TOSHIBA

FILE NO. A04-017

DESIGN MANUAL

SUPER

SUPER HEAT RECOVERY MULTI

HFC R410A

Heat Recovery Type (2 Series)

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, AP0721H,
MMD-AP0961H

<Under Ceiling Type>

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

<High Wall Type>

MMK-AP0071H, AP0091H, AP0121H,
MMK-AP0151H, AP0181H, AP0241H,
MMK-AP0072H*, AP0092H*, AP0122H*

*** European market only**

<Floor Standing Cabinet Type>

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

<Floor Standing Concealed Type>

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

<Floor Standing Type>

MMF-AP0151H, AP0181H, AP0241H
MMF-AP0271H, AP0361H, AP0481H
MMF-AP0561H

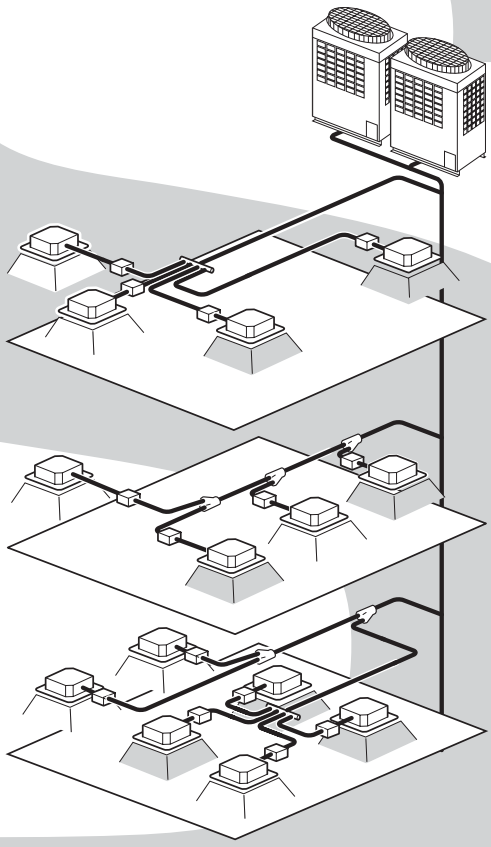
Outdoor Unit

<Inverter Unit>

MMY-MAP0802FT8
MMY-MAP1002FT8
MMY-MAP1202FT8

FS unit

RBM-Y1122FE
RBM-Y1802FE
RBM-Y2802FE



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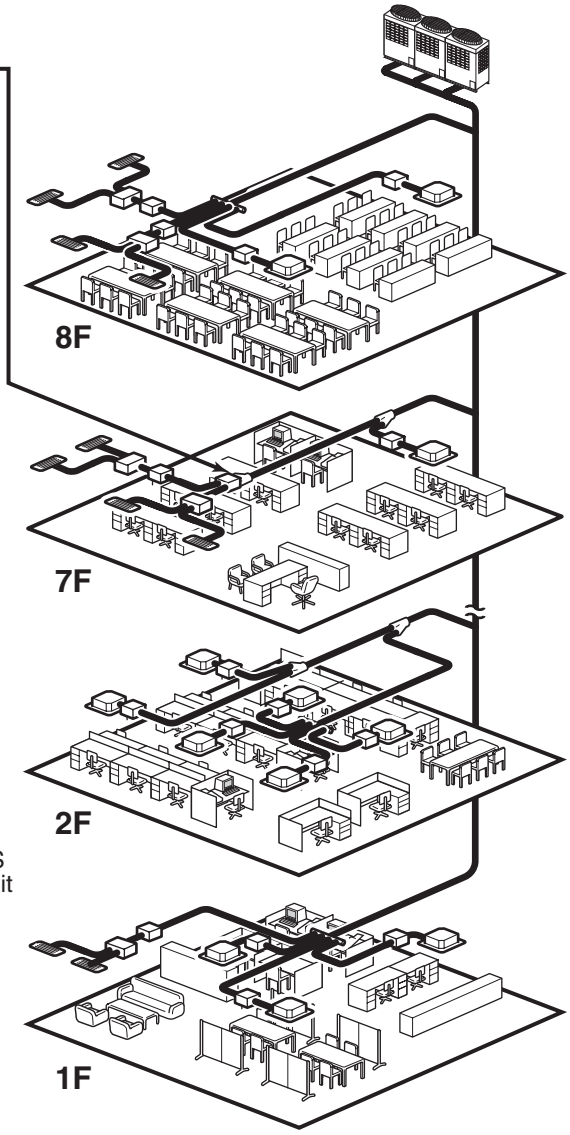
DESIGN MANUAL

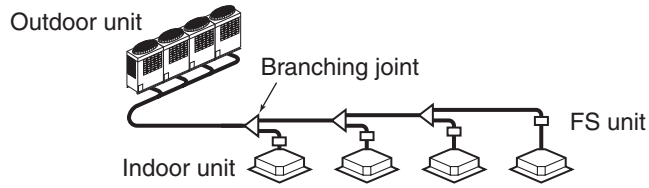
1. OUTLINE OF TOSHIBA SUPER HRM (Super Heat Recovery Multi System)

◆ Shortest route design by free branching

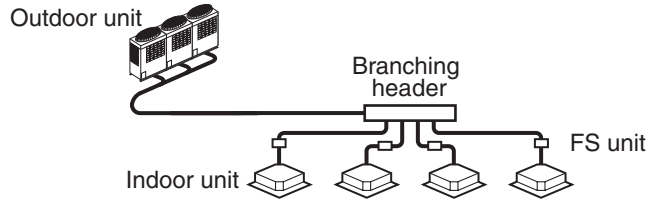
Combination of line and header branching is highly flexible. This follows for the shortest design route possible, thereby saving on installation time and cost. Line/header branching after header branching is only available with TOSHIBA Super HRM.



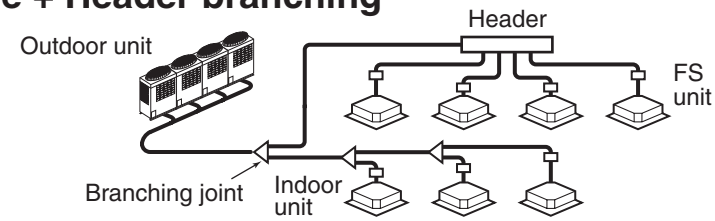
Line branching



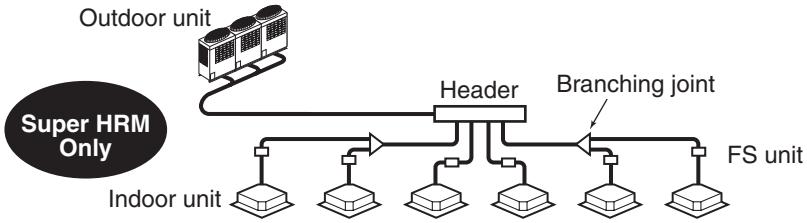
Header branching



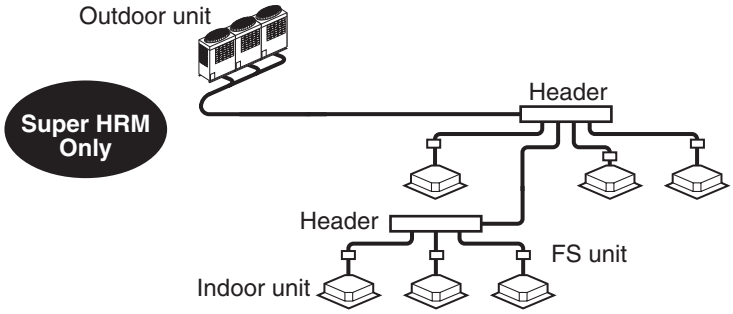
Line + Header branching

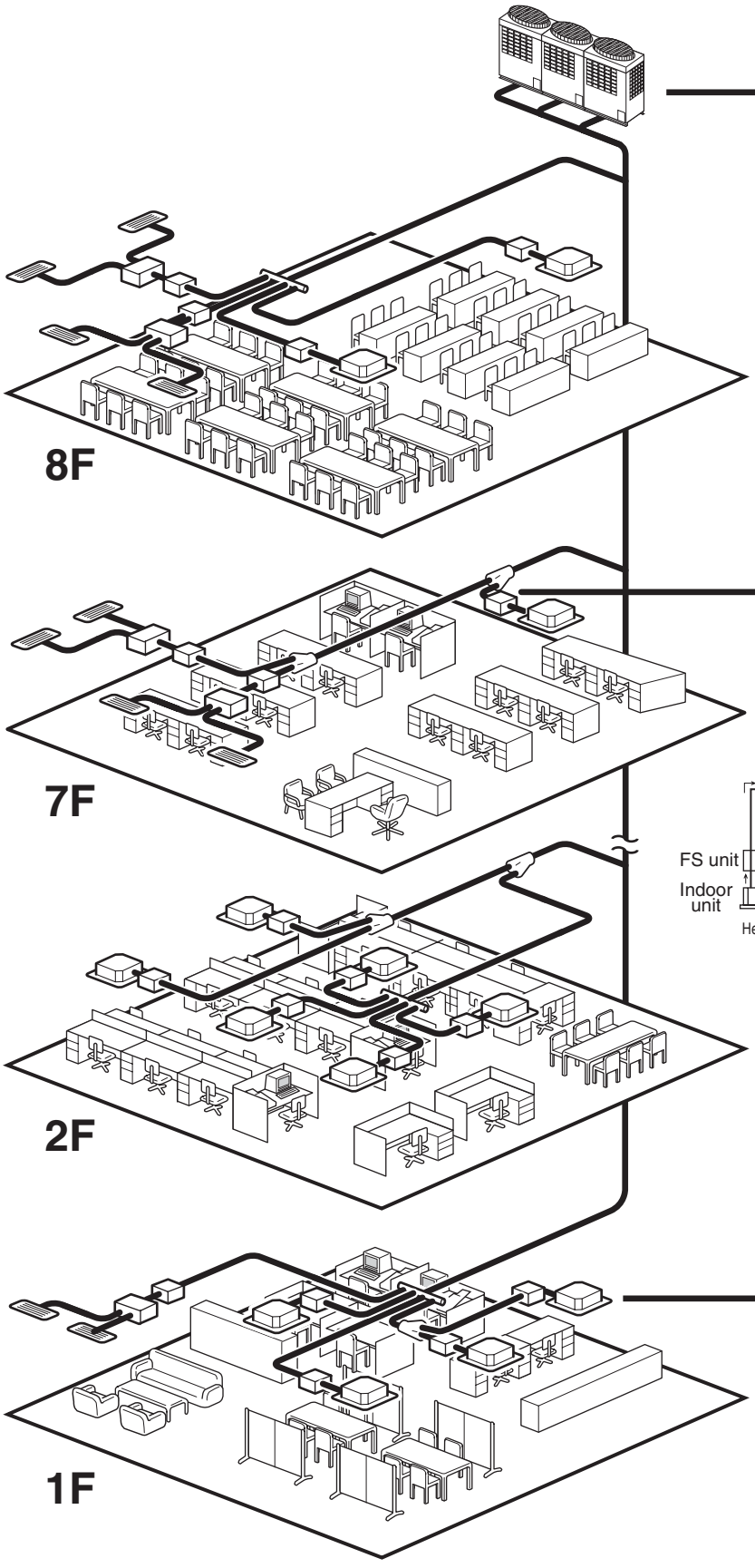


Line branching after header branching

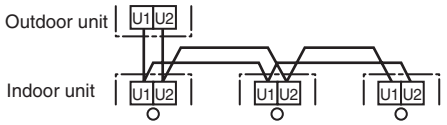


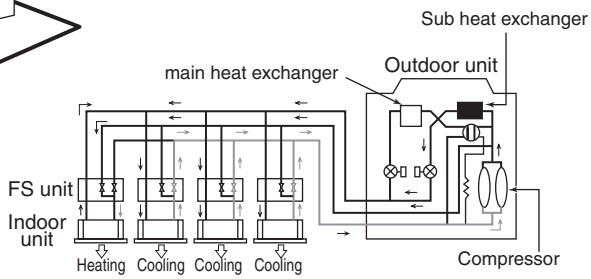
Header branching after header branching



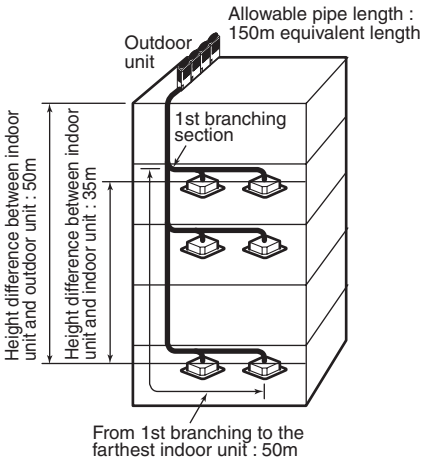


- Non-polarized control wiring between outdoor and indoor units





- 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 and flexible piping design

Equivalent pipe length of 150m 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.
Also, maximum piping length from 1st branching is 50m.
These allow for greater flexibility in the location of the system.

◆ Simultaneous operation

By controling 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.

◆ Extended outdoor temperature operating range

By employing sophisticated system control with all inverter driven compressor, the operating range in cooling has been extended from -5ºC to -10ºC.

◆ 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.

◆ Group control by one FS unit

Up to 8 indoor units of group control by one FS unit gives the design flexibility for various type and size of rooms.

◆ 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-	MAP0802FT8	MAP1002FT8	MAP1202FT8	
Cooling capacity (kW)	22.4	28.0	33.5	
Heating capacity (kW)	25.0	31.5	35.5	

2. Outdoor units (Combination of outdoor units)

Corresponding HP		8HP	10HP	12HP	16HP	18HP
Combined model	MMY-	MAP0802FT8	MAP1002FT8	MAP1202FT8	AP1602FT8	AP1802FT8
Cooling capacity (kW)		22.4	28	33.5	45	50.4
Heating capacity (kW)		25	31.5	35.5	50	56.5
Combined outdoor units		8HP	10HP	12HP	8HP	10HP
					8HP	8HP
No. of connectable indoor units		13	16	16	27	30

Corresponding HP		20HP	24HP	26HP	28HP	30HP
Combined model	MMY-	AP2002FT8	AP2402FT8	AP2602FT8	AP2802FT8	AP3002FT8
Cooling capacity (kW)		56	68	73	78.5	84
Heating capacity (kW)		63	76.5	81.5	88	95
Combined outdoor units		10HP	8HP	10HP	10HP	10HP
		10HP	8HP	8HP	10HP	10HP
			8HP	8HP	8HP	10HP
No. of connectable indoor units		33	40	43	47	48

3. FS units (Flow selector units)

Model name	Usage	Appearance
RBM-Y1122FE	Total capacity for indoor unit : Below 11.2 kw	
RBM-Y1802FE	Total capacity for indoor unit : 11.2 to below 18.0 kw	
RBM-Y2802FE	Total capacity for indoor unit : 18.0 to 28.0 kw or less	

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

4. 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 6.4 or more and below 14.2		
	RBM-BY203FE	Indoor unit capacity code (*1) : Total 14.2 or more and below 25.2		
	RBM-BY303FE	Indoor unit capacity code (*1) : Total 25.2 or more		
	RBM-BY53E	Indoor unit capacity code (*1) : Total below 6.4	For 2 piping (*6)	
	RBM-BY103E	Indoor unit capacity code (*1) : Total 6.4 or more and below 14.2		
	RBM-BY203E	Indoor unit capacity code (*1) : Total 14.2 or more and below 25.2		
	RBM-BY303E	Indoor unit capacity code (*1) : Total 25.2 or more		
4-branching header (*4) (*5)	RBM-HY1043FE	Indoor unit capacity code (*1) : Total below 14.2	For 3 piping	
	RBM-HY2043FE	Indoor unit capacity code (*1) : Total 14.2 or more and below 25.2		
	RBM-HY1043E	Indoor unit capacity code (*1) : Total below 14.2	For 2 piping (*6)	
	RBM-HY2043E	Indoor unit capacity code (*1) : Total 14.2 or more and below 25.2		
8-branching header (*4) (*5)	RBM-HY1083FE	Indoor unit capacity code (*1) : Total below 14.2	For 3 piping	
	RBM-HY2083FE	Indoor unit capacity code (*1) : Total 14.2 or more and below 25.2		
	RBM-HY1083E	Indoor unit capacity code (*1) : Total below 14.2	For 2 piping (*6)	
	RBM-HY2083E	Indoor unit capacity code (*1) : Total 14.2 or more and below 25.2		
T-shape branching joint (For connection of outdoor units)	RBM-BT13FE	1 set 4 types T-shape joint pipes as described below: The required quantity is arranged and they are combined on site.		

Connection piping	Corresponded dia. (mm)	Q'ty
Balance pipe	Ø 9.5	1
Piping at liquid side	Ø12.7 to Ø22.2	1
Piping at discharge gas side	Ø19.1 to Ø28.6	1
Piping at suction gas side	Ø22.2 to Ø38.1	1

*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 If capacity code of outdoor unit is 26 or more, it is not used for 1st branching.
*6 This is used for branching to "cooling only" indoor unit.
*7 Model names for outdoor and indoor units described in this guide are shortened because of the space constraint.

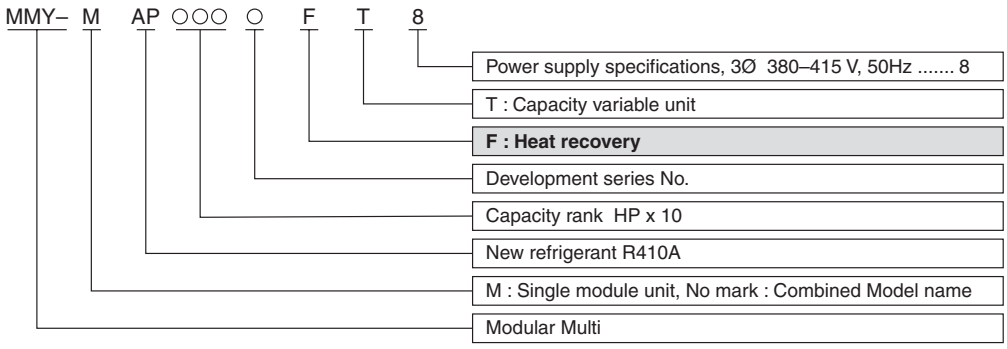
50Hz

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)	**MAP0802HT8**	1	**MAP0802FT8**	1				
10HP (10)	**MAP1002HT8**	1			**MAP1002FT8**	1		
12HP (12)	**MAP1202HT8**	1					**MAP1202FT8***	1
16HP (16)		2	**MAP0802FT8**	2				
18HP (18)		2	**MAP0802FT8**	1	**MAP1002FT8**	1		
20HP (20)		2			**MAP1002FT8**	2		
24HP (24)			**MAP0802FT8**	3				
26HP (26)			**MAP0802FT8**	2	**MAP1002FT8**	1		
28HP (28)			**MAP0802FT8**	1	**MAP1002FT8**	2		
30HP (30)					**MAP1002FT8**	3		

* 12HP unit is for stand-alone usage only.
Outdoor unit combination with 12HP unit is not available.

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

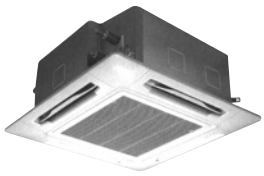
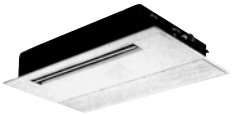
3. Compatibility with 1 Series

		Oudoor unit MMY-	
		1 Series	2 Series*
		-MAP**1FT8	-MAP**2FT8
FS unit	1 Series RBM-Y***1E	OK	NG
	2 Series RBM-Y***2E	OK	OK

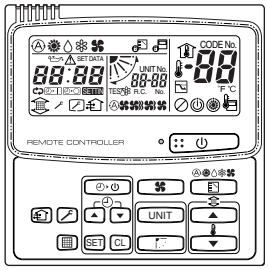
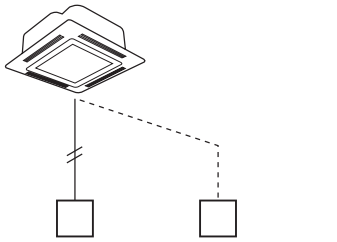
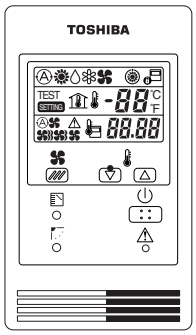
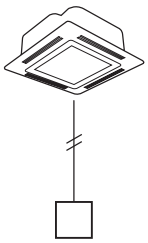
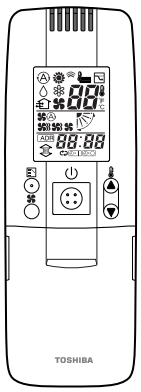
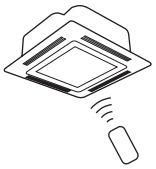
* 2 series outdoor units cannot be used with 1 series outdoor units.

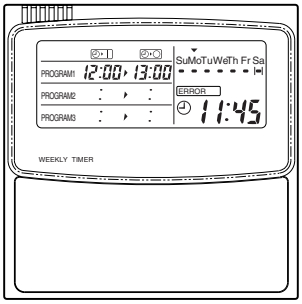
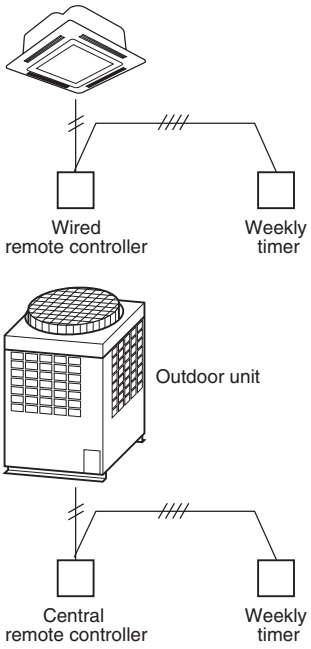
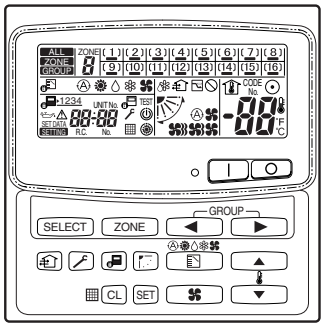
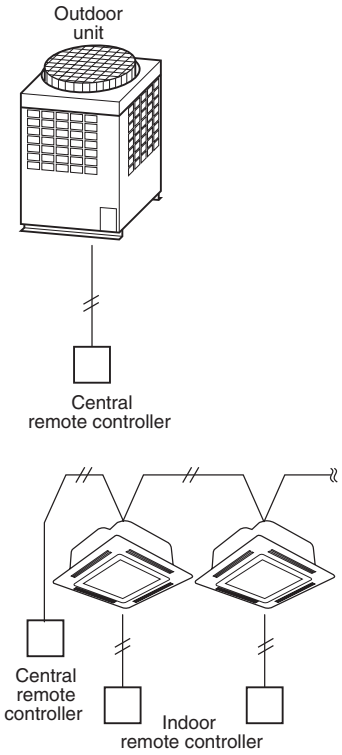
4. Indoor unit

*1) China only *2) European market only

Type	Appearance	Model name	Capacity rank	Capacity code	Cooling capacity (kW)	Heating capacity (kW)
4-way Air Discharge Cassette Type		**MMU-AP0091H**	009 type	1	2.8	3.2
		MMU-AP0121H	012 type	1.25	3.6	4.0
		MMU-AP0151H	015 type	1.7	4.5	5.0
		MMU-AP0181H	018 type	2	5.6	6.3
		MMU-AP0241H	024 type	2.5	7.1	8.0
		MMU-AP0271H	027 type	3	8.0	9.0
		MMU-AP0301H	030 type	3.2	9.0	10.0
		MMU-AP0361H	036 type	4	11.2	12.5
		MMU-AP0481H	048 type	5	14.0	16.0
		MMU-AP0561H	056 type	6	16.0	18.0
2-way Air Discharge Cassette Type		**MMU-AP0071WH**	007 type	0.8	2.2	2.5
		MMU-AP0091WH	009 type	1	2.8	3.2
		MMU-AP0121WH	012 type	1.25	3.6	4.0
		MMU-AP0151WH	015 type	1.7	4.5	5.0
		MMU-AP0181WH	018 type	2	5.6	6.3
		MMU-AP0241WH	024 type	2.5	7.1	8.0
		MMU-AP0271WH	027 type	3	8.0	9.0
		MMU-AP0301WH	030 type	3.2	9.0	10.0
		MMU-AP0481WH[*1)]	048 type	5	14.0	16.0
1-way Air Discharge Cassette Type		**MMU-AP0071YH**	007 type	0.8	2.2	2.5
		MMU-AP0091YH	009 type	1	2.8	3.2
		MMU-AP0121YH	012 type	1.25	3.6	4.0
		MMU-AP0151SH	015 type	1.7	4.5	5.0
		MMU-AP0181SH	018 type	2	5.6	6.3
		MMU-AP0241SH	024 type	2.5	7.1	8.0
Concealed Duct Standard Type		**MMD-AP0071BH**	007 type	0.8	2.2	2.5
		MMD-AP0091BH	009 type	1	2.8	3.2
		MMD-AP0121BH	012 type	1.25	3.6	4.0
		MMD-AP0151BH	015 type	1.7	4.5	5.0
		MMD-AP0181BH	018 type	2	5.6	6.3
		MMD-AP0241BH	024 type	2.5	7.1	8.0
		MMD-AP0271BH	027 type	3	8.0	9.0
		MMD-AP0301BH	030 type	3.2	9.0	10.0
		MMD-AP0361BH	036 type	4	11.2	12.5
		MMD-AP0481BH	048 type	5	14.0	16.0
		MMD-AP0561BH	056 type	6	16.0	18.0
Concealed Duct High Static Pressure Type		**MMD-AP0181H**	018 type	2	5.6	6.3
		MMD-AP0241H	024 type	2.5	7.1	8.0
		MMD-AP0271H	027 type	3	8.0	9.0
		MMD-AP0361H	036 type	4	11.2	12.5
		MMD-AP0481H	048 type	5	14.0	16.0
		MMD-AP0721H	072 type	8	22.4	25.0
		MMD-AP0961H	096 type	10	28.0	31.5
Under Ceiling Type		**MMC-AP0151H**	015 type	1.7	4.5	5.0
		MMC-AP0181H	018 type	2	5.6	6.3
		MMC-AP0241H	024 type	2.5	7.1	8.0
		MMC-AP0271H	027 type	3	8.0	9.0
		MMC-AP0361H	036 type	4	11.2	12.5
		MMC-AP0481H	048 type	5	14.0	16.0
High Wall Type (1 Series)		**MMK-AP0071H**	007 type	0.8	2.2	2.5
		MMK-AP0091H	009 type	1	2.8	3.2
		MMK-AP0121H	012 type	1.25	3.6	4.0
		MMK-AP0151H	015 type	1.7	4.5	5.0
		MMK-AP0181H	018 type	2	5.6	6.3
		MMK-AP0241H	024 type	2.5	7.1	8.0
High Wall Type (2 Series) [*2)]		**MMK-AP0072H**	007 type	0.8	2.2	2.5
		MMK-AP0092H	009 type	1.0	2.8	3.2
		MMK-AP0122H	012 type	1.25	3.6	4.0
Floor Standing Cabinet Type		**MML-AP0071H**	007 type	0.8	2.2	2.5
		MML-AP0091H	009 type	1	2.8	3.2
		MML-AP0121H	012 type	1.25	3.6	4.0
		MML-AP0151H	015 type	1.7	4.5	5.0
		MML-AP0181H	018 type	2	5.6	6.3
		MML-AP0241H	024 type	2.5	7.1	8.0
Floor Standing Concealed Type		**MML-AP0071BH**	007 type	0.8	2.2	2.5
		MML-AP0091BH	009 type	1	2.8	3.2
		MML-AP0121BH	012 type	1.25	3.6	4.0
		MML-AP0151BH	015 type	1.7	4.5	5.0
		MML-AP0181BH	018 type	2	5.6	6.3
		MML-AP0241BH	024 type	2.5	7.1	8.0
Floor Standing Type		**MMF-AP0151H**	015 type	1.7	4.5	5.0
		MMF-AP0181H	018 type	2	5.6	6.3
		MMF-AP0241H	024 type	2.5	7.1	8.0
		MMF-AP0271H	027 type	3	8.0	9.0
		MMF-AP0361H	036 type	4	11.2	12.5
		MMF-AP0481H	048 type	5	14.0	16.0
		MMF-AP0561H	056 type	6	16.0	18.0

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 RBC-AX22CE TCB-AX21E		**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 **TCB-AX21U (W)-E** (For 4-way air discharge cassette) **RBC-AX22CE** (For under ceiling) **TCB-AX21E** (For others except concealed duct high static pressure)

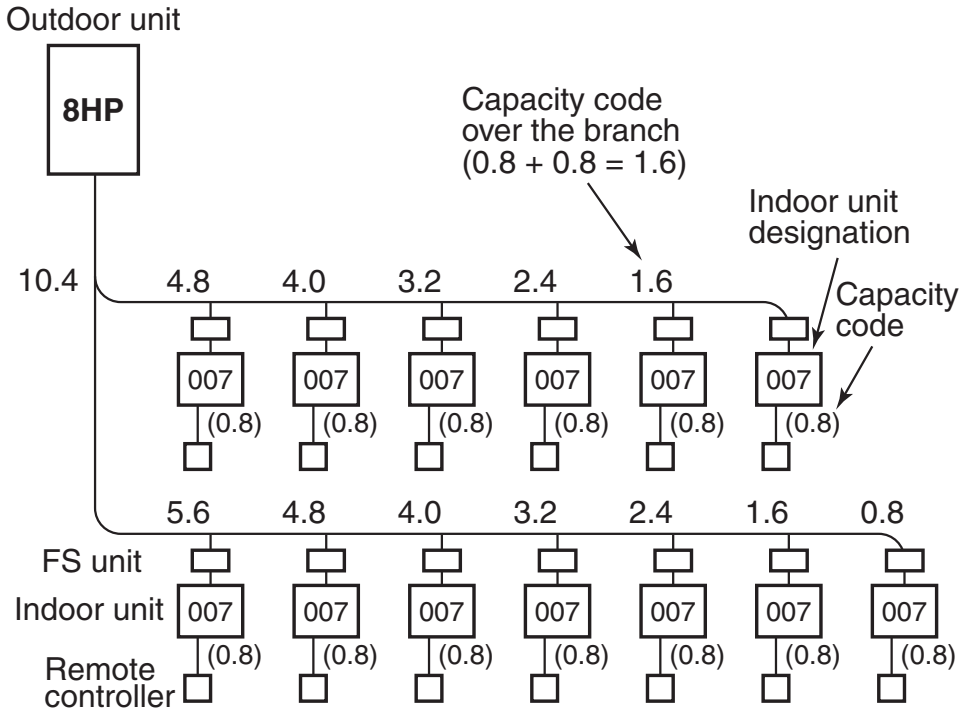
Name	Model name	Appearance	Application	Performance
Weekly timer	**RBC-EXW21E**		**Connected to central remote controller, wired remote controller** 	• Weekly schedule operation ① Setting different start / stop time for each day of the week ② ON / OFF can be easily set 3 times a day.  ③ "CHECK" "PROGRAM" "DAY" button make setting copy easy. ④ Two patterns of schedule for a week can be specified. (Summer schedule and winter schedule, etc.) ⑤ "CANCEL" "DAY" button make holiday setting easy. ⑥ 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

8HP system

- Max. indoor unit : 13 units
- Capacity code of indoor unit : Min. : 5.6, Max. : 10.8

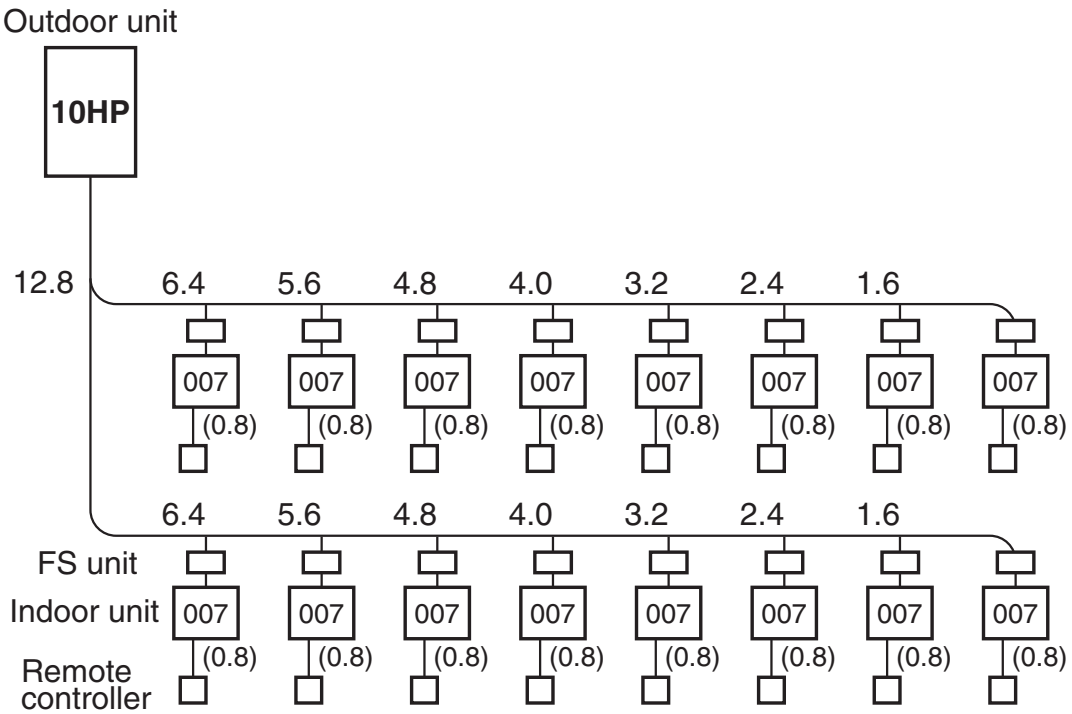
Capacity code
Total 10.4
No. of total units
13



10 HP system

- Max. indoor unit : 16 units
- Capacity code of indoor unit : Min. : 7, Max. : 13.5

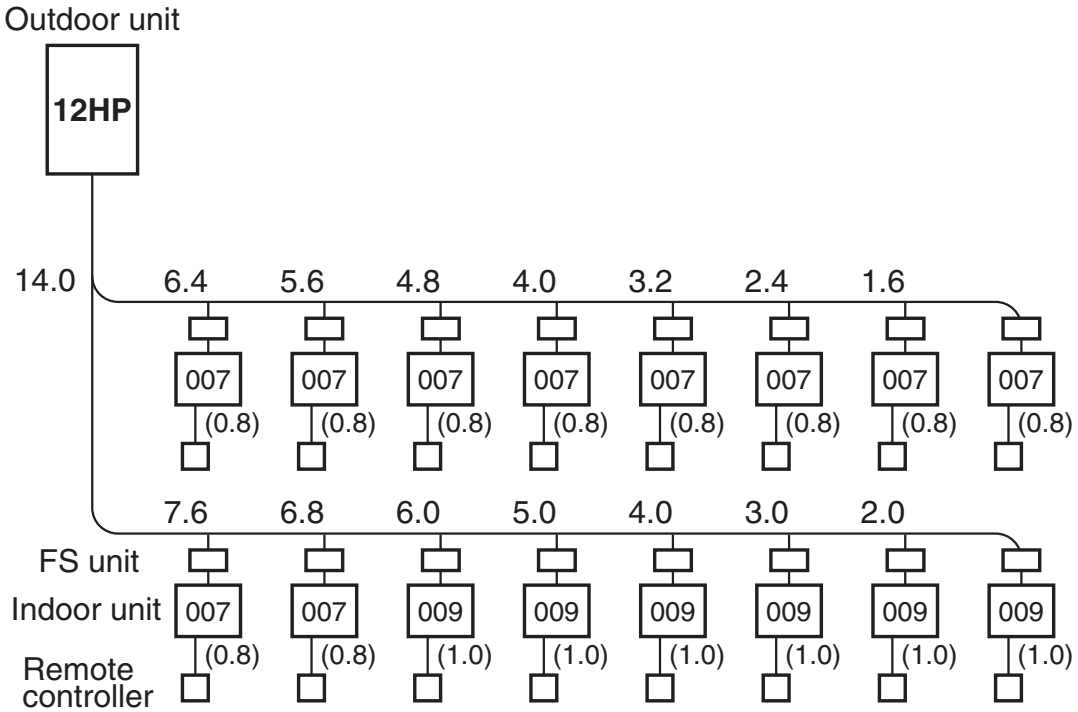
Capacity code
Total 12.8
No. of total units
16



12 HP system

- Max. indoor unit : 16 units
- Capacity code of indoor unit : Min. : 8.4, Max. : 14.4

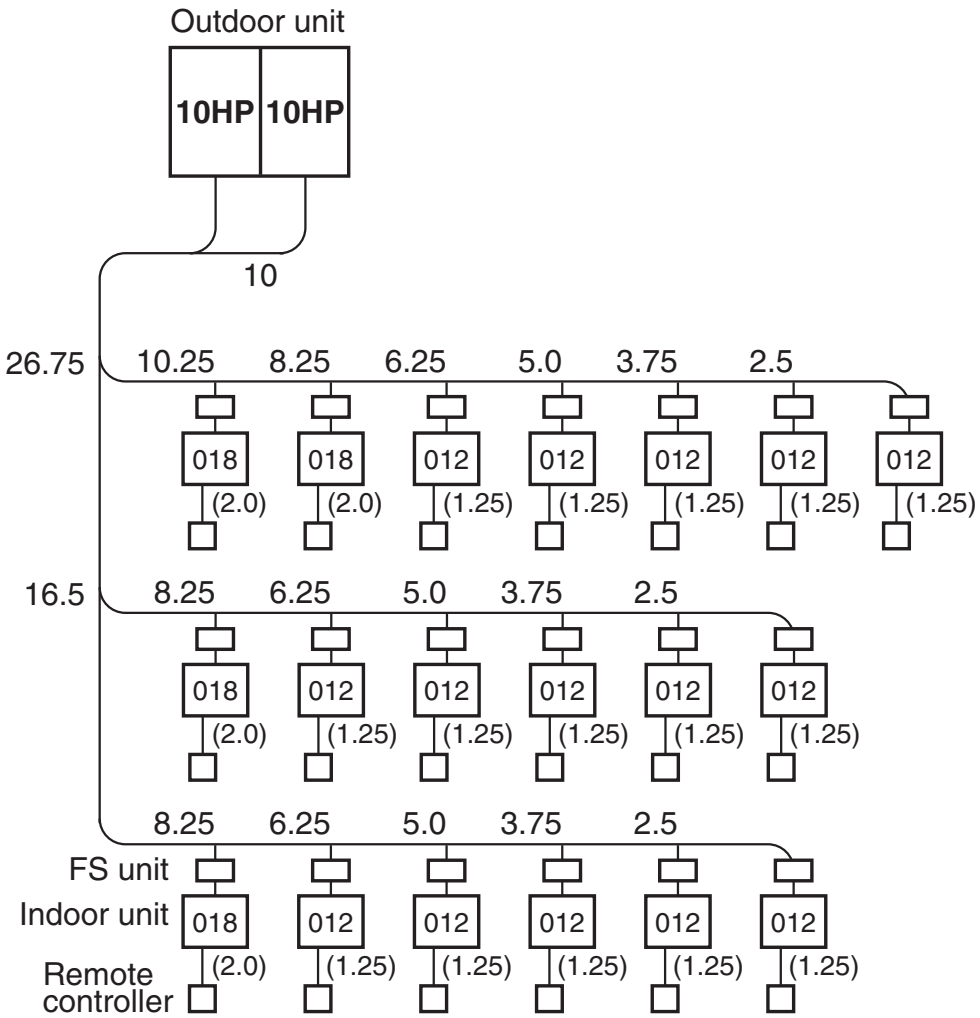
Capacity code
Total 14.0
No. of total units
16



20 HP system

- Max. indoor unit : 33 units
- Capacity code of indoor unit : Min. : 14, Max. : 27

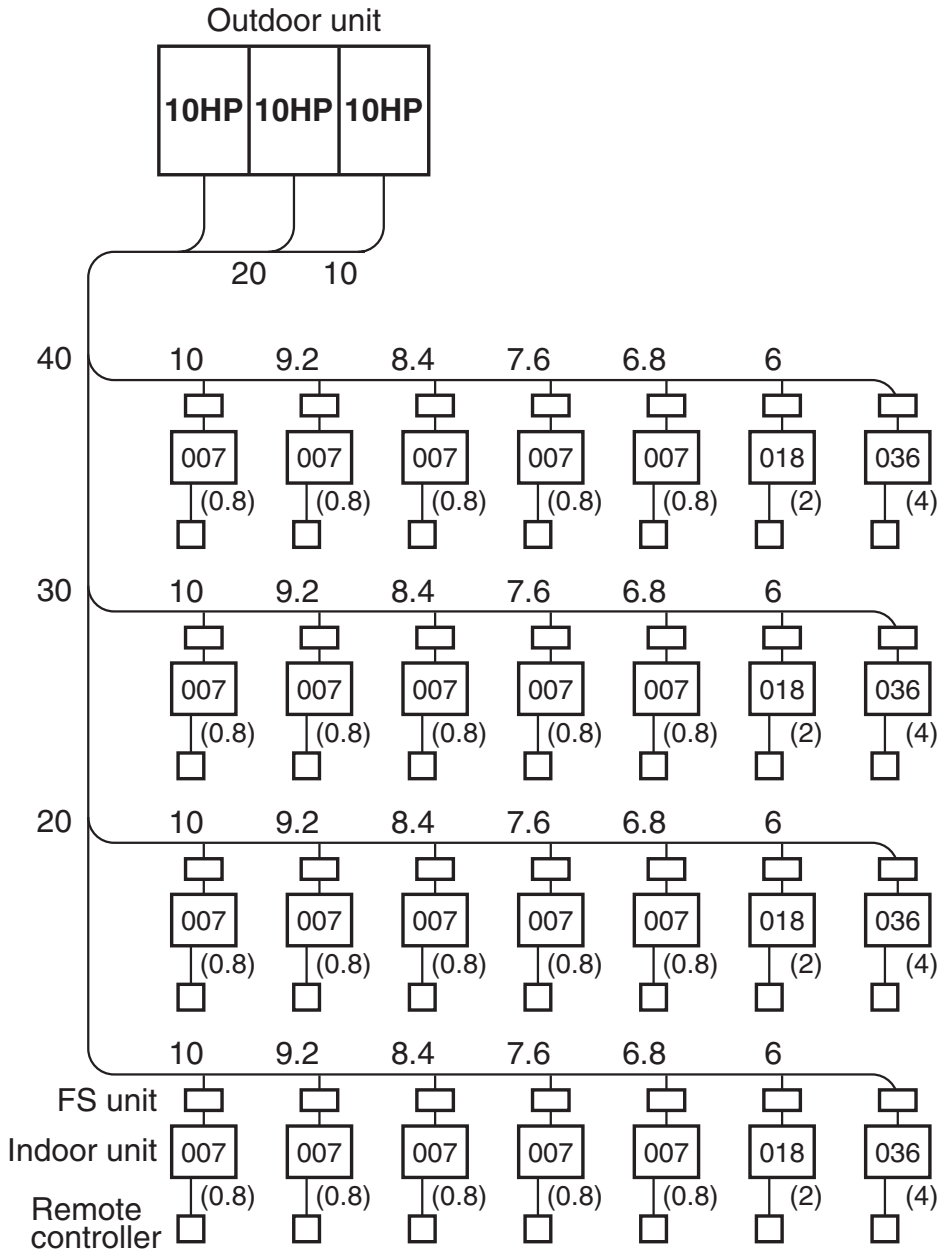
Capacity code
Total 26.75
No. of total units
19



30 HP system

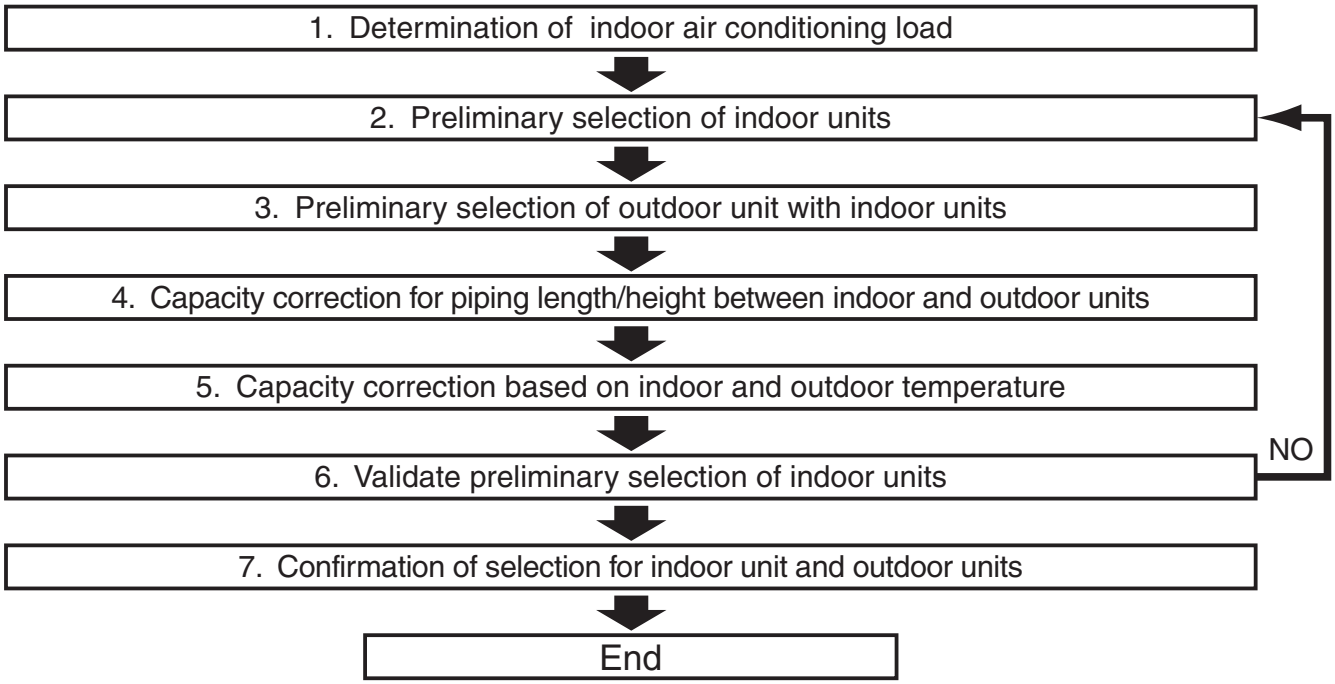
- Max. indoor unit : 48 units
- Capacity code of indoor unit : Min. : 21, Max. : 40.5

Capacity code
Total 40
No. of total units
28



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	072	096
Capacity code	0.8	1	1.25	1.7	2	2.5	3	3.2	4	5	6	8	10

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.

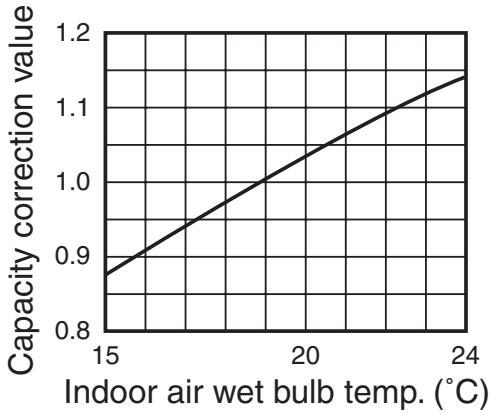
Outdoor unit (Heat recovery)	Capacity code of outdoor unit	Max. No. of indoor units	Total capacity code of indoor units
MMY-MAP0802FT8	8	13	5.6 to 10.8
MMY-MAP1002FT8	10	16	7.0 to 13.5
MMY-MAP1202FT8	12	16	8.4 to 14.4
MMY-AP1602FT8	16	27	11.2 to 21.6
MMY-AP1802FT8	18	30	12.6 to 24.3
MMY-AP2002FT8	20	33	14.0 to 27.0
MMY-AP2402FT8	24	40	16.8 to 32.4
MMY-AP2602FT8	26	43	18.2 to 35.1
MMY-AP2802FT8	28	47	19.6 to 37.8
MMY-AP3002FT8	30	48	21.0 to 40.5

70 to 135% of outdoor unit capacity for all systems except 12HP
70 to 120% of outdoor unit capacity for 12HP

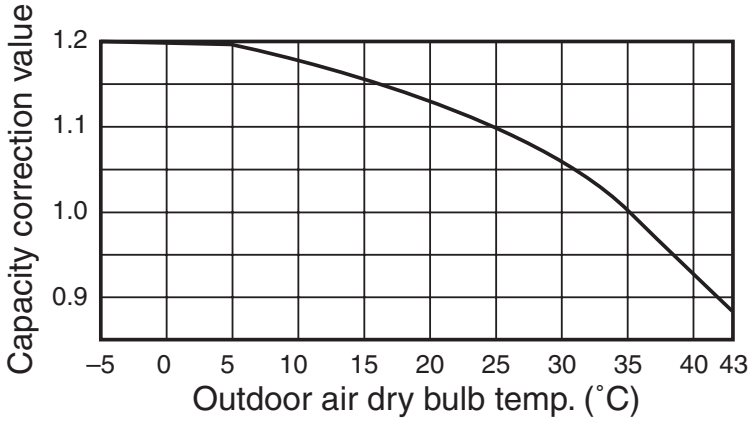
3. Cooling/heating capacity characteristics

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

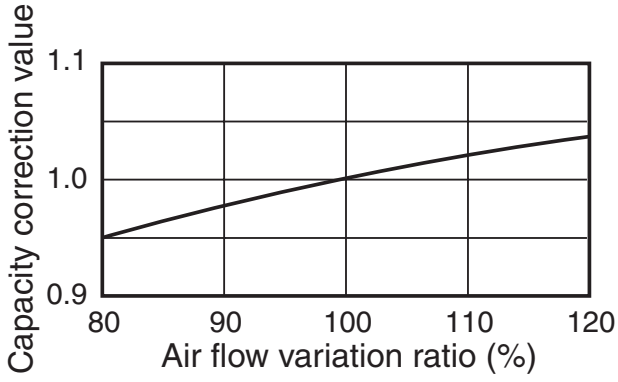
① Indoor air wet bulb temperature vs. capacity correction value



② Outdoor air dry bulb temperature vs.capacity correction value

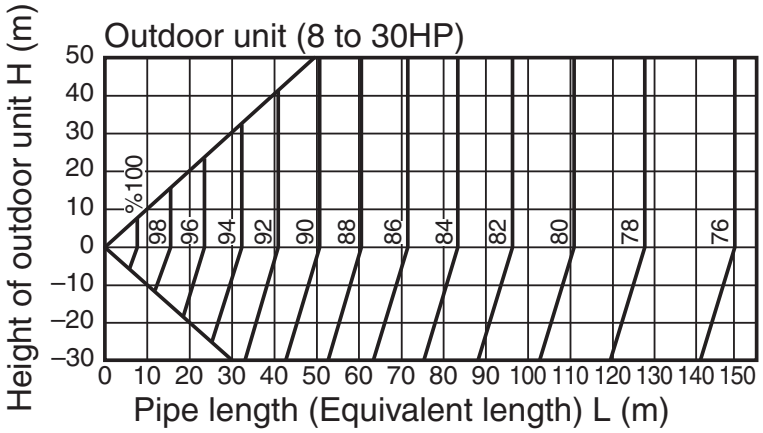


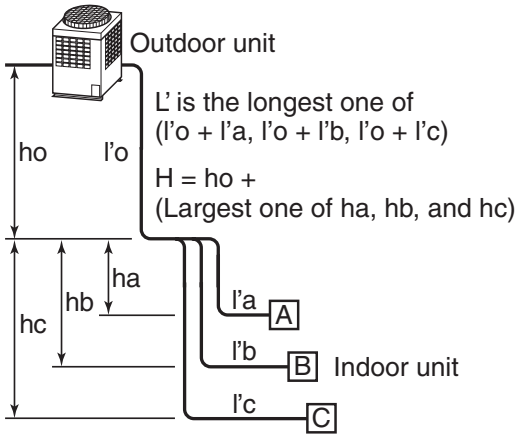
③ Air flow variation ratio of indoor unit vs. capacity correction (For concealed duct type only)



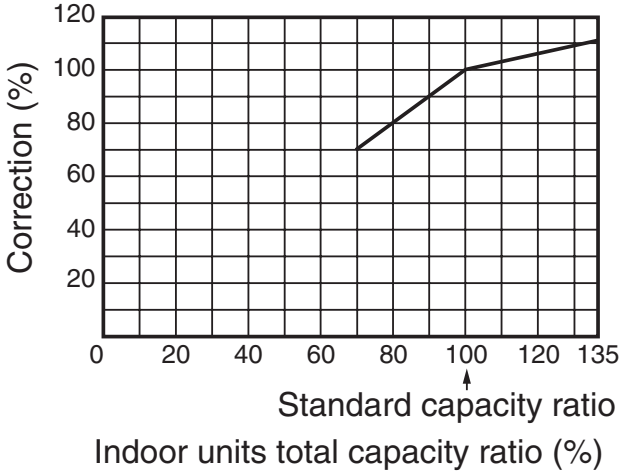
*1 : Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

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





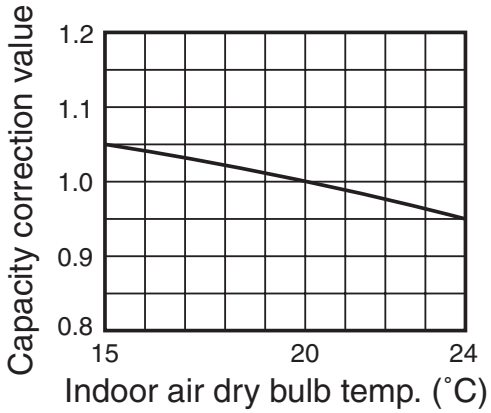
⑤ Correction of outdoor unit diversity



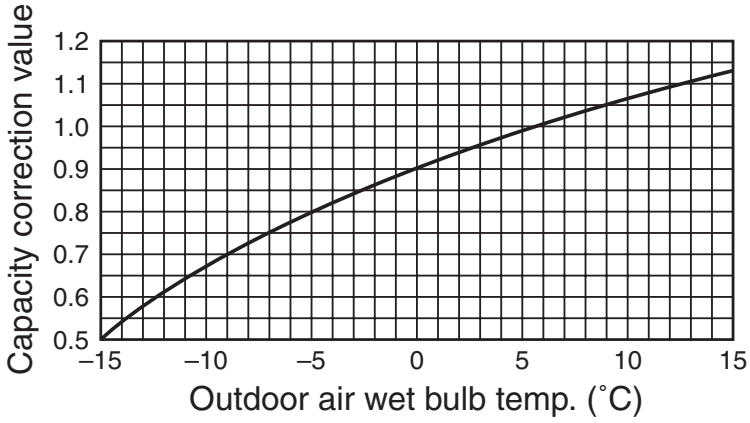
*1 : Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

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

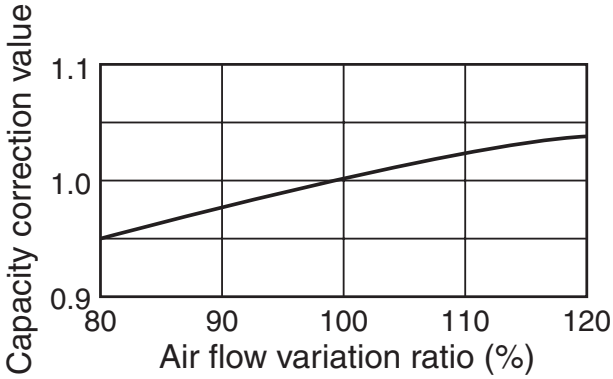
① Indoor air dry bulb temperature vs. capacity correction value



② Outdoor air wet bulb temperature vs. capacity correction value



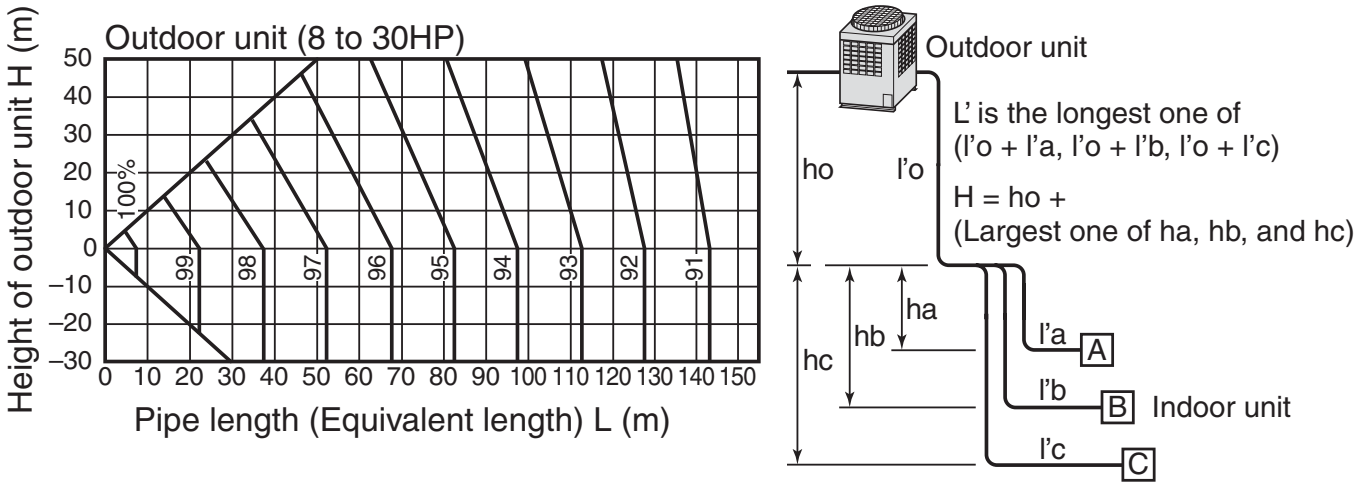
③ Air flow variation ratio of indoor unit vs. capacity correction (For concealed duct type only)



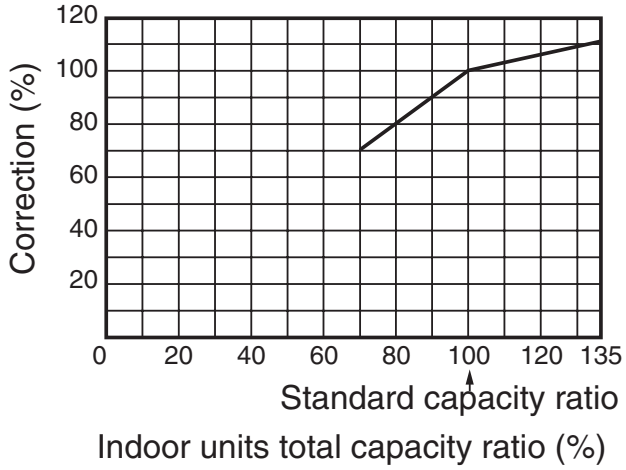
*1 : Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

*2 : Refer to item 3 in page 20.

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



⑤ Correction of outdoor unit diversity



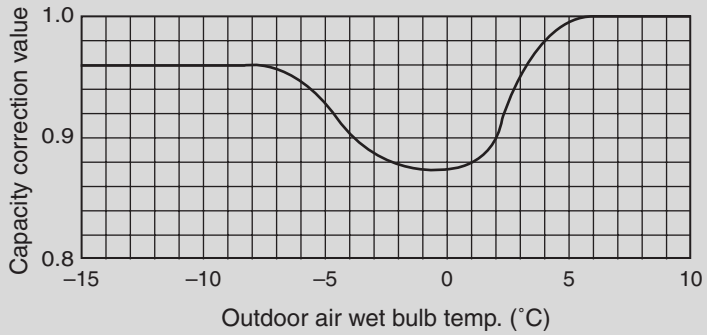
*1 : Coefficient to use for correction of outdoor unit capacity when total capacity of the indoor units are not equal to the outdoor unit capacity.

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

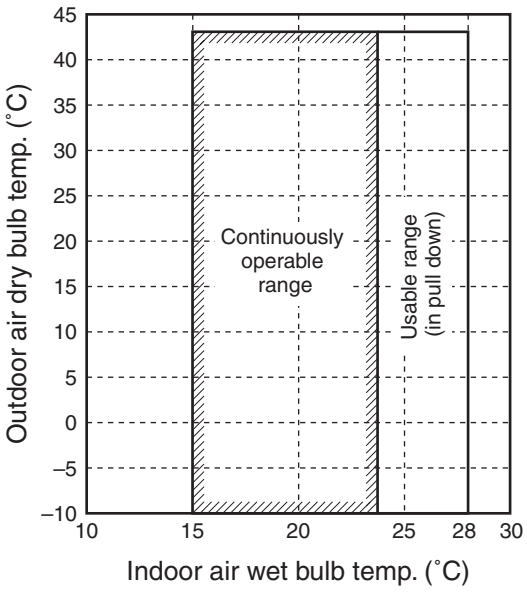


4. Capacity calculation for each indoor unit

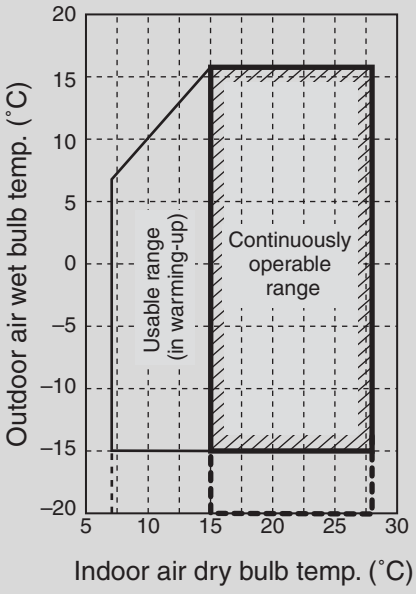
Capacity for each indoor unit
= Capacity after correction of outdoor unit × $\frac{\text{Required standard capacity of indoor unit}}{\text{Total value of standard indoor unit capacity}}$

5. Operating temperature range

In cooling time



In heating time



* 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) <-10°C: Cooling,
>21°C: Heating)

* Do not use "Super HRM" for other than personal usage where the ambient temperature may go down below -10°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

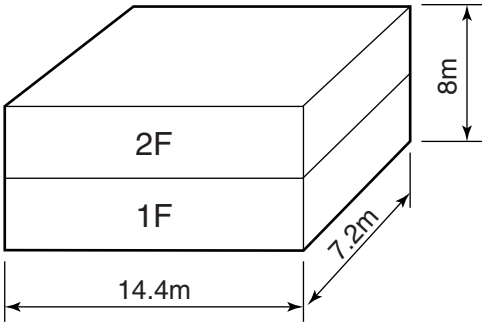
Heating :
Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB

4. Example of equipment selection

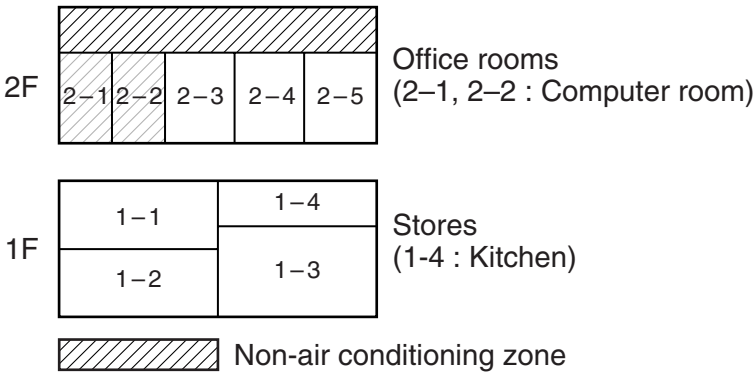
The following shows an example of equipment selection based upon a building model

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

a. Calculate cooling for every rooms.

b. Select an indoor unit to match the cooling load for every room from the table in pages 8.

c. 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.

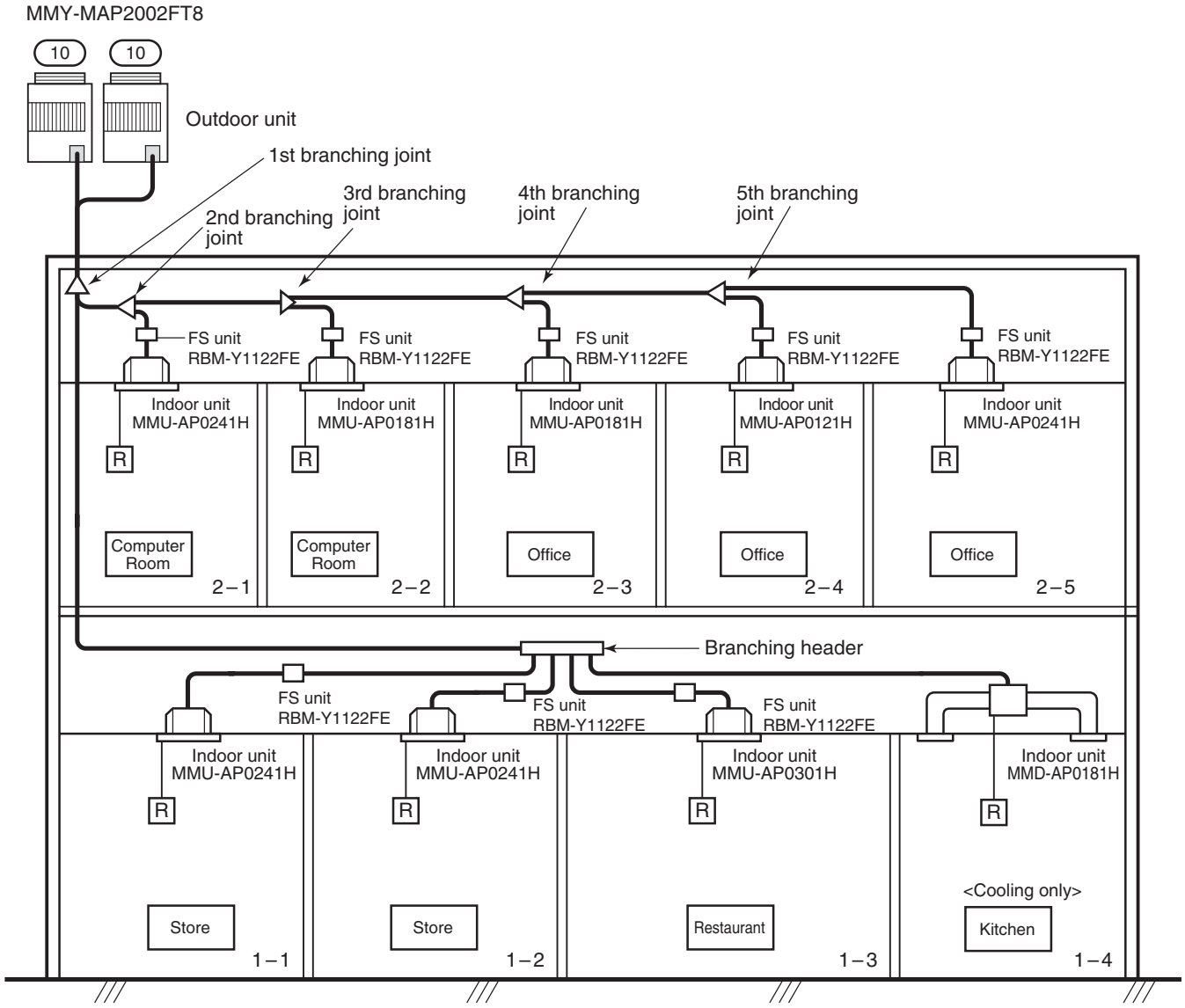
Then, make sure the corrected system cooling capacity satisfies the cooling load.

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	Capacity (kW)	
		Cooling	Heating		Cooling	Heating	MMY-	Cooling	Heating
2F	2-1	6.0	3.4	MMU-AP0241H	7.1	8.0	MAP2002FT8	56.0	63.0
	2-2	5.0	2.2	MMU-AP0181H	5.6	6.3			
	2-3	5.0	4.2	MMU-AP0181H	5.6	6.3			
	2-4	3.2	2.7	MMU-AP0121H	3.6	4.0			
	2-5	6.4	5.4	MMU-AP0241H	7.1	8.0			
1F	1-1	6.1	6.0	MMU-AP0241H	7.1	8.0			
	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	2-1	34	5	1.0 × 1.0 × 0.936 = 0.936	1.0 × 0.95 × 0.98 × 0.95 = 0.884	6.6	7.0	good
	2-2					5.2	5.5	
	2-3					5.2	5.5	
	2-4					3.3	3.5	
	2-5					6.6	7.0	
1F	1-1					6.6	7.0	
	1-2					6.6	7.0	
	1-3					8.4	8.8	
	1-4					5.2	5.5	

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.

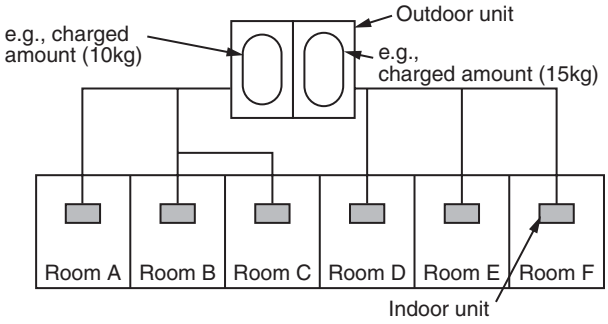
The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise 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.
(For details, refer and comply with local regulations.)

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.



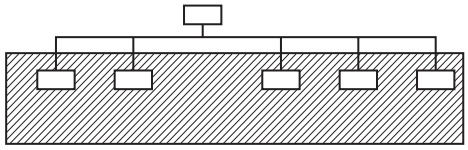
For the amount of charge in this example:

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.

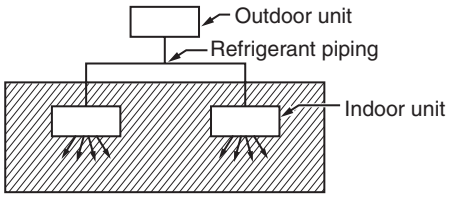
NOTE 2 :

The standards for minimum room volume are as follows.

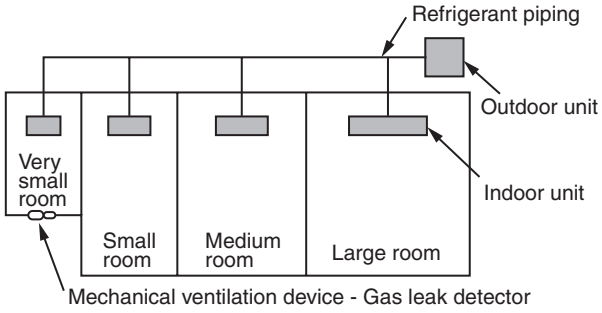
(1) No partition (shaded portion)



(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).

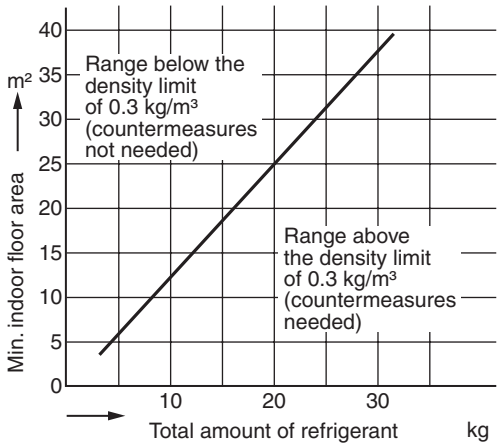


(3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the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



NOTE 3 :

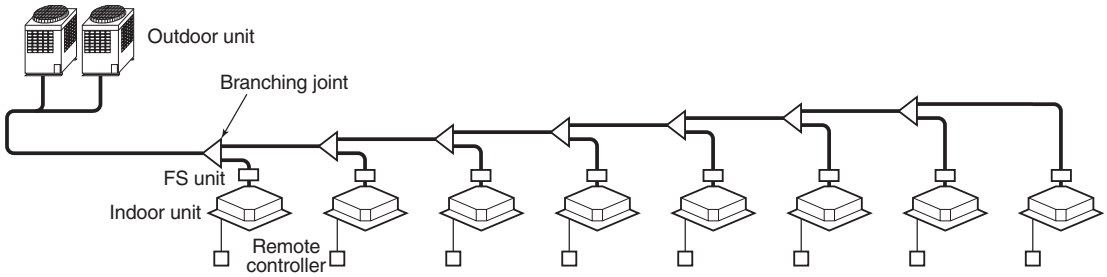
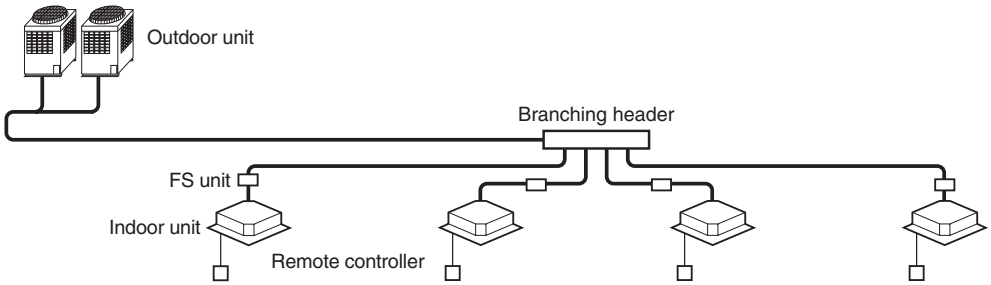
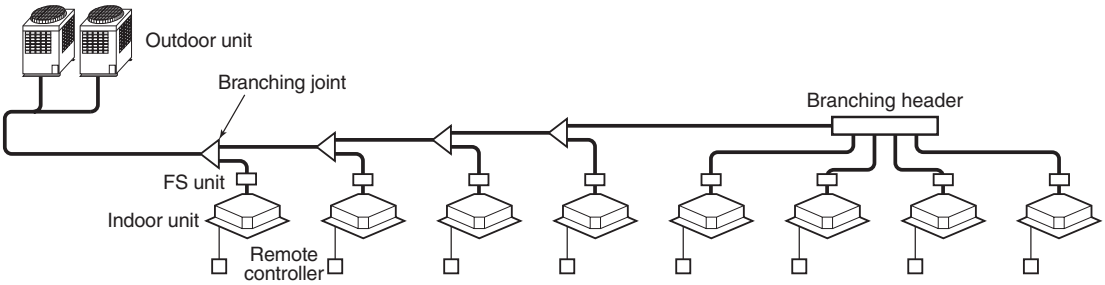
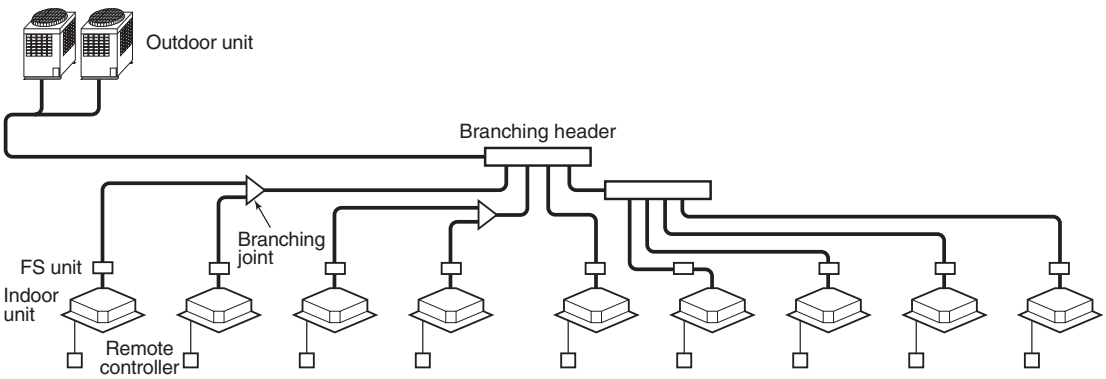
The minimum indoor floor area compared with the amount of refrigerant is roughly as follows:
(When the ceiling is 2.7m high)



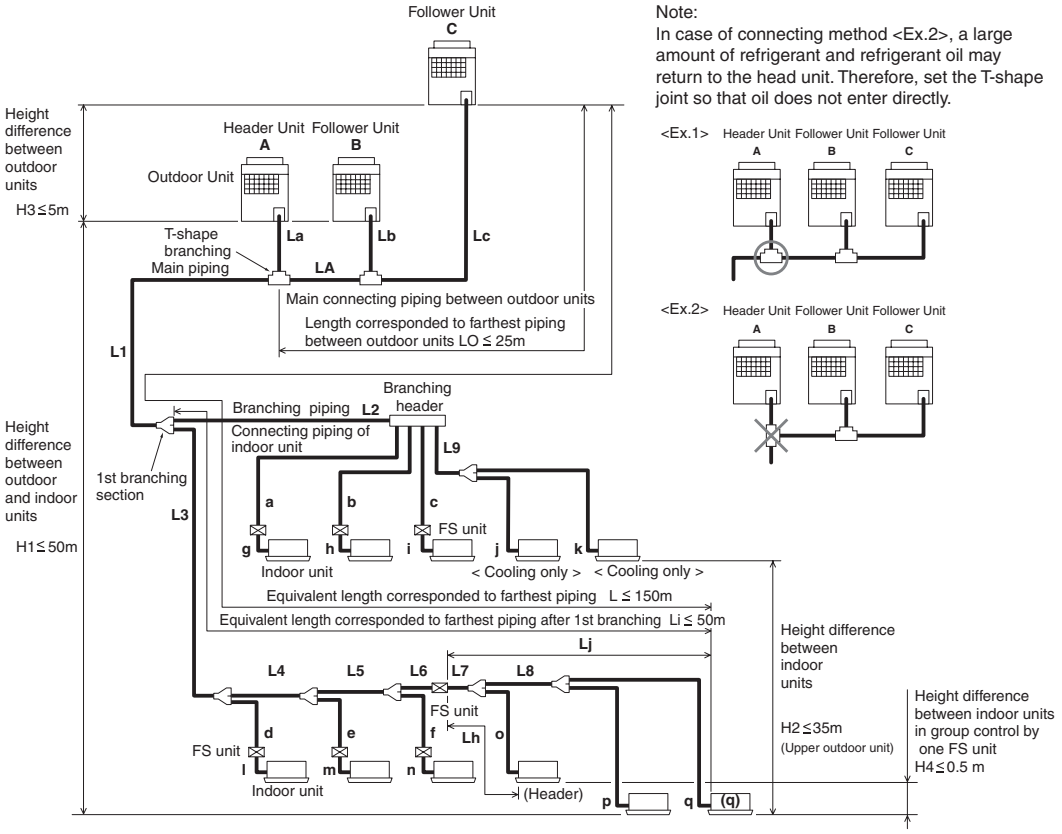
2. Free branching system

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.

Line branching system	
Header branching system	
Header branching system after line branching	
Line branching system after header branching Header branching system after header branching	

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)		300 m	LA+La+Lb+Lc+L1+L2+L3+L4+L5+L6+L7+L8+9 +a+b+c+d+e+f+g+h+i+j+k+l+m+n+o+p+q
	Farthest piping length L (*1)	Real length	125 m	LA+Lc+L1+L3+L4+L5+L6+L7+L8+q
		Equivalent length	150 m	
	Max. equivalent length of main piping		85 m	L1
	Equivalent length of farthest piping from 1st branching Li (*1)		50 m	L3+L4+L5+L6+L7+L8+q
	Max. real length of indoor unit connecting piping		30 m	a+g, b+h, c+i, d+l, e+m, f+n, j, k
	Max. real length between FS unit and indoor unit (*2)		15 m	g, h, i, l, m, n, L7+o, L7+L8+p, L7+L8+q
	Max. Equivalent length of outdoor unit connecting piping LO (*1)		25 m	LA+Lc (LA+Lb)
	Max. real length of outdoor unit connecting piping		10 m	La, Lb, Lc
	Max. equivalent length between FS unit and indoor unit Lj		30 m	L7+L8+q, L7+L8+p
	Max. real length between FS unit and header indoor unit Lh (*2)		15 m	L7+o
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	——
	Height between outdoor units H3		5 m	——
	Height difference between indoor units in group control by one FS unit H4		0.5 m	——

*1 : The farthest outdoor unit from 1st branch to be named C, and farthest indoor unit from 1st branch to be named (q).

*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).

* System restrictions

Max. No. of combined outdoor units	3 units	
Max. capacity of combined outdoor units	84.0 kW	
Max. No. of connected indoor units	48 units	
Max. capacity of combined indoor units	H2 ≤ 15m	135% (*1)
	H2 > 15m	105%

*1 : MMY-MAP1201HT8 : UP to 120 %

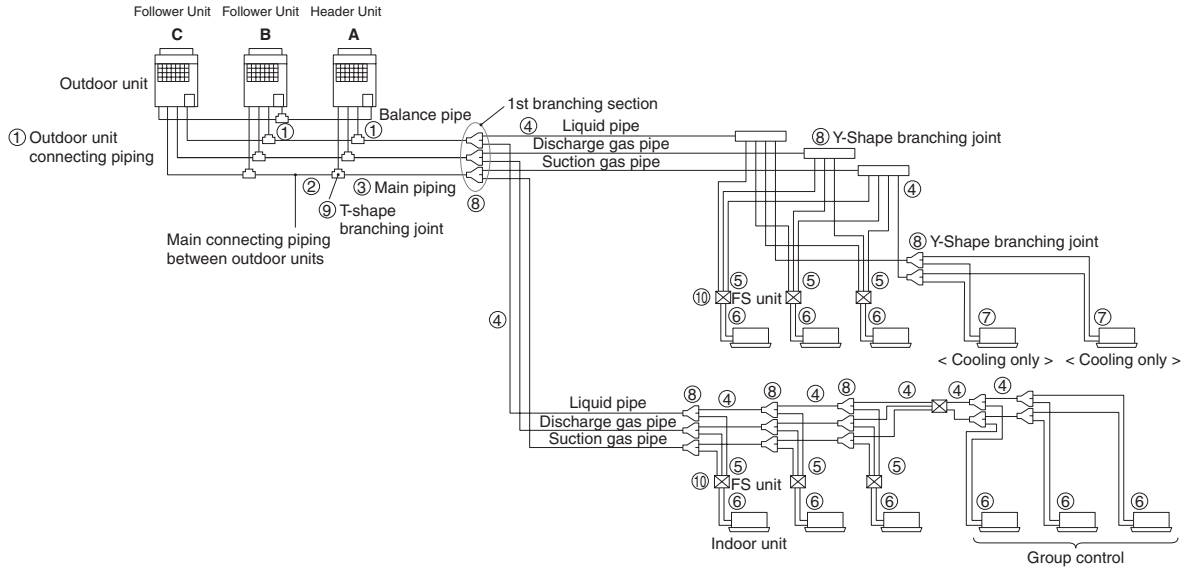
Note 1) Combination of outdoor units : Header unit (1 unit) + Follower unit (0 to 2 units). Header unit is outdoor unit nearest to the connected indoor units

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

Note 3) Refer to outdoor unit combination table in page.6.

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

4. Selection of refrigerant piping



* Selection of refrigerant piping

No.	Item	Suction gas side	Discharge gas side	Liquid side		Outdoor unit model name
①	Pipe size of outdoor unit	Ø 22.2	Ø 19.1	Ø 12.7	—	MMY-MAP0802FT8
		Ø 22.2	Ø 19.1	Ø 12.7		MMY-MAP1002FT8
		Ø 28.6	Ø 19.1	Ø 12.7		MMY-MAP1202FT8

No.	Item	Suction gas side	Discharge gas side	Liquid side	Balance pipe	Total capacity code of indoor units at downstream side	
						Equivalent to capacity	Equivalent to HP
②	Connecting pipe size between outdoor units	Ø 28.6	Ø 22.2	Ø 15.9	Ø 9.5	Below 61.5	Below 22

No.	Item	Suction gas side	Discharge gas side	Liquid side		Total capacity code of all outdoor units	
						Equivalent to capacity	Equivalent to HP
③	Size of main pipe	Ø 22.2	Ø 19.1	Ø 12.7	—	Below 33.5	Below 12
		Ø 28.6	Ø 19.1	Ø 12.7		33.5	12
		Ø 28.6	Ø 22.2	Ø 19.1		45.0 to below 61.5	16 to below 22
		Ø 34.9	Ø 28.6	Ø 19.1		61.5 to below 73.0	22 to below 26
		Ø 34.9	Ø 28.6	Ø 22.2		73.0 or more	26 or more

No.	Item	Suction gas side	Discharge gas side	Liquid side		Total capacity code of all indoor units	
						Equivalent to capacity	Equivalent to HP
④	Pipe size between branching sections *1 *2 *3	Ø 15.9	Ø 12.7	Ø 9.5	—	Below 18.0	Below 6.4
		Ø 22.2	Ø 19.1	Ø 12.7		18.0 to below 34.0	6.4 to below 12.2
		Ø 28.6	Ø 22.2	Ø 15.9		34.0 to below 56.5	12.2 to below 20.2
		Ø 34.9	Ø 28.6	Ø 15.9		56.5 to below 70.5	20.2 to below 25.2
		Ø 34.9	Ø 28.6	Ø 19.1		70.5 or more	25.2 or more
⑤	Pipe size between the end of branch and FS unit	Ø 15.9	Ø 12.7	Ø 9.5	—	Below 18.0	Below 6.4
		Ø 22.2	Ø 19.1	Ø 12.7		18.0 or more	6.4 or more

No.	Item	Suction gas side	Discharge gas side	Liquid side		Capacity rank of indoor unit	
⑥	Piping of indoor unit	Ø 9.5	—	Ø 6.4	—	007 to 012 Type	
		Ø 12.7	—	Ø 6.4		015 to 018 Type	
		Ø 15.9	—	Ø 9.5		024 to 056 Type	
		Ø 22.2	—	Ø 12.7		072 to 096 Type	
⑦	Piping of cooling only indoor unit (Between branching and indoor unit) *2	Ø 9.5	—	Ø 6.4	—	15m or less	007 to 012 Type
		Ø 12.7		Ø 9.5		15m above	
		Ø 12.7	—	Ø 6.4		15m or less	015 to 018 Type
		Ø 15.9		Ø 9.5		15m above	
		Ø 15.9	—	Ø 9.5		024 to 056 Type	
		Ø 22.2	—	Ø 12.7		072 to 096 Type	

⑩ Selection of FS unit

Model Name	Total capacity code of indoor unit		Max.No. of connected indoor units
	Equivalent to capacity (kW)	Equivalent to HP	
RBM-Y1122FE	Below 11.2	Below 4.0	5
RBM-Y1802FE	11.2 to below 18.0	4.0 to below 6.4	8
RBM-Y2802FE	18.0 to 28.0 or less	6.4 to 10.0 or less	8

* Minimum wall thickness for R410A application

Soft	Half Hard or Hard	Outer dia. (Inch)	Outer dia. (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	OK	3/4”	19.05	1.00
NG	OK	7/8”	22.20	1.00
NG	OK	1.1/8”	28.58	1.00
NG	OK	1.3/8”	34.92	1.10

*1 In case the pipe exceeds main pipe size, it should be the same as main pipe size.
*2 2 pipes for cooling only indoor unit shall be used with liquid pipe and suction gas pipe.
*3 2 pipes from FS unit to branching section shall be used with liquid pipe and suction gas pipe.
*4 Branching pipe on the 1st branch should be selected according to the capacity code for outdoor unit.
*5 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.
*6 For 1 line after header branching, indoor units with a maximum of 6.0 capacity code in total can be connected.

* Selection for branching section

No.			Total capacity code of indoor unit		Model Name	
			Equivalent to capacity	Equivalent to HP	For 3 piping	For 2 piping
⑧	Y-Shape branching joint *4 *5		Below 18.0	Below 6.4	RBM-BY53FE	RBM-BY53E
			18.0 to below 40.0	6.4 to below 14.2	RBM-BY103FE	RBM-BY103E
			40.0 to below 70.5	14.2 to below 25.2	RBM-BY203FE	RBM-BY203E
			70.5 or more	25.2 or more	RBM-BY303FE	RBM-BY303E
	Branching Header *4, *5, *6	For 4 Branching	Below 40.0	Below 14.2	RBM-HY1043FE	RBM-HY1043E
			40.0 to below 70.5	14.2 to below 25.2	RBM-HY2043FE	RBM-HY2043E
		For 8 Branching	Below 40.0	Below 14.2	RBM-HY1083FE	RBM-HY1083E
			40.0 to below 70.5	14.2 to below 25.2	RBM-HY2083FE	RBM-HY2083E
⑨	T-Shape branching joint (For connecting outdoor unit)		1 set of 4 types of T-shape joint pipes as described below : The rewired quantity is arranged and combined at the site. - Balance pipe (Ø 9.52) X 1 - Piping at liquid side (Ø 12.7 to Ø 22.2) X 1 - Piping at discharge gas side (Ø 19.1 to Ø 28.6) X 1 - Piping at suction gas side (Ø 22.2 to Ø 38.1) X 1		RBM-BT13FE	

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

HFC R410A

Refrigerant in the system when shipped from the factory

		8HP	10HP	12HP
Refrigerant amount charged in factory	Heat recovery model	11.5kg	11.5kg	11.5kg

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.

[Additional refrigerant charge amount at site] =
[Real length of liquid pipe] × [Additional refrigerant charge amount per liquid pipe 1m **(Table 1)**] × 1.3 + [Compensation by system HP **(Table 2)**]

Example : Additional charge amount R (kg) = {(L1 x 0.025kg/m) + (L2 x 0.055kg/m) + (L3 x 0.105kg/m) + (L4 x 0.160kg/m) + (L5 x 0.250kg/m)} x 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)
L4 : Real total length of liquid pipe Ø15.9 (m)
L5 : Real total length of liquid pipe Ø19.1 (m)
System : 24HP

Table 1

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

Table 2

Combined horse power (HP)	**Outdoor combination (HP)**			**Compensation by system HP (kg)**
8	8			2.0
10	10			2.5
12	12			3.0
16	8	8		-1.5
18	10	8		0.0
20	10	10		2.0
24	8	8	8	-4.5
26	10	8	8	-3.0
28	10	10	8	-1.5
30	10	10	10	0.0

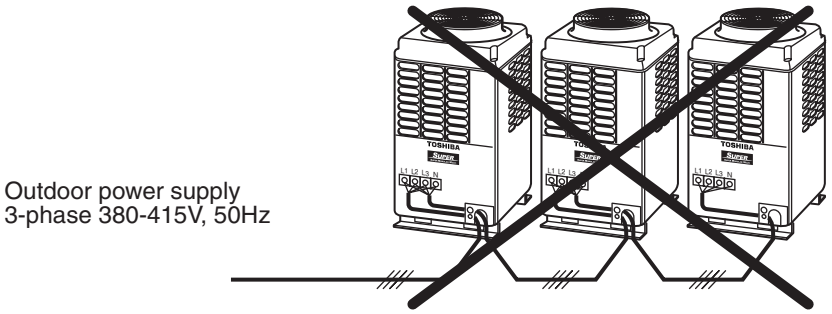
6. WIRING DESIGN

1. General

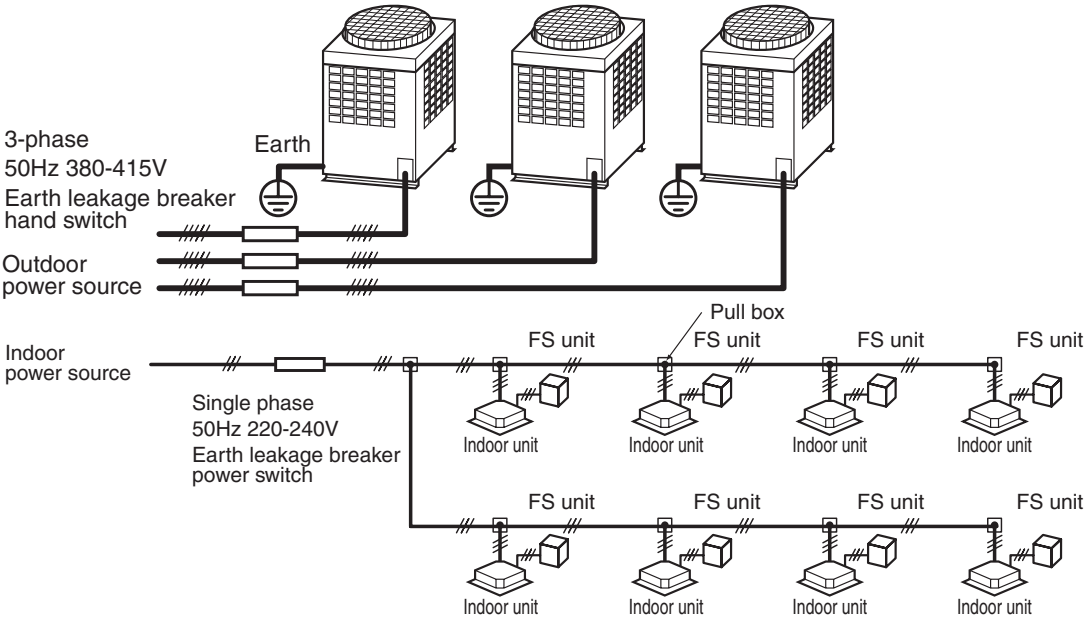
(1) Perform wiring of the power supply in conformance with the regulations of the local electric company.
(2) For the control wires connecting indoor units, and between indoor and outdoor units, use of double-core shield wires is recommended to prevent noise trouble.
(3) Be sure to set the earth leakage 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
- Do not connect them via the incorporated terminal block (L1, L2, L3, N).



3. Electrical wiring design



- Unit capacities and power supply wire sizes (Reference)

Model MMY-	Power supply wiring	
	Wire size	Field fuse
MAP0802FT8	3.5 mm² (AWG #10) Max. 20 m	30 A
MAP1002FT8	5.5 mm² (AWG #10) Max. 28 m	30 A
MAP1202FT8	5.5 mm² (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.)

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

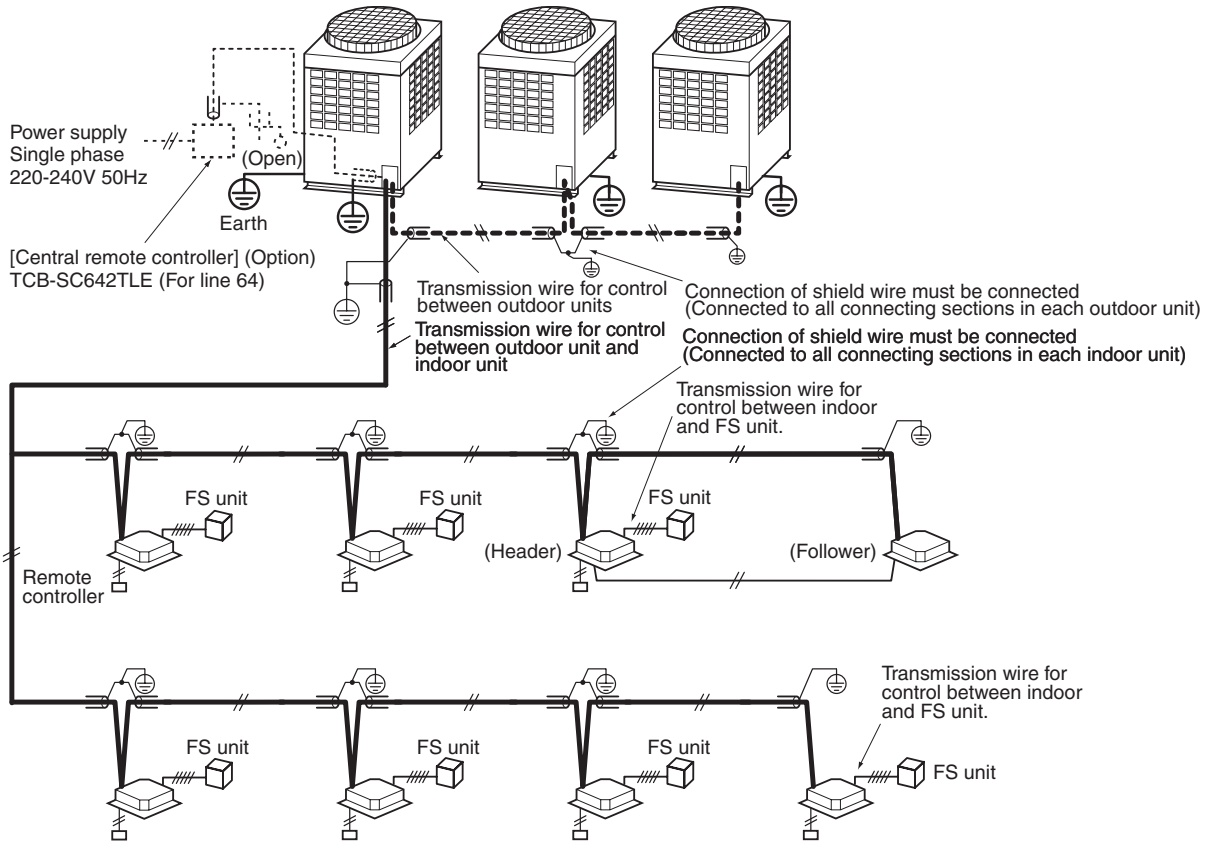
NOTE :

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

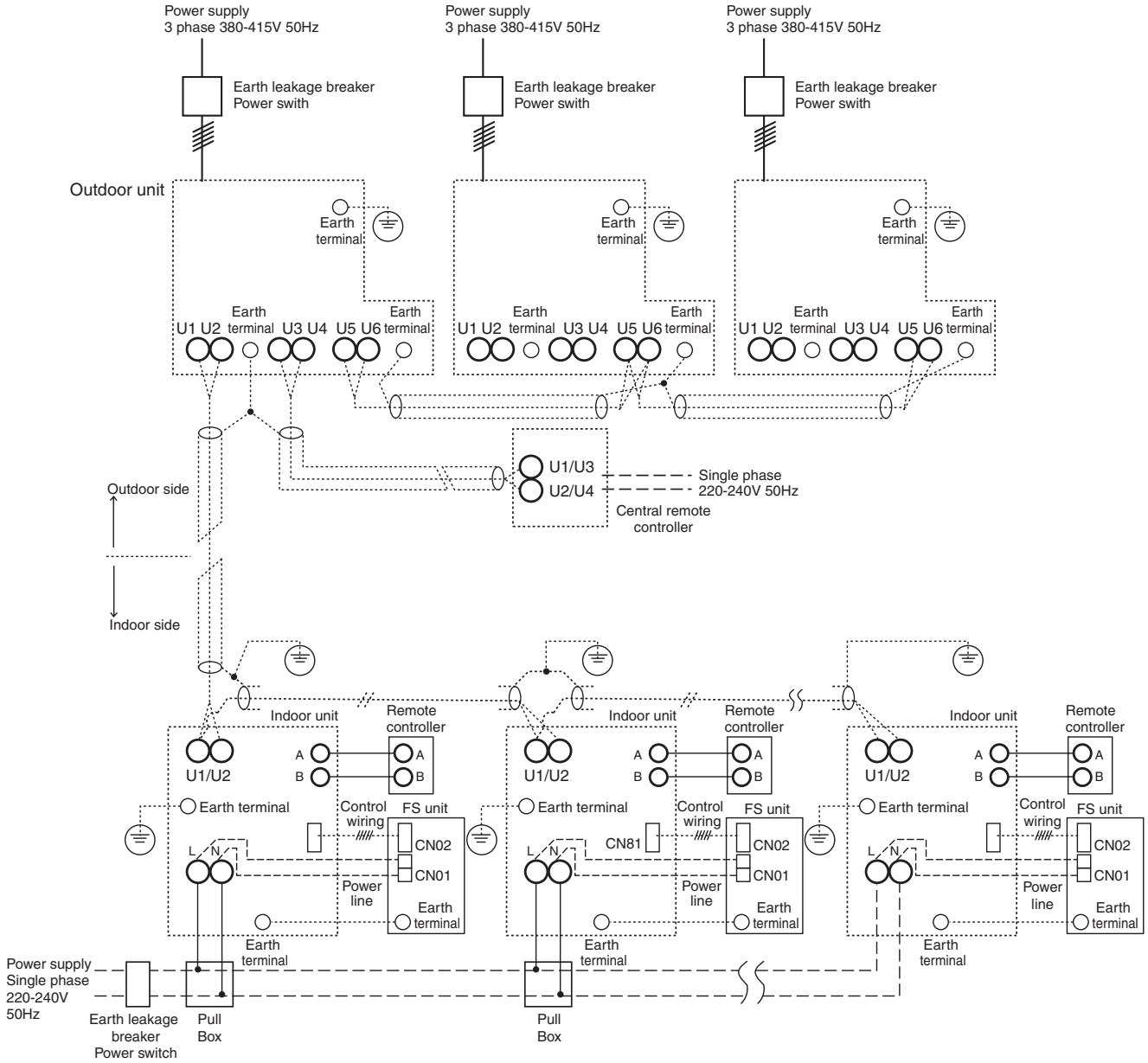


- Wire specification, quantity, size of crossover wiring and remote controller wiring

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	1.25mm²		2.0mm²	Shield wire
Remote controller wiring	2 cores	0.5 to 2.0mm²	—	—	—
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 accessary 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

■ 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
	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
2-Way Air Discharge Cassette Type	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
	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
1-Way Air Discharge Cassette Type	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
	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
Concealed Duct Type	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
	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
Concealed Duct High Static Pressure Type	MMD-AP0181H	230-1-50	198	264	0.160	0.93	1.16	15
	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
	MMD-AP0721H	230-1-50	198	264	0.370×3	6.04	7.55	15
	MMD-AP0961H	230-1-50	198	264	0.370×3	6.35	7.94	15
Under Ceiling Type	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
	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
High Wall Type (1 series)	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
	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
High Wall Type (2 series)	MMK-AP0072H	230-1-50	198	264	0.030	0.20	0.24	15
	MMK-AP0092H	230-1-50	198	264	0.030	0.21	0.26	15
	MMK-AP0122H	230-1-50	198	264	0.030	0.22	0.27	15
Floor Standing Cabinet Type	MML-AP0071H	230-1-50	198	264	0.045	0.30	0.37	15
	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 Concealed 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
Floor Standing Type	MMF-AP0151H	230-1-50	198	264	0.037	0.77	0.96	15
	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
	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)

■ Single outdoor unit

50Hz

Heat Pump Model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor		Fan Motor		Power Supply		
		Min	Max	RLA	LRA	kW	FLA	MCA	MOCP	ICF
MAP0802FT8	400-3-50	342	457	5.2 + 5.2	—	0.60	1.0	20.0	30	—
MAP1002FT8	400-3-50	342	457	6.5 + 6.5	—	0.60	1.1	22.5	30	—
MAP1202FT8	400-3-50	342	457	9.5 + 9.5	—	0.60	1.1	24.5	30	—

■ Combination of outdoor unit

Heat Pump Model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor						Fan Motor		Power Supply		
				Unit No.1		Unit No.2		Unit No.3						
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	kW	FLA	MCA	MOCP	ICF
AP1602FT8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	—	—	0.60 × 2	1.0 + 1.0	40.0	50	—
AP1802FT8	400-3-50	342	457	6.5 + 6.5	—	5.2 + 5.2	—	—	—	0.60 × 2	1.1 + 1.0	42.5	50	—
AP2002FT8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	—	—	0.60 × 2	1.1 + 1.1	45.0	60	—
AP2402FT8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	5.2 + 5.2	—	0.60 × 3	1.0 + 1.0 + 1.0	60.0	70	—
AP2602FT8	400-3-50	342	457	6.5 + 6.5	—	5.2 + 5.2	—	5.2 + 5.2	—	0.60 × 3	1.1 + 1.0 + 1.0	62.5	70	—
AP2802FT8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	5.2 + 5.2	—	0.60 × 3	1.1 + 1.1 + 1.0	65.0	80	—
AP3002FT8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	6.5 + 6.5	—	0.60 × 3	1.1 + 1.1 + 1.1	67.5	80	—

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

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

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.

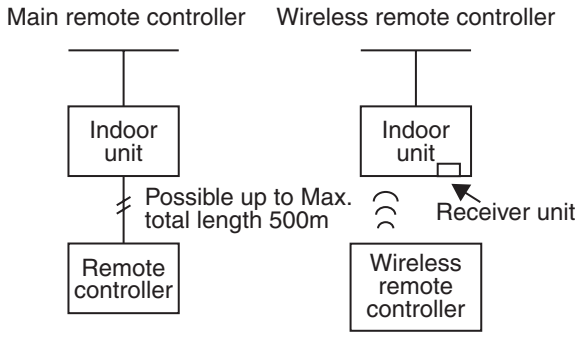
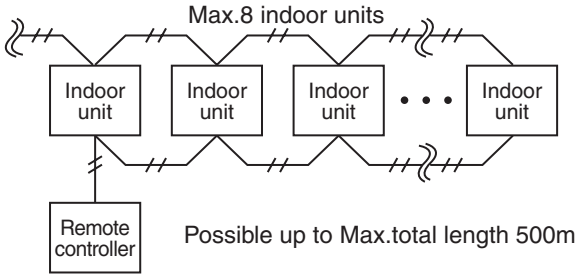
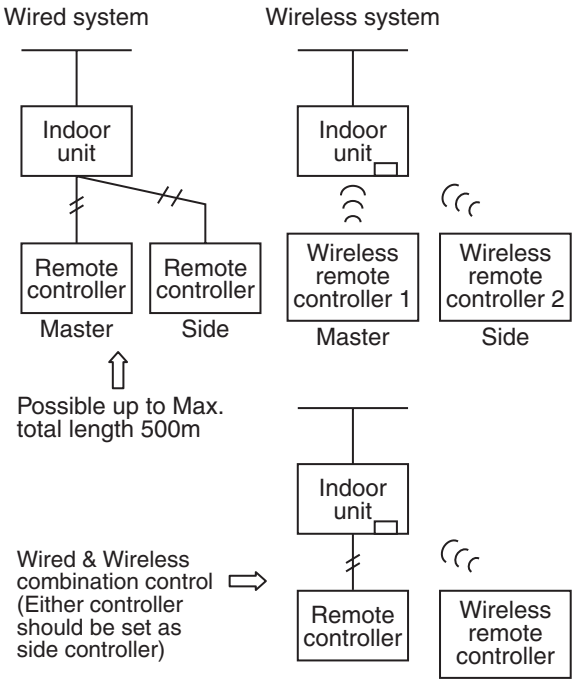
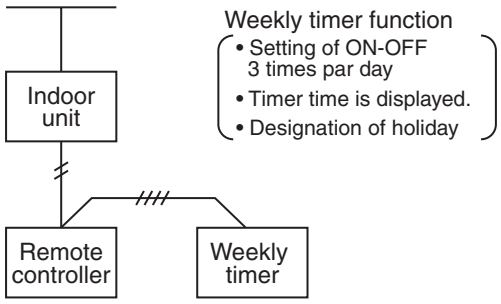
3-2. Stand-alone central control

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

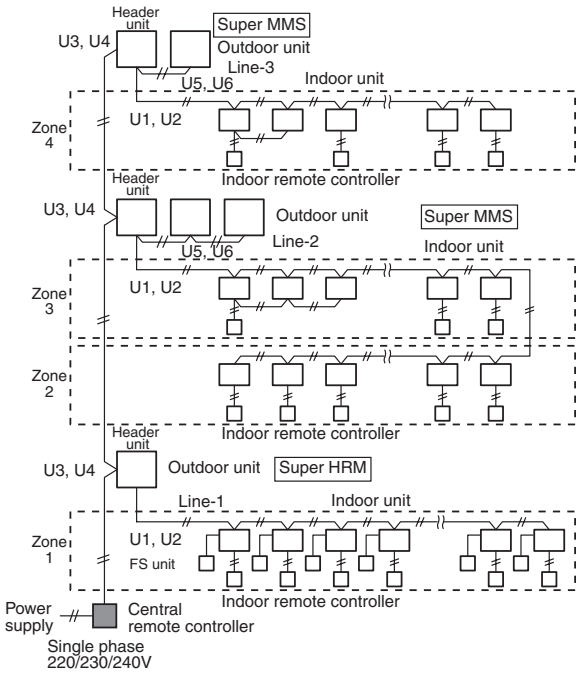
3-2-1. Touch screen controller

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

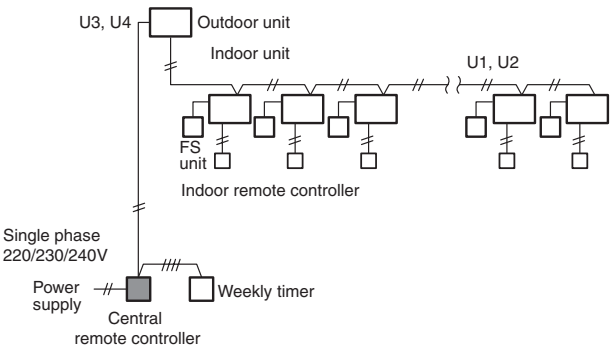
1. Applications for indoor remote controller

	Basic function	System diagram	Model
1-1	**Individual control** Air conditioner is individually operated at a distance.		• 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		• 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 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		• Wired remote controller **RBC-AMT21E** + • Weekly timer **RBC-EXW21E**

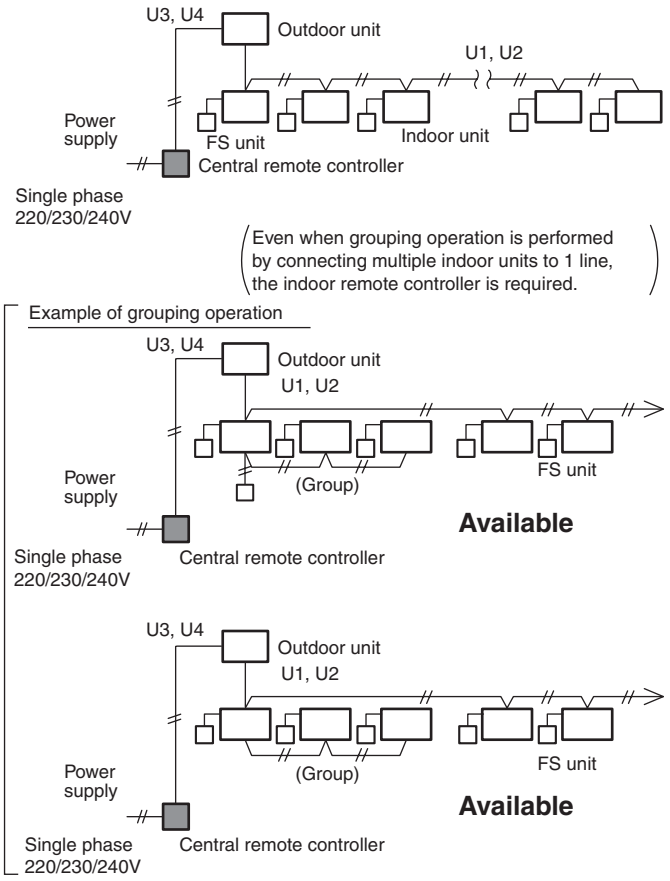
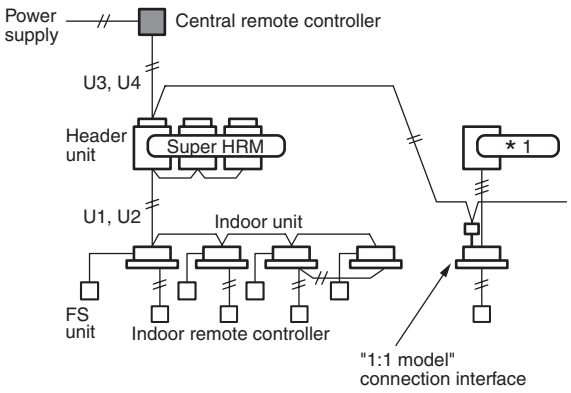
2. Application controls for central remote controller

<table>
<tr><th></th><th>Basic function</th><th>System diagram</th><th>Model</th></tr>
<tr><td>2-1</td><td>Central management controller for 64 units</td><td> 

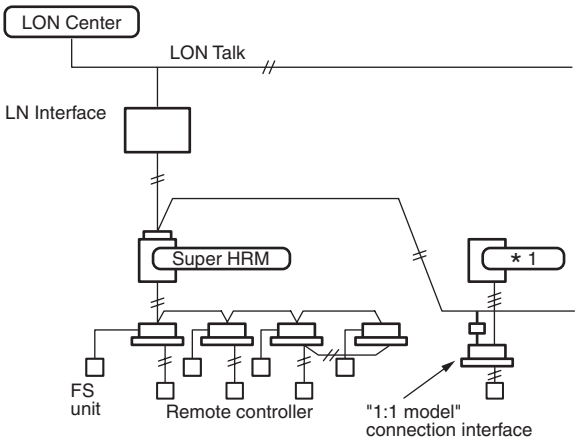
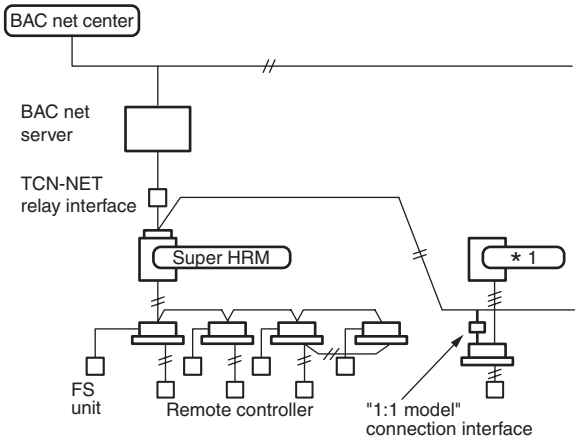
Function of central remote controller
• Individual control up to 64 indoor units.
• Individual control for max. 64 indoor units divided 1 to 4 zone. (Up to 16 indoor units for each zone.)
• Up to 16 outdoor header units are connectable.
• 4 type central control setting to inhibit individual operation 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.</td><td>• Central remote controller TCB-SC642TLE

<Indoor remote controller>
• Wired remote controller RBC-AMT21E
• Simple remote controller RBC-AS21E</td></tr>
<tr><td>2-2</td><td>Central remote controller
+
Weekly timer
(Weekly operation schedule can be set by connecting a weekly timer to the central remote controller)</td><td> 
</td><td>• Central remote controller TCB-SC642TLE
+
• Weekly timer RBC-EXW21E

<Indoor remote controller>
• Wired remote controller RBC-AMT21E
or
• Simple remote controller RBC-AS21E</td></tr>
</table>

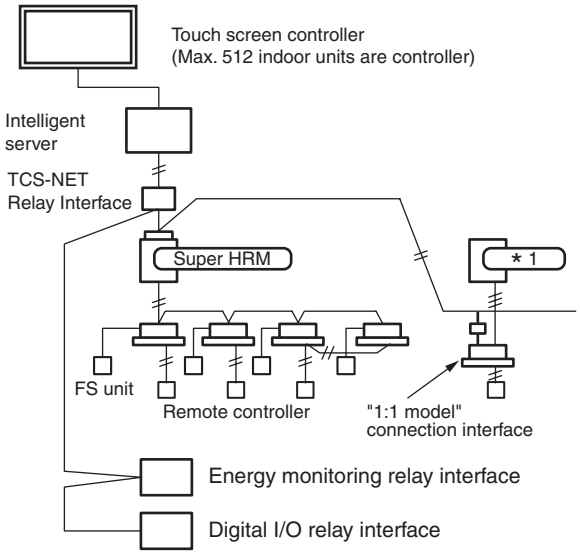
	Basic function	System diagram	Model
2-3	Remote central control without indoor remote controller		• Central remote controller **TCB-SC642TLE** **<Indoor remote controller>** • Wired remote controller **RBC-AMT21E**
2-4	Central management control with “1 : 1 model”	 * TOSHIBA Digital Inverter System and 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)	 *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. Max. 64 indoor units are connectable per interface.	• LN interface **TCB-IFLN640TLE** • "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 (*2)	 *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 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**

*1) LONWORKS : Registered trademark Echelon corporation.

*2) BACnet™ : Registered trademark Echelon corporation.

	Basic function	System diagram	Model
3-2-1	Touch screen controller	 *1 TOSHIBA Digital Inverter System and Super Digital Inverter System *2 With energy monitoring and billing function Combination of touch screen and local server.	• Touch screen controller **BMS-TP0640ACE** **BMS-TP5120ACE** **BMS-TP0640PWE*2** **BMS-TP5120PWE*2** • Intelligent server **BMS-LSV2E** **BMS-STCC01E (Soft ware)** • 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**

8. ACCESSORIES

Options for application controls

• Application controls of indoor unit

Appliance name	Model name	Contents of application control	Connecting device or setting method
Remote location ON/OFF control box	TCB-IFCB-4E	・Monitoring from outside ・ON/OFF command from external signals	Indoor unit
Network adapter	TCB-PCNT20E	Central control with AI-Network system	Indoor unit
"1:1 model" connection interface	TCB-PCNT30TLE	Central control with " 1:1 model" (link Toshiba Digital Inverter system and Super Digital Inverter system)	Indoor unit

• Application controls of outdoor unit

Appliance name	Model name	Contents of application control	Connecting device or setting method
Power peak-cut control board	TCB-PCDM2E	Power peak-cut (Standard function)	Inverter assembly of the header outdoor unit
		Power peak-cut (Expansion function)	
External master ON/OFF control board	TCB-PCMO2E	Snowfall fan control	
		External master ON/OFF control	
		Night operation (sound reduction) control	
		Operation mode selection control	
Error output control board	TCB-PCIN2E	Operation and error monitoring from external position	

Accessories parts for indoor unit

• Remote controller

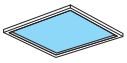
Indoor unit type	Accessory parts name	Model	Applicable model
4-way Air Discharge Cassette Type	Wired remote controller	RBC-AMT21E	Common parts for all type model
2-way Air Discharge Cassette Type	Central remote controller	TCB-SC642TLE	
1-way Air Discharge Cassette Type	Weekly timer	RBC-EXW21E	
Concealed Duct Type	Simple remote controller	RBC-AS21E	
	Remote sensor	TCB-TC21LE	
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			
High Wall Type (1 series)		RBC-AX22CE	Under Ceiling Type
High Wall Type (2 series)			
Floor Standing Cabinet Type		TCB-AX21E	Universal Type (Except concealed duct high static pressure type)
Floor Standing Concealed Type		WH-H2UE	High Wall Type (2 series) Packed with indoor unit
Floor Standing Type			

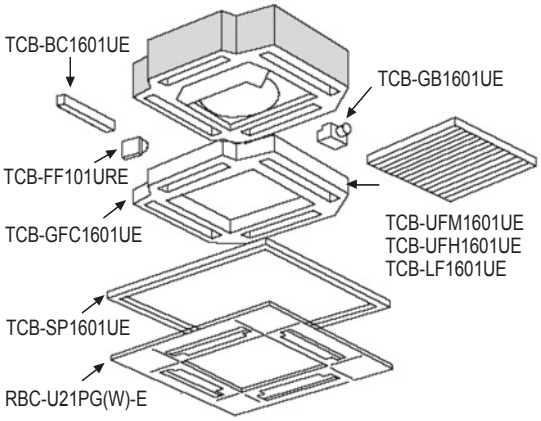
*1: For handling the Wireless Remote Controller kit, consult your dealer about availability.

• Panels and accessories

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-LF1601UE		Be used with TCB-GFC1601UE
		High Efficiency Filter 65	TCB-UFM1601UE		
		High Efficiency Filter 90	TCB-UFH1601UE		
		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		
		Air discharge direction kit	TCB-BC1601UE		Three-piece set
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 pcs.
			TCB-UFM21BFCE	AP0151-0181/AP0361-0561	AP0361-AP0581 use two pcs.
			TCB-UFM11BE	AP0071-0121	For underside suction
			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 pcs.
			TCB-UFH61BFCE	AP0151-0181/AP0361-0561	AP0361-AP0561 use two pcs.
			TCB-UFH51BE	AP0071-0121	For underside suction
			TCB-UFH61BE	AP0151-0181	
			TCB-UFH71BE	AP0241-0301	
			TCB-UFH81BE	AP0361-0561	
		Ceiling panel	RBC-UD281PE(W)	AP0071-0121	(Half panel for underside suction)
			RBC-UD501PE(W)	AP0151-0181	
			RBC-UD801PE(W)	AP0241-0301	
			RBC-UD1401PE(W)	AP0361-0561	
		Suction Canvas	TCB-CA281BE	AP0071-0121	For underside suction
			TCB-CA501BE	AP0151-0181	
			TCB-CA801BE	AP0241-0301	
			TCB-CA1401BE	AP0361-0561	
		Filter Chamber	TCB-FC281BE	AP0071-0121	For rear suction
			TCB-FC501BE	AP0151-0181	
			TCB-FC801BE	AP0241-0301	
			TCB-FC1401BE	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 pcs.
			TCB-UFM2D-1E	AP0241-0361	Use two pcs.
			TCB-UFM3DE	AP0721-0961	
		High Efficiency Filter 90	TCB-UFH5D-1E	AP0181/0481	AP0481 use two pcs.
			TCB-UFH6D-1E	AP0241-0361	Use two pcs.
			TCB-UFH7DE	AP0721-0961	
		Long Life Pre-Filter	TCB-PF1D-1E	AP0181/0481	AP0481 use two pcs.
			TCB-PF2D-1E	AP0241-0361	Use two pcs.
			TCB-PF3DE	AP0721-0961	
		Filter Chamber	TCB-FCY21DE	AP0181	
			TCB-FCY31DE	AP0241-0361	
			TCB-FCY51DE	AP0481	
			TCB-FCY100DE	AP0721-0961	
		Drain pump kit	TCB-DP31DE	AP0181-0481	
			TCB-DP32DE	AP0721-0961	
Under Ceiling Type	Optional	Drain pump kit	TCB-DP22CE	AP0151-0481	* Required accessories when using Drain Pump Kit
		Elbow piping kit	TCB-KP12CE	AP0151-0181	
			TCB-KP22CE	AP0241-0481	

1. Accessory Parts for 4-Way Air Discharge Cassatte type (Detail)

External view	Name	Model name	Note
	Super long life filter	**TCB-LF1601UE**	Dust collecting effect : 50% (Weight method) Operation time : 10,000hours Reuse is available Use with TCB-GFC1601UE
	High efficiency filter 65	**TCB-UFM1601UE**	Dust collecting effect : 65% (NBS Colorimetric method) Operation time : 2500hours Reuse is not available with TCB-GFC1601UE
	High Efficiency Filter 90	**TCB-UFH1601UE**	Dust collecting effect : 90% (NBS Colorimetric method) Operation time : 1800 hours Reuse is not available with TCB-GFC1601UE
	Fresh Air and Filter Chamber	**TCB-GFC1601UE**	For fresh air intake and installing high efficiency filter or super long life filter
	Fresh Air Inlet Box	**TCB-GB1601UE**	Use with TCB-GFC1601UE
	Auxiliary Fresh Air Flange	**TCB-FF101URE**	Easy fresh air intake by using the knockout hole of indoor unit. (dia.=100mm)
	Spacer for Height Adjustment	**TCB-SP1601UE**	Height = 50mm
	Air Discharge Direction kit	**TCB-BC1601UE**	Air direction change by cutting off of air discharge port (3 pcs.)



2. Accessory for 4-way Air Discharge Cassette Type:Combination Pattern

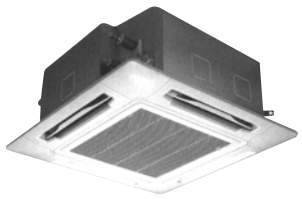
			Ceiling Panel RBC-U21PG (W)-E	Wireless remote controller kit TCB-AX21U (W)-E	Auxiliary fresh air flange TCB-FF101URE	Fresh air and filter chamber (as fiter chamber) TCB-GFC1601UE	Fresh air inlet box + Fresh air and filter chamber TCB-GB1601UE + TCB-GFC1601UE	Super long life fitler TCB-LF1601UE	High efficiency filter (65%) TCB-UFM1601UE	High efficiency filter (90%) TCB-UFH1601UE	Spacer for height adjustment TCB-SP1601UE	Air discharge direction kit TCB-BC1601UE
Panel	Ceiling Panel	RBC-U21PG (W)-E		OK	OK	OK	OK	OK	OK	OK	OK	OK
	Wireless remote controller kit	TCB-AX21U (W)-E	OK		OK	OK	OK	OK(*1)	OK(*1)	OK(*1)	OK	OK(*2)
Optional Parts	Auxiliary fresh air flange	TCB-FF101URE	OK	OK		OK	OK	OK	OK	OK	OK	OK
	Fresh air and filter chamber (Used for filter frame)	TCB-GFC1601UE	OK	OK	OK			OK	OK	OK	OK	OK
	Fresh air inlet box + Fresh air and filter chamber	TCB-GB1601UE + TCB-GFC1601UE	OK	OK	OK			OK	OK	OK	-	OK
	Super long life filter	TCB-LF1601UE	OK	OK(*1)	OK	OK	OK		-	-	OK	-
	High efficiency filter (65%)	TCB-UFM1601UE	OK	OK(*1)	-	OK	OK	-		-	OK	-
	High efficiency filter (90%)	TCB-UFH1601UE	OK	OK(*1)	-	OK	OK	-	-		OK	-
	Spacer for height adjustment	TCB-SP1601UE	OK	OK	OK	OK	-	OK	OK	OK		OK
	Air discharge direction kit	TCB-BC1601UE	OK	OK(*2)	OK	OK	OK	-	-	-	OK	

(*1)Setup of air volume by connecting main wired remote controller and item code setting is necessary.
(*2) Procedure same as (*1) is necessary when indoor unit is used under the different air volume from setting at shipment.

9. TECHNICAL SPECIFICATIONS

50Hz

Indoor unit (50Hz specifications)



- **4-way Air Discharge Cassette Type**

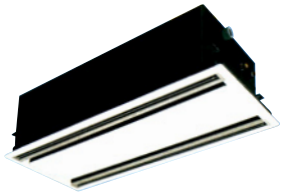
Model name				MMU-	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H	AP0271H	AP0301H	AP0361H	AP0481H	AP0561H
Cooling/Heating capacity (Note 1)				(kW)	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	9.0/10.0	11.2/12.5	14.0/16.0	16.0/18.0
Electrical characteristics	Power supply				1 phase 50Hz 230V (220 – 240V) (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)			(m^3/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)			(m^3/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)			(m^3/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										
Sound proof/Heat-insulating material					Non-flammable insulation										
Fan unit	Fan				Centrifugal fan										
	Standard air flow High (Mid./Low)			(m^3/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)	40										
	External static pressure			(Pa)	100										
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

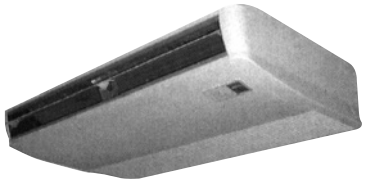
• Concealed Duct High Static Pressure Type

Model name			MMD-	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H	AP0721H	AP0961H
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	22.4/25.0	28.0/31.5
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	5.25	5.52
	Power consumption		(kW)	0.184	0.299		0.368	0.414	1.200	1.260
	Power factor		(%)	99	96		98	98	99	99
	Starting current		(A)	1.3	3.5		4.1	4.8	13.6	14.8
Appearance				Zinc hot dipping steel plate						
Outer dimension	Height x Width x Depth		(mm)	380 x 850 x 660				380 x 1,200 x 660	470 x 1,380 x 1,250	
Total weight			(kg)	50	52		56	67	150	
Heat exchanger				Finned tube						
Soundproof/Heat-insulating material				Non-flammable insulation						
Fan unit	Fan			Centrifugal fan						
	Standard air flow		(m^3/h)	900	1,320		1,600	2,100	3,600	4,200
	Motor		(W)	160			260		370 x 3	
	External static pressure (Factory setting)		(Pa)	137						
	External static pressure		(Pa)	68.6-137-196						
	Air flow limit Lower limit/Upper limit		(m^3/h)	720/1,080	1,060/1,580		1,280/1,920	1,680/2,520	2,880/4,320	3,360/5,040
Air filter				Option or field supply						
Controller				Remote controller						
Connecting pipe	Gas side		(mm)	Ø12.7	Ø15.9				Ø22.2	
	Liquid side		(mm)	Ø6.4	Ø9.5				Ø12.7	
	Drain port	(Nominal dia.)		25 (One side of male screw)						
Sound level (Note 2) (High/Mid./Low)			(dB(A))	37	40				49	50

Note 1 : The cooling capacities and electrical characteristics are measured under the conditions speciied 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)	(m^3/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 (1 series)

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)		(m^3/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

• High Wall Type (2 series)*

***European market only**

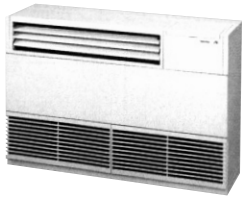
Model name			MMK-	AP0072H	AP0092H	AP0122H
Cooling/Heating capacity (Note 1)			(kW)	2.2/2.5	2.8/3.2	3.6/4.0
Electrical characteristics	Power supply			1 phase 50Hz 230V (220 – 240V) (Power exclusive for indoor is required.)		
	Running current		(A)	0.17	0.18	0.19
	Power consumption		(kW)	0.017	0.018	0.019
	Starting current		(A)	0.22	0.23	0.24
Appearance	Suction grille and side panel			Moon white		
	Discharge grille			Moon white		
	Bottom surface			Moon white		
Outer dimension	Height x Width x Depth		(mm)	275 x 790 x 208		
Total weight			(kg)	11		
Heat exchanger				Finned tube		
Soundproof/Heat-insulating material				Non-flammable insulation		
Fan unit	Fan			Cross-flow fan		
	Standard air flow (High/Mid./Low)		(m^3/h)	480/420/360	510/450/360	540/450/360
	Motor outlet		(W)	30		
Air filter				Standard filter attached (Simple filter)		
Controller				Wireless remote controller (WH-H2UE, Packed with indoor unit)		
Connecting pipe	Gas side		(mm)	Ø 9.5		
	Liquid side		(mm)	Ø 6.4		
	Drain port	(Outer dia.)		16 (Polyvinyl chloride tube)		
Sound level (Note 2) (High/Mid./Low)			(dB(A))	35/32/29	36/33/29	37/33/29

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 3 : Wireless remote controller is packed with indoor unit.
Wired remote controller (RBC-AMT21E, RBC-AS21E) can be also connected.

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



50Hz

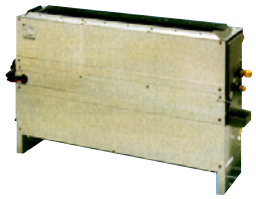
• Floor Standing Cabinet Type

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)		(m^3/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

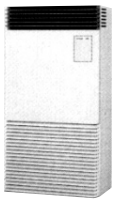
• Floor Standing Concealed Type

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)		(m^3/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 (Polyvinyl chloride tube)					
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)	(m^3/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 (Polyvinyl chloride tube)						
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-	MAP0802FT8	MAP1002FT8	MAP1202FT8
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	94	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	94	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			(m^3/h)	9,900	10,500	
Heat exchanger					Finned tube		
Refrigerant R410A (Charged refrigerant amount) (* 3)				(kg)	11.5		
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		(mm)	Ø9.5		
	Connecting method	Discharge gas side			Brazing		
		Suction gas side			Brazing		
		Liquid side			Flare		
		Balance pipe			Flare		
	Max. equivalent length			(m)	150		
	Max. real length			(m)	125 (However, if equivalent bend length is longer, equivalent length is the standard.)		
	Max. total pipe length (Real length)			(m)	300		
	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

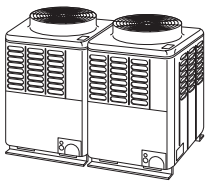
The standard piping means that main pipe length is 5 m, branching pipe length 2.5 m of branch piping connected with a 0 meter height.

***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.



50Hz

Outdoor unit (Combination) (50Hz)

Equivalent HP				Equivalent to 16HP		Equivalent to 18HP		Equivalent to 20HP	
Set Model name	Heat Recovery	MMY-		AP1602FT8		AP1802FT8		AP2002FT8	
Outdoor unit type				Inverter					
Outdoor unit model	Heat Recovery	MMY-		MAP0802FT8	MAP0802FT8	MAP1002FT8	MAP0802FT8	MAP1002FT8	MAP1002FT8
Rated cooling capacity (* 1)			(kW)	45.0		50.4		56.0	
Standard heating capacity (* 1)			(kW)	50.0		56.5		63.0	
Power supply (* 2)				3 phase 50Hz 400V (380 – 415V)					
Electrical characteristics (* 1)	Cooling	Running current	(A)	19.68		23.29		26.90	
		Power consumption	(kW)	13.01		15.42		17.89	
		Power factor	(%)	95		96		96	
		EER (Energy Efficiency Ratio)	(kW/kW)	3.46		3.27		3.13	
		Starting current	(A)	1.0		1.0		1.0	
	Heating	Running current	(A)	19.90		23.47		27.03	
		Power consumption	(kW)	13.10		15.54		17.98	
		Power factor	(%)	95		96		96	
		EER (Energy Efficiency Ratio)	(kW/kW)	3.82		3.64		3.50	
		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	2.3 × 2	3.1 × 2	
Fan unit	Fan			Propeller fan					
	Motor output		(kW)	0.6					
	Air volume		(m^3/h)	9,900		10,500	9,900	10,500	
Heat exchanger				Finned tube					
Refrigerant R410A Charged amount (* 3)			(kg)	11.5					
High-pressure switch			(MPa)	OFF : 2.90 ON : 3.73					
Protective devices				(* 5)					
Refrigerant pipe spec. (* 4)	Connecting port dia.	Discharge gas side	(mm)	Ø19.1					
		Suction gas side	(mm)	Ø22.2					
		Liquid side	(mm)	Ø12.7					
		Balance side	(mm)	Ø9.5					
	Connecting method	Discharge gas side		Brazing					
		Suction gas side		Brazing					
		Liquid side		Flare					
		Balance side		Flare					
	Max. equivalent length		(m)	150					
	Max. real length		(m)	125 (However, if equivalent bend length is longer, equivalent length is the standard.)					
	Max. total pipe length (Real length)		(m)	300					
	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				27		30		33	
Sound level			(dB(A))	60		60.5		61	

***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 5m, branching pipe length 2.5m of branch piping connected with a 0 meter height.

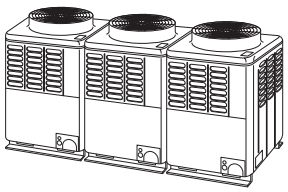
***2 :** The source voltage must not fluctuate more than ±10%.

***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.

System safety protection

***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.



50Hz

Equivalent HP				Equivalent to 24HP		
Set Model name	Heat Recovery	MMY-		AP2402FT8		
Outdoor unit type				Inverter		
Outdoor unit model	Heat Recovery	MMY-		MAP0802FT8	MAP0802FT8	MAP0802FT8
Rated cooling capacity (* 1)			(kW)	68.0		
Standard heating capacity (* 1)			(kW)	76.5		
Power supply (* 2)				3 phase 50Hz 400V (380 – 415V)		
Electrical characteristics (* 1)	Cooling	Running current	(A)	29.52		
		Power consumption	(kW)	19.66		
		Power factor	(%)	96		
		EER (kW/kW) (Energy Efficiency Ratio)		3.46		
		Starting current	(A)	1.0		
	Heating	Running current	(A)	29.86		
		Power consumption	(kW)	20.04		
		Power factor	(%)	97		
		EER (kW/kW) (Energy Efficiency Ratio)		3.82		
		Starting current	(A)	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 x 2		
Fan unit	Fan			Propeller fan		
	Motor output		(kW)	0.6		
	Air volume		(m^3/h)	9,900		
Heat exchanger				Finned tube		
Refrigerant R410A Charged amount (* 3)			(kg)	11.5		
High-pressure switch			(MPa)	OFF : 2.90 ON : 3.73		
Protective devices				(* 5)		
Refrigerant pipe spec. (* 4)	Connecting port dia.	Discharge gas side	(mm)	Ø19.1		
		Suction gas side	(mm)	Ø22.2		
		Liquid side	(mm)	Ø12.7		
		Balance side	(mm)	Ø9.5		
	Connecting method	Discharge gas side		Brazing		
		Suction gas side		Brazing		
		Liquid side		Flare		
		Balance side		Flare		
	Max. equivalent length		(m)	150		
	Max. real length		(m)	125 (However, if equivalent bend length is longer, equivalent length is the standard.)		
	Max. total pipe length (Real length)		(m)	300		
	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				40		
Sound level			(dB(A))	62		

***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 5m, branching pipe length 2.5m of branch piping connected with a 0 meter height.

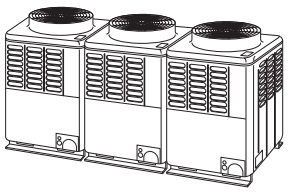
***2 :** The source voltage must not fluctuate more than ±10%.

***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.

System safety protection

***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.



50Hz

Equivalent HP				Equivalent to 26HP			Equivalent to 28HP			Equivalent to 30HP		
Set Model name	Heat Recovery	MMY-		AP2602FT8			AP2802FT8			AP3002FT8		
Outdoor unit type				Inverter								
Outdoor unit model	Heat Recovery	MMY-		MAP1002FT8	MAP0802FT8	MAP0802FT8	MAP1002FT8	MAP1002FT8	MAP0802FT8	MAP1002FT8	MAP1002FT8	MAP1002FT8
Rated cooling capacity (* 1)			(kW)	73			78.5			84.0		
Standard heating capacity (* 1)			(kW)	81.5			88.0			95.0		
Power supply (* 2)				3 phase 50Hz 400V (380 – 415V)								
Electrical characteristics (* 1)	Cooling	Running current	(A)	33.13			36.74			40.35		
		Power consumption	(kW)	21.96			24.40			26.84		
		Power factor	(%)	96			96			96		
		EER (Energy Efficiency Ratio)	(kW/kW)	3.32			3.22			3.13		
		Starting current	(A)	1.0			1.0			1.0		
	Heating	Running current	(A)	33.42			36.99			40.55		
		Power consumption	(kW)	22.09			24.53			27.11		
		Power factor	(%)	95			96			97		
		EER (Energy Efficiency Ratio)	(kW/kW)	3.69			3.59			3.50		
		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)	3.1 × 2	2.3 × 2		3.1 × 2		2.3 × 2	3.1 × 2		
Fan unit	Fan			Propeller fan								
	Motor output		(kW)	0.6								
	Air volume		(m^3/h)	10,500	9,900		10,500		9,900	10,500		
Heat exchanger				Finned tube								
Refrigerant R410A Charged amount (* 3)			(kg)	11.5								
High-pressure switch			(MPa)	OFF : 2.90 ON : 3.73								
Protective devices				(* 5)								
Refrigerant pipe spec. (* 4)	Connecting port dia.	Discharge gas side	(mm)	Ø19.1								
		Suction gas side	(mm)	Ø22.2								
		Liquid side	(mm)	Ø12.7								
		Balance side	(mm)	Ø9.5								
	Connecting method	Discharge gas side		Brazing								
		Suction gas side		Brazing								
		Liquid side		Flare								
		Balance side		Flare								
	Max. equivalent length		(m)	150								
	Max. real length		(m)	125 (However, if equivalent bend length is longer, equivalent length is the standard.)								
	Max. total pipe length (Real length)		(m)	300								
	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				43			47			48		
Sound level			(dB(A))	62			62.5			63		

***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 5m, branching pipe length 2.5m 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.

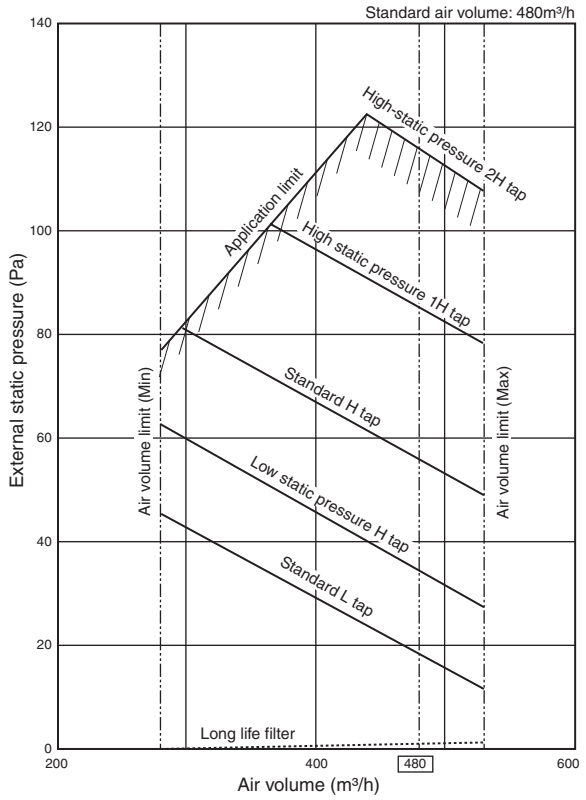
System safety protection

***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.

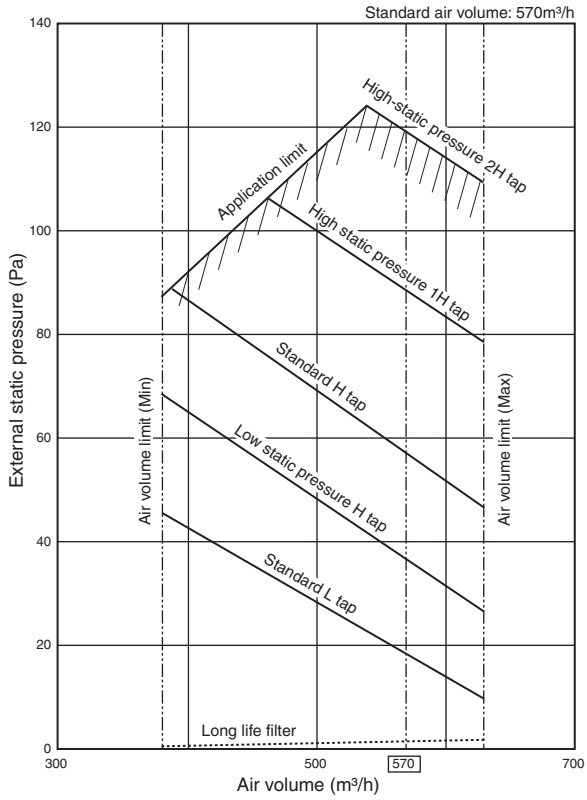
10. FAN CHARACTERISTICS

- **In case of square duct flange of discharge section**

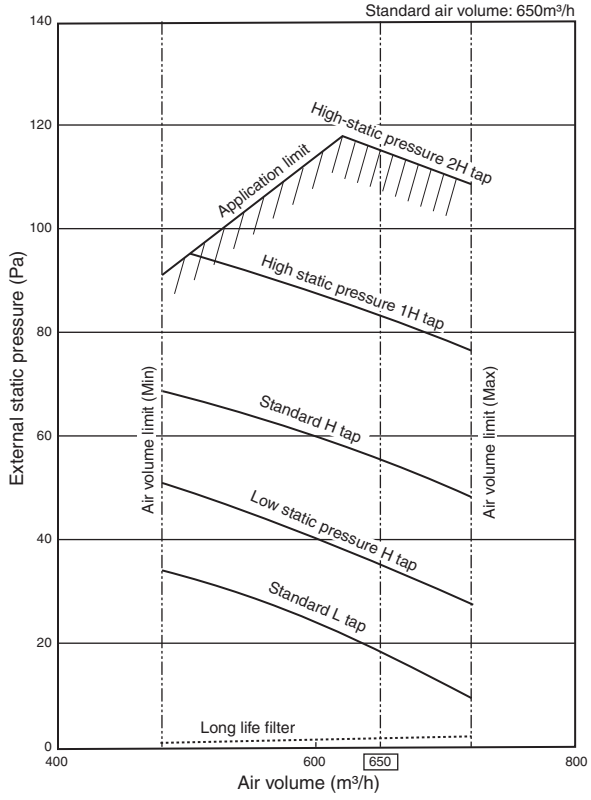
MMD-AP0071BH, AP0091BH



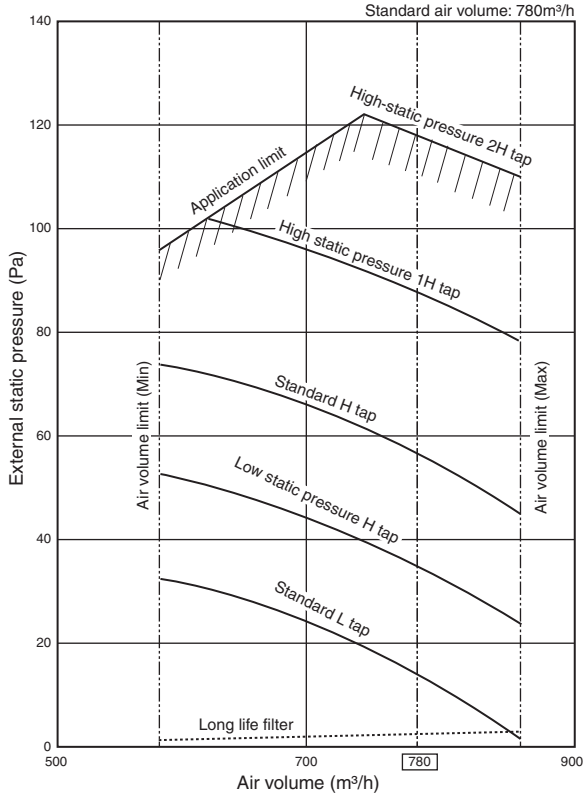
MMD-AP0121BH



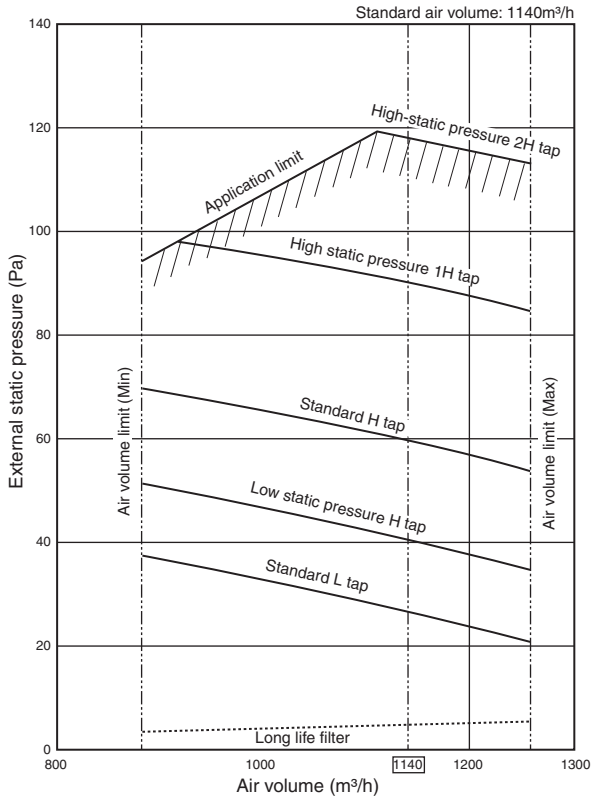
MMD-AP0151BH



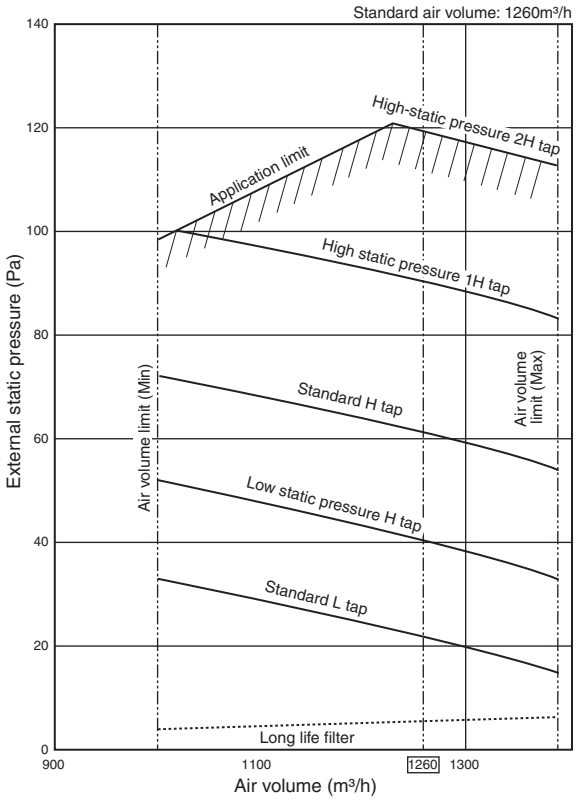
MMD-AP0181BH



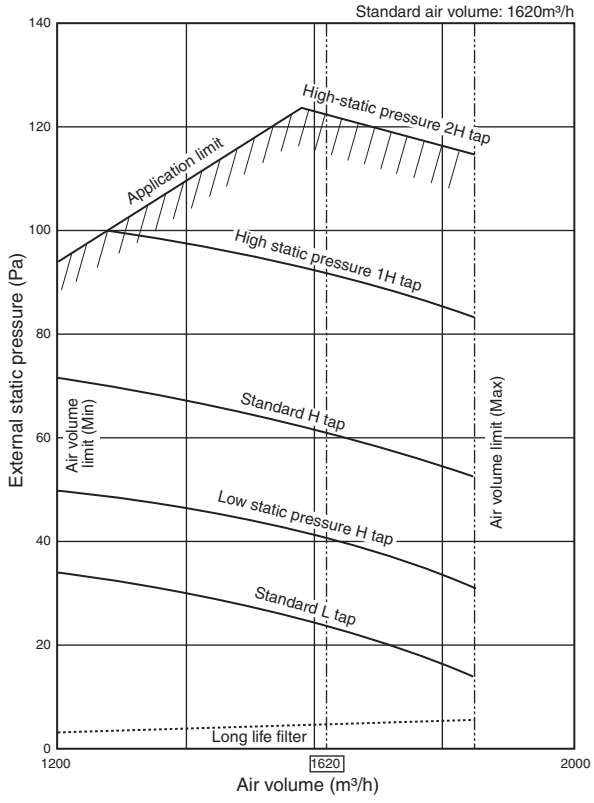
MMD-AP0241BH, AP0271BH



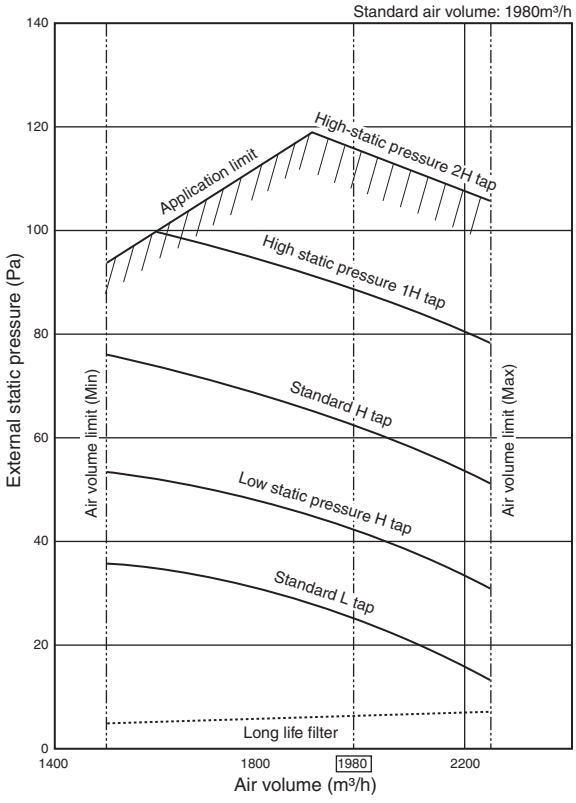
MMD-AP0301BH



MMD-AP0361BH

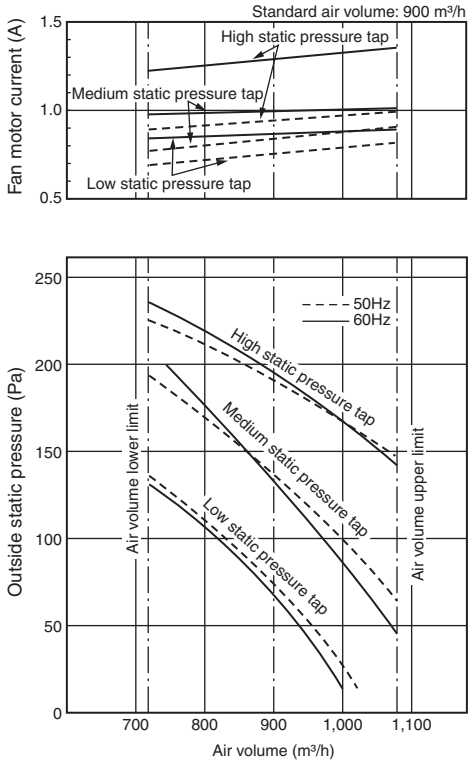


MMD-AP0481BH, AP0561BH

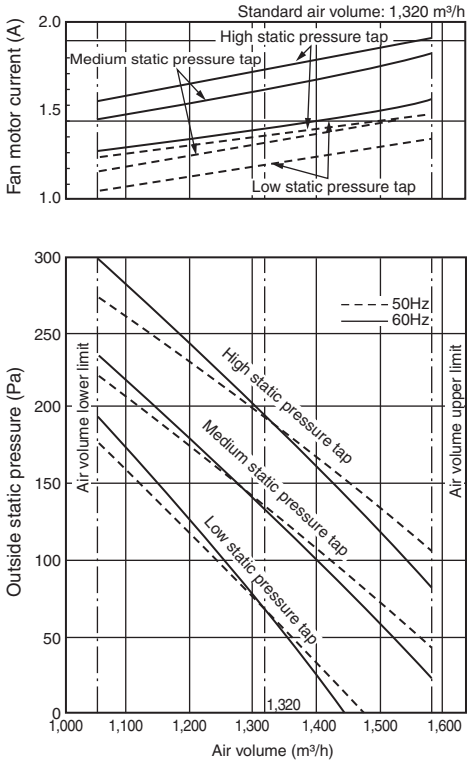


• Concealed Duct High Static Pressure type

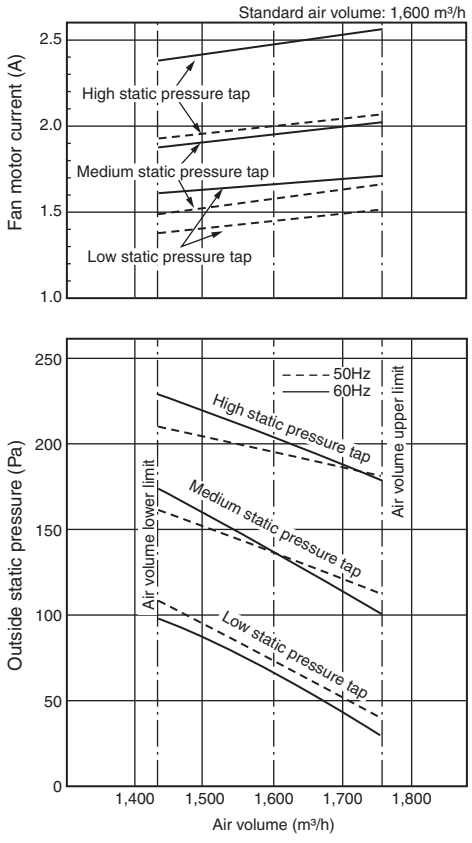
MMD-AP0181H



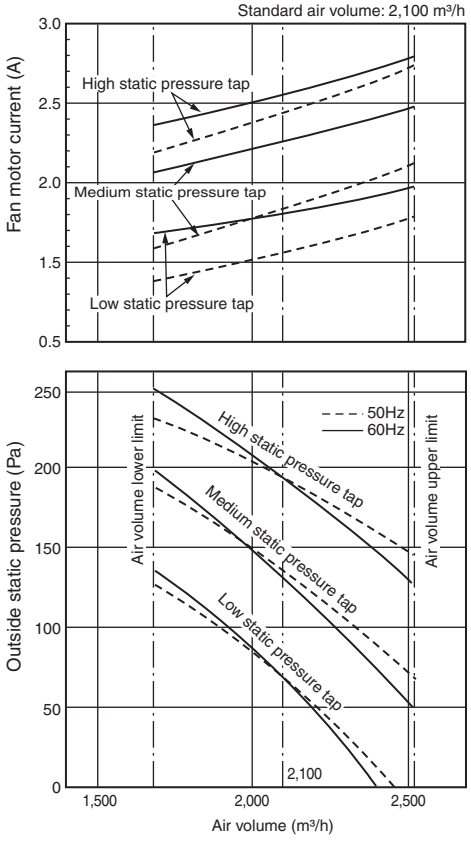
MMD-AP0241H, AP0271H



MMD-AP0361H



MMD-AP0481H

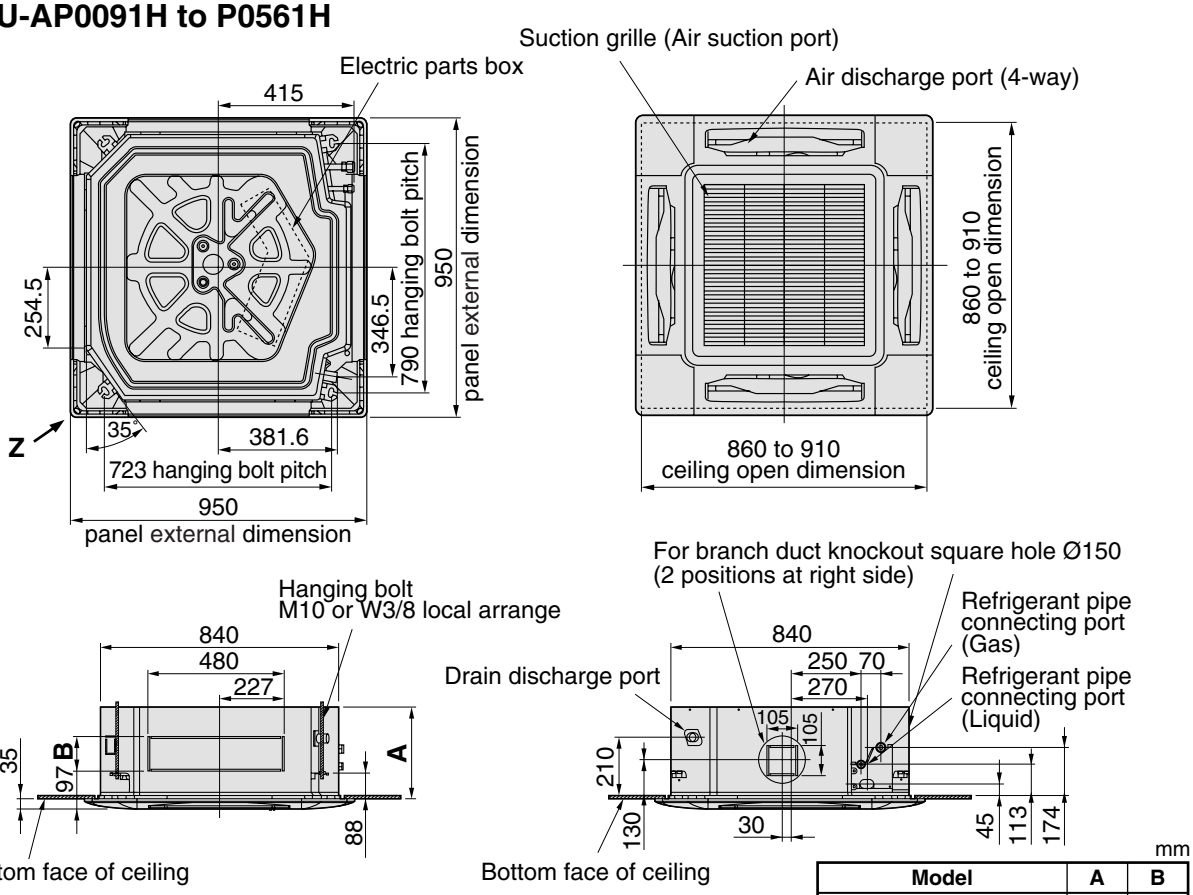


11. DIMENSIONAL DRAWINGS

Indoor unit

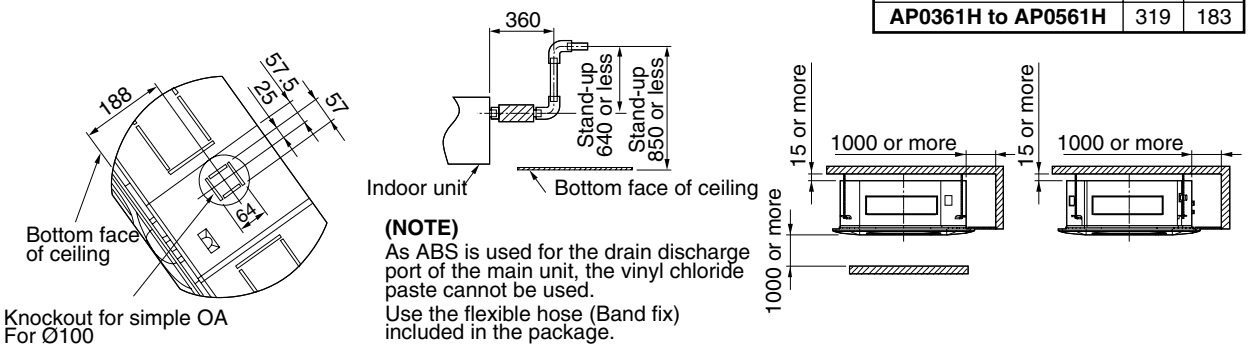
• 4-way Air Discharge Cassette Type

MMU-AP0091H to P0561H



mm

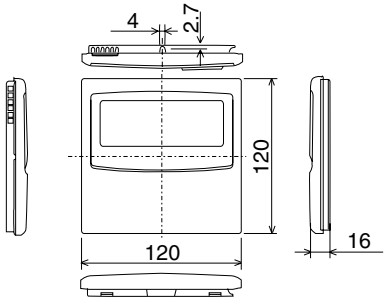
Model	A	B
AP0091H to AP0301H	250	120
AP0361H to AP0561H	319	183

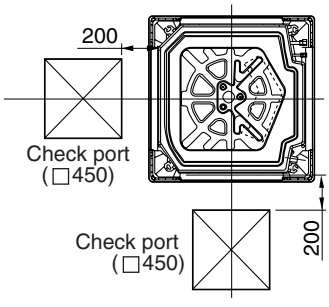


(NOTE)
As ABS is used for the drain discharge port of the main unit, the vinyl chloride paste cannot be used.
Use the flexible hose (Band fix) included in the package.

Z view | **Drain-up standing-up size** | **Space required for installation and servicing**

• Wired remote controller (RBC-AMT21E)

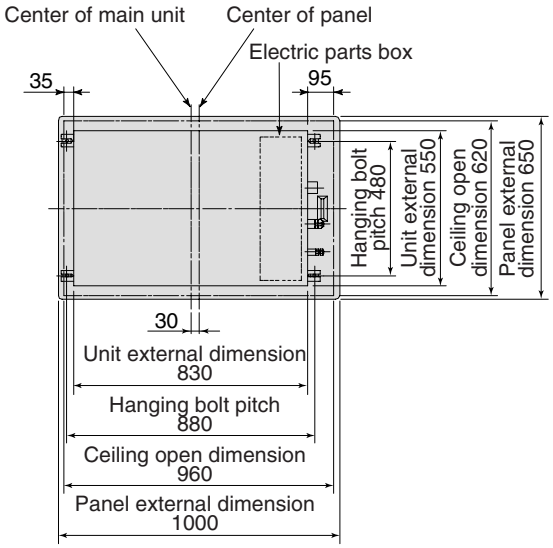




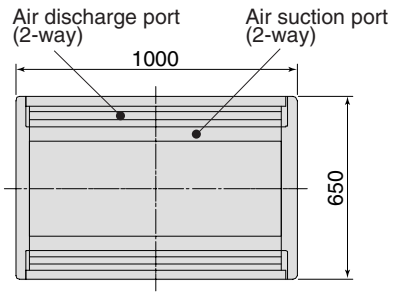
Note: All dimensions are in mm.

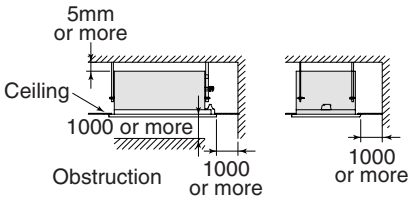
• 2-way Air Discharge Cassette Type

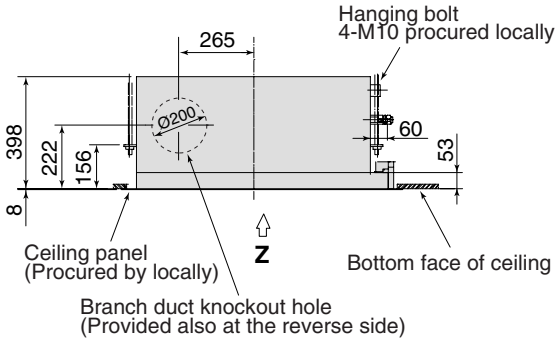
MMU-AP0071WH, AP0091WH, AP0121WH



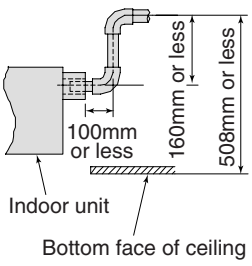
Z view

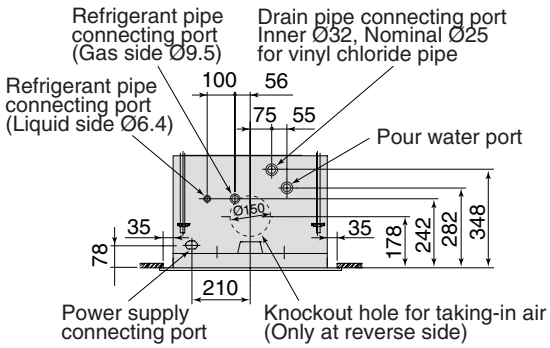






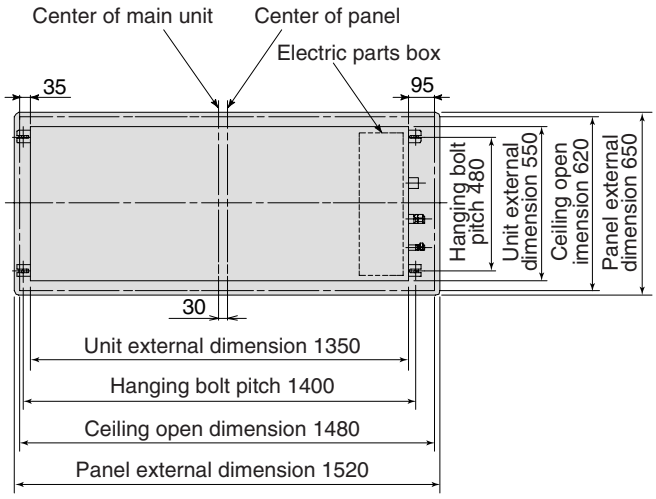
Space required for installation and servicing



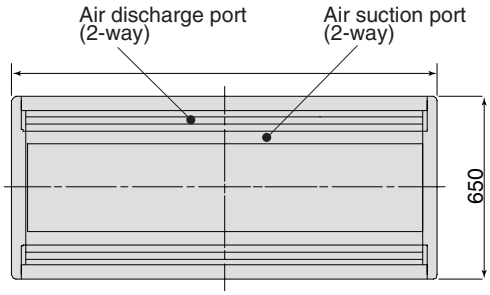


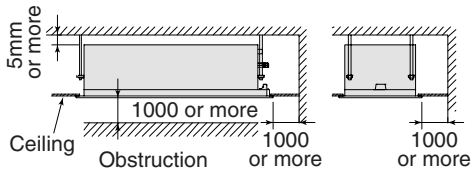
Note: All dimensions are in mm.

MMU-AP0151WH, AP0181WH, AP0241WH, AP0271WH. AP0301WH

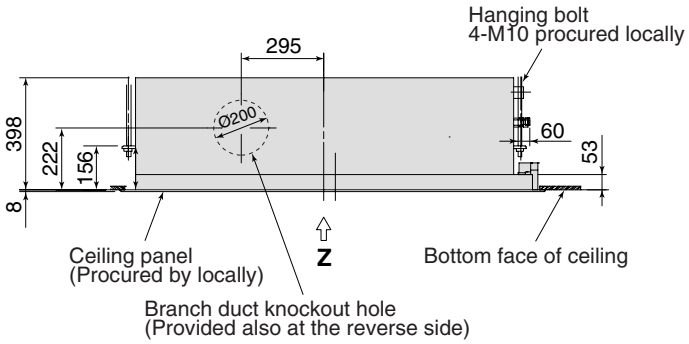


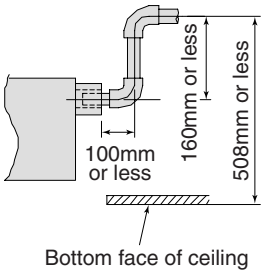
Z view

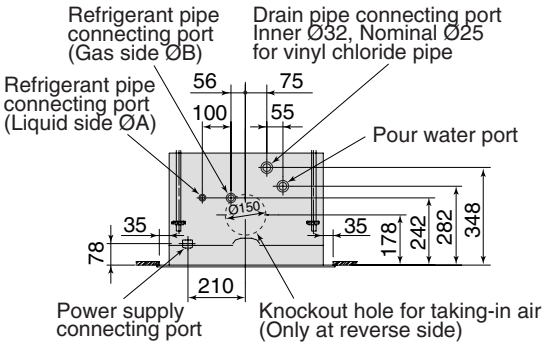




Space required for installation and servicing



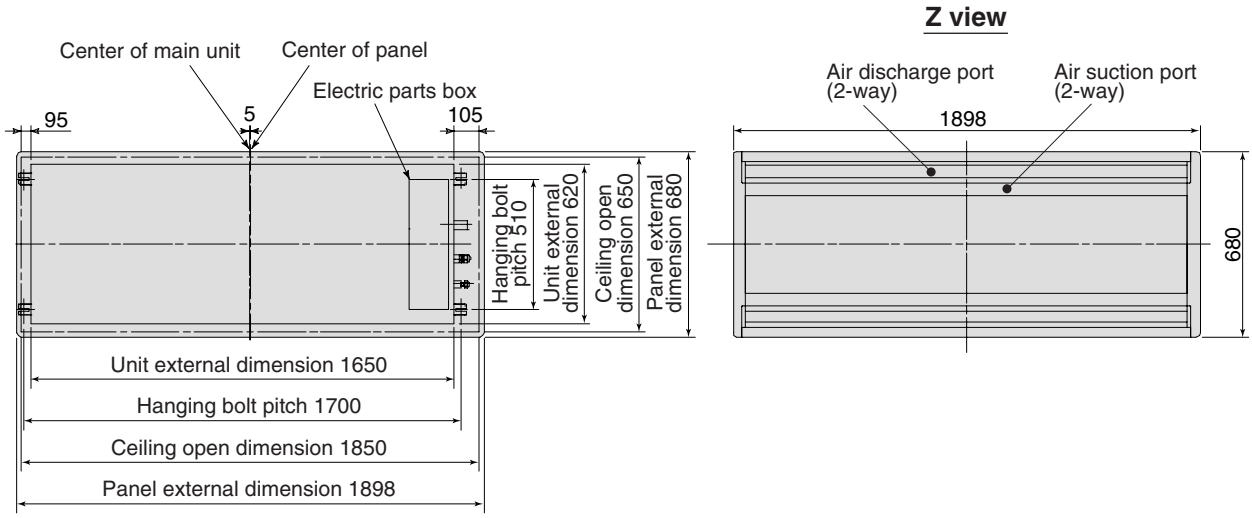


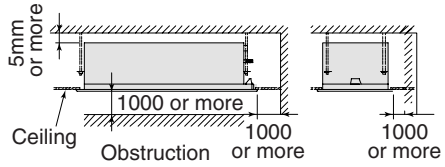


Model	A	B
MMU-AP0151WH to AP0181WH	Ø6.4	Ø12.7
MMU-AP0241WH to AP0301WH	Ø9.5	Ø15.9

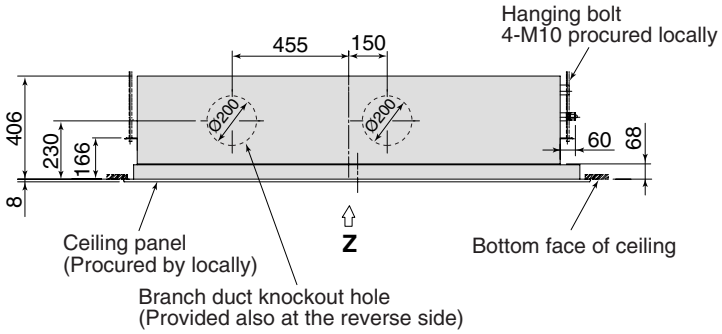
Note: All dimensions are in mm.

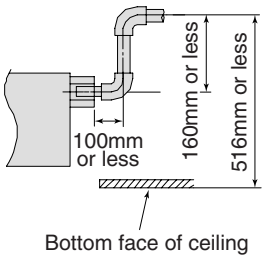
MMU-AP0481WH

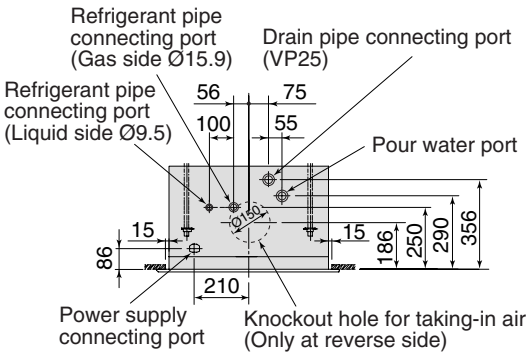




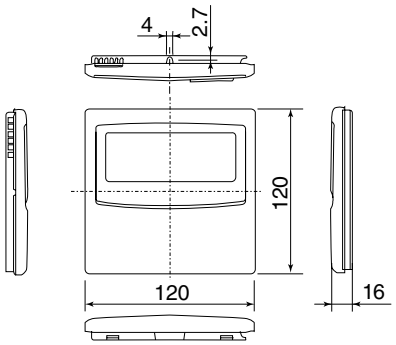
Space required for installation and servicing







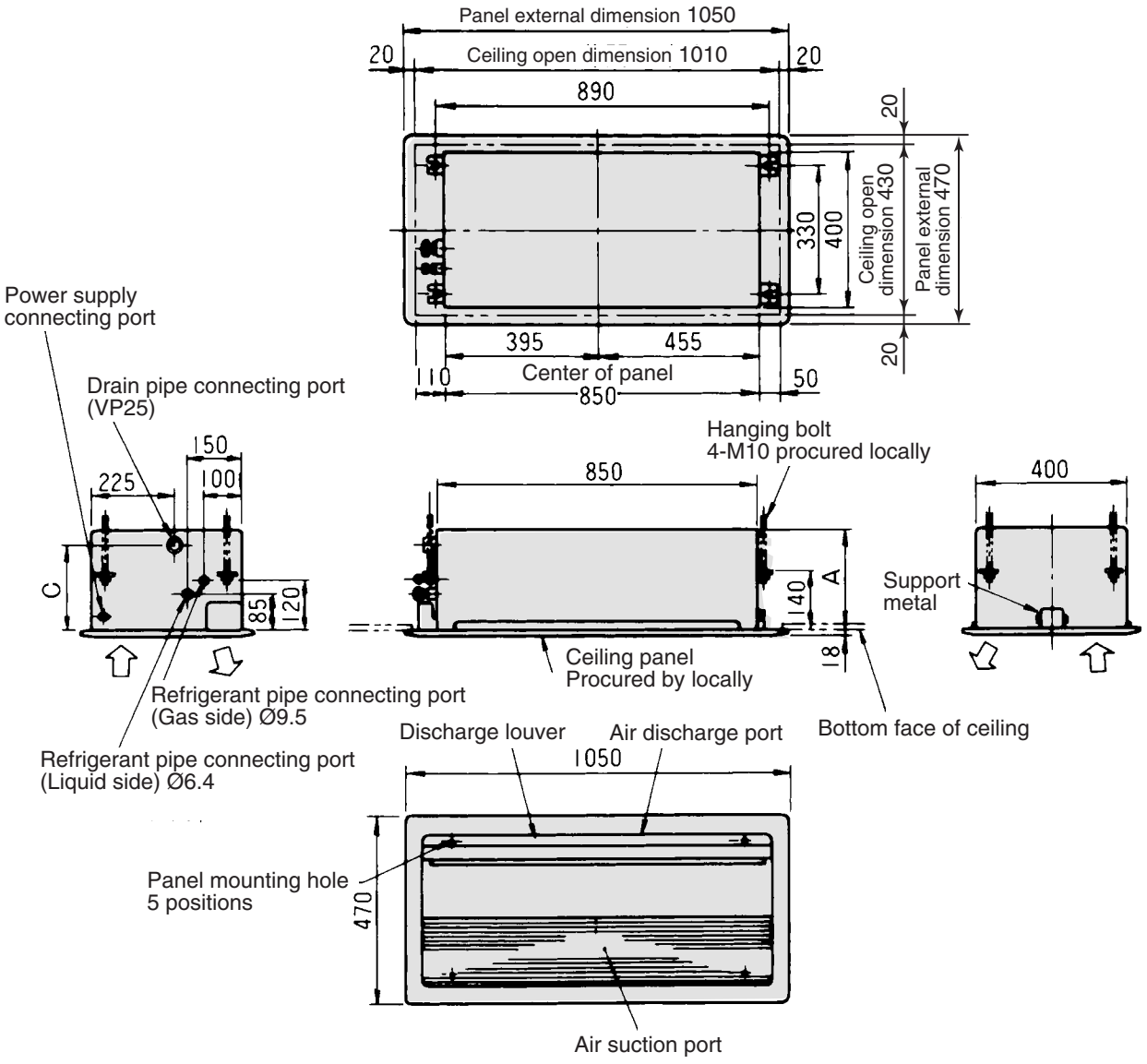
- **Wired remote controller (RBC-AMT21E)**



Note: All dimensions are in mm.

• 1-way Air Discharge Cassette Type

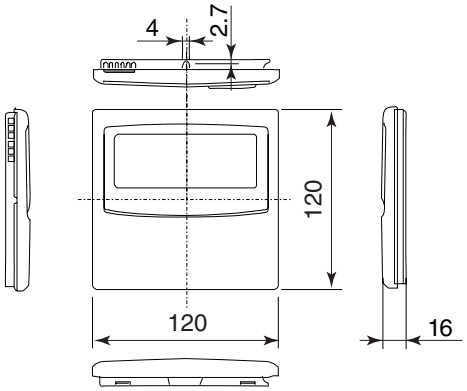
MMU-AP0071YH, AP0091YH, AP0121YH

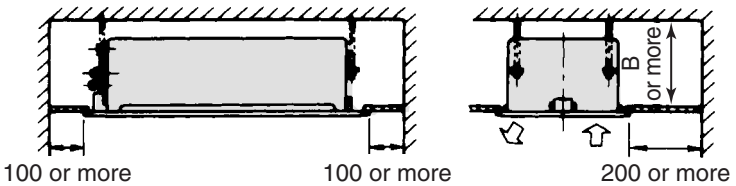


Dimensions

Model MMU-	A	B	C
AP0071YH, AP0091YH, AP0121YH	235	245	200

• **Wired remote controller (RBC-AMT21E)**

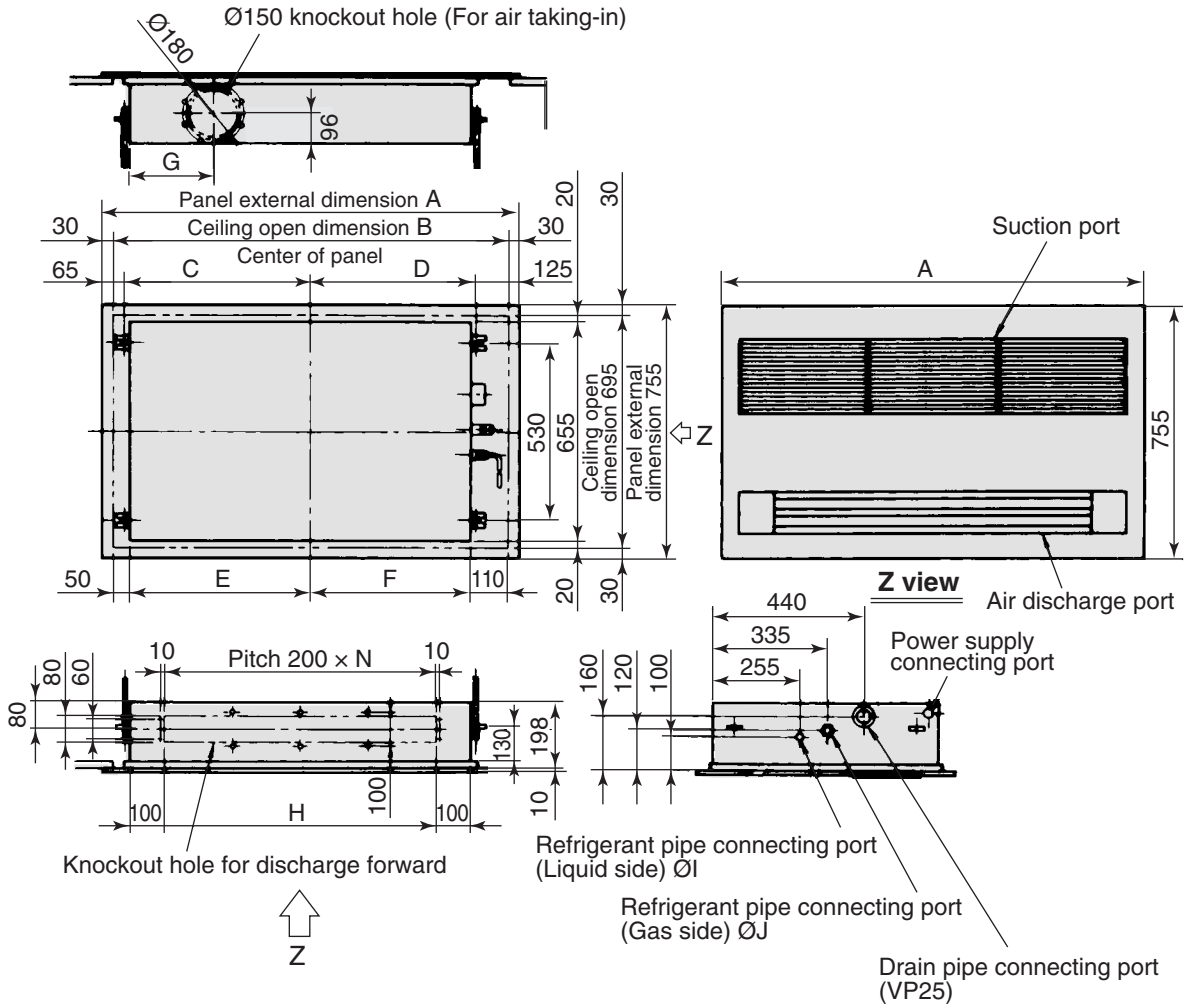




Space required for installation and servicing

Note: All dimensions are in mm.

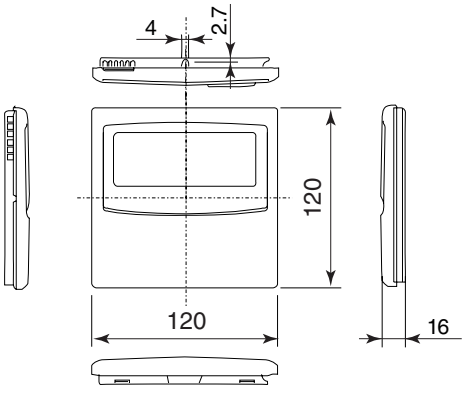
MMU-AP0151SH, AP0181SH, AP0241SH

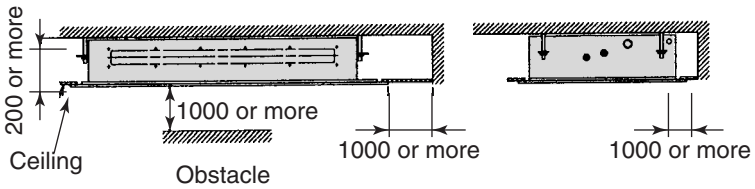


Dimensions

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)**



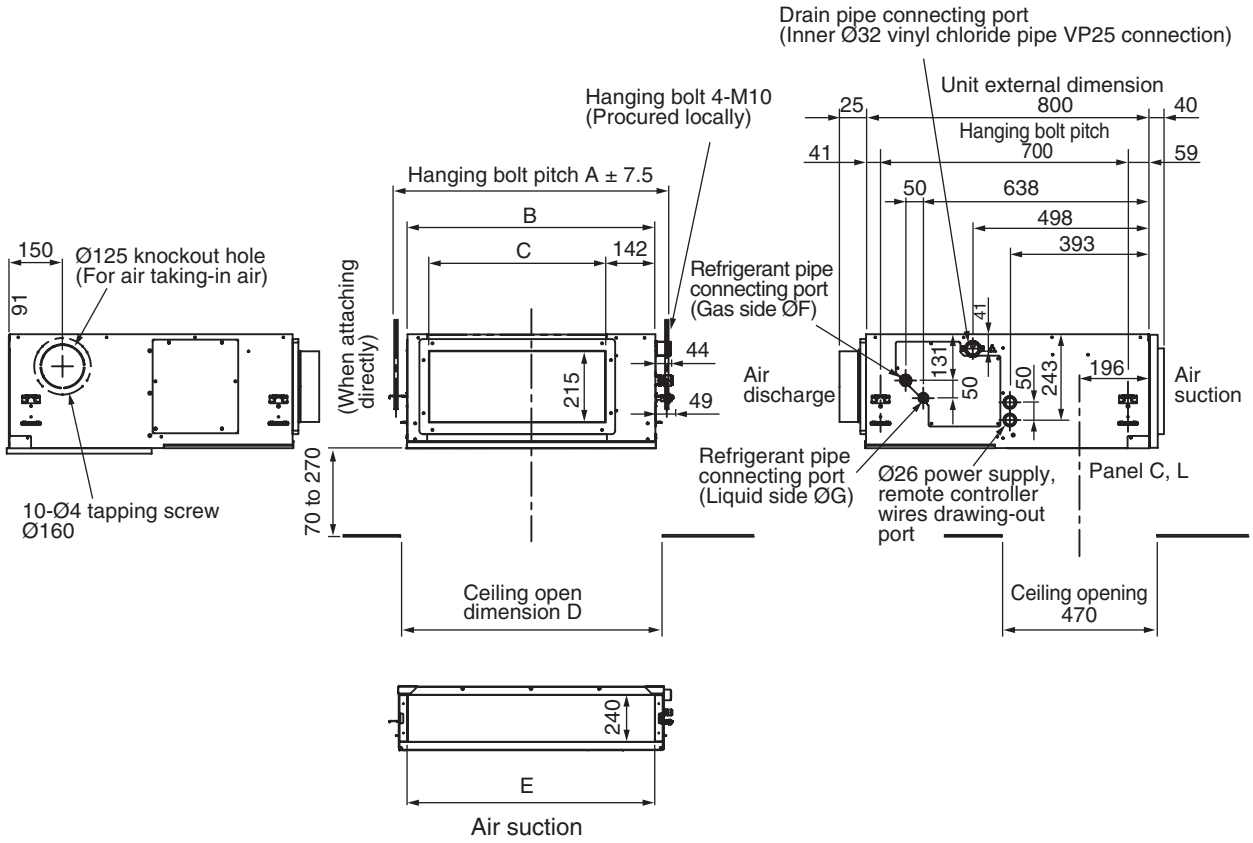


Space required for installation and servicing

Note: All dimensions are in mm.

• Concealed Duct Standard Type

MMD-AP0071BH, AP0091BH, AP0121BH, AP0151BH, AP0181BH, AP0241BH, AP0271BH, AP0301BH, AP0361BH, AP0481BH, AP0561BH



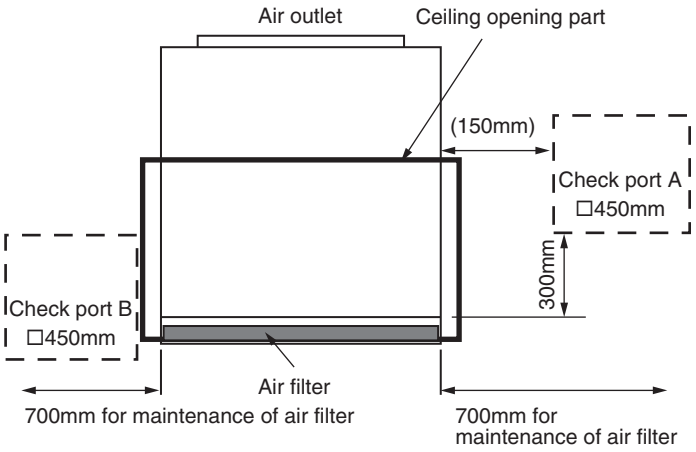
Model MMD-	A	B	C	D	D	E	F	G
AP0071BH, AP0091BH, AP0121BH	616	550	350	600	600	470	9.5	6.4
AP0151BH, AP0181BH	766	700	500	750	750	620	12.7	9.4
AP0241BH, AP0271BH, AP0301BH	1066	1000	800	1050	1050	920	15.9	9.5
AP0361BH, AP0481BH, AP0561BH	1416	1350	1150	1400	1400	1270	15.9	9.5

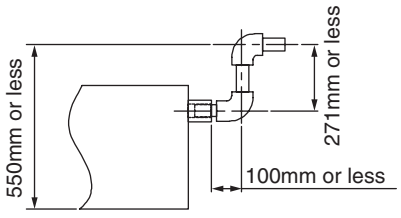
(Note)

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.





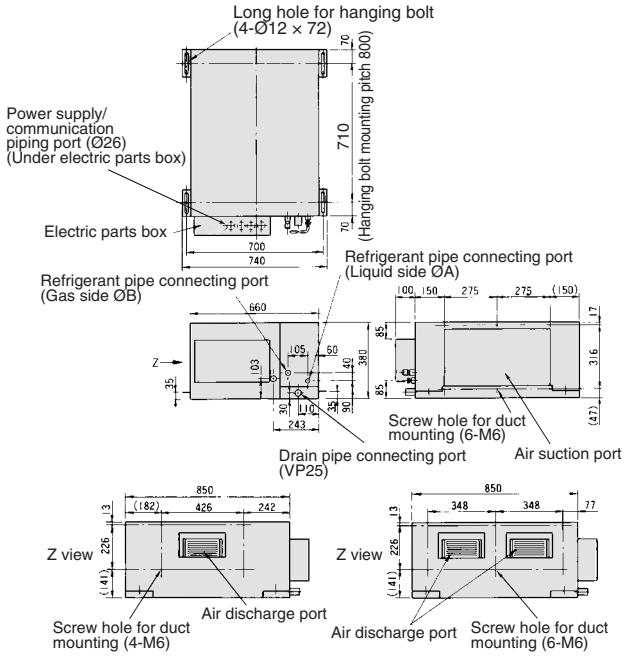
Drain-up piping

Note: All dimensions are in mm.

• Concealed Duct High Static Pressure Type

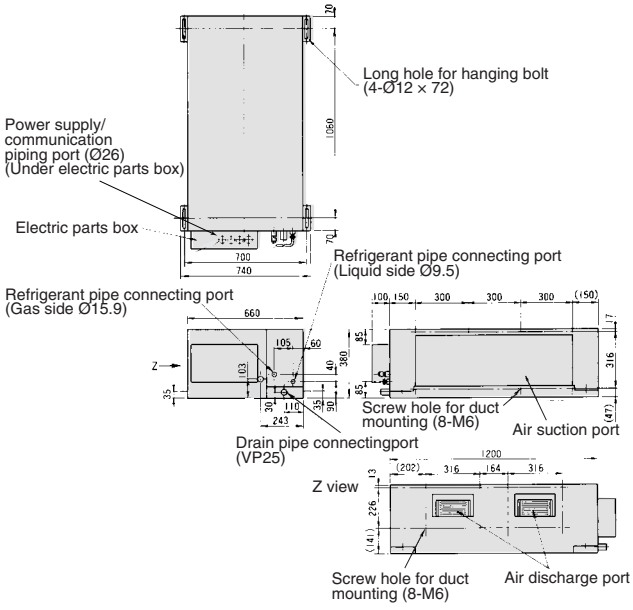
MMD-AP0181H, AP0241H, AP0271H, AP0361H, AP0481H, AP0721H, AP0961H

MMD-AP0181H to AP0361H



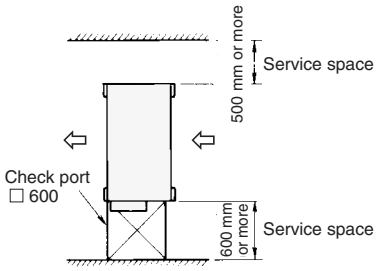
AP0181H to AP0271H type AP0361H type

MMD-AP0481H



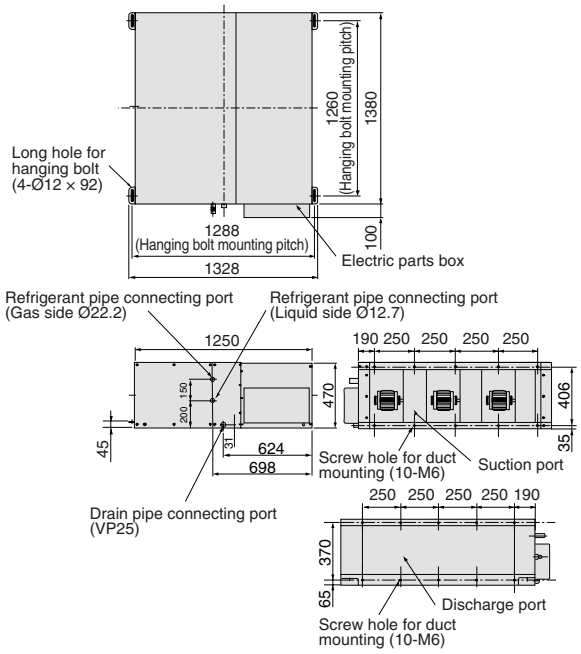
Model MMD-	A	B
AP0181H	6.4	12.7
AP0241H, AP0271H, AP0361H, AP0481H	9.5	15.9

Space required for installation and servicing *1

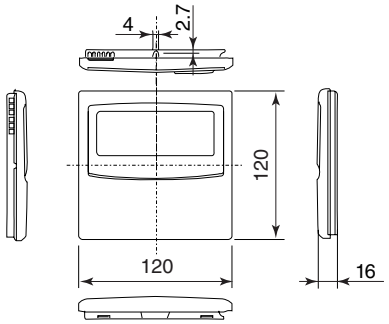


*1 Service spaces for MMD-AP0721H and AP0961H are different from those in the above figure. For inquiries please contact us separately.

MMD-AP0721H, AP0961H



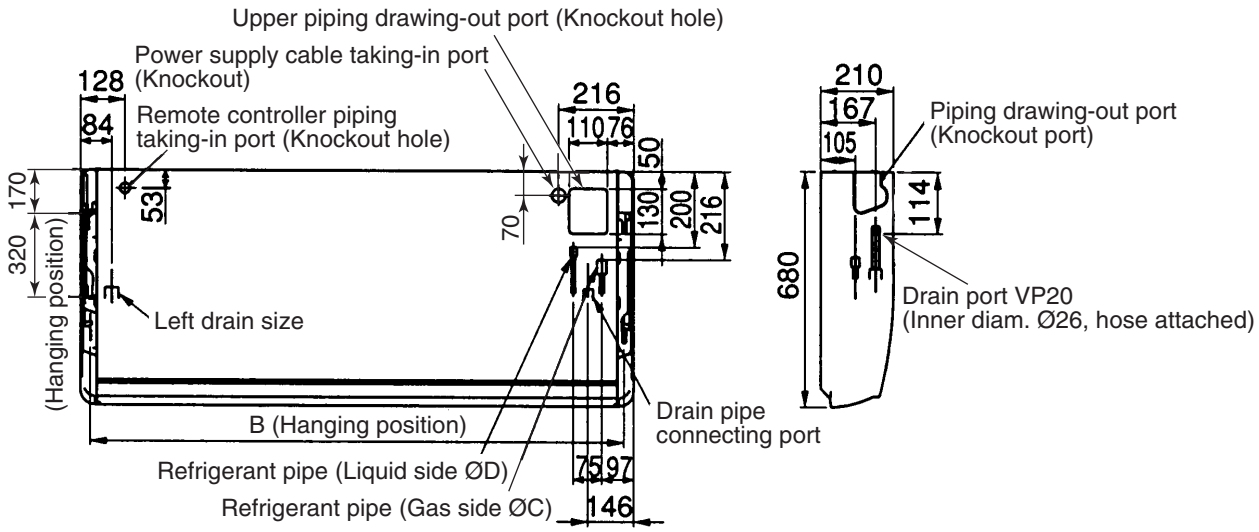
- **Wired remote controller (RBC-AMT21E)**

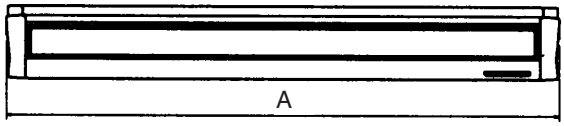


Note: All dimensions are in mm.

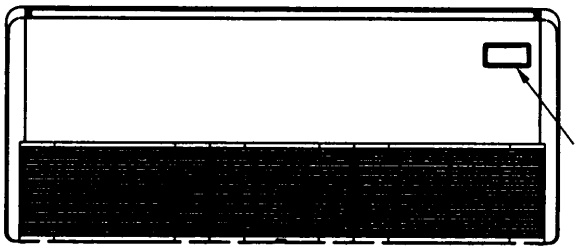
• Under Ceiling Type

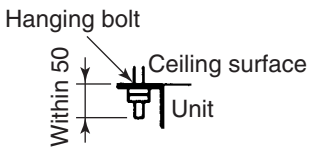
MMC-AP0151H, AP0181H, AP0241H, AP0271H, AP0361H, AP0481H

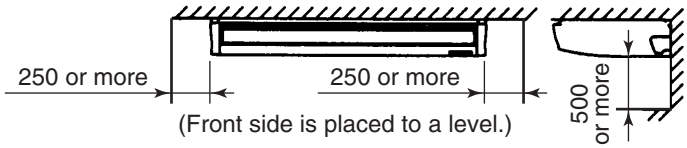




Model MMC-	A	B	C	D
AP0151H, AP0181H	910	855	12.7	6.4
AP0241H to AP0271H	1180	1125	15.9	9.5
AP0361H, AP0481H	1595	1540	15.9	9.5

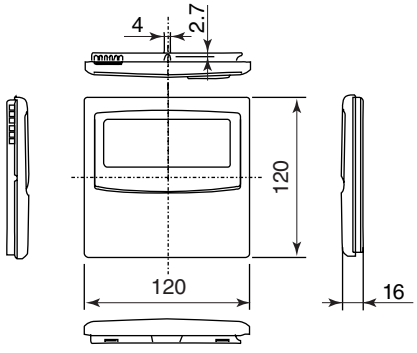


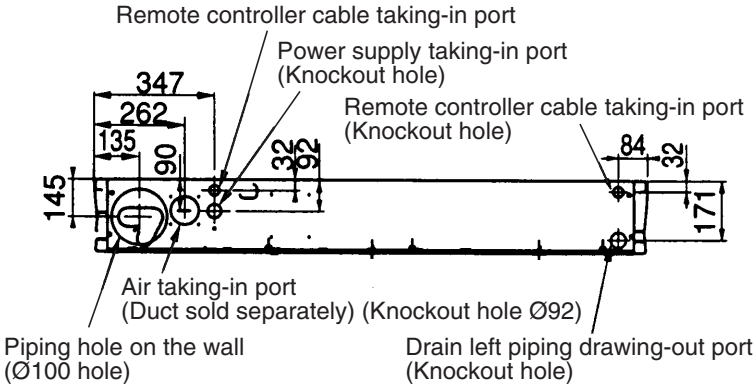




Space required for installation and servicing

• **Wired remote controller (RBC-AMT21E)**

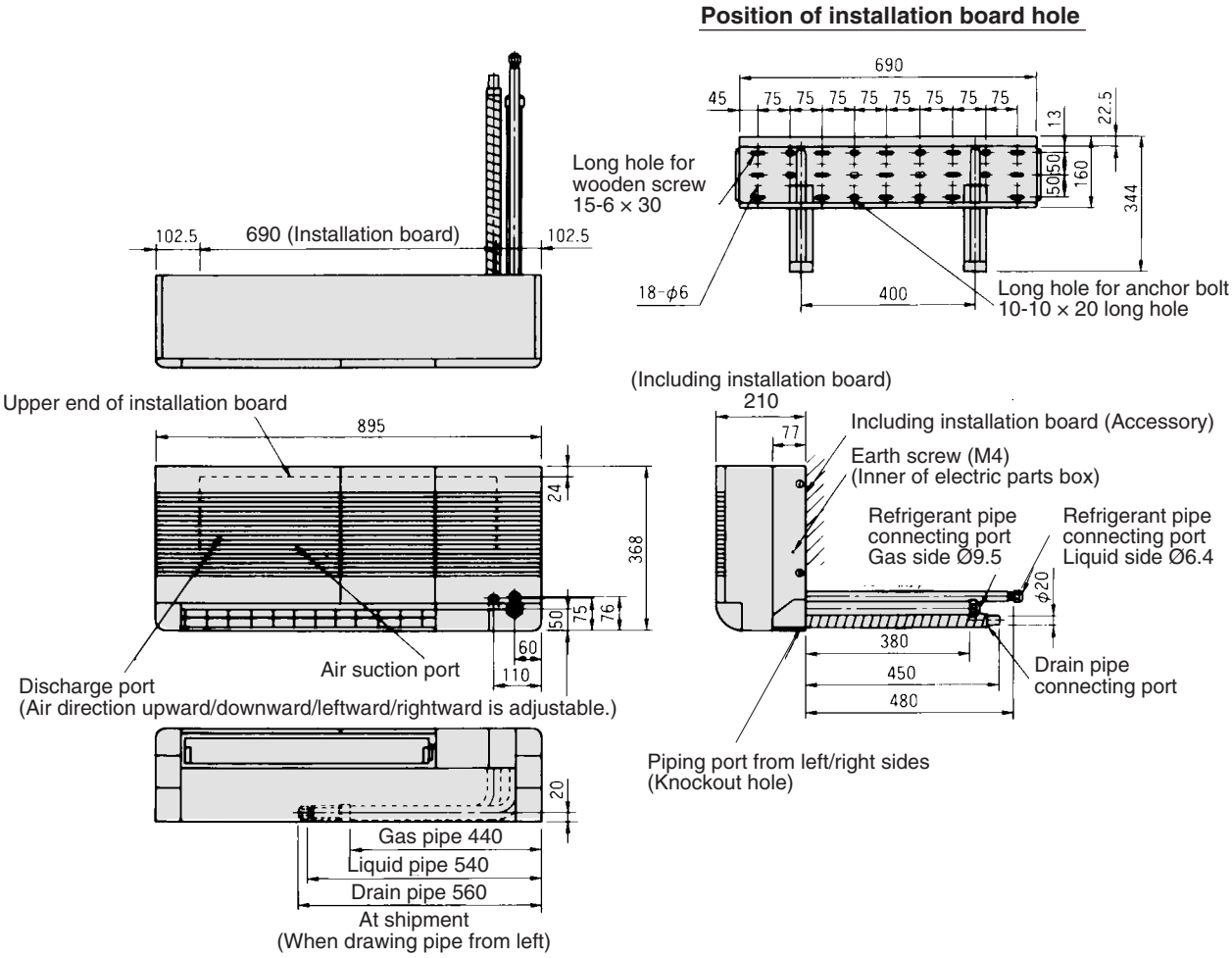


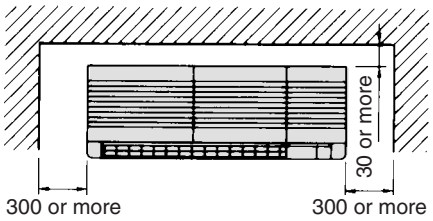


Note: All dimensions are in mm.

• High Wall Type (1 series)

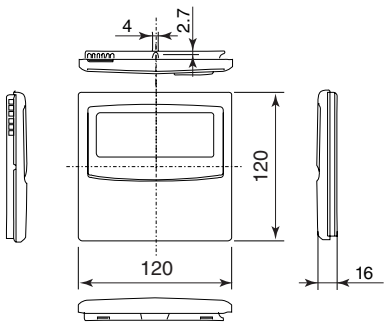
MMK-AP0071H, AP0091H, AP0121H





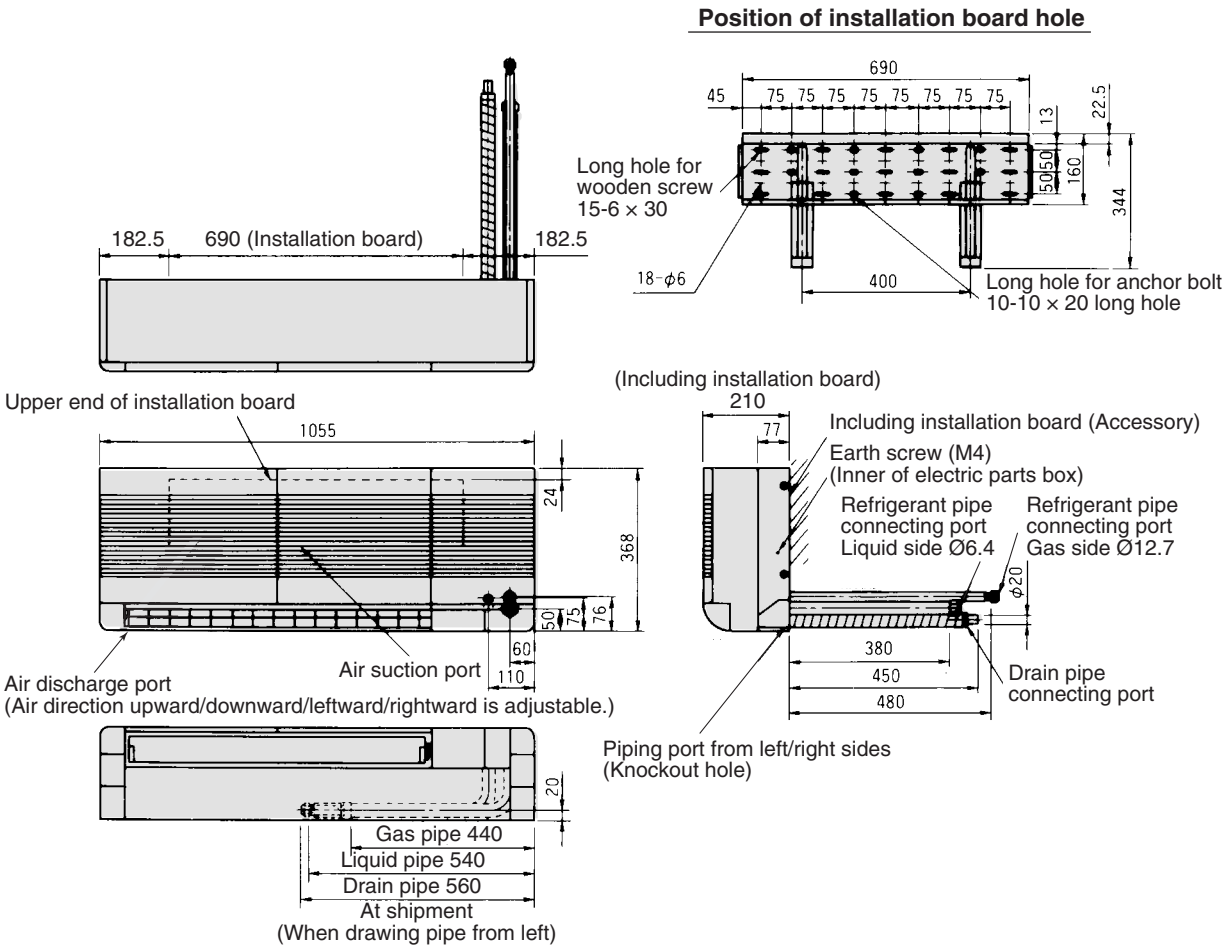
Space required for service

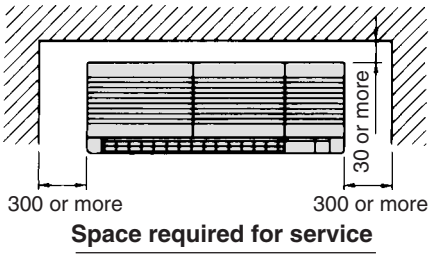
• **Wired remote controller (RBC-AMT21E)**



Note: All dimensions are in mm.

MMK-AP0151H, AP0181H



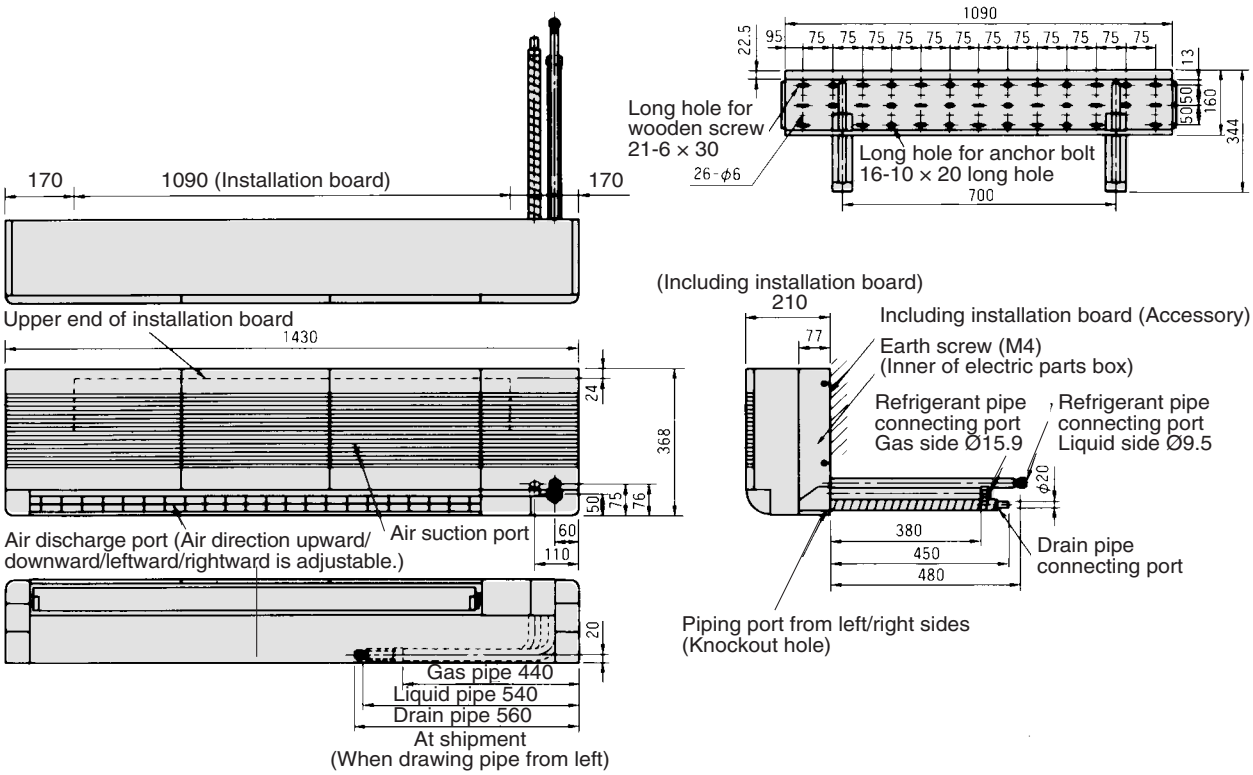


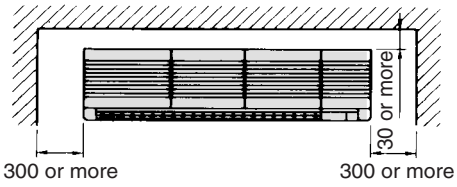
Space required for service

Note: All dimensions are in mm.

MMK-AP0241H

Position of installation board hole





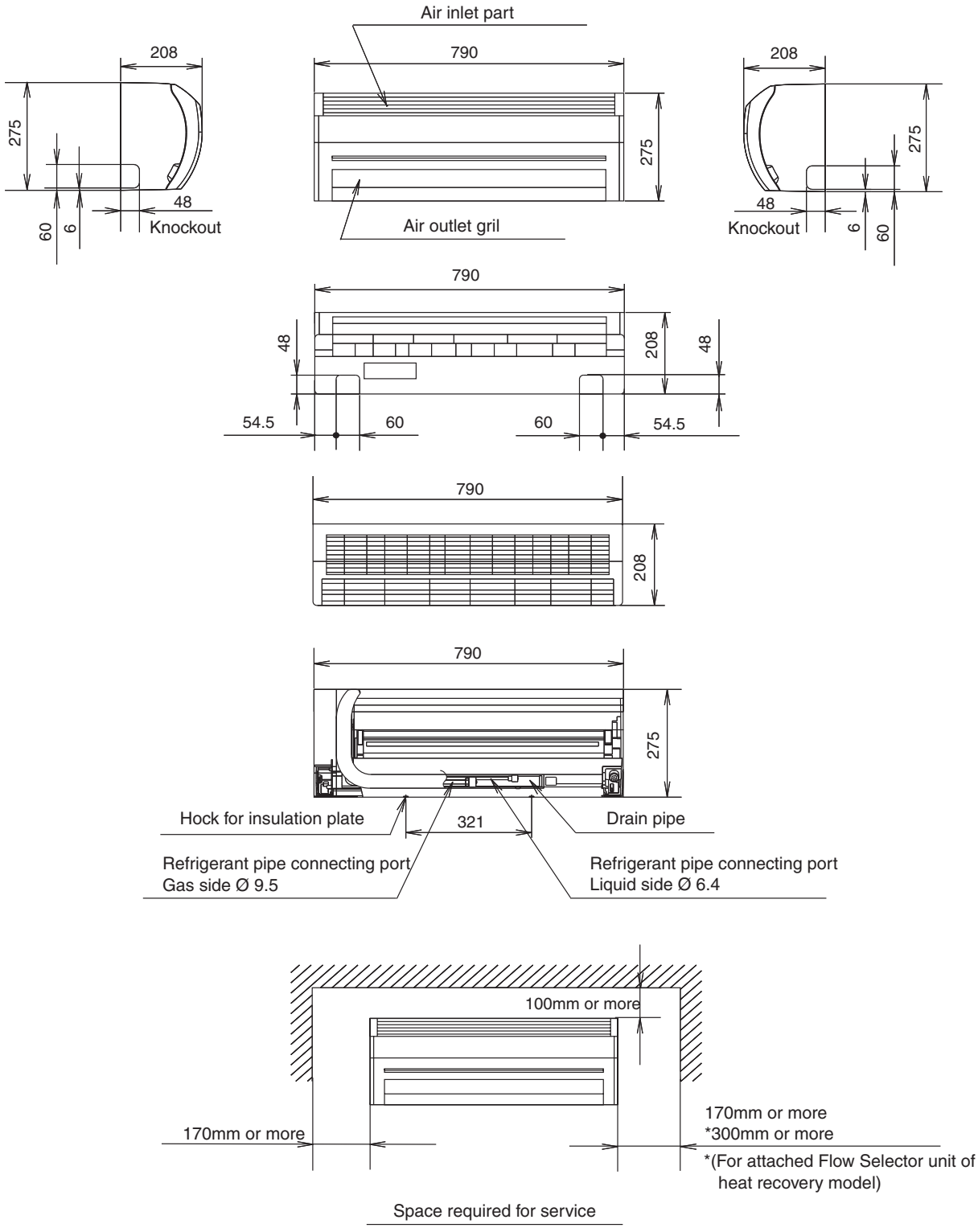
Space required for service

Note: All dimensions are in mm.

• High Wall Type (2 series)*

*European market only

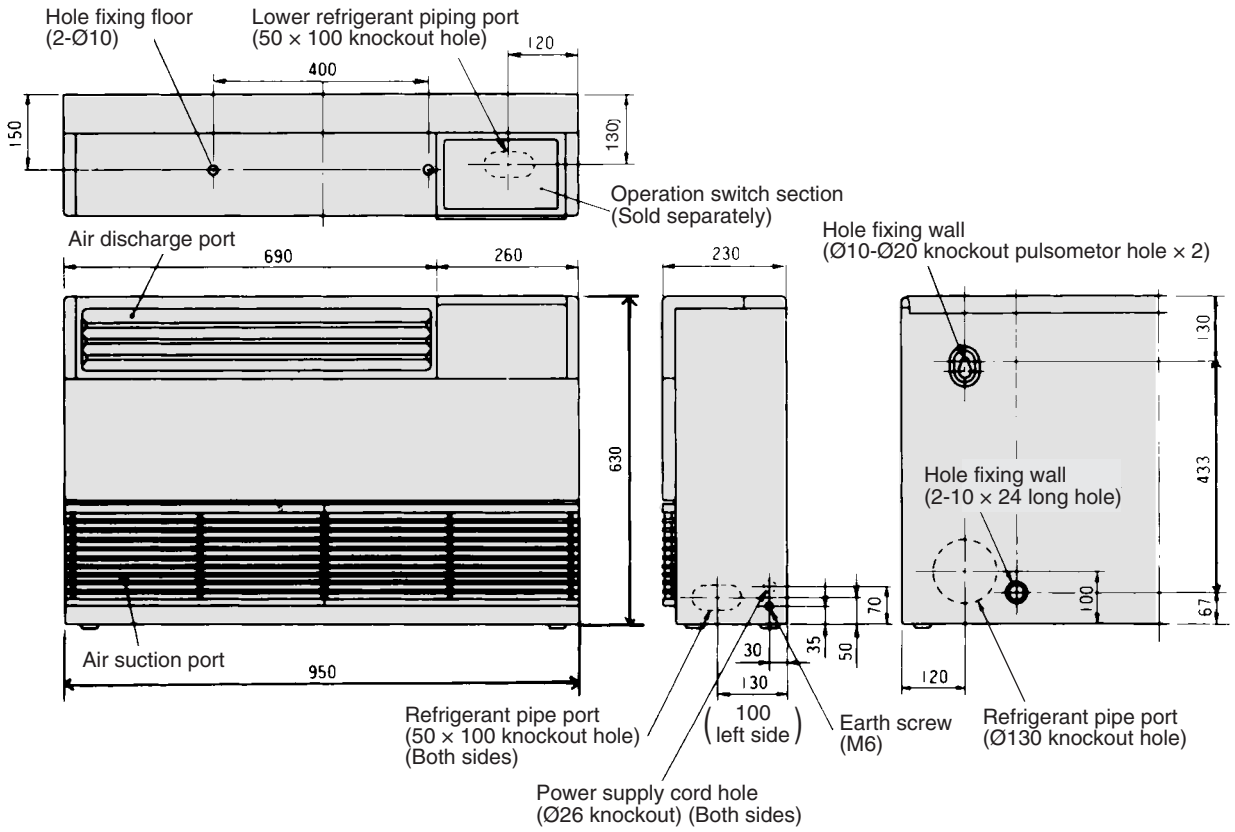
MMK-AP0072H, AP0092H, AP0122H



Note: All dimensions are in mm.

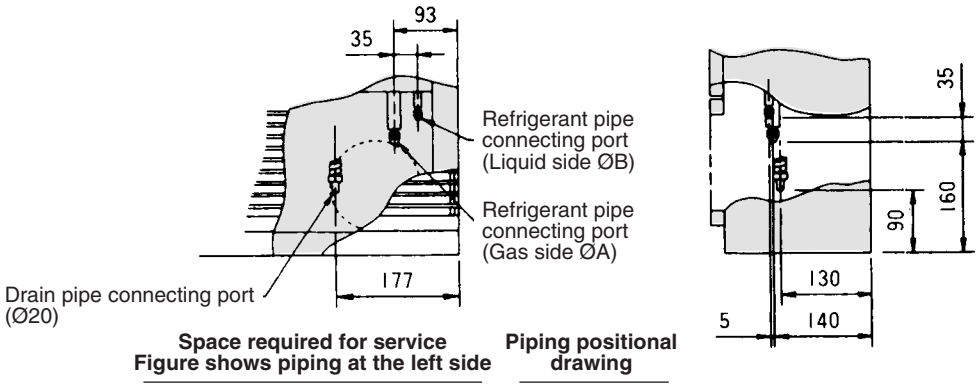
• Floor Standing Cabinet Type

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



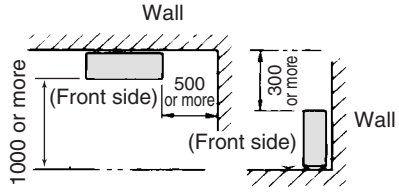
Dimensions

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



Space required for service
Figure shows piping at the left side

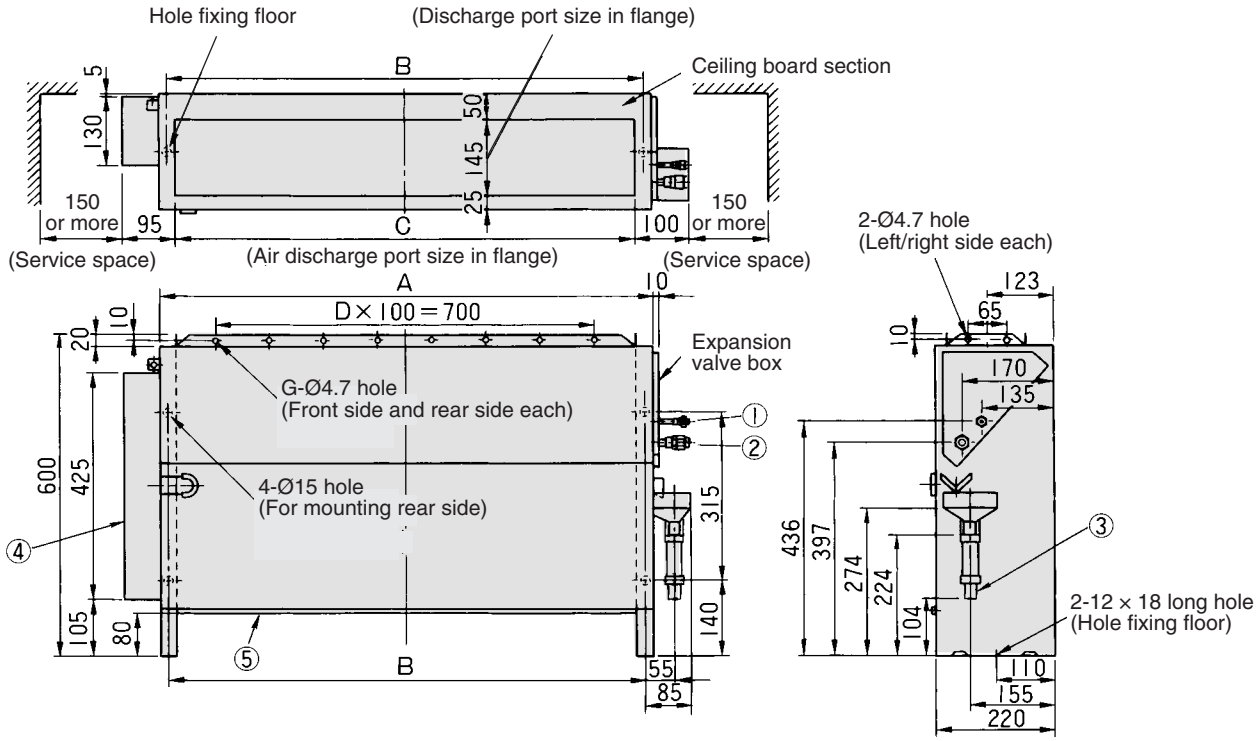
Piping positional drawing



Note: All dimensions are in mm.

• Floor Standing Concealed Type

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

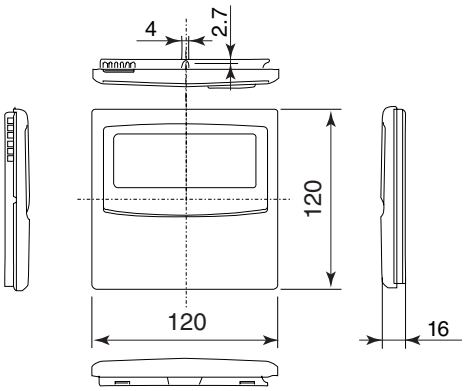


No.	Name
①	Pipe connecting port at liquid side (ØE)
②	Pipe connecting port at gas side (ØF)
③	Drain pipe connecting port (20A)
④	Electric parts box (Earth terminal is provided in inner side.)
⑤	Air filter

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	

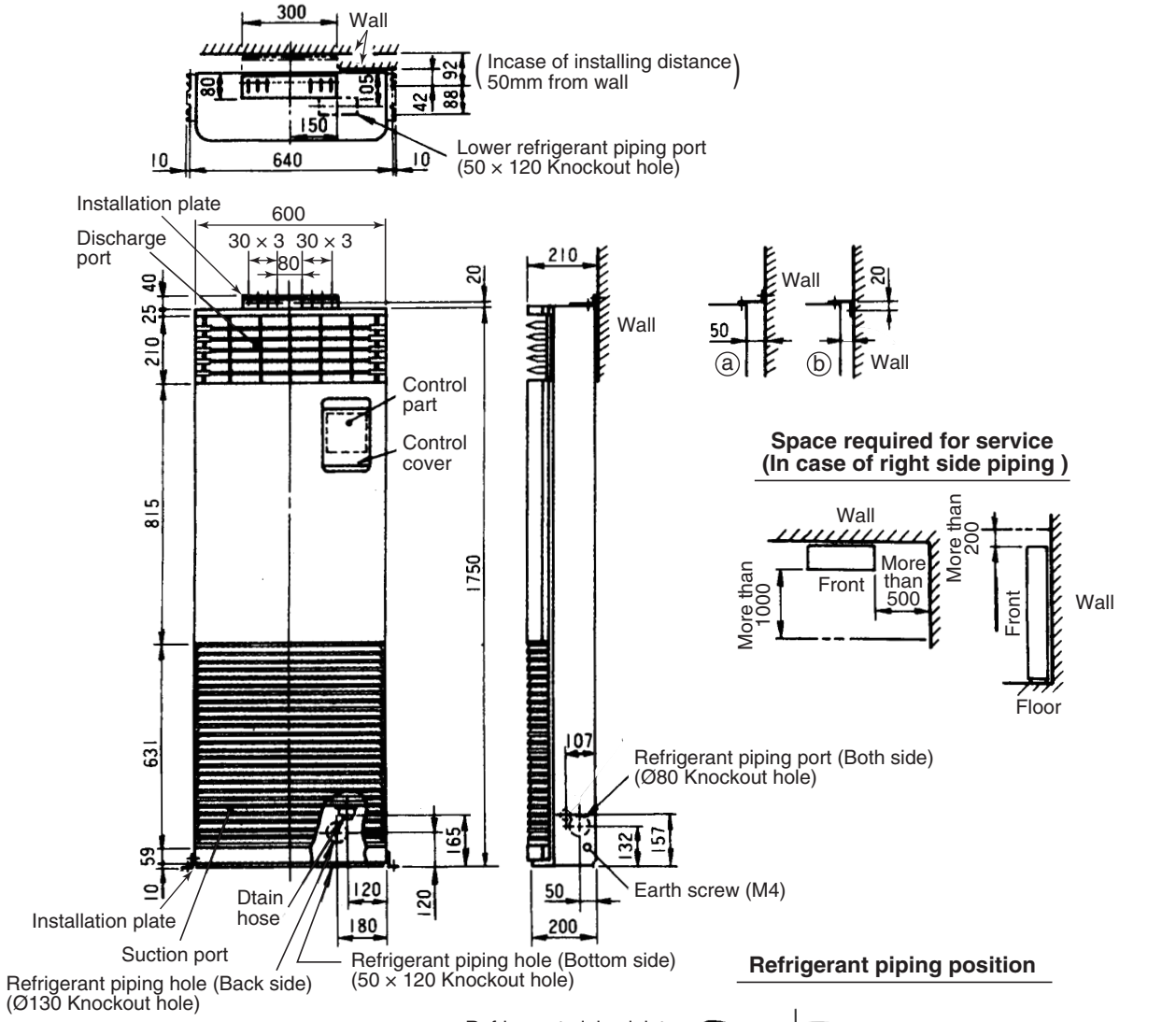
• **Wired remote controller (RBC-AMT21E)**



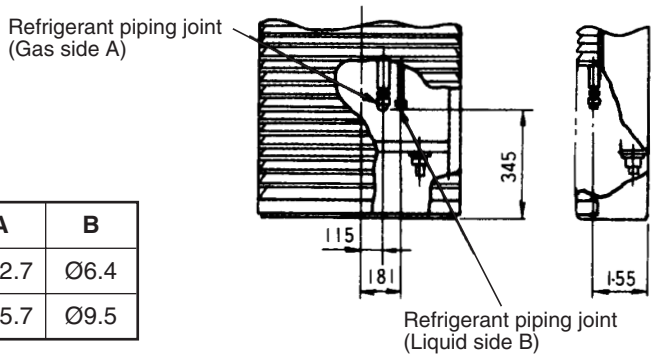
Note: All dimensions are in mm.

• Floor Standing Type

MMF-AP0151H, AP0181H, AP0241H, AP0271H



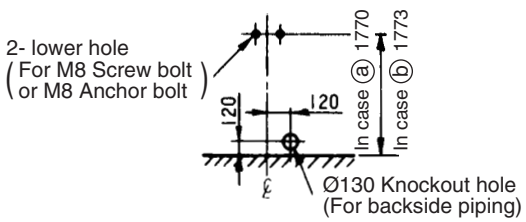
Refrigerant piping position



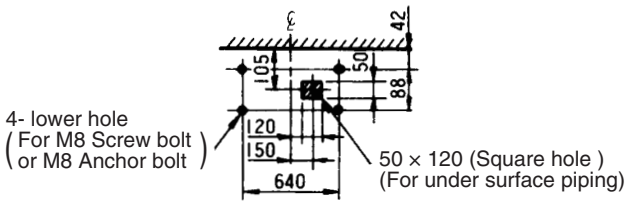
Dimensions

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

Details of hole for back side piping

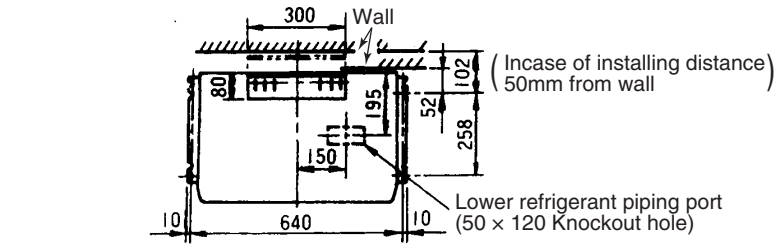


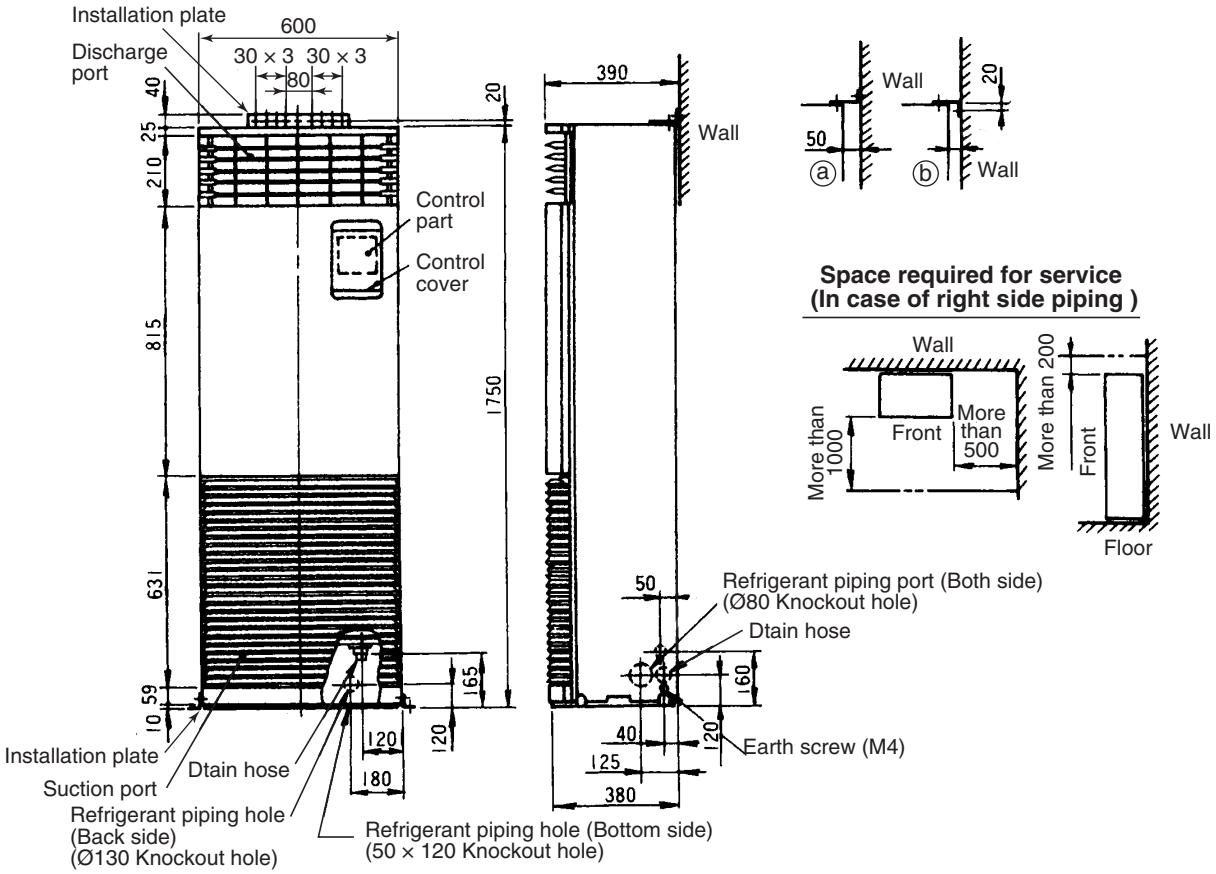
Details of hole for lower side piping



Note: All dimensions are in mm.

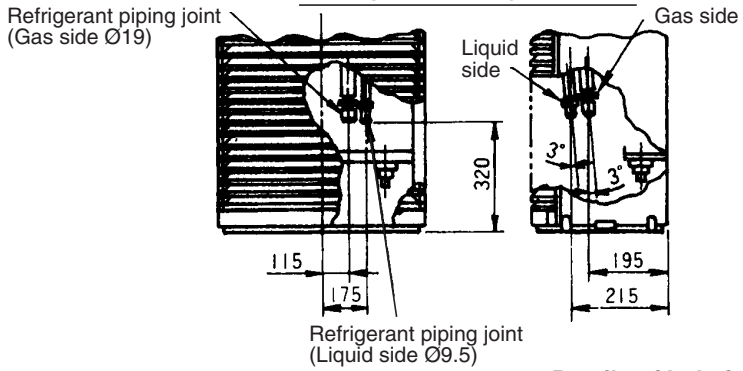
MMF-AP0361H, AP0481H, AP0561H



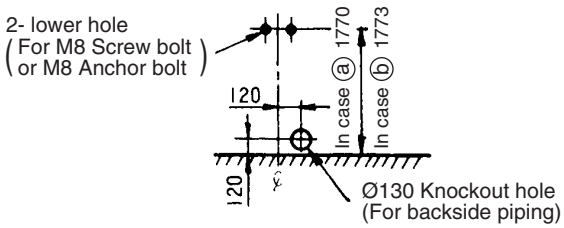


Space required for service (In case of right side piping)

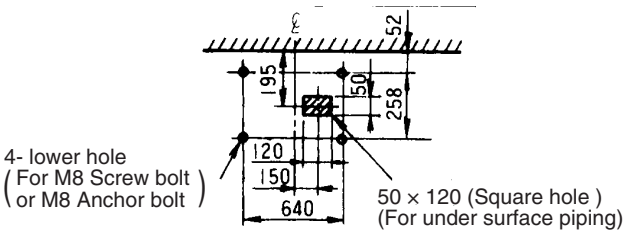
Refrigerant piping position



Details of hole for back side piping



Details of hole for lower side piping

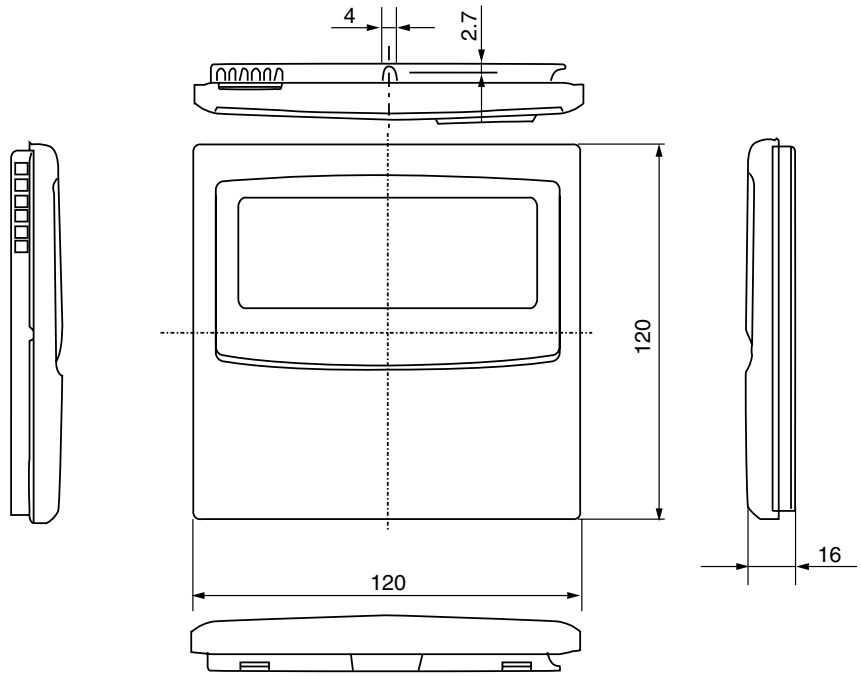


Note: All dimensions are in mm.

Remote controller

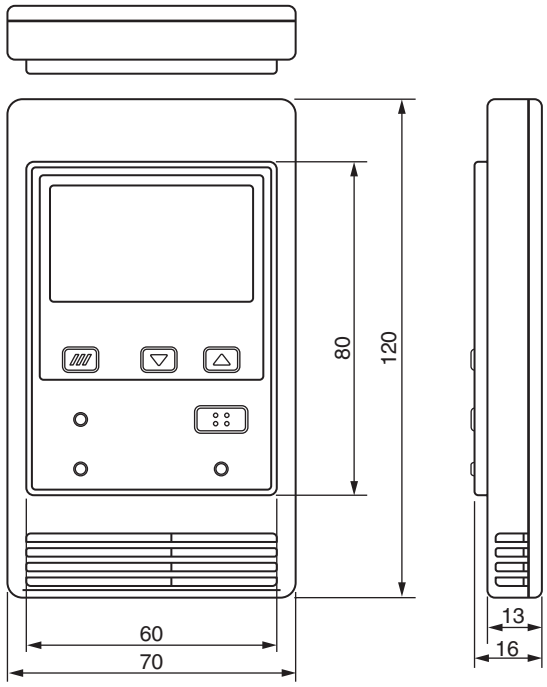
• Wired remote controller

RBC-AMT21E



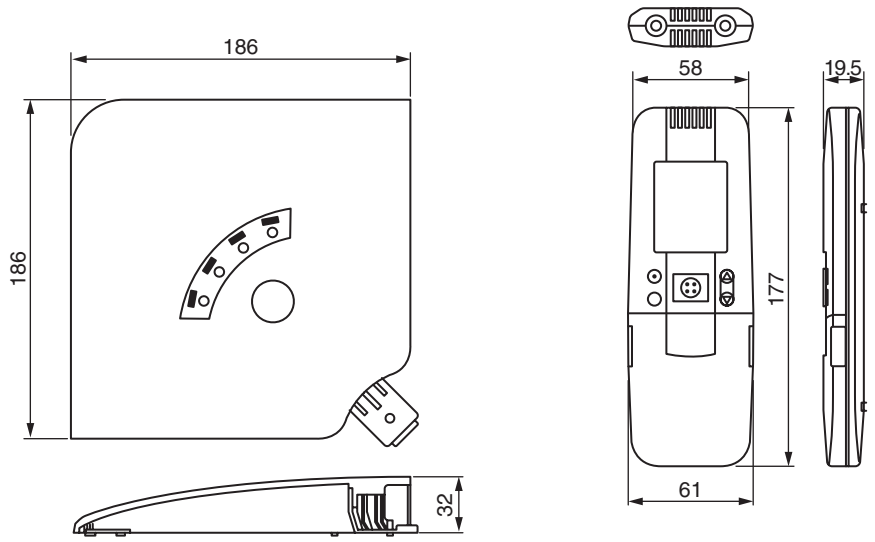
• Simple remote controller

RBC-AS21E



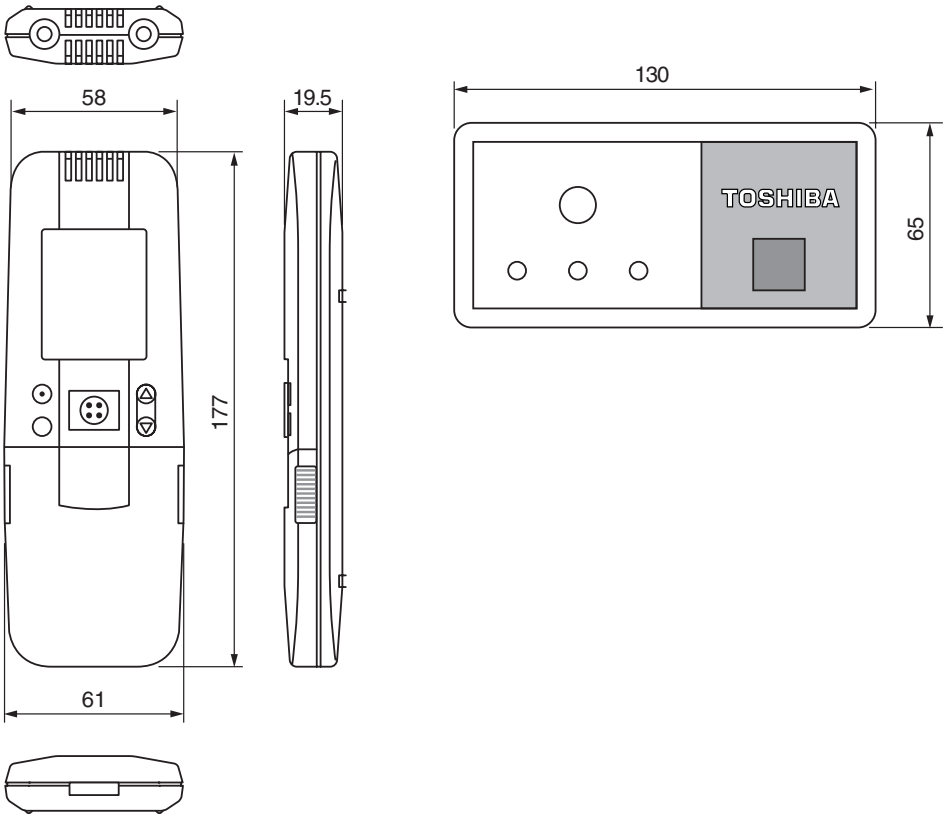
• Wireless remote controller

TCB-AX21U (W)-E



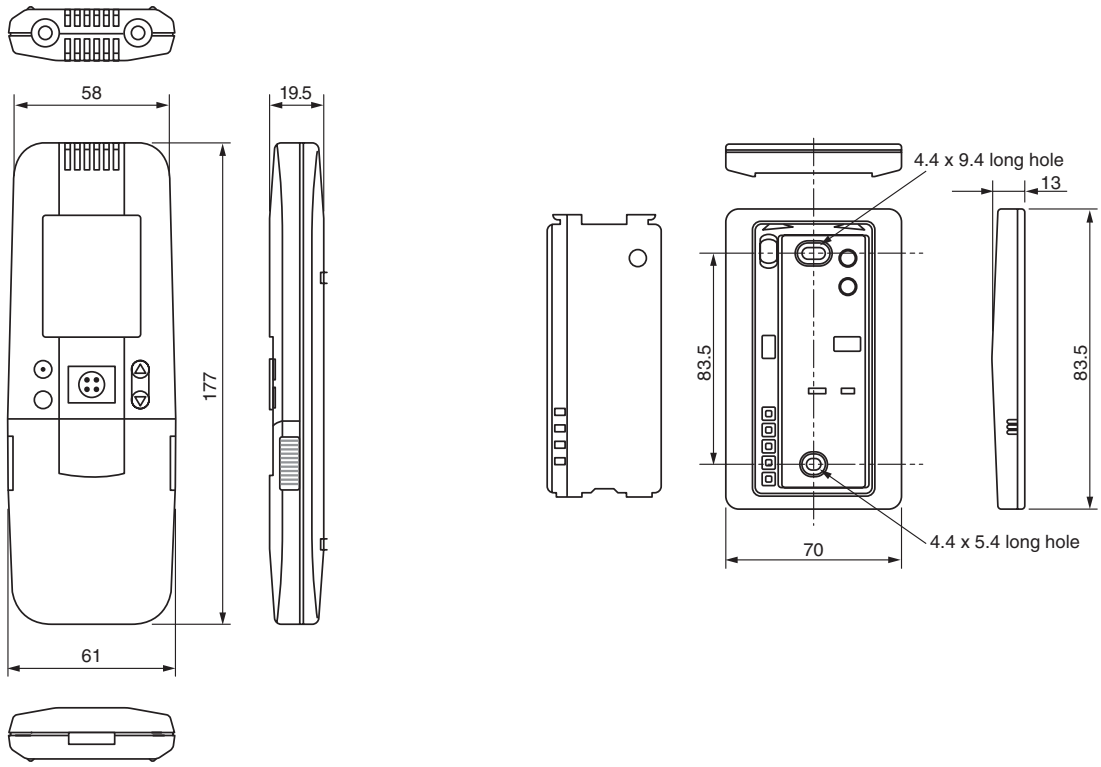
• Wireless remote controller kit

RBC-AX22CE



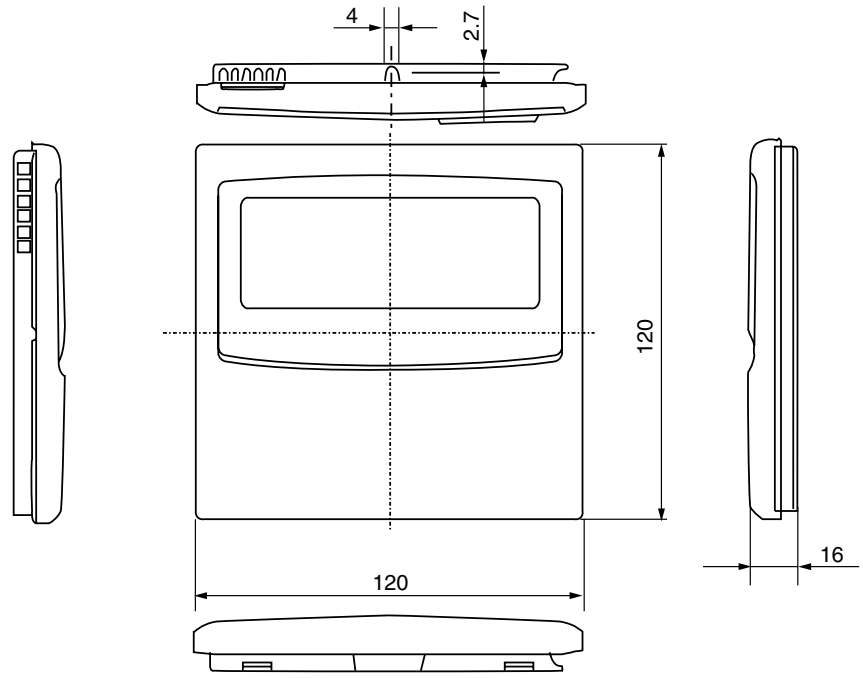
• Wireless remote controller kit

TCB-AX21E



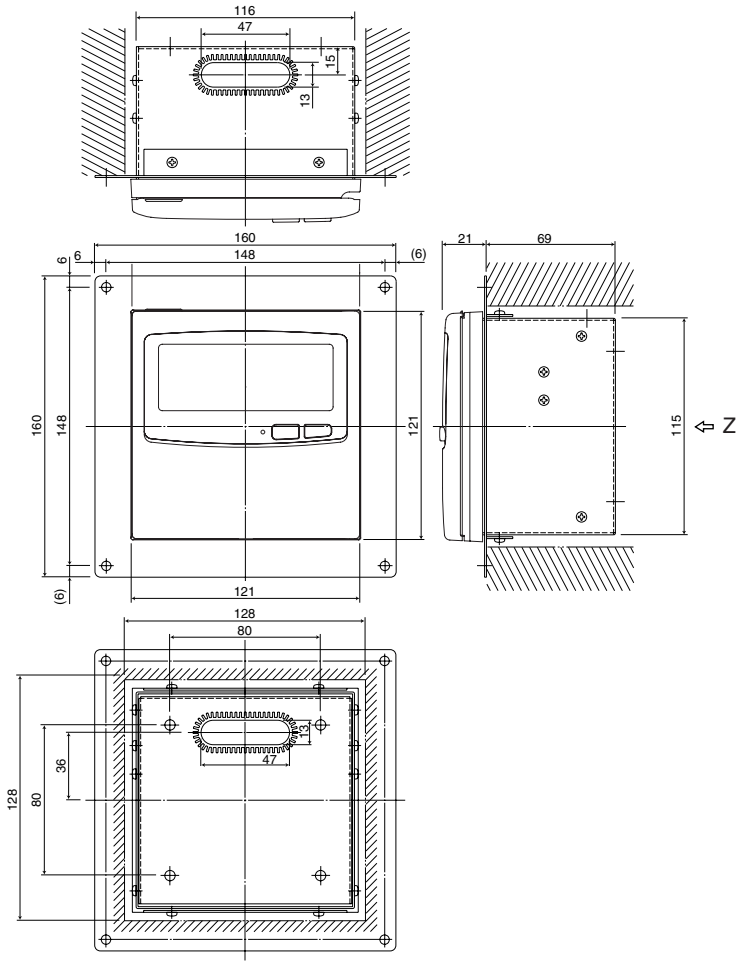
• Weekly timer

RBC-EXW21E



• Central remote controller

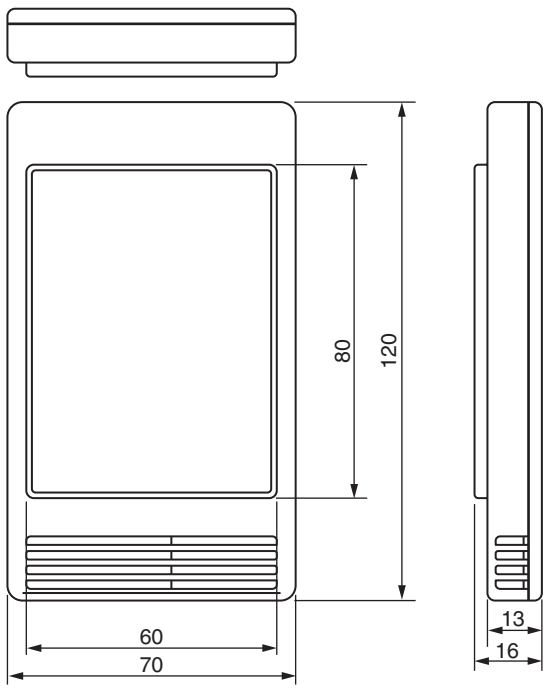
TCB-SC642TLE



Z view (back side)

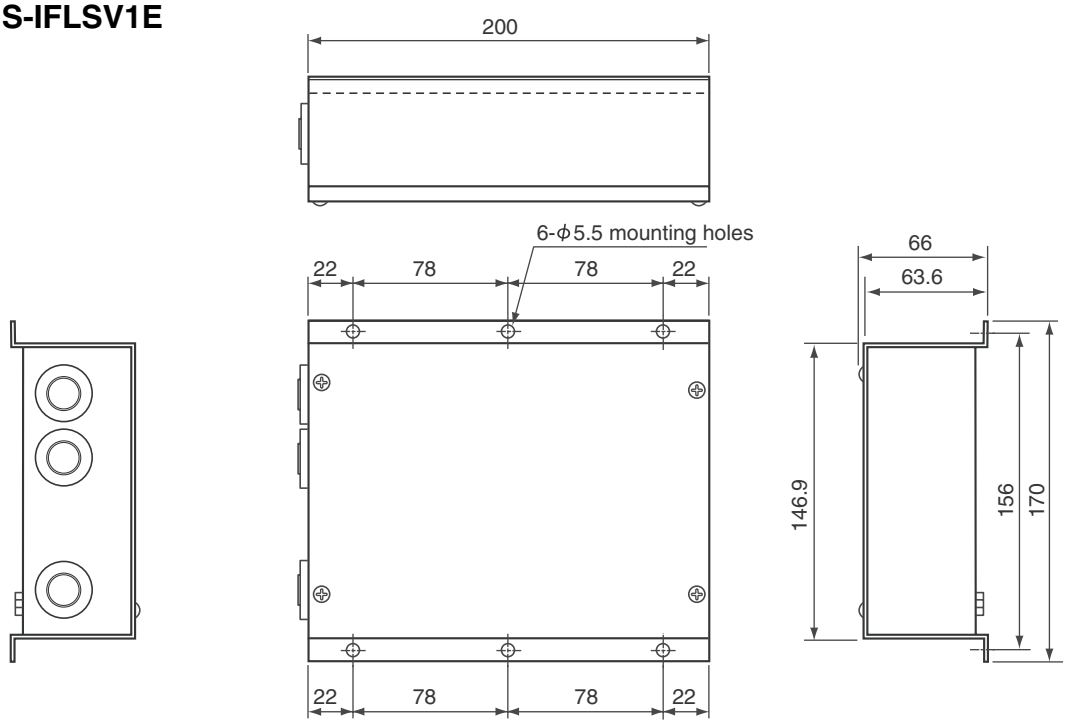
• Remote sensor

TCB-TC21LE



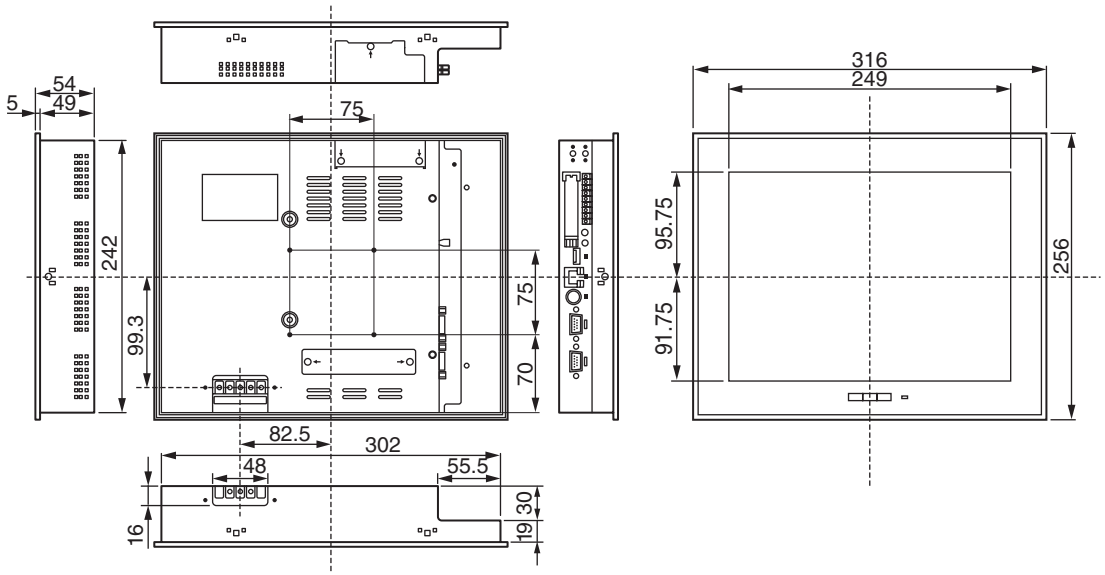
• TCS-Net relay interface

BMS-IFLSV1E



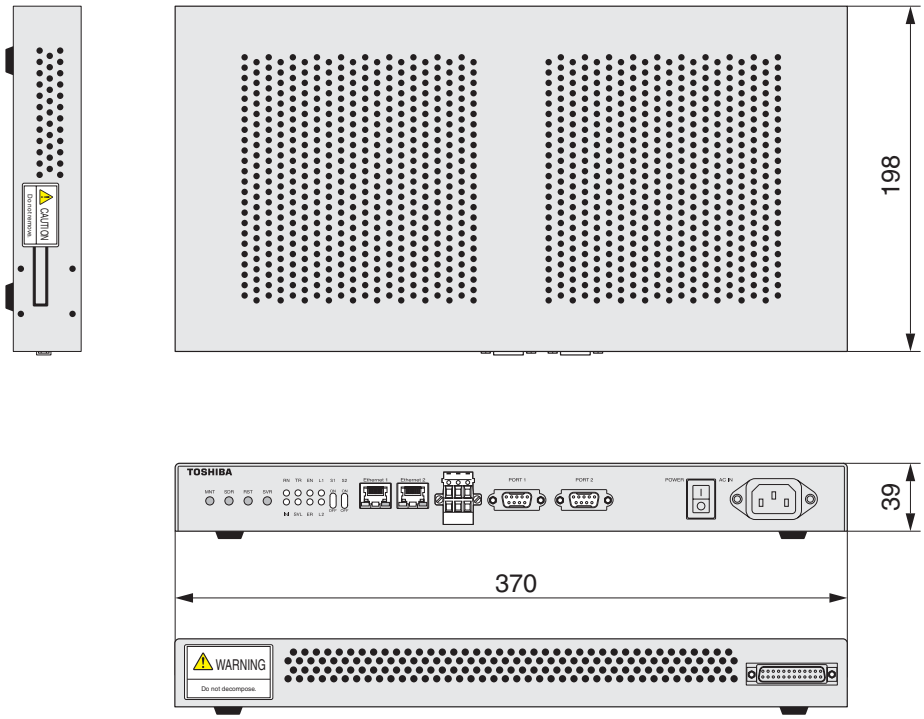
• Touch screen controller

BMS-TP0640ACE
BMS-TP5120ACE
BMS-TP0640PWE
BMS-TP5120PWE



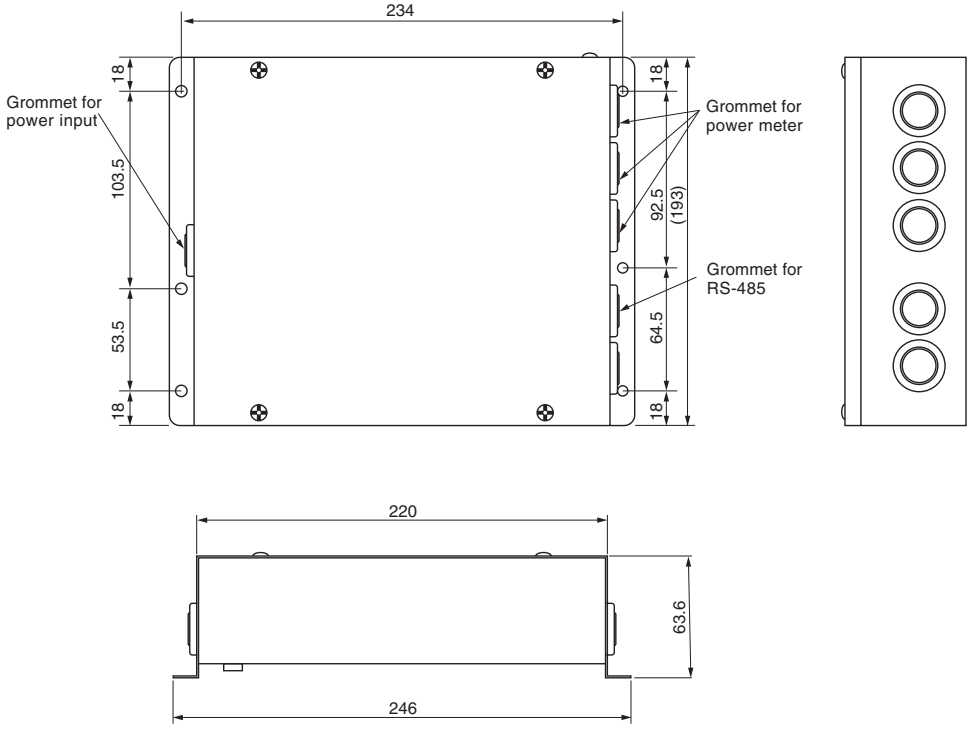
• Intelligent server

BMS-LSV2E



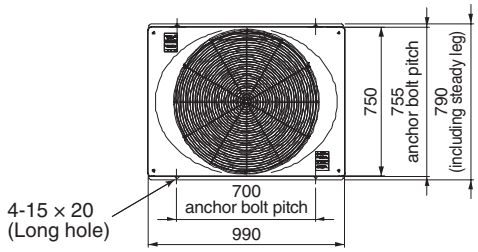
• Energy mountoring relay interface/Digital I/O relay interface

BMS-IFWH3E
BMS-IFDD01E



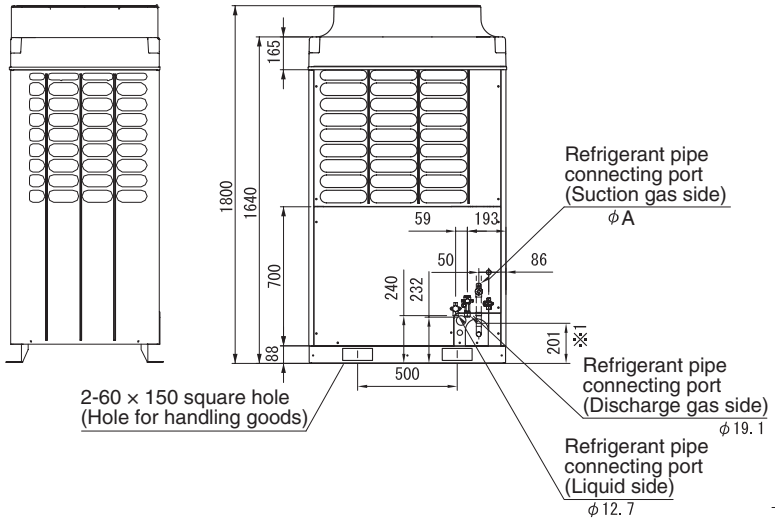
Outdoor unit

MMY-MAP0802FT8, MAP1002FT8, MAP1202FT8



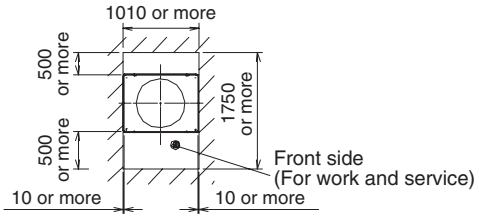
(NOTES)

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.

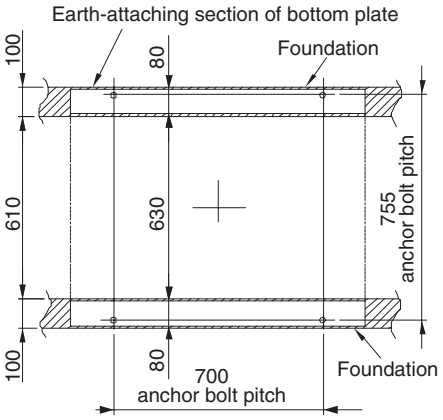


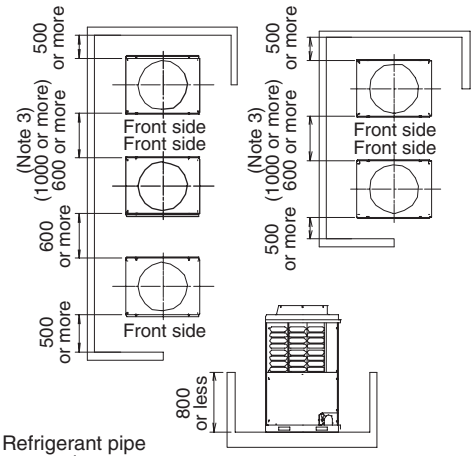
Model name	ØA
MMY-MAP0802FT8	22.2
MMY-MAP1002FT8	22.2
MMY-MAP1202FT8	28.6

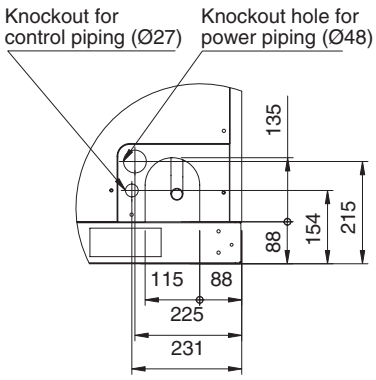
※1 Cutting position of L-shape pipe when pipe at gas side is connected (Recommended pipe connecting position)



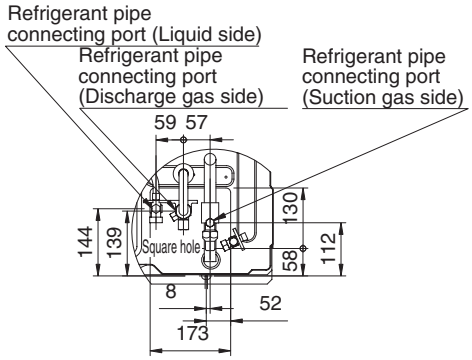
Space required for service







Details of front pipe/cabling holes



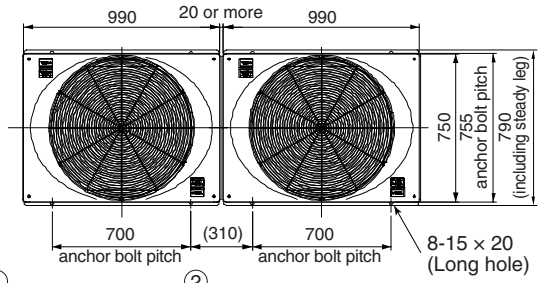
Details of hole for piping at lower side (Plane view)

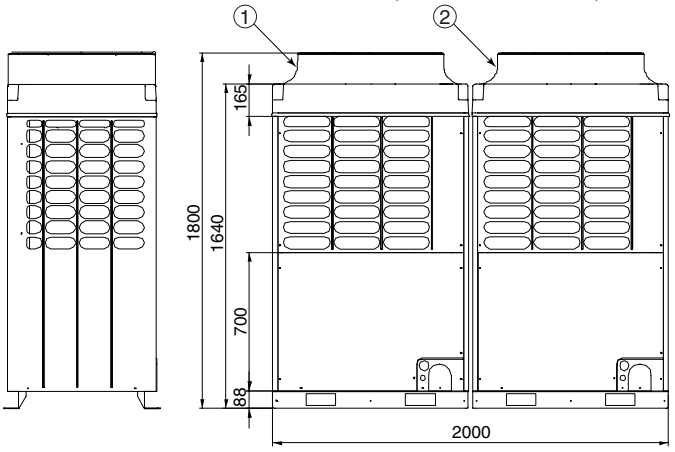
Note: All dimensions are in mm.

<Two units connected>

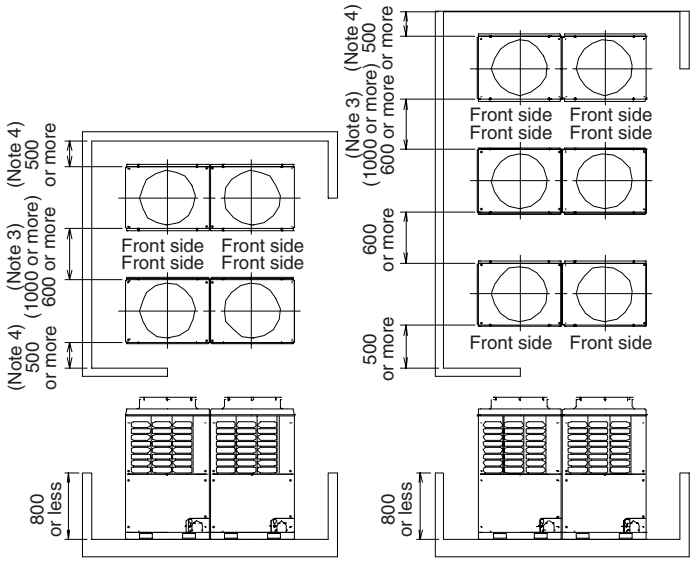
MMY-AP1602FT8, AP1802FT8, AP2002FT8

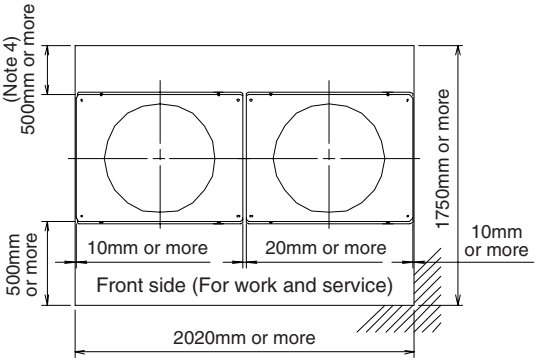
(NOTES)
1. If there is an obstacle at the upper side of the outdoor unit, set the top end of the outdoor unit 2000mm apart from the obstacle.
2. Limit the height of the obstacle surrounding the outdoor unit to 800mm or less from the bottom end of the outdoor unit.
3. Draw out the pipe procured locally to the front of the outdoor unit horizontally, and keep 500mm or more between the outdoor unit and traversing pipe if placing pipe transversely.
4. Arrange each outdoor unit in order of its capacity. (Head unit > Follower)





Combination unit	Combination outdoor unit	
	Header	Follower
MMY-AP1602FT8	MAP0802FT8	MAP0802FT8
MMY-AP1802FT8	MAP1002FT8	MAP0802FT8
MMY-AP2002FT8	MAP1002FT8	MAP1002FT8





Space required for service

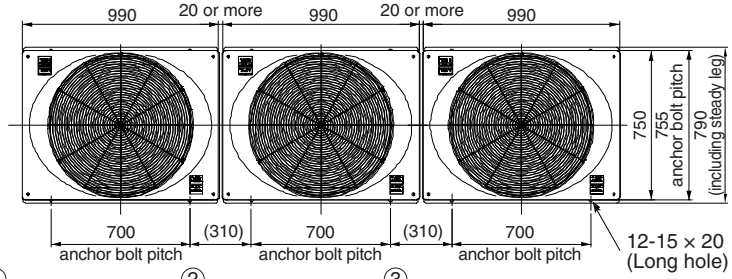
Note: All dimensions are in mm.

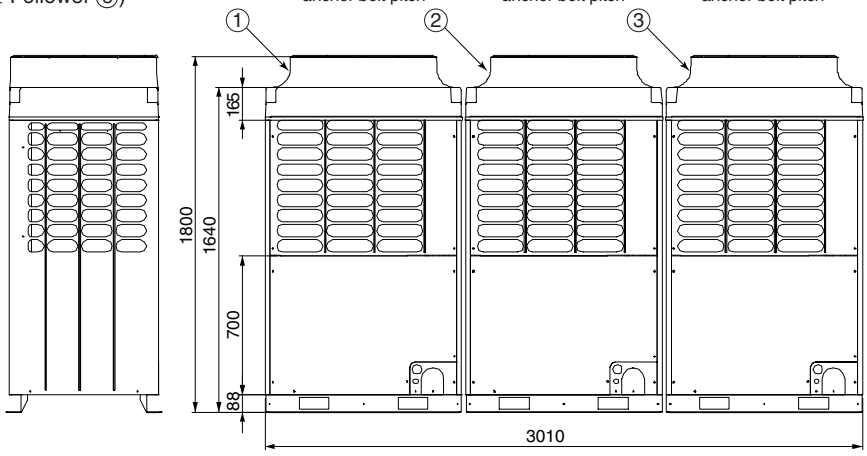
<Three units connected>

MMY-AP2402FT8, AP2602FT8, AP2802FT8, AP3002FT8

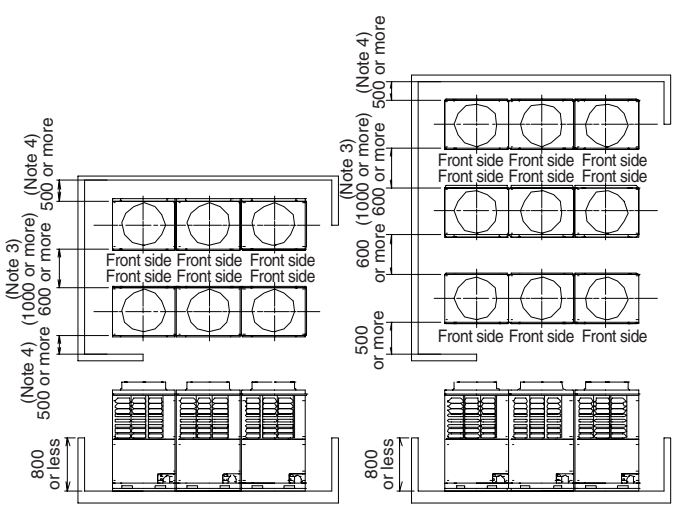
(NOTES)

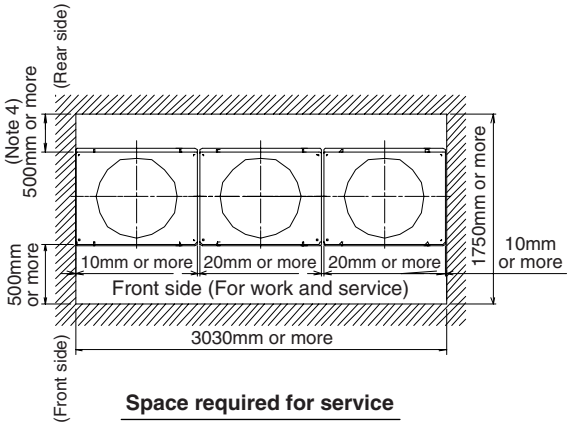
1. If there is an obstacle at the upper side of the outdoor unit, set the top end of the outdoor unit 2000mm apart from the obstacle.
2. Limit the height of the obstacle surrounding the outdoor unit to 800mm or less from the bottom end of the outdoor unit.
3. Draw out the pipe procured locally to the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





Combination unit	Combination outdoor unit		
	Header	Follower ②	Follower ③
MMY-AP2402FT8	MMY-MAP0802FT8	MMY-MAP0802FT8	MMY-MAP0802FT8
MMY-AP2602FT8	MMY-MAP1002FT8	MMY-MAP0802FT8	MMY-MAP0802FT8
MMY-AP2802FT8	MMY-MAP1002FT8	MMY-MAP1002FT8	MMY-MAP0802FT8
MMY-AP3002FT8	MMY-MAP1002FT8	MMY-MAP1002FT8	MMY-MAP1002FT8





Space required for service

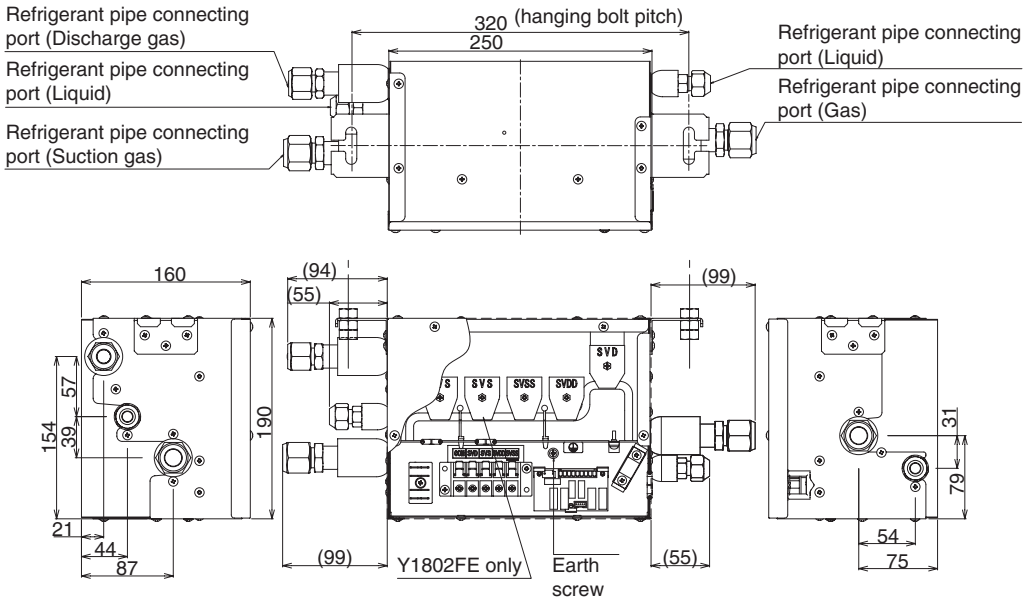
Note: All dimensions are in mm.

FS unit (Flow Selector Unit)

RBM-Y1122FE, Y1802FE

Outdoor unit side

Indoor unit side



(Specifications)

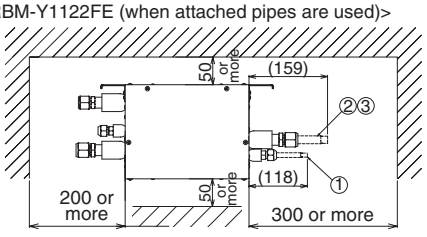
Model name		RBM-Y1122FE		RBM-Y1802FE	
		Connecting pipe	Connecting method	Connecting pipe	Connecting method
Indoor unit side	Liquid side	Ø9.5 *1	Flare	Ø9.5	Flare
	Gas side	Ø15.9 *1	Flare	Ø15.9	Flare
Outdoor unit side	Liquid side	Ø9.5	Flare	Ø9.5	Flare
	Discharge gas side	Ø12.7	Flare	Ø12.7	Flare
	Suction gas side	Ø15.9	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		5kg	
Dimension (mm)		Height 190 X Width 250 X Depth 160			

Accessory pipe and socket

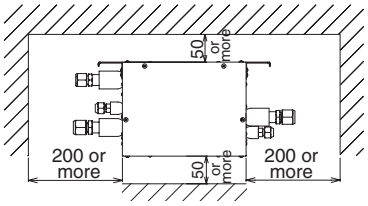
③	Ø9.5, Brazing	For gas pipe	007 to 012 type
②	Ø12.7, Brazing	For gas pipe	015, 018 type
①	Ø6.4, Brazing	For liquid pipe	007 to 018 type

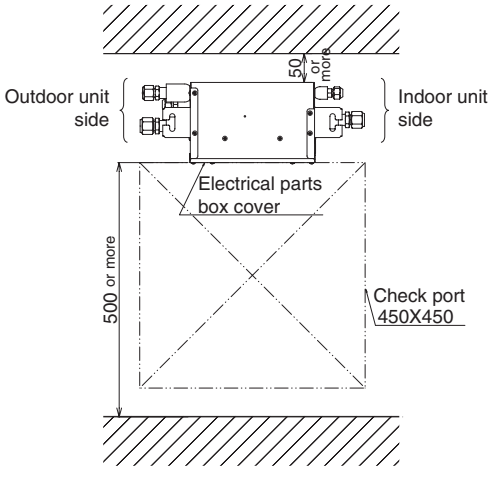
(Installation space)

<RBM-Y1122FE (when attached pipes are used)>



<RBM-Y1122FE, RBM-Y1802FE>



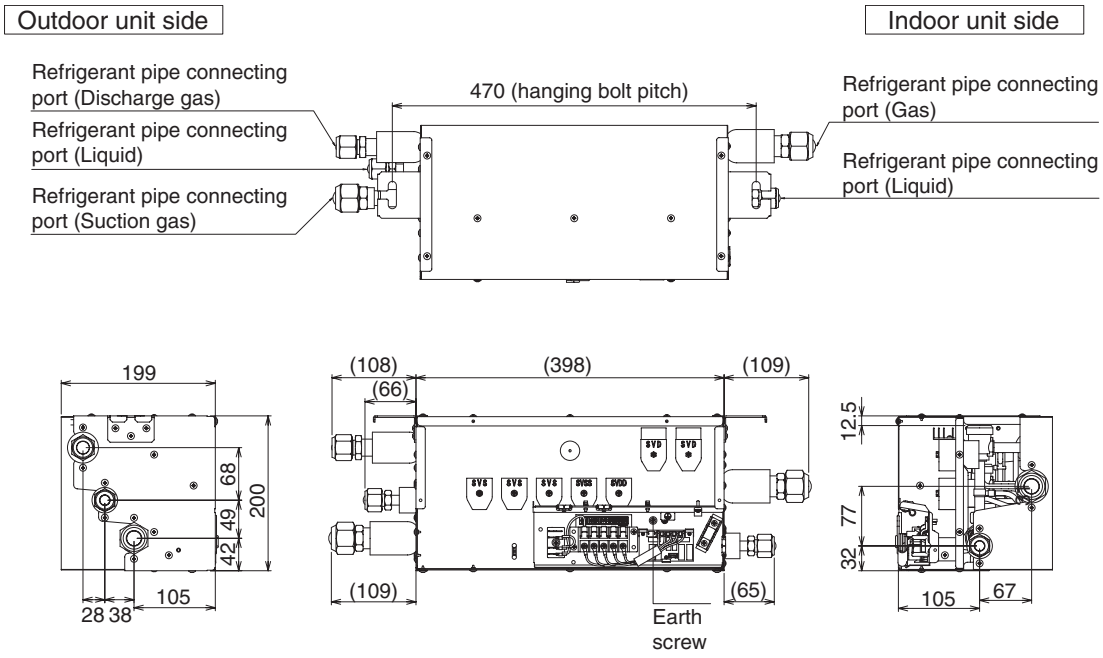


*1) When the capacity of connected indoor unit is less than 5.6 kW, adjust the pipe size by using this accessory pipe.

Note: All dimensions are in mm.

RBM-Y2802FE

Tentative

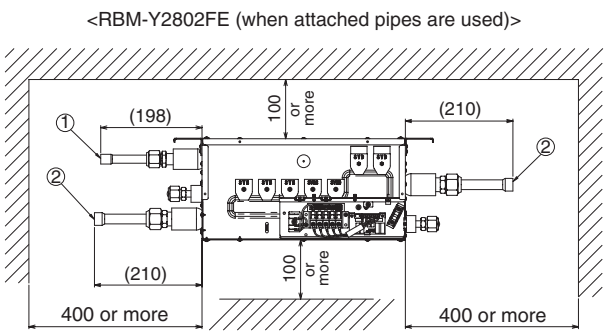


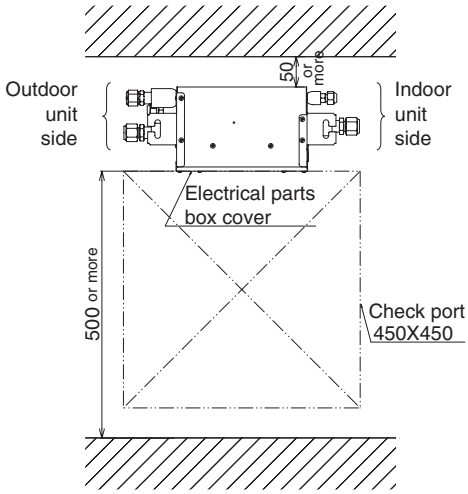
(Specifications)

Model name		RBM-Y2802FE		Accessory pipe
		Connecting port	Connecting method	
Indoor unit side	Liquid side	Ø12.7	Flare	
	Gas side	Ø22.2 *1	Flare	② Ø19.1 (Flare) → Ø22.2 (Brazing)
Outdoor unit side	Liquid side	Ø12.7	Flare	
	Discharge gas side	Ø15.9 *1	Flare	① Ø15.9 (Flare) → Ø19.1 (Brazing)
	Suction gas side	Ø22.2 *1	Flare	② Ø19.1 (Flare) → Ø22.2 (Brazing)
Total capacity of indoor unit (kW)		18.0 to 28.0 or less		
Power Supply		Single phase 50Hz 230V (220-240V)		
Total Weight		8 kg		
Dimension (mm)		Height 200 X Width 398 X Depth 199		

(Installation space)

<RBM-Y2802FE (when attached pipes are used)>





*1) Adjust the pipe size by using this accessory pipe.

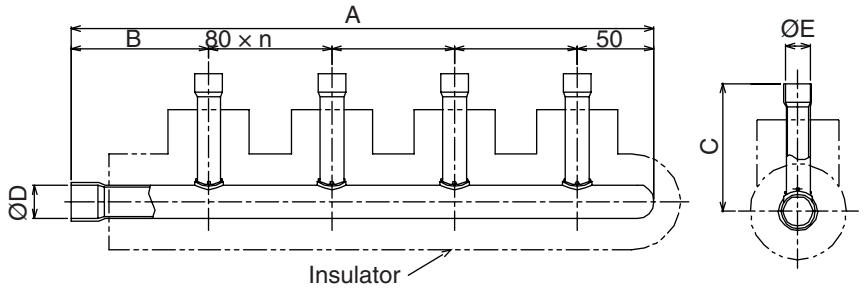
Note: All dimensions are in mm.

Branch header/Branch joint

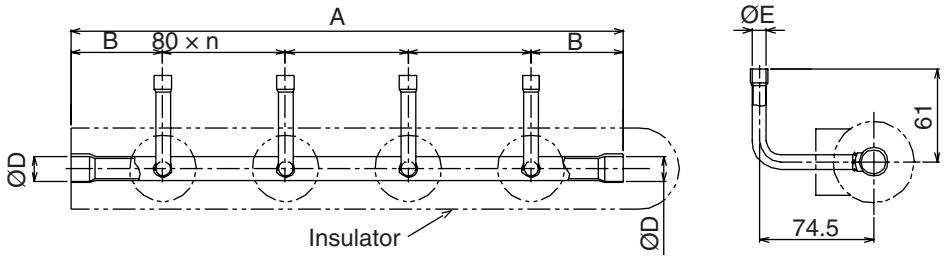
Branch header

RBM-HY1043E, HY1083E, HY2043E, HY2083E

Gas side



Liquid side



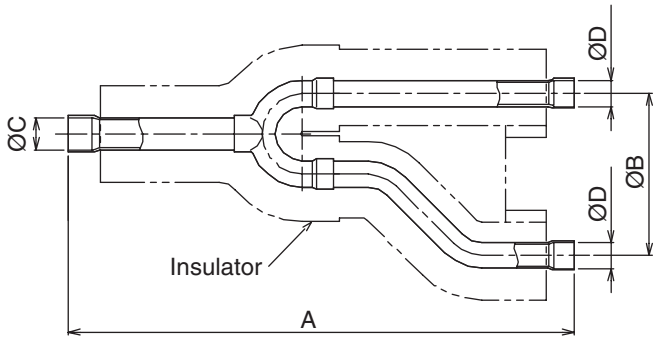
Model		A	B	C	ØD	ØE	n	Accessory socket × Q'ty
RBM-HY1043E	Gas side	380	90	83.6	22.2	15.9	3	(6) × 4, (9) × 4, (14) × 1, (18) × 1, (70) × 1
	Liquid side	360	60	—	15.9	9.5	3	(1) × 4, (6) × 1, (9) × 1
RBM-HY1083E	Gas side	700	90	83.6	22.2	15.9	7	(6) × 8, (9) × 8, (14) × 1, (18) × 1, (70) × 1
	Liquid side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

Note: All dimensions are in mm.

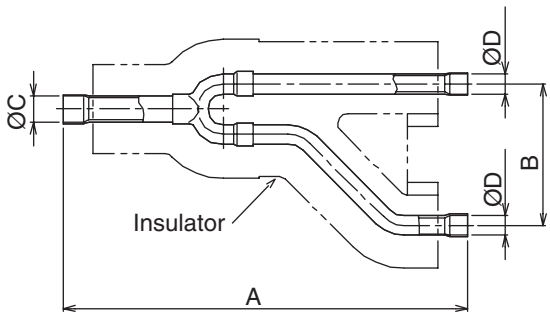
Y-shape branch joint

RBM-BY53E, BY103E

Gas side

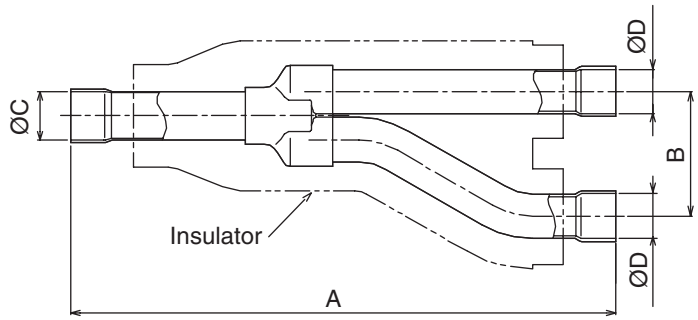


Liquid side

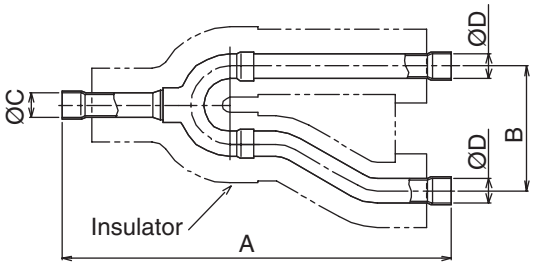


RBM-BY203E, BY303E

Gas side



Liquid side

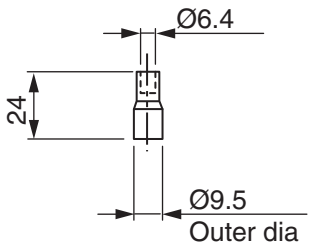


Model		A	B	ØC	ØD	Accessory socket × Q'ty
RBM-BY53E	Gas side	250	80	15.9	12.7	⑤ × 2, ⑭ × 2, ⑨ × 1, ⑪ × 1
	Liquid side	200	70	12.7	9.5	① × 2, ⑤ × 1
RBM-BY103E	Gas side	350	80	22.2	19.1	⑦ × 1, ⑩ × 1, ⑬ × 2, ⑱ × 1, ⑫ × 2, ⑳ × 1, ㊾ × 1
	Liquid side	250	80	15.9	12.7	② × 1, ⑤ × 2, ⑥ × 1, ⑨ × 1, ⑭ × 1
RBM-BY203E	Gas side	350	80	31.8	28.6	⑯ × 1, ⑳ × 1, ㉗ × 1, ㊸ × 2, ㊽ × 1, ㊾ × 1, ㊽ × 1, ㊾ × 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	㊶ × 3, ㊷ × 2, ㊶ × 2, ㊸ × 1, ㊹ × 1, ㊺ × 1, ㊻ × 1, ㊼ × 1
	Liquid side	350	80	22.2	19.1	④ × 1, ⑦ × 1, ⑩ × 1, ⑬ × 2, ⑭ × 1, ⑱ × 1, ⑫ × 1

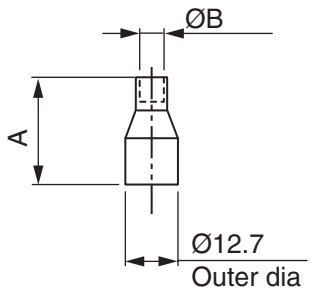
Note: All dimensions are in mm.

Accessory socket

(1)

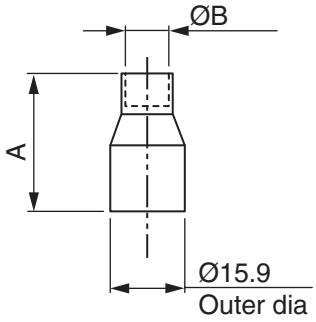


(2) (5) (54)



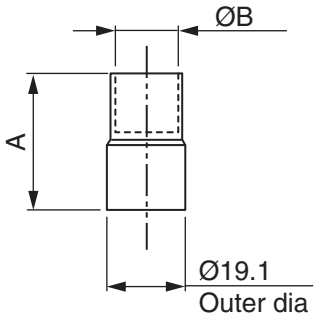
	A	ØB
(2)	29	6.4
(5)	26	9.5
(54)	31	15.9

(3) (6) (9) (51)



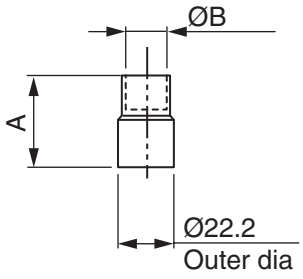
	A	ØB
(3)	35	6.4
(6)	32	9.5
(9)	28	12.7
(51)	38	19.1

(4) (7) (10) (13) (52) (89)



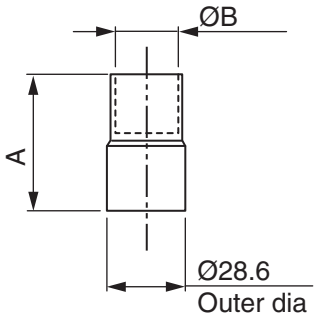
	A	ØB
(4)	39	6.4
(7)	39	9.5
(10)	36	12.7
(13)	33	15.9
(52)	43	22.2
(89)	53	28.6

(14) (18) (70) (85) (86)



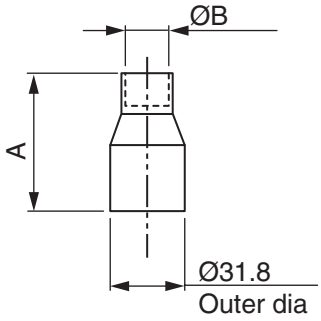
	A	ØB
(14)	40	15.9
(18)	40	19.1
(70)	54	28.6
(85)	41	12.7
(86)	44	9.5

(16) (20) (43) (48) (49) (58)



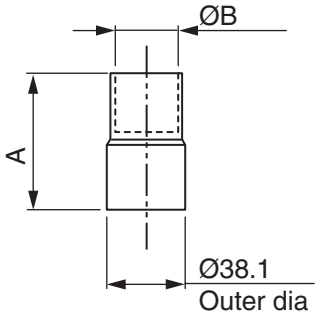
	A	ØB
(16)	50	15.9
(20)	52	19.1
(43)	50	22.2
(48)	54	9.5
(49)	52	12.7
(58)	62	34.9

(27) (59)



	A	ØB
(27)	49	28.6
(59)	59	34.9

(61) (62) (73) (74) (75) (76) (77)

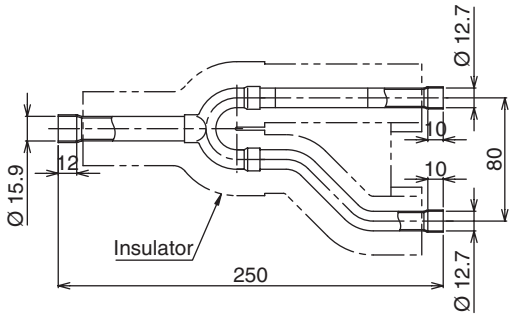


	A	ØB
(61)	55	34.9
(62)	66	41.3
(71)	66	28.6
(73)	66	22.2
(74)	66	19.1
(75)	64	15.9
(76)	62	12.7
(77)	62	9.5

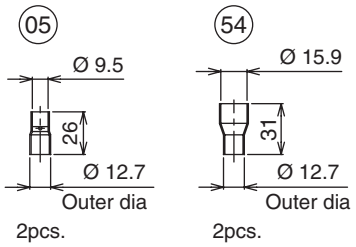
Note: All dimensions are in mm.

Y-shape branch joint
RBM-BY53FE

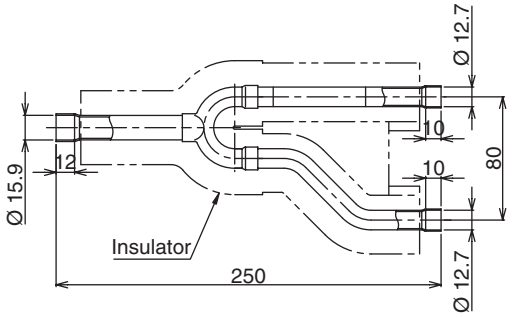
Suction gas side



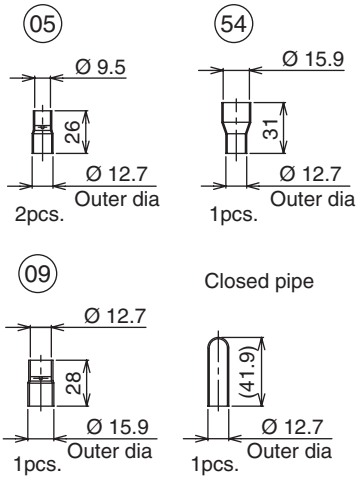
Accessory socket



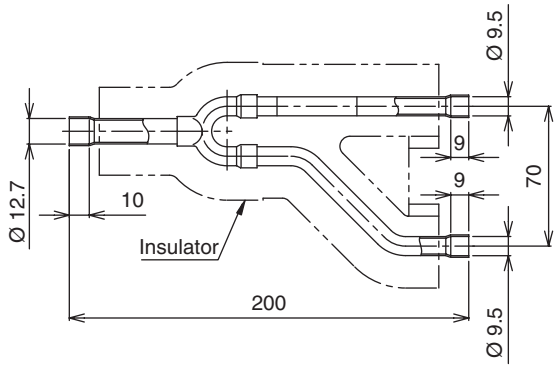
Discharge gas side



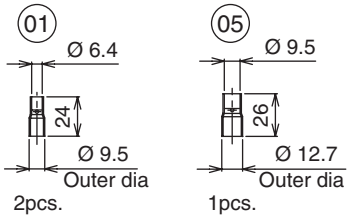
Accessory socket



Liquid side



Accessory socket

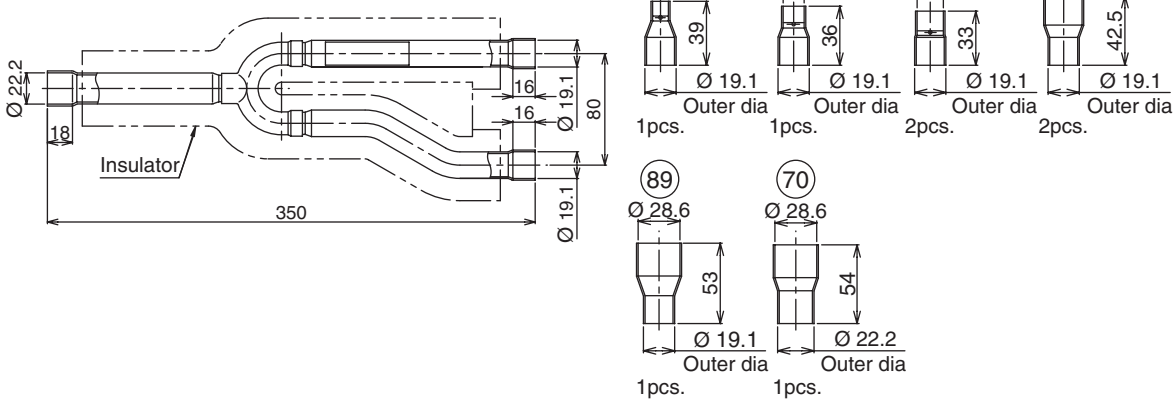


Note: All dimensions are in mm.

Y-shape branch joint
RBM-BY103FE

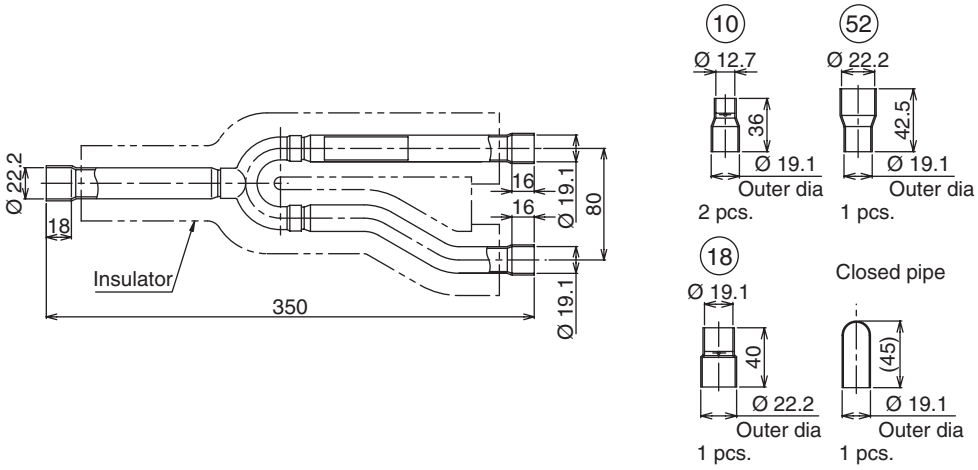
Suction gas side

Accessory socket



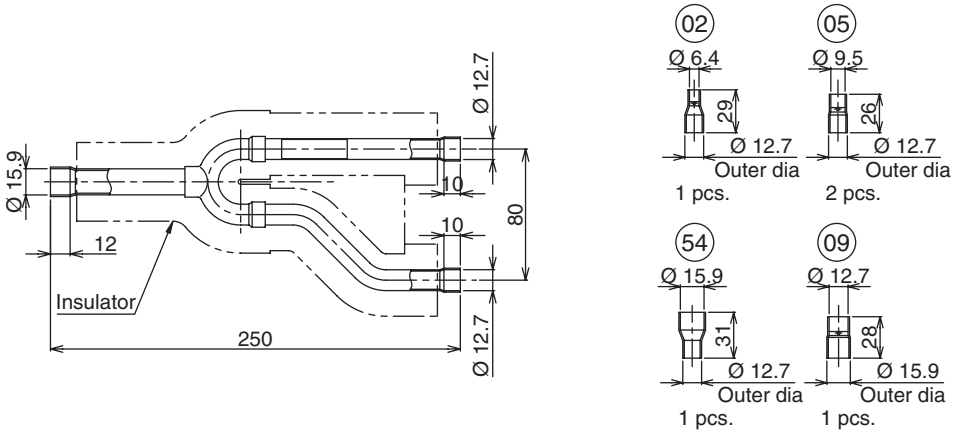
Discharge gas side

Accessory socket



Liquid side

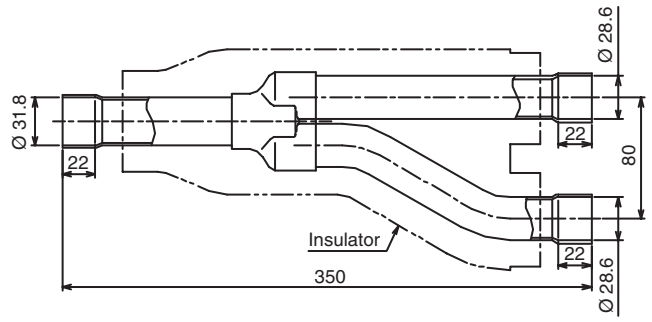
Accessory socket



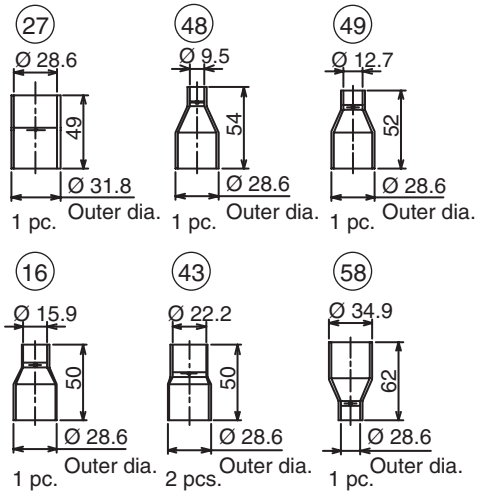
Note: All dimensions are in mm.

Y-shape branch joint
RBM-BY203FE

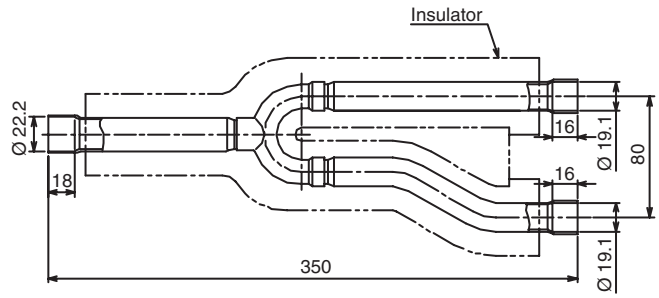
Suction gas side



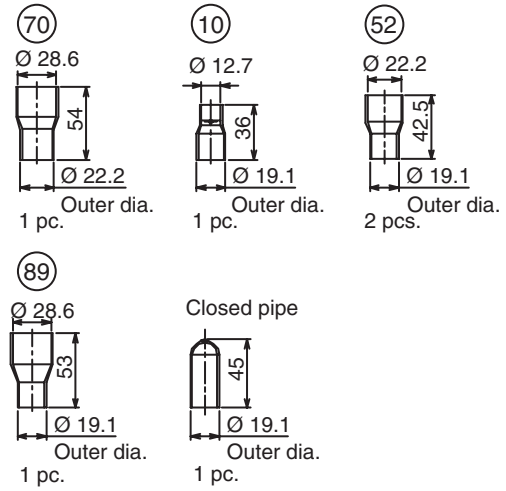
Accessory socket



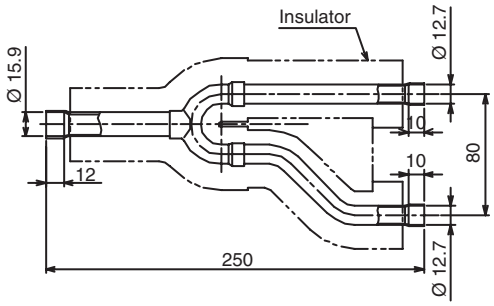
Discharge gas side



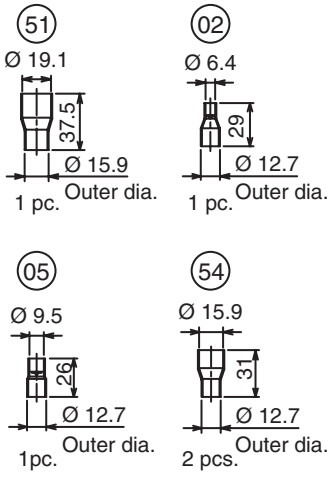
Accessory socket



Liquid side



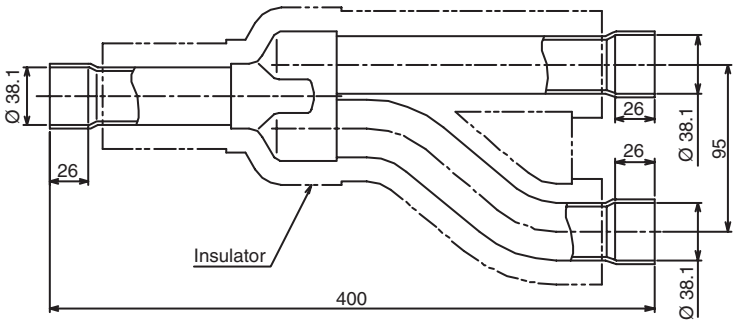
Accessory socket



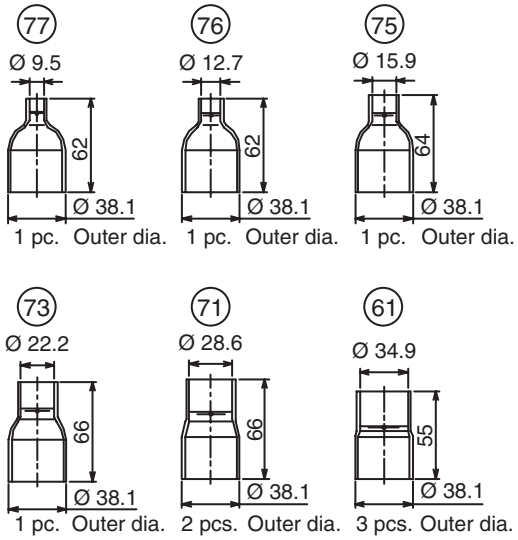
Note: All dimensions are in mm.

Y-shape branch joint
RBM-BY303FE

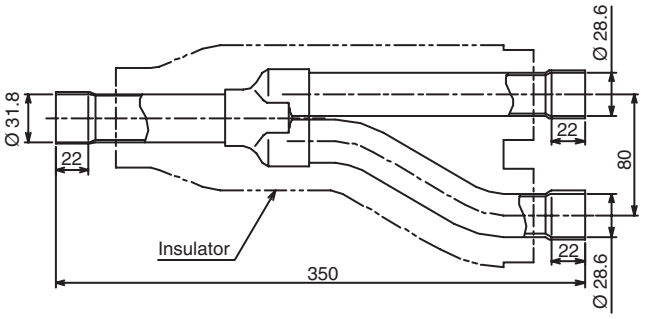
Suction gas side



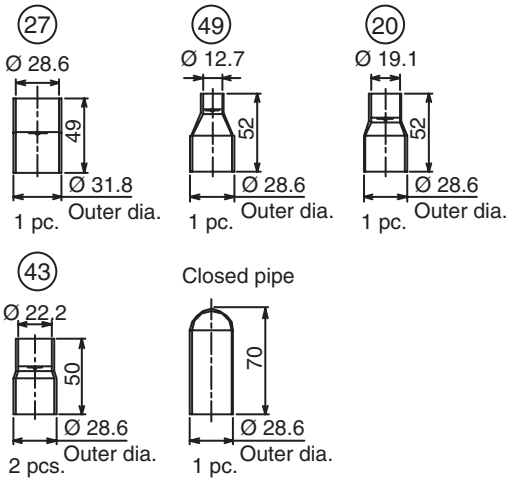
Accessory socket



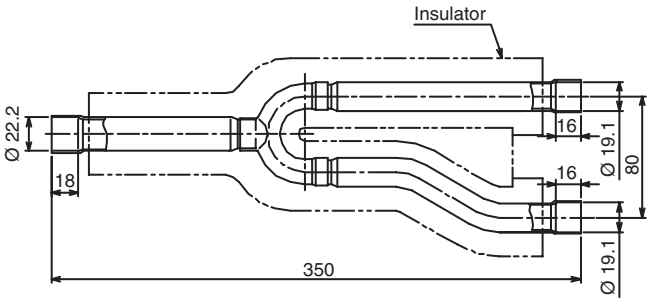
Discharge gas side



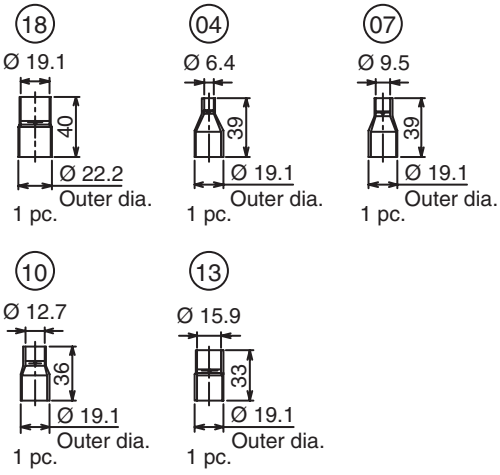
Accessory socket



Liquid side



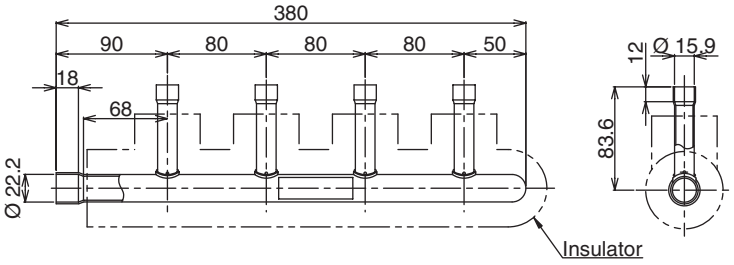
Accessory socket



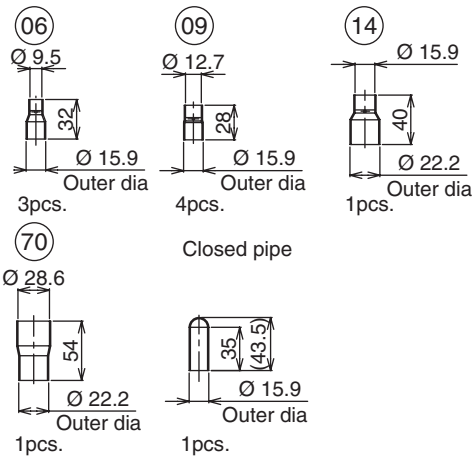
Note: All dimensions are in mm.

Branch header
RBM-HY1043FE

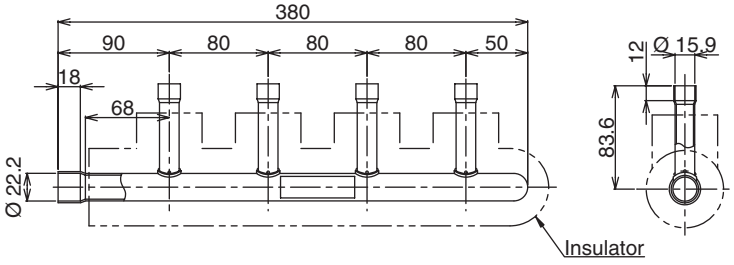
Suction gas side



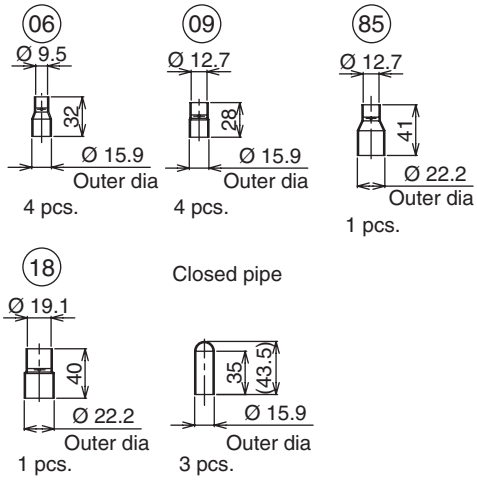
Accessory socket



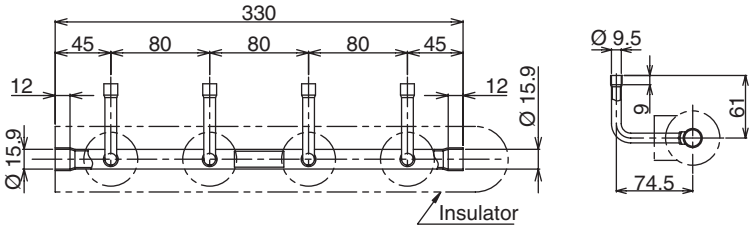
Discharge gas side



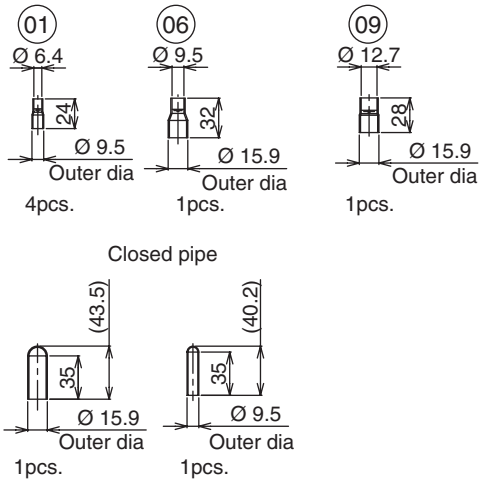
Accessory socket



Liquid side



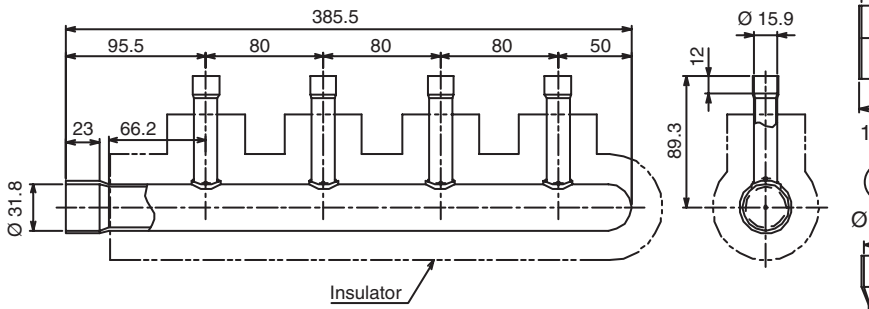
Accessory socket



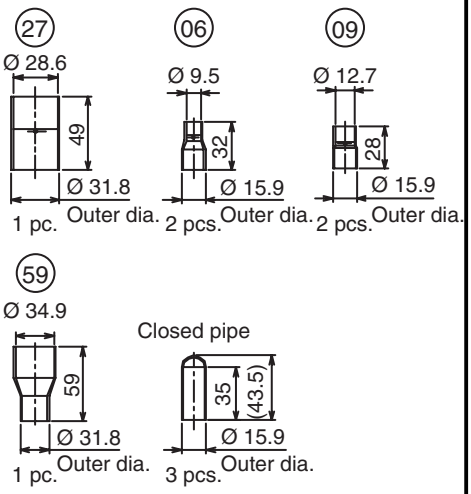
Note: All dimensions are in mm.

Branch header
RBM-HY2043FE

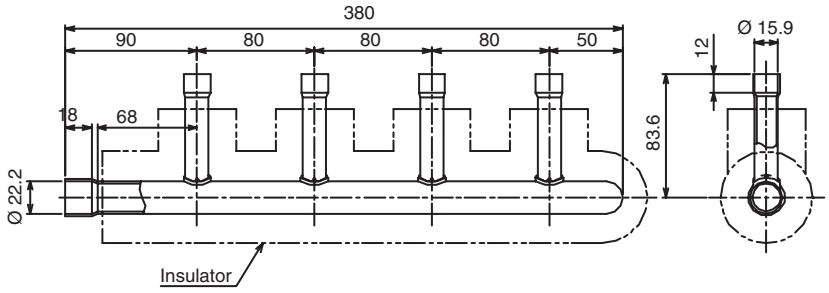
Suction gas side



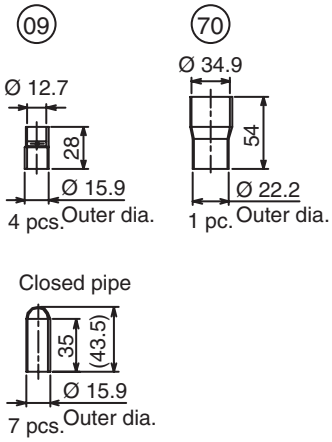
Accessory socket



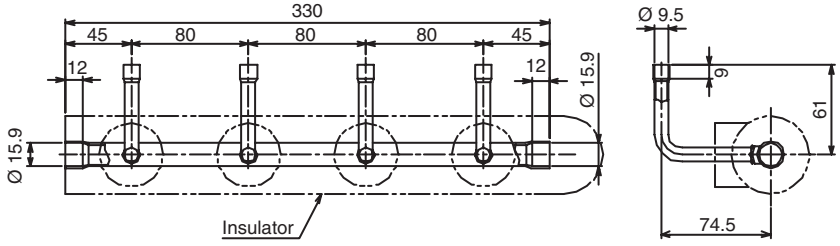
Discharge gas side



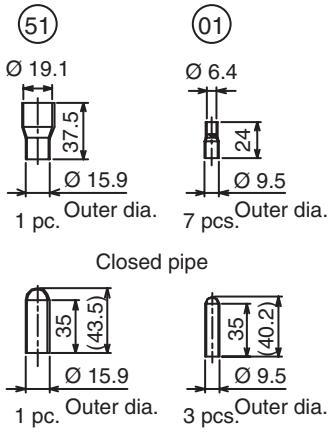
Accessory socket



Liquid side



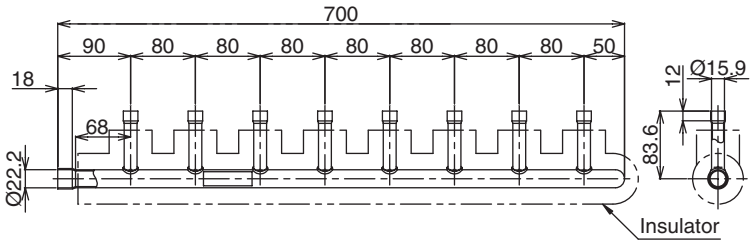
Accessory socket



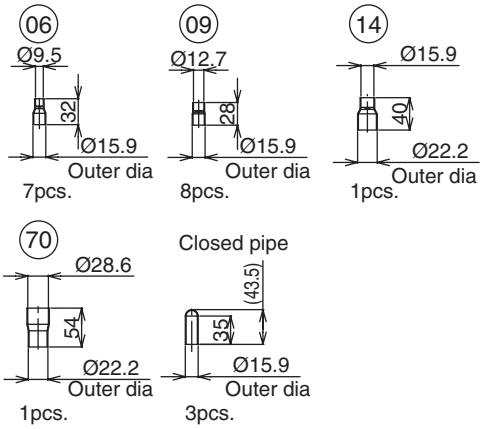
Note: All dimensions are in mm.

Branch header
RBM-HY1083FE

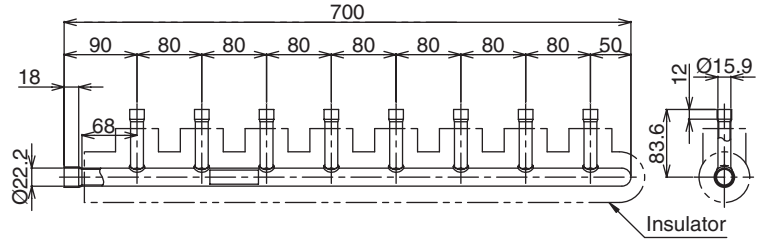
Suction gas side



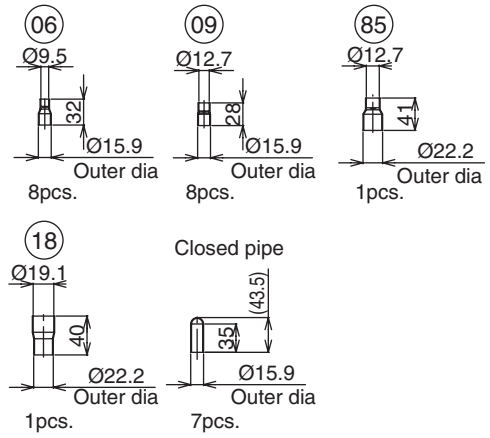
Accessory socket



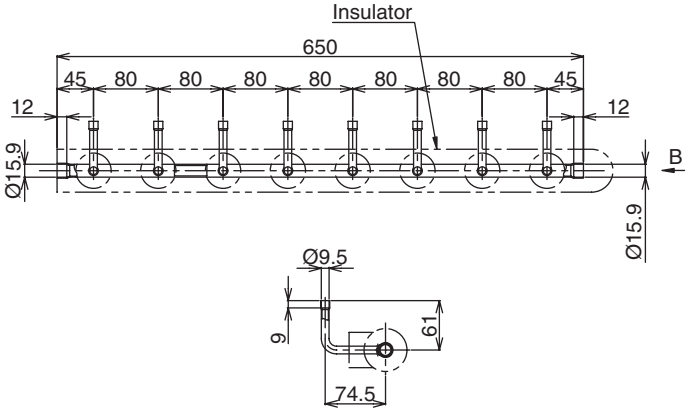
Discharge gas side



Accessory socket

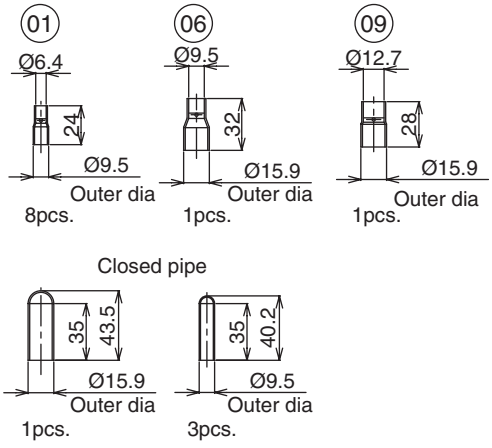


Liquid side



B-view

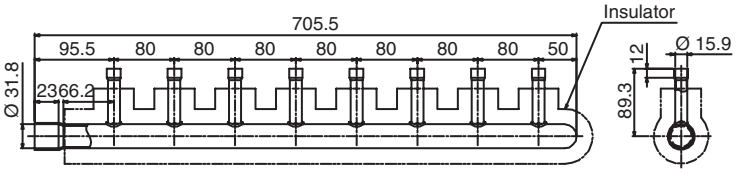
Accessory socket



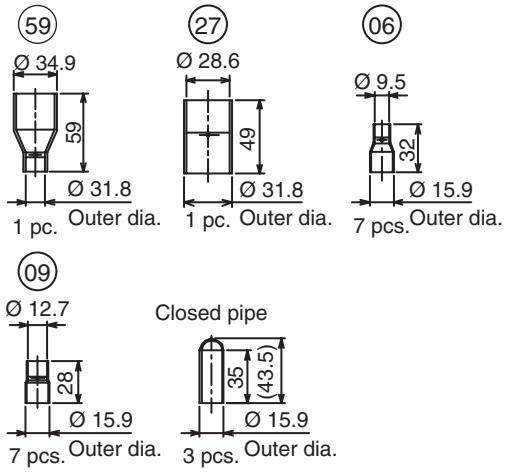
Note: All dimensions are in mm.

Branch header
RBM-HY2083FE

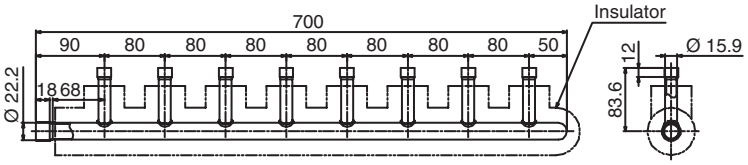
Suction gas side



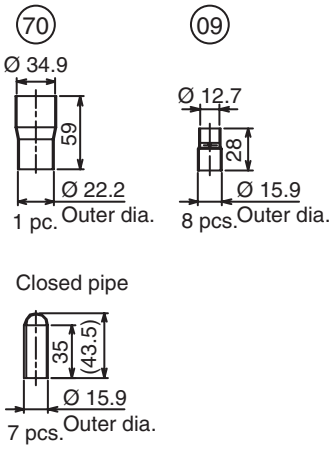
Accessory socket



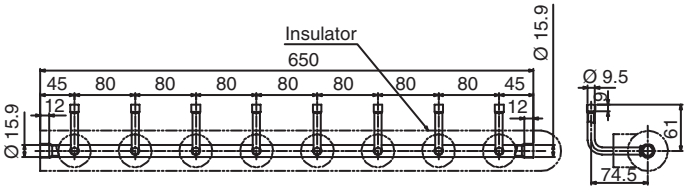
Discharge gas side



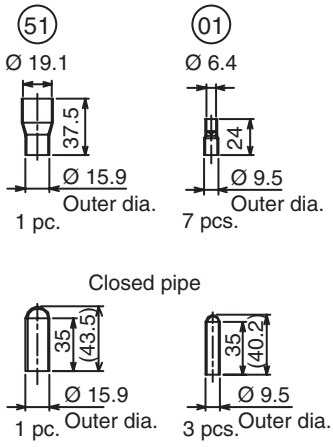
Accessory socket



Liquid side



Accessory socket

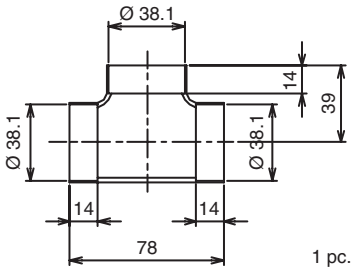


Note: All dimensions are in mm.

T-shape branch joint

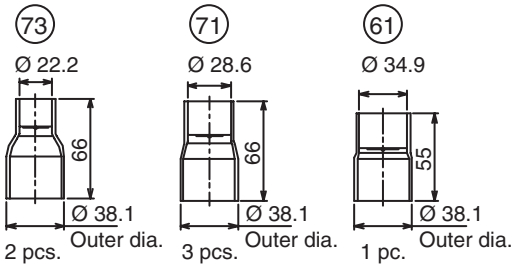
RBM-BT13FE

Suction gas side

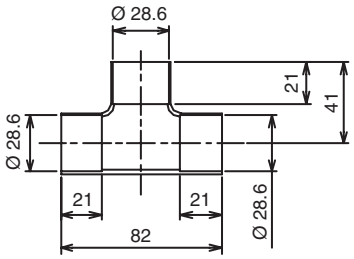


1 pc.

Accessory socket

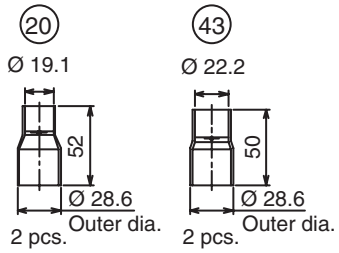


Discharge gas side

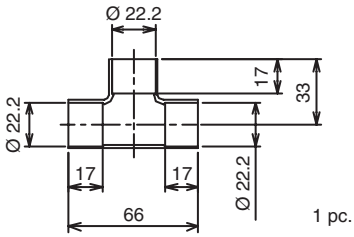


1 pc.

Accessory socket

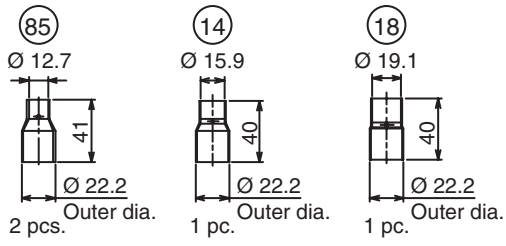


Liquid side

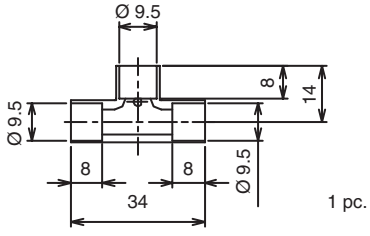


1 pc.

Accessory socket



Blkance pipe side



1 pc.

Note: All dimensions are in mm.

TOSHIBA CARRIER CORPORATION
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