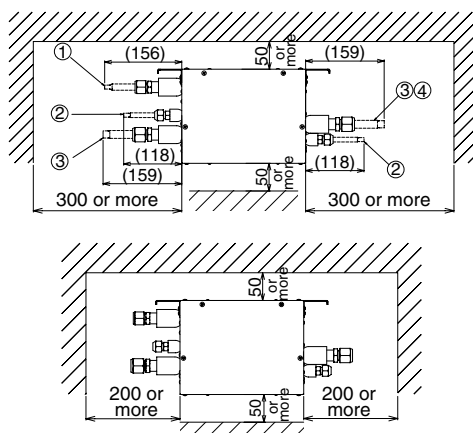
(Specifications)

Model name		RBM-Y1121F		RBM-Y1801F	
		Connecting pipe	Connecting method	Connecting pipe	Connecting method
Indoor unit side	Liquid side	Ø9.5 *1	Flare	Ø9.5	Flare
	Gas side	Ø15.9 *1*2	Flare	Ø15.9	Flare
Outdoor unit side	Liquid side	Ø9.5 *1	Flare	Ø9.5	Flare
	Discharge gas side	Ø12.7 *1	Flare	Ø12.7	Flare
	Suction gas side	Ø15.9 *1	Flare	Ø15.9	Flare
Connecting indoor unit capacity		007 to 030 type		036 to 056 type	
Power supply		Single phase 50Hz 230V(220-240V)			
Total weight		5kg		22kg	
Dimension (mm)		Height 190 X Width		250 X Depth 160	

Accessory pipe and socket

①	Ø9.5, Brazing	For discharge gas pipe
②	Ø6.4, Brazing	For liquid pipe
③	Ø12.7, Brazing	For gas pipe For suction gas pipe
④	Ø9.5, Brazing ^{*3}	For gas pipe

(Installation space)



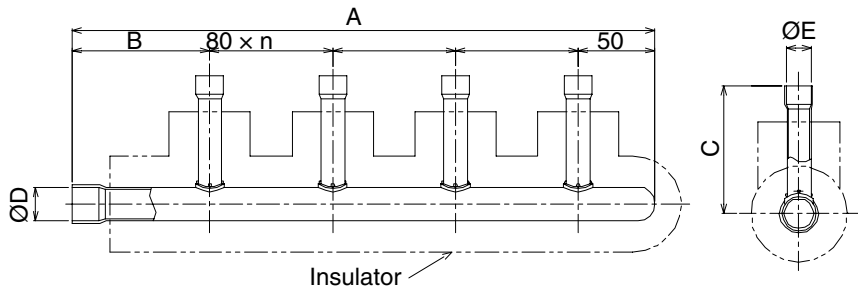
- *1) When the capacity of connected indoor unit is less than 5.6 kW, adjust the pipe size by using this accessory pipe.
- *2) When 007, 009, 012 type of indoor unit is connected, adjust the gas side pipe size by using this accessory pipe.
- *3) This accessory pipe is used when 007, 009, 012 type of indoor unit is connected.

Branch header/Branch joint

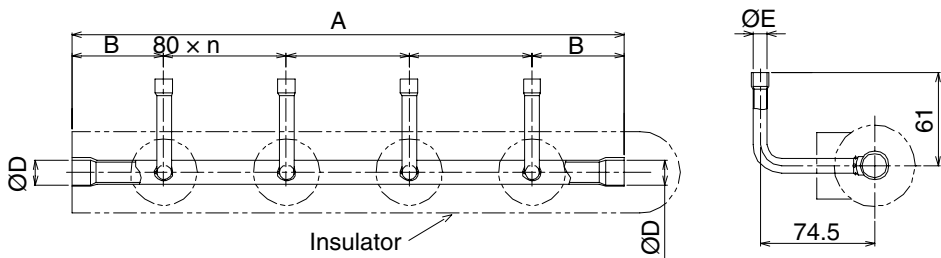
Branch header

RBM-HY1043E, HY1083E, HY2043E, HY2083E

Gas side



Liquid side

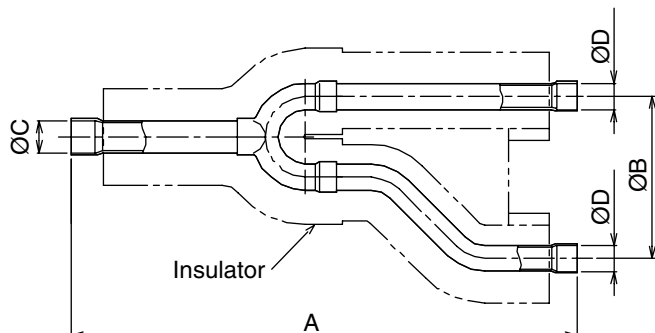


Model		A	B	C	ØD	ØE	n	Accessory soket x Q'ty
RBM-HY1043E	Gas side	380	90	83.6	22.2	15.9	3	(6) x 4, (9) x 4, (14) x 1, (18) x 1, (70) x 1
	Liquid side	360	60	—	15.9	9.5	3	(1) x 4, (6) x 1, (9) x 1
RBM-HY1083E	Gas side	700	90	83.6	22.2	15.9	7	(6) x 8, (9) x 8, (14) x 1, (18) x 1, (70) x 1
	Liquid side	680	60	—	15.9	9.5	7	(1) x 8, (6) x 1, (9) x 1
RBM-HY2043E	Gas side	385.5	95.5	89.3	31.8	15.9	3	(6) x 2, (9) x 2, (27) x 1, (59) x 1
	Liquid side	360	60	—	15.9	9.5	3	(1) x 2
RBM-HY2083E	Gas side	705.5	95.5	89.3	31.8	15.9	7	(6) x 7, (9) x 7, (27) x 1, (59) x 1
	Liquid side	680	60	—	15.9	9.5	7	(1) x 7

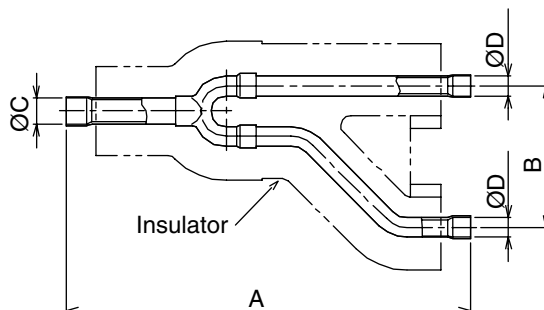
Y-shape branch joint

RBM-BY53E, BY103E

Gas side

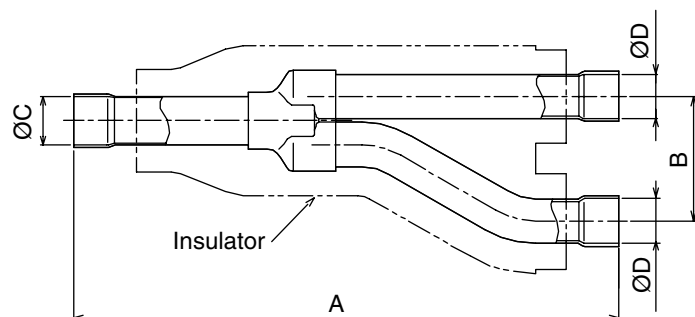


Liquid side

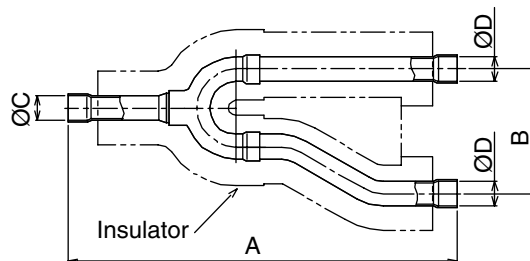


RBM-BY203E, BY303E

Gas side

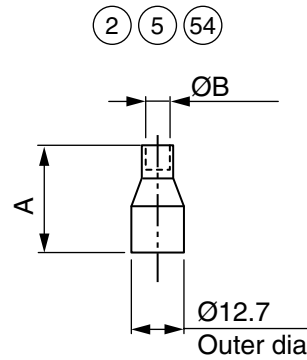
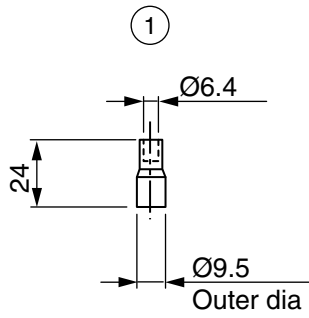


Liquid side

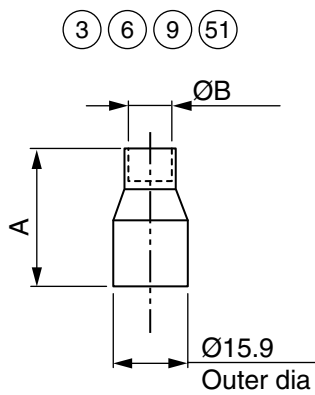


Model		A	B	ØC	ØD	Accessory soket × Q'ty
RBM-BY53E	Gas side	250	80	15.9	12.7	(5) × 2, (54) × 2, (9) × 1, (51) × 1
	Liquid side	200	70	12.7	9.5	(1) × 2, (5) × 1
RBM-BY103E	Gas side	350	80	22.2	19.1	(7) × 1, (10) × 1, (13) × 2, (18) × 1, (52) × 2, (70) × 1, (89) × 1
	Liquid side	250	80	15.9	12.7	(2) × 1, (5) × 2, (6) × 1, (9) × 1, (54) × 1
RBM-BY203E	Gas side	350	80	31.8	28.6	(16) × 1, (20) × 1, (27) × 1, (43) × 2, (48) × 1, (49) × 1, (58) × 1, (59) × 1
	Liquid side	250	80	15.9	15.9	(3) × 1, (6) × 1, (9) × 2
RBM-BY303E	Gas side	400	110	38.1	38.1	(61) × 3, (62) × 2, (71) × 2, (73) × 1, (74) × 1, (75) × 1, (76) × 1, (77) × 1
	Liquid side	350	80	22.2	19.1	(4) × 1, (7) × 1, (10) × 1, (13) × 2, (14) × 1, (18) × 1, (52) × 1

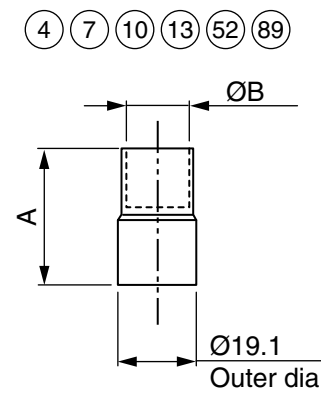
Accessory socket



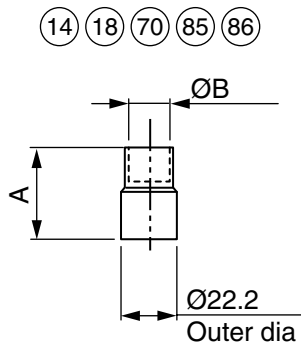
	A	ØB
②	29	6.4
⑤	26	9.5
⑤4	31	15.9



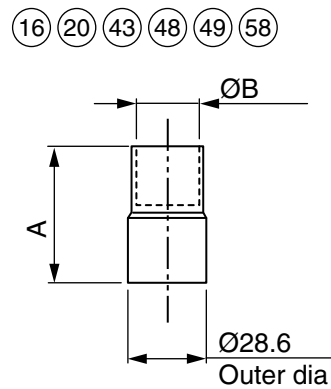
	A	ØB
③	35	6.4
⑥	32	9.5
⑨	28	12.7
⑤1	38	19.1



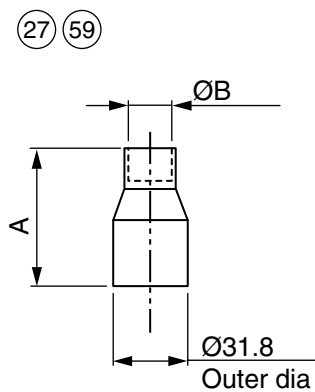
	A	ØB
④	39	6.4
⑦	39	9.5
⑩	36	12.7
⑬	33	15.9
⑤2	43	22.2
⑧9	53	28.6



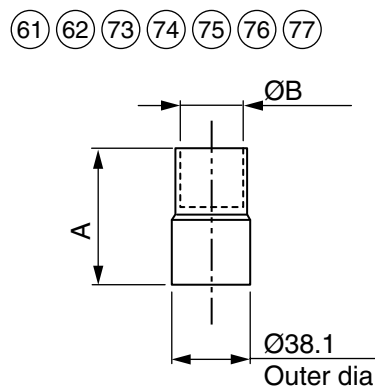
	A	ØB
⑭	40	15.9
⑱	40	19.1
⑦0	54	28.6
⑧5	41	12.7
⑧6	44	9.5



	A	ØB
⑰	50	15.9
⑲	52	19.1
④3	50	22.2
④8	54	9.5
④9	52	12.7
⑤8	62	34.9



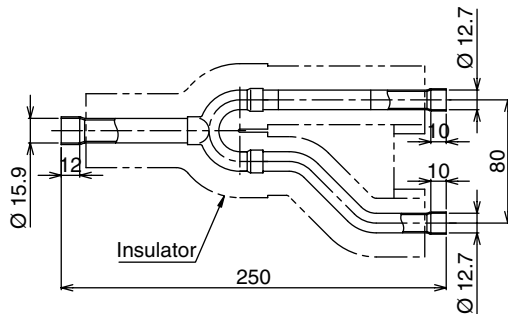
	A	ØB
⑲7	49	28.6
⑤9	59	34.9



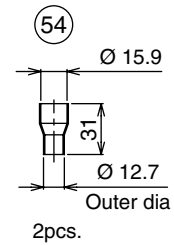
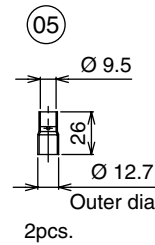
	A	ØB
⑥1	55	34.9
⑥2	66	41.3
⑦1	66	28.6
⑦3	66	22.2
⑦4	66	19.1
⑦5	64	15.9
⑦6	62	12.7
⑦7	62	9.5

Y-shape branch joint RBM-BY53FE

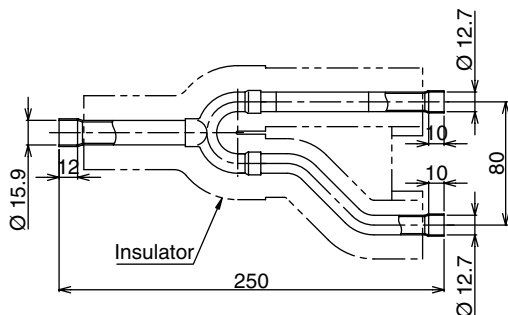
Suction gas side



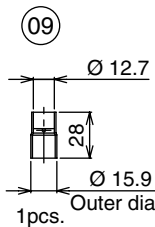
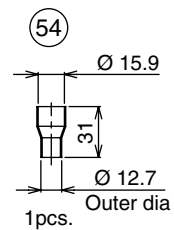
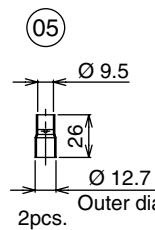
Accessory socket



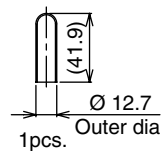
Discharge gas side



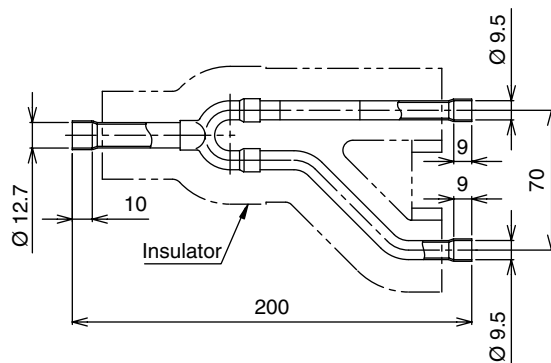
Accessory socket



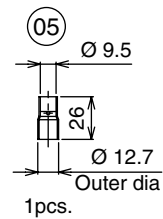
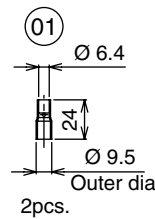
Closed pipe



Liquid side

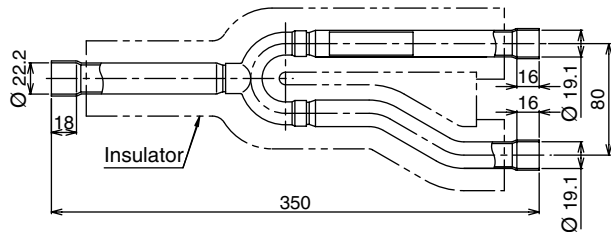


Accessory socket

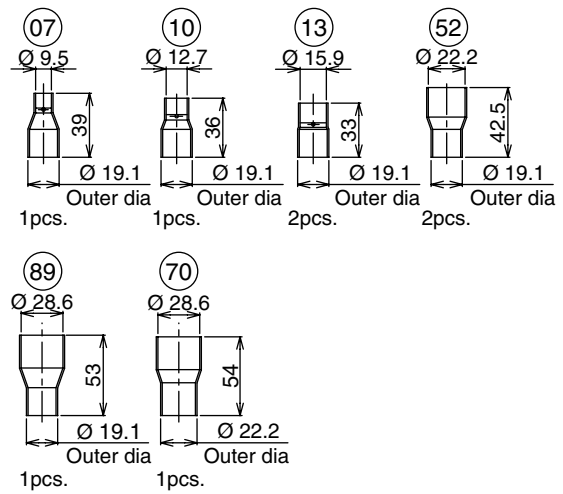


Y-shape branch joint RBM-BY103FE

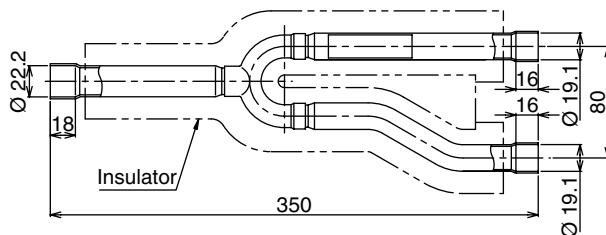
Suction gas side



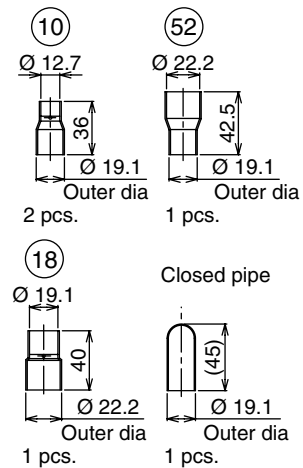
Accessory socket



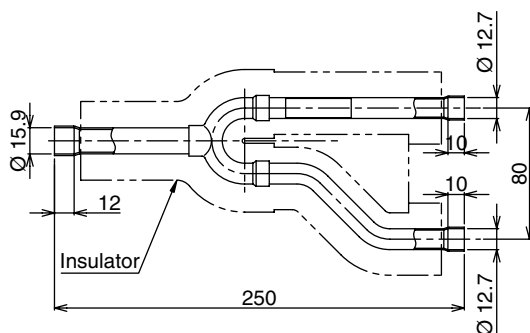
Discharge gas side



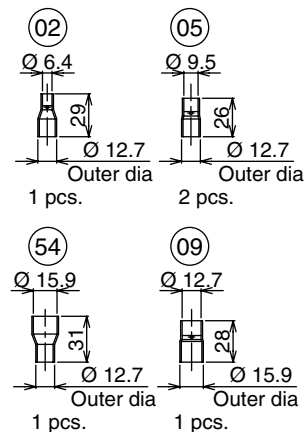
Accessory socket



Liquid side

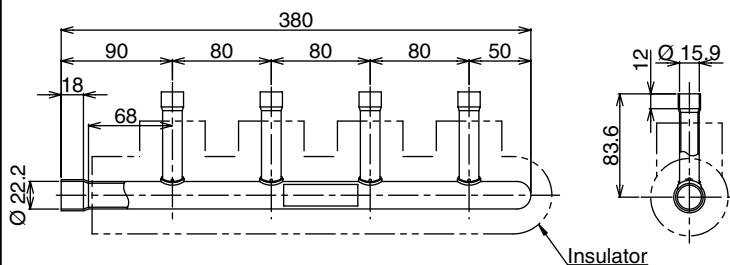


Accessory socket

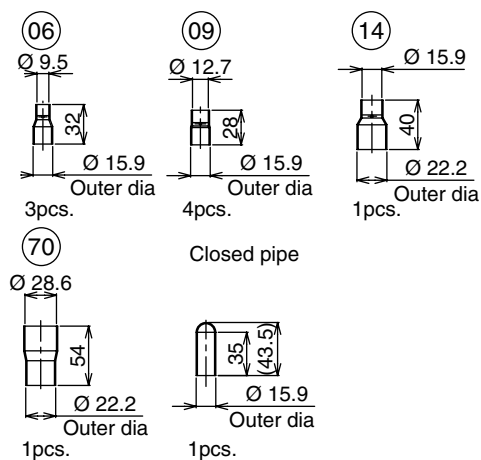


Branch header RBM-HY1043FE

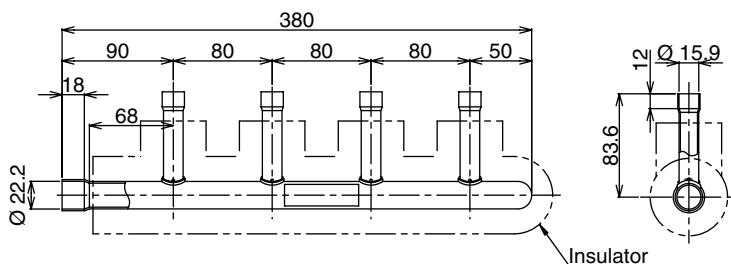
Suction gas side



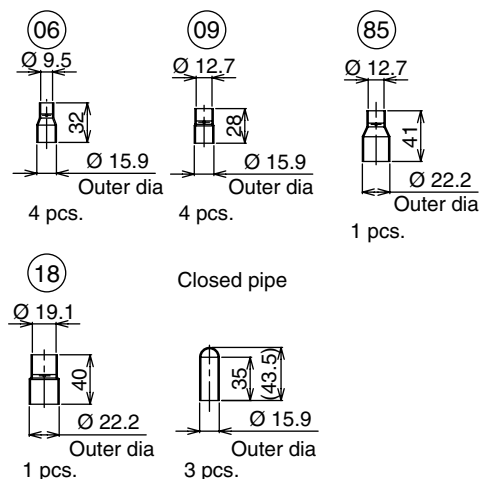
Accessory socket



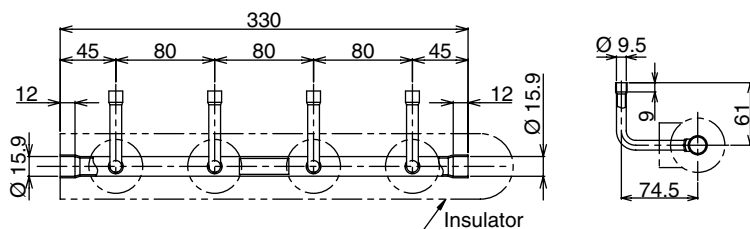
Discharge gas side



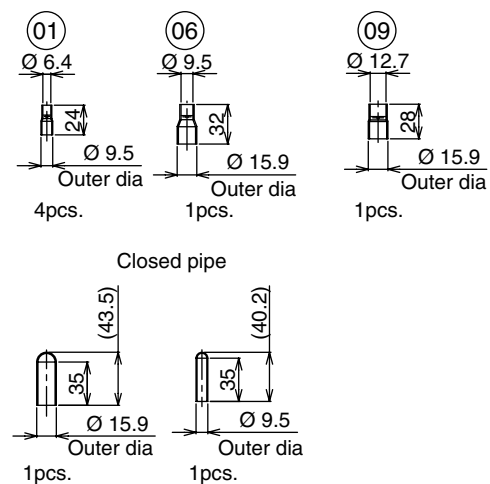
Accessory socket



Liquid side

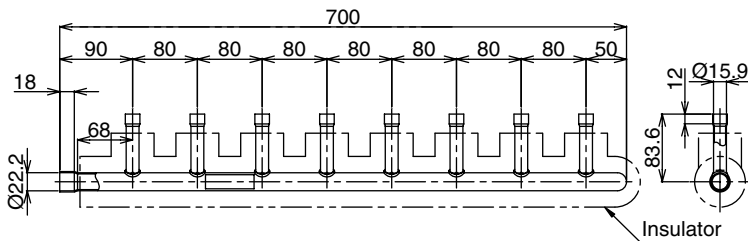


Accessory socket

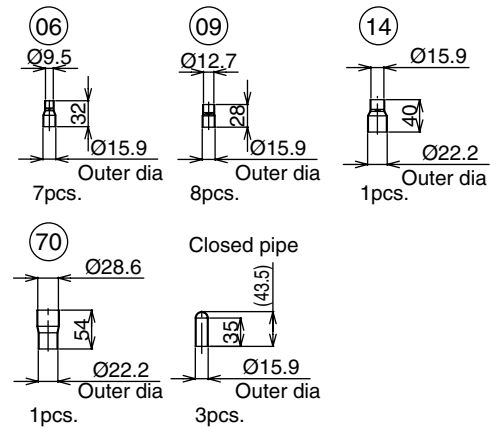


Branch header RBM-HY1083FE

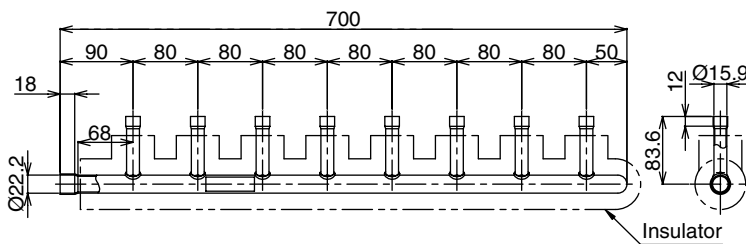
Suction gas side



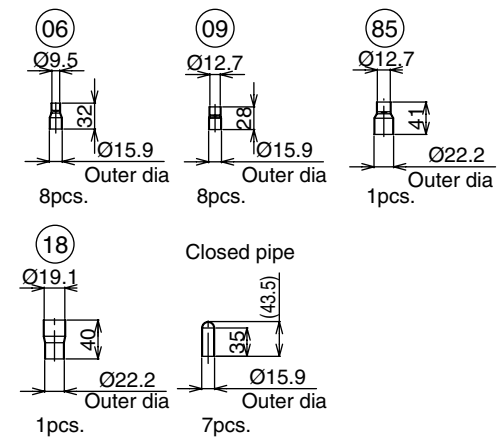
Accessory socket



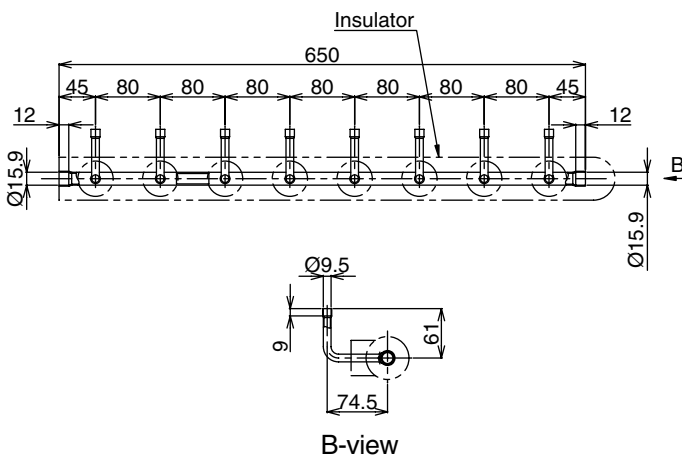
Discharge gas side



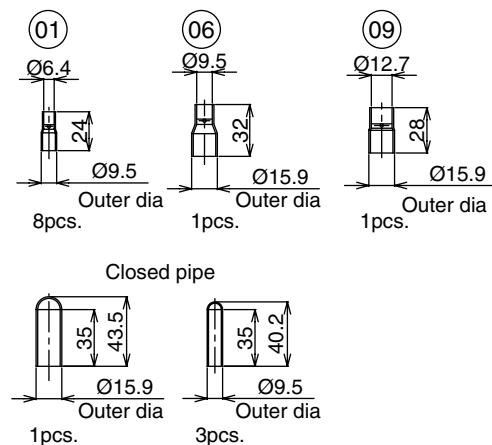
Accessory socket



Liquid side



Accessory socket



TOSHIBA CARRIER CORPORATION

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