

*Changes for the Better*

for a greener tomorrow



AIR CONDITIONING SYSTEMS

MODEL

**PWFY-P200VM-E1-AU**

**- For high temperature flow**

**DATA BOOK**

# Safety Precautions

- Before installing the unit, thoroughly read the following safety precautions.
- Observe these safety precautions for your safety.

## WARNING

This symbol is intended to alert the user to the presence of important instructions that must be followed to avoid the risk of serious injury or death.

## CAUTION

This symbol is intended to alert the user to the presence of important instructions that must be followed to avoid the risk of serious injury or damage to the unit.

- After reading this manual, give it to the user to retain for future reference.
- Keep this manual for easy reference. When the unit is moved or repaired, give this manual to those who provide these services.  
When the user changes, make sure that the new user receives this manual.

## WARNING

- **Do not use refrigerant other than the type indicated in the manuals provided with the unit and on the nameplate.**
  - Doing so may cause the unit or pipes to burst, or result in explosion or fire during use, during repair, or at the time of disposal of the unit.
  - It may also be in violation of applicable laws.
  - MITSUBISHI ELECTRIC CORPORATION cannot be held responsible for malfunctions or accidents resulting from the use of the wrong type of refrigerant.
- **Do not use steel pipes as water pipes.**
  - Copper pipes are recommended.
- **The water circuit should be a closed circuit.**
- **Ask the dealer or an authorized technician to install the air conditioner.**
  - Improper installation by the user may result in water leakage, electric shock, or fire.
- **Install the unit in a place that can withstand its weight.**
  - Inadequate strength may cause the unit to fall down, resulting in injuries.
- **Do not touch the unit. The unit surface can be hot.**
- **Do not install the unit where corrosive gas is generated.**
- **Use the specified cables for wiring. Make the connections securely so that the outside force of the cable is not applied to the terminals.**
  - Inadequate connection and fastening may generate heat and cause a fire.
- **Prepare for rain and other moisture and earthquakes and install the unit at the specified place.**
  - Improper installation may cause the unit to topple and result in injury.
- **Always use a strainer and other accessories specified by Mitsubishi Electric.**
  - Ask an authorized technician to install the accessories. Improper installation by the user may result in water leakage, electric shock, or fire.
- **Never repair the unit. If the air conditioner must be repaired, consult the dealer.**
  - If the unit is repaired improperly, water leakage, electric shock, or fire may result.
- **Do not touch the refrigerant pipes and Water pipes.**
  - Improper handling may result in injury.
- **When handling this product, always wear protective equipment.**  
**EG: Gloves, full arm protection namely boiler suit, and safety glasses.**
  - Improper handling may result in injury.
- **If refrigerant gas leaks during installation work, ventilate the room.**
  - If the refrigerant gas comes into contact with a flame, poisonous gases will be released.
- **Install the unit according to this manual.**
  - If the unit is installed improperly, water leakage, electric shock, or fire may result.
- **Have all electric work done by a licensed electrician according to “Electric Facility Engineering Standard” and “Interior Wire Regulations” and the instructions given in this manual and always use a special circuit.**
  - If the power source capacity is inadequate or electric work is performed improperly, electric shock and fire may result.
- **Keep the electric parts away from water (washing water etc.).**
  - It might result in electric shock, catching fire or smoke.
- **Securely install the heat source unit terminal cover (panel).**
  - If the terminal cover (panel) is not installed properly, dust or water may enter the heat source unit and fire or electric shock may result.
- **When installing and moving the air conditioner to another site, do not charge it with a refrigerant different from the refrigerant (R410A) specified on the unit.**
  - If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.

- **If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.**
  - Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, hazards due to lack of oxygen in the room could result.
- **When moving and reinstalling the air conditioner, consult the dealer or an authorized technician.**
  - If the air conditioner is installed improperly, water leakage, electric shock, or fire may result.
- **After completing installation work, make sure that refrigerant gas is not leaking.**
  - If the refrigerant gas leaks and is exposed to a fan heater, stove, oven, or other heat source, it may generate noxious gases.
- **Do not reconstruct or change the settings of the protection devices.**
  - If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by Mitsubishi Electric are used, fire or explosion may result.
- **To dispose of this product, consult your dealer.**
- **The installer and system specialist shall secure safety against leakage according to local regulation or standards.**
  - Following standards may be applicable if local regulation are not available.
- **Pay a special attention to the place, such as a basement, etc. where refrigeration gas can stay, since refrigeration is heavier than the air.**

## Precautions for handling units for use with R410A

### CAUTION

- **Do not use the existing refrigerant piping.**
  - The old refrigerant and refrigerant oil in the existing piping contains a large amount of chlorine which may cause the refrigerant oil of the new unit to deteriorate.
  - R410A is a high-pressure refrigerant and can cause the existing piping to burst.
- **Use refrigerant piping made of C1220 (CU-DHP) phosphorus deoxidized copper as specified in the JIS H3300 "Copper and copper alloy seamless pipes and tubes". In addition, be sure that the inner and outer surfaces of the pipes are clean and free of hazardous sulphur, oxides, dust/dirt, shaving particles, oils, moisture, or any other contaminant.**
  - Contaminants on the inside of the refrigerant piping may cause the refrigerant residual oil to deteriorate.
- **Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing. (Store elbows and other joints in a plastic bag.)**
  - If dust, dirt, or water enters the refrigerant cycle, deterioration of the oil and compressor trouble may result.
- **Apply a small amount of ester oil, ether oil, or alkyl benzene to flares. (for indoor unit)**
  - Infiltration of a large amount of mineral oil may cause the refrigerant oil to deteriorate.
- **Use liquid refrigerant to fill the system.**
  - If gas refrigerant is used to seal the system, the composition of the refrigerant in the cylinder will change and performance may drop.
- **Do not use a refrigerant other than R410A.**
  - If another refrigerant (R22, etc.) is mixed with R410A, the chlorine in the refrigerant may cause the refrigerant oil to deteriorate.
- **Use a vacuum pump with a reverse flow check valve.**
  - The vacuum pump oil may flow back into the refrigerant cycle and cause the refrigerant oil to deteriorate.
- **Do not use the following tools that are used with conventional refrigerants.**  
(Gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, refrigerant recovery equipment)
  - If the conventional refrigerant and refrigerant oil are mixed in the R410A, the refrigerant may deteriorate.
  - If water is mixed in the R410A, the refrigerant oil may deteriorate.
  - Since R410A does not contain any chlorine, gas leak detectors for conventional refrigerants will not react to it.
- **Do not use a charging cylinder.**
  - Using a charging cylinder may cause the refrigerant to deteriorate.
- **Do not use antioxidant or leak-detection additive.**
- **Be especially careful when managing the tools.**
  - If dust, dirt, or water gets in the refrigerant cycle, the refrigerant may deteriorate.

## Before installing the unit

### WARNING

- **Do not install the unit where combustible gas may leak.**
  - If the gas leaks and accumulates around the unit, an explosion may result.
- **Do not use the air conditioner where food, pets, plants, precision instruments, or artwork are kept.**
  - The quality of the food, etc. may deteriorate.
- **Do not use the air conditioner in special environments.**
  - Oil, steam, sulfuric smoke, etc. can significantly reduce the performance of the air conditioner or damage its parts.
- **When installing the unit in a hospital, communication station, or similar place, provide sufficient protection against noise.**
  - The inverter equipment, private power generator, high-frequency medical equipment, or radio communication equipment may cause the air conditioner to operate erroneously, or fail to operate. On the other hand, the air conditioner may affect such equipment by creating noise that disturbs medical treatment or image broadcasting.
- **Do not install the unit on a structure that may cause leakage.**
  - When the room humidity exceeds 80 % or when the drain pipe is clogged, condensation may drip from the indoor unit. Perform collective drainage work together with the unit, as required.

## Before installing the unit (moving and reinstalling the unit) and performing electrical work

### CAUTION

- **Ground the unit.**
  - Do not connect the ground wire to gas or water pipes, lightning rods, or telephone ground lines. Improper grounding may result in electric shock.
- **Install the power cable so that tension is not applied to the cable.**
  - Tension may cause the cable to break and generate heat and cause a fire.
- **Install a leak circuit breaker, as required.**
  - If a leak circuit breaker is not installed, electric shock may result.
- **Use power line cables of sufficient current carrying capacity and rating.**
  - Cables that are too small may leak, generate heat, and cause a fire.
- **Use only a circuit breaker and fuse of the specified capacity.**
  - A fuse or circuit breaker of a larger capacity or a steel or copper wire may result in a general unit failure or fire.
- **Do not wash the air conditioner units.**
  - Washing them may cause an electric shock.
- **Be careful that the installation base is not damaged by long use.**
  - If the damage is left uncorrected, the unit may fall and cause personal injury or damage property.
- **Install the drain piping according to this manual to ensure proper drainage. Wrap thermal insulation around the pipes to prevent condensation.**
  - Improper drain piping may cause water leakage and damage to furniture and other possessions.
- **Be very careful about product transportation.**
  - If the unit weighs more than 20kg, carry the unit with more than one person.
  - Some products use PP bands for packaging. Do not use any PP bands for a means of transportation. It is dangerous.
  - When transporting the unit, support it at the specified positions on the unit base. Also support the unit at four points so that it cannot slip side ways.
- **Safely dispose of the packing materials.**
  - Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
  - Tear apart and throw away plastic packaging bags so that it is out of reach of children. If children play with a plastic bag which was not torn apart, they face the risk of suffocation.

## Before the test run

### CAUTION

- **Turn on the power at least 12 hours before starting operation.**
  - Starting operation immediately after turning on the main power switch can result in severe damage to internal parts. Keep the power switch turned on during the operational season.
- **Do not touch the switches with wet fingers.**
  - Touching a switch with wet fingers can cause electric shock.
- **Do not touch the refrigerant pipes during and immediately after operation.**
  - During and immediately after operation, the refrigerant pipes are may be hot and may be cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes.
- **Do not operate the air conditioner with the panels and guards removed.**
  - Rotating, hot, or high-voltage parts can cause injuries.
- **Do not turn off the power immediately after stopping operation.**
  - Always wait at least five minutes before turning off the power. Otherwise, water leakage and trouble may occur.
- **Do not touch the surface of the compressor during servicing.**
  - If unit is connected to the supply and not running, crank case heater at compressor is operating.
- **Do not touch the panels near the fan outlet with bare hands: they can get hot while the unit is in operation (even if it is stopped) or immediately after operation to prevent burns. Wear gloves to protect your hands when it is necessary to touch the panels.**
- **While the unit is in operation or immediately after operation, high-temperature exhaust air may blow out of the fan exhaust outlet. Do not hold your hands over the outlet or touch the panels near the outlet.**
- **Be sure to provide a pathway for the exhaust air from the fan.**
- **Water pipes can get very hot, depending on the preset temperature. Wrap the water pipes with insulating materials to prevent burns.**

# Contents

## Safety Precautions

### I General Equipment Descriptions

1. Unit configuration table..... 1
2. Operable temperature range ..... 1
3. Setting of Dip switch..... 1

### II Product Specifications

1. Specifications ..... 2
  - (1) PWFY-P200VM-E1-AU (for high temperature flow)
2. External Dimensions ..... 3
  - (1) PWFY-P200VM-E1-AU
  - (2) PUHY-P300YJM-A(-BS)
  - (3) PQHY-P300YHM-A
3. Electrical Wiring Diagrams..... 6
  - (1) PWFY-P200VM-E1-AU
  - (2) PUHY-P300YJM-A(-BS)
  - (3) PQHY-P300YHM-A
4. Accessories..... 9
  - (1) PWFY

### III Product Data

1. Capacity tables..... 10
  - (1) Correction by temperature (Estimated performance without defrost)
  - (2) Correction by water flow rate
  - (3) Correction at frosting and defrosting
  - (4) Water pressure drop
  - (5) Operation temperature range
2. Sound pressure levels ..... 18
  - (1) PWFY-P200VM-E1-AU
3. Refrigerant circuit diagrams and thermal sensors... 18
  - (1) PWFY-P200VM-E1-AU

### IV Installation

1. How to calculate the necessary heating capacity.. 19
  - (1) Heating capacity calculation
  - (2) Calculation example
2. Installation..... 20
  - (1) Selecting an installation site (for PWFY unit)
  - (2) Installing the unit
  - (3) Refrigerant pipe and drain pipe specifications
  - (4) Connecting refrigerant pipes and drain pipes

3. Water pipe installation..... 27
  - (1) Water circuit sample
  - (2) Selecting a water pump
  - (3) Installing the strainer
  - (4) Precautions during installation
  - (5) Example of unit installation
  - (6) Insulation installation
  - (7) Flow switch installation
  - (8) Water processing and water quality control
  - (9) Brine
  - (10) Pump interlock
  - (11) Anti freeze mode (Dip SW4-4 ON)

### V System Design

1. Electrical work ..... 34
  - (1) General cautions
  - (2) Power supply for PWFY unit
  - (3) Connecting remote controller, indoor and outdoor transmission cables
  - (4) Transmission cable specifications
  - (5) Connecting electrical connections
  - (6) Indoor unit address setting
  - (7) External input/output function

### VI Controller

1. PAR-W21MAA specifications..... 40
2. Dip switch functions ..... 41

### VII Maintenance Cycle

1. Routine maintenance checks ..... 42
2. Parts Replacement Cycle..... 42

# I | General Equipment Descriptions

---

## 1. Unit configuration table

Model Name	ATW unit	PWFY-P200VM-E1-AU	
	Outdoor unit (Heat source unit)	PUHY-P300YJM-A	PQHY-P300YHM-A

## 2. Operable temperature range

		PWFY	
		Cooling	Heating
Inlet water temperature		10 to 35°C	10 to 54°C
Outdoor temperature	Y series	-5 to 46°CDB	-5 to 15.5°CWB *1
Circulating water temperature	WY series	10 to 45°C	10 to 45°C

\*1. Temp. range for high-temperature specifications. When the outdoor temperature is between -20°C(-4 °F)W.B. and -5°C(23 °F)W.B., the inlet water temperature range will be between 10°C(50 °F) and 40°C(104 °F).

## 3. Setting of Dip switch

<Outdoor unit (Heat source unit)>  
Dip SW 3-7 OFF, Dip SW 4-7 ON

<ATW unit>  
Dip SW 1-6 ON, Dip SW 3-8 ON



# Product Specifications

## 1. Specifications

### (1) PWFY-P200VM-E1-AU (for high temperature flow)

Model				PWFY-P200VM-E1-AU (for high temperature flow)	
Power source				1-phase 220-230-240V 50/60Hz	
Heating capacity		Nominal	*1 kW	25.0	
			*1 kcal / h	21,500	
			*1 BTU / h	85,300	
		High temp. flow Heating (PUHY/PQHY)	*2 kW	25.0 / 22.5	
			*2 kcal / h	21,500 / 19,400	
			*2 BTU / h	85,300 / 76,800	
		Power input		kW	0.015
Current input		A	0.068 - 0.065 - 0.063		
Temp. range of heating	Heat source	PUHY - series	Outdoor temp. *4	W.B -5~15.5°C (23~60°F)	
		PQHY - series	Circulating water temp.	-	
	PWFY range	PQHY - series (for ground source)	Circulating brine temp.	-	
		Inlet Water temp.	-		
Cooling capacity (Nominal)		*3 kW	22.4		
		*3 kcal / h	19,300		
		*3 BTU / h	76,400		
Power input		kW	0.015		
Current input		A	0.068 - 0.065 - 0.063		
Temp. range of heating	Heat source	PUHY - series	Outdoor temp.	D.B -5~46°C (23~115°F)	
		PQHY - series	Circulating water temp.	-	
	PWFY range	PQHY - series (for ground source)	Circulating brine temp.	-	
		Inlet Water temp.	-		
Connectable outdoor unit/heat source unit				PUHY-P300YJM-A(-BS) / PQHY-P300YHM-A	
Sound pressure level (measured in anechoic room)				dB<A> 29	
Diameter of refrigerant pipe		Liquid	mm(in.)	Ø9.52 (Ø3/8") Brazed	
		Gas	mm(in.)	Ø19.05 (Ø3/4") Brazed	
Diameter of water pipe		Inlet	mm(in.)	PT 1 Screw	
		Outlet	mm(in.)	PT 1 Screw	
Strainer size		mm(in.)	Ø19.05 (Rc3/4") Brazed		
Field drain pipe size		mm(in.)	Ø32 (1-1/4")		

External finish		NO	
External dimension H x W x D		mm	800 (785 without legs) x 450 x 300
		in.	31-1/2" (30-15/16" without legs) x 17-3/4" x 11-13/16"
Net weight		kg(lbs)	38 (84)
Circulating water		Operation Volume Range	m <sup>3</sup> /h 1.8~4.30
		R410A	MPa 4.15
Design pressure		Water	MPa 1.00
		Drawing	
		External	WKB94L763
		Wiring	E94C228X01
Standard attachment		Document	Installation Manual, Instruction Book
		Accessory	Strainer, Connector, Heat insulation material, 2 x Connector sets, Expansion joint, wire, Flow switch x 1set
Optional parts		NONE	
Remark		Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual.	

Note:	*1 Nominal heating conditions <PUHY-series> Outdoor Temp. : 7°CDB/6°CWB (45°FDB / 43°FWB) Pipe length : 7.5m (24-9/16ft) Level difference : 0m (0ft) Inlet water Temp 30°C Water flow rate 4.30m <sup>3</sup> /h	<PQHY-series> Circulating water Temp. : 20°C (68°F) Pipe length : 7.5m (24-9/16ft) Level difference : 0m (0ft) Inlet water Temp 30°C Water flow rate 4.30m <sup>3</sup> /h brain connection 0%	Unit converter kcal = kW x 860 BTU/h= kW x 3,412 cfm = m <sup>3</sup> /min x 35.31 lbs = kg / 0.4536 * The specification data is subject to rounding variation.
	*2 Hi-temp flow Heating conditions <PUHY-series> Outdoor Temp. : -3°CWB (27°F) Pipe length : 7.5m (24-9/16ft) Level difference : 0m (0ft) Inlet water Temp 45°C Water flow rate 2.50m <sup>3</sup> /h	<PQHY-series> Circulating water Temp. : 2°C (36°F) Pipe length : 7.5m (24-9/16ft) Level difference : 0m (0ft) Inlet water Temp 45°C Water flow rate 2.50m <sup>3</sup> /h brain connection 0%	
	*3 Nominal cooling conditions <PUHY-series> Outdoor Temp. : 35°CDB (95°FDB) Pipe length : 7.5m (24-9/16ft) Level difference : 0m (0ft) Inlet water Temp 23°C Water flow rate 3.86m <sup>3</sup> /h	<PQHY-series> Circulating water Temp. : 30°C (86°F) Pipe length : 7.5m (24-9/16ft) Level difference : 0m (0ft) Inlet water Temp 23°C Water flow rate 3.86m <sup>3</sup> /h brain connection 0%	
	*4 Temp. range for high-temperature specifications. When the outdoor temperature is between -20°C(-4 °F)W.B. and -5°C(23 °F)W.B., the inlet water temperature range will be between 10°C(50 °F) and 40°C(104 °F).		

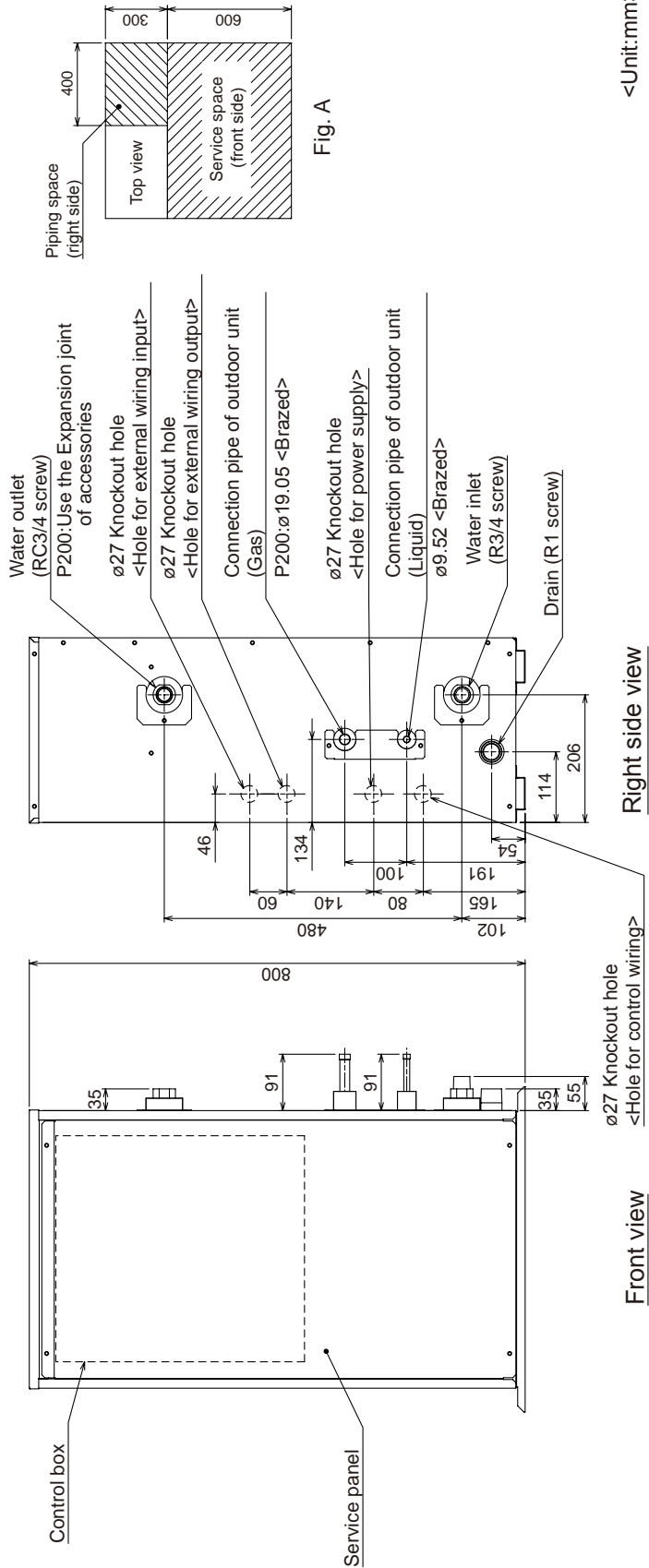
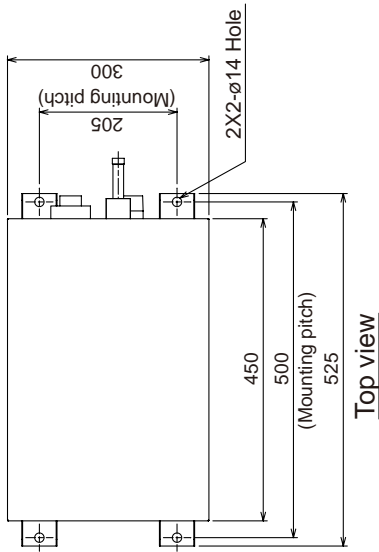
- \* Due to continuing improvement, the above specifications may be subject to change without notice.
- \* The unit is not designed for outside installations.
- \* Please don't use the steel material for the water piping material.
- \* Please always make water circulate or add the brine to the circulation water when the ambient temperature becomes 0°C or less.
- \* Please always make water circulate or pull out the circulation water completely when not using it.
- \* Please do not use groundwater and well water.
- \* Install the unit in an environment where the wet bulb Temp. will not exceed 32°C.
- \* The water circuit must use the closed circuit.
- \* Please do not use it as a drinking water.

## 2. External Dimensions

### (1) PWFY-P200VM-E1-AU

- <Accessories>
- Y-type strainer (RC3/4) ..... 1pc.
  - Heat Insulation material ..... 1pc.
  - Connector set ..... 2set
  - Expansion joint (P200) ..... 2pcs.
  - [From RC3/4 to RC1]
  - Wire ..... 1pc.
  - Flow switch ..... 1set

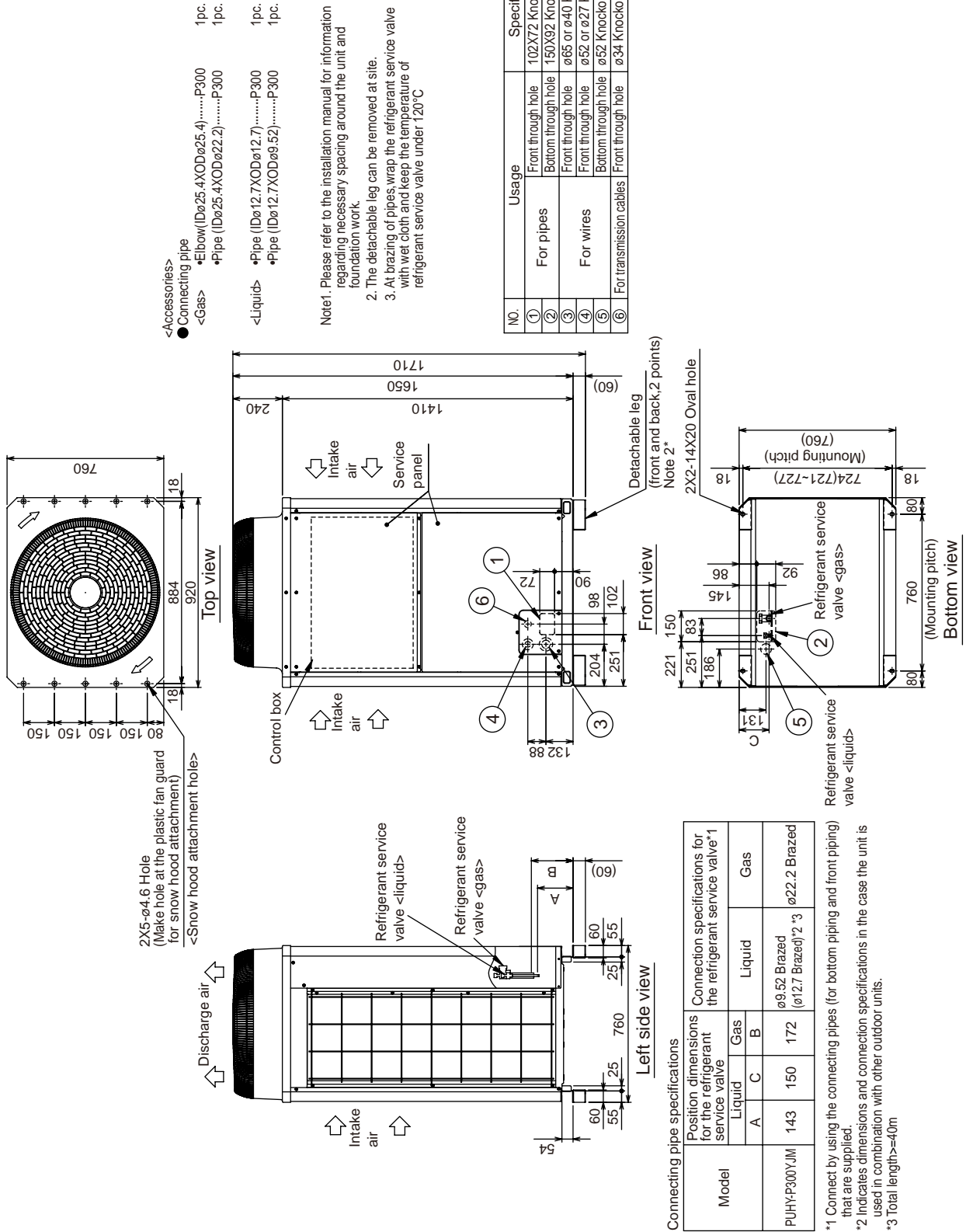
- Note 1. Ensure no rain water or debris can enter the unit through any gaps around wiring or piping.
2. Ensure adequate service space is right around the unit, according to Fig A.
3. Please always make water circulate or add the brine to the circulation water when the ambient temperature becomes 0°C or less.
4. The unit is not designed for outside installations.
5. Install the unit in an environment where the wet bulb Temp. will not exceed 32degC.
6. Please always make water circulate or pull out the circulation water completely when not using it.
7. The water circuit must use the closed circuit.
8. Please don't use the steel material for the water piping material.
9. Connect the strainer which is put as accessory to water inlet pipe.



<Unit:mm>

## (2) PUHY-P300YJM-A(-BS)

Unit : mm



(3) PQHY-P300YHM-A

Unit : mm

- Note 1. Close a hole of the water piping, the refrigerant piping, the power supply, and the control wiring and unused knockout holes with the putty etc. so as not to infiltrate rain water etc. (field erection work)
- Note 2. At the time of product shipment, the front side piping specification serves as the local drainage connection. When connecting on the rear side, please remove the rear side plug sealing corks, and attach a front side. Ensure there is no leak after the attachment has been fitted.
- Note 3. Take notice of service space as Fig. A. (In case of single installation, 600mm or more of back space as front side) makes easier access when servicing the unit from rear side)
- Note 4. If water pipes or refrigerant pipes stretch upward, required space for service and maintenance due to replacement of control box is shown in Fig. B.
- Note 5. Environmental condition for installation; -20~40°C (DB) as indoor installation.
- Note 6. In case the temperature around the heat source unit has possibility to drop under 0°C, be careful for the following point to prevent the pipe burst by the water pipe freeze-up.
  - Circulate the water all the time even if the heat source unit is not in operation.
  - Drain the water from inside of the heat source unit when the heat source unit will not operate for a long term.
- Note 7. Ensure that the drain piping is downward with a pitch of more than 1/100.
- Note 8. The detachable leg can be removed at site.
- Note 9. At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C.

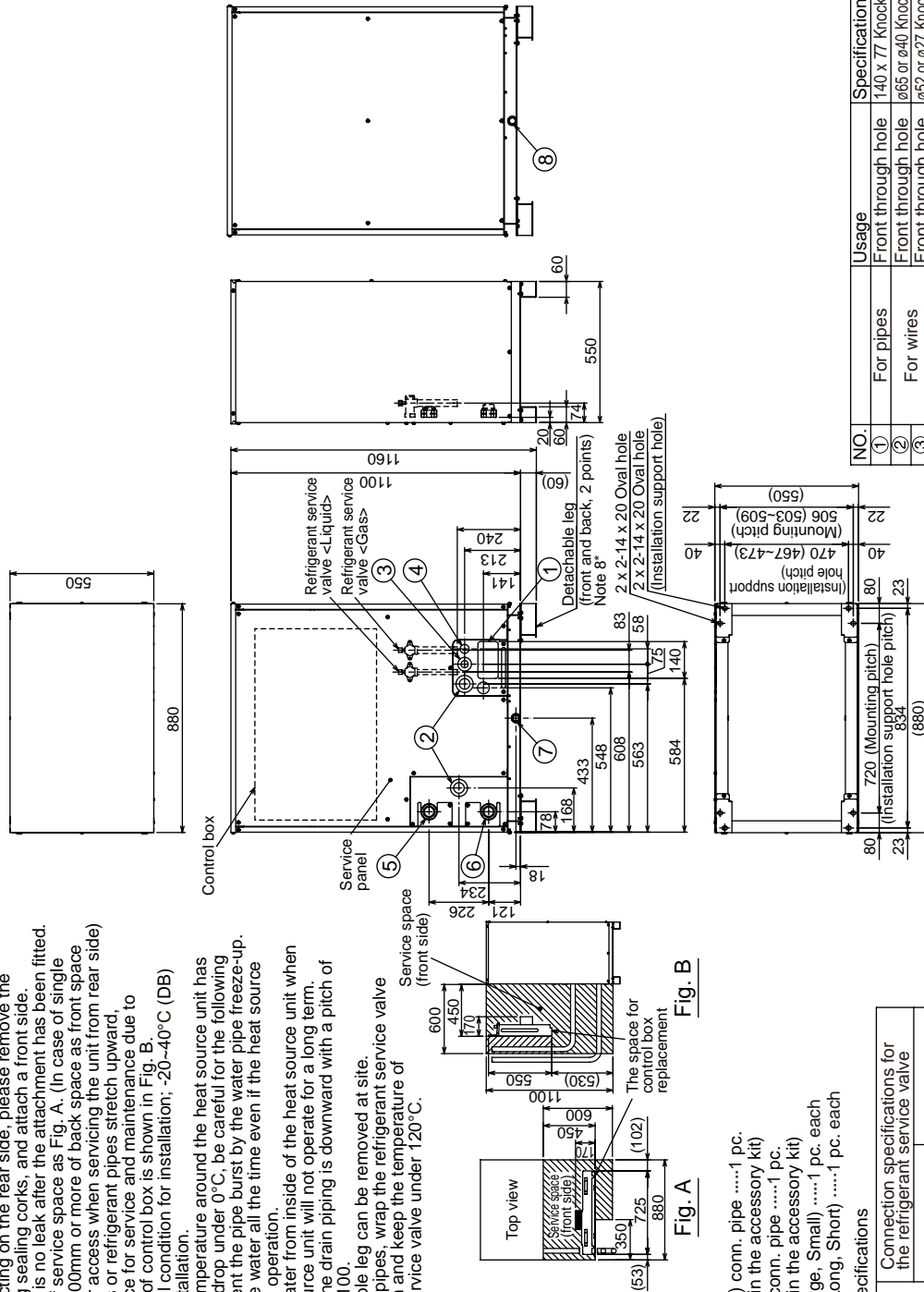


Fig. A

Fig. B

<Accessories>

- Refrigerant (Liquid) conn. pipe .....1 pc. (P300 : Packaged in the accessory kit)
- Refrigerant (Gas) conn. pipe .....1 pc. (P300 : Packaged in the accessory kit)
- Water stopper (Large, Small) .....1 pc. each
- Sealing material (Long, Short) .....1 pc. each

Connecting pipe specifications

Model	Connection specifications for the refrigerant service valve
PQHY-P300YHM-A	Liquid Gas ø9.52 Brazed *1 ø22.2 Brazed *1

NO.	Usage	Specifications
①	Front through hole	140 x 77 Knockout hole
②	For pipes	Front through hole ø65 or ø40 Knockout hole
③	For wires	Front through hole ø52 or ø27 Knockout hole
④	For transmission cables	Front through hole ø34 Knockout hole
⑤	Water pipe inlet	Rc1-1/2 Screw
⑥	Water pipe outlet	Rc1-1/2 Screw
⑦	Drain pipe	Rc3/4 Screw

\*1. Connect by using the connecting pipes that are supplied.

### 3. Electrical Wiring Diagrams

#### (1) PWFY-P200VM-E1-AU

<CAUTION FOR INSTALLATION>

- Prior to installation, read the Installation Manual carefully.
- 1. Single-dotted lines indicate wiring not supplied with the unit.
- 2. Dot-dash lines indicate the control box boundaries.
- 3. Difference of appliance

Model name	Appliance
P200	1, 3 exist

\*4 TB141A (output)

Symbol	Function
OUT1	Operation ON/OFF
OUT2	Defrost
OUT4	Error signal

\*5 TB142A (input)

Symbol	Function
INI	Flow switch

\*6 TB142B (input)

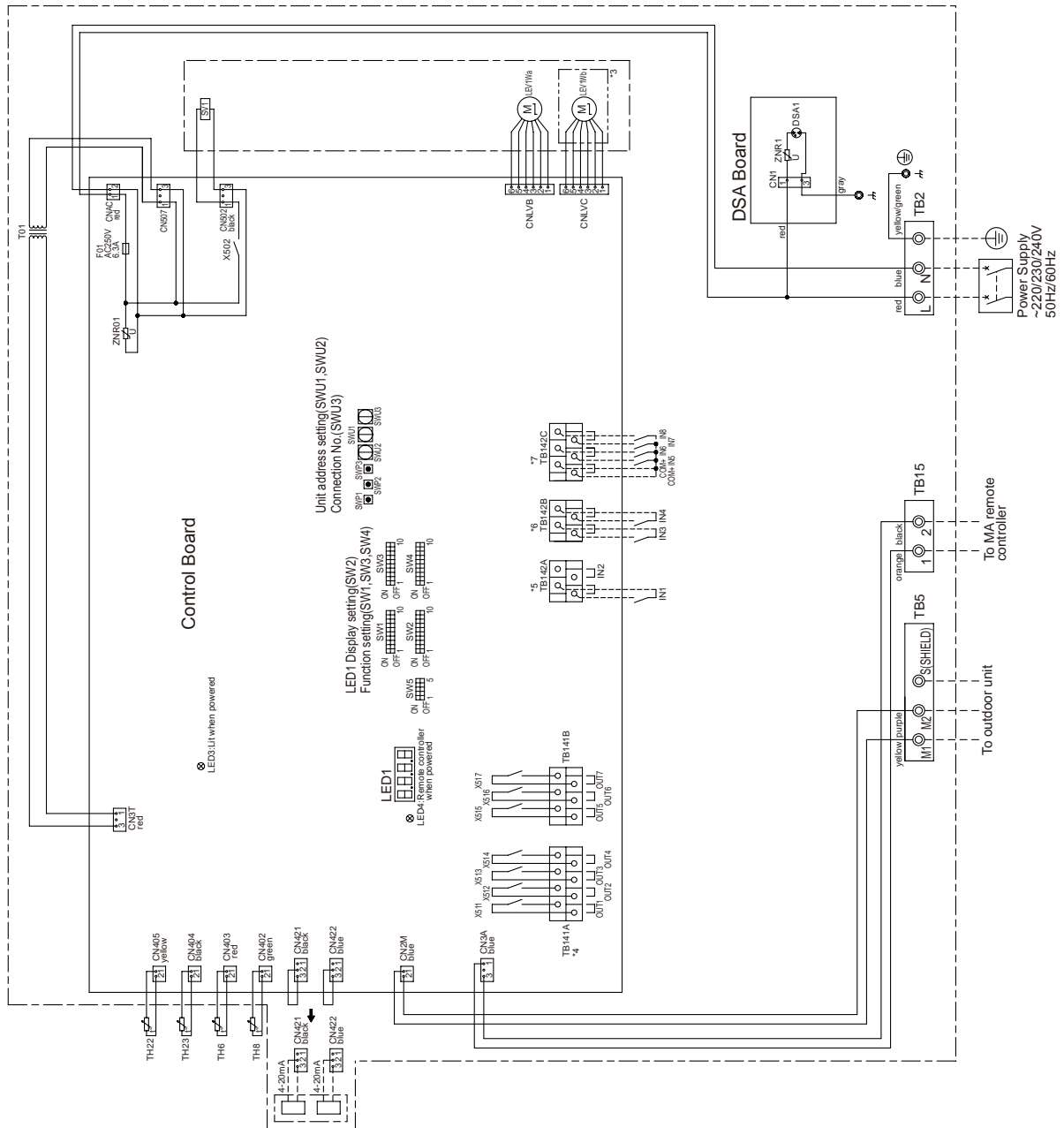
Symbol	Function
INS3	Connection demand
INI4	Operation ON/OFF

\*7 TB142C (input)

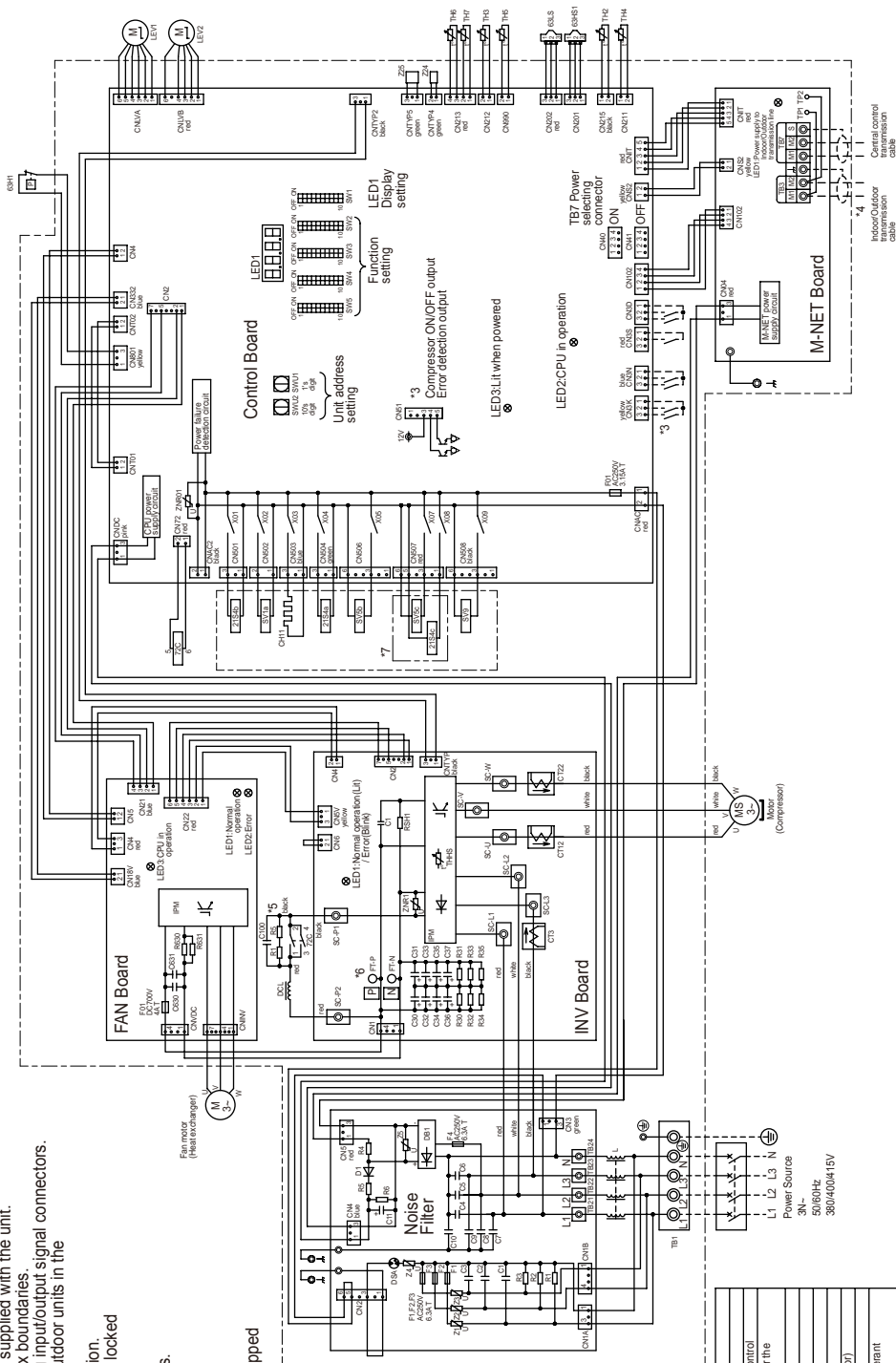
Symbol	Function
COM4	Common
INS6	Heating
INS8	Heating ECO
INI7	Anti-freeze
INS8	Cooling

<Symbol explanation>

Symbol	Explanation
SV1	Solenoid valve
LEV1/Wa	Linear expansion valve
LEV1/Wb	Linear expansion valve
TB2	Terminal block
TB5	Terminal block
TB15	Terminal block
TH22	Thermistor
TH4	Gas pipe temp. sensor at top
TH6	Gas pipe temp. sensor at top
TH8	Water outlet temp.



## (2) PUHY-P300YJM-A(-BS)



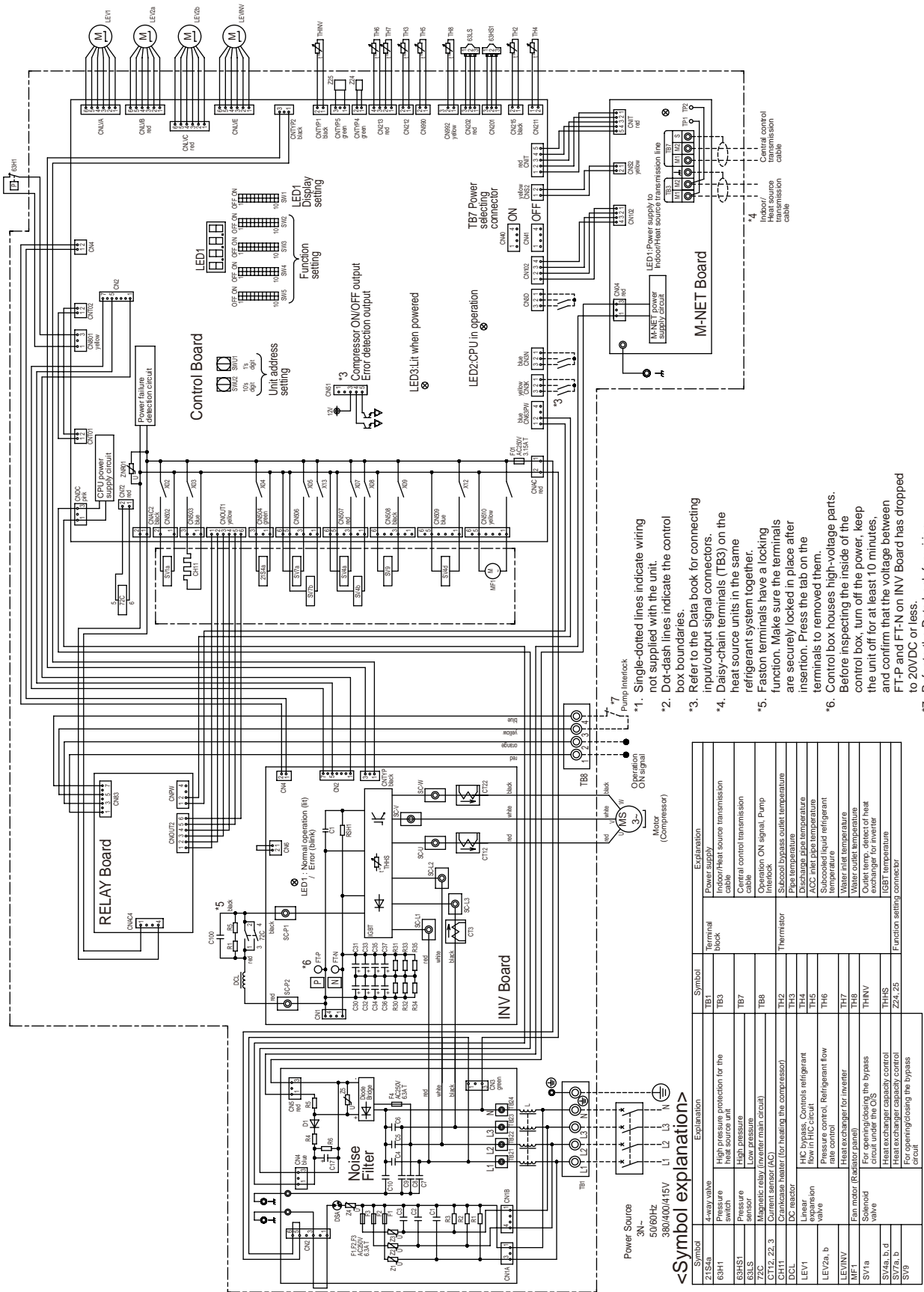
- \*1. Single-dotted lines indicate wiring not supplied with the unit.
- \*2. Dot-dash lines indicate the control box boundaries.
- \*3. Refer to the Data book for connecting input/output signal connectors.
- \*4. Daisy-chain terminals (TB3) on the outdoor units in the same refrigerant system together.
- \*5. Fasion terminals have a locking function. Make sure the terminals are securely locked in place after insertion. Press the tab on the terminals to remove them.
- \*6. Control box houses high-voltage parts. Before inspecting the inside of the control box turn off the power, keep the unit off for at least 10 minutes, and confirm that the voltage between FT-P and FT-N on INV Board has dropped to DC20V or less.
- \*7. Difference of appliance

Model name	Appliance
P200/P250/P300	*7 do not exist
EP200	
P350/P400	*7 exist
EP250	

### <Symbol explanation>

Symbol	Explanation
Z1S4a	Cooling/Heating switching
Z1S4b.c	Heat exchanger capacity control
69H1	High pressure protection for the outdoor unit
69HS1	Pressure switch
69HS2	Pressure switch
69HS3	Pressure switch
69HS4	Pressure switch
69HS5	Pressure switch
69HS6	Pressure switch
69HS7	Pressure switch
69HS8	Pressure switch
69HS9	Pressure switch
69HS10	Pressure switch
69HS11	Pressure switch
69HS12	Pressure switch
69HS13	Pressure switch
69HS14	Pressure switch
69HS15	Pressure switch
69HS16	Pressure switch
69HS17	Pressure switch
69HS18	Pressure switch
69HS19	Pressure switch
69HS20	Pressure switch
69HS21	Pressure switch
69HS22	Pressure switch
69HS23	Pressure switch
69HS24	Pressure switch
69HS25	Pressure switch
69HS26	Pressure switch
69HS27	Pressure switch
69HS28	Pressure switch
69HS29	Pressure switch
69HS30	Pressure switch
69HS31	Pressure switch
69HS32	Pressure switch
69HS33	Pressure switch
69HS34	Pressure switch
69HS35	Pressure switch
69HS36	Pressure switch
69HS37	Pressure switch
69HS38	Pressure switch
69HS39	Pressure switch
69HS40	Pressure switch
69HS41	Pressure switch
69HS42	Pressure switch
69HS43	Pressure switch
69HS44	Pressure switch
69HS45	Pressure switch
69HS46	Pressure switch
69HS47	Pressure switch
69HS48	Pressure switch
69HS49	Pressure switch
69HS50	Pressure switch
69HS51	Pressure switch
69HS52	Pressure switch
69HS53	Pressure switch
69HS54	Pressure switch
69HS55	Pressure switch
69HS56	Pressure switch
69HS57	Pressure switch
69HS58	Pressure switch
69HS59	Pressure switch
69HS60	Pressure switch
69HS61	Pressure switch
69HS62	Pressure switch
69HS63	Pressure switch
69HS64	Pressure switch
69HS65	Pressure switch
69HS66	Pressure switch
69HS67	Pressure switch
69HS68	Pressure switch
69HS69	Pressure switch
69HS70	Pressure switch
69HS71	Pressure switch
69HS72	Pressure switch
69HS73	Pressure switch
69HS74	Pressure switch
69HS75	Pressure switch
69HS76	Pressure switch
69HS77	Pressure switch
69HS78	Pressure switch
69HS79	Pressure switch
69HS80	Pressure switch
69HS81	Pressure switch
69HS82	Pressure switch
69HS83	Pressure switch
69HS84	Pressure switch
69HS85	Pressure switch
69HS86	Pressure switch
69HS87	Pressure switch
69HS88	Pressure switch
69HS89	Pressure switch
69HS90	Pressure switch
69HS91	Pressure switch
69HS92	Pressure switch
69HS93	Pressure switch
69HS94	Pressure switch
69HS95	Pressure switch
69HS96	Pressure switch
69HS97	Pressure switch
69HS98	Pressure switch
69HS99	Pressure switch
69HS100	Pressure switch
69HS101	Pressure switch
69HS102	Pressure switch
69HS103	Pressure switch
69HS104	Pressure switch
69HS105	Pressure switch
69HS106	Pressure switch
69HS107	Pressure switch
69HS108	Pressure switch
69HS109	Pressure switch
69HS110	Pressure switch
69HS111	Pressure switch
69HS112	Pressure switch
69HS113	Pressure switch
69HS114	Pressure switch
69HS115	Pressure switch
69HS116	Pressure switch
69HS117	Pressure switch
69HS118	Pressure switch
69HS119	Pressure switch
69HS120	Pressure switch
69HS121	Pressure switch
69HS122	Pressure switch
69HS123	Pressure switch
69HS124	Pressure switch
69HS125	Pressure switch
69HS126	Pressure switch
69HS127	Pressure switch
69HS128	Pressure switch
69HS129	Pressure switch
69HS130	Pressure switch
69HS131	Pressure switch
69HS132	Pressure switch
69HS133	Pressure switch
69HS134	Pressure switch
69HS135	Pressure switch
69HS136	Pressure switch
69HS137	Pressure switch
69HS138	Pressure switch
69HS139	Pressure switch
69HS140	Pressure switch
69HS141	Pressure switch
69HS142	Pressure switch
69HS143	Pressure switch
69HS144	Pressure switch
69HS145	Pressure switch
69HS146	Pressure switch
69HS147	Pressure switch
69HS148	Pressure switch
69HS149	Pressure switch
69HS150	Pressure switch
69HS151	Pressure switch
69HS152	Pressure switch
69HS153	Pressure switch
69HS154	Pressure switch
69HS155	Pressure switch
69HS156	Pressure switch
69HS157	Pressure switch
69HS158	Pressure switch
69HS159	Pressure switch
69HS160	Pressure switch
69HS161	Pressure switch
69HS162	Pressure switch
69HS163	Pressure switch
69HS164	Pressure switch
69HS165	Pressure switch
69HS166	Pressure switch
69HS167	Pressure switch
69HS168	Pressure switch
69HS169	Pressure switch
69HS170	Pressure switch
69HS171	Pressure switch
69HS172	Pressure switch
69HS173	Pressure switch
69HS174	Pressure switch
69HS175	Pressure switch
69HS176	Pressure switch
69HS177	Pressure switch
69HS178	Pressure switch
69HS179	Pressure switch
69HS180	Pressure switch
69HS181	Pressure switch
69HS182	Pressure switch
69HS183	Pressure switch
69HS184	Pressure switch
69HS185	Pressure switch
69HS186	Pressure switch
69HS187	Pressure switch
69HS188	Pressure switch
69HS189	Pressure switch
69HS190	Pressure switch
69HS191	Pressure switch
69HS192	Pressure switch
69HS193	Pressure switch
69HS194	Pressure switch
69HS195	Pressure switch
69HS196	Pressure switch
69HS197	Pressure switch
69HS198	Pressure switch
69HS199	Pressure switch
69HS200	Pressure switch

(3) PQHY-P300YHM-A



1. Single-dotted lines indicate wiring not supplied with the unit.
2. Dot-dash lines indicate the control box boundaries.
3. Refer to the Data book for connecting input/output signal connectors.
4. Daisy-chain terminals (TB3) on the heat source units in the same refrigerant system together.
5. Faston terminals have a locking function. Make sure the terminals are securely locked in place after insertion. Press the tab on the terminals to removed them.
6. Control box houses high-voltage parts. Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the voltage between FT-P and FT-N on INV Board has dropped to 20VDC or less.
7. Refer to the Data book for wiring terminal block for Pump Interlock (TB8).

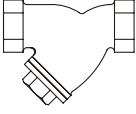
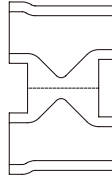
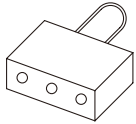
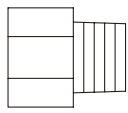
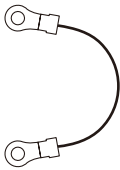
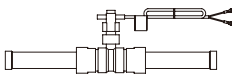
<Symbol explanation>

Symbol	Explanation	Terminal block	Explanation
Z1S4a	4-way valve	TB1	Power supply
63H1	Pressure switch	TB3	Indoor/Heat source transmission cable
63H51	High pressure sensor	TB7	Indoor control transmission cable
63LS	Magnetic relay (inverter main circuit)	TB8	Operation ON signal, Pump Interlock
C112, 22, 3	Current sensor (AC)	TH2	Subcool bypass, outlet temperature
DCL	DC reactor	TH3	Pipe temperature
LEV1	Linear solenoid valve	TH4	Discharge pipe temperature
LEV2a, b	Fan motor (Radiator panel)	TH5	A/C2 mist pipe temperature
MF1	Solenoid valve	TH6	A/C2 liquid refrigerant temperature
SV1a	Heat exchanger capacity control valve	TH7	Water outlet temperature
SV2a, b	Heat exchanger capacity control valve	TH8	Water outlet temperature
SV9	Heat exchanger capacity control valve	TH9, TH10	Outlet temp. detect of heat exchanger for inverter
		TH15	IGBT temperature
		TH24, 25	Function setting connector

---

## 4. Accessories

### (1) PWFY

(A) Strainer	(B) Heat insulation material	(C) Connector sets X2	(D) Expansion joint X2	(E) Wire	(F)
					

(A) Install the strainer at the water pipe inlet.

(B) This insulation is for exclusive use with the strainer. Wrap the strainer with the insulation after water pipes are installed.

(C) These are analog input connectors. Cut the wire before using.

(D) Install them at the strainer inlet. Refer to P28 for details.

(E) To perform test run before the pump interlock circuit is completed, short circuit the terminal block TB142A (IN1), and then perform test run.

(F) When installing the unit, be sure to install the supplied flow switch on the water outlet side of the unit and connect the wire to IN1 of TB142A on the unit.



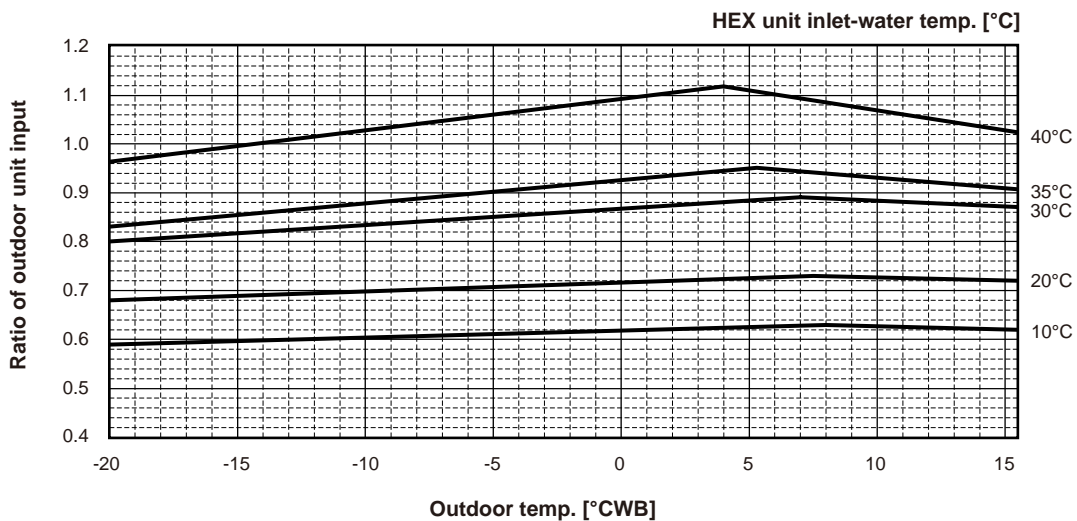
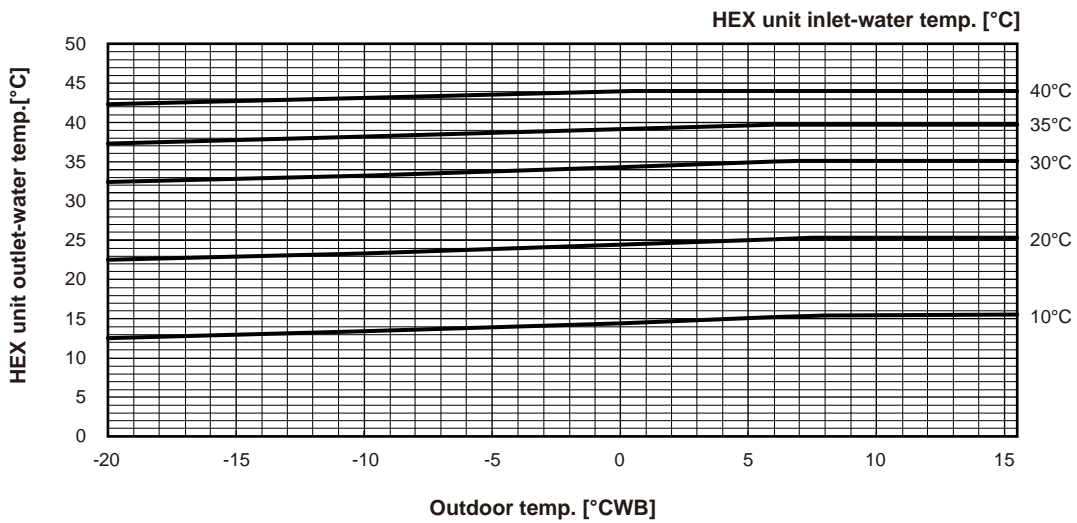
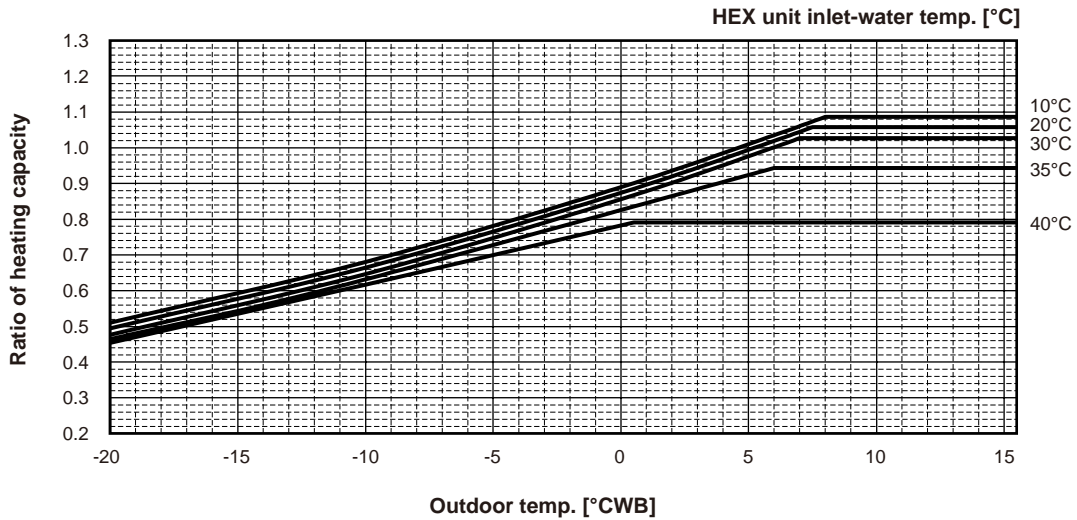
# III Product Data

## 1. Capacity tables

(1) Correction by temperature (Estimated performance without defrost)

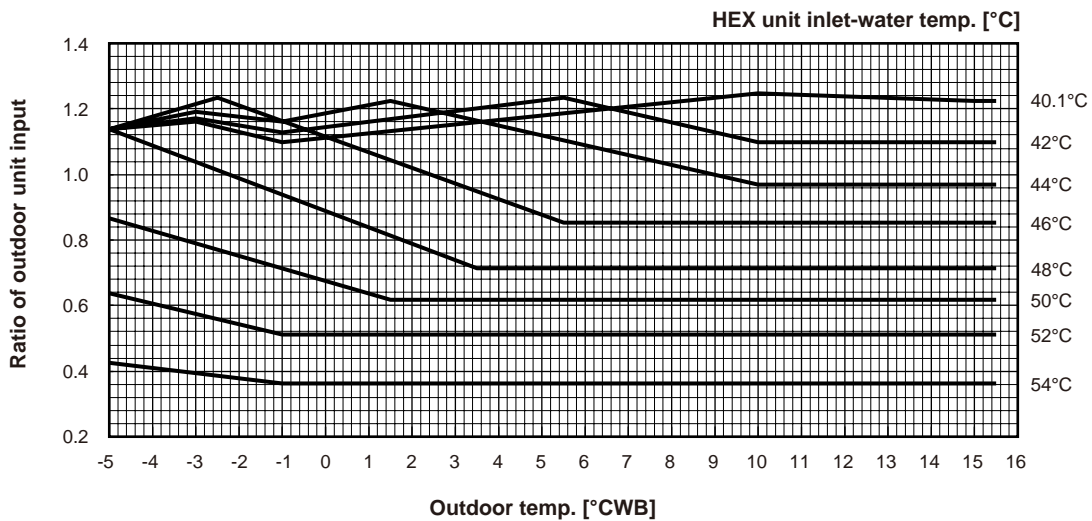
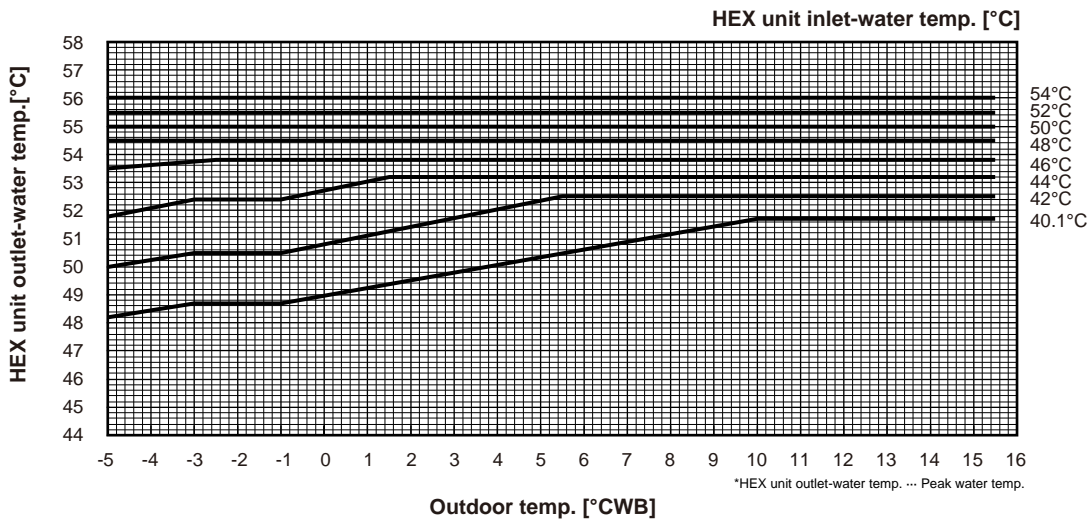
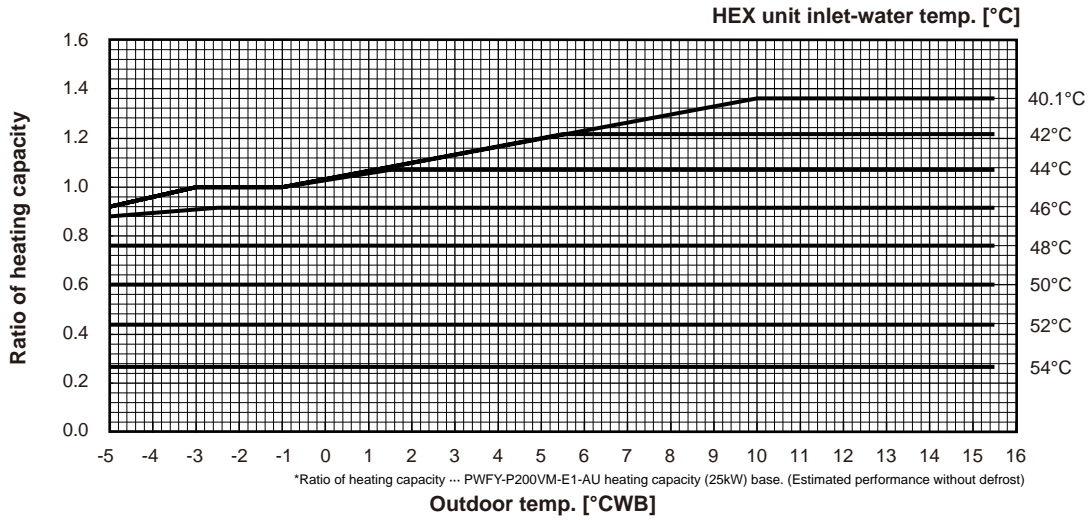
(1)-1 PUHY-P300YJM-A(-BS) + PWFY-P200VM-E1-AU (for standard)

PUHY-P300YJM-A + PWFY-P200VM-E1-AU (for standard)



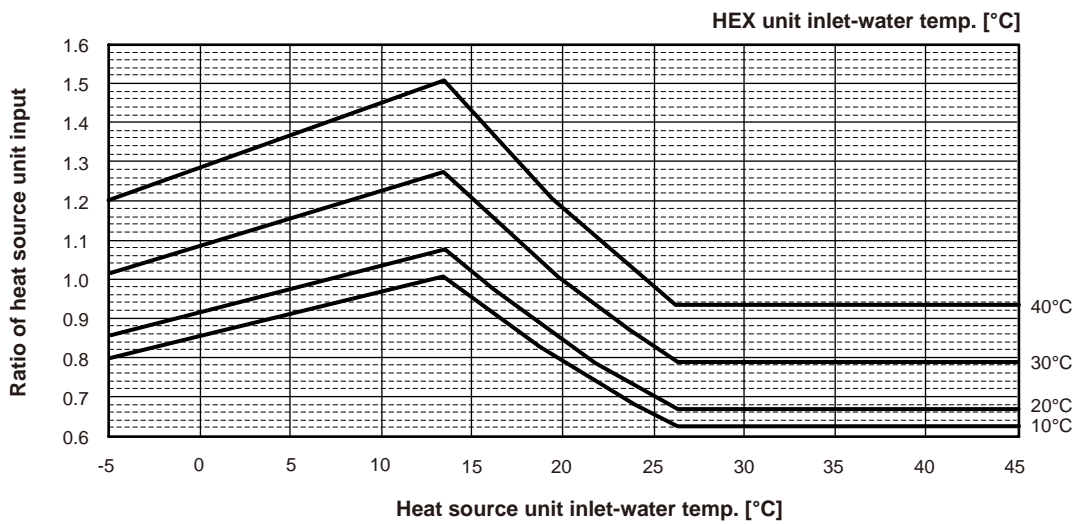
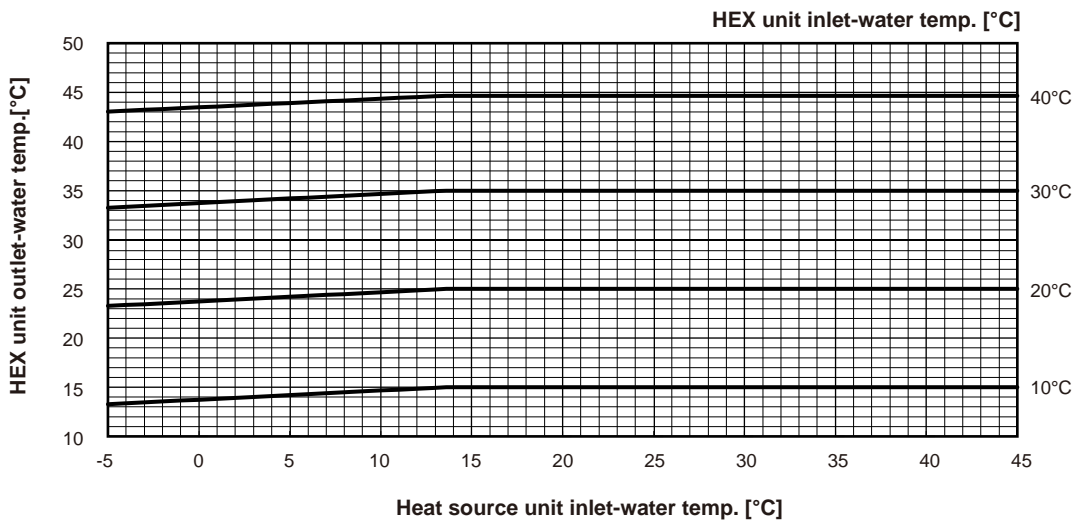
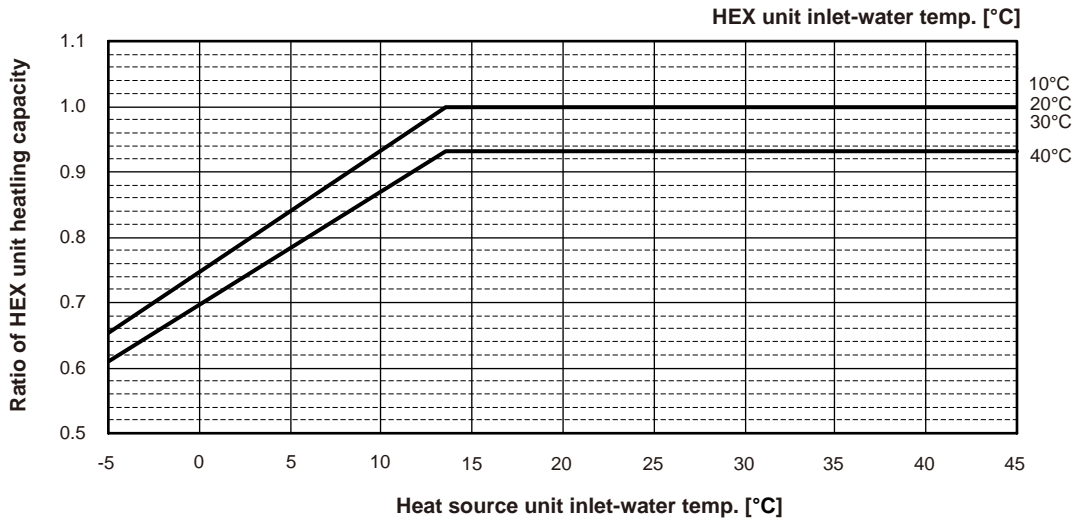
(1)-2 PUHY-P300YJM-A(-BS) + PWFY-P200VM-E1-AU (for high temperature flow)

PUHY-P300YJM-A + PWFY-P200VM-E1-AU (for high temperature flow)



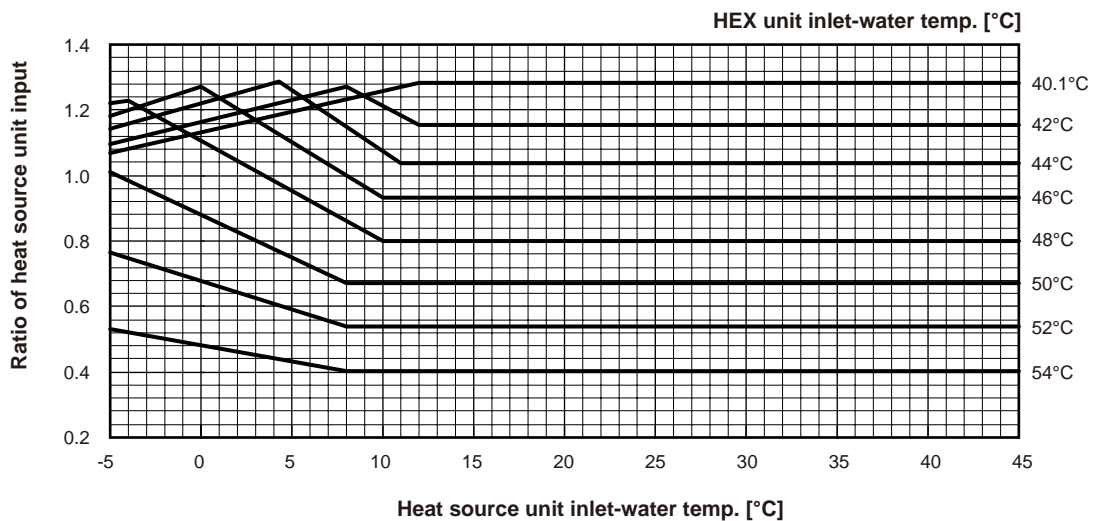
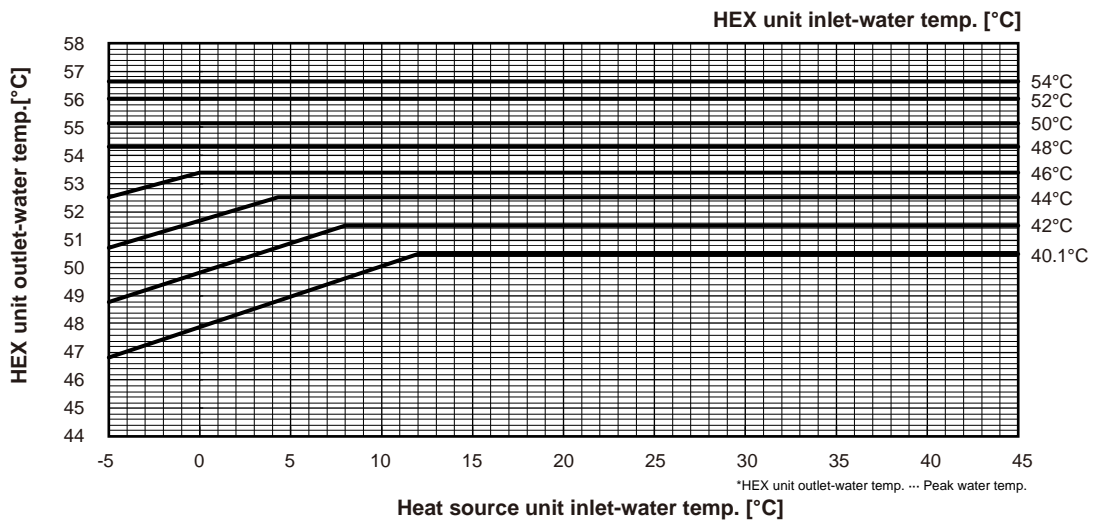
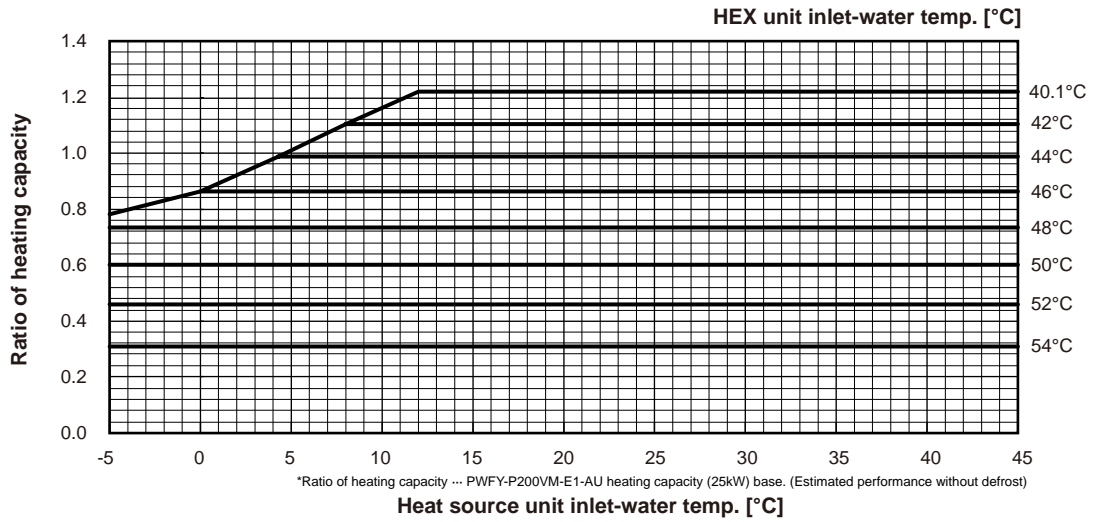
(1)-3 PQHY-P300YHM-A + PWFY-P200VM-E1-AU (for standard)

PQHY-P300YHM-A + PWFY-P200VM-E1-AU (for standard)



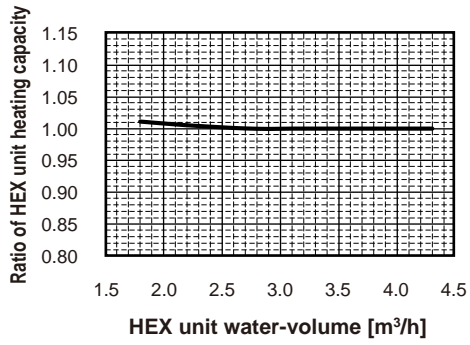
(1)-4 PQHY-P300YHM-A + PWFY-P200VM-E1-AU (for high temperature flow)

PQHY-P300YHM-A + PWFY-P200VM-E1-AU (for high temperature flow)

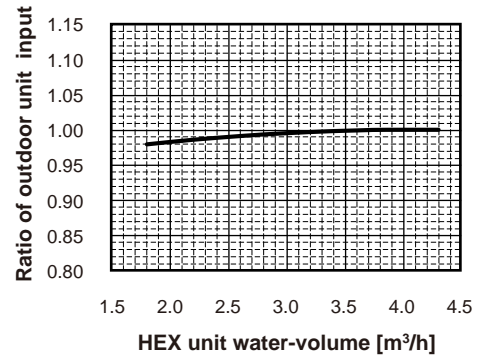
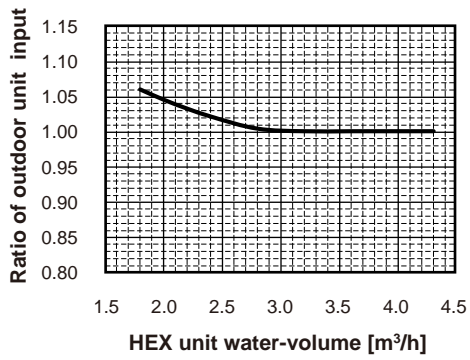
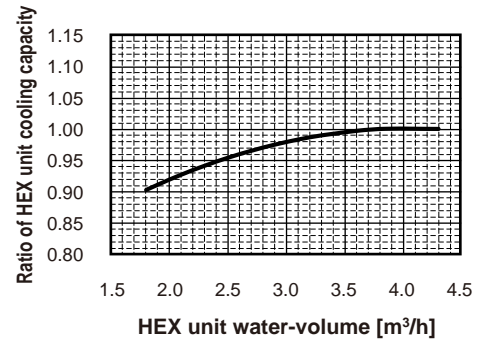


(2) Correction by water flow rate  
 PWFY-P200VM-E1-AU

Heating



Cooling



(3) Correction at frosting and defrosting

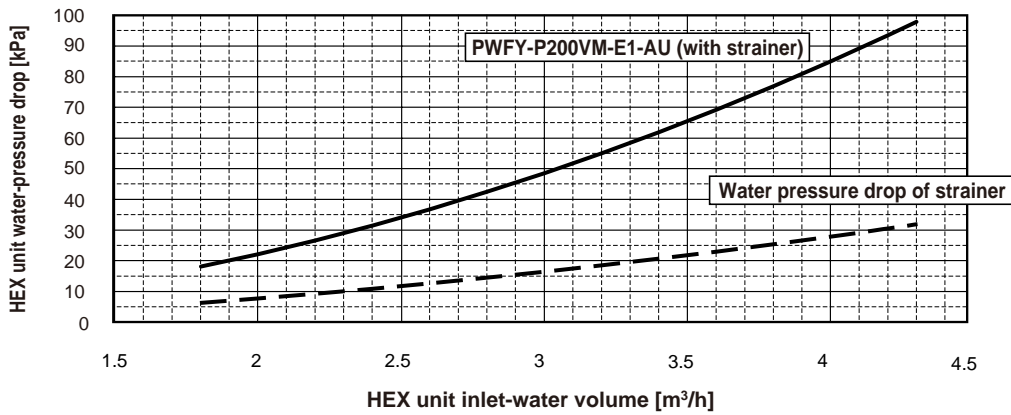
Due to frost at the outdoor heat exchanger and the automatic defrost operation, the heating capacity of the outdoor unit can be calculated by multiplying the correction factor shown in the table below.

Table of correction factor at frost and defrost

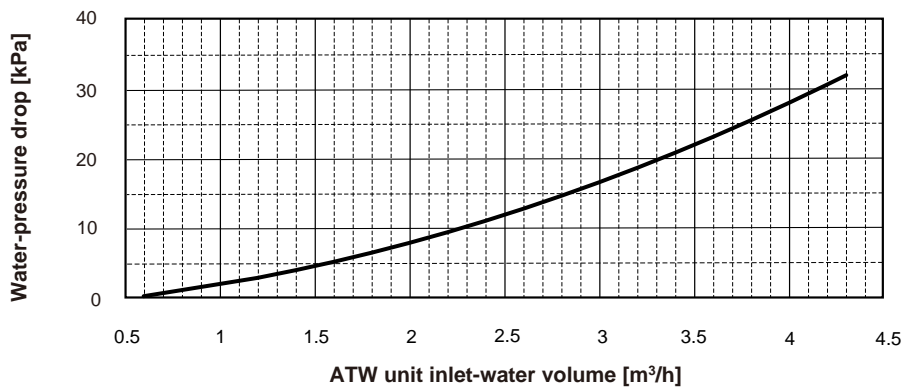
<b>Outdoor inlet air temp. °C</b>	6	4	2	1	0	-2	-4	-6	-8	-10	-20
<b>Outdoor inlet air temp. °F</b>	43	39	36	34	32	28	25	21	18	14	-4
PUHY-P300YJM-A (-BS)	1.00	0.93	0.82	0.80	0.82	0.86	0.90	0.90	0.95	0.95	0.95

(4) Water pressure drop

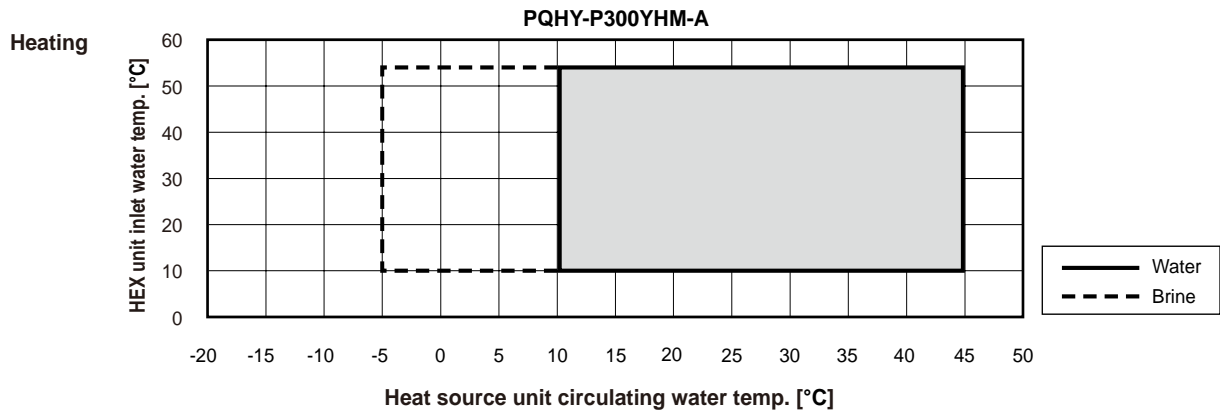
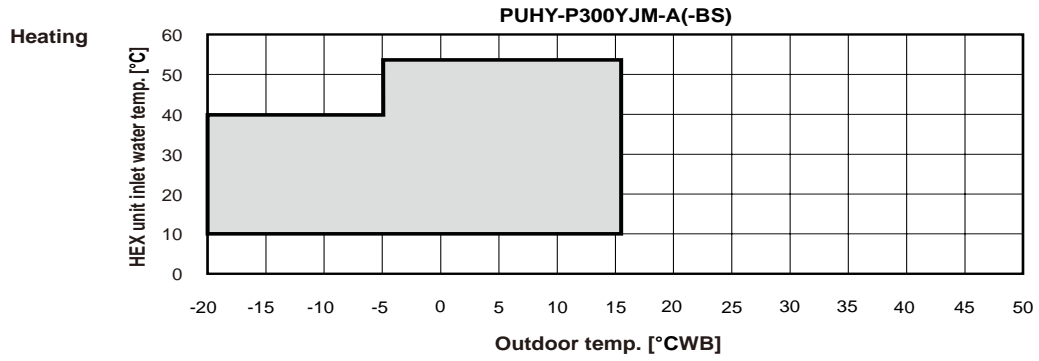
(4)-1 PWFY-P200VM-E1-AU (with strainer)



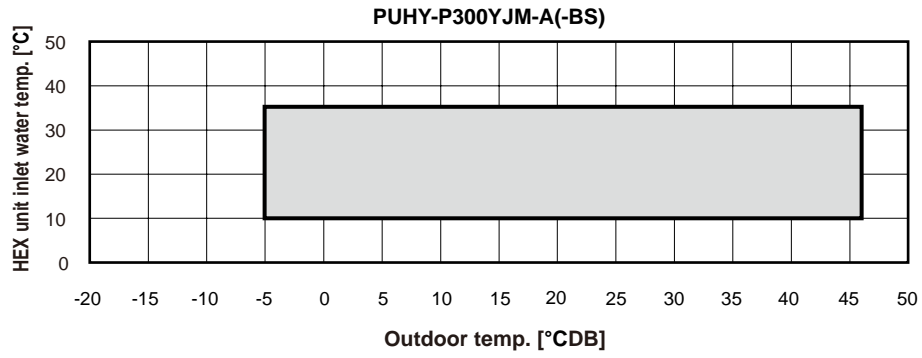
(4)-2 Water pressure drop of Strainer only  
(accessory for PWFY-P200VM-E1-AU)



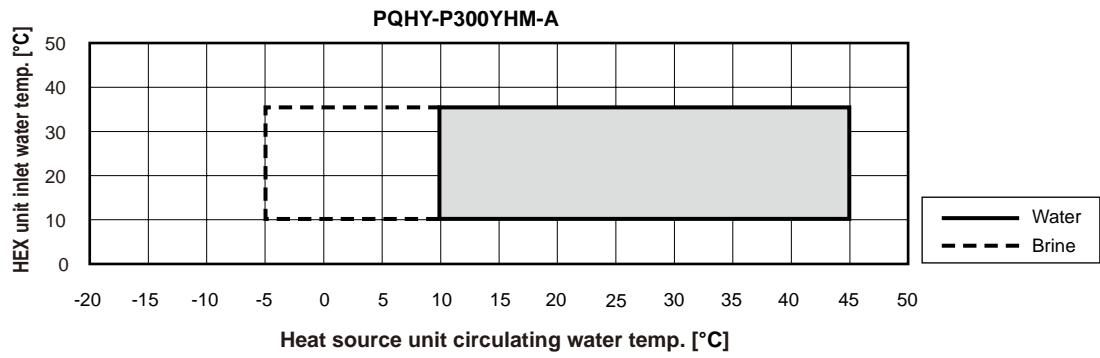
(5) Operation temperature range  
PWFY-P200VM-E1-AU



Cooling



Cooling

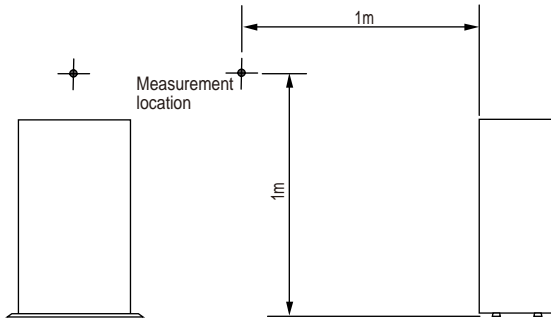




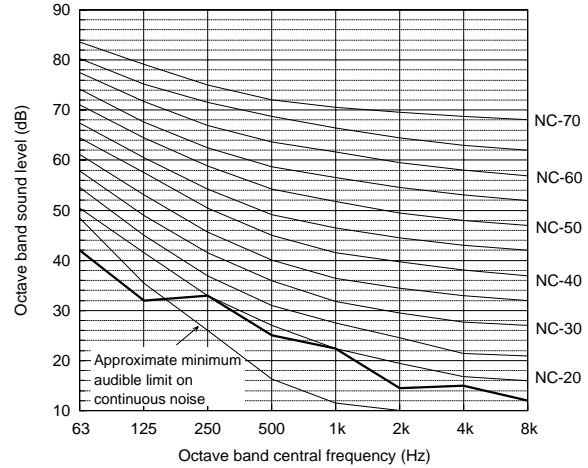
## 2. Sound pressure levels

### (1) PWFY-P200VM-E1-AU

Measurement condition  
PWFY-P200VM-E1-AU



Sound level of PWFY-P200VM-E1-AU

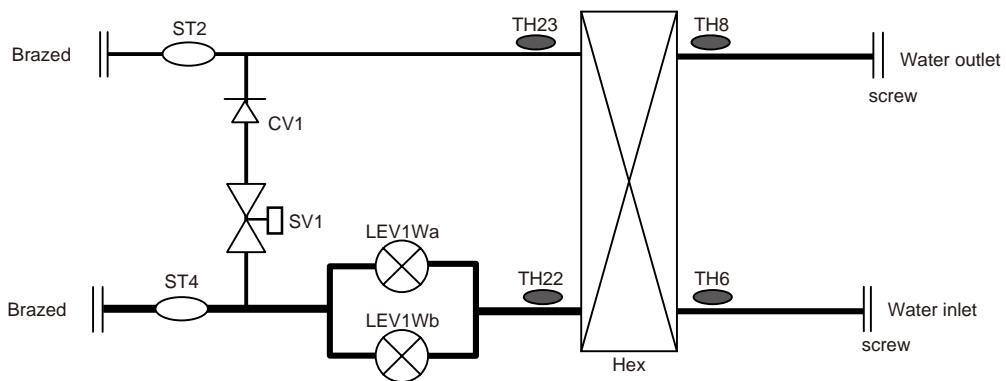


	63	125	250	500k	1k	2k	4k	8k	dB(A)
50/60Hz	42.0	32.0	33.0	25.0	22.5	14.5	15.0	12.0	29.0

When Low noise mode is set, the A/C system's capacity is limited. The system could return to normal operation from Low noise mode automatically in the case that the operation condition is severe.

## 3. Refrigerant circuit diagrams and thermal sensors

### (1) PWFY-P200VM-E1-AU



# IV Installation

## 1. How to calculate the necessary heating capacity

### (1) Heating capacity calculation

A. For Air conditioning using such as Panel Heaters, Floor Heating and Fan coil units

Required total heating capacity  kW

Safety factor;  %

B. For Sanitary use such as Shower and Bathrooms

Conditions

Tank inlet water Temp.;  °C

Tank outlet water Temp.;  °C

(Set Temp -5 °C)

Safety factor for Heat Loss;  %

Operating time;  Hours

For Shower;  ℓ/person x  Person =  ℓ (Water Temp. Condition  °C)

For Bathrooms;  ℓ/Person x  Person =  ℓ (Water Temp. Condition  °C)

The conversion of water volume to  °C

x (  -  ) / (  -  )

+  x (  -  ) / (  -  )

=  /day

Heating Capacity Calculation for sanitary usage

/1,000 x (  -  ) =  M cal / day

The conversion of M cal to kW

/ 860 x 1,000 /  =  kW

C. Total (A+B)

Total Heating Capacity

x (100% +  %) +  x (100% +  %) =  kW

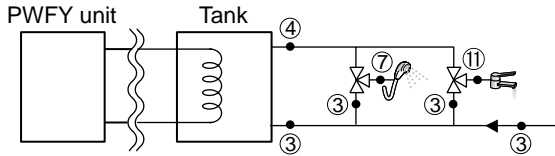
D. No. of units required

Safety factor;  %

x (100% +  %) / 12.5 kW =  units



units are required



### (2) Calculation example

A. For Air conditioning using such as Panel Heaters, Floor Heating and Fan coil units

Required total heating capacity  kW

Safety factor;  %

B. For Sanitary use such as Shower and Bathrooms

Conditions

Tank inlet water Temp.;  °C

Tank outlet water Temp.;  °C

(Set Temp -5 °C)

Safety factor for Heat Loss;  %

Operating time;  Hours

For Shower;  ℓ/person x  Person =  ℓ (Water Temp. Condition  °C)

For Bathrooms;  ℓ/Person x  Person =  ℓ (Water Temp. Condition  °C)

The conversion of water volume to  °C

x (  -  ) / (  -  )

+  x (  -  ) / (  -  )

=  /day

Heating Capacity Calculation for sanitary usage

/1,000 x (  -  ) =  M cal / day

The conversion of M cal to kW

/ 860 x 1,000 /  =  kW

C. Total (A+B)

Total Heating Capacity

x (100% +  %) +  x (100% +  %) =  kW

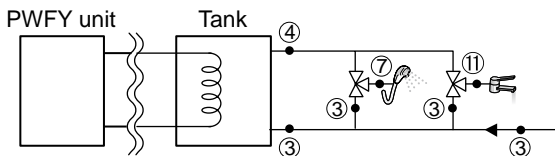
D. No. of units required

Safety factor;  %

x (100% +  %) / 12.5 kW =  units



units are required



---

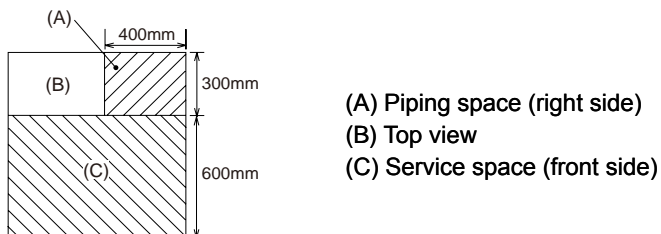
## 2. Installation

### (1) Selecting an installation site (for PWFY unit)

- **Do not install outdoors. The unit is not waterproof.**
- **Back up system is recommended in case of PWFY unit breakdown.**
- **The unit will get hot. Do not install in a location where heat gets trapped inside.**
- **Be sure to install unit in a place strong enough to withstand its weight.**  
Any lack of strength may cause unit to fall down, resulting in a personal injury.
- **Do not install the unit where corrosive gas is generated.**
- **Have installation work in order to protect against earthquake.**  
Any installation deficiency may cause unit to fall down, resulting in a personal injury.
- **Pay a special attention to the place, such as a basement, etc. where refrigeration gas can stay, since refrigeration is heavier than the air.**
- **Do not install the unit where combustible gas may leak.**
  - If the gas leaks and accumulates around the unit, an explosion may result.
- **When installing the unit in a hospital, communication station, or similar place, provide sufficient protection against noise.**
  - The inverter equipment, private power generator, high-frequency medical equipment, or radio communication equipment may cause the air conditioner to operate erroneously, or fail to operate. On the other hand, the air conditioner may affect such equipment by creating noise that disturbs medical treatment or image broadcasting.
- **Do not install the unit on a structure that may cause leakage.**
  - When the room humidity exceeds 80 % or when the drain pipe is clogged, condensation may drip from the indoor unit. Perform collective drainage work together with the unit, as required.
- **It is recommended that a water pump is connected to each PWFY unit.**

### (1)-1 Securing installation and service space

- Please secure the following service spaces after installation.  
(All servicing can be performed from the front of the unit)  
[Fig. IV. 2. (1). 1]



#### **Warning:**

- **Be sure to install the unit in a location which can adequately support its weight.**
  - If there is insufficient strength to support the unit's weight, it could fall and cause injuries.

(2) Installing the unit

(2)-1 Lifting method



**Exercise caution when transporting products.**

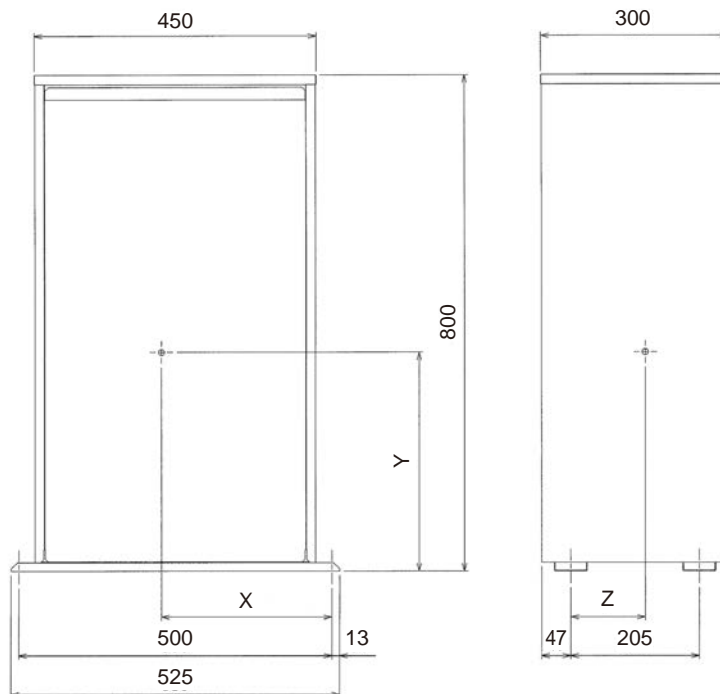
- Products weighing more than 20 kg [45 LBS] should not be carried alone.
- Do not carry the product by the PP bands.
- To avoid the risk of injury, do not touch the heat exchanger fins.
- Plastic bags may pose a risk of choking hazard to children. Tear plastic bags into pieces before disposing of them.
- When lifting and transporting outdoor units (heat source unit) with ropes, run the ropes through lifting hole at the unit base. Securely fix the unit so that the ropes will not slide off, and always lift the unit at four points to prevent the unit from falling.

(2)-2 Product net weight

Model	PWFY-P200VM-E1-AU	PUHY-P300YJM-A(-BS)
Net weight	38 kg	215 kg

(2)-3 Center of gravity

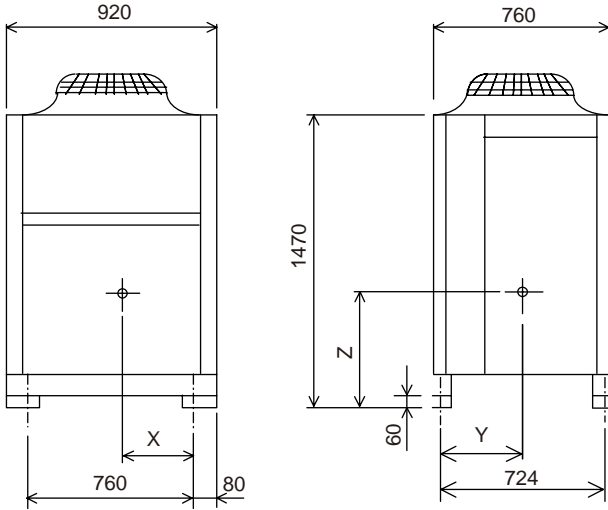
(2)-3-1 PWFY-P200VM-E1-AU



Unit : mm

Model	X	Y	Z
PWFY-P200VM-E1-AU	277	347	99

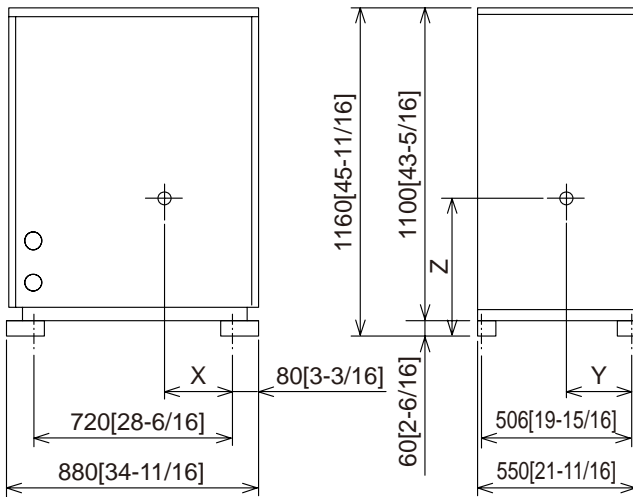
(2)-3-2 PUHY-P300YJM-A(-BS)



Unit:mm

Model	X	Y	Z
PUHY-P300YJM-A (-BS)	320	319	632

(2)-3-3 PQHY-P300YHM-A



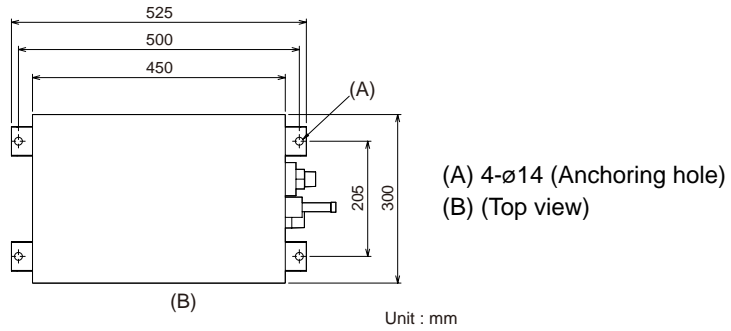
Unit : mm[in.]

Model	X	Y	Z
PQHY-P300YHM-A	418[16-8/16]	250[9-14/16]	532[21]

---

## (2)-4 Installation method

- Using the anchoring holes shown below, firmly bolt the unit to the base.  
[Fig. IV. 2. (2). 1]



### Bases

- Be sure to install unit in a place strong enough to withstand its weight. If the base is unstable, reinforce with a concrete base.
- The unit must be anchored on a level surface. Use a level to check after installation.
- If the unit is installed near a room where noise is a problem, using an anti-vibration stand on the base of the unit is recommended.

### (3) Refrigerant pipe and drain pipe specifications

#### (3)-1 Refrigerant pipe and drain pipe specifications

To avoid dew drops, provide sufficient antisweating and insulating work to the refrigerant and drain pipes.

When using commercially available refrigerant pipes, be sure to wind commercially available insulating material (with a heat-resisting temperature of more than 100 °C and thickness given below) onto both liquid and gas pipes.

Be also sure to wind commercially available insulating material (with a form polyethylene's specific gravity of 0.03 and thickness given below) onto all pipes which pass through rooms.

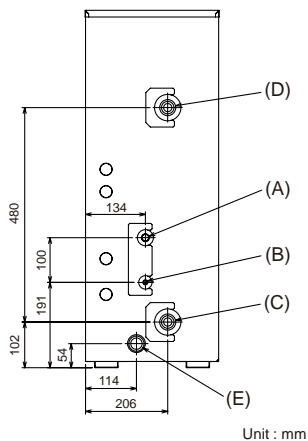
- 1) Select the thickness of insulating material by pipe size.

Unit : mm

Model	PWFY-P200VM-E1-AU
Gas	ø19.05
Liquid	ø9.52
Drain	ø32
Insulating material's thickness	More than 10 mm

- 2) If the unit is used on the highest story of a building and under conditions of high temperature and humidity, it is necessary to use pipe size and insulating material's thickness more than those given in the table above.
- 3) If there are customer's specifications, simply follow them.

#### (3)-2 Refrigerant pipe, drain pipe and filling port



- (A) Refrigerant piping (gas)
- (B) Refrigerant piping (liquid)
- (C) Water inlet
- (D) Water outlet
- (E) Drain outlet

Unit : mm

## (4) Connecting refrigerant pipes and drain pipes

### (4)-1 Refrigerant piping work

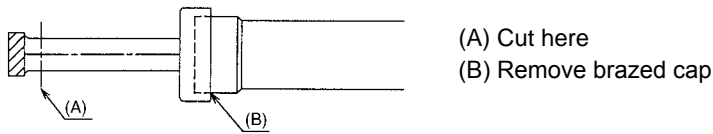
This piping work must be done in accordance with the installation manuals for outdoor unit (heat source unit).

- For constraints on pipe length and allowable difference of elevation, refer to the outdoor unit installation manual.
- The method of pipe connection is brazing connection.

#### ⚠ Caution:

- **Install the refrigerant piping for the indoor unit in accordance with the following.**

1. Cut the tip of the indoor unit piping, remove the gas, and then remove the brazed cap.  
[Fig. IV. 2. (4). 1]

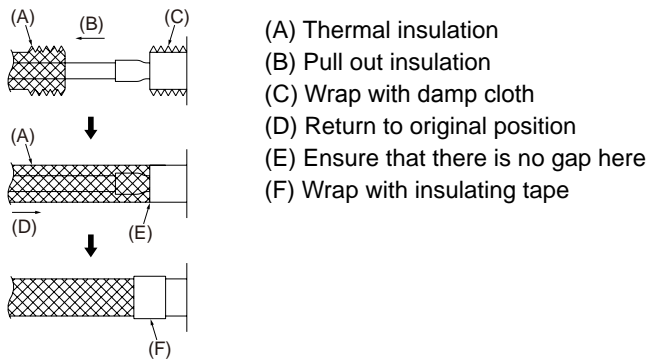


2. Pull out the thermal insulation on the site refrigerant piping, braze the unit piping, and replace the insulation in its original position.  
Wrap the piping with insulating tape.

#### Note:

- **Pay strict attention when wrapping the copper piping since wrapping the piping may cause condensation instead of preventing it.**
- \* Before brazing the refrigerant piping, **always wrap the piping on the main body, and the thermal insulation piping, with damp cloths to prevent heat shrinkage and burning the thermal insulation tubing.** Take care to ensure that the flame does not come into contact with the main body itself.

[Fig. IV. 2. (4). 2]



### (4)-2 Mixed system of PWFY-AU and Indoor unit (Y, WY system)

Take one of the options listed below.

- 1) Install the External Solenoid Valve  
(External Solenoid Valve kit (PAC-SV01PW-E) will be available in Nov. 2012.)
- 2) Add brine, assuming that the temperature will drop to  $-20^{\circ}\text{C}$ .  
Set Dip SW 1-10 (on ATW unit) to ON if brine is added.  
\*See section IV.3.(9) for the brine concentration graphs.

\* With the WY system, the above steps apply only when operating the WY at the water temperature below  $10^{\circ}\text{C}$ .

### (4)-3 PWFY-AU in cooling operation (Y, WY system)

Add brine, assuming that the temperature will drop to  $-20^{\circ}\text{C}$ .

Set Dip SW 1-10 (on ATW unit) to ON if brine is added.

\* With the WY system, the above steps apply only when operating the WY at the water temperature below  $10^{\circ}\text{C}$ .



## Cautions On Refrigerant Piping

- Be sure to use non-oxidative brazing for brazing to ensure that no foreign matter or moisture enter into the pipe.
- Be sure to apply refrigerating machine oil over the flare connection seating surface and tighten the connection using a double spanner.
- Provide a metal brace to support the refrigerant pipe so that no load is imparted to the indoor unit end pipe. This metal brace should be provided 500 mm away from the indoor unit's flare connection.

### ⚠ Warning:

When installing and moving the unit, do not charge it with refrigerant other than the refrigerant (R407C or R22) specified on the unit.

- Mixing of a different refrigerant, air, etc. may cause the refrigerant cycle to malfunction and result in severe damage.

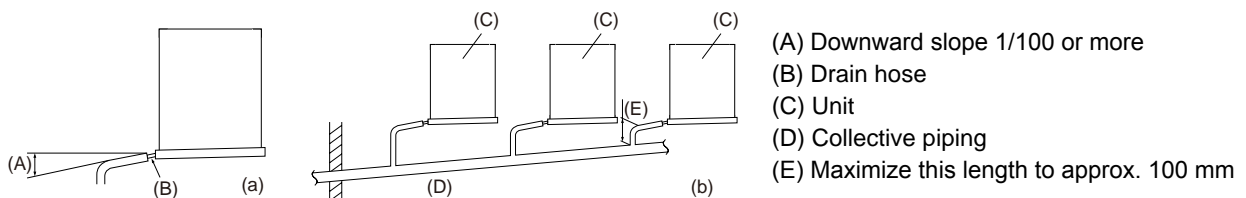
### ⚠ Caution:

- Use refrigerant piping made of C1220 (CU-DHP) phosphorus deoxidized copper as specified in the JIS H3300 "Copper and copper alloy seamless pipes and tubes". In addition, be sure that the inner and outer surfaces of the pipes are clean and free of hazardous sulphur, oxides, dust/dirt, shaving particles, oils, moisture, or any other contaminant.
- Never use existing refrigerant piping.
  - The large amount of chlorine in conventional refrigerant and refrigerator oil in the existing piping will cause the new refrigerant to deteriorate.
- Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing.
  - If dust, dirt, or water gets into the refrigerant cycle, the oil will deteriorate and the compressor may fail.

## (4)-4 Drain piping work

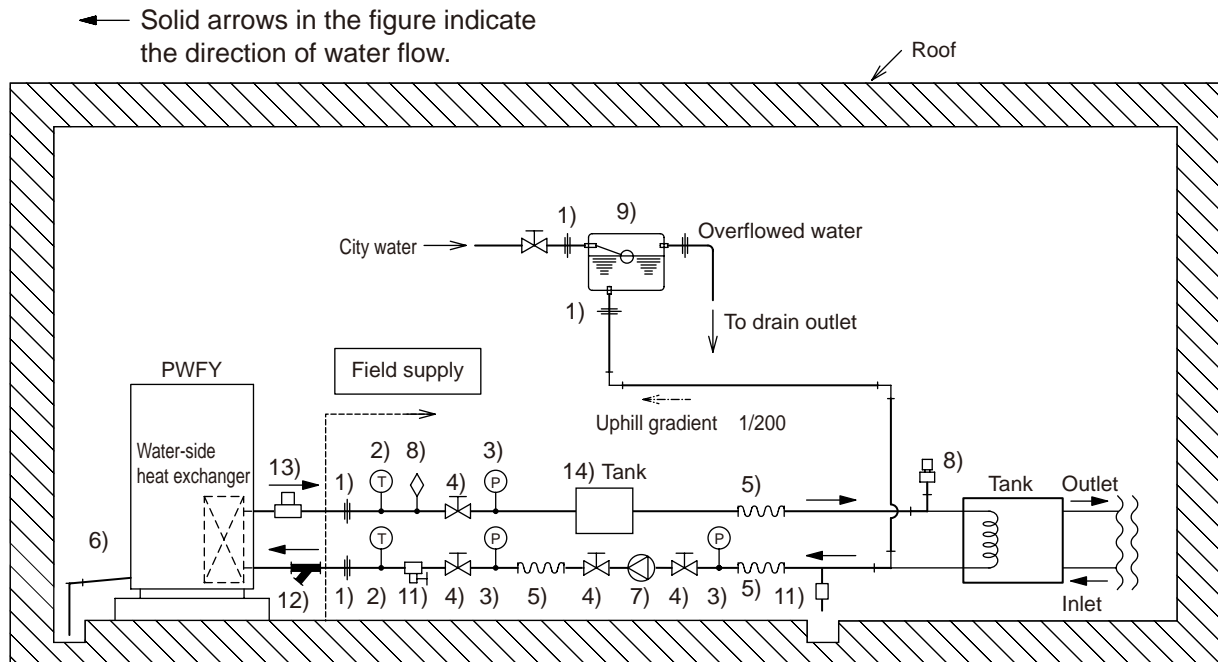
1. Ensure that the drain piping is downward (pitch of more than 1/100) to the outdoor (discharge) side. Do not provide any trap or irregularity on the way. (a)
2. Ensure that any cross-wise drain piping is less than 20 m (excluding the difference of elevation). If the drain piping is long, provide metal braces to prevent it from waving. Never provide any air vent pipe. Otherwise drain may be ejected.
3. Use a hard vinyl chloride pipe VP-25 (with an external diameter of 32 mm) for drain piping.
4. Ensure that collected pipes are 100 mm lower than the unit body's drain port as shown in (b).
5. Do not provide any odor trap at the drain discharge port.
6. Put the end of the drain piping in a position where no odor is generated.
7. Do not put the end of the drain piping in any drain where ionic gases are generated.

[Fig. IV. 2. (4).3]



### 3. Water pipe installation

#### (1) Water circuit sample



Sample of water circuit for PWFY

Consider the following when designing and installing a water piping system. (Items (1)-(14) in the figure are explained below.)

- 1) Union joints/flange joints etc.  
Install a flange etc. to allow for easy replacement of connected equipment.
- 2) Thermometer  
For checking unit performance and operation monitoring
- 3) Water pressure gauge  
For operation status monitoring
- 4) Valve  
Install a valve for easy replacement and cleaning of the refrigerant flow control device.  
Install a refrigerant flow control valve on the fan coil outlet side.
- 5) Flexible joint  
Recommended to prevent the noise and vibration from the pump from being transmitted.
- 6) Drain pipe  
Install the drain pipe with an inclination of between 1/100 and 1/200 to provide a downward flow of drain water.  
For cold climate installation, take an appropriate measure (e.g., drain heater) to prevent the drain water from freezing.
- 7) Pump  
Use a pump that is large enough to compensate for the total water pressure loss and to supply sufficient water to the unit.
- 8) Air vent valve  
Provide air vent valves on the pipes.
- 9) Expansion tank  
Install an expansion tank to accommodate expanded water and to supply water.
- 10) Cold/Hot water pipe  
Use pipes that allow for easy air purging, and provide sufficient insulation.
- 11) Drain valve  
Install drain valves so that water can be drained for servicing.
- 12) Strainer  
Install a strainer near the PWFY unit to keep foreign materials from entering the water-side heat exchanger.
- 13) Flow switch  
Install the supplied flow switch on the outlet pipe.
- 14) Tank  
Minimum tank capacity : 100 L (Refer to Fig. IV.3.(8).1)

## (1)-1 Caution for water pipe installation

Consider the following when designing and installing a water piping system.

- Do not use steel pipes as water pipes.
- Copper pipes or stainless steel pipes are recommended. If iron pipes are used in the existing system, do not connect a new circuit to the old one. Keep the existing and new circuits separate.
- Light pipes are similar to other air-conditioning pipes, however, please observe the following precautions during installation.
- Before a long period of non use, purge the water out of the pipes and thoroughly let them dry.
- Use a closed water circuit.
- When operating the unit, add brine to the circulating water to prevent it from freezing. To use brine in the system, DipSW 1-10 must be set to ON.
- When installed in a low-ambient temperature environment, keep the water circulating at all times. If that is not possible, purge the water out of the pipes completely.
- Do not use the water used for this unit for drinking or food manufacturing.
- When the ambient temperature is 0 °C or lower during stop operation, keep the water circulating at all times, or purge the water out of the pipes completely.

Model	Water inlet	Water outlet
PWFY-P200VM-E1-AU *1 When the attached expansion joints are installed.	PT 1 Screw*1	PT 1 Screw*1

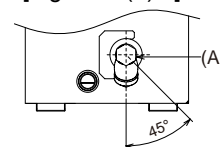
## (2) Selecting a water pump

Use a pump that is large enough to compensate for the total water pressure loss and to supply sufficient water to the unit.

## (3) Installing the strainer

- Install the strainer at the angle of 45° or less as shown in [Fig. IV 3.(3).1].
- Install the supplied strainer at the water inlet.

[Fig. IV 3.(3).1]



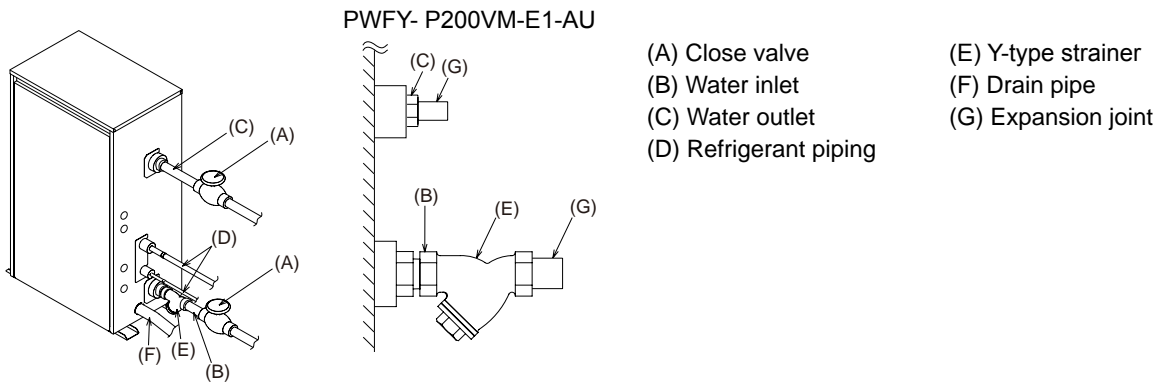
(A) Y-type strainer

## (4) Precautions during installation

- Use the reverse-return method to insure proper pipe resistance to each unit.
- To insure easy maintenance, inspection, and replacement of the unit, use a proper joint, valve, etc. on the water intake and outlet port. In addition, be sure to install a strainer on the water intake pipe. (In order to maintain the heat source unit, a strainer on the circulating water inlet is necessary.)  
\* An example of the heat source unit installation is shown in [Fig. IV 3.(5).1].
- Install a suitable air vent on the water pipe. After sending water through the pipe, be sure to vent the excess air.
- Compressed water may form in the low-temperature sections of heat source unit. Use a drainage pipe connected to the drain valve at the base of the unit to drain the water.
- Install a back flow-prevention valve on the pump and a flexible joint to prevent excess vibration.
- Use a sleeve to protect the pipes where they go through a wall.
- Use metal fittings to secure the pipes, and install them so that they have maximum protection against breakage and bending.
- Do not confuse the water intake and outlet valves.
- This unit doesn't have any heater to prevent freezing within tubes. When the water flow is stopped on low ambient, take out the water from tubes.
- The unused knockout holes should be closed and the opening of refrigerant pipes, water pipes, power source and transmission wires should be filled with putty and so on to prevent from rain. (field construction)
- Wrap some sealing tape around the screw part to prevent water leakage.
- Wrap the sealing tape as follows.
  1. Wrap the joint with sealing tape in the direction of the threads (clockwise), and do not let the tape run over the edge.
  2. Overlap the sealing tape by two-thirds to three-fourths of its width on each turn. Press the tape with your fingers so that it is pressed firmly against each thread.
  3. Leave the 1.5th through 2nd farthest threads away from the pipe and unwrapped.
- Hold the pipe on the unit side in place with a spanner when installing the pipes or strainer. Tighten screws to a torque of 50 N·m.
- Water pipes can get very hot, depending on the preset temperature. Wrap the water pipes with insulating materials to prevent burns.
- Install the expansion joint (accessory) at the inlet after installing the strainer, and outlet.

## (5) Example of unit installation

[Fig. IV. 3.(5).1]

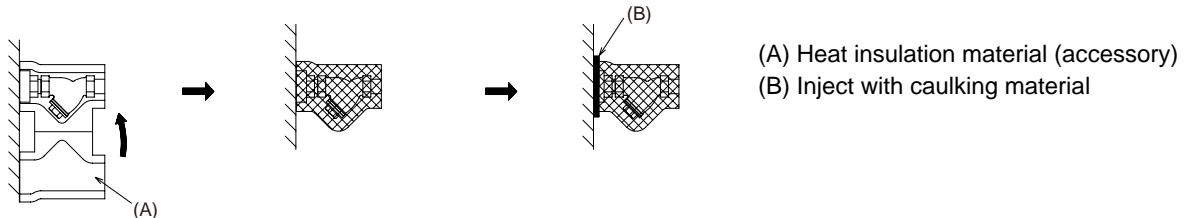


## (6) Insulation installation

The surface temperature of the water pipe would be very high, depending on the set temperature. Insulate the pipe to prevent burns. When operating PWFY-P200VM-E1-AU with cold water, insulate the water pipe to prevent condensation. Wrap insulation material around water pipes as shown in [Fig. IV. 3.(6).1].

- Any heat source piping.
- Indoor piping in cold-weather regions where frozen pipes are a problem.
- When air coming from the outside causes condensation to form on piping.
- Any drainage piping.

[Fig. IV. 3.(6).1]



## (7) Flow switch installation

<Caution>

When installing the unit, be sure to install the supplied flow switch on the water outlet side of the unit and connect the wire to IN1 of TB142A on the unit.

If the flow switch is not installed, the unit will emit the error signal (2100: Interlock error) and not operate.

\* A short-circuit wire is supplied, but it is only for test run.

<Installation procedures>

- 1) Remove the pipes attached to the flow switch.

Note: The unit is shipped with the pipes loosely tightened.

- 2) Wrap seal tape around the threads at the end of the pipes, starting at the 1.5th or 2nd thread, and not over the openings. Apply two to three wraps in the direction of the pipe threads (clockwise). Each course of the tape should overlap the one before it by 2/3 to 3/4 the width of the tape. Run your fingers around the threads and tape to press the tape into the threads.

Then, attach the pipes to the flow switch, holding parts A and B with a spanner. The maximum tightening torque is 60 N•m (611 kgf•cm).

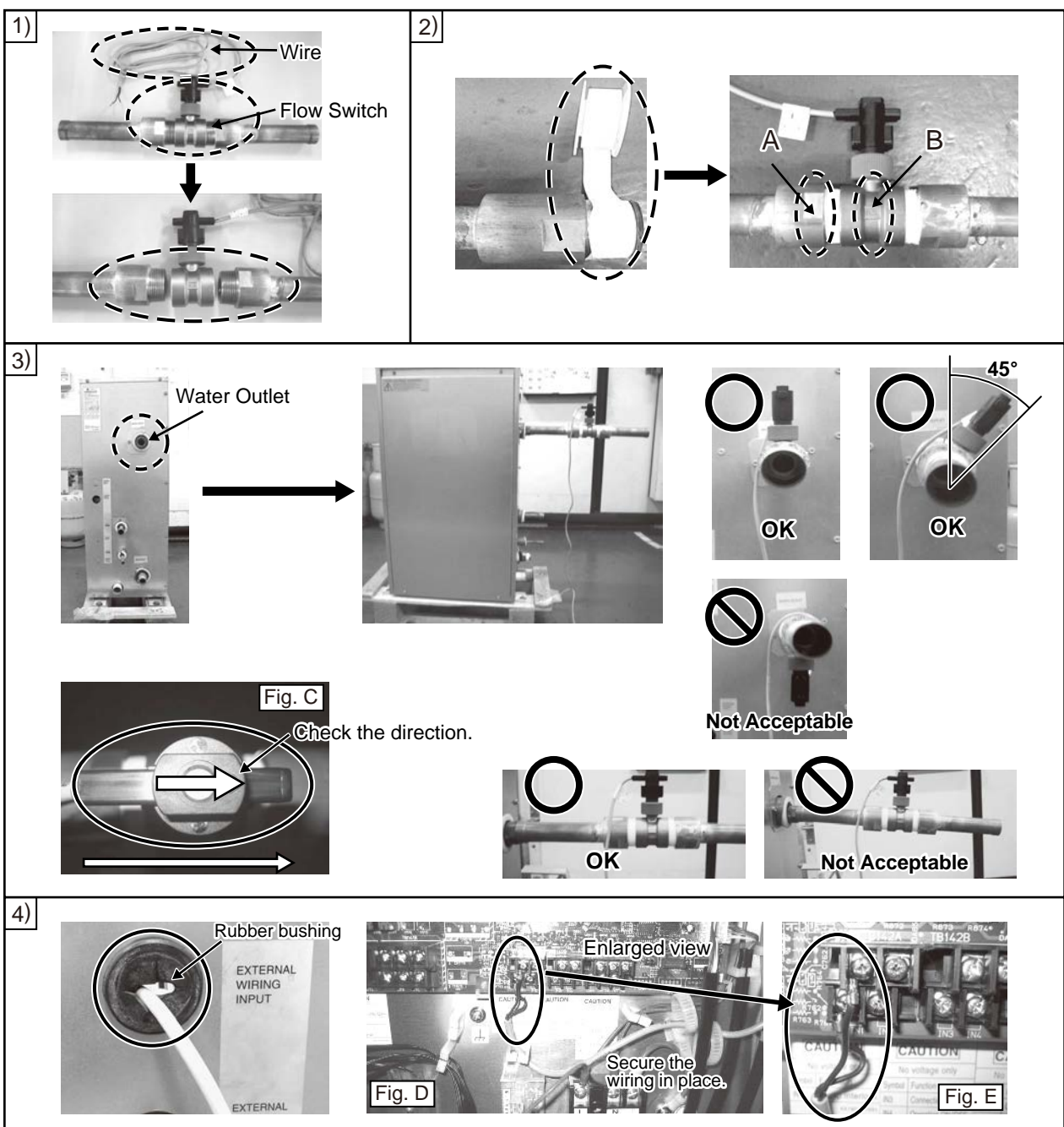
- 3) Attach the flow switch and pipes to the water outlet in the horizontal position.

The angle of the axis of the pipe should be less than 45 degrees.

Check the direction of the flow switch as shown in Fig. C.

- 4) Connect the flow switch wire to IN1 of TB142A.

From the External Wiring Input, route the wire as shown in Fig. D and connect it to the terminal as shown in Fig. E. Use a wire protector such as a rubber bushing in the access hole on the unit.



## (8) Water processing and water quality control

To preserve water quality, use the closed type of cooling tower for unit. When the circulating water quality is poor, the water heat exchanger can develop scales, leading to a reduction in heat-exchange power and possible corrosion of the heat exchanger. Please pay careful attention to water processing and water quality control when installing the water circulation system.

- Removal of foreign objects or impurities within the pipes.  
During installation, be careful that foreign objects, such as welding fragments, sealant particles, or rust, do not enter the pipes.
- Water Quality Processing
  - a) Depending on the quality of the cold-temperature water used in the air-conditioner, the copper piping of the heat exchanger may become corroded. We recommend regular water quality processing.  
Cold water circulation systems using open heat storage tanks are particularly prone to corrosion.  
When using an open-type heat storage tank, install a water-to-water heat exchanger, and use a closed-loop circuit on the air conditioner side. If a water supply tank is installed, keep contact with air to a minimum, and keep the level of dissolved oxygen in the water no higher than 1mg/liter.
  - b) Water quality standard

Items	Lower mid-range temperature water system Water Temp. ≤ 60 °C		Higher mid-range temperature water system Water Temp. > 60 °C		Tendency		
	Recirculating water	Make-up water	Recirculating water	Make-up water	Corrosive	Scale-forming	
Standard items	pH (25 °C)	7.0 ~ 8.0	7.0 ~ 8.0	7.0 ~ 8.0	7.0 ~ 8.0	○	○
	Electric conductivity(mS/m) (25 °C) (μ s/cm) (25 °C)	30 or less [300 or less]	30 or less [300 or less]	30 or less [300 or less]	30 or less [300 or less]	○	○
	Chloride ion (mg Cl/liter)	50 or less	50 or less	30 or less	30 or less	○	
	Sulfate ion (mg SO <sub>4</sub> <sup>2-</sup> /liter)	50 or less	50 or less	30 or less	30 or less	○	
	Acid consumption (pH4.8) (mg CaCO <sub>3</sub> /liter)	50 or less	50 or less	50 or less	50 or less		○
	Total hardness (mg CaCO <sub>3</sub> /liter)	70 or less	70 or less	70 or less	70 or less		○
	Calcium hardness (mg CaCO <sub>3</sub> /liter)	50 or less	50 or less	50 or less	50 or less		○
Reference items	Ionic silica (mg SiO <sub>2</sub> /liter)	30 or less	30 or less	30 or less	30 or less		○
	Iron (mg Fe/liter)	1.0 or less	0.3 or less	1.0 or less	0.3 or less	○	○
	Copper (mg Cu/liter)	1.0 or less	1.0 or less	1.0 or less	1.0 or less	○	
	Sulfide ion (mg S <sup>2-</sup> /liter)	not to be detected	not to be detected	not to be detected	not to be detected	○	
	Ammonium ion (mg NH <sub>4</sub> <sup>+</sup> /liter)	0.3 or less	0.1 or less	0.1 or less	0.1 or less	○	
	Residual chlorine (mg Cl/liter)	0.25 or less	0.3 or less	0.1 or less	0.3 or less	○	
	Free carbon dioxide (mg CO <sub>2</sub> /liter)	0.4 or less	4.0 or less	0.4 or less	4.0 or less	○	
Ryzner stability index	-	-	-	-	○	○	

Reference : Guideline of Water Quality for Refrigeration and Air Conditioning Equipment. (JRA GL02E-1994)

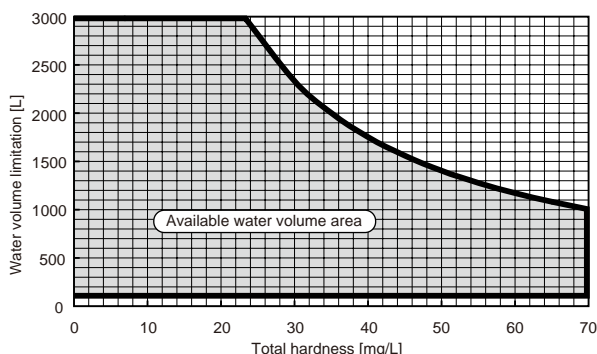
- c) Please consult with a water quality control specialist about water quality control methods and water quality calculations before using anti-corrosive solutions for water quality management.
- d) When replacing a previously installed air conditioning device (even when only the heat exchanger is being replaced), first conduct a water quality analysis and check for possible corrosion.

Corrosion can occur in cold-water systems even if there has been no prior signs of corrosion.

If the water quality level has dropped, please adjust water quality sufficiently before replacing the unit. Refer to the below graph for the maximum amount of circulating water in the water pipe. Make sure that this amount does not exceed.

[Fig. IV. 3. (8).1] Maximum circulating water

PWFY-P200VM-E1-AU

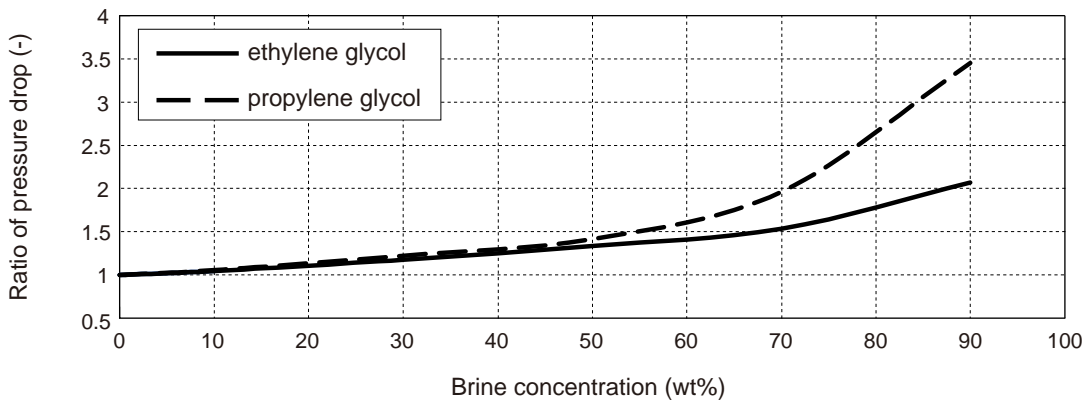
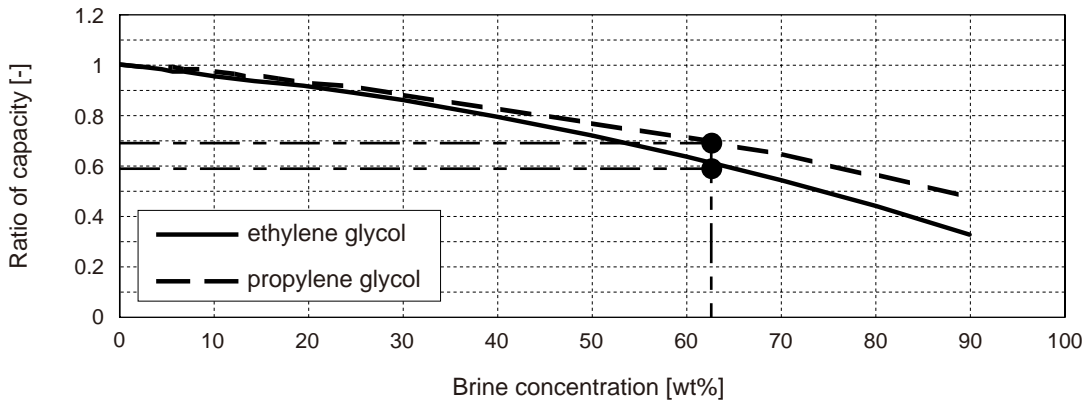
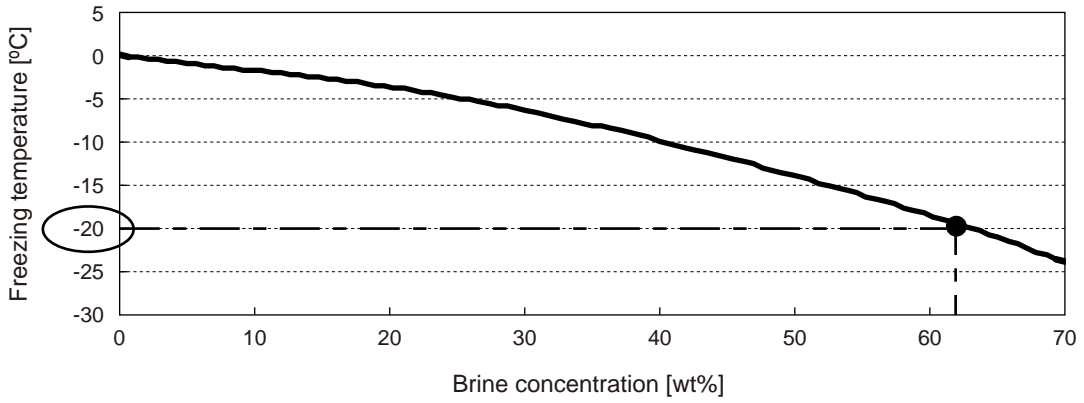


Condition: Water outlet temp. 45°C

### (9) Brine

When (a) PWFY-AU is used for cooling purpose, or (b) PWFY-AU is installed in the temperature condition below freezing temperature, Brine is required to add.

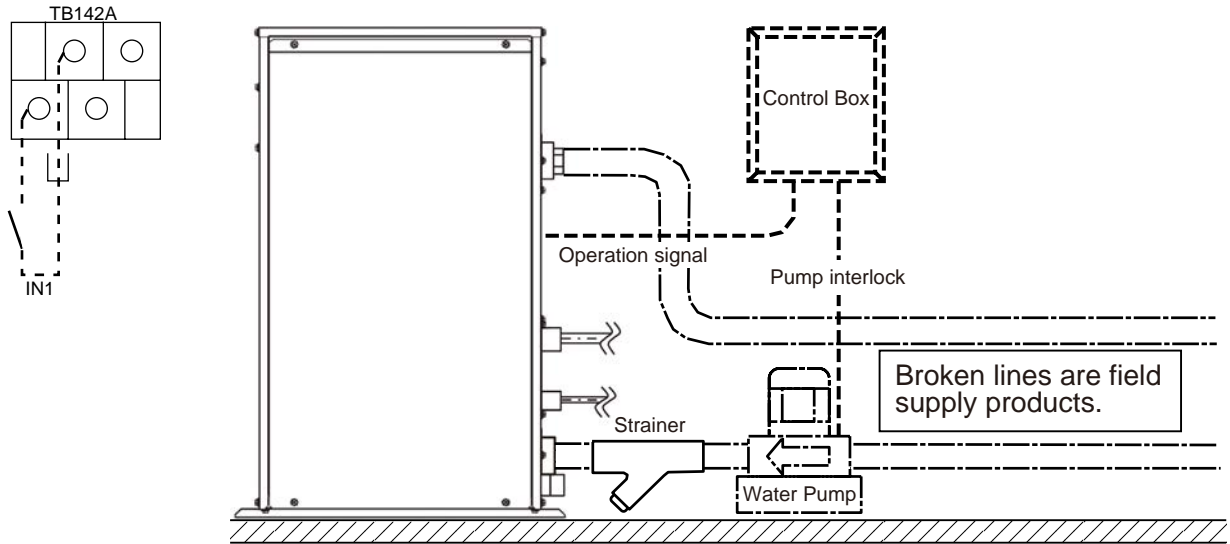
Set Dip SW 1-10 (on ATW unit) to ON if brine is added.



## (10) Pump interlock

The unit may become damaged if it is operated with no water circulating through the pipes. Be sure to interlock unit operation and the water-circuit pump.

[Fig. IV. 3. (10).1]



Example drawing for pump interlock

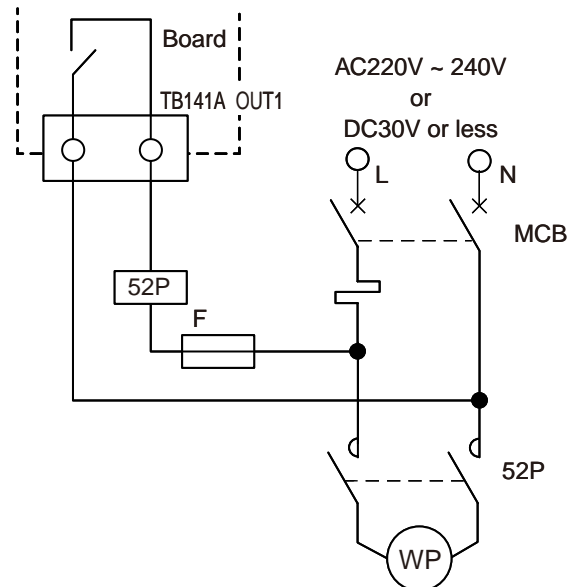
In the system including PWFY-P200VM-E1-AU, the circulating water may freeze, and result in a unit malfunction. Perform the electrical work as shown in [Fig. IV. 3. (10).2] to prevent water from freezing. Set the DipSW as shown in the table below.

DipSW3-6	External output contact
ON	Effective when Thermo-ON
OFF	Effective when Operation-ON (Remote controller-ON)

Be sure to turn on the power supply of the pump, since the control does not work if the power supply of the pump is turned off.

\*Refer to (7) Flow switch installation for details.

[Fig. IV. 3. (10).2]



- F: Fuse
- 52P: Magnetic contactor for heat source water pump
- MCB: Circuit breaker
- WP: Water pump

## (11) Anti freeze mode (Dip SW4-4 ON)

Anti freeze mode is to prevent water pipe from freezing.

The Anti freeze mode can set the heating temperature range between 10°C~45°C enabling the unit to maintain low water temperature to prevent water pipes from freezing.



# V System Design

## 1. Electrical work

### (1) General cautions

**⚠ Warning:**

Electrical work should be done by qualified electrical engineers in accordance with “Engineering Standards For Electrical Installation” and supplied installation manuals. Special circuits should also be used. If the power circuit lacks capacity or has an installation failure, it may cause a risk of electric shock or fire.

1. Be sure to take power from the special branch circuit.
2. Be sure to install an earth leakage breaker to the power.
3. Install the unit to prevent that any of the control circuit cables (remote controller, transmission cables, or external input/output line) is brought in direct contact with the power cable outside the unit.
4. Ensure that there is no slack on all wire connections.
5. Some cables (power, remote controller, transmission cables external input/output line) above the ceiling may be bitten by mice. Use as many metal pipes as possible to insert the cables into them for protection.
6. Never connect the power cable to leads for the transmission cables. Otherwise the cables would be broken.
7. Be sure to connect control cables to the indoor unit, remote controller, and the outdoor unit.
8. Be sure to ground the unit.
9. Select control cables from the conditions given in page 36.

**⚠ Caution:**

Be sure to put the unit to the ground on the outdoor unit side. Do not connect the earth cable to any gas pipe, water pipe, lightning rod, or telephone earth cable. Incomplete grounding may cause a risk of electric shock.

### (2) Power supply for PWFY unit

#### (2)-1 Electrical characteristics of PWFY unit

- Power supply cords of appliances shall not be lighter than design 245 IEC 57 or 227 IEC 57.
- A switch with at least 3 mm contact separation in each pole shall be provided by the Air conditioner installation.

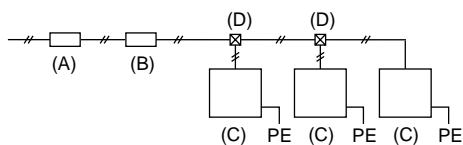
Model	Power supply				RLA (A)	
	Hz	Volts	Voltage range	MCA (A)	Cooling	Heating
PWFY-P200VM-E1-AU	50/60	220-230-240 V	Max. 264 V Min. 198 V	0.085	0.068-0.065-0.063	

#### (2)-2 Power cable specifications

Model	Total operating current	Minimum wire thickness (mm <sup>2</sup> )	Minimum wire thickness (mm <sup>2</sup> )			Breaker for current leakage	Local switch (A)		Breaker for wiring (NFB) (A)
			Main cable	branch	Ground		capacity	fuse	
PWFY-P200VM-E1-AU	16 A or less	1.5	1.5	1.5	20 A 30 mA 0.1 sec. or less	16	16	20	
	25 A or less	2.5	2.5	2.5	30 A 30 mA 0.1 sec. or less	25	25	30	
	32 A or less	4.0	4.0	4.0	40 A 30 mA 0.1 sec. or less	32	32	40	

[Fig. V. 1.(2).1]

PWFY-P200VM-E1-AU



- (A) Breaker for current leakage
- (B) Local switch or breakers for wiring
- (C) PWFY-P200VM-E1-AU
- (D) Pull box

**⚠ Caution:**

Do not use anything other than the correct capacity breaker and fuse. Using fuse, wire or copper wire with too large capacity may cause a risk of malfunction or fire.

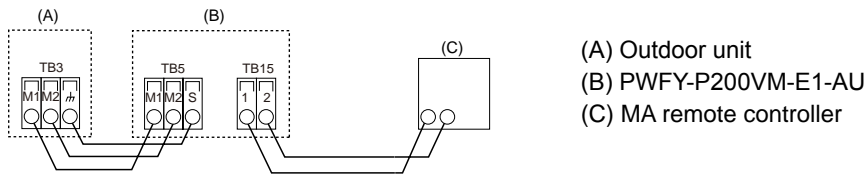
### (3) Connecting remote controller, indoor and outdoor transmission cables

- Connect unit TB5 and outdoor unit TB3. (Non-polarized 2-wire (shield))  
The “S” on unit TB5 is a shielding wire connection. For specifications about the connecting cables, refer to the outdoor unit installation manual.
- Install a remote controller following the manual supplied with the remote controller.

#### (3)-1 Power supply examples

##### (3)-1-1 Using MA Remote controller (Remote controller is optionally available)

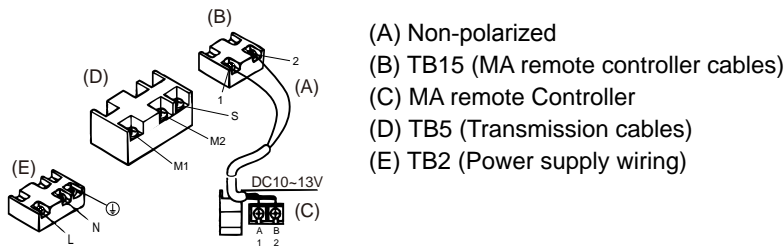
- Connect the “1” and “2” on unit TB15 to a MA remote controller. (Non-polarized 2-wire)  
[Fig. V. 1. (3). 1] MA Remote controller



- (A) Outdoor unit
- (B) PWFY-P200VM-E1-AU
- (C) MA remote controller

- DC 10 to 13 V between 1 and 2 (MA remote controller)  
[Fig. V. 1. (3). 2] MA Remote controller

#### PWFY- P200VM-E1-AU



- (A) Non-polarized
- (B) TB15 (MA remote controller cables)
- (C) MA remote Controller
- (D) TB5 (Transmission cables)
- (E) TB2 (Power supply wiring)

- The MA remote controller cannot be used at the same time or interchangeably.

#### Note:

Ensure that the wiring is not pinched when fitting the terminal box cover. Pinching the wiring may cut it.

#### ⚠ Caution:

- Use wire with supplemental insulation.
- Input to TB142A, TB142B, and TB142C should not carry voltage.
- Cables from equipment connected to external input/output should have supplemental insulation.
- Use a single multiple-core cable for external input/output to allow for connection to the PG screw.

#### ⚠ Caution:

Wire the power supply so that no tension is imparted. Otherwise disconnection, heating or fire result.

## (4) Transmission cable specifications

### (4)-1 Transmission cables

PWFY-P200VM-E1-AU

	Transmission cables	MA Remote controller cables	External input	External output
Type of cable	Shielding wire (2-core) CVVS, CPEVS or MVVS	Sheathed 2-core cable CVV (unshielded)	Sheathed multi-core cable CVV or MVV (unshielded)	Sheathed multi-core cable (unshielded) CVV or MVV
Cable diameter	More than 1.25 mm <sup>2</sup>	0.3 ~ 1.25 mm <sup>2</sup> (0.75 ~ 1.25 mm <sup>2</sup> )*1	0.3 ~ 0.5 mm <sup>2</sup>	0.3 ~ 1.25 mm <sup>2</sup>
Remarks	-	Max.length: 200 m	Max.length: 100 m	Rated voltage: L1-N: 220 ~ 240 V Rated load: 0.6 A

\*1 Connected with simple remote controller. CVVS, MVVS: PVC insulated PVC jacketed shielded control cable  
CVV, MVV : PVC insulated PVC sheathed control cable  
CPEVS : PE insulated PVC jacketed shielded communication cable

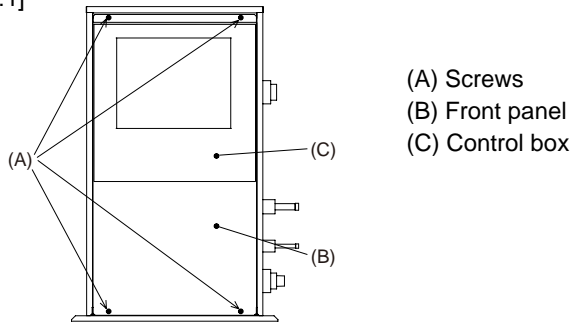
## (5) Connecting electrical connections

Verify that the model name on the operating instructions on the cover of the control box is the same as the model name on the nameplate.

Step 1

Remove the screws holding the terminal box cover in place.

[Fig. V.1.(5).1]



**Note:**

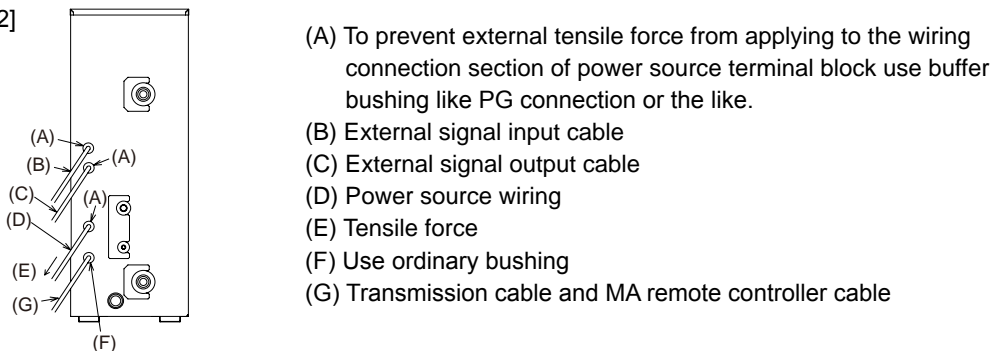
**Ensure that the wiring is not pinched when fitting the terminal box cover. Pinching the wiring may cut it.**

**⚠ Caution:**

**Install wiring so that it is not tight and under tension. Wiring under tension may break, or overheat and burn.**

- Fix power source external input/output line wiring to control box by using buffer bushing for tensile force to prevent electric shock. (PG connection or the like.) Connect transmission wiring to transmission terminal block through the knockout hole of control box using ordinary bushing.
- After wiring is complete, make sure again that there is no slack on the connections, and attach the cover onto the control box in the reverse order removal.

[Fig. IV. 1.(5).2]



**⚠ Caution:**

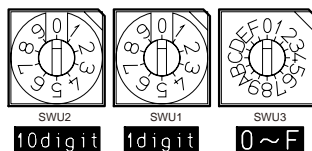
**Wire the power supply so that no tension is imparted. Otherwise disconnection, heating or fire result.**

## (6) Indoor unit address setting














(Be sure to operate with the main power turned OFF.)

[Fig. V. 1.(6).1]

<Address board>



### (6)-1 Rule of setting address

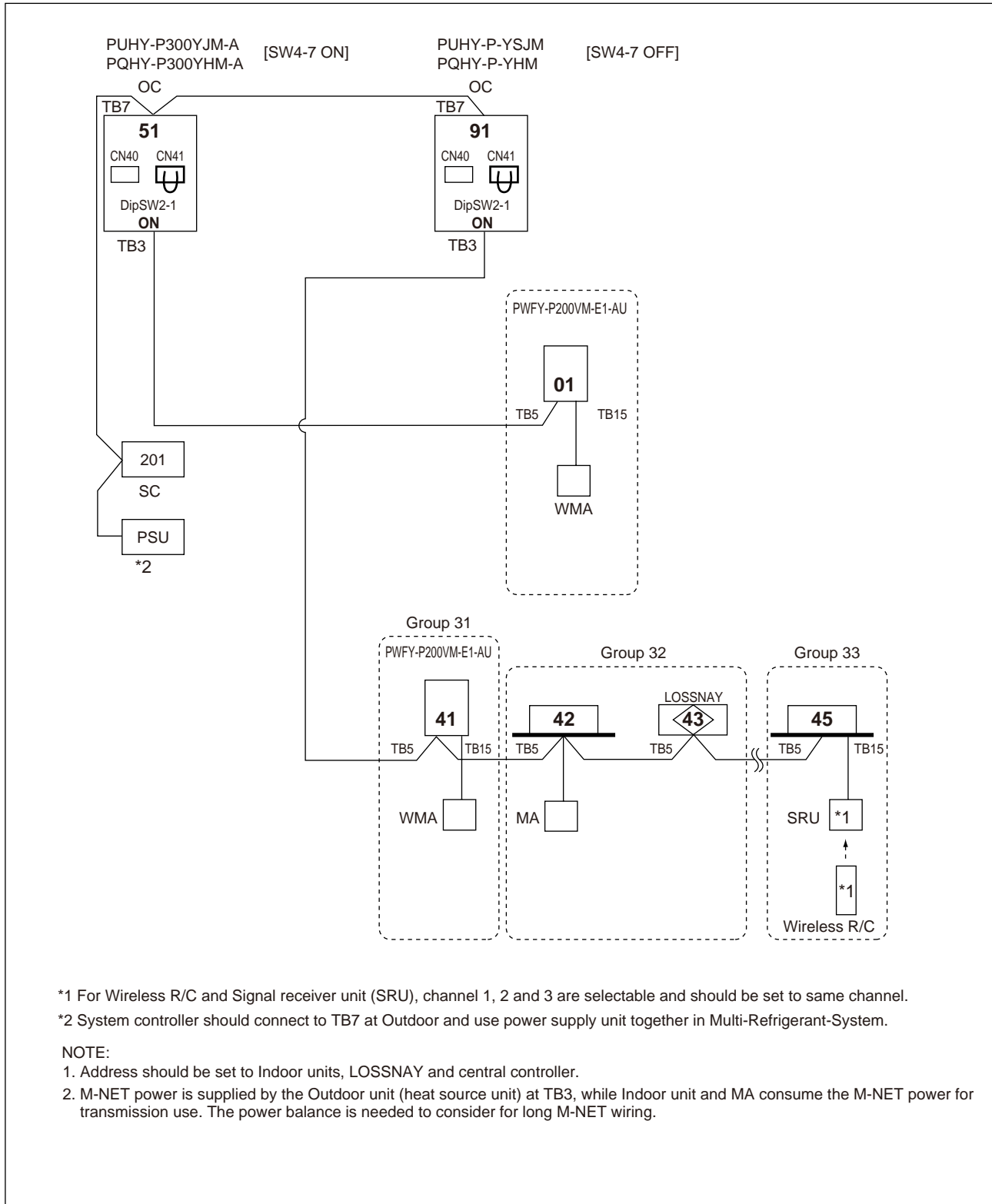
Unit		Address setting	Example			Note
PWFY unit		01 ~ 50				Use the most recent address within the same group of indoor units.
Outdoor unit (Heat source unit)		51 ~ 99, 100 (Note1)				The smallest address of indoor unit in same refrigerant system + 50 * Please reset one of them to an address between 51 and 99 when two addresses overlap. * The address automatically becomes "100" if it is set as "01~ 50"
Local remote controller	ME, LOSSNAY Remote controller (Main)	101 ~ 150	<b>1</b> Fixed			The smallest address of indoor unit in the group + 100 * The place of "100" is fixed to "1"
	ME, LOSSNAY Remote controller (Sub)	151 ~ 199, 200	<b>1</b> Fixed			The address of main remote controller + 50 * The address automatically becomes "200" if it is set as "00"
System controller	ON/OFF remote controller	000, 201 ~ 250				
	AG-150A GB-50ADA	000, 201 ~ 250	0,2 100	0~5 10	0~9 1	
	PAC-YG50ECA	000, 201 ~ 250	0,2 100	0~5 10	0~9 1	* Settings are made on the initial screen of AG-150A.
	BAC-HD150	000, 201 ~ 250	0,2 100	0~5 10	0~9 1	* Settings are made with setting tool of BM ADAPTER.
	LMAPO2-E	201 ~ 250	<b>2</b> Fixed			

Note1: To set the address to "100", set it to "50"

## (6)-2 System examples

(6)-2-1 MA remote controller, Multi-refrigerant-system, System Controller at TB7 side, Booster for long M-NET wiring

### PWFY-P200VM-E1-AU with PUHY-P300YJM-A or PQHY-P300YHM-A outdoor unit (heat source unit)



\*1 For Wireless R/C and Signal receiver unit (SRU), channel 1, 2 and 3 are selectable and should be set to same channel.

\*2 System controller should connect to TB7 at Outdoor and use power supply unit together in Multi-Refrigerant-System.

#### NOTE:

1. Address should be set to Indoor units, LOSSNAY and central controller.

2. M-NET power is supplied by the Outdoor unit (heat source unit) at TB3, while Indoor unit and MA consume the M-NET power for transmission use. The power balance is needed to consider for long M-NET wiring.

## (7) External input/output function

### Preset temperature input (external analog input: 4mA-20mA)

#### • External input

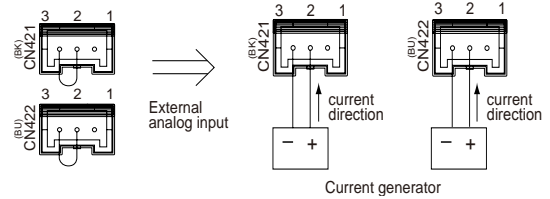
Input through CN421, CN422 on the circuit board. (Fig. V. 1.(7).1)

#### • External analog input

Use the supplied connector.

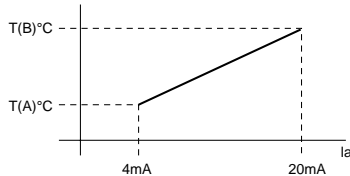
If no temperature settings are made via the MA remote controller, the temperature changes with the current of generator.

[Fig. V. 1.(7).1]



#### Method

Input T(A), T(B) } Changeable with  
4mA :T(A) PAR-W21MAA  
20mA:T(B)



S/W default  
T(A)=10°C  
T(B)=70°C.

\*All setting with a controller.

Conversion equation:  $To = \frac{T(B) - T(A)}{16} \times I_a + \frac{T(A) - T(B) - T(A)}{4}$

To: set temperature, Ia: analogue input value (mA)

Calculation example: T(A)=30°C, T(B)=70°C, Ia=10mA

Conversion equation:  $To = 2.5 \times I_a + 20$  To=45°C

### External output terminal

External output terminal (refer to Fig. V. 1.(7).2) is ineffective when the circuit is open.

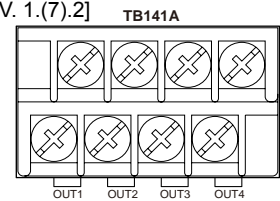
Refer to Table V. 1.(7).1 for information about each contact.

The current and voltage in the circuit to be connected to external output terminal (TB141A OUT1) must meet the following conditions.

[Table. V. 1.(7).1]

OUT1	Operation ON/OFF
OUT2	Defrost
OUT4	Error signal

[Fig. V. 1.(7).2]



Contact rating voltage	AC250V	Contact rating current
	AC250V	1A or less
	AC125V	3A or less
	DC30V	3A or less

### External input terminal

The piping length must be within 100 m.

External input terminal (refer to Fig. V. 1.(7).3) is ineffective when the circuit is open.

Refer to Table V. 1.(7).2 through Table V. 1.(7).4 for information about each contact.

Only the "pump interlock" function is ineffective when the circuit is short-circuited.

Connect a relay circuit to the external output terminal as shown in Fig. IV. 3.(10).2.

The specifications of the relay circuit to be connected must meet the following conditions.

Contact rating voltage  $\geq$  DC15V

Contact rating current  $\geq$  0.1A

Minimum applicable load  $\leq$  1mA at DC

[Table V. 1.(7).2] TB142A

IN1	Pump interlock
-----	----------------

[Table V. 1.(7).3] TB142B

IN3	Connection demand
IN4	Operation ON/OFF

\*1 PWFY-P200VM-E1-AU Heating

\*2 Effective when SW 4-3 is set to ON.

\*3 Effective when SW 4-4 is set to ON.

\*4 PWFY-P200VM-E1-AU only

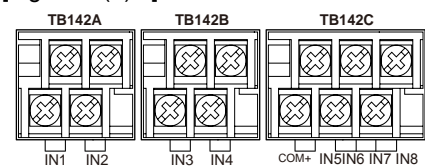
\*5 When Heating ECO mode is effective, the outlet water temp. will be changed based on ambient temp. automatically. (Except for PQHY-series)

\*6 When Anti-freeze mode is effective, the unit will set the heating temperature range between 10°C-45°C enabling the unit to maintain low water temperature to prevent water pipes from freezing.

[Table V. 1.(7).4] TB142C

COM+	Common
IN5 *1	Hot Water/Heating
IN6 *2	Heating ECO *5
IN7 *3	Anti-freeze *6
IN8 *4	Cooling operation

[Fig. V. 1.(7).3]



Note: When setting Heating ECO or Anti-freeze mode, reset all power supply of all units (outdoor/indoor units).

**Note: Dip S/W 1-1 OFF: Water Inlet Temp.**

**Dip S/W 1-1 ON : Water Outlet Temp.**

**The factory setting for Dip SW 1-1 is OFF.**

Signal priority = External input > centralized controller > remote controller

# VI Controller

## 1. PAR-W21MAA specifications

Item	Description	Operations	Display
ON/OFF	Runs and stops the operation of a group of units	○	○
Operation mode switching	Switches between Hot Water / Heating / Heating ECO / Anti-freeze / Cooling * Available operation modes vary depending on the unit to be connected. * Switching limit setting can be made via a remote controller.	○	○
Water temperature setting	Temperature can be set within the ranges below. (in increments of 1°C or 1°F) Hot Water 30°C ~ 70°C Heating 30°C ~ 55°C Heating ECO 30°C ~ 55°C Anti-freeze 10°C ~ 45°C Cooling 10°C ~ 30°C * The settable range varies depending on the unit to be connected.	○	○
Preset temperature range	Preset temperature range setting can be limited via a remote controller. 10°C ~ 90°C	○	○
Water temperature display	(in increments of 1°C or 1°F) * The settable range varies depending on the unit to be connected.	×	○
Permit / Prohibit local operation	Individually prohibits operations of each local remote control function :ON/OFF, Operation modes, water temperature setting, Circulating water replacement warning reset. * Upper level controller may not be connected depending on the unit to be connected.	×	○
Weekly scheduler	ON / OFF / Water temperature setting can be done up to 6 times one day in the week. (in increments of a minute)	○	○
Error	When an error is currently occurring on a unit, the afflicted unit and the error code are displayed.	×	○
Self check (Error history)	Searches the latest error history by pressing the CHECK button twice.	○	○
Test run	Enables the Test run mode by pressing the TEST button twice. * Test run mode is not available depending on the unit to be connected.	○	○
Circulating water replacement warning	Displays the circulating water replacement warning via the unit message. Clears the display by pressing the CIR.WATER button twice. * Circulating water replacement warning is not available depending on the unit to be connected.	○	○
LANGUAGE setting	The language on the dot matrix LCD can be changed. (Seven languages) English/German/Spanish/Russian/Italian/French/Swedish	○	○
Operation locking function	Remote controller operation can be locked or unlocked. ·All-switch locking ·Locking except ON/OFF switch	○	○

## 2. Dip switch functions

Switch	Function	Function according to switch setting		Switch setting timing	
		OFF	ON		
SW1	1	TH0 thermistor selection	Water inlet thermistor TH6	Water outlet thermistor TH8	Before power on
	2	-	-	-	-
	3	Operation after power recovery *1	Remains stopped	Auto recovery (to the status before power failure)	Before power on
	4	Operation after power recovery	Depends on the SW1-3 setting	Forced to operate	Before power on
	5	-	-	-	-
	6	-	-	-	-
	7	Test-run mode	OFF	ON	Any time
	8	Error history deleted	Normal	Deleted	Any time
	9	Effective only when SW1-7 is set to ON and only on the HEX models.	Heating	Cooling	Any time
	10	Brine mode *2	Ineffective	Effective	Any time
SW2	1-10	For self-diagnosis/operation monitoring	-	-	Any time
SW3	1	-	-	8HP	-
	2	Service LED display selection	Display in Centigrade	Display in Fahrenheit	Any time
	3	-	-	-	-
	4	-	-	-	-
	5	Cumulative compressor operation time is deleted.	Normal	Deleted	Any time
	6	Pump interlock operation	During Thermo-ON or Thermo-OFF	During Thermo-ON only	Any time
	7	-	-	-	-
	8	-	-	-	-
	9	Heating Thermo OFF differential change *3			Any time
	10	-	-	-	-
SW4	1	Do not change from factory setting.			
	2	Do not change from factory setting.			
	3	Use to change preset temperature range for the Heating ECO mode.	Ineffective	30°C to 55°C	Before power on
	4	Use to change preset temperature range for the Anti-freeze mode.	Ineffective	10°C to 45°C	Before power on
	5	-	-	-	-
	6	-	-	-	-
	7	-	-	-	-
	8	-	-	-	-
	9	-	-	-	-
	10	-	-	-	-
SW5	1	Enabling/disabling ACCT sensor error detection	Error detection enabled	Error detection disable (No load operation is possible)	Any time
	2	-	-	-	-
	3	-	-	-	-
	4	-	-	-	-

\*1 Valid only when SW1-4 is set to OFF

\*2 Refer to P32

\*3 The following changes can be made by changing the setting of the switch from OFF to ON.

0.5 → 1 → 0.5 → 2 → 0.5 → 3 → 0.5 → 4 → 0.5 → 5 → 0.5 → 6 → 0.5 → 7 → 0.5 → 8



## VII Maintenance Cycle

### 1. Routine maintenance checks

- Periodically and thoroughly check the circulating water circuit. (See table below.)
- Consult a maintenance technician.

### 2. Parts Replacement Cycle

Regular preventive maintenance and parts replacement help keep the unit running smoothly and minimize problems. The table below shows the maintenance schedule. Use the replacement timing in the table only as a guide. Some parts may need to be replaced sooner, depending on the usage.

Components		What to look for	Maintenance cycle (times/year)	Replacement cycle
Refrigerant circuit components	Compressor	High/low pressure, vibration, noise Insulation resistance, loose terminals	2	20,000 hours
	Water-refrigerant heat exchanger	High/low pressure, water pressure loss	2	10 Years
	Solenoid valve (PWFY-P200VM-E1-AU)	Operation, leakage, clogging	2	7 Years
	Check valve (PWFY-P200VM-E1-AU)	Operation, leakage, clogging	1	10 Years
	Linear expansion valve	Operation	2	7 Years
	Strainer	Inlet/outlet temperature difference	1	While in heavy use
	Capillary tube	Contact wear, Vibration	1	10 Years
	Pipes	Contact wear, Vibration	1	10 Years
Electric circuit parts	Electromagnetic contactor	Corroded contact, loose terminals Insulation resistance	2	8 Years
	Overcurrent relay	loose terminals	2	7 to 10Years
	Relay	Operation, Contact resistance. Insulation resistance	2	6 Years
	Solenoid valve	Insulation resistance	2	7 Years
	Fuse	External appearance	2	8 Years
	Electronic board	External appearance	2	8 Years
	Switch	Operation, Contact resistance.	2	8 Years
	Pressure switch	Contact resistance.	2	7 to 10Years
	Terminal block	loose terminals	2	8 Years
	Cable/connector	Looseness, corrosion, and wearing	2	10 Years
Fan	Balance	2	10 Years	
Motor	Insulation resistance, noise, vibration	2	6 to 10Years	





# DATA BOOK    PWFY-P200VM-E1-AU

## - For high temperature flow



**for a greener tomorrow**

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

### **⚠ Warning**

- Do not use refrigerant other than the type indicated in the manuals provided with the unit and on the nameplate.
- Doing so may cause the unit or pipes to burst, or result in explosion or fire during use, during repair, or at the time of disposal of the unit.
  - It may also be in violation of applicable laws.
  - MITSUBISHI ELECTRIC CORPORATION cannot be held responsible for malfunctions or accidents resulting from the use of the wrong type of refrigerant.

## **MITSUBISHI ELECTRIC CORPORATION**

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN