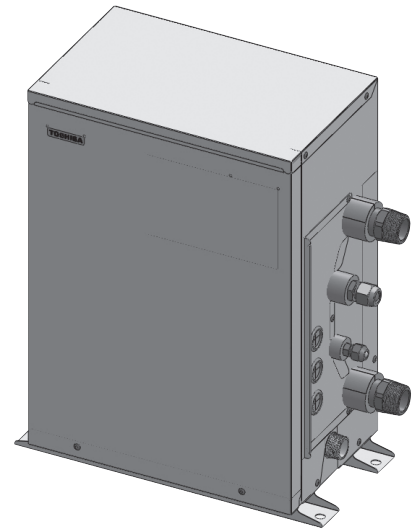


Hot Water Module

MMW-AP0271LQ-E
MMW-AP0271LQ-TR
MMW-AP0561LQ-E
MMW-AP0561LQ-TR



Contents

1. System summary
2. Specifications
3. Dimensional drawing
4. Center of gravity
5. Refrigerant cycle diagram
6. Wiring diagram
7. Electrical characteristics
8. External wiring diagram
9. Water side characteristics
10. Sound data
11. Caution of installation

1. System summary

CONCEPT

- To design and produce a low temperature Hot Water Module, capable of producing up to 50 °C outlet water temperature, whilst maximizing the performance and efficiency of the entire VRF system.
- To be used in both space heating and domestic hot water applications. Typical applications include Hotel, Office and residential apartment suits.
- To create a single solution for our customers heating, cooling and domestic hot water requirements.

Toshiba SMMS-i and SMMS-e Hot Water Module – CHARACTER

- New Design, specifically engineered for VRF application
- Operating Control designed specifically to maximize both performance and efficiency.
- Capacity line up - 8 kW & 16 kW
- All models come in single phase (220 - 240 V ~ 50 Hz)
- Maximum 50% Hot Water Module to CDU diversity (Max 2 Hot Water Module's per refrigerant system)
- System diversity 65% (exclude Hot Water Module) - 115% (include Hot Water Module)
- Outdoor operation range (-20 °C WB ~ 19 °C WB)

Domestic Hot Water Installation Example

Typical Installations examples include –

- Office use, where there is a requirement for Domestic Hot Water, such as small canteen or Rest room.
- Apartment block, where there is a requirement for Domestic Hot Water, such as kitchen, Shower and Bath.
- Hotel use, where there is an auxiliary requirement for Domestic Hot Water, for the purpose of cleaning and sanitary operations.
- Small Businesses, for example coffee shops, hairdressers etc, where there is a requirement for a single heating solution.

Space Heating Installation Example

Typical Installations examples include –

- Office use, where there is a requirement for space heating via fan coils or Air Handling Unit.
- Apartment, where there is a requirement for space heating via under-floor heating.
- Hotel use, where there is an auxiliary requirement for space heating via a combination of fan coils, Air Handling Unit or under-floor heating circuits.
- Small Businesses, for example coffee shops, hairdressers etc, where there is a requirement for a single heating solution.

Connectable units

VRF products

VRF products	SMMS-i	SMMS-i (5 HP, 6 HP)	SHRM-i	Mini-SMMS	SMMS	SHRM	SMMS-e
Connectable	✓	–	–	–	–	–	✓

- BMS units can not be connected with these units.
- The Fresh Air Intake type and Air to Air Heat Exchanger with DX Coil can not be connected with the same refrigerant system.

Remote controller

- RBC-ATM32E
- TCB-CC163TLE2
- BMS-CM1280TLE
- RBC-AMS41E
- TCB-EXS21TLE

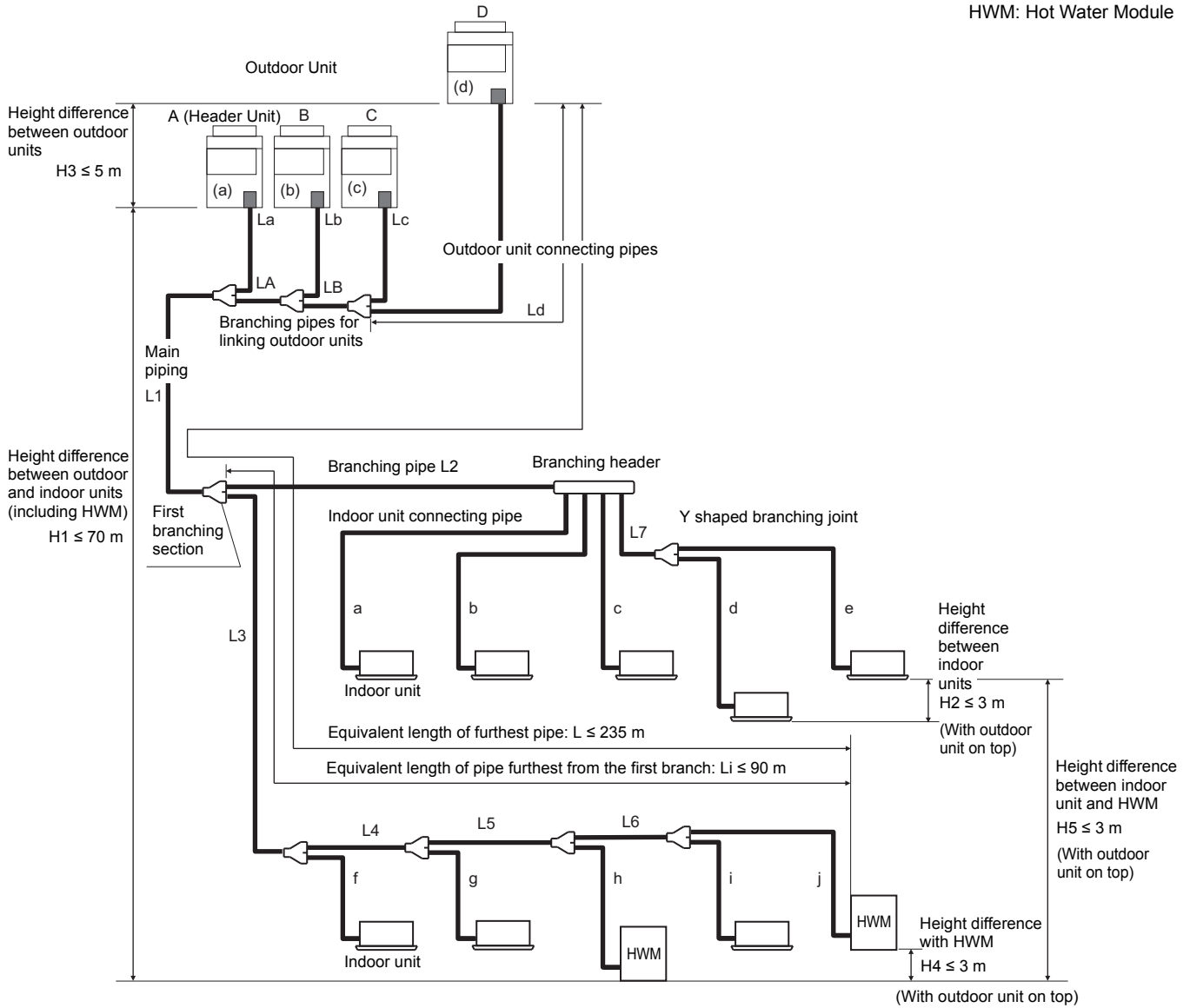
Allowable length / height difference of refrigerant piping

System able to be combined

The Hot Water Module is connectable to only SMMS-i (Super Modular Multi system).
 The system does not work when it connect to the MiNi-SMMS, MiNi-SMMS-e, SMMS (5,6 HP) and SHRM-i.
 The Fresh Air Intake type and Air to Air Heat Exchanger with DX Coil cannot be connected with the same refrigerant system.

▼ Allowable length of refrigerant pipes and allowable height difference between units

HWM: Hot Water Module



• System restrictions

	SMMS-i		SMMS-e		
	Without HWM	With HWM	Without HWM	With HWM	
Maximum total No. of outdoor units	4 units	4 units	3 units	3 units	
Maximum total capacity of outdoor units	48 HP	48 HP	60 HP	60 HP	
Maximum No. of connected indoor units	48 units	48 units - HWM unit connection	64 units	64 units - HWM unit connection	
HWM connection capacity per refrigerant system	-	2 units and 50% or less	-	2 units and 50% or less	
Maximum total capacity of connected indoor units (varies depending on the height difference between indoor units.)	H2 ≤ 15 m	135%	H2 ≤ 15 m	135%	115% (including HWM)
	H2 > 15 m	105%	H2 > 15 m	105%	105% (including HWM)
Minimum capacity of connected indoor units	50%	65%	50%	65%	

• Cautions for installation

- 1 Make the outdoor unit first connected to the bridging pipe to the indoor units the header unit.
- 2 Install the outdoor units in order of their capacity codes: A (header unit) ≥ B ≥ C ≥ D
- 3 When connecting outdoor unit gas pipes to indoor units, use Y-shaped branching joints to keep pipes level.
- 4 Ensure that pipes to the indoor units and pipes to the outdoor unit at T shaped liquid joints intersect at a right angle (⊥) as in Figure 1. Do not connect them in a straight line as in figure 2.

• Allowable length and height difference of refrigerant piping

Item		SMMS-i		SMMS-e		Pipes	
		Without HWM	With HWM	Without HWM	With HWM		
Pipe length	Total extension of pipe (liquid pipe / real length)	Less than 34 HP	300 m	300 m	300 m	300 m	La + Lb + Lc + Ld + L1 + L2 + L3 + L4 + L5 + L6 + L7 + a + b + c + d + e + f + g + h + i + j
		34 HP or more	500 m (*2)	500 m (*2)	1000 m (*8)	1000 m (*8)	
	Farthest piping length L (*1)	Equivalent length	235 m	235 m	235 m	235 m	LA + LB + Ld + L1 + L3 + L4 + L5 + L6 + j
		Real length	190 m	190 m	190 m	190 m	
	Maximum equivalent main piping length	Equivalent length	120 m (*3)	120 m (*3)	120 m (*3)	120 m (*3)	L1
		Real length	100 m (*3)	100 m (*3)	100 m (*3)	100 m (*3)	
	Farthest equivalent piping length from the first branch Li (*1)		90 m (*4)	90 m (*4)	90 m (*4)	90 m (*4)	L3 + L4 + L5 + L6 + j
	Farthest equivalent piping length between outdoor units L0 (*1)		25 m	25 m	25 m	25 m	LA + LB + Ld (LA + Lb, LA + LB + Lb)
	Maximum equivalent length of pipes connected to outdoor units		10 m	10 m	10 m	10 m	Ld (La, Lb, Lc)
	Maximum real length of pipes connected to indoor units		30 m	30 m	30 m	30 m	a, b, c, d, e, f, g, h, i, j
Maximum equivalent length between branching sections		50 m	50 m	50 m	50 m	L2, L3, L4, L5, L6, L7	
Height length	Difference between outdoor and indoor units H1	Upper outdoor units	70 m (*5)	70 m (*5)	70 m (*5,9)	70 m (*5,9)	-
		Lower outdoor units	40 m (*6)	40 m (*6)	40 m (*6)	40 m (*6)	-
	Difference between indoor units H2	Upper outdoor units	40 m	3 m (*7 40 m)	40 m	3 m (*7 40 m)	-
		Lower outdoor units		10 m (*7 40 m)		10 m (*7 40 m)	-
	Difference between indoor units and HWM H5	Upper outdoor units	-	3 m (*7 40 m)	-	3 m (*7 40 m)	-
		Lower outdoor units	-	10 m (*7 40 m)	-	10 m (*7 40 m)	-
	Difference between HWM units H4	Upper outdoor units	-	3 m	-	3 m	-
		Lower outdoor units	-	-	-	-	-
Difference between outdoor units H3		5 m	5 m	5 m	5 m	-	

- *1: Furthest outdoor unit from the first branch: (D), furthest indoor unit: (j).
- *2: If the length is 300 m or more, please contact our customer service.
- *3: Make the equivalent length 70 m (real length 50 m) or less if the total capacity of outdoor units is 46 HP or more.
- *4: Make the difference 65 m or less if the height difference between outdoor and indoor units (H1) is more than 5 m.
- *5: Make the difference 50 m or less if the height difference between indoor units (H2) is more than 3 m.
- *6: Make the difference 30 m or less if the height difference between indoor units (H2) is more than 3 m.
- *7: If the Hot Water Module and indoor units are not operating at the same time.
- *8: Total charging refrigerant is 140 kg or less.
- *9: Extension up till 90 m is possible with conditions below.
 - Outdoor Temperature Cooling : 10°C to 46°C (Dry-bulb temp.)
 - Heating : -5°C to 15.5°C (Wet-bulb temp.)
 - Equivalent length of farthest piping from 1st branching Li<50 m
 - Real length of main piping L1<100 m
 - Height difference between indoor units H2<3 m
 - Total capacity of combined indoor units : 90%-105%
 - Single CDU, and up to 20 HP
 - Minimum capacity of connectable indoor unit : 4 HP or Larger

▼ Capacity code of Hot Water Module

- For the Hot Water Module, the capacity code is decided at each model. (Table 1)

Table 1

Hot Water Module model	Capacity code	
	Equivalent to HP	Equivalent to capacity
MMW-AP0271LQ-E/-TR	2.5	7.1
MMW-AP0561LQ-E/-TR	5	14

The capacity code of the Hot Water Module is different from the capacity code of the standard indoor unit.

2. Specifications

Hot Water Module Specification

For Europe, Turkey

Model				MMW-AP0271LQ-E, TR	MMW-AP0561LQ-E, TR	
Heating capacity *1		kW		8.0	16.0	
Electrical characteristics	Power supply *2			1 phase 50 Hz 230 V (220 - 240 V)		
	Running current		A	0.08	0.08	
	Power consumption		W	14	14	
Appearance				Zinc hot dipping steel plate		
Dimension	Unit	Height	mm	580		
		Width (leg included)	mm	400 (467)		
		Depth	mm	250		
	Packed *3	Height	mm	357		
		Width	mm	638		
		Depth	mm	833		
Weight	Unit		kg	17.8	20.3	
	Packed		kg	23	25	
Design Pressure	Refrigerant side		MPa	3.73		
	Water side		MPa	1.0		
Heat exchanger				Plate type heat exchanger		
Heat-insulating material				Polyethylene foam + Polyurethane foam		
Water flow rate	Standard		L/min	22.9	45.8	
	Min.		L/min	19.5	38.9	
Water pressure loss (at standard water flow rate)			kPa	40.5	44.2	
Controller				Remote controller		
Operation range	Ambient	indoor Allowable dew point	°CDB	5 - 32		
			°CWB	23 or less		
			RH(%)	30 - 85		
	Outdoor (at heating)	°CWB	-20 - 19			
		Water inlet side		°C	15 or more and 45 or less	
		Water outlet side		°C	25 - 50	
Water filter				Strainer with Mesh 30 to 40 (procured locally)		
Connecting pipe	Water pipe	Inlet		R1 - 1/4		
		Outlet		R1 - 1/4		
	Refrigerant pipe	Gas pipe	mm	φ15.9 flare connection		
		Liquid pipe	mm	φ9.5 flare connection		
	Drain pipe		R1			
Sound pressure level			dB(A)	25	27	
Installation place				Indoor		

*1: Rated conditions: entering condenser water temp. 30 °C leaving condenser water temp. 35 °C Outdoor air temp. 7 °CDB / 6 °CWB

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

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

*3: The unit is packed in a sideways state.

*4: This specification is value as of May, 2014, please note that specification is subject to change without notice.

Remote controller able to be connected

Remote controller

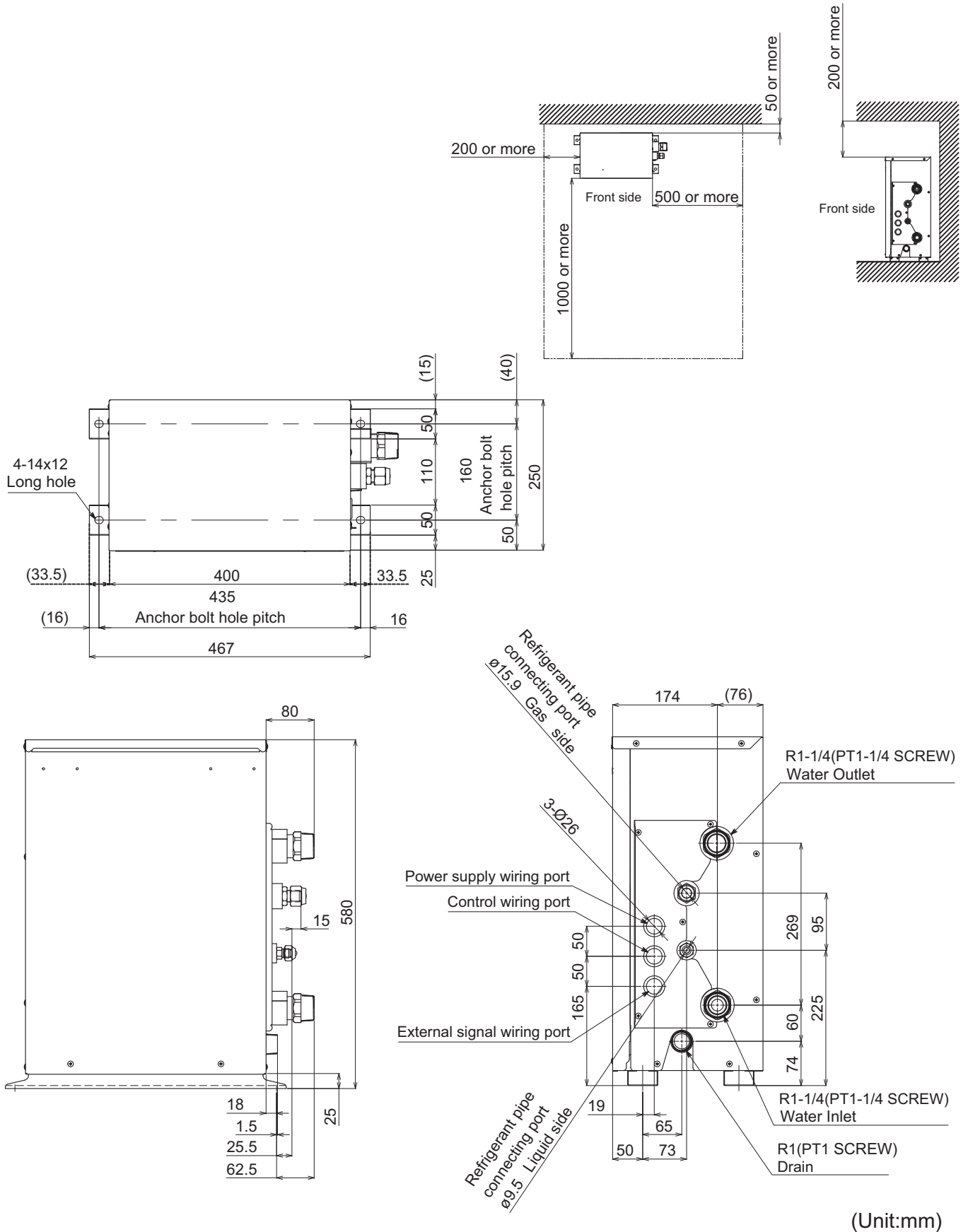
RBC-AMT32E, RBC-AMS41E, TCB-CC163TLE2, TCB-EXS21TLE

Application control

TCB-IFCB-4E2

3. Dimensional drawing

MMW-AP0271LQ-E, MMW-AP0271LQ-TR, MMW-AP0561LQ-E, MMW-AP0561LQ-TR



4. Center of gravity

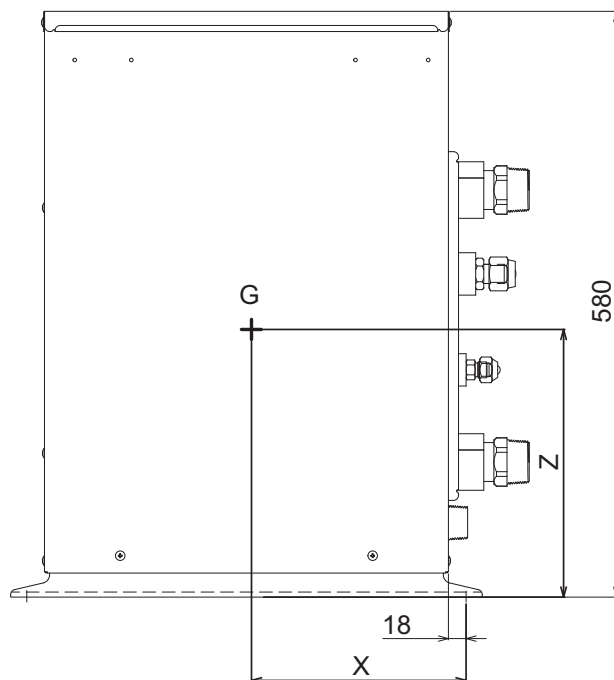
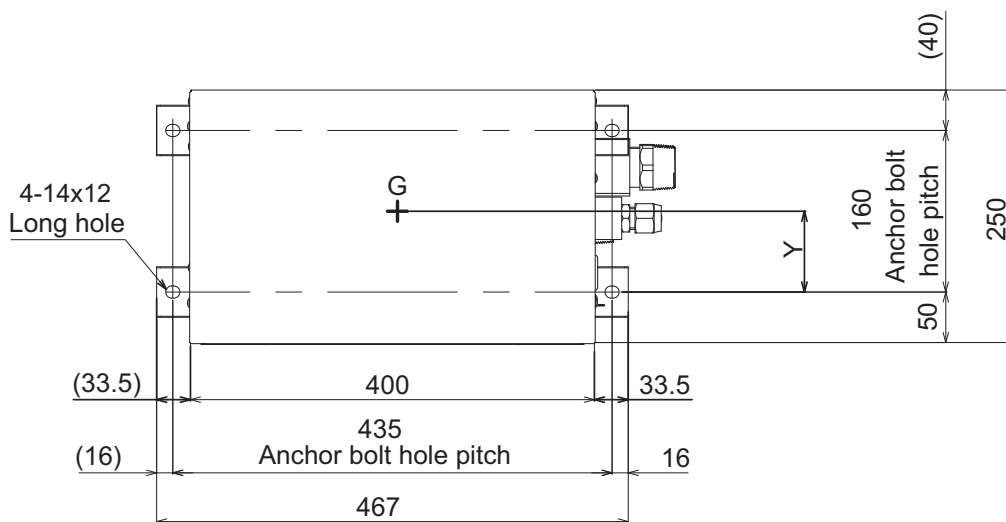
MMW-AP0271LQ-E, MMW-AP0271LQ-TR, MMW-AP0561LQ-E, MMW-AP0561LQ-TR

Default

Model type	X (mm)	Y (mm)	Z (mm)	Weight (kg)
027	203	80	265	17.8
056	213	90	265	20.3

Operating

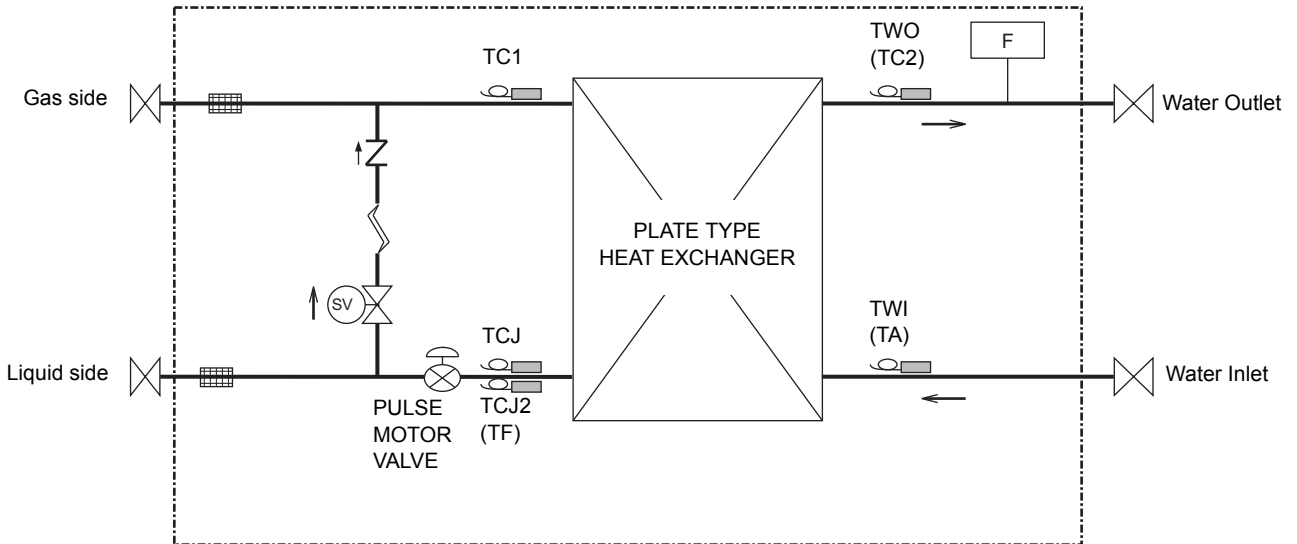
Model type	X (mm)	Y (mm)	Z (mm)	Weight (kg)
027	206	81	265	18.4
056	218	91	265	21.6



(Unit:mm)

5. Refrigerant cycle diagram

MMW-AP0271LQ-E, MMW-AP0271LQ-TR, MMW-AP0561LQ-E, MMW-AP0561LQ-TR

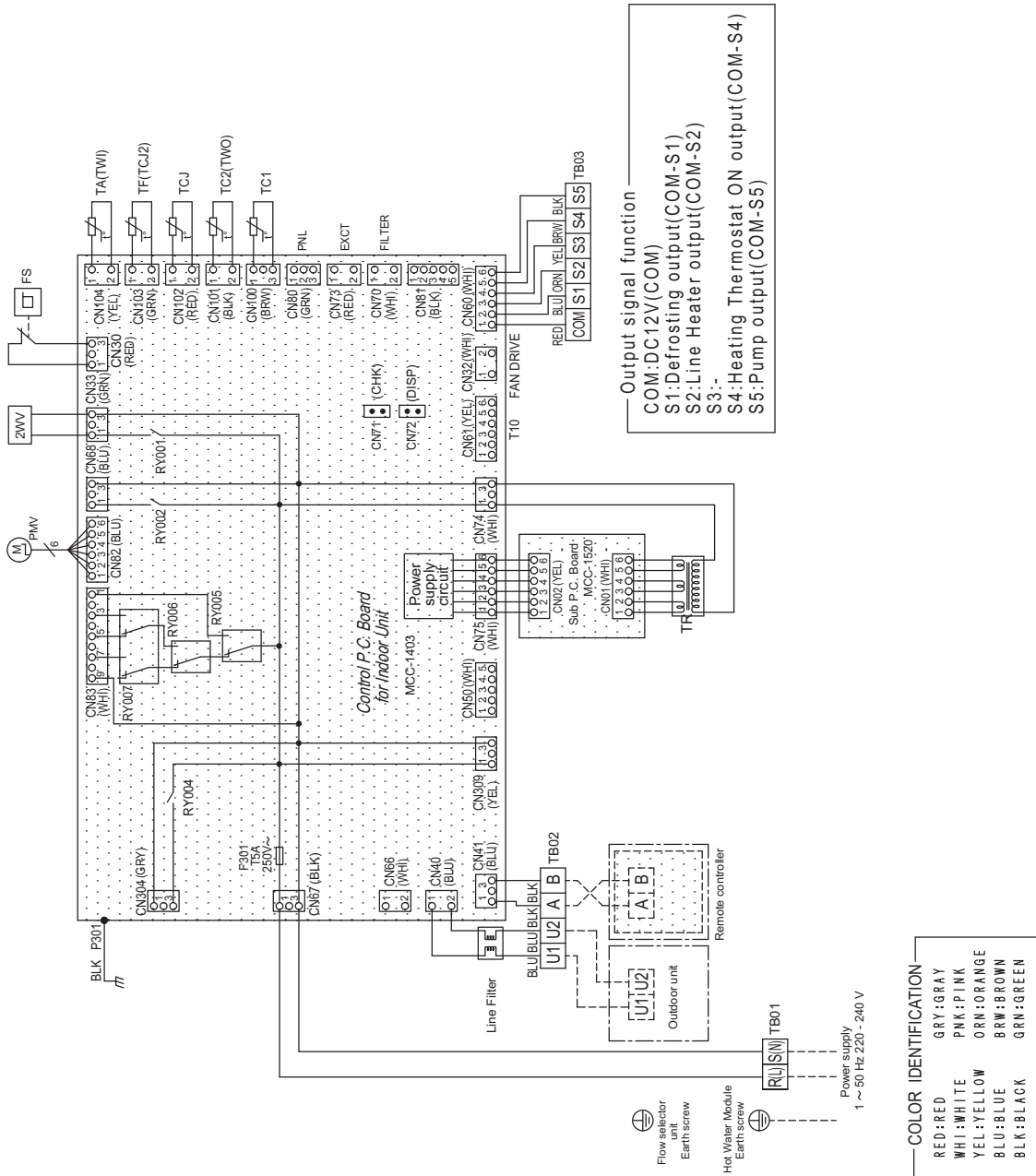


mark						
	SOLENOID VALVE	CAPILLARY TUBE	CHECK VALVE	STRAINER	SENSOR TEMPERATUR	Flow switch

Functional part name		Functional outline
Pulse Motor Valve	PMV	(Connector CN082 (6P): Blue) 1) Controls sub cool in heating operation 2) Recovers refrigerant oil in cooling operation 3) Recovers refrigerant oil in heating operation
Sensor Temperature	1. TWI (TA)	(Connector CN104 (2P): Yellow) 1) Detects Water inlet temperature
	2. TC1	(Connector CN100 (3P): Brown) 1) Detects refrigerant gas temperature
	3. TWO (TC2)	(Connector CN101 (2P): Black) 1) Controls PMV sub cool in heating operation 2) Detects Water outlet temperature
	4. TCJ	(Connector CN102 (2P): Red) 1) Detects refrigerant liquid temperature
	5. TCJ2 (TF)	(Connector CN103 (2P): Green) 1) Detects refrigerant liquid temperature
Solenoid valve	SV	(Connector CN033 (3P): Green) Opens valve to bypass refrigerant to heat exchanger in 1) cooling operation 2) defrost operation
Flow switch	F	(Connector CN030 (3P): Red) 1) Detects water flow

6. Wiring diagram

MMW-AP0271LQ-E, MMW-AP0271LQ-TR, MMW-AP0561LQ-E, MMW-AP0561LQ-TR



Symbol	Parts Name
CN**	Connector
RY001	2Way Valve Relay
F301	Fuse
PMV	Pulse Motor Valve
TB01,02,03	Terminal Block
TC1,TCJ,TF	Temp sensor
TC2,TA	Temp sensor
TR	Transformer
2WV	2Way Valve
FS	Flow Switch

1. Broken line indicate the wiring at site. Long dashed short dashed line indicate the accessories.
2. indicates the terminal block. indicates the connection terminal. indicates the connector on the control P.C. board.
3. indicates the protection ground.
4. indicates the control P.C. board.

7. Electrical characteristics

Model	Nominal Voltage	Voltage Range		Power Supply	
	(V-Ph-Hz)	Min.	Max.	MCA	MOCP
MMW-AP0271LQ-E	230-1-50	198	264	0.09	15
MMW-AP0271LQ-TR	230-1-50	198	264	0.09	15
MMW-AP0561LQ-E	230-1-50	198	264	0.09	15
MMW-AP0561LQ-TR	230-1-50	198	264	0.09	15

MCA : Minimum Circuit Amps

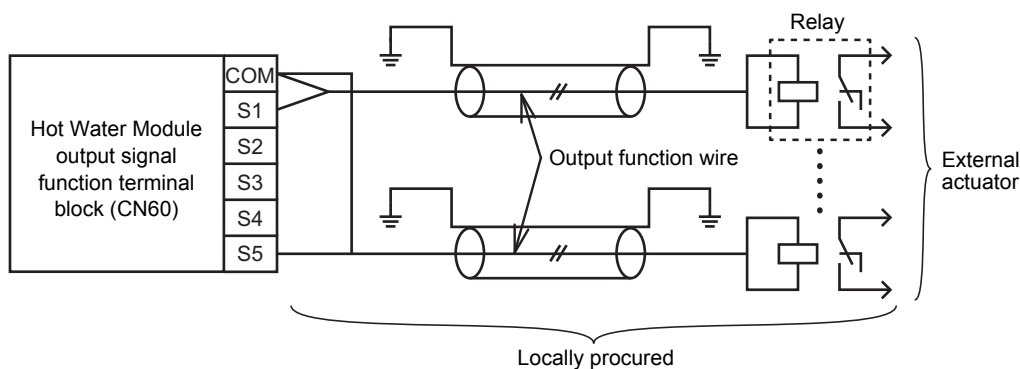
MOCP: Maximum Overcurrent Protection (Amps)

8. External wiring diagram

Output signal function wiring

Connect the following output signals from the Hot Water Module.

Terminal block No.	Function	Comments
COM	DC12 V (COM)	Common for connector S2 ~ S5
S1	Defrosting output (COM-S1)	DC12 V Relay coil is less than 16 mA.
S2	Line heater output (COM-S2)	DC12 V Relay coil is less than 16 mA.
S3	-	-
S4	Heating thermostat ON output (COM-S4)	DC12 V Relay coil is less than 16 mA.
S5	Pump output (COM-S5)	DC12 V Relay coil is less than 16 mA.



NOTE

Auxiliary relays (locally procured) must be connected to output signal function wirings to allow connection to the Hot Water Module output signal functions. The maximum current output signal, from each of the output signal function wirings, is 16 mA. Please ensure the rated current of the relay coil is less than 16 mA to avoid damage to the Hot Water Module P.C. board.

CAUTION

Output signal functions are separated from primary basic insulation.

- To prevent noise trouble, use 2-core shield wire.
- Determine the wire length between the Hot Water Module output signal function terminal block and the relay up to 2 m.
- Locally procure and install protective devices such as the heater and pump.

Optional connector function table

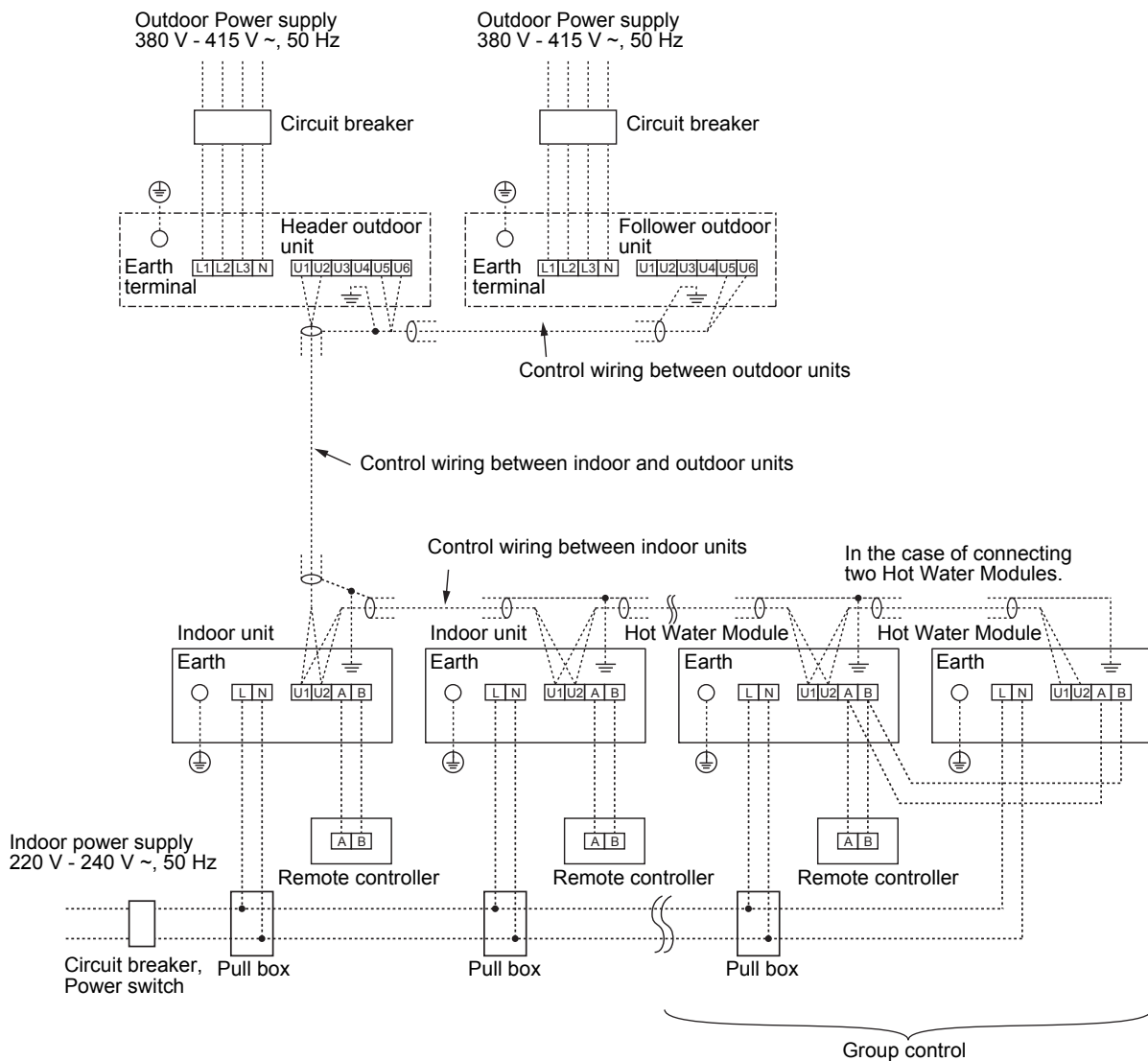
Function	Connector No.	Pin No.	Specification	Remarks
Optional output	CN60	1	DC12 V (COM)	
		2	Defrosting output	ON while outdoor unit ON
		3	Heater output	
		4	-	
		5	Heating thermostat output	ON while heating thermostat ON (compressor ON)
		6	Pump output	

Wiring between indoor (including Hot Water Module) and outdoor units

NOTE

- An outdoor unit connected with control wiring between indoor (including Hot Water Module) and outdoor units wire becomes automatically the header unit.
- Do not turn off the circuit breaker of the Hot Water Module when the circuit breaker of the system (outdoor unit) is set to the ON position.
- It becomes a cause of a trouble.

▼ **Wiring example**



▼ Power supply

- Power supply wire specification: Cable 3-core 2.5 mm², in conformity with Design 60245 IEC 57.

Power supply	220 V – 240 V ~, 50 Hz	
Power supply switch / circuit breaker or power supply wiring / fuse rating for Hot Water Module should be selected by the accumulated total current values of the Hot Water Module.		
Power supply wiring	Below 50 m	2.5 mm ²

Control wiring, Central controller wiring

- 2-core with polarity wires are used for the Control wiring between indoor unit (including Hot Water Module) and outdoor unit and Central controller wiring.
- To prevent noise trouble, use 2-core shield wire.
- The length of the communication line means the total length of the inter-unit wire length between indoor (including Hot Water Module) and outdoor units added with the central control system wire length.

▼ Communication line

Control wiring between indoor units (including Hot Water Module), and outdoor unit (2-core shield wire)	Wire size	(Up to 1000 m) 1.25 mm ² (Up to 2000 m) 2.0 mm ²
Central control line wiring (2-core shield wire)		

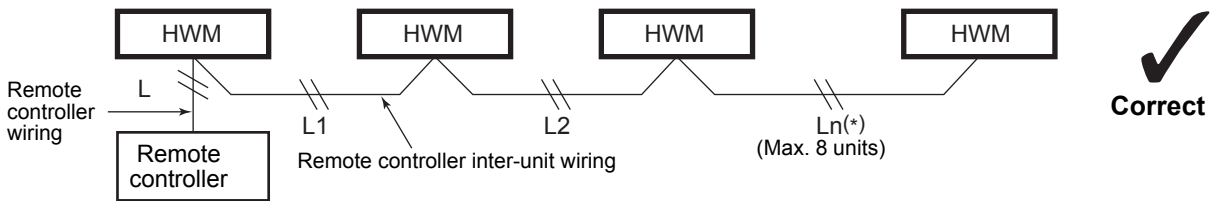
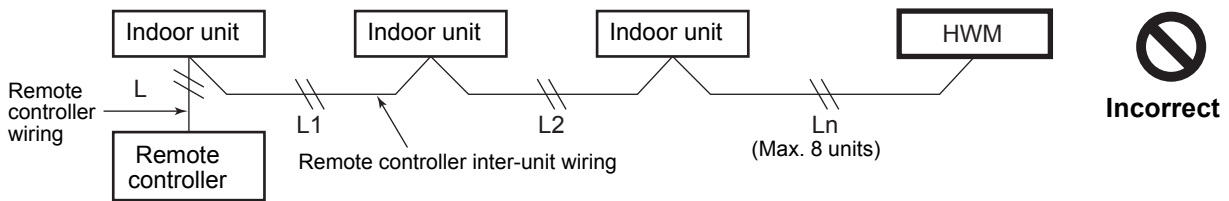
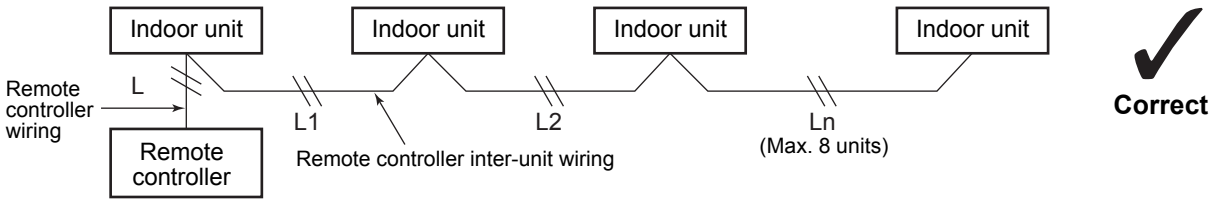
Remote controller wiring

- 2-core with non-polarity wire is used for wiring of the remote controller wiring and group remote controllers wiring.

Remote controller wiring, remote controller inter-unit wiring	Wire size: 0.5 mm ² to 2.0 mm ²	
Total wire length of remote controller wiring and remote controller inter-unit wiring = L + L1 + L2 + ... Ln	In case of wired type only	Up to 500 m
	In case of wireless type included	Up to 400 m
Total wire length of remote controller inter-unit wiring = L1 + L2 + ... Ln	Up to 200 m	

Remote controller wiring

HWM: Hot Water Module



(*) : In case of multiple refrigerant systems

NOTE

It is not possible to connect any Hot Water Modules and any indoor units together for group control.

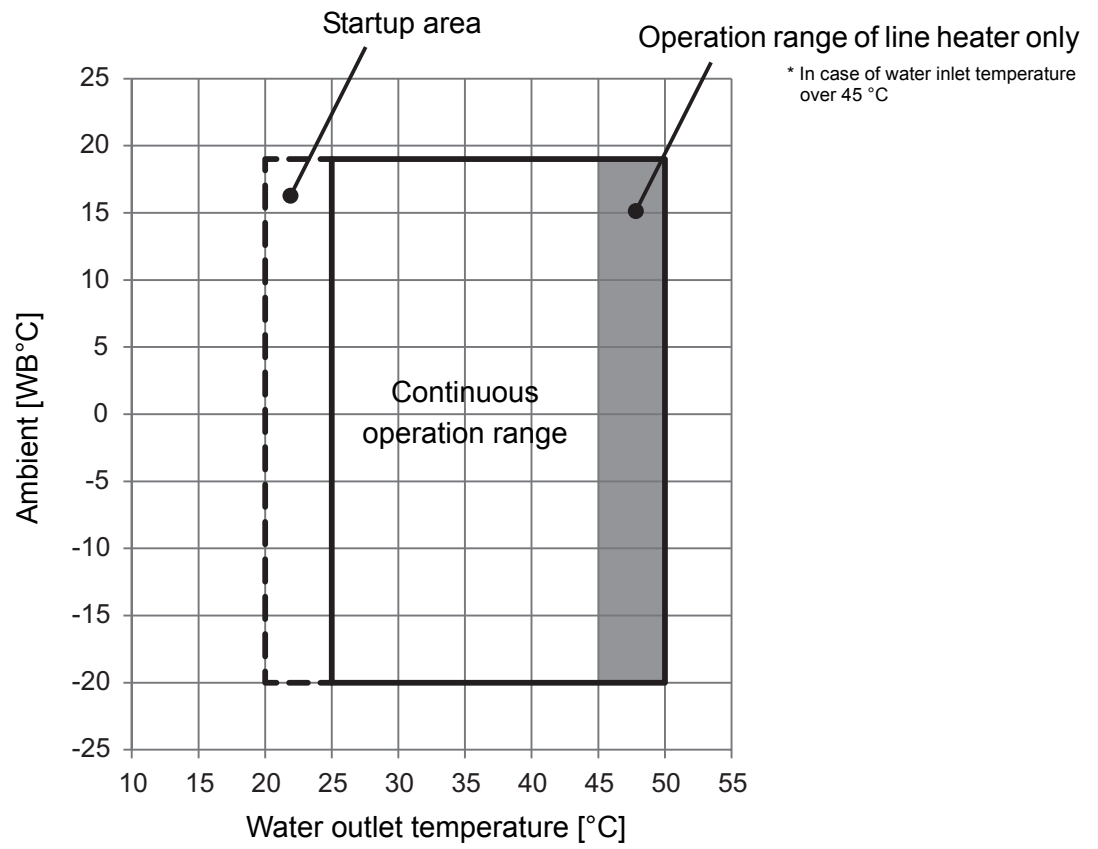
Remote controller sensor

CAUTION

Remote controller sensor can not be used for the Hot Water Module.
Remote controller sensor has no function when remote controller is connected to the Hot Water Module.

9. Water side characteristics

Hot Water Module operation temperature range



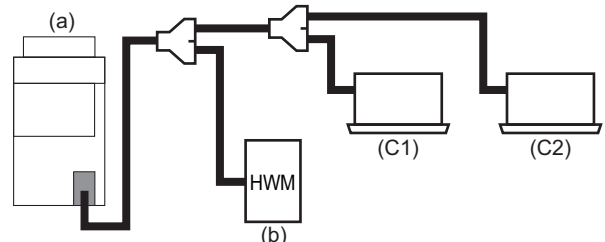
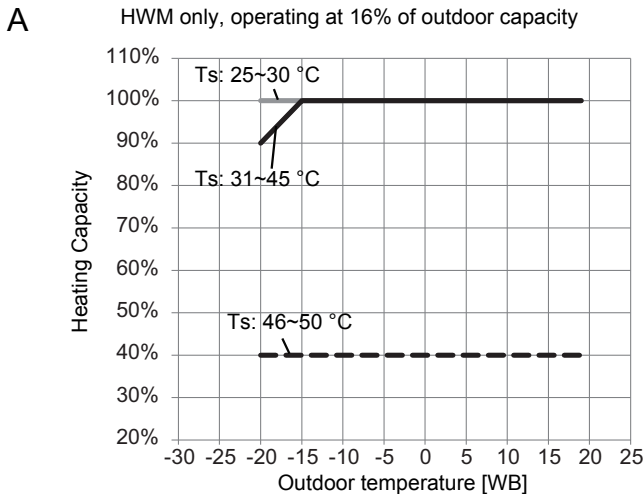
Hot Water Module capacity characteristics

As with standard air conditioners, the heating capacity of the Hot Water Module decreases according to the decrease in outdoor temperature and total indoor unit capacity (kW). (The characteristics graphs below are made using an auxiliary heater with 40% of the Hot Water Module's rated capacity and rated flow rate.*)

* rated flow rate 027 Type: 22.9 L/min, 056 Type: 45.8 L/min

The Hot Water Module does not have sufficient heating ability to be used for heating in low temperatures with no auxiliary heater. Therefore, provide a heater or similar on the side of the device being used to compensate for the lack of heating ability indicated in the characteristics graphs below.

Ts : Temperature setting
HWM: Hot Water Module



The operating ratio of the outdoor unit capacity
: N [%] = (b) or (c) / (a)

(a): Outdoor unit rated capacity [kW]

(b): Operating capacity of HWM [kW]

(c): Operating capacity of indoor unit (excluding HWM) [kW]

* Capacity is capacity code (Please see Table 1 of 1. System summary)

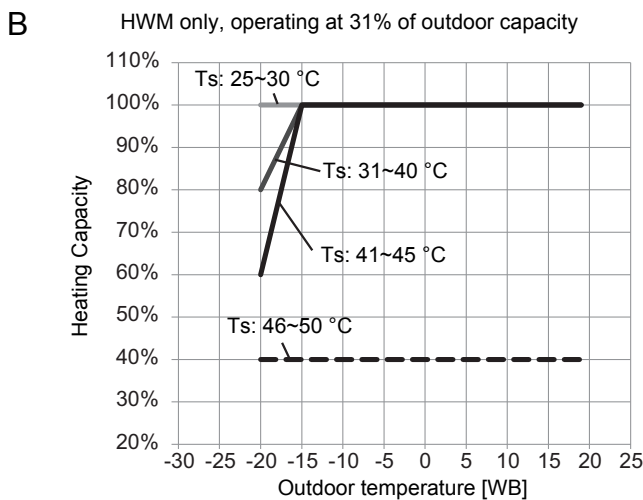
For example:

Condition A : Outdoor unit rated capacity (a) = 45 kW

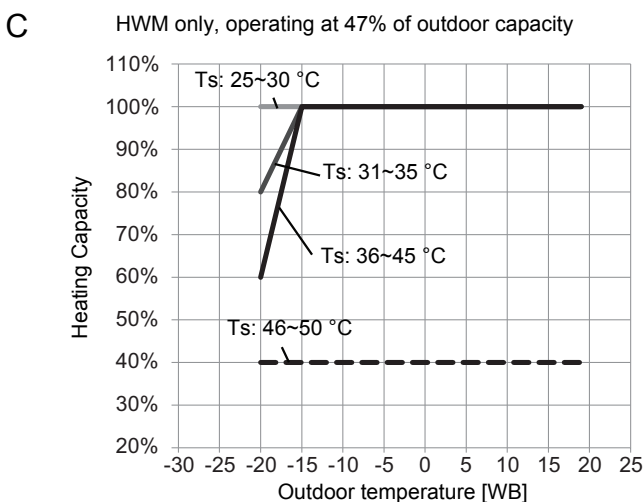
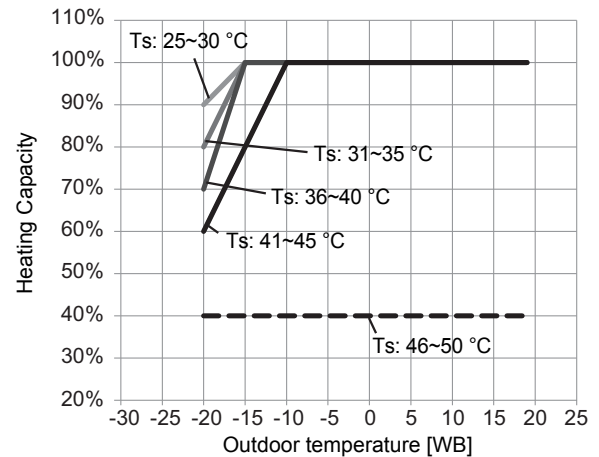
Operating capacity of HWM (b) = 7.1 kW

$N = 7.1 \text{ kW} / 45 \text{ kW}$

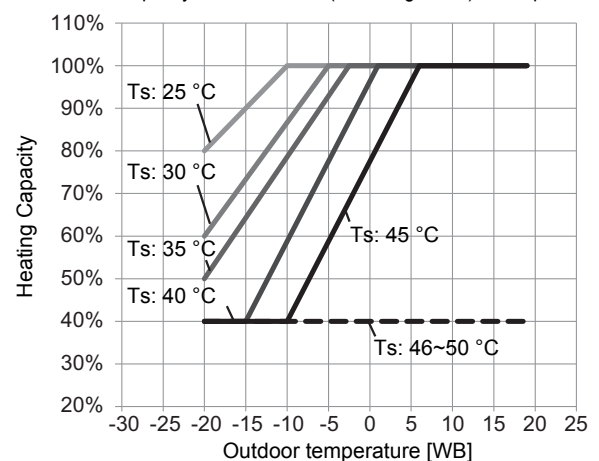
= 16%



D HWM and Indoor unit (excluding HWM) operation, HWM operation capacity: 47% of outdoor capacity and Indoor unit (excluding HWM) 6% operation

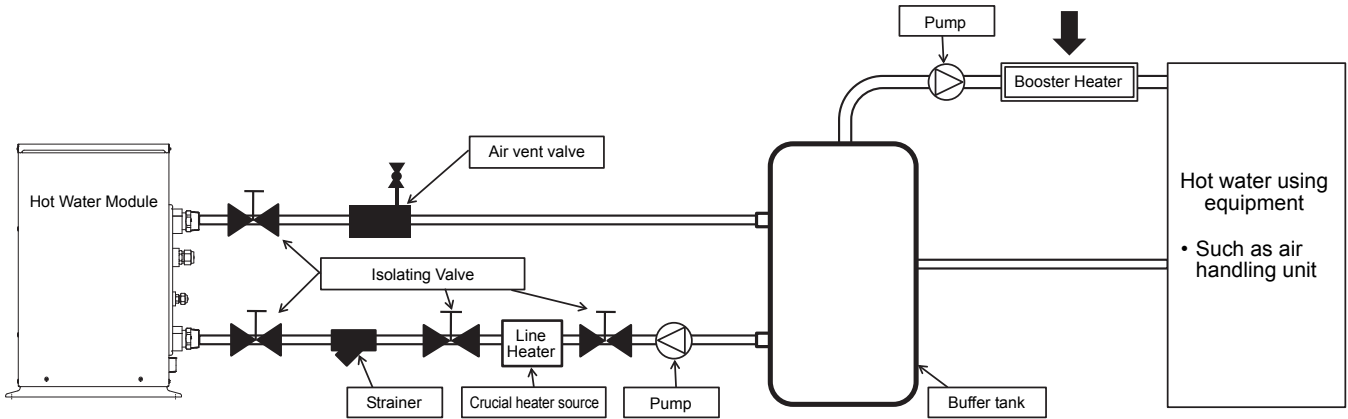


E HWM and Indoor unit (excluding HWM) operation, HWM operation capacity: 47% of outdoor capacity and Indoor unit (excluding HWM) 55% operation



Booster Heater capacity simple selection table

Water piping installation example



Booster Heater capacity (%: Hot Water Module rated capacity ratio) simple selection table

Condition examples *	Outdoor temperature WB °C	Remote controller set temperature Ts				
		25 ≤ Ts ≤ 30	31 ≤ Ts ≤ 35	36 ≤ Ts ≤ 40	41 ≤ Ts ≤ 45	46 ≤ Ts ≤ 50
A	-20 ≤ TO < -15	-	10	10	10	60
	-15 ≤ TO ≤ 19	-	-	-	-	60
B	-20 ≤ TO < -15	-	20	20	40	60
	-15 ≤ TO ≤ 19	-	-	-	-	60
C	-20 ≤ TO < -15	-	20	40	40	60
	-10 ≤ TO ≤ 19	-	-	-	-	60
D	-20 ≤ TO < -15	10	20	30	40	60
	-15 ≤ TO < -10	-	-	-	20	60
	-10 ≤ TO ≤ 19	-	-	-	-	60
E	-20 ≤ TO < -10	40	50	60	60	60
	-10 ≤ TO < -5	13	22	43	60	60
	-5 ≤ TO < -3	-	8	22	43	60
	-3 ≤ TO < 1	-	-	13	33	60
	1 ≤ TO < 6	-	-	-	18	60
	6 ≤ TO ≤ 19	-	-	-	-	60

* Conditions A to B see the graphs Hot Water Module capacity characteristics

TO: Outdoor temperature

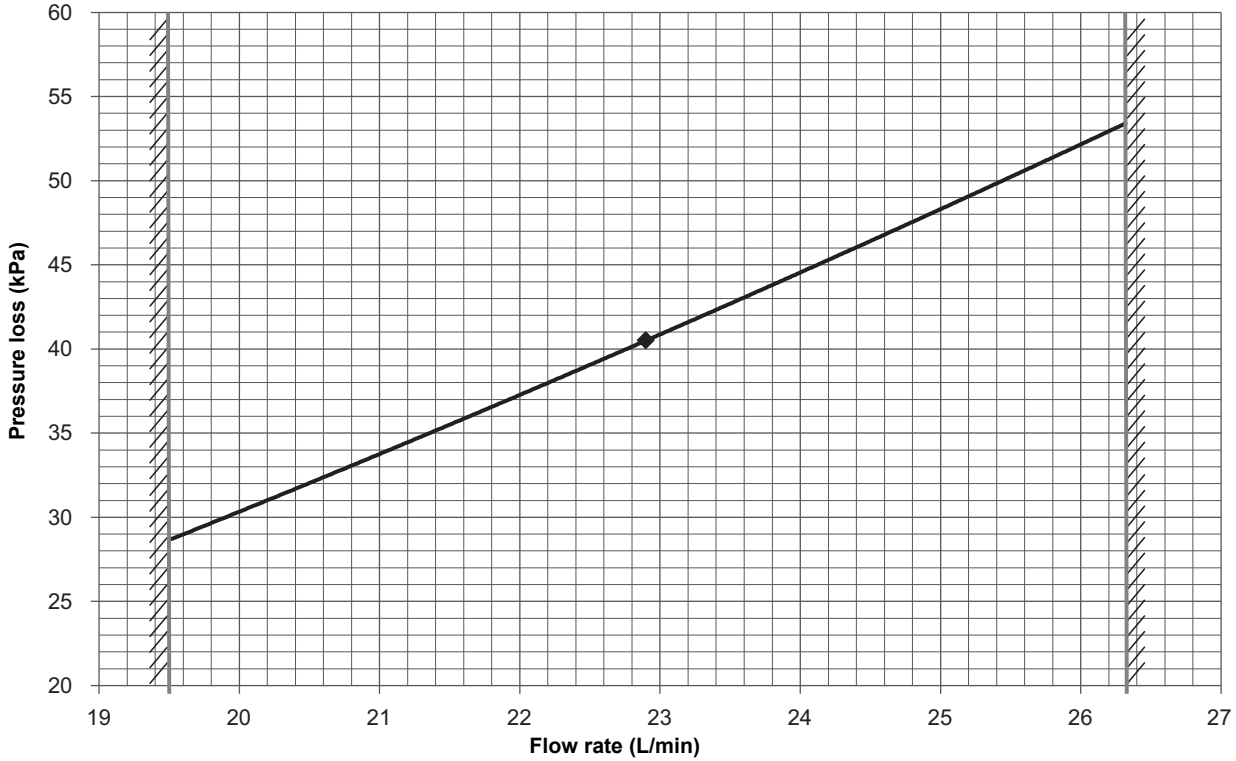
The table shows the values in the case of connecting the heater of 40% Hot Water Module rated capacity ratio.

Characteristics of Hot Water Module flow rate and pressure loss

The following graph shows the range of flow rates used for the Hot Water Module, and the characteristic pressure losses. Use this as an aid in the local pump procurement process.

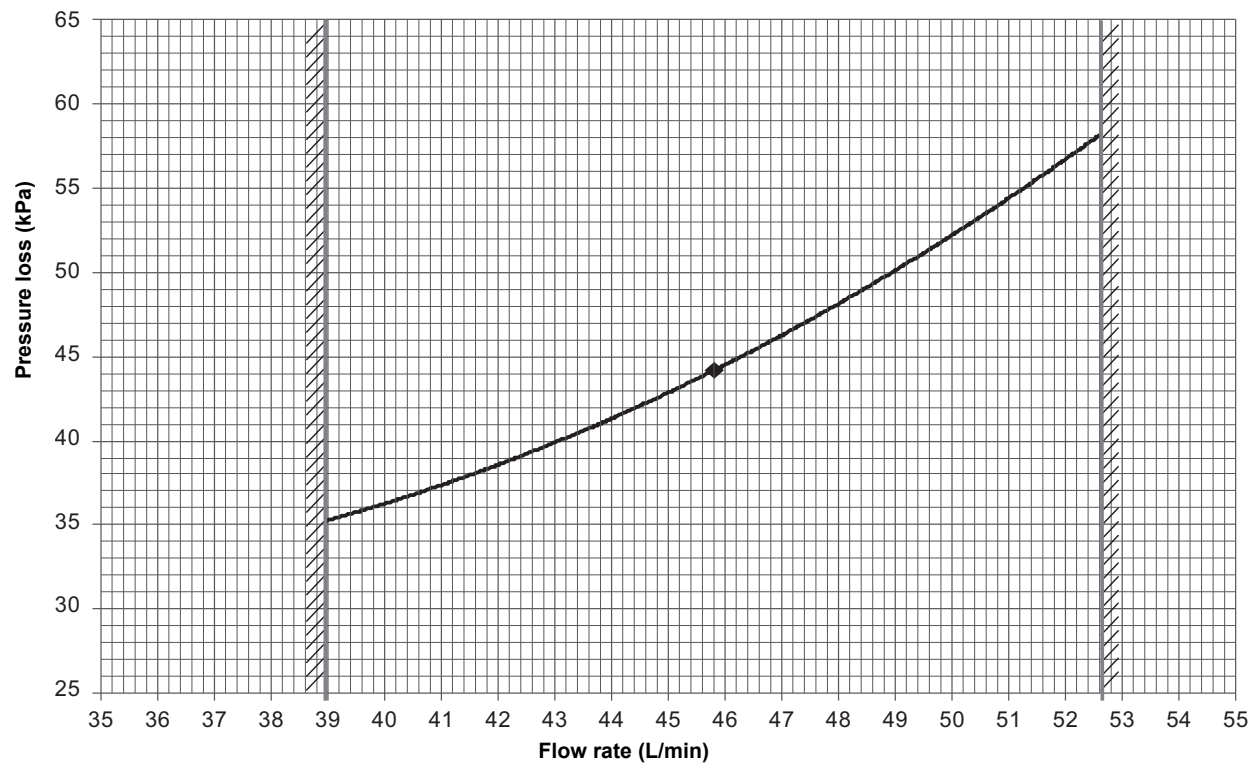
027 type

	Minimum	Rated	Maximum
Water flow rate (L/min)	19.5	22.9	26.3
Pressure loss (kPa)	28.5	40.5	53.5



056 type

	Minimum	Rated	Maximum
Water flow rate (L/min)	38.9	45.8	52.6
Pressure loss (kPa)	35.2	44.2	58.2



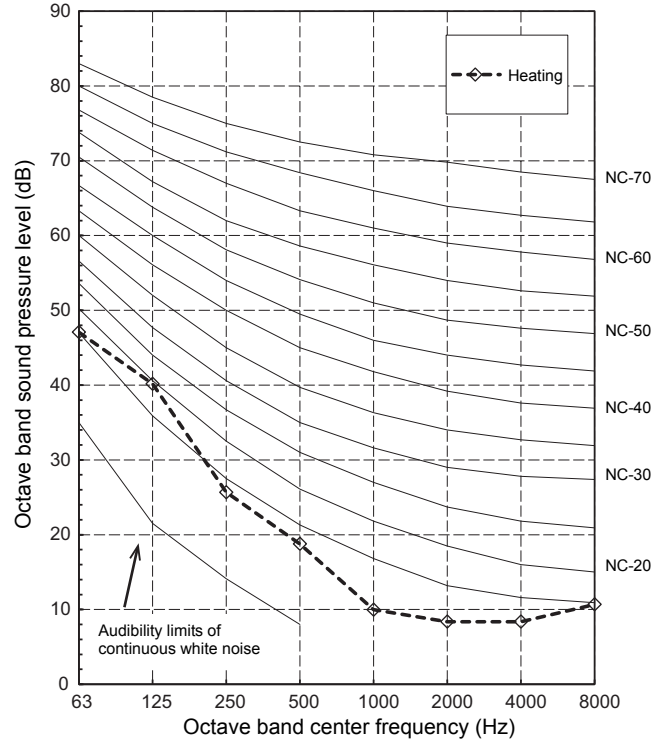
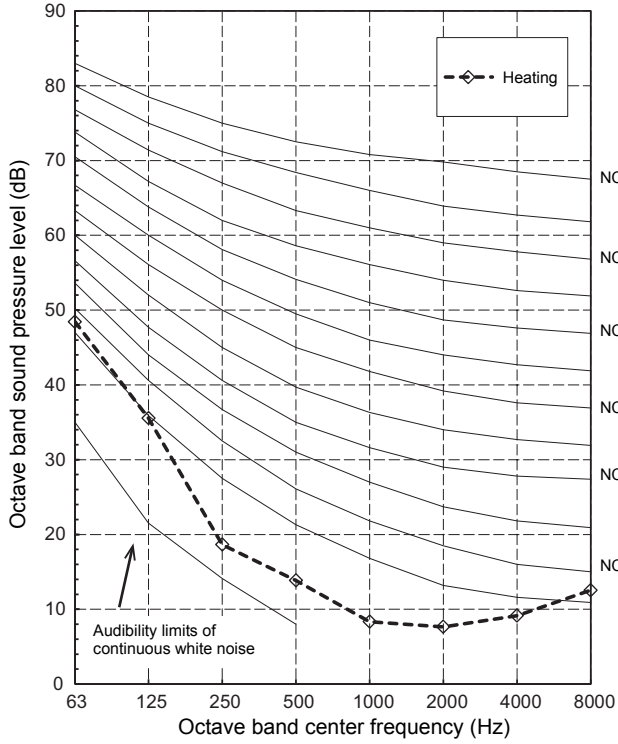
10. Sound data

Sound characteristics of Hot Water Module
MMW-AP0271LQ-E/TR

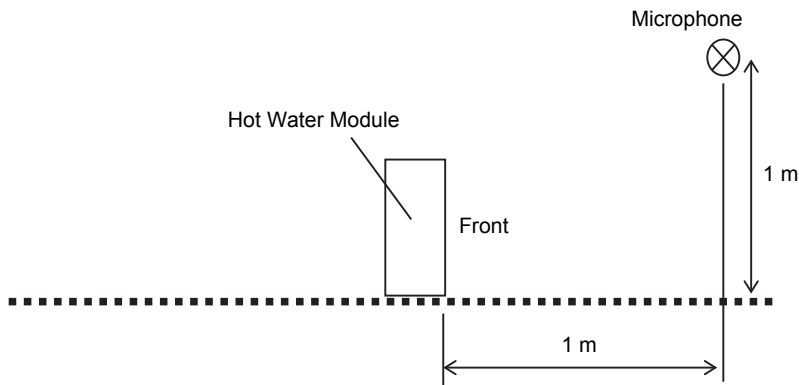
Sound pressure level dB(A)	Heating
	25

MMW-AP0561LQ-E/TR

Sound pressure level dB(A)	Heating
	27



Measuring location



11. Caution of installation

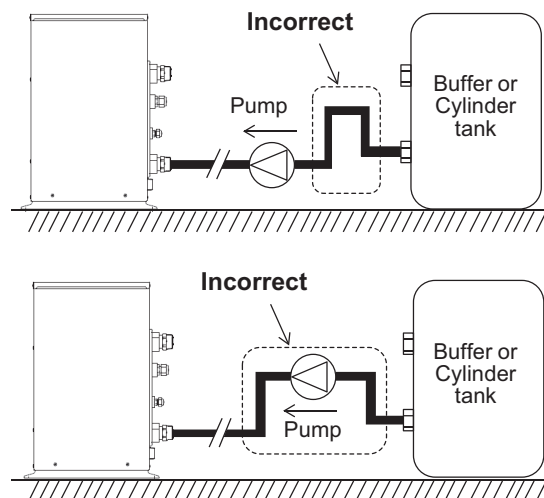
Water piping

⚠ WARNING

- Install water pipes according to the regulations of respective countries.
- Install water pipes in the freeze-free place.
- Make sure that water pipes have sufficient pressure resistance. The design pressure is 1.0 MPa.

⚠ CAUTION

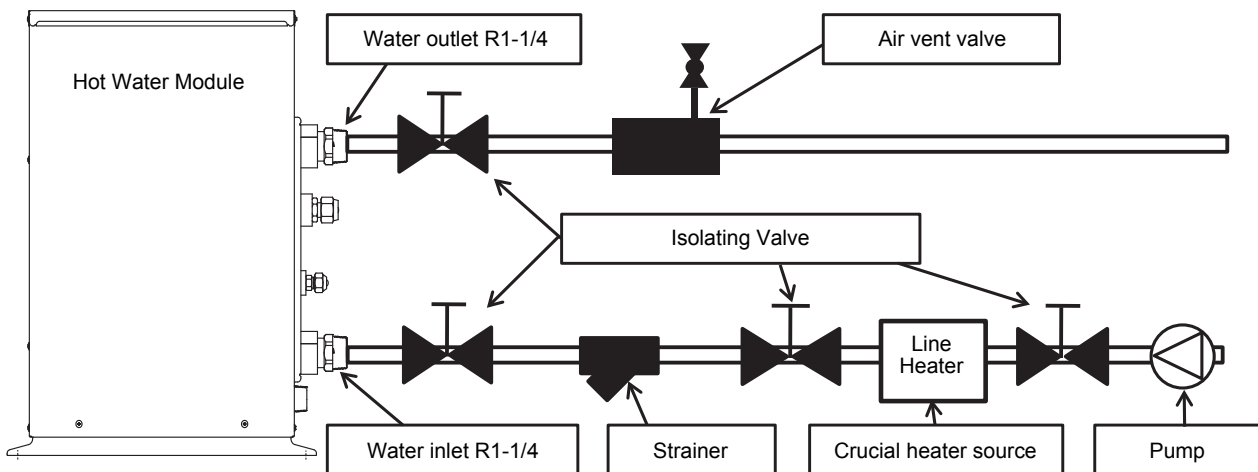
- Do not use zinc plated water pipes. When steel pipes are used, insulate both ends of the pipes.
- Copper pipes are recommended.
- The water to be used must meet the water quality standard specified in EN directive 98/83 EC.
- **After the vacuuming is completed, carry out the following procedure before adding refrigerant.**
- Plate heat exchanger may explode because the water in the plate heat exchanger frozen.
To avoid this phenomenon, add refrigerant before carrying out a water supply to the water pipe system of the Hot Water Module.
- The hot water module and the buffer/cylinder tank must be installed on the same floor height.
- The water piping on the inlet side of the hot water module must not be connected with right-angled loop piping (refer to the figure below).
- When flow switch detects a decrease in the water flow rate, the outdoor unit stops.



Water piping and line heater installation

- Make the piping route a closed circuit. (An open water circuit may cause a failure.)
- Before a long period of none use, purge the water out of the pipes and thoroughly let them dry.
- Do not add brine to the circulating water.
- Do not use the water used for the unit for drinking or food manufacturing.
- To ensure easy maintenance, inspection, and replacement of the unit, use a proper joint, valve, etc. (procured locally) on the water inlet and outlet port.
- Be sure to install a strainer with 30 to 40 meshes (procured locally) on the water inlet pipe. If a strainer is not installed, this may cause impaired performance, or damage to the plate heat exchanger from freezing.
- Install a suitable air vent (procured locally) on the water pipe. After sending water through the pipe, be sure to vent the excess air.
- To avoid water leak, wrap some sealing tape around the screw part.
- Water pipes can get very hot, depending on the preset temperature. Wrap the water pipes with heat insulation (procured locally) to prevent burns.
- Be sure to install the line heater (procured locally) on the water inlet side. In addition, position it within 5 m of the water inlet pipe of the Hot Water Module.
- Follow the table below to select a line heater (procured locally) within the range of 40 to 50% of the Hot Water Module's rated capacity.

Hot Water Module model name	Capacity of line heater (kW)
MMW-AP0271LQ-E/-TR	3.2~4.0
MMW-AP0561LQ-E/-TR	6.4~8.0

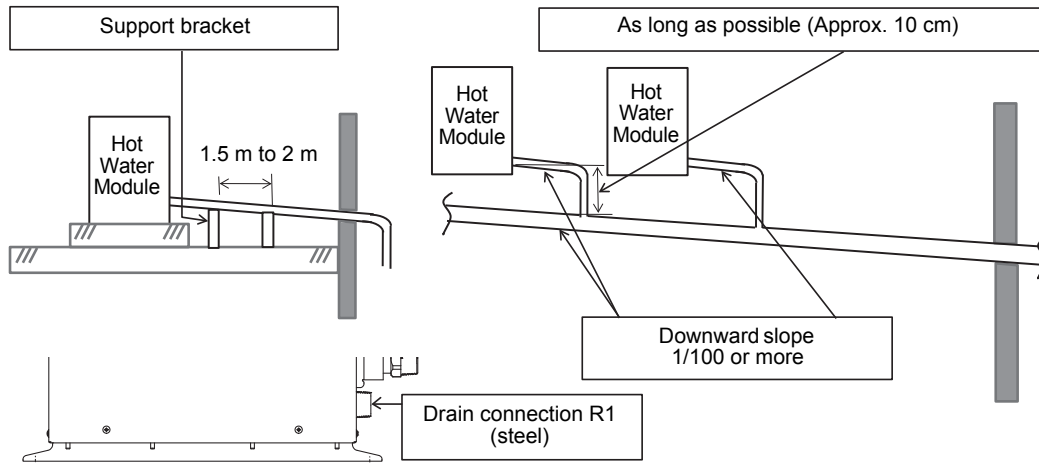


Pipe size, material and insulator

The following specification for piping work and insulating process are procured locally.

Model		MMW-	AP027	AP056
Connecting pipe (unit side)	Water pipe	Inlet	R1 - 1/4	
		Outlet	R1 - 1/4	
Connecting pipes material			Copper pipes are recommended	
Insulator			Formed polyethylene foam, thickness: 10 mm or more	

Drain piping



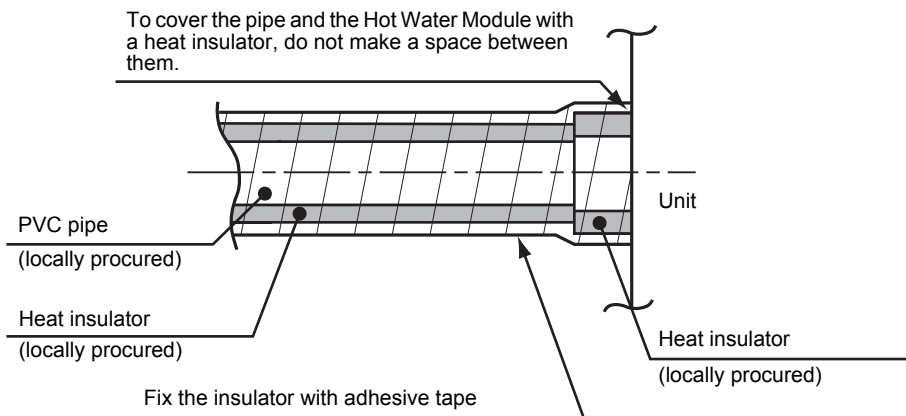
Pipe material, size and insulator

The following materials for piping work and insulating process are procured locally.

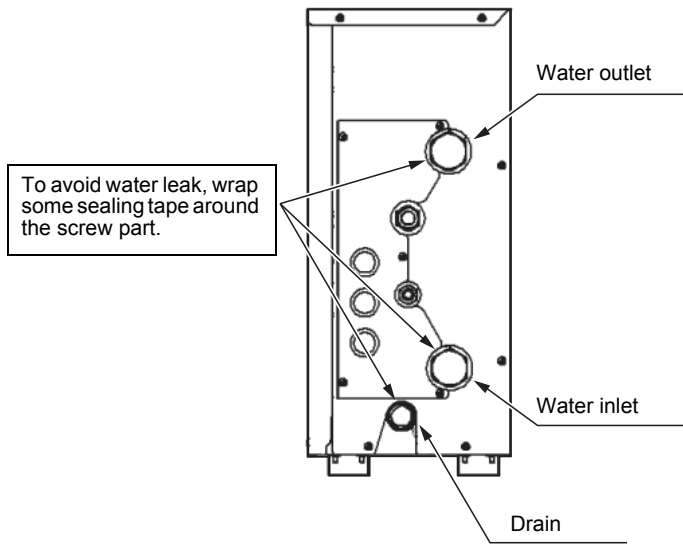
Pipe material	Hard vinyl chloride pipe, VP25A (Nominal outer diameter 32 mm)
Insulator	Foamed polyethylene foam, thickness: 10 mm or more

Heat insulating process

- After drain check, covering the heat insulator for drain connecting section, wrap the drain pipe with heat insulator (Locally procured) without clearance from the end of the drain pipe connecting port of the Hot Water Module.



Check the following contents



Selection of installation place

Avoid installing in the following places

Select a location for the indoor unit where the cool or warm air will circulate evenly.

Avoid installation in the following kinds of locations.

- Saline area (coastal area)
- Locations with acidic or alkaline atmospheres (such as areas with hot springs, factories where chemicals or pharmaceuticals are made and places where the exhaust air from combustion appliances will be sucked into the unit).
Doing so may cause the heat exchanger and other parts to become corroded.
- Locations with atmospheres with mist of cutting oil or other types of machine oil.
Doing so may cause the heat exchanger to become corroded, mists caused by the blockage of the heat exchanger to be generated, the plastic parts to be damaged, the heat insulators to peel off, and other such problems to result.
- Locations where vapors from food oils are formed (such as kitchens where food oils are used).
The plastic parts to be damaged, and other such problems to result.
- Locations where an in-house power generator is used for the power supply.
The power line frequency and voltage may fluctuate, and the Hot Water Module may not work properly as a result.
- On truck cranes, ships or other moving conveyances.
- The Hot Water Module must not be used for special applications (such as for storing food, plants, precision instruments or art works).
(The quality of the items stored may be degraded.)
- Locations where high frequencies are generated (by inverter equipment, in-house power generators, medical equipment or communication equipment).
(Malfunctioning or control trouble in the Hot Water Module or noise may adversely affect the equipment's operation.)
- Locations where there is anything under the unit installed that would be compromised by wetness.
(If the drain has become blocked or when the humidity is over 85%, condensation from the Hot Water Module will drip, possibly causing damage to anything underneath.)
- In the case of the wireless type of system, rooms with the inverter type of fluorescent lighting or locations exposed to direct sunlight.
(The signals from the wireless remote controller may not be sensed.)
- Locations where organic solvents are being used.
- The Hot Water Module cannot be used for liquefied carbonic acid cooling or in chemical plants.
- Location near doors or windows where the Hot Water Module may come into contact with high-temperature, high humidity outdoor air.
(Condensation may occur as a result.)
- Locations where special sprays are used frequently.
- Places where iron or other metal dust is present. If iron or other metal dust adheres to or collects on the interior of the Hot Water Module, it may spontaneously combust and start a fire.
- Locations such as living rooms and bedrooms where you can easily be bothered by noise. Noise may become a problem.

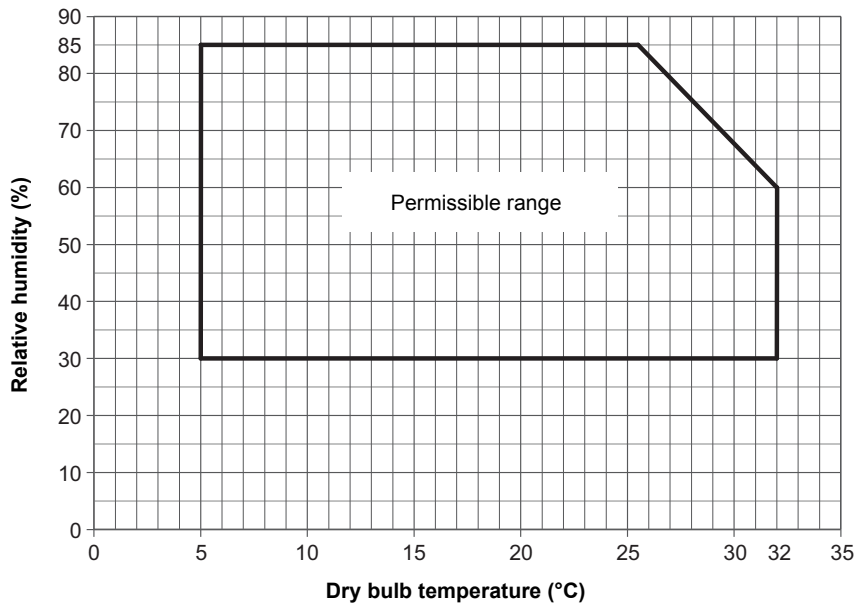
CAUTION

- Do not install Hot Water Module in a place where water freezes.
- Do not install the Hot Water Module in a place where combustible gas may leak.
- Do not install the Hot Water Module in a place exposed to rain or water.
- Do not install the Hot Water Module near equipment which generates heat.
- Do not install the Hot Water Module to a movable object.
- Do not install the Hot Water Module in a place exposed to vibration.
- The Hot Water Module must be installed in accordance with national wiring regulation.
- The Hot Water Module must not be installed in a high humidity condition area.

Installation atmosphere

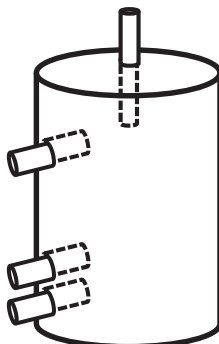
Installation atmosphere of the unit is as follows. Be careful of installation atmosphere. It becomes a cause of failure of a product by dewing or freezing.

Installation atmosphere	Dry-bulb temp. (°C)	5 to 32
	Wet-bulb temp. (°C)	24 (Max.)
	RH (%)	30 to 85
	Allowable dew point (°C Wet-bulb temp)	23 or less



Buffer Tank Installation

A buffer tank must be installed in order to stabilize the temperature of the water supplied when using a Hot Water Module to the heating equipment such as a radiator or floor heating.

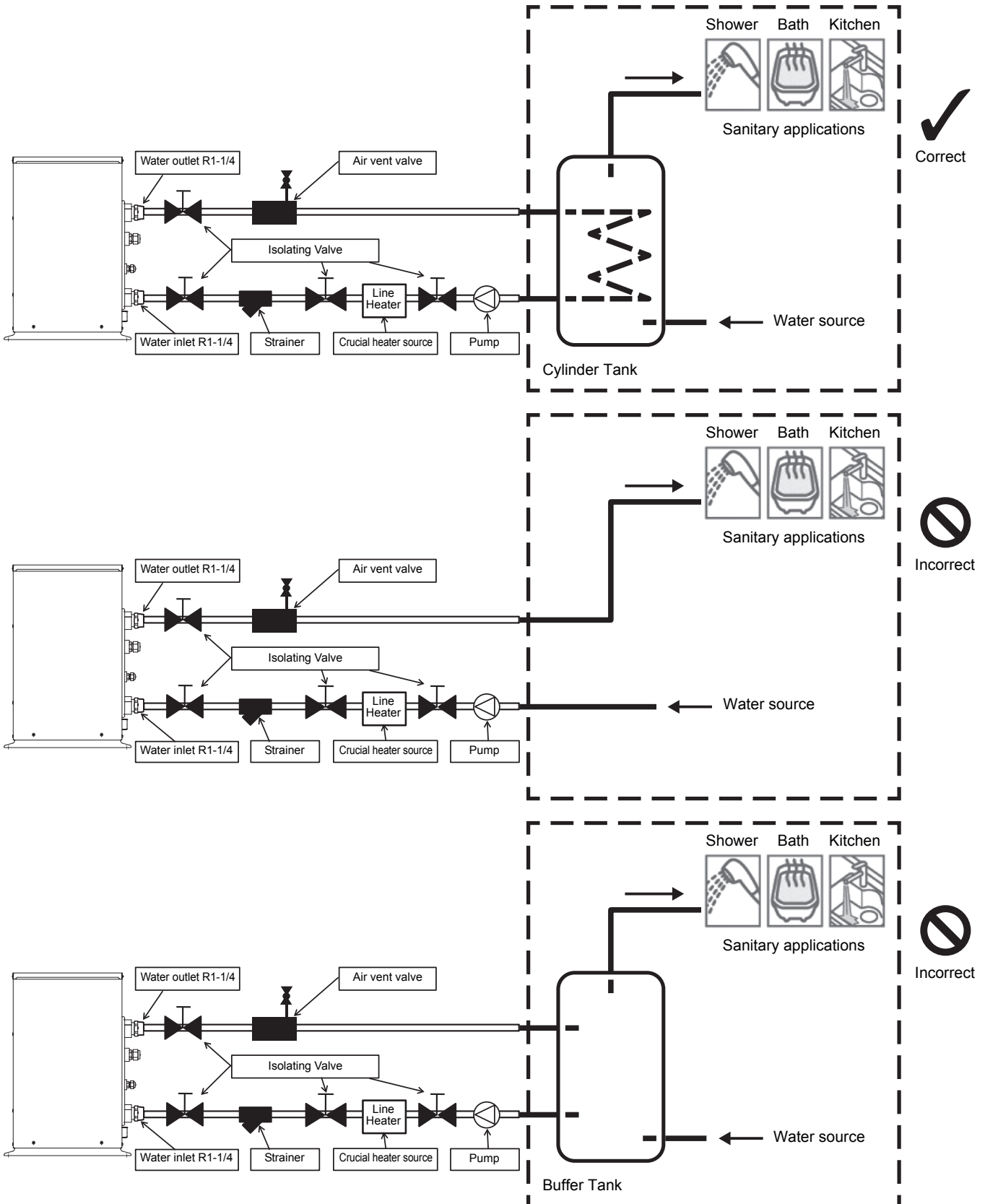


Buffer tank for space heating

Cylinder Tank Installation (For sanitary applications)

A cylinder tank must be installed in order to protect for Hot Water Module when used in sanitary applications. For Hot water module protection, always install a cylinder tank.

If the cylinder tank is not installed, the temperature of the water does not rise, or problems occurs that do not come up with warm air from the air conditioner, which is connected to the same refrigerant piping.



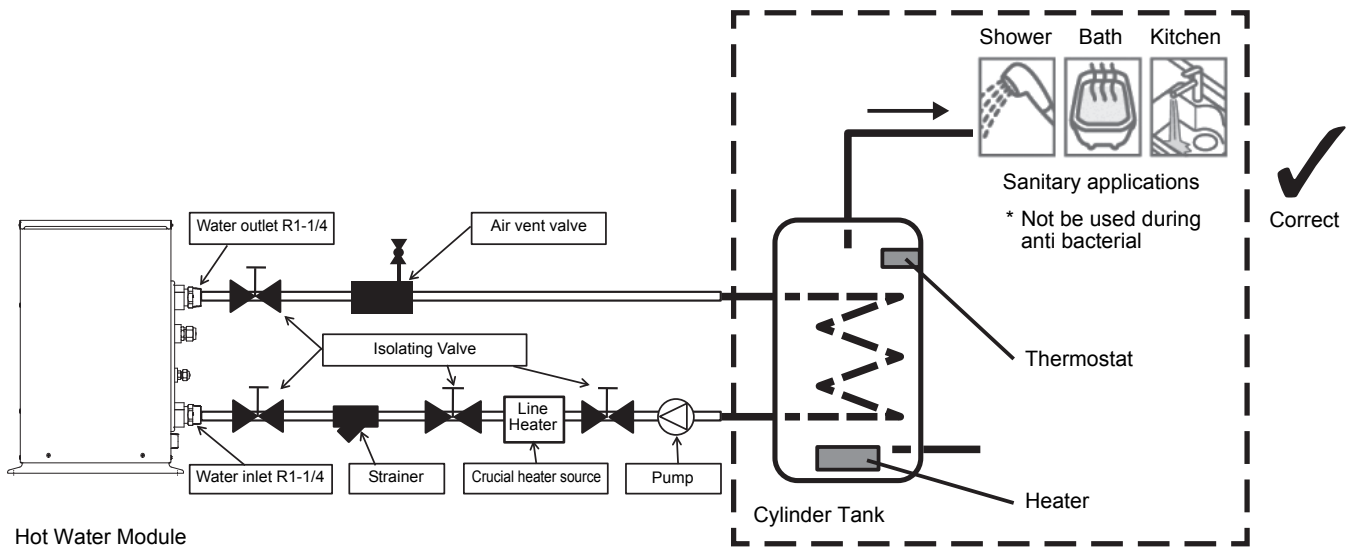
Antibacterial (For Sanitary applications)

There is no function of Antibacterial on Hot Water Module.

Heater and thermostat in local must be installed in case of use the function of antibacterial.

Shown the example following diagram.

- * Should stop operation of the Hot Water Module during antibacterial.
In case of operating the Hot Water Module during antibacterial, there is possibility of failure on the Hot Water Module.



Hot Water Module

* Should be operation stop during antibacterial

External (Support) Line Heater Installations

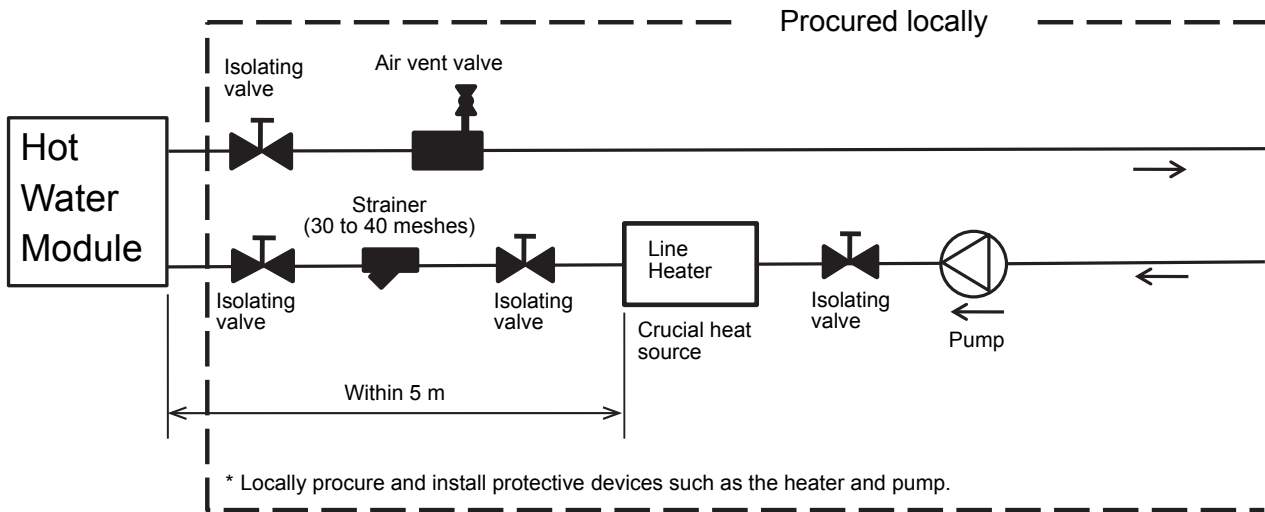
Be sure to install a heater in the Hot Water Module.

Not installing a heater causes problems such as the HWM water heat exchanger freezing and loss of heating ability.

[1] Install the heater within 5 m of the water pipe between the Hot Water Module and the water pump, and 5 m of the HWM pipe connections.

[2] Select a heater with a capacity of 40 to 50% of the rated capacity of the HWM.

[3] To prevent fires caused by overheating, use a heater with safeguards such as a fuse and temperature type protective switch.



Hot Water Module Engineering Data Book

Model name:

MMW-AP__1LQ

October, 2016 First Edition

TOSHIBA CARRIER CORPORATION