

AIR CONDITIONING SYSTEMS

CITY MULTI



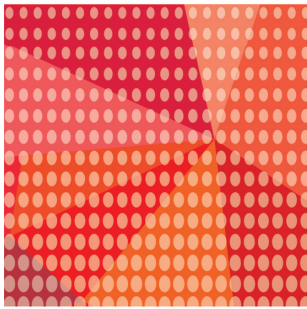
DATA BOOK

MODEL

PWFY-P36NMU-E-BU

PWFY-P36NMU-E2-AU

PWFY-P72NMU-E2-AU



PWFY-P-NMU-E-BU, PWFY-P-NMU-E2-AU

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1-1. Unit configuration table

Model	PWFY-P36NMU-E-BU		PWFY-P36, P72NMU-E2-AU	
Outdoor unit	R2-Series	PURY-P T(S)NU PURY-P Y(S)NU	Y-Series	PUHY-P T(S)NU PUHY-P Y(S)NU
			Y-Series (High efficiency)	PUHY-EP T(S)NU PUHY-EP Y(S)NU
			H2i-Series (Y)	PUHY-HP TNU PUHY-HP YNU
	R2-Series (High efficiency)	PURY-EP T(S)NU PURY-EP Y(S)NU	R2-Series	PURY-P T(S)NU PURY-P Y(S)NU
			R2-Series (High efficiency)	PURY-EP T(S)NU PURY-EP Y(S)NU
	H2i-Series (R2)	PURY-HP TNU PURY-HP YNU	H2i-Series (R2)	PURY-HP TNU PURY-HP YNU
Connection	BC controller	BC controller: CMB-P104, 106, 108, 1012, 1016NU-J1 Main BC controller: CMB-P108, 1012, 1016NU-JA1/CMB-P1016NU-KA1 Sub BC controller: CMB-P104, 108NU-KB1		

1-2. Operable temperature range

<PWFY-P36NMU-E2-BU>

		Only PWFY	PWFY with standard indoor units
		Heating	Heating
Inlet water temperature	R2-Series R2-Series (High efficiency) H2i-Series (R2)	50 to 160°F (10 to 71°C)	50 to 160°F (10 to 71°C)
Outdoor temperature	R2-Series R2-Series (High efficiency)	-4 to 90°F WB (-20 to 32°C WB)	-4 to 90°F WB (-20 to 32°C WB)
	H2i-Series (R2)	-13 to 90°F WB (-25 to 32°C WB)	-13 to 90°F WB (-25 to 32°C WB)

<PWFY-P36, P72NMU-E2-AU>

		Only PWFY		PWFY with standard indoor units	
		Cooling	Heating	Cooling	Heating
Inlet water temperature	R2-Series R2-Series (High efficiency) H2i-Series (R2)	50 to 95°F (10 to 35°C)	50 to 105°F (10 to 41°C)	50 to 95°F (10 to 35°C)	50 to 105°F (10 to 41°C)
	Y-Series Y-Series (High efficiency) H2i-Series (Y)	50 to 95°F (10 to 35°C)	50 to 105°F (10 to 41°C)	50 to 95°F (10 to 35°C)	50 to 105°F (10 to 41°C)
Outdoor temperature	R2-Series R2-Series (High efficiency)	23 to 115°F DB (-5 to 46°C DB)	-4 to 90°F WB (-20 to 32°C)	23 to 115°F DB (-5 to 46°C DB)	-4 to 90°F WB (-20 to 32°C)
	H2i-Series (R2)	23 to 115°F DB (-5 to 46°C DB)	-13 to 90°F WB (-25 to 32°C WB)	23 to 115°F DB (-5 to 46°C DB)	-13 to 90°F WB (-25 to 32°C WB)
	Y-Series Y-Series (High efficiency)	23 to 115°F DB (-5 to 46°C DB)	-4 to 60°F WB (-20 to 15.5°C WB)	23 to 115°F DB (-5 to 46°C DB)	-4 to 60°F WB (-20 to 15.5°C WB)
	H2i-Series (Y)	23 to 109°F DB (-5 to 43°C DB)	-13 to 60°F WB (-25 to 15.5°C WB)	23 to 109°F DB (-5 to 43°C DB)	-13 to 60°F WB (-25 to 15.5°C WB)

1-3. Connectable outdoor unit capacity range

<PWFY-P36NMU-E2-BU>

	Only PWFY	PWFY with standard indoor units
R2-Series R2-Series (High efficiency) H2i-Series (R2)	50 to 100%	50 to 150%

<PWFY-P36, P72NMU-E2-AU>

	Only PWFY	PWFY with standard indoor units
R2-Series R2-Series (High efficiency) H2i-Series (R2)	50 to 100%	50 to 150%
Y-Series Y-Series (High efficiency) H2i-Series (Y)	50 to 100%	50 to 130%

2. SPECIFICATIONS

AIR TO WATER

PWFY-P-NMU-E-BU, P-NMU-E2-AU

Model			PWFY-P36NMU-E-BU	
Power source			1-phase 208-230V 60Hz	
Heating capacity (Nominal)	*1	kW	11.7	
	*1	kcal / h	10,100	
	*1	BTU / h	39,900	
	Power input		kW	2.48
	Current input		A	12.30 - 11.12
Temp. range of heating	Outdoor temp.		W.B	-4~90°F (-20~32°C) R2-Series
			W.B	-13~90°F (-25~32°C) H2i-Series (R2)
	Circulating Water temp. (for water source unit side)			50~113°F (10~45°C) WR2-Series
	Inlet Water temp. (for PWFY side)		-	50~160°F (10~71°C)
	Connectable outdoor unit/heat source unit	Total capacity		50~100% of outdoor/heat source unit capacity
Model / Quantity		R2-Series R2-Series (High efficiency) H2i-Series (R2) WR2-Series		
Sound pressure level (measured in anechoic room)		dB<A>	44	
Diameter of refrigerant pipe	Liquid	in.(mm)	Φ3/8 (Φ9.52) Brazed	
	Gas	in.(mm)	Φ5/8 (Φ15.88) Brazed	
Diameter of water pipe	Inlet	in.(mm)	PT3/4 (27.2) Screw	
	Outlet	in.(mm)	PT3/4 (27.2) Screw	
Field drain pipe size		in.(mm)	Φ1-1/4 (Φ32)	
External finish		NO		
External dimension H × W × D		mm	800 (785 without legs) × 450 × 300	
		in.	31-1/2" (30-15/16" without legs) × 17-3/4" × 11-13/16"	
Net weight		lbs(kg)	131 (59)	
Compressor	Type		Inverter rotary hermetic compressor	
	Maker		MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output		kW	1.0
	Lubricant		NEO22	
Circulating water	Operation volume Range	m³/h	0.6~2.15	
		G/h	158~568	
		gpm	2.6~9.4	
		L/min	10~36	
Protection on Internal circuit (R134a)	High pressure protection		High pressure sensor, High pressure switch at 3.60 MPa (522 psi)	
	Inverter circuit (COMP)		Over-heat protection, Over-current protection	
	Compressor		Discharge thermo protection, Over-current protection	
Refrigerant	Type × original charge		R134a x (2lbs + 7oz) (1.1kg)	
	Control		LEV	
Design pressure	R410A	psi	601	
		MPa	4.15	
	R134a	psi	522	
		MPa	3.60	
	Water	psi	145	
		MPa	1.00	
Drawing	External		WKB94T460	
	Wiring		KE94C344	
Standard attachment	Document		Installation Manual, Instruction Book	
	Accessory		Strainer, Heat insulation material, 2 × Washer, wire	
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 (PWFY conditions are indicated in the parentheses.) <R2/H2i R2-Series> Outdoor Temp. : 47°FDB / 43°FWB (8.3°CDB/6.1°CWB) Pipe length : 25 ft (7.6 m) Level difference : 0 ft (0 m) (Inlet water Temp.: 149°F (65°C) Water flow rate: 9.4 gpm (2.15 m³/h)) * 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 32°F (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.			<WR2-Series> Circulating water Temp.: 70°F (21.1°C) Pipe length : 25 ft (7.6 m) Level difference : 0 ft (0 m) (Inlet water Temp. for PWFY side : 149°F (65°C) Water flow rate 9.4 gpm (2.15 m³/h)) * Install the unit in an environment where the wet bulb Temp. will not exceed 90°F (32°C). * The water circuit must use the closed circuit. * Please do not use it as a drinking water.	
			Unit converter kcal/h = kW x 860 BTU/h = kW x 3,412 cfm = m³/min x 35.31 G(us) = L × 0.2642 lbs = kg / 0.4536 psi = MPa×145.038 * The specification data is subject to rounding variation.	

2. SPECIFICATIONS

AIR TO WATER

PWFY-P-NMU-E-BU, P-NMU-E2-AU

Model			PWFY-P36NMU-E2-AU
Power source			1-phase 208 - 230 V 60Hz
Heating capacity (Nominal)	*1	kW	11.7
	*1	kcal / h	10,100
	*1	BTU / h	39,900
	Power input	kW	0.025 - 0.028
Temp. range of heating	Outdoor temp.	A	0.145 - 0.150
		W.B	-4~90°F (-20~32°C) R2-Series
		W.B	-13~90°F (-25~32°C) H2i-Series (R2)
		W.B	-4~60°F (-20~15.5°C) Y-Series
		W.B	-13~60°F (-25~15.5°C) H2i-Series (Y)
	Circulating Water temp. (for water source unit side)		50~113°F (10~45°C) WY, WR2-Series
Cooling capacity (Nominal)	Inlet Water temp. (for PWFY side)		50~105°F (10~41°C)
	*2	kW	10.6
	*2	kcal / h	9,100
	*2	BTU / h	36,200
Temp. range of cooling	Outdoor temp.	kW	0.025 - 0.028
		A	0.145 - 0.150
		D.B	23~115°F (-5~46°C) R2-Series
		D.B	23~115°F (-5~46°C) H2i-Series (R2)
		D.B	23~115°F (-5~46°C) Y-Series
		D.B	23~109°F (-5~43°C) H2i-Series (Y)
Connectable outdoor unit/heat source unit	Circulating Water temp. (for water source unit side)		50~113°F (10~45°C) WY, WR2-Series
	Inlet Water temp. (for PWFY side)		50~95°F (10~35°C)
	Total capacity		50~100% of outdoor/heat source unit capacity
	Model / Quantity		Y-Series Y-Series (High efficiency) H2i-Series (Y) R2-Series R2-Series (High efficiency) H2i-Series (R2) WY-Series WR2-Series
Sound pressure level (measured in anechoic room)		dB<A>	29
Diameter of refrigerant pipe	Liquid	in.(mm)	Φ3/8 (Φ9.52) Brazed
	Gas	in.(mm)	Φ5/8 (Φ15.88) Brazed
Diameter of water pipe	Inlet	in.(mm)	PT3/4 (27.2) Screw
	Outlet	in.(mm)	PT3/4 (27.2) Screw
Field drain pipe size		in.(mm)	Φ1-1/4 (Φ32)

External finish		NO	
External dimension H × W × D		mm	800 (785 without legs) × 450 × 300
		in.	31-1/2" (30-15/16" without legs) × 17-3/4" × 11-13/16"
Net weight		lbs(kg)	73 (33)
Circulating water	Operation Volume Range	m³/h	1.1~2.15
		G/h	290~568
		gpm	4.8~9.4
		L/min	18~36
Design pressure	R410A	psi	601
		MPa	4.15
	Water	psi	145
		MPa	1.00
Drawing	External	WKS79C728	
	Wiring	KE94G154	
Standard attachment	Document	Installation Manual, Instruction Book	
	Accessory	Strainer, Heat insulation material, 2 × Washer, Flow switch × 1set, Buffer material	
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 (PWFY conditions are indicated in the parentheses.)		Unit converter kcal/h = kW x 860 BTU/h = kW x 3,412 cfm = m³/min x 35.31 G(us) = L x 0.2642 lbs = kg / 0.4536 psi = MPa x 145.038
	<Y/H2i Y/R2/H2i R2-Series> Outdoor Temp. : 47°FDB/43°FWB (8.3°CDB/6.1°CWB) Pipe length : 25 ft (7.6 m) Level difference : 0 ft (0 m) (Inlet water Temp. : 86°F (30°C)) (Water flow rate : 9.4 gpm (2.15 m³/h))		
	*2 Nominal cooling conditions (PWFY conditions are indicated in the parentheses.)		* The specification data is subject to rounding variation.
	<Y/H2i Y/R2/H2i R2-Series> Outdoor Temp. : 95°FDB (35°CDB) Pipe length : 25 ft (7.6 m) Level difference : 0 ft (0 m) (Inlet water Temp. : 149°F (23°C)) (Water flow rate : 8.4 gpm (1.93 m³/h))		
* Due to continuing improvement, the above specifications may be subject to change without notice.		* Install the unit in an environment where the wet bulb Temp. will not exceed 92°F (32°C)	
* The unit is not designed for outside installations.		* The water circuit must use the closed circuit.	
* Please don't use the steel material for the water piping material.		* Please do not use it as a drinking water.	
* Please always make water circulate or add the brine to the circulation water when the ambient temperature becomes 32°F (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.			

2. SPECIFICATIONS

AIR TO WATER

PW-FY-P-NMU-E-BU, P-NMU-E2-AU

Model			PWFY-P72NMU-E2-AU
Power source			1-phase 208 - 230 V 60Hz
Heating capacity (Nominal)	*1	kW	23.4
		kcal / h	20,100
		BTU / h	79,800
	Power input	kW	0.025 - 0.028
		Current input	A
Temp. range of heating	Outdoor temp.	W.B	-4~90°F (-20~32°C) R2-Series
		W.B	-13~90°F (-25~32°C) H2i-Series (R2)
		W.B	-4~60°F (-20~15.5°C) Y-Series
		W.B	-13~60°F (-25~15.5°C) H2i-Series (Y)
	Circulating Water temp. (for water source unit side)		50~113°F (10~45°C) WY, WR2-Series
	Inlet Water temp. (for PWFY side)		- 50~105°F (10~41°C)
Cooling capacity (Nominal)	*2	kW	21.1
		kcal / h	18,100
		BTU / h	72,000
	Power input	kW	0.025 - 0.028
		Current input	A
Temp. range of cooling	Outdoor temp.	D.B	23~115°F (-5~46°C) R2-Series
		D.B	23~115°F (-5~46°C) H2i-Series (R2)
		D.B	23~115°F (-5~46°C) Y-Series
	Circulating Water temp. (for water source unit side)		50~113°F (10~45°C) WY, WR2-Series
	Inlet Water temp. (for PWFY side)		- 23~109°F (-5~43°C) H2i-Series (Y)
	Connectable outdoor unit/heat source unit	Total capacity	
Model / Quantity		Y-Series Y-Series (High efficiency) H2i-Series (Y) R2-Series R2-Series (High efficiency) H2i-Series (R2) WY-Series WR2-Series	
Sound pressure level (measured in anechoic room)		dB<A>	29
Diameter of refrigerant pipe	Liquid	in.(mm)	Φ3/8 (Φ9.52) Brazed
	Gas	in.(mm)	Φ3/4 (Φ19.05) Brazed
Diameter of water pipe	Inlet	in.(mm)	PT 1 (3/4) Screw (PT 3/4 Screw without expansion joint)
	Outlet	in.(mm)	PT 1 (3/4) Screw (PT 3/4 Screw without expansion joint)
Field drain pipe size		in.(mm)	Φ1-1/4 (Φ32)

External finish			NO	
External dimension H × W × D		mm	800 (785 without legs) × 450 × 300	
		in.	31-1/2" (30-15/16" without legs) × 17-3/4" × 11-13/16"	
Net weight		lbs(kg)	80 (36)	
Circulating water	Operation Volume Range	m³/h	1.8~4.30	
		G/h	475~1136	
		gpm	7.9~18.9	
		L/min	30~72	
Design pressure	R410A	psi	601	
		MPa	4.15	
	Water	psi	145	
		MPa	1.00	
Drawing	External	WKS79C728		
	Wiring	KE94G154		
Standard attachment	Document	Installation Manual, Instruction Book		
	Accessory	Strainer, Heat insulation material, Expansion joint , 2 × Washer, Flow switch × 1set, Buffer material		
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 (PWFY conditions are indicated in the parentheses.) <Y/H2i Y/R2/H2i R2-Series> Outdoor Temp. : 47°FDB/43°FWB (8.3°CDB/6.1°CWB) Pipe length : 25 ft (7.6 m) Level difference : 0 ft (0 m) (Inlet water Temp. : 86°F (30°C)) (Water flow rate : 18.9 gpm (4.30 m³/h)) *2 Nominal cooling conditions (PWFY conditions are indicated in the parentheses.) <Y/H2i Y/R2/H2i R2-Series> Outdoor Temp. : 95°FDB (35°CDB) Pipe length : 25 ft (7.6 m) Level difference : 0 ft (0 m) (Inlet water Temp. : 149°F (23°C)) (Water flow rate : 16.9 gpm (3.86 m³/h))	<WY/WR2-Series> Circulating water Temp. : 70°F (21.1°C) Pipe length : 25 ft (7.6 m) Level difference : 0 ft (0 m) (Inlet water Temp. for PWFY side : 86°F (30°C)) (Water flow rate : 18.9 gpm (4.30 m³/h)) <WY/WR2-Series> Circulating water Temp. : 70°F (21.1°C) Pipe length : 25 ft (7.6 m) Level difference : 0 ft (0 m) (Inlet water Temp. for PWFY side : 149°F (23°C)) (Water flow rate : 16.9 gpm (3.86 m³/h))	Unit converter kcal/h = kW x 860 BTU/h = kW x 3,412 cfm = m³/min x 35.31 G(us) = L × 0.2642 lbs = kg / 0.4536 psi = MPa×145.038 * The specification data is subject to rounding variation.
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* 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 32°F (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 92°F (32°C)

* The water circuit must use the closed circuit.

* Please do not use it as a drinking water.

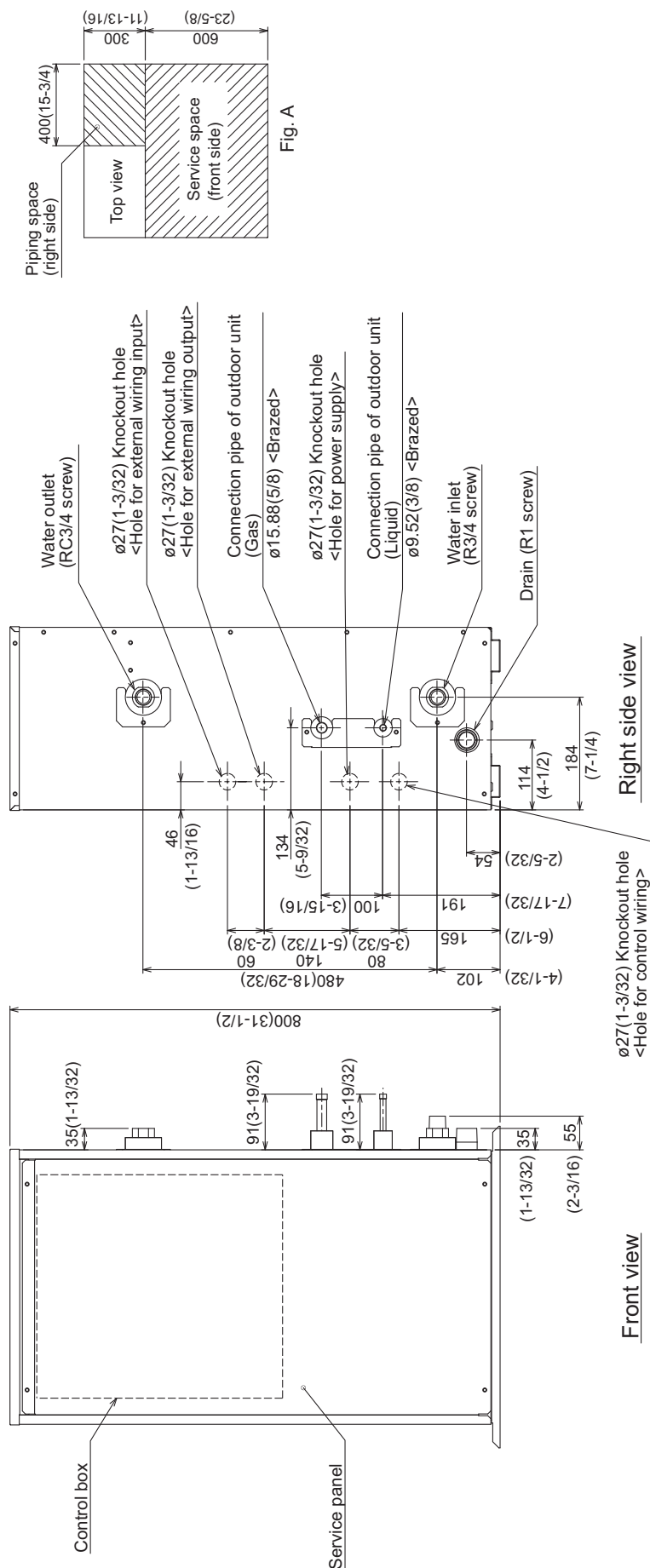
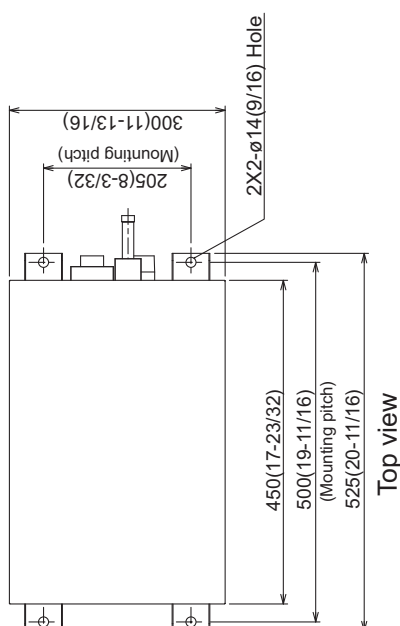
PWFY-P36NMU-E-BU

Unit: mm (in)

<Accessories>

- Y-type strainer (RC3/4)1pc.
- Heat Insulation material 1pc.
- Washer2pcs.
- Wire1pc.

- 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 0degC(32°F) 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(90°F).
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.

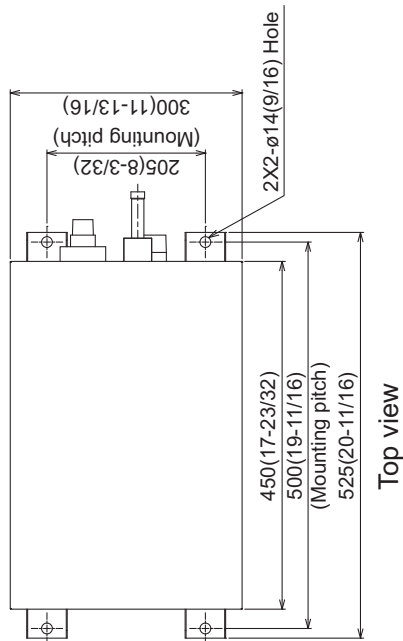


PWFY-P36, P72NMU-E2-AU

Unit: mm (in)

- <Accessories>
- Y-type strainer(RC3/4).....1pc.
 - Heat Insulation material.....1pc.
 - Expansion joint(P72).....2pcs.
[From RC3/4 to RC1]
 - Flow switch.....1set
 - Washer.....2pcs.
 - Buffer material.....1pc.

- Note 1. Ensure no water or debris can enter the unit through any gaps around wiring or piping.
2. Ensure adequate both service and piping space, as shown in Fig A.
3. Please always make water circulate or add the brine to the circulation water when the ambient temperature becomes 0°C(32°F) or below.
4. The unit is not designed for outside installations.
5. Please always make water circulate or remove all circulation water completely when not in operation.
6. The water circuit must be the closed circuit.
7. Please don't use the steel material for the water piping.
8. Connect the strainer as accessory for unit to water inlet pipe.



Top view

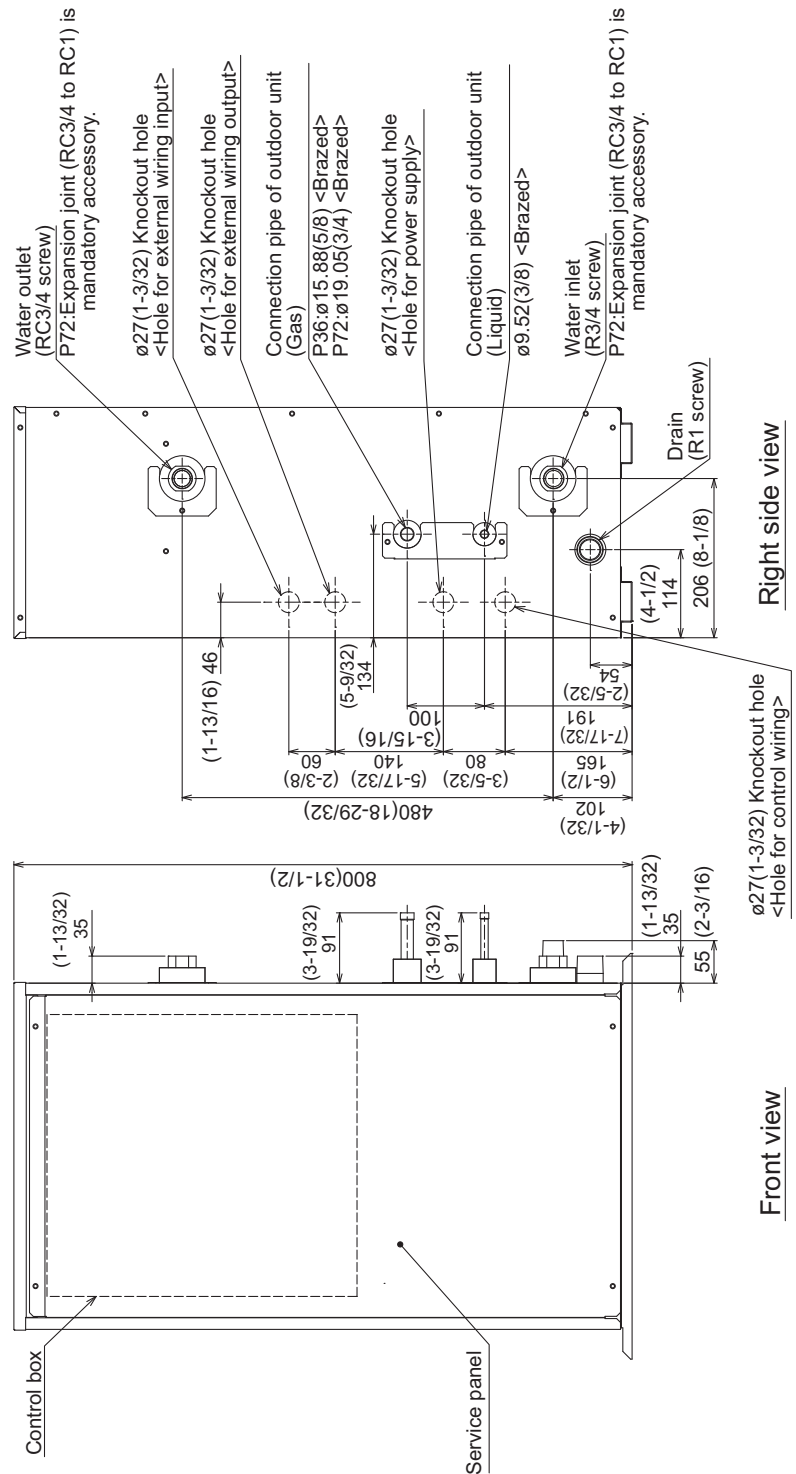
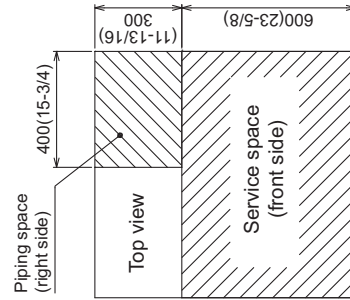


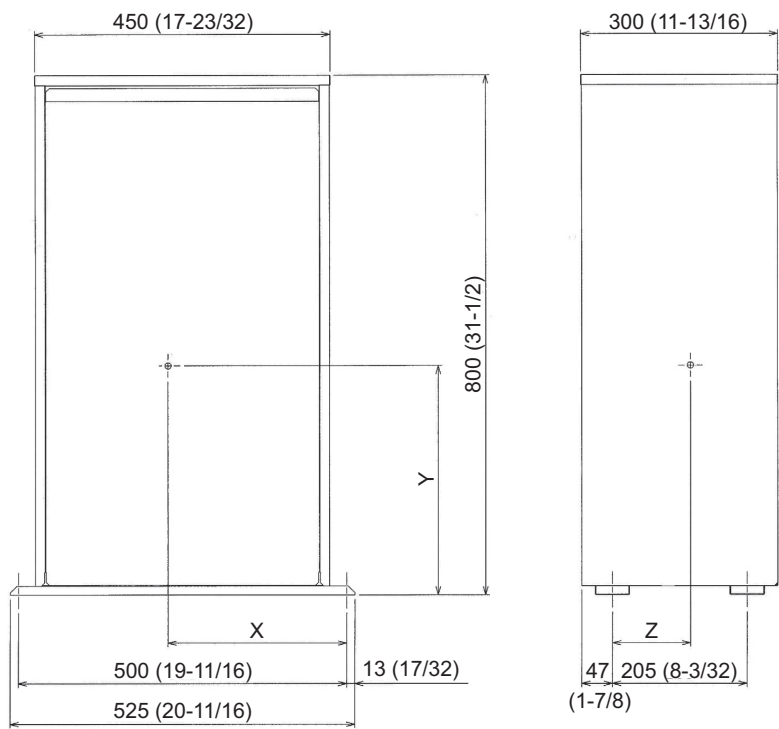
Fig. A



PWFY-P-NMU-E-BU, P-NMU-E2-AU

PWFY-P36NMU-E-BU

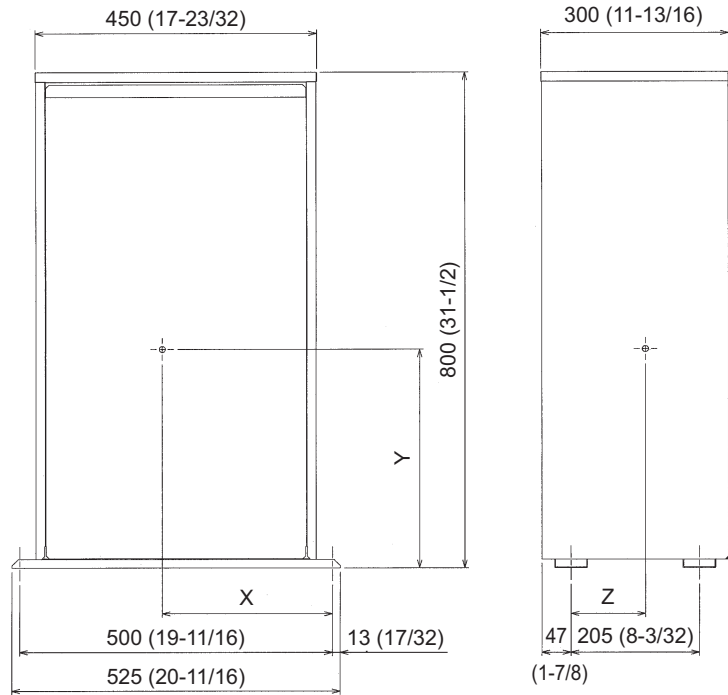
unit: mm (in)



unit: mm (in)			
Model	X	Y	Z
PWFY-P36NMU-E-BU	272 (10-23/32)	355 (13)	119 (4-11/16)

PWFY-P36, P72NMU-E2-AU

unit: mm (in)



unit: mm (in)			
Model	X	Y	Z
PWFY-P36NMU-E2-AU	257 (10-1/8)	355 (14)	100 (3-15/16)
PWFY-P72NMU-E2-AU	267 (10-17/32)	368 (14-1/2)	103 (4-1/16)

PWfY-P-NMU-E-BU, P-NMU-E2-AU



PWFY-P36, P72NMU-E2-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
P36	*3 do not exist
P72	*3 exist

Symbol	Function
OUT1	Operation ON/OFF (Voltage contact)
OUT2	Defrost
OUT4	Error signal

Symbol	Function
IN1	Flow switch

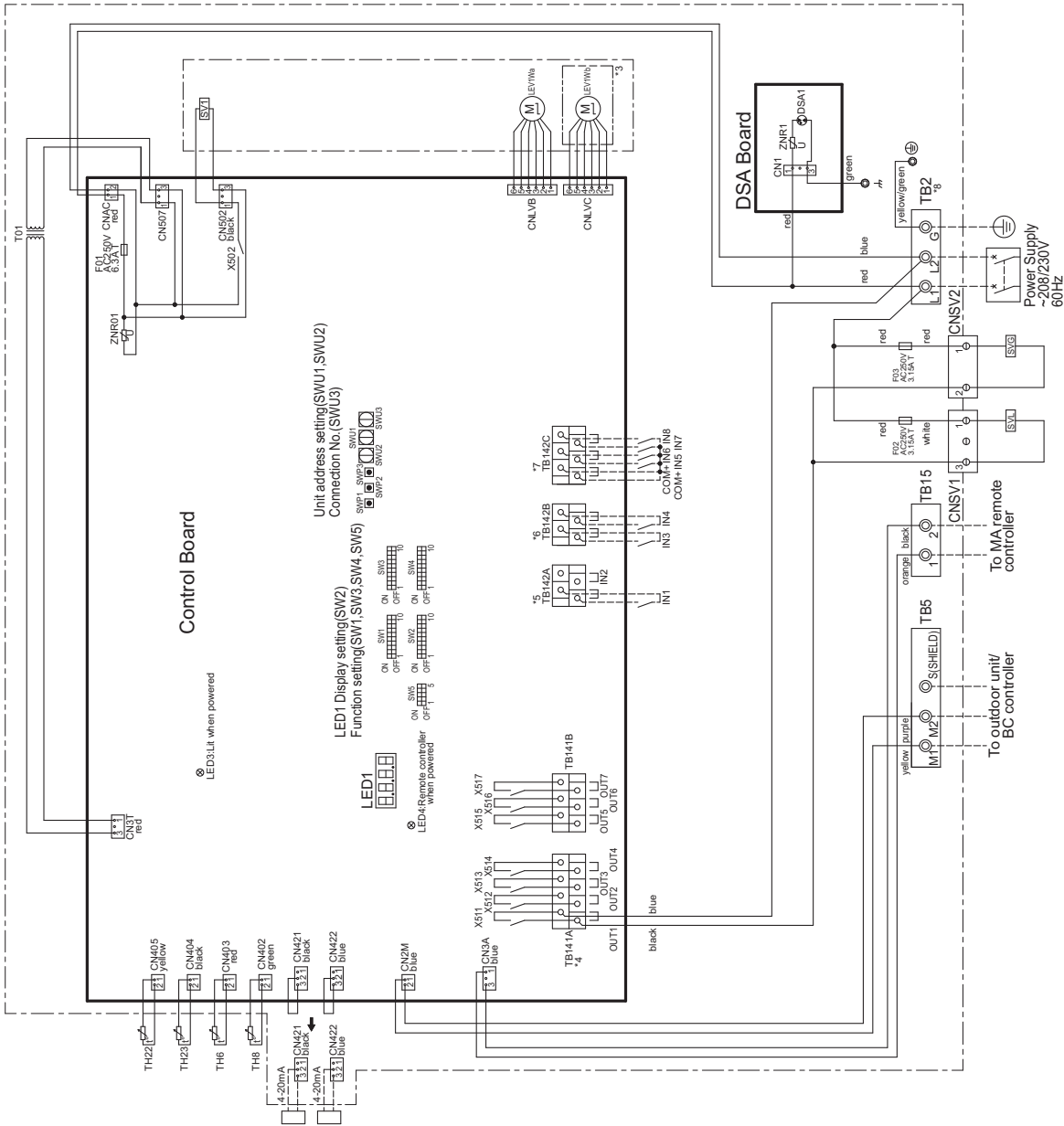
Symbol	Function
IN3	Connection demand
IN4	Operation ON/OFF

Symbol	Function
COM+	Common
IN5	Heating
IN6	Heating ECO
IN7	Anti-freeze
IN8	Cooling

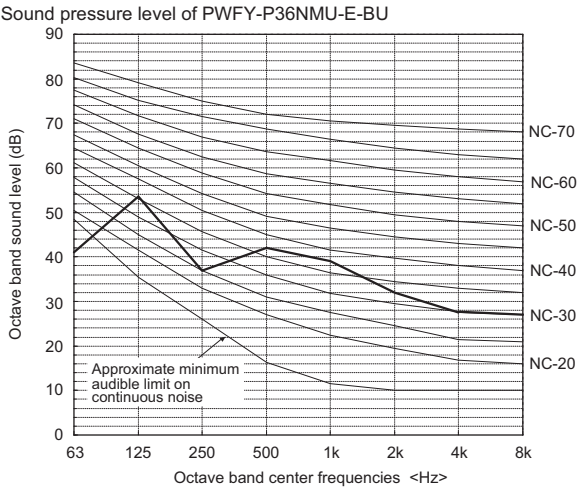
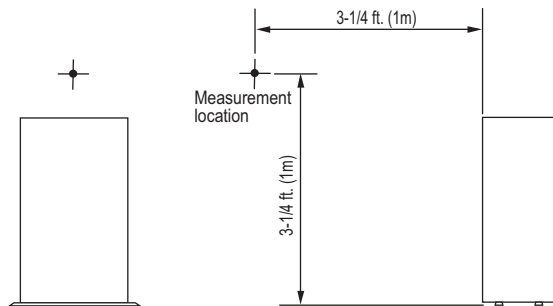
*8. Use copper supply wires.

<Symbol explanation>

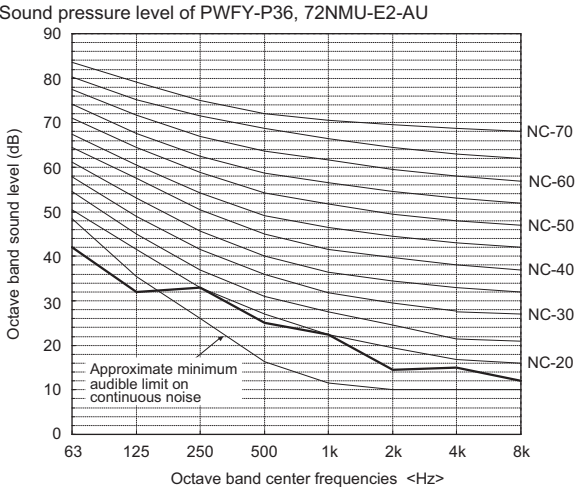
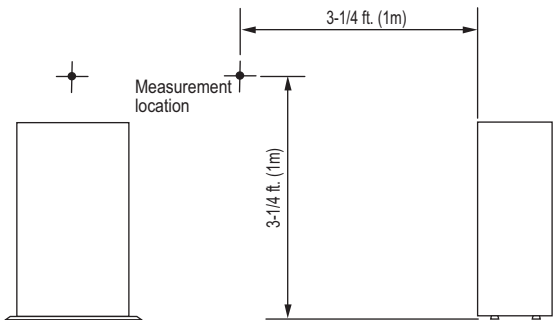
Symbol	Explanation
SV1	Solenoid valve
SVL	For opening/closing the gas refrigerant circuit
SVL	For opening/closing the liquid refrigerant circuit
LEV1Wa	Linear expansion valve
LEV1Wb	BC controller/outdoor unit
TB2	Terminal block
TB5	Outdoor unit/BC controller
TB15	MA remote controller
TH22	Thermistor
TH23	liquid pipe temp
TH6	gas pipe temp
TH8	water inlet temp
TH8	water outlet temp



Measurement condition
PW-FY-P36NMU-E-BU

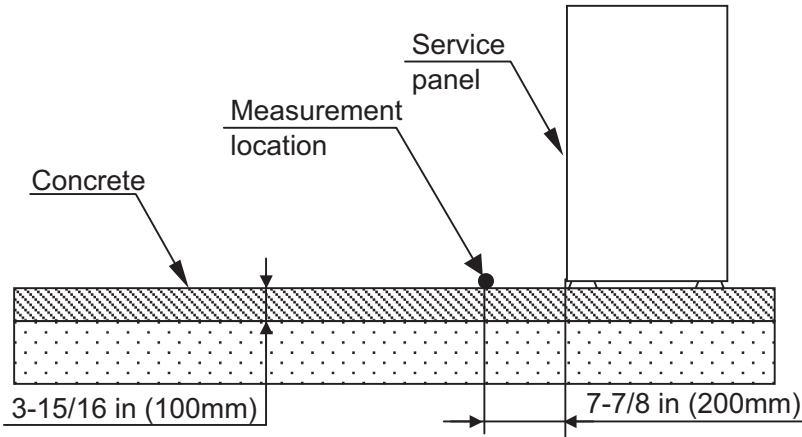


Measurement condition
PW-FY-P36, 72NMU-E2-AU



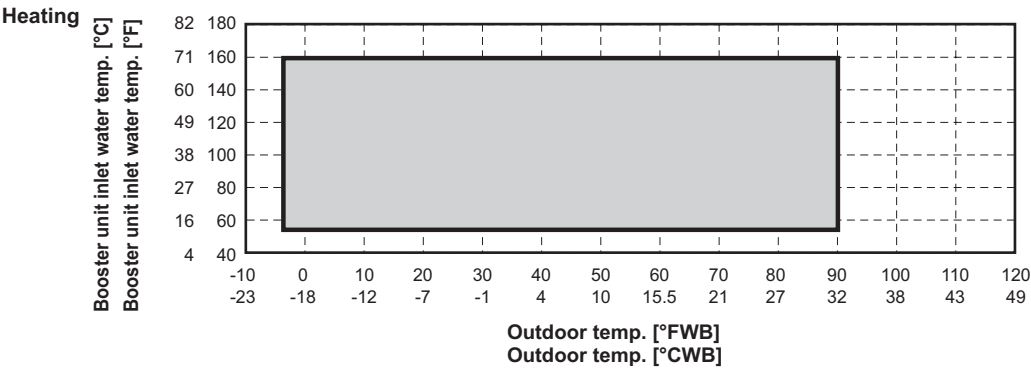
PWFY-P36NMU-E-BU

PWFY-P-NMU-E-BU, P-NMU-E2-AU

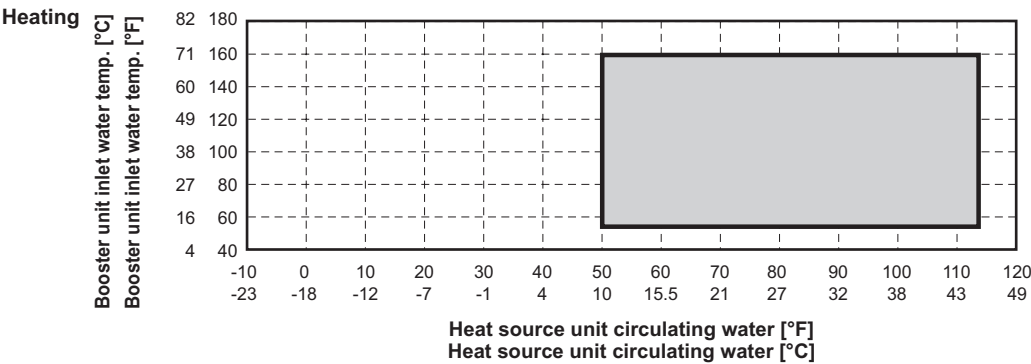


Model	Vibration Levels[dBA]
PWFY-P36NMU-E-BU	34

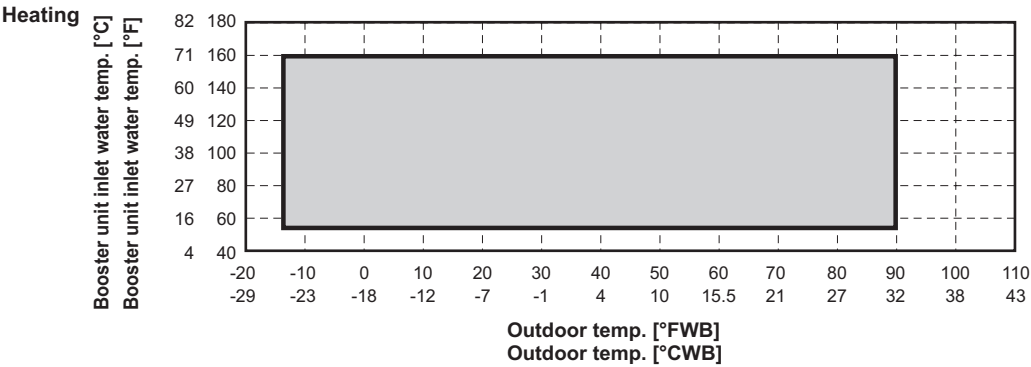
PWFFY-P36NMU-E-BU
R2-Series, R2-Series (High efficiency)



WR2-Series

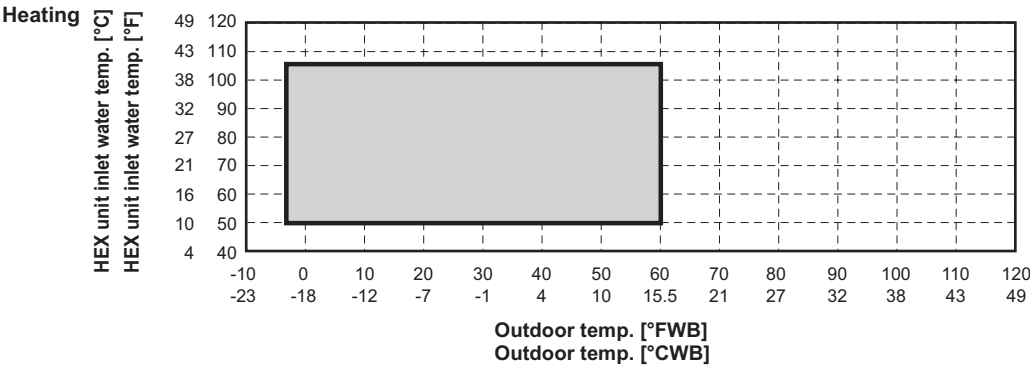


H2i-Series (R2)

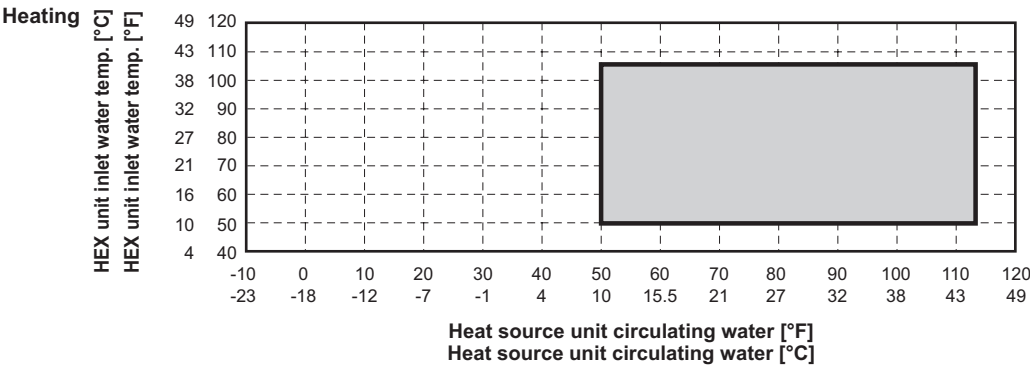


PWFY-P-NMU-E-BU, P-NMU-E2-AU

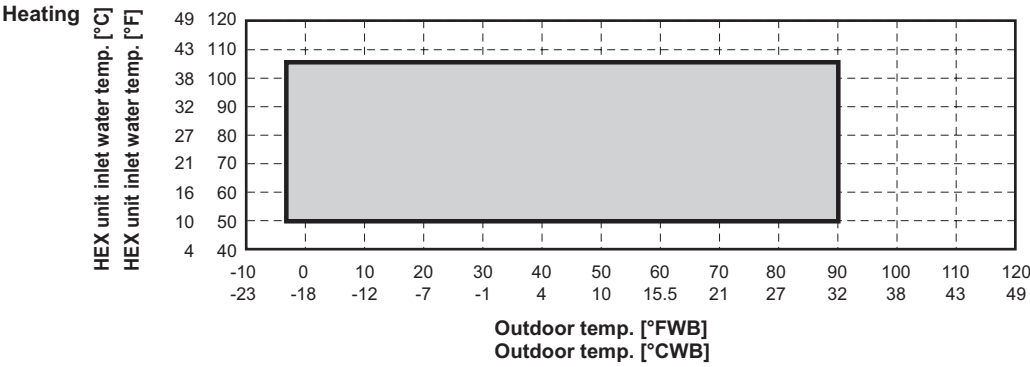
PWFY-P36, P72NMU-E2-AU
Y-Series, Y-Series (High efficiency)



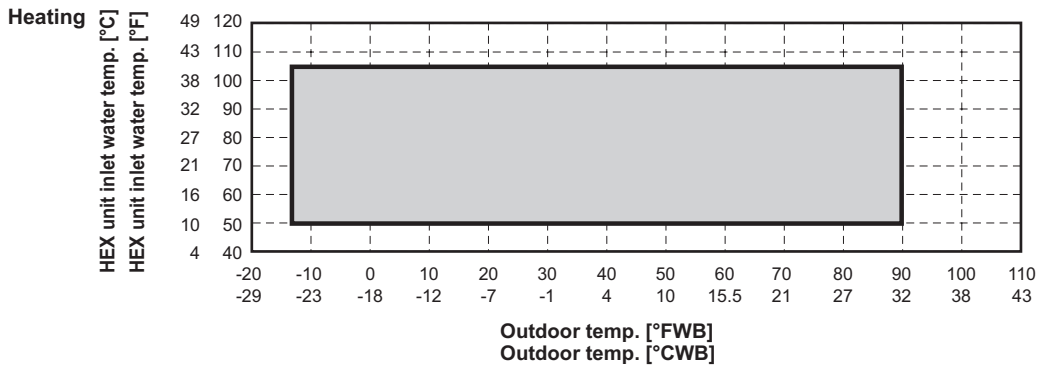
WY-Series, WR2-Series



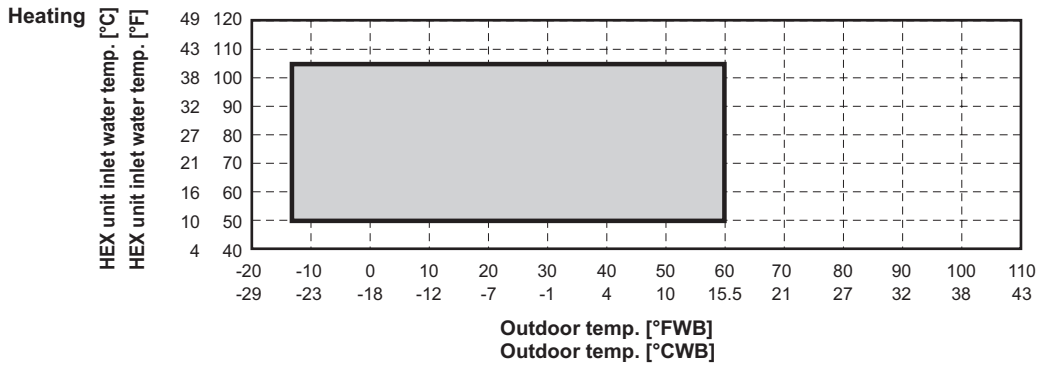
R2-Series, R2-Series (High efficiency)



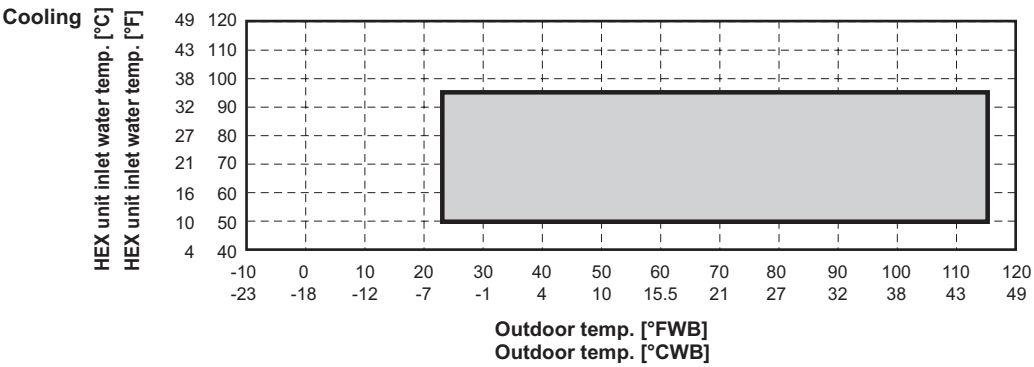
H2i-Series (R2)



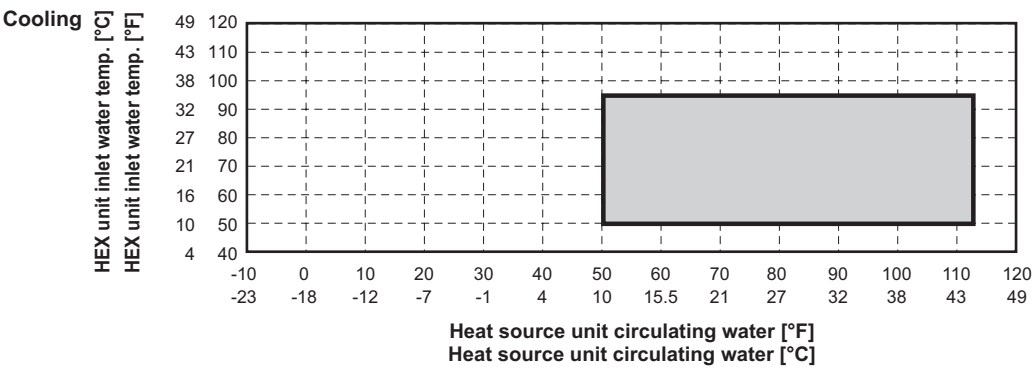
H2i-Series (Y)



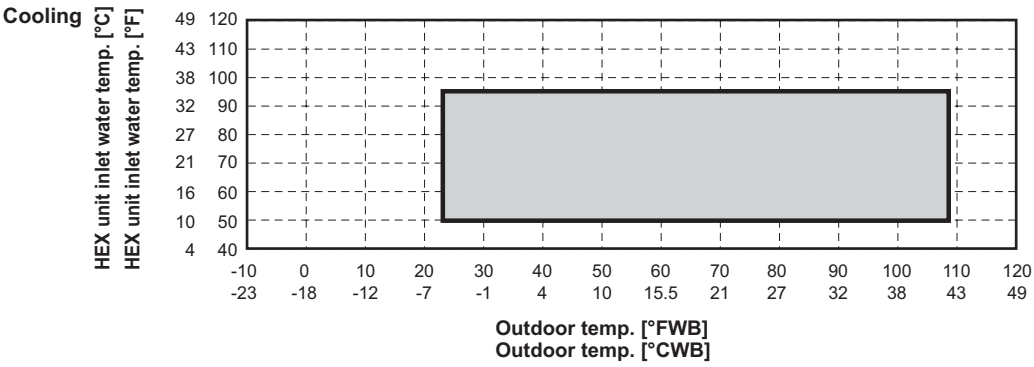
Y-Series, Y-Series (High efficiency), R2-Series, R2-Series (High efficiency), H2i-Series (R2)



WY-Series, WR2-Series



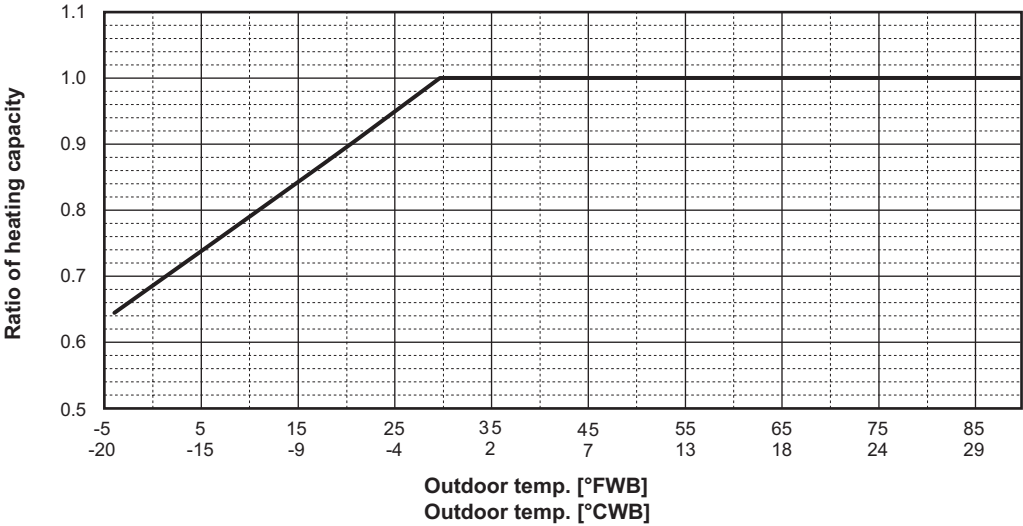
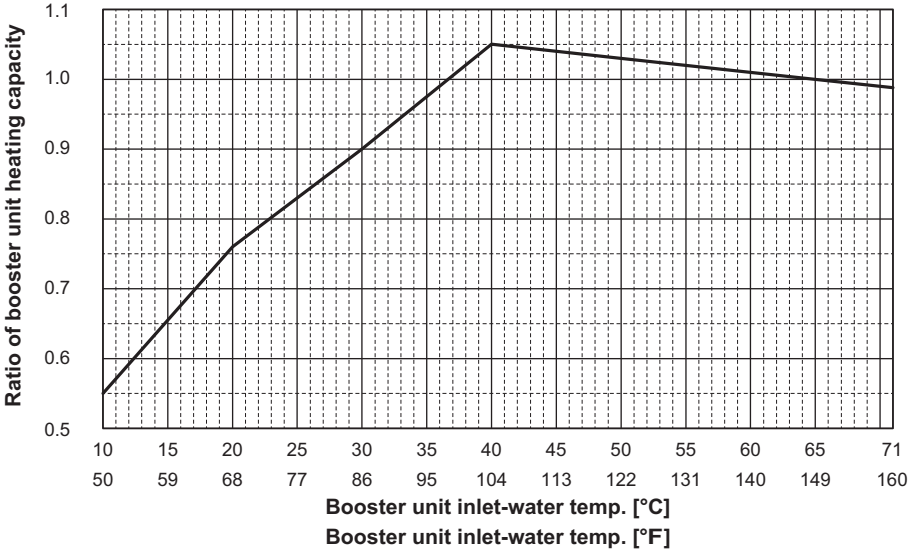
H2i-Series (Y)

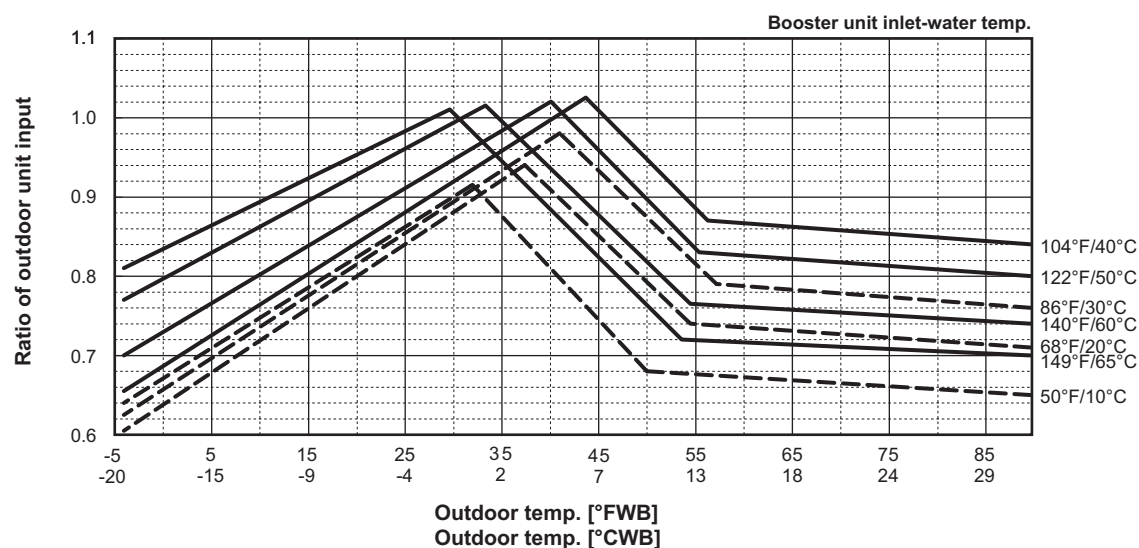
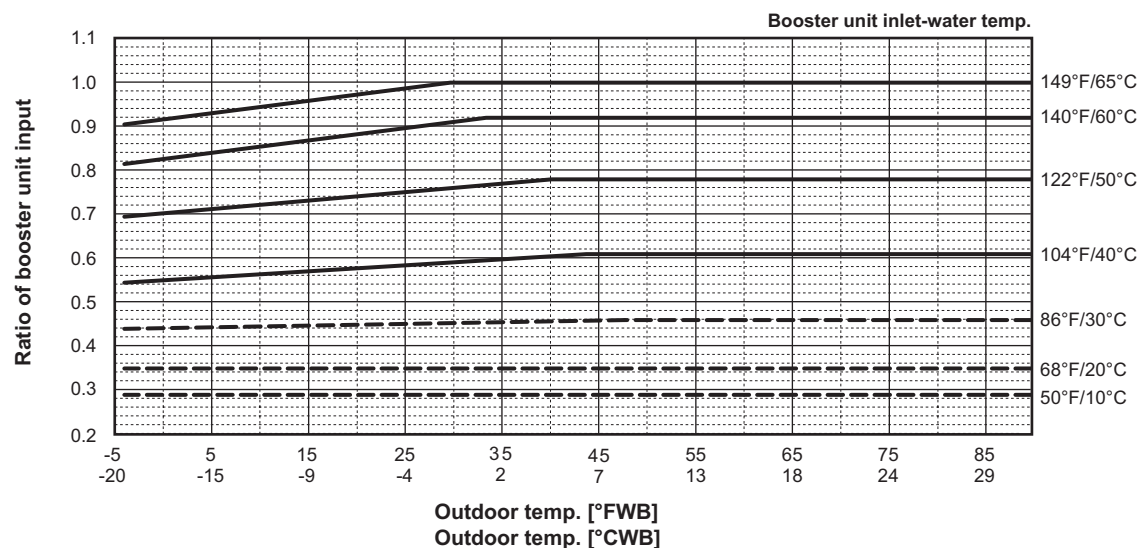


9-1. Correction by temperature

Estimated performance without defrost
R2-Series/R2-Series (High efficiency) + PWFY-P36NMU-E-BU

PWFY-P-NMU-E-BU, P-NMU-E2-AU





R2-Series

BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K
Nominal Input (kW)	5.66	8.28	10.86	12.49	15.16	17.20	19.89	22.73	24.99	27.65	30.75	33.66

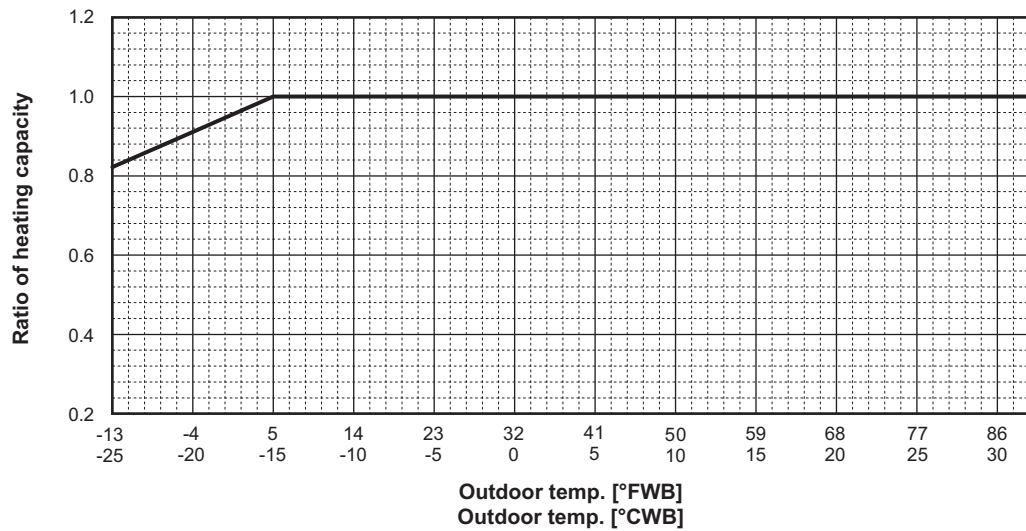
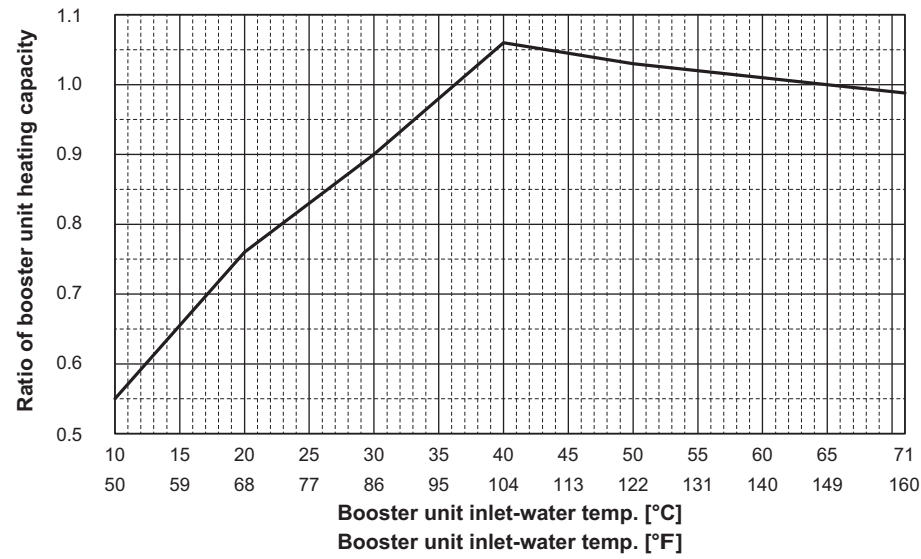
R2-Series (High efficiency)

BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K	384K	432K
Nominal Input (kW)	6.05	8.11	9.89	12.34	15.92	17.54	20.43	21.79	24.56	27.30	30.53	33.89	38.66	43.14

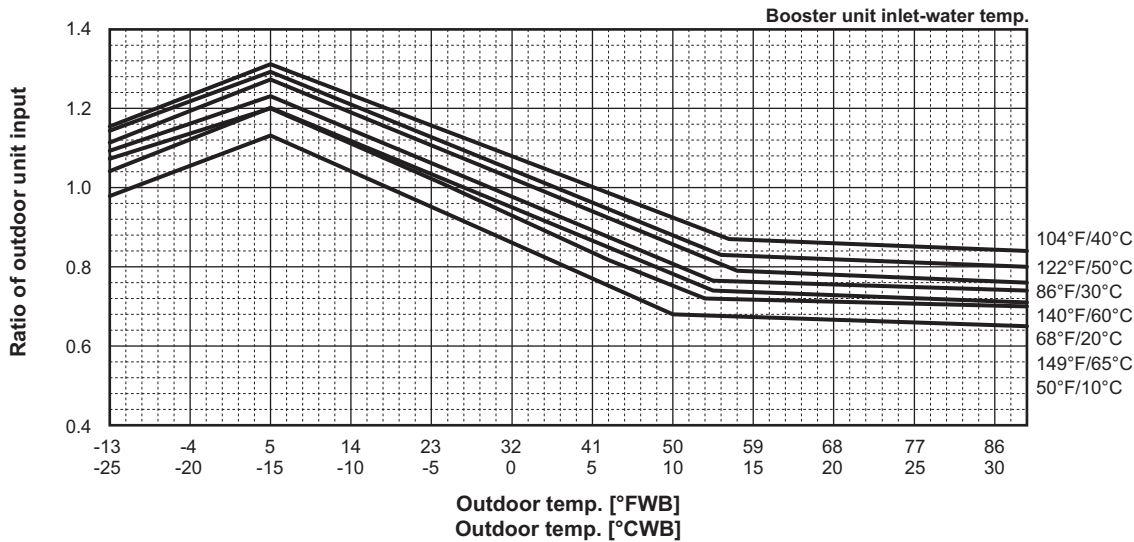
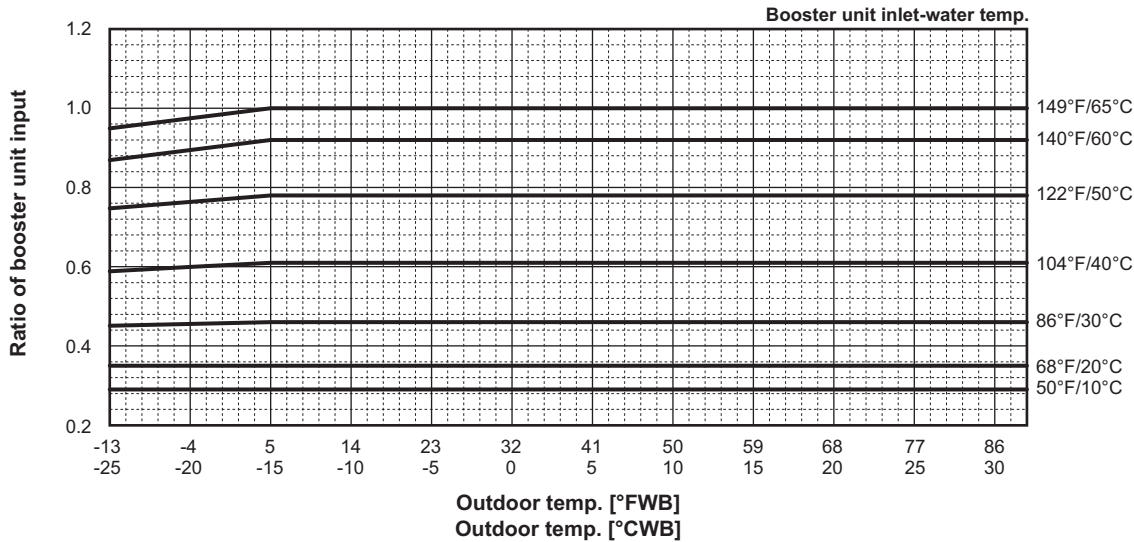
* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

Estimated performance without defrost
H2i-Series (R2) + PWFY-P36NMU-E-BU

PWFY-P-NMU-E-BU, P-NMU-E2-AU



PWFY-P-NMU-E-BU, P-NMU-E2-AU



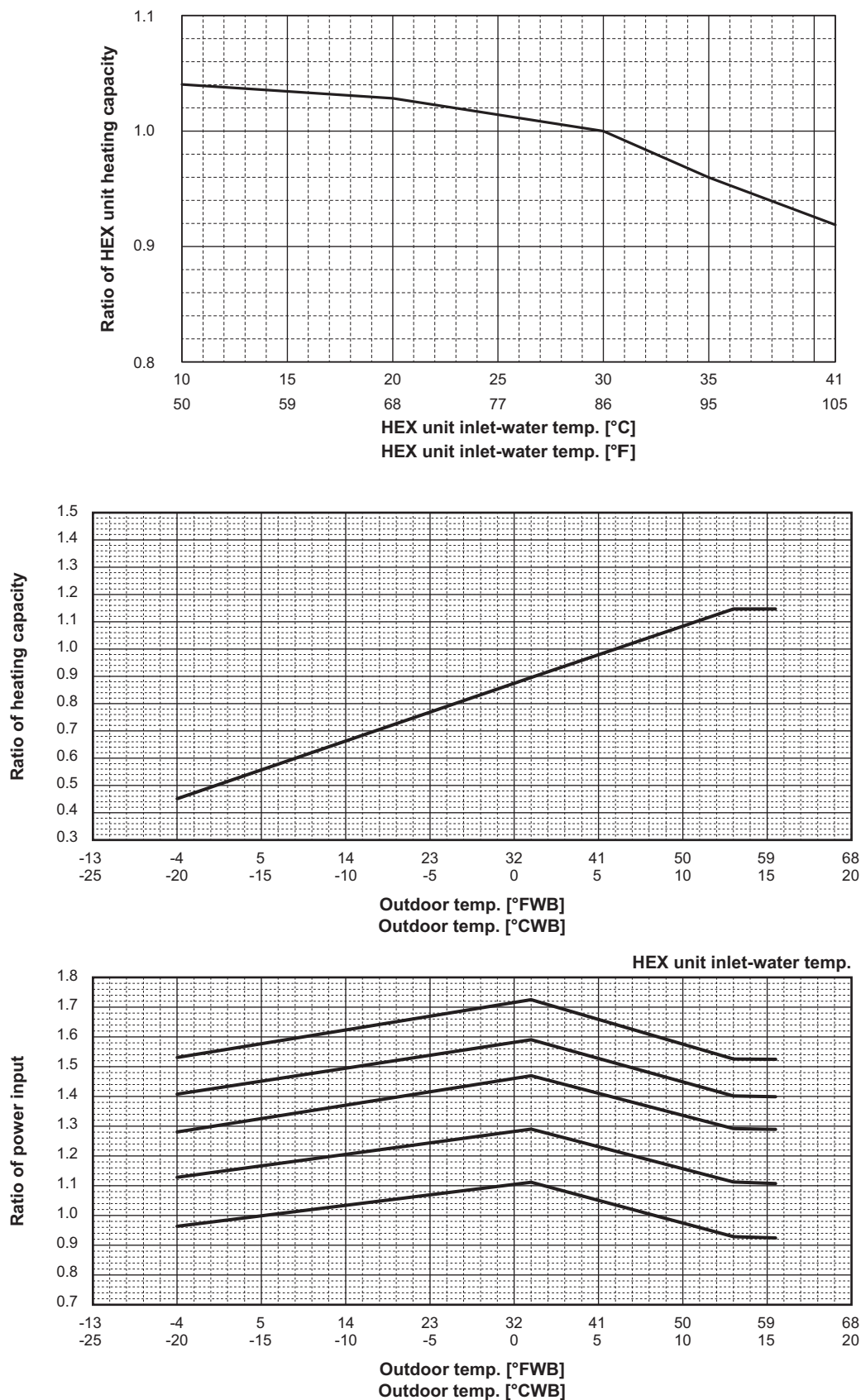
H2i-Series (R2)

BTU/h	72K	96K	120K	144K	192K	240K
Nominal Input (kW)	5.66	8.88	10.07	12.50	18.52	22.45

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

Y-Series + PWFY-P36, P72NMU-E2-AU

Heating

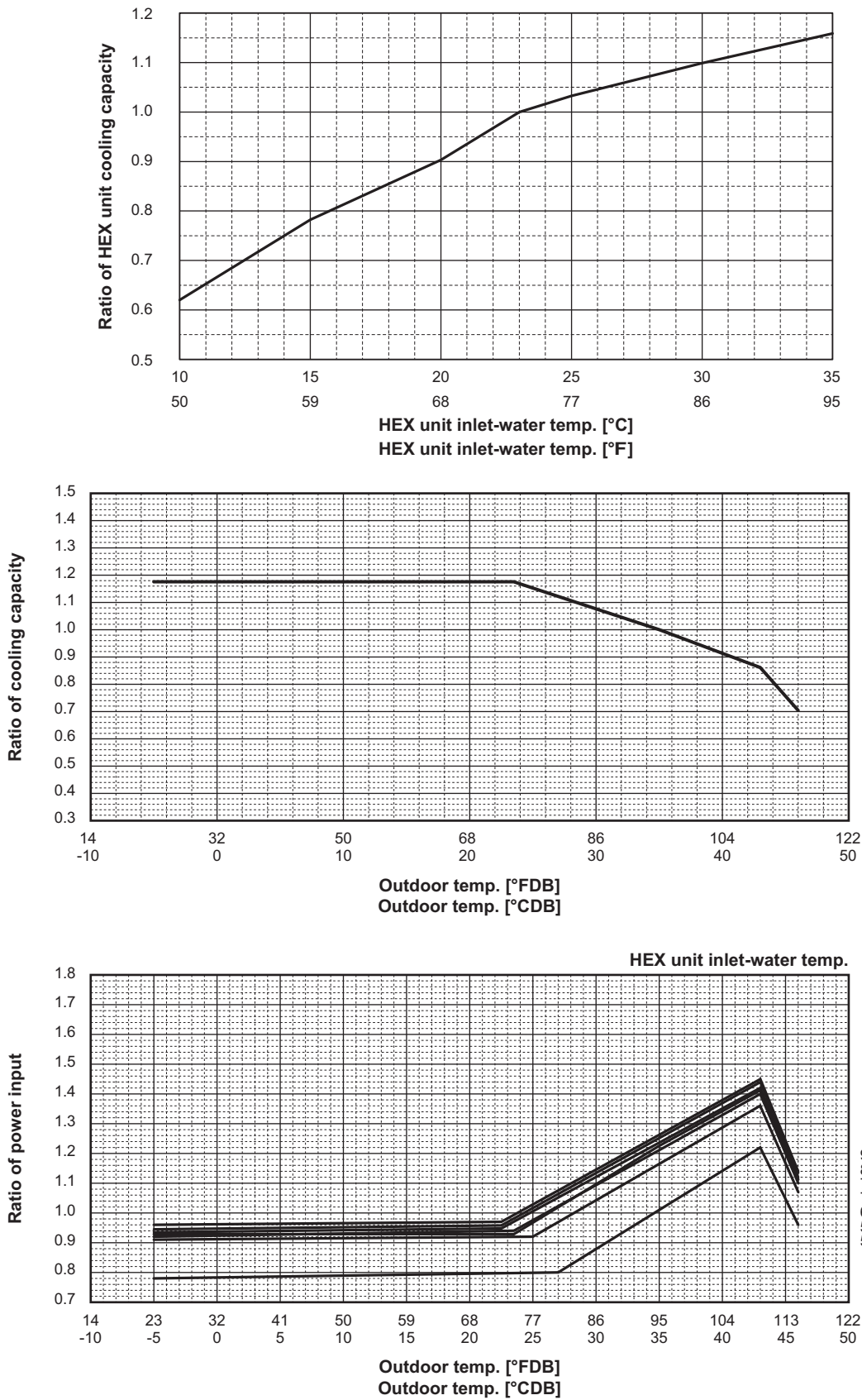


BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K	360K	384K	408K	432K
Nominal Input (kW)	5.62	7.47	10.28	12.47	14.15	16.91	19.26	22.12	22.63	25.23	28.28	30.84	33.78	36.26	38.94	41.66

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

Cooling

PWFY-P-NMU-E-BU, P-NMU-E2-AU

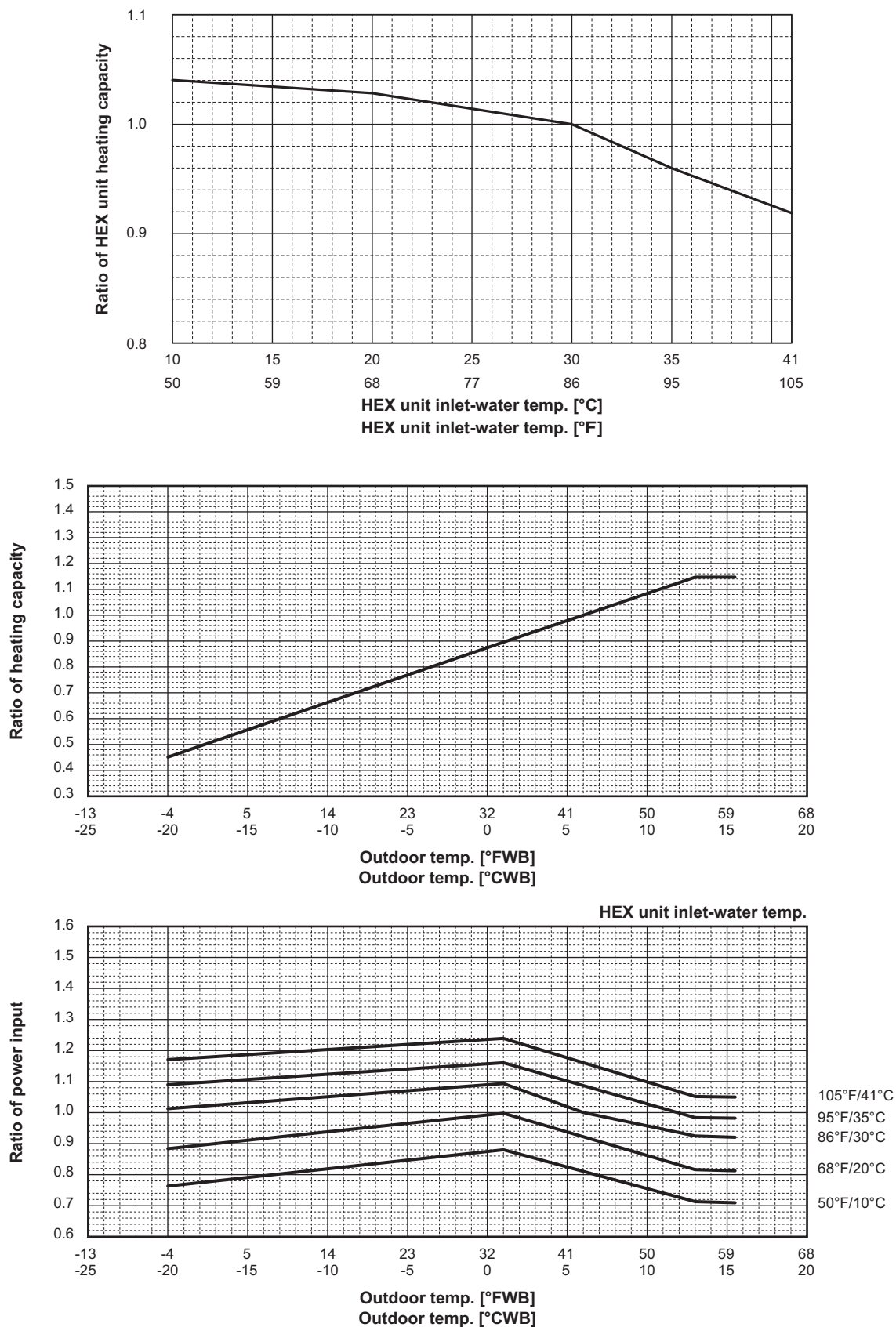


BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K	360K	384K	408K	432K
Nominal Input (kW)	5.06	7.00	9.09	11.84	14.28	14.81	16.90	19.97	20.69	23.21	25.98	27.77	30.67	33.18	35.79	38.31

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

Y-Series (High efficiency) + PWFY-P36, P72NMU-E2-AU

Heating

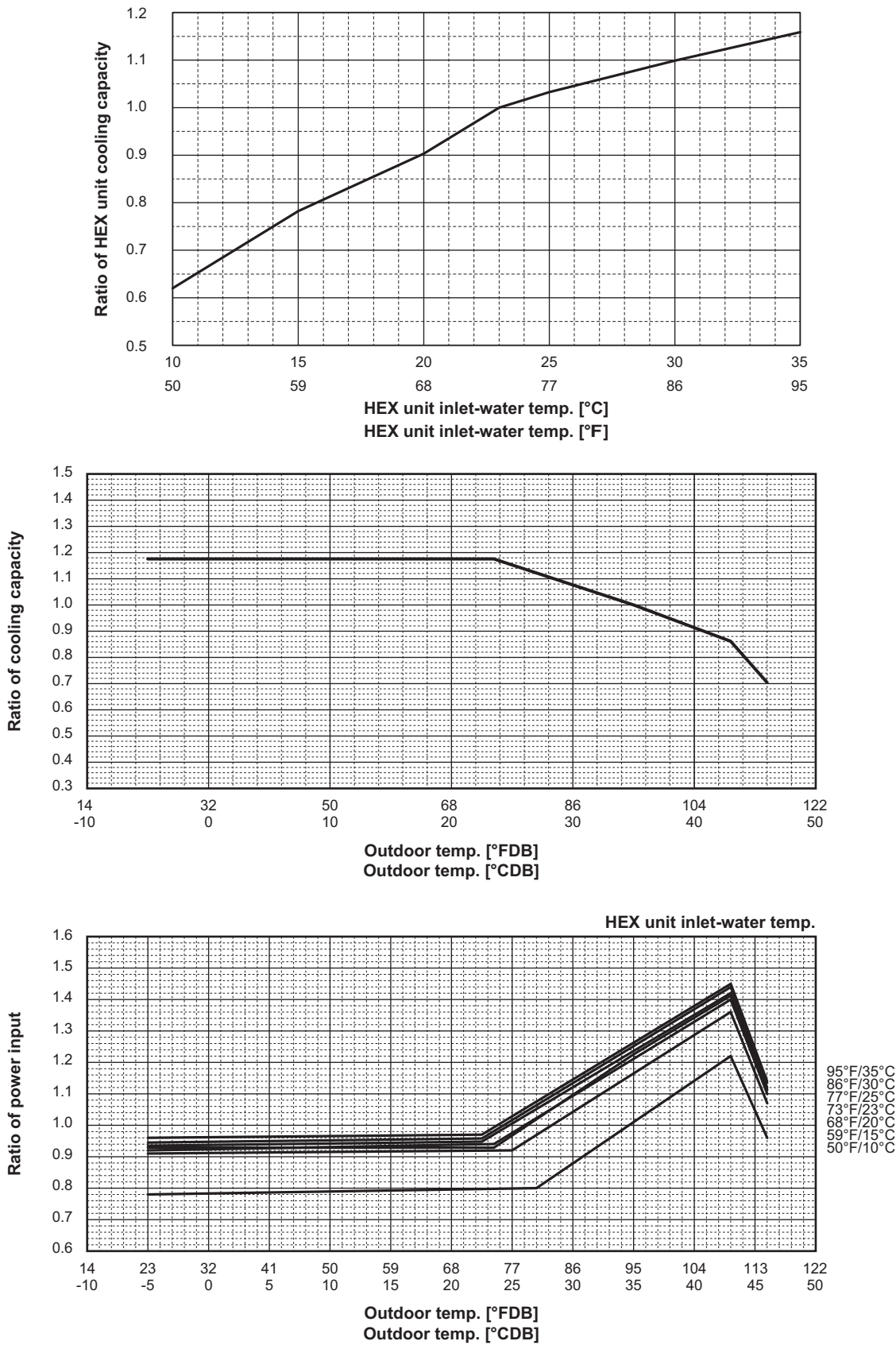


BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K	360K	384K	408K	432K
Nominal Input (kW)	5.21	7.26	9.97	11.84	13.95	16.38	20.00	21.44	23.07	25.82	27.37	30.01	32.65	35.13	37.71	40.45

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

Cooling

PWFY-P-NMU-E-BU, P-NMU-E2-AU

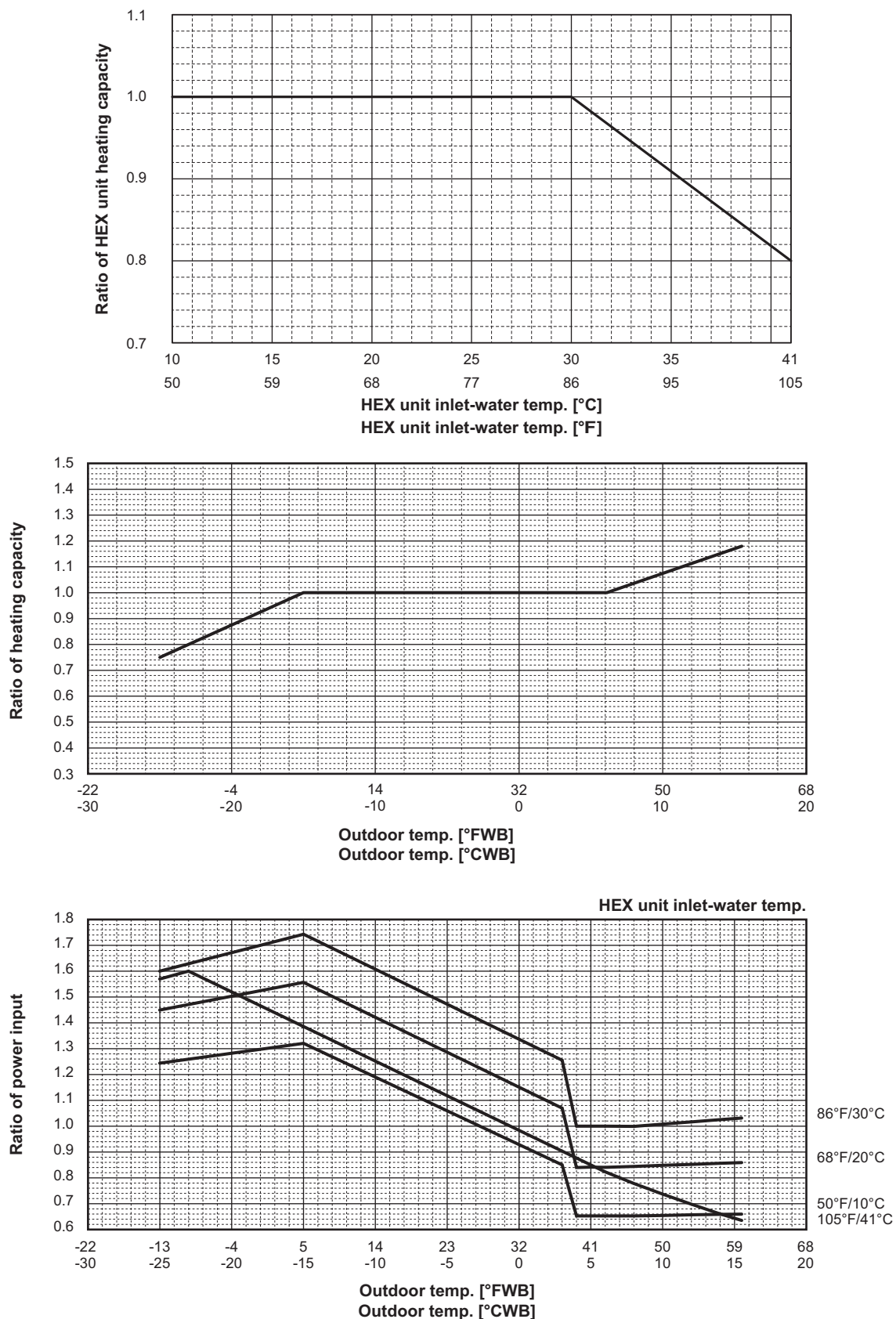


BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K	360K	384K	408K	432K
Nominal Input (kW)	4.58	6.12	8.88	10.63	13.53	16.66	18.33	21.35	19.61	21.83	24.33	26.34	28.67	31.41	34.31	37.39

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

H2i-Series (Y) + PWFY-P36, P72NMU-E2-AU

Heating

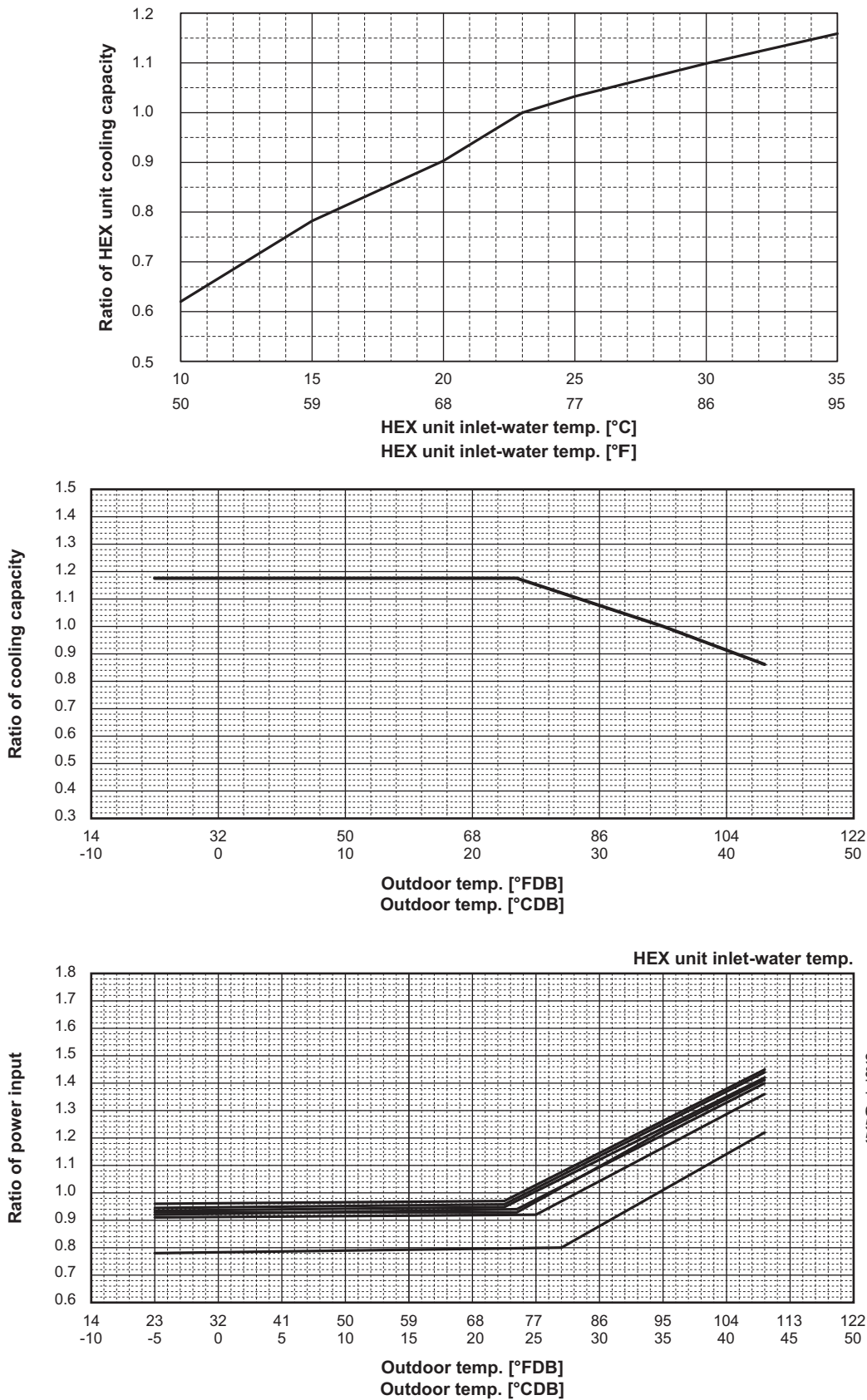


BTU/h	72K	96K	120K	144K	192K	240K
Nominal Input (kW)	6.14	8.80	9.63	11.70	18.13	21.38

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

Cooling

PWFY-P-NMU-E-BU, P-NMU-E2-AU

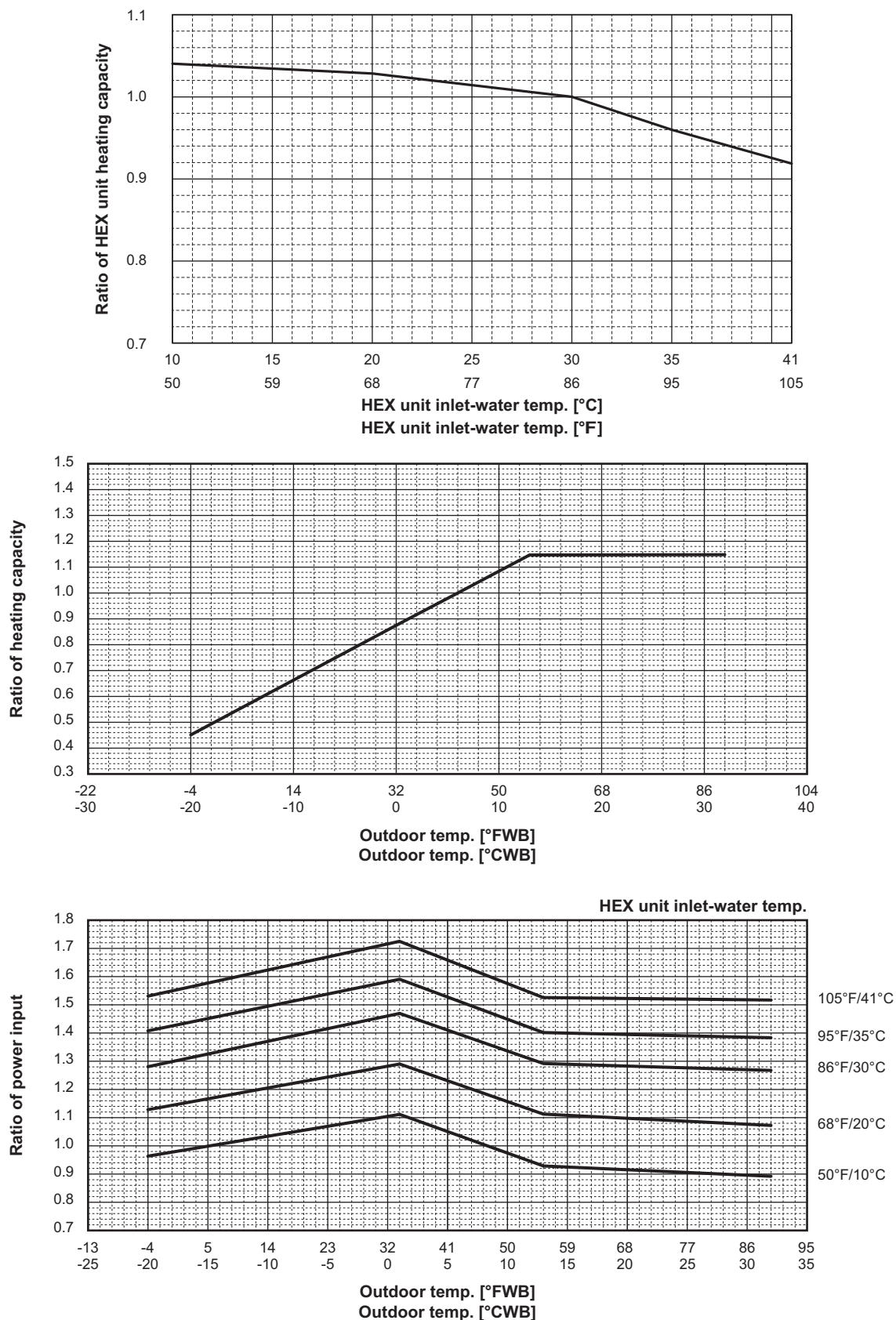


BTU/h	72K	96K	120K	144K	192K	240K
Nominal Input (kW)	5.60	8.16	8.53	12.20	16.81	19.37

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

R2-Series + PWFY-P36, P72NMU-E2-AU

Heating

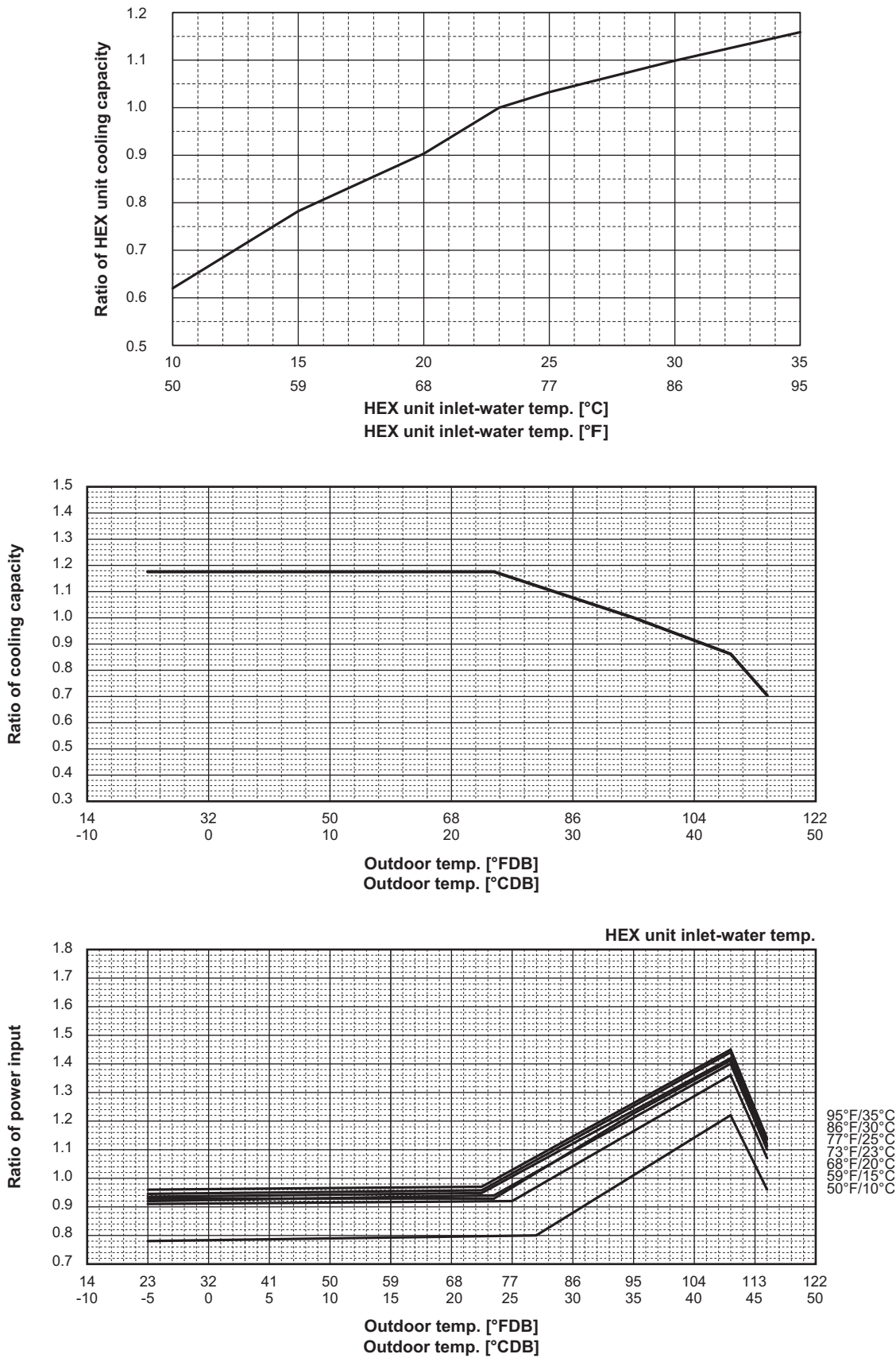


BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K
Nominal Input (kW)	5.66	8.28	10.86	12.49	15.16	17.20	19.89	22.73	24.99	27.65	30.75	33.66

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

Cooling

PWFY-P-NMU-E-BU, P-NMU-E2-AU

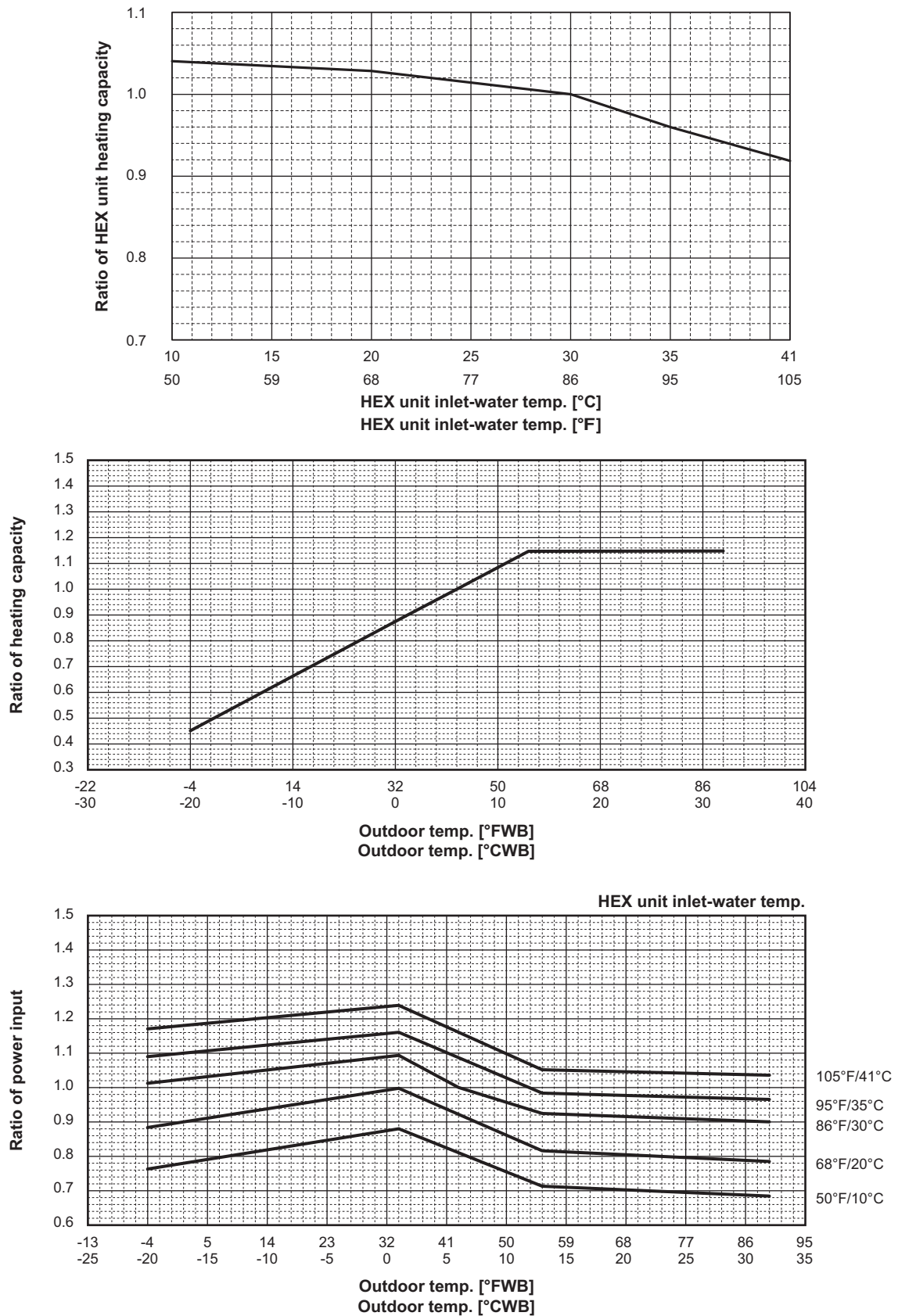


BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K
Nominal Input (kW)	4.62	7.05	9.44	11.74	14.99	15.61	18.22	21.11	23.14	26.47	29.80	33.76

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

R2-Series (High efficiency) + PWFY-P36, P72NMU-E2-AU

Heating

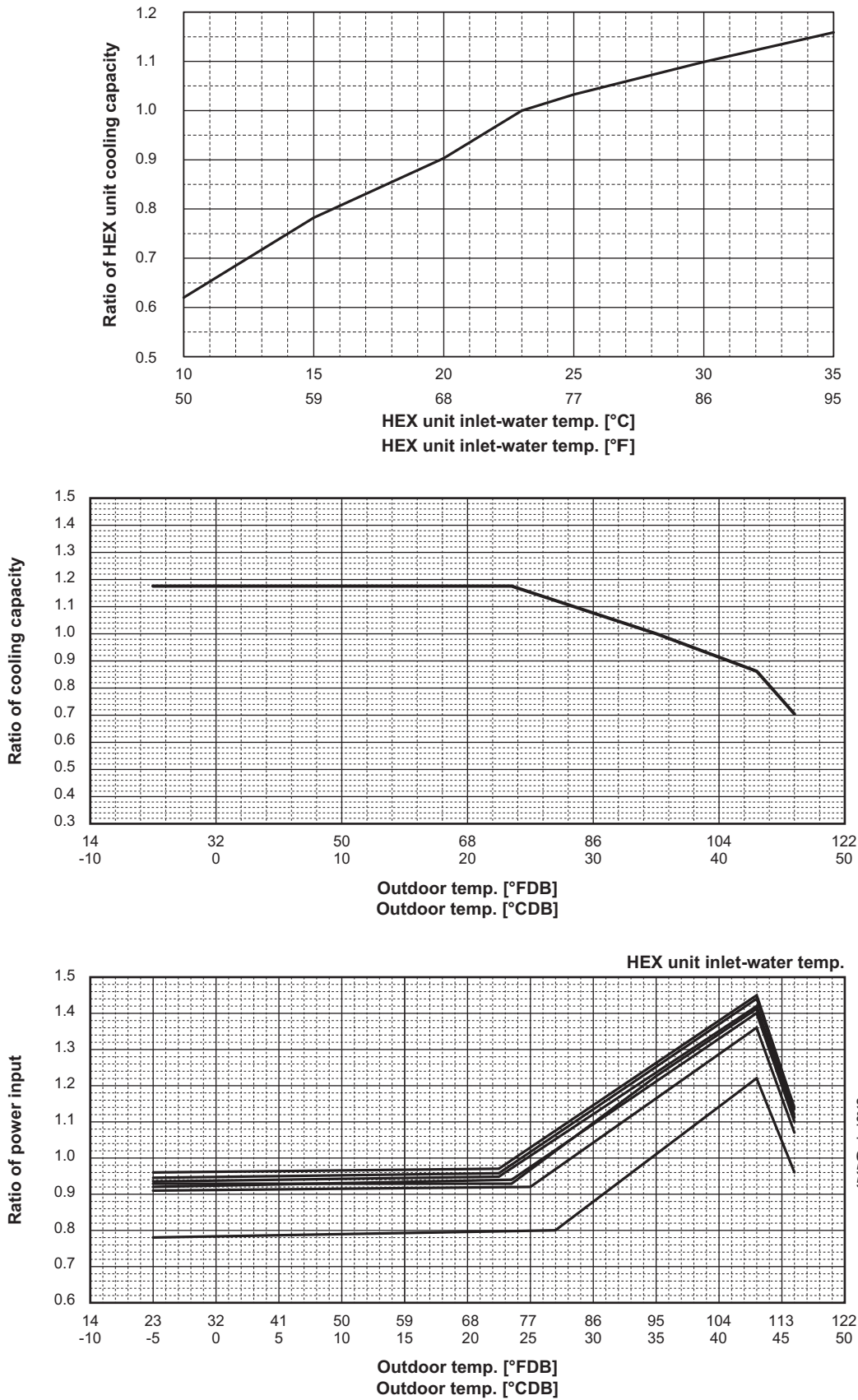


BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K	384K	432K
Nominal Input (kW)	6.05	8.11	9.89	12.34	15.92	17.54	20.43	21.79	24.56	27.30	30.53	33.89	38.66	43.14

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

Cooling

PWFY-P-NMU-E-BU, P-NMU-E2-AU

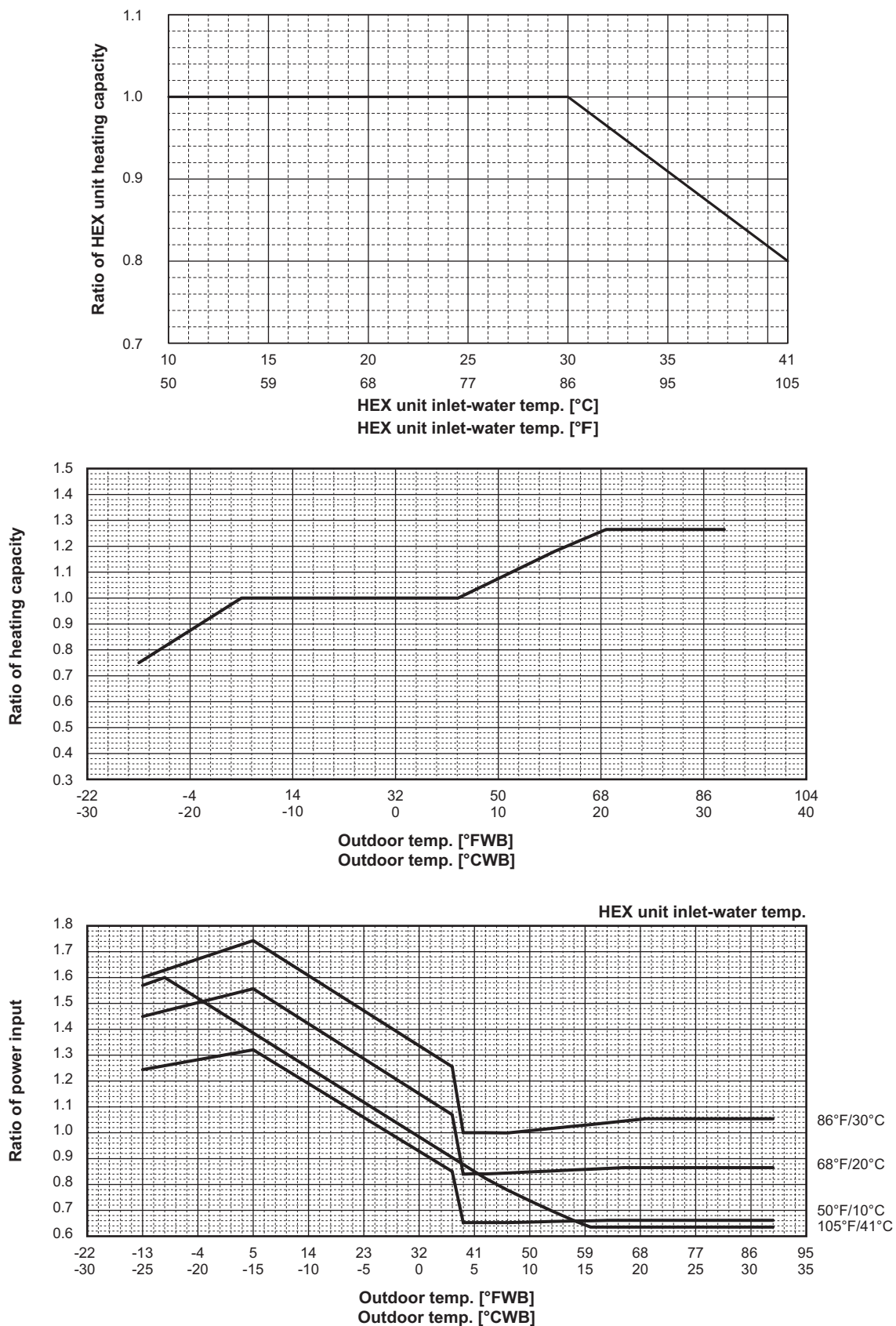


BTU/h	72K	96K	120K	144K	168K	192K	216K	240K	264K	288K	312K	336K	384K	432K
Nominal Input (kW)	4.84	7.31	8.43	11.03	14.74	15.65	18.66	21.39	21.86	24.83	27.98	33.20	36.62	42.36

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

H2i-Series (R2) + PWFY-P36, P72NMU-E2-AU

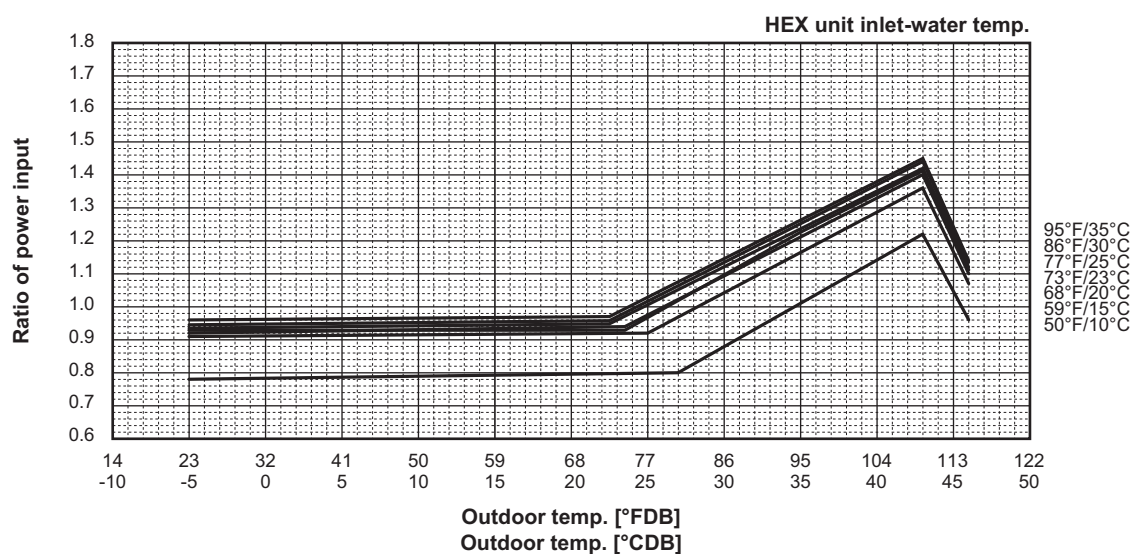
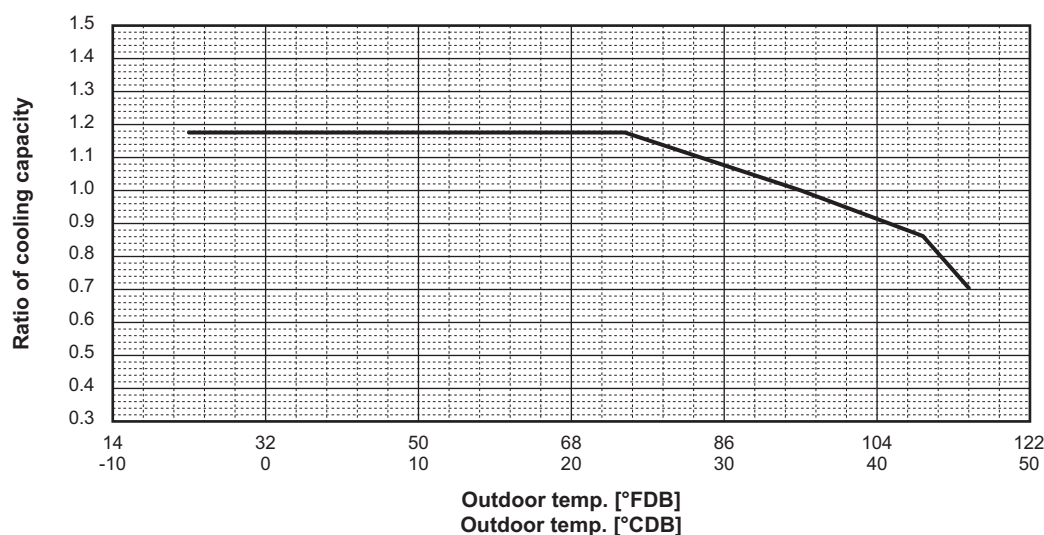
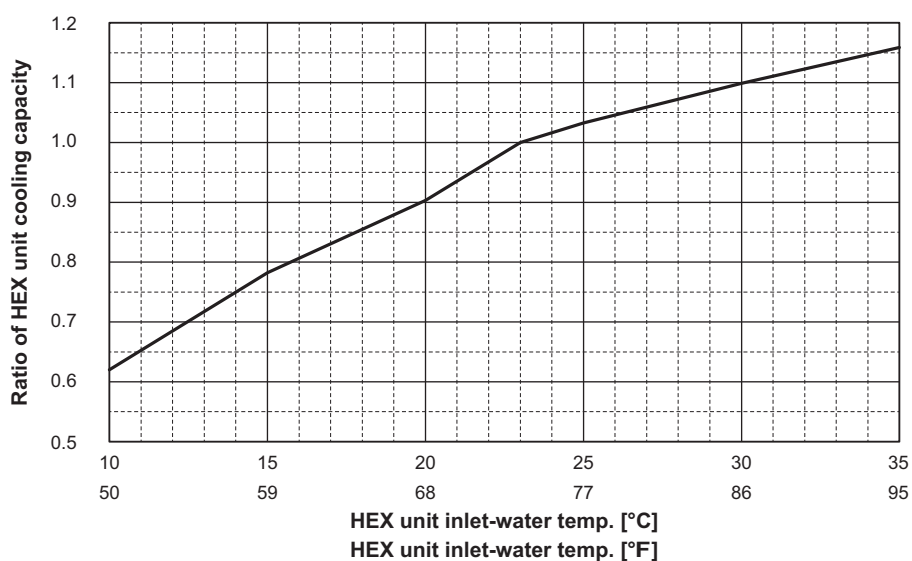
Heating



BTU/h	72K	96K	120K	144K	192K	240K
Nominal Input (kW)	5.66	8.88	10.07	12.50	18.52	22.45

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

Cooling

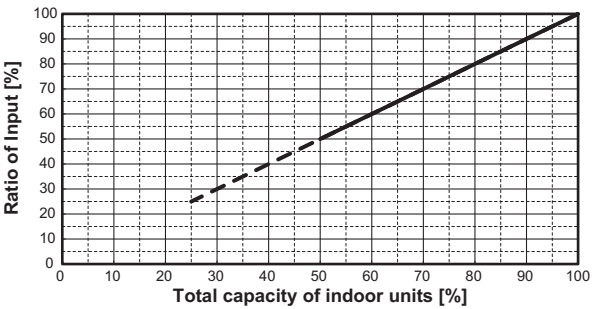
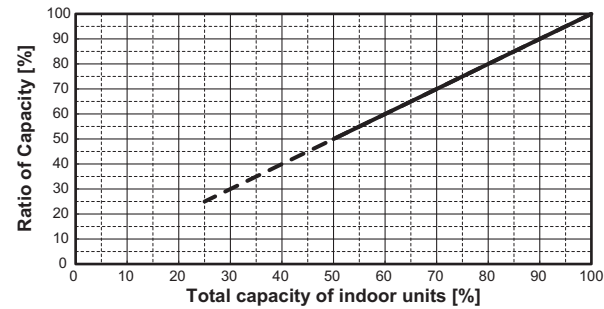


BTU/h	72K	96K	120K	144K	192K	240K
Nominal Input (kW)	5.22	7.66	8.82	11.92	15.86	20.08

* The nominal input values for outdoor units above are referential values for a system in which the PWFY units are connected to the outdoor units to its 100% capacity. The actual calculation results of the corrected input of the outdoor unit depend on the ratio of PWFY and other types of indoor units connected. Use the nominal input values above for the PWFY units when calculating the corrected input.

9-2. Correction by total indoor

Total capacity of PWFY-P36NMU-E-BU/P36, P72NMU-E2-AU

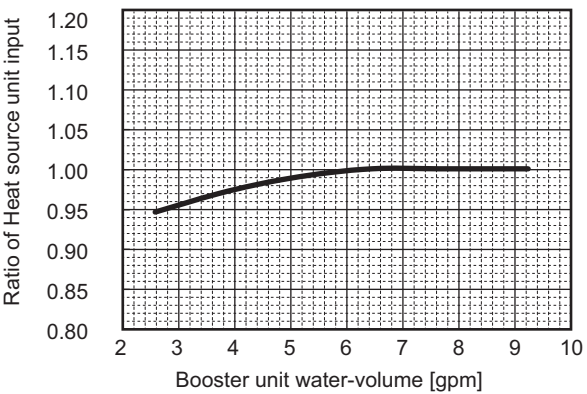
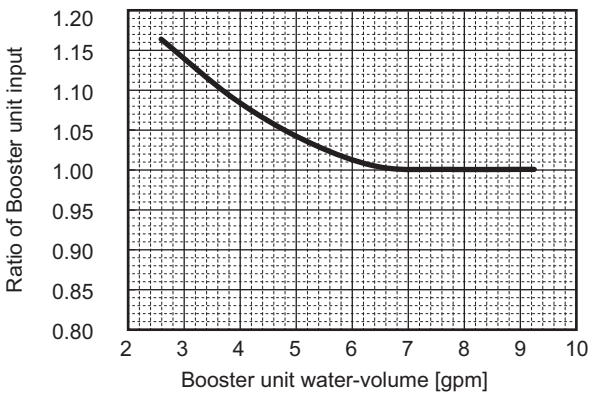
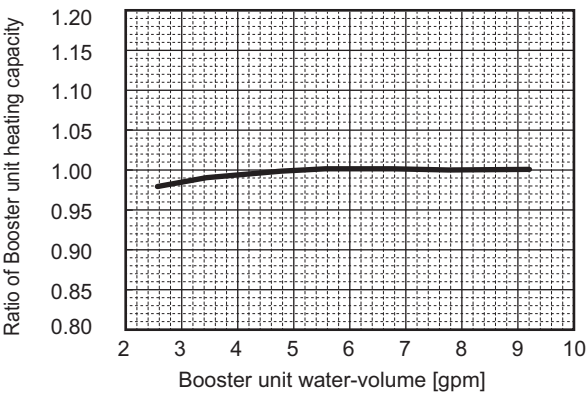
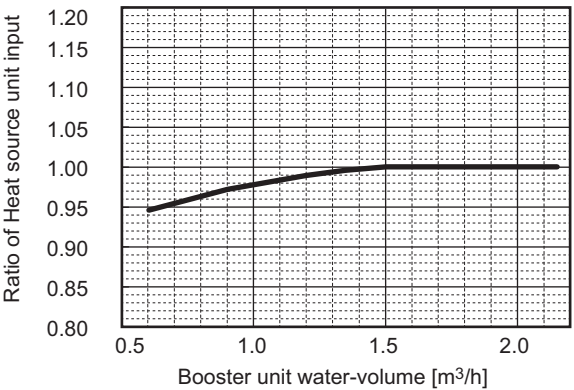
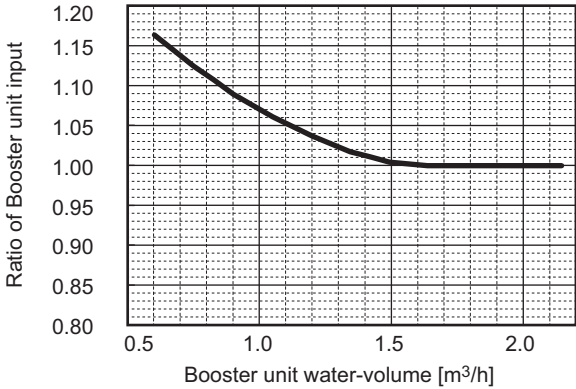
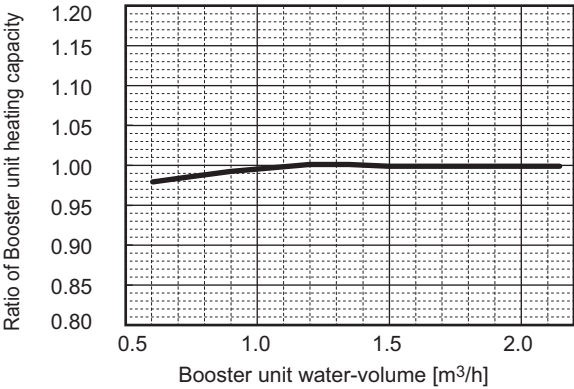


Note Out of warranty at 50% or less due to unit's turn on-off.

9-3. Correction by water volume

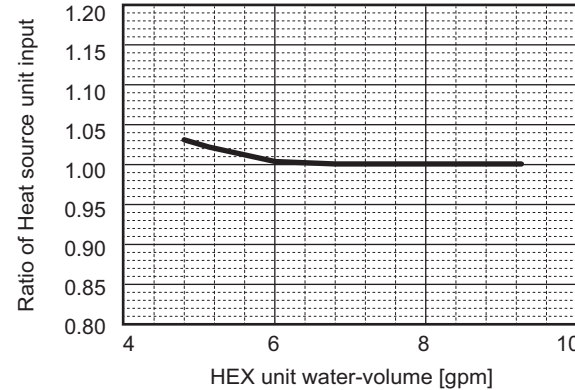
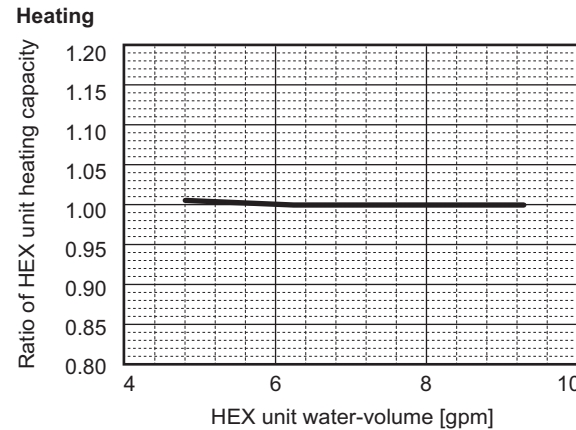
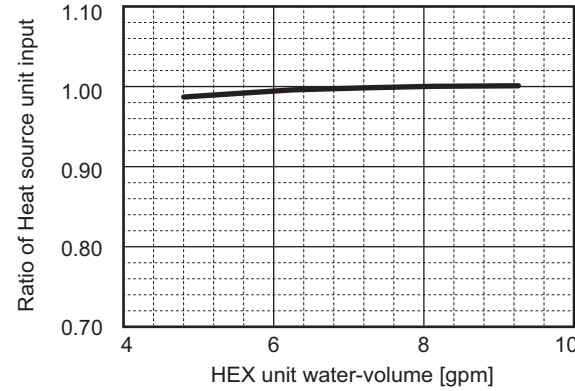
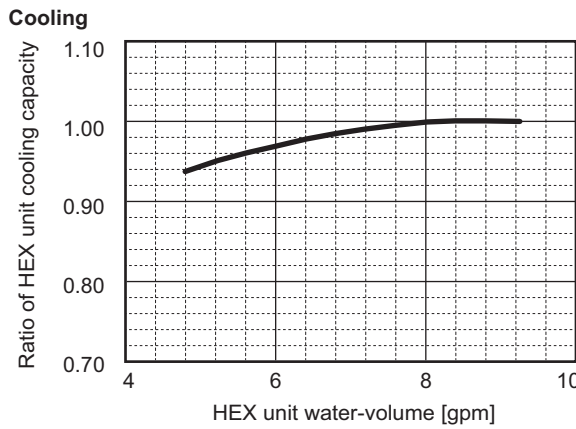
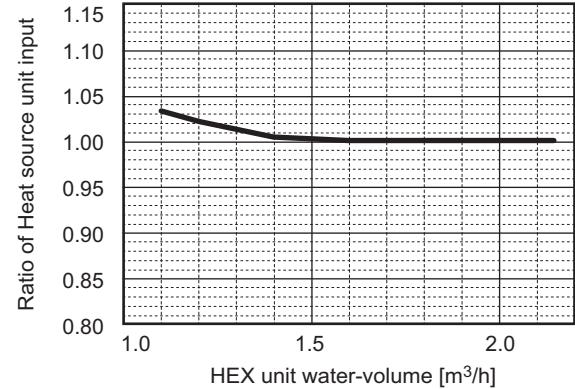
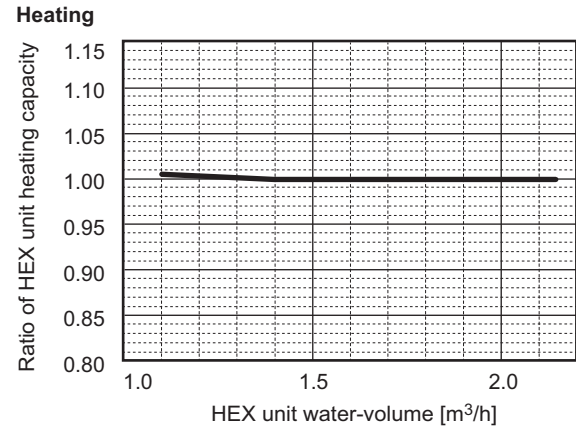
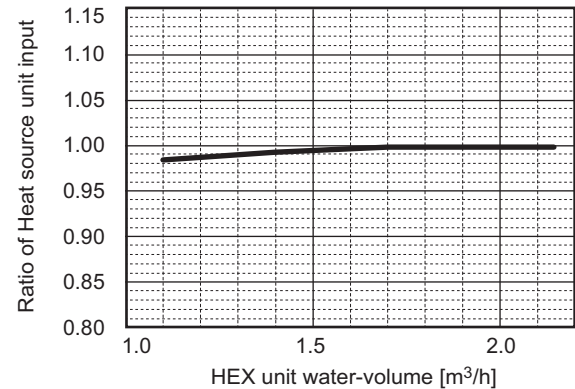
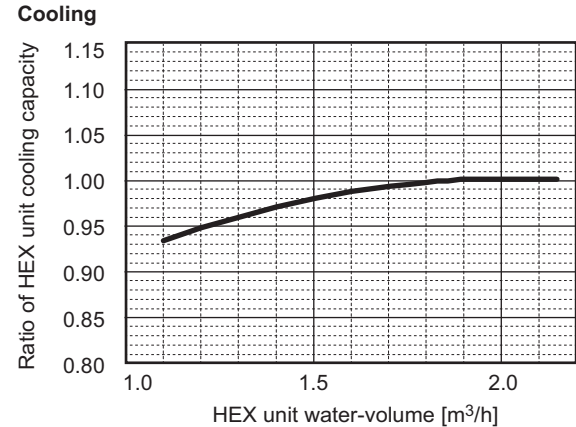
PWFY-P36NMU-E-BU

PWFY-P-NMU-E-BU, P-NMU-E2-AU



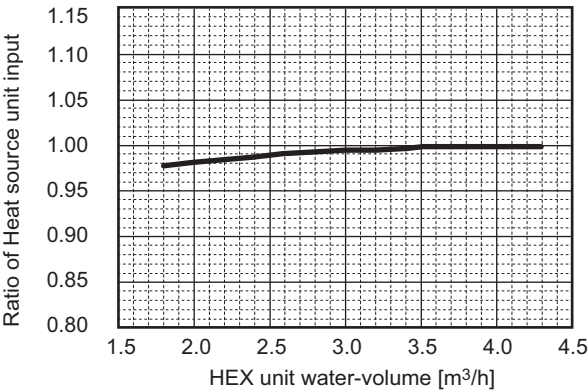
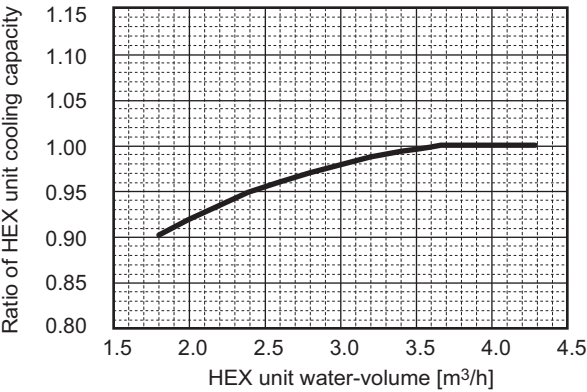
PWFY-P36NMU-E2-AU

PWFY-P-NMU-E-BU, P-NMU-E2-AU

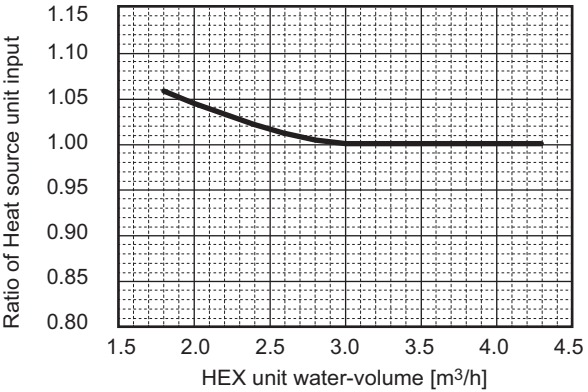
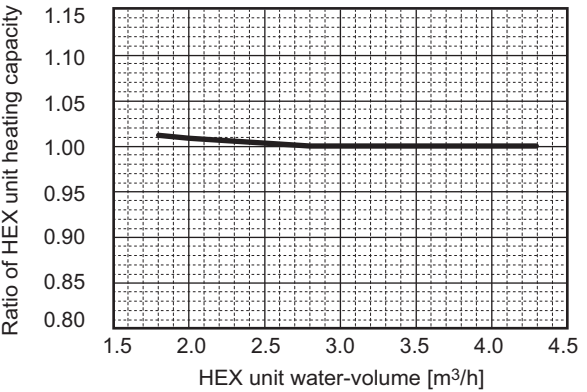


PWFY-P72NMU-E2-AU

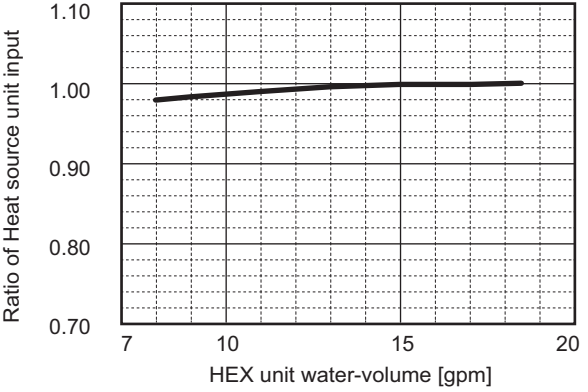
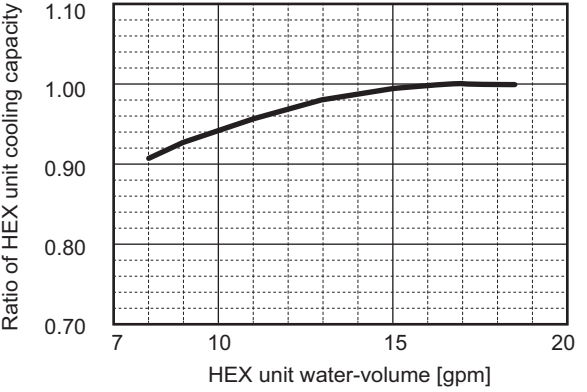
Cooling



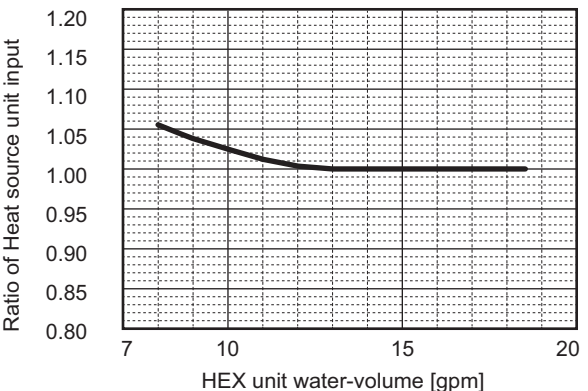
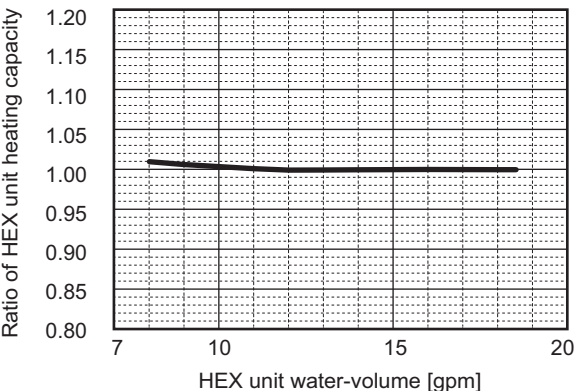
Heating



Cooling



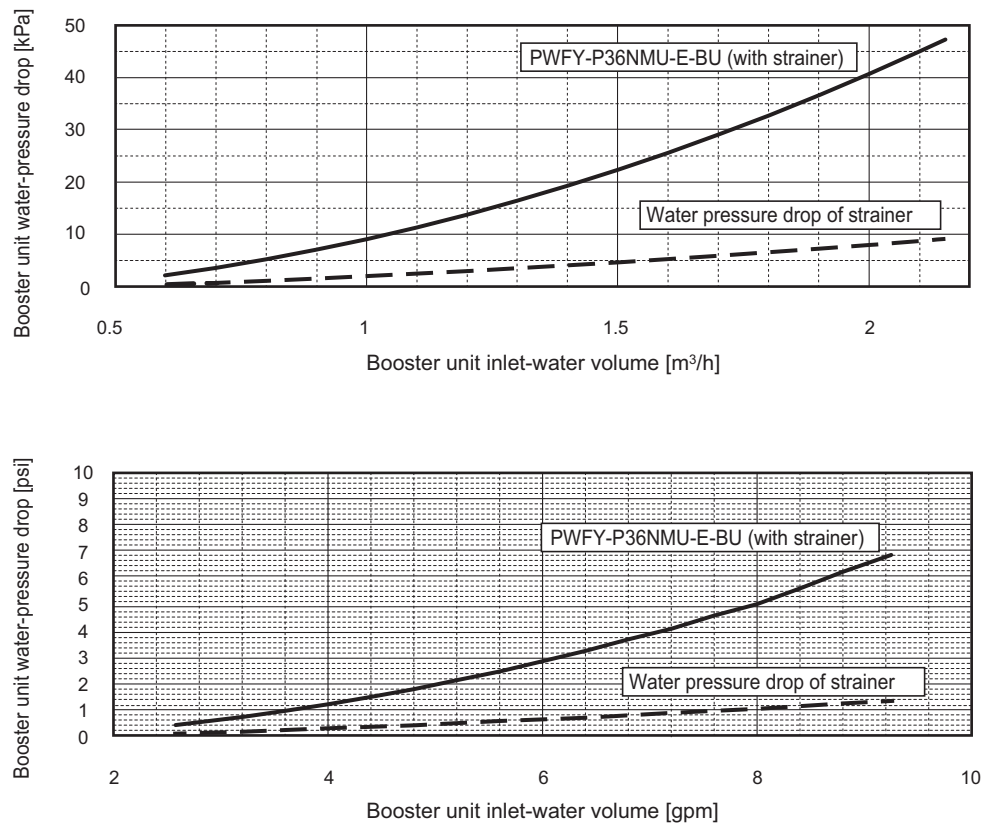
Heating



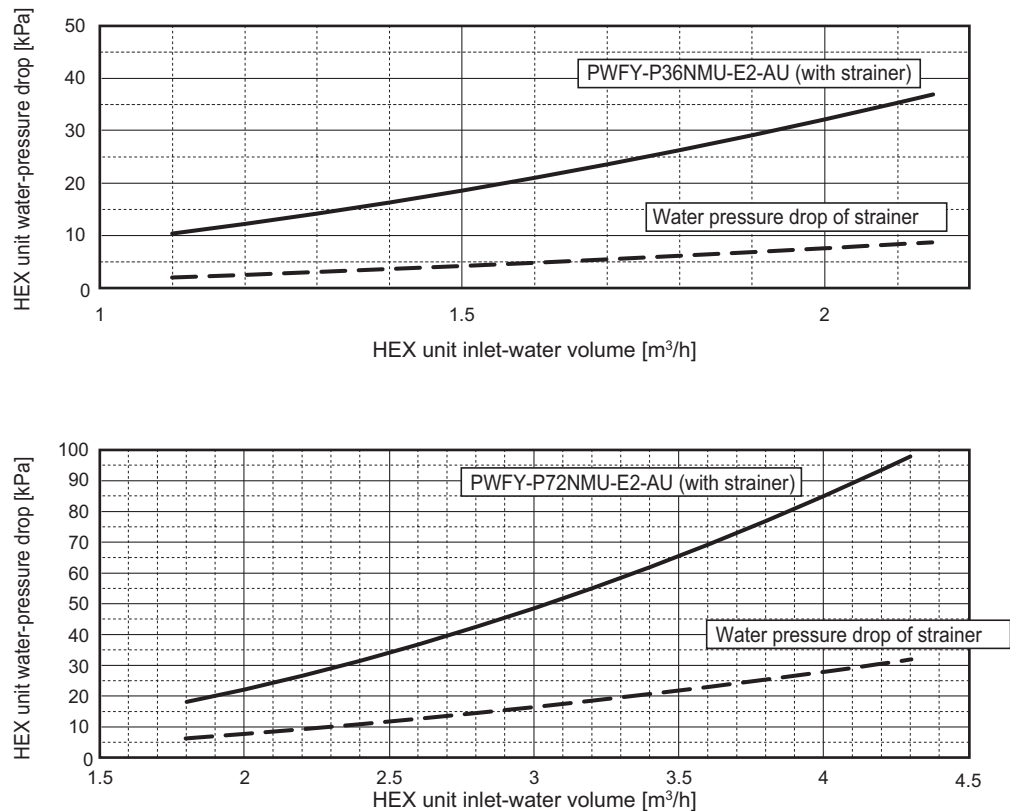
PWFY-P-NMU-E-BU, P-NMU-E2-AU

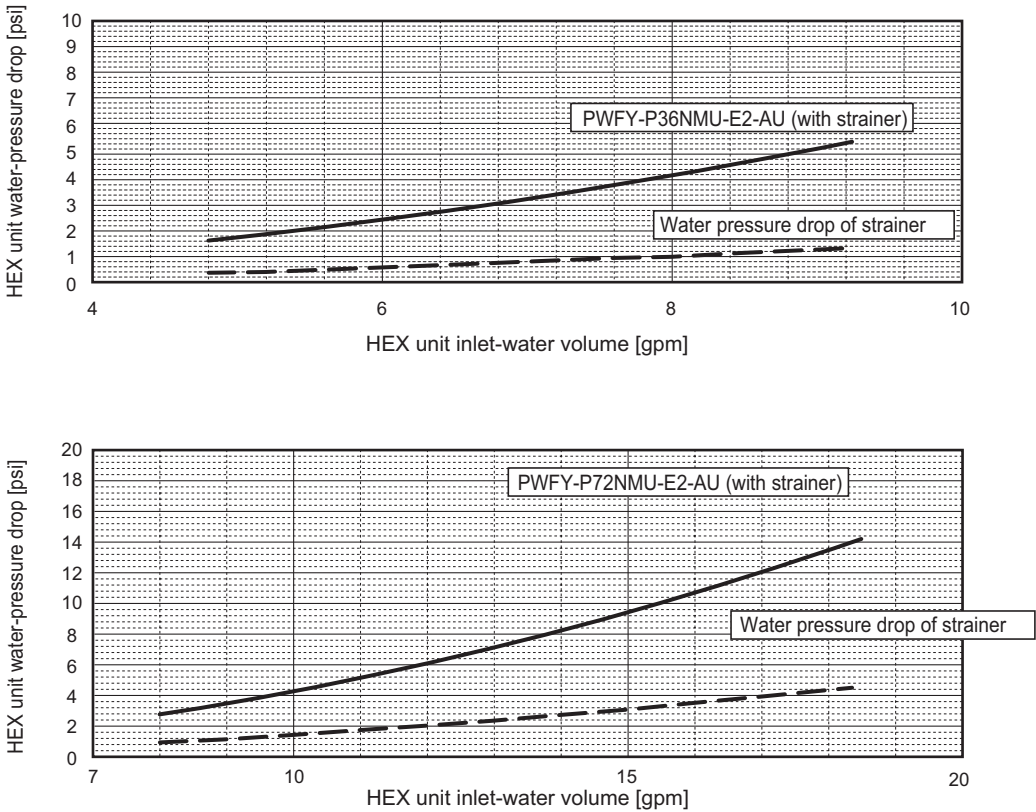
9-4. Water pressure drop

PWFY-P36NMU-E-BU (with strainer)

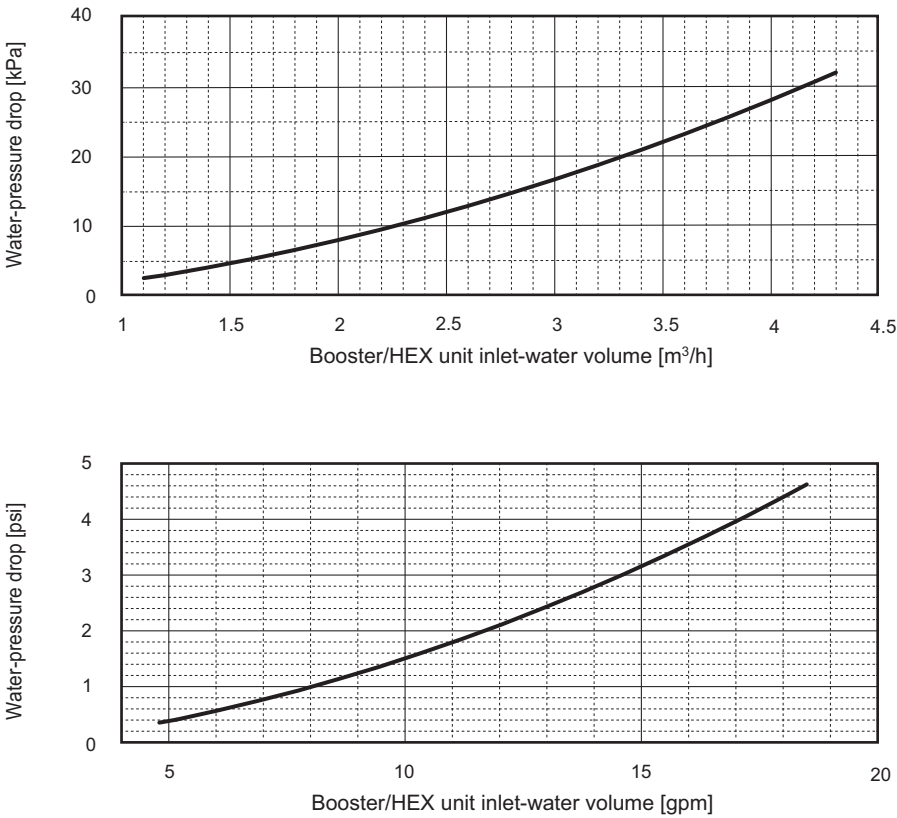


PWFY-P36, P72NMU-E2-AU (with strainer)

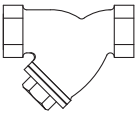
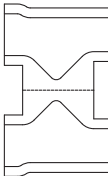
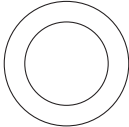
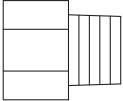
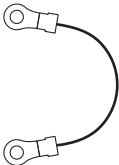
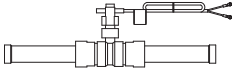
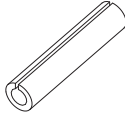




9-5. Water pressure drop of Strainer only
accessory for PWFY-P36NMU-E-BU and PWFY-P36, P72NMU-E2-AU



PWFY

(A) Strainer	(B) Heat insulation material	(C) Washer × 2	(D) Expansion joint × 2
			 *1
(E) Wire	(F) Flow switch	(G) Buffer material	
 *2			

*1. PWFY-P72NMU-E2-AU only

*2. PWFY-P36NMU-E-BU only

- (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) Fix power source wiring to terminal bed box by using buffer bushing for tensile force. (Conduit or the like.)
Connect transmission wiring to transmission terminal bed through the knockout hole of terminal bed box using ordinary bushing.
- (D) Supplied only with the PWFY-P72NMU-E2-AU. Install them at the strainer inlet. Refer to P.58 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.
- (G) If allowing wires inside the unit to hang loosely so as to prevent water from collecting and running down into electrical components, be careful not to let the wires hang so loosely as to come into contact with nearby piping (solenoid valves). If there is any risk of contact being made, use the included buffer material to protect other components.

11-1. Remote controller

PAR-W21MAA specifications

○ : Each group × : Not available

Item	Description	Operations	Display
ON/OFF	ON and OFF 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°F or 1°C) Hot Water 87°F (30°C) min. ~ 158°F (70°C) max. Heating 87°F (30°C) min. ~ 122°F (50°C) max. Anti-freeze 50°F (10°C) min. ~ 113°F (45°C) max. Cooling 50°F (10°C) min. ~ 87°F (30°C) max. * 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. 50°F (10°C) min. ~ 194°F (90°C) max. (in increments of 1°F or 1°C) * The settable range varies depending on the unit to be connected.	○	○
Water temperature display	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.	×	○
Permit/Prohibit local operation	ON/OFF/Water temperature setting can be done up to 6 times one day in the week. (in increments of a minute)	○	○
Weekly scheduler	When an error is currently occurring on a unit, the afflicted unit and the error code are displayed.	×	○
Error	Searches the latest error history by pressing the CHECK button twice.	○	○
Self check (Error history)	Enables the Test run mode by pressing the TEST button twice. * Test run mode is not available depending on the unit to be connected.	○	○
Test run	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.	○	○
Circulating water replacement warning	The language on the dot matrix LCD can be changed. (Seven languages) English/German/Spanish/Russian/Italian/French/Swedish	○	○
LANGUAGE setting	Remote controller operation can be locked or unlocked. · All-switch locking · Locking except ON/OFF switch	○	○
Operation locking function			

12-1. 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 mouses. 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 P45.

⚠ 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.

12-2. Power supply for PWFY unit

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 (1/8 in) contact separation in each pole shall be provided by the Air conditioner installation.

Model	Unit						Compressor	
	Hz	Volts	Voltage range	RLA (A)	MCA (A)	Max.Fuse (A)	Output (kW)	SC (A)
PWFY-P36NMU-E-BU	60Hz	208/230V	188 to 253V	12.30/11.12	25	25	1.00	1.25

Model	Unit							
	Hz	Volts	Voltage range	RLA (A)	MCA (A)	Max.Fuse (A)		
PWFY-P36NMU-E2-AU	60Hz	208/230V	188 to 253V	0.072/0.065	0.09	15		
PWFY-P72NMU-E2-AU								

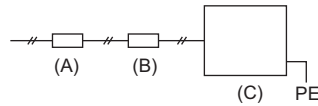
PWFY-P-NMU-E-BU, P-NMU-E2-AU

12-3. Power cable specifications

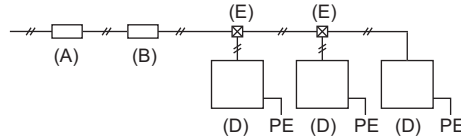
1-phase 2-wire, 208/230V,60Hz	Minimum wire thickness (mm ² /AWG)			Switch (A)		Breaker for wiring (NFB)	Breaker for current leakage
	Main cable	Branch	Ground	Capacity	Fuse		
PWFY-P36NMU-E-BU	2.5/12	-	2.5/12	25	25	25	25A 30mA or 100mA 0.1sec. or less

1-phase 2-wire, 208/230V,60Hz	Minimum wire thickness (mm ² /AWG)			Switch (A)		Breaker for wiring (NFB)	Breaker for current leakage
	Main cable	Branch	Ground	Capacity	Fuse		
PWFY-P36NMU-E2-AU PWFY-P72NMU-E2-AU	1.5/14	-	1.5/14	15	15	15	15A 30mA or 100mA 0.1sec. or less

PWFY-P36NMU-E-BU



PWFY-P36, 72NMU-E2-AU



- (A) Breaker for current leakage
- (B) Local switch or breakers for wiring
- (C) PWFY-P36NMU-E-BU
- (D) PWFY-P36, 72NMU-E2-AU
- (E) 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.

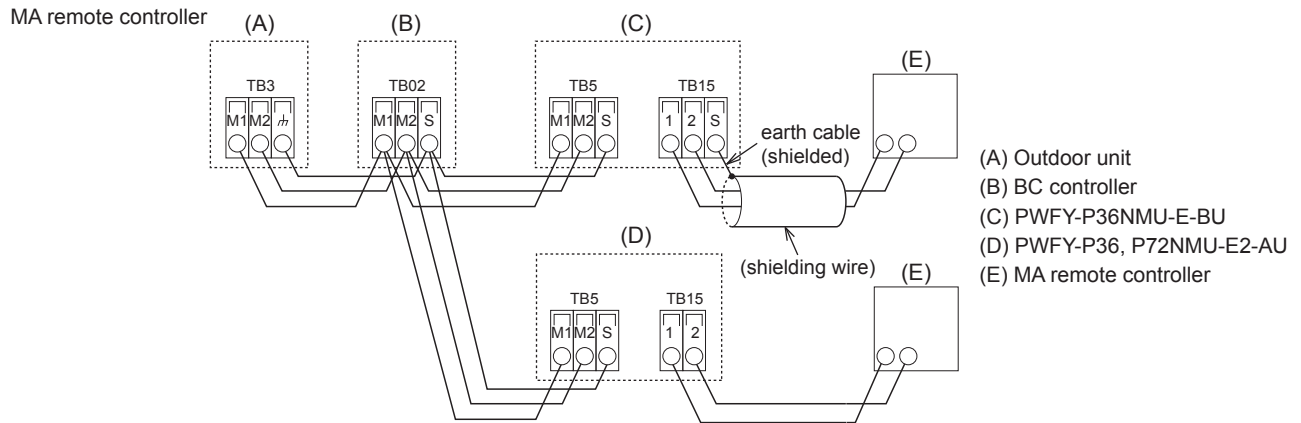
12-4. Connecting remote controller, indoor and outdoor transmission cables

- 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.

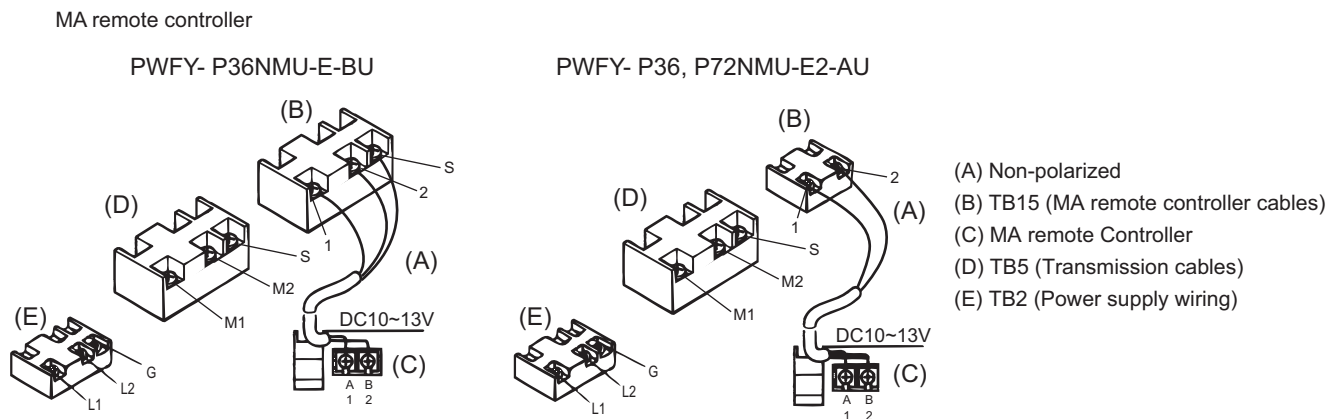
Power supply examples

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)



- DC 10 to 13 V between 1 and 2 (MA remote controller)



- 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.

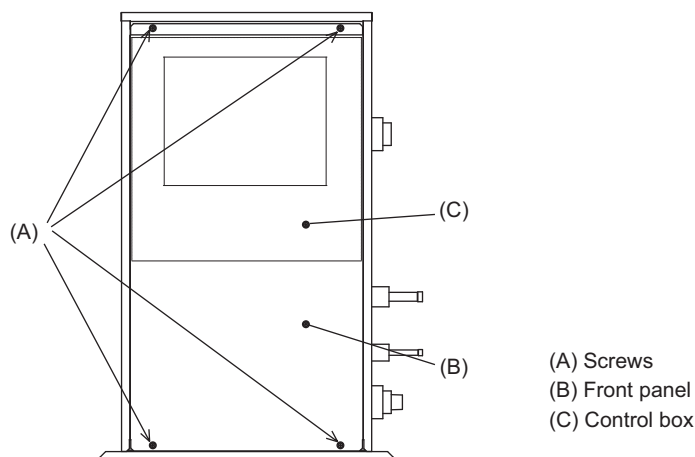
Wire the power supply so that no tension is imparted. Otherwise disconnection, heating or fire result.

12-5. 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.

Remove the screws holding the terminal box cover in place.

•PWFY unit



Note

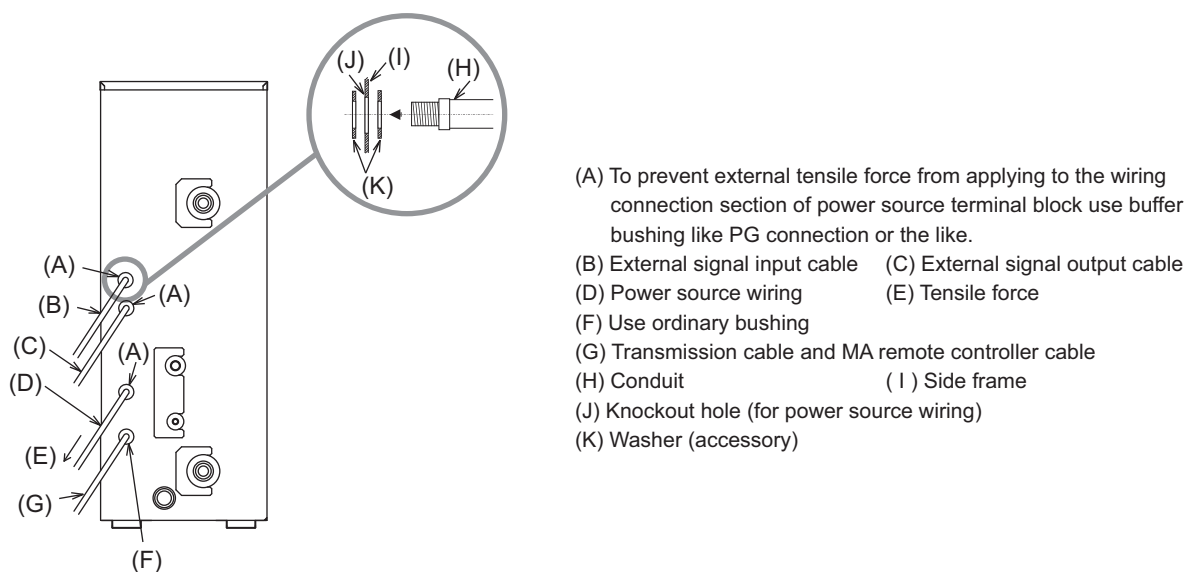
Ensure that the wiring is not pinched when fitting the terminal box cover. Pinching the wiring may cut it.

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.

•PWFY unit



CAUTION

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

13-1. Transmission cable specifications

Transmission cables

PWFY-P36NMU-E-BU

	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 (shielded) CVVS	Sheathed multi-core cable (shielded) CVVS or MVVS	Sheathed multi-core cable (unshielded) CVV or MVV
Cable diameter	More than 1.25 mm ² [AWG16]	0.3 ~ 1.25 mm ² [AWG22 ~ 16] (0.75 ~ 1.25 mm ² [AWG18 ~ 16])*1	0.3 ~ 0.5 mm ² [AWG18 ~ 16]	0.3 ~ 1.25 mm ² [AWG18 ~ 16]
Remarks	—	Max.length: 200 m [656 ft]	Max.length: 100 m [328 ft]	Rated voltage: L1-L2: 208 ~ 230 V Rated load: 0.6 A

PWFY-P36, P72NMU-E2-AU

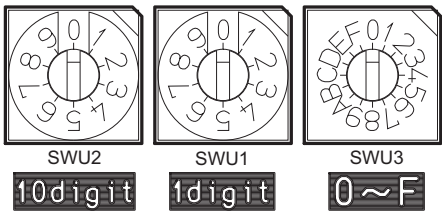
	Transmission cables	MA Remote controller cables	External input	External output
Type of cable	Shielding wire (2-core) CVVS, CPEVS or MVVS	Sheathed 2-core cable (shielded) CVVS	Sheathed multi-core cable (shielded) CVVS or MVVS	Sheathed multi-core cable (unshielded) CVV or MVV
Cable diameter	More than 1.25 mm ² [AWG16]	0.3 ~ 1.25 mm ² [AWG22 ~ 16] (0.75 ~ 1.25 mm ² [AWG18 ~ 16])*1	0.3 ~ 0.5 mm ² [AWG18 ~ 16]	0.3 ~ 1.25 mm ² [AWG18 ~ 16]
Remarks	—	Max.length: 200 m [656 ft]	Max.length: 100 m [328 ft]	Rated voltage: L1-L2: 208 ~ 230 V Rated load: 0.6 A

*1 Connected with simple remote controller.

CVVS, MVVS: PVC insulated PVC sheathed shielded control cable
CVV, MVV: PVC insulated PVC sheathed control cable
CPEVS: PE insulated PVC sheathed shielded communication cable

13-2. Indoor unit address setting

(Be sure to operate with the main power turned OFF.)
<Address board>

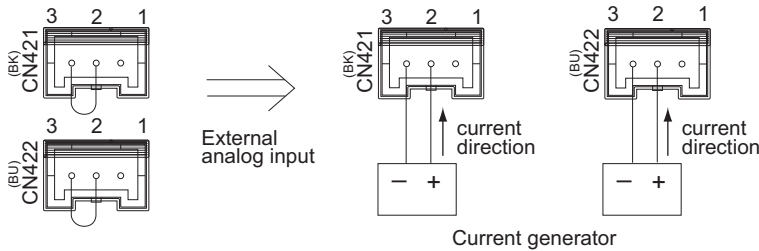


13-2-1. Switch operation (BC controller)

- There are two types of rotary switch setting available: setting addresses 1 to 9 and over 10, and setting branch numbers.
- a) How to set addresses
Example: If Address is "3", SWU2 (for over 10) remains at "0", and match SWU1 (for 1 to 9) to "3".
- b) How to set branch numbers SWU3 (only for R2/WR2-Series)
Match the indoor unit's refrigerant pipe with the BC controller's end connection number. Remain other than R2 at "0".
- The rotary switches are all set to "0" when shipped from the factory. These switches can be used to set unit addresses and branch numbers at will.

13-3. External input/output function

Preset temperature input (external analog input: 4mA-20mA)
•External input
Input through CN421, CN422 on the circuit board.



- 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.

Refer to the instructions manual that came with the MA remote controller for how to make the settings.
4 mA → 50 °F (10 °C) 20 mA → 160 °F (71 °C)

Note: Use a 4-20mA signal output device with insulation.

External output terminal
External output terminal (refer to [Fig. 1-7-A]) is ineffective when the circuit is open.
Refer to [Table 1] for information about each contact.

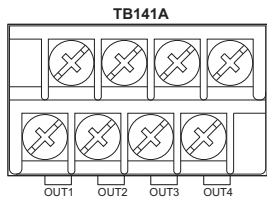
The current and voltage in the circuit to be connected to external output terminal (TB141A OUT1) must meet the following conditions.

[Table 1]

OUT1	Operation ON/OFF
OUT2	Defrost
OUT3 *1	Compressor
OUT4	Error signal

*1 This function is available for
PWFY-P36NMU-E-BU.

[Fig. 1-7-A]



External input terminal

The piping length must be within 100 m.

External input terminal (refer to [Fig. 1-7-B]) is ineffective when the circuit is open.

Refer to [Table 2] through [Table 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. 3-1-F].

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 2] TB142A

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

[Table 3] TB142B

IN3	Connection demand
IN4	Operation ON/OFF

[Table 4] TB142C

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

*1 PWFY-P36NMU-E-BU ... Hot Water
PWFY-P36, 72NMU-E2-AU ... Heating

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

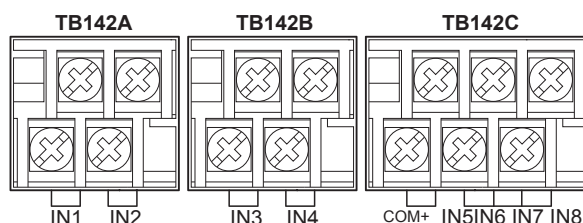
*3 Effective when SW 4-4 is set to ON.

*4 PWFY-P36, 72NMU-E2-AU only

*5 When Heating ECO mode is effective, the outlet water temp. will be changed based on ambient temp. automatically.

*6 When Anti-freeze mode is effective, the unit will work for keeping set water temp. automatically.

[Fig.1-7-B]



Note

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

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

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

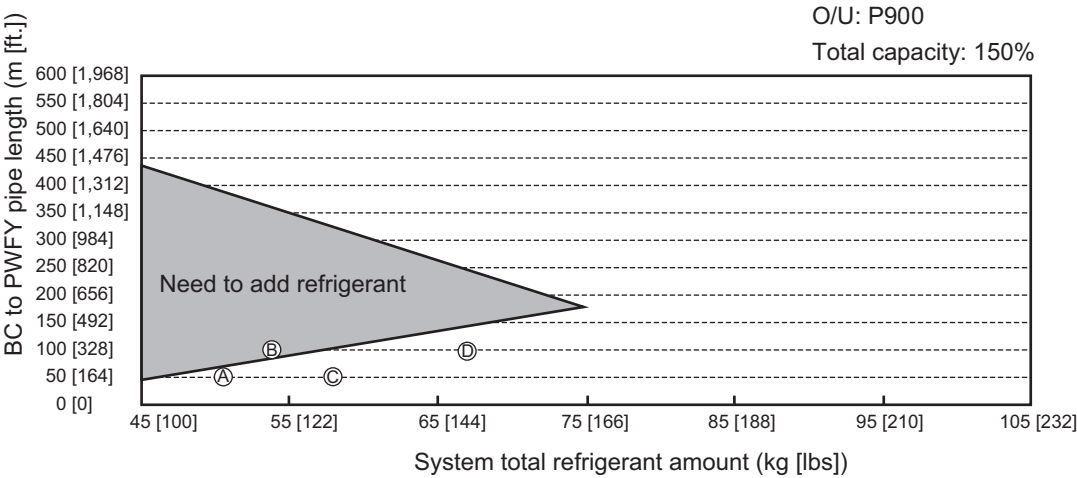
The factory setting for Dip SW 1-1 is OFF.

Signal priority = External input > centralized controller > remote controller

14-1. Refrigerant charging calculation (PWFY-AU with R2 system or H2i R2 system)

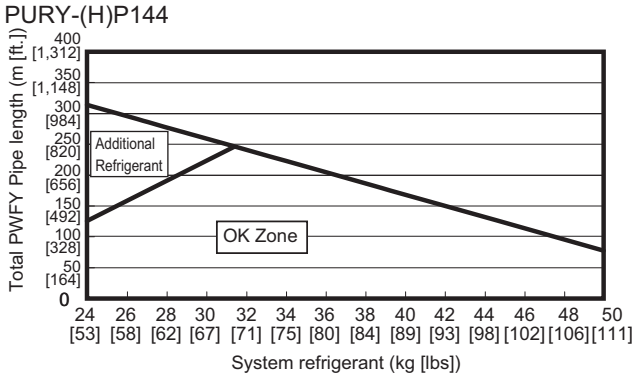
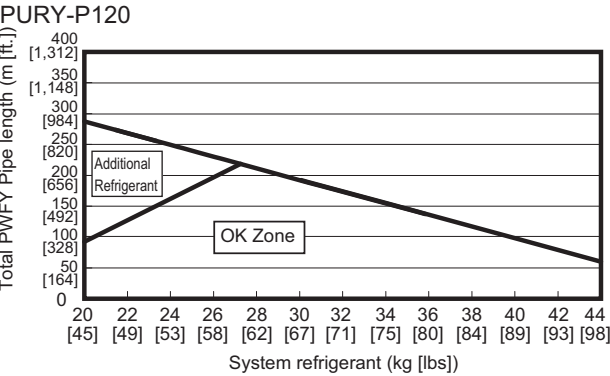
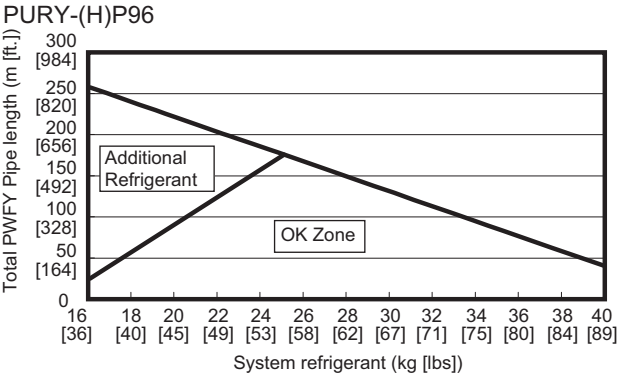
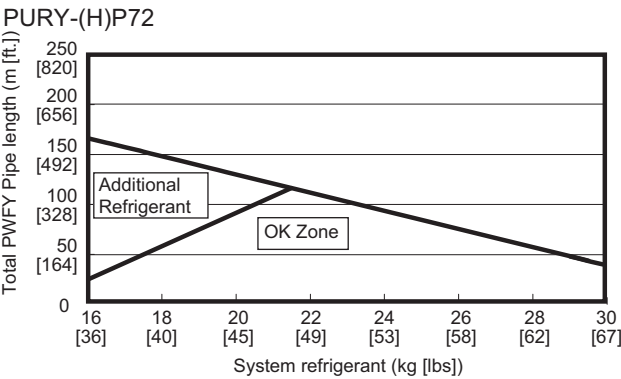
It is needed to add extra refrigerant if the system is under the following conditions.
See the attachment for how to decide the amount of refrigerant to be added to each outdoor unit.
The graph below shows an example.

PWFY-P-NMU-E-BU, P-NMU-E2-AU

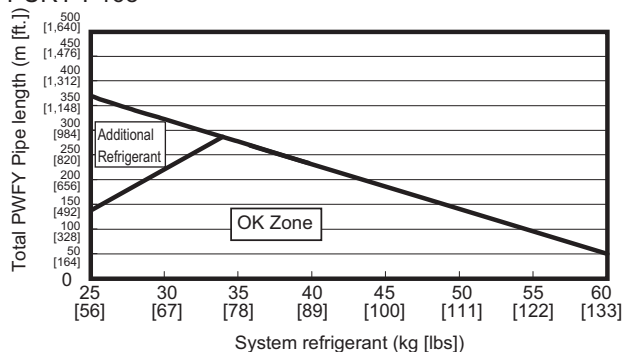


- Ⓐ Main pipe: 40m [131ft.]
PWFY: P200 x 4, Pipe 12.5m [41ft.] each
- Ⓑ Main pipe: 40m [131ft.]
PWFY: P200 x 4, Pipe 25m [82ft.] each
- Ⓒ Main pipe: 40m [131ft.]
PWFY: P200 x 2, Pipe 25m [82ft.] each
IC: P50 x 10, Pipe 20m [65ft.] each (100%)
- Ⓓ Main pipe: 40m [131ft.](BC) + 20m [65ft.](BS)
PWFY: P200 x 4, Pipe 25m [82ft.] each
IC: P50 x 11, Pipe 20m [65ft.] each (150%)

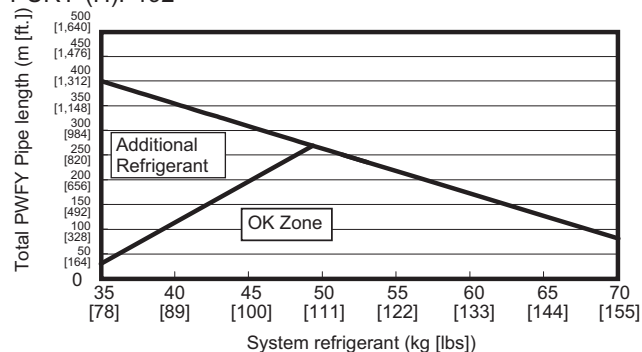
Extra charge amount (kg [lbs]): BC to PWFY pipe length (m [ft.]) × 0.1



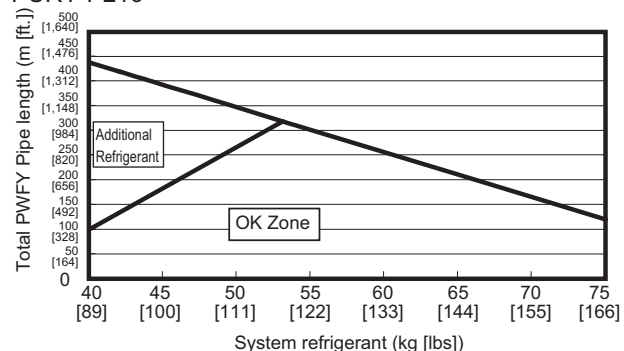
PURY-P168



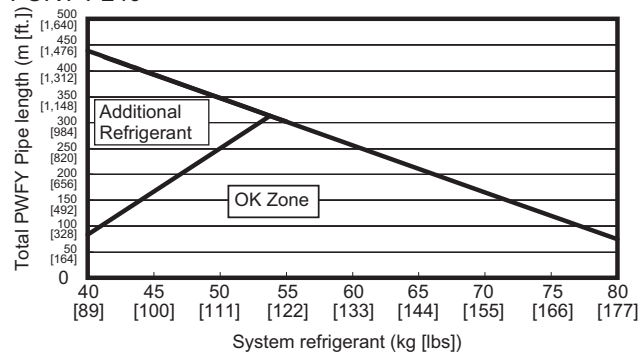
PURY-(H)P192



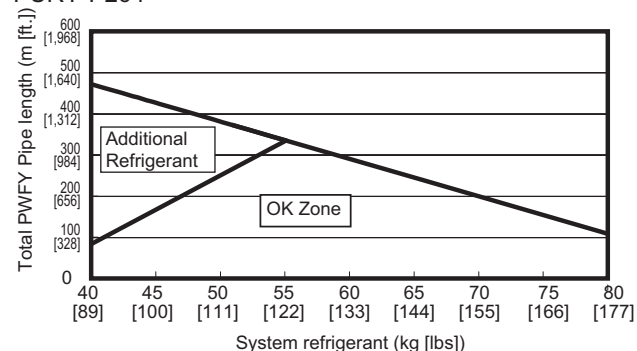
PURY-P216



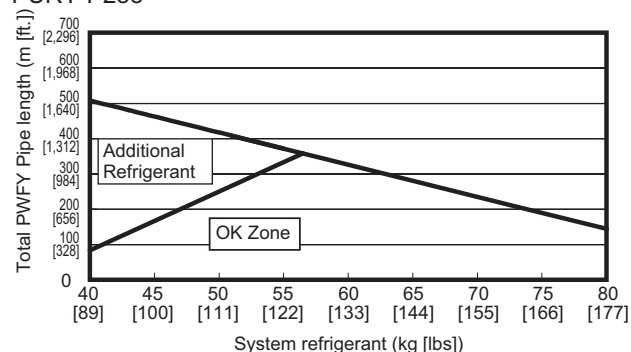
PURY-P240



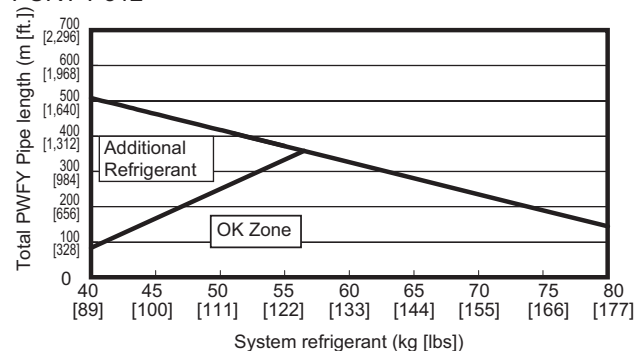
PURY-P264



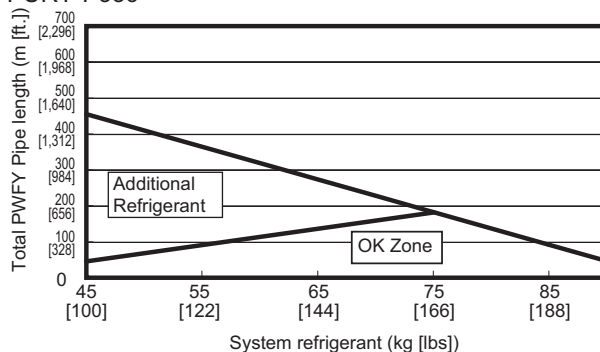
PURY-P288



PURY-P312



PURY-P336



*Total PWFY pipe length

Shows the total length of gas pipes from PWFY units that are connected to the system

15-1. How to calculate the necessary heating capacity

Heating capacity calculation (Unit: °F/BTU/G)

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

Required total heating capacity BTUSafety factor; %

- B. For Sanitary use such as Shower and Bathrooms

Conditions

Tank inlet water Temp.; °FTank outlet water Temp.; °F

(Set Temp 23 °F)

Safety factor for Heat Loss; %Operating time; HoursFor Shower; G/Person x Person = G (Water Temp. Condition °F)For Bathrooms; G/Person x Person = G (Water Temp. Condition °F)The conversion of water volume to °F

$$\begin{aligned} & \frac{\text{9}}{\text{13}} \times \left(\frac{\text{10}}{\text{14}} - \frac{\text{3}}{\text{3}} \right) / \left(\frac{\text{4}}{\text{4}} - \frac{\text{3}}{\text{3}} \right) \\ & + \frac{\text{13}}{\text{13}} \times \left(\frac{\text{14}}{\text{14}} - \frac{\text{3}}{\text{3}} \right) / \left(\frac{\text{4}}{\text{4}} - \frac{\text{3}}{\text{3}} \right) \\ & = \text{15} \text{ G/day} \end{aligned}$$

Heating Capacity Calculation for sanitary usage

$$\frac{\text{15}}{\text{15}} / 1,000 \times \left(\frac{\text{4}}{\text{3}} \right) / 2 = \text{16} \text{ M BTU / day}$$

The conversion of M BTU to BTU

$$\frac{\text{16}}{\text{16}} \times 1,000 / \frac{\text{6}}{\text{6}} = \text{17} \text{ BTU}$$

- C. Total (A+B)

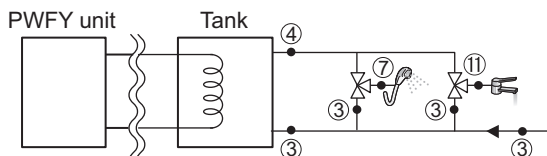
Total Heating Capacity

$$\frac{\text{1}}{\text{1}} \times (100\% + \frac{\text{2}}{\text{2}}\%) + \frac{\text{17}}{\text{17}} \times (100\% + \frac{\text{5}}{\text{5}}\%) = \text{18} \text{ BTU}$$

- D. No. of units required

Safety factor; %

$$\frac{\text{18}}{\text{18}} \times (100\% + \frac{\text{19}}{\text{19}}\%) / 39900\text{BTU} = \frac{\text{20}}{\text{20}} \text{ units}$$

 units are required

A calculation example (Unit: °F/BTU/G)

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

Required total heating capacity BTUSafety factor; %

- B. For Sanitary use such as Shower and Bathrooms

Conditions

Tank inlet water Temp.; °FTank outlet water Temp.; °F

(Set Temp 23 °F)

Safety factor for Heat Loss; %Operating time; HoursFor Shower; G/Person x Person = G (Water Temp. Condition °F)For Bathrooms; G/Person x Person = G (Water Temp. Condition °F)The conversion of water volume to °F

$$\begin{aligned} & \frac{\text{317}}{\text{63.4}} \times \left(\frac{\text{104}}{\text{113}} - \frac{\text{50}}{\text{50}} \right) / \left(\frac{\text{140}}{\text{140}} - \frac{\text{50}}{\text{50}} \right) \\ & + \frac{\text{63.4}}{\text{63.4}} \times \left(\frac{\text{113}}{\text{113}} - \frac{\text{50}}{\text{50}} \right) / \left(\frac{\text{140}}{\text{140}} - \frac{\text{50}}{\text{50}} \right) \\ & = \text{234.6} \text{ G/day} \end{aligned}$$

Heating Capacity Calculation for sanitary usage

$$\frac{\text{234.6}}{\text{234.6}} / 1,000 \times \left(\frac{\text{140}}{\text{50}} \right) / 2 = \text{11.2} \text{ M BTU / day}$$

The conversion of M BTU to BTU

$$\frac{\text{11.2}}{\text{11.2}} \times 1,000 / \frac{\text{8}}{\text{8}} = \text{1400} \text{ BTU}$$

- C. Total (A+B)

Total Heating Capacity

$$\frac{\text{68240}}{\text{68240}} \times (100\% + \frac{\text{10}}{\text{10}}\%) + \frac{\text{1400}}{\text{1400}} \times (100\% + \frac{\text{15}}{\text{15}}\%) = \text{76674} \text{ BTU}$$

- D. No. of units required

Safety factor; %

$$\frac{\text{76674}}{\text{76674}} \times (100\% + \frac{\text{20}}{\text{20}}\%) / 39900\text{BTU} = \frac{\text{2.31}}{\text{2.31}} \text{ units}$$

 units are required

* The value shown here is the rated capacity, and varies depending on the installation conditions.

Heating capacity calculation (Unit: °C/kW/ℓ)

- 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

$$\begin{aligned} & \frac{\text{9}}{\text{13}} \times \left(\frac{\text{10}}{\text{14}} - \frac{\text{3}}{\text{3}} \right) / \left(\frac{\text{4}}{\text{4}} - \frac{\text{3}}{\text{3}} \right) \\ & + \frac{\text{13}}{\text{13}} \times \left(\frac{\text{14}}{\text{14}} - \frac{\text{3}}{\text{3}} \right) / \left(\frac{\text{4}}{\text{4}} - \frac{\text{3}}{\text{3}} \right) \\ & = \text{15} \text{ ℓ/day} \end{aligned}$$

Heating Capacity Calculation for sanitary usage

$$\frac{\text{15}}{\text{15}} / 1,000 \times \left(\frac{\text{4}}{\text{3}} - \frac{\text{3}}{\text{3}} \right) = \text{16} \text{ M cal / day}$$

The conversion of M cal to kW

$$\frac{\text{16}}{\text{16}} / 860 \times 1,000 / \frac{\text{6}}{\text{6}} = \text{17} \text{ kW}$$

- C. Total (A+B)

Total Heating Capacity

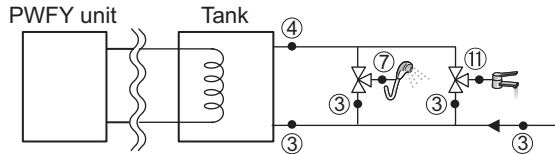
$$\frac{\text{1}}{\text{1}} \times (100\% + \frac{\text{2}}{\text{2}}\%) + \frac{\text{17}}{\text{17}} \times (100\% + \frac{\text{5}}{\text{5}}\%) = \text{18} \text{ kW}$$

- D. No. of units required

Safety factor; %

$$\frac{\text{18}}{\text{18}} \times (100\% + \frac{\text{19}}{\text{19}}\%) / 11.7 \text{ kW} = \text{20} \text{ units}$$

↓
 units are required



A calculation example (Unit: °C/kW/ℓ)

- 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

$$\begin{aligned} & \frac{\text{1,200}}{\text{240}} \times \left(\frac{\text{40}}{\text{45}} - \frac{\text{10}}{\text{10}} \right) / \left(\frac{\text{60}}{\text{60}} - \frac{\text{10}}{\text{10}} \right) \\ & + \frac{\text{240}}{\text{240}} \times \left(\frac{\text{45}}{\text{45}} - \frac{\text{10}}{\text{10}} \right) / \left(\frac{\text{60}}{\text{60}} - \frac{\text{10}}{\text{10}} \right) \\ & = \text{888} \text{ ℓ/day} \end{aligned}$$

Heating Capacity Calculation for sanitary usage

$$\frac{\text{888}}{\text{888}} / 1,000 \times \left(\frac{\text{60}}{\text{10}} - \frac{\text{10}}{\text{10}} \right) = \text{44.4} \text{ M cal / day}$$

The conversion of M cal to kW

$$\frac{\text{44.4}}{\text{44.4}} / 860 \times 1,000 / \frac{\text{8}}{\text{8}} = \text{6.45} \text{ kW}$$

- C. Total (A+B)

Total Heating Capacity

$$\frac{\text{20}}{\text{20}} \times (100\% + \frac{\text{10}}{\text{10}}\%) + \frac{\text{6.45}}{\text{6.45}} \times (100\% + \frac{\text{15}}{\text{15}}\%) = \text{29.42} \text{ kW}$$

- D. No. of units required

Safety factor; %

$$\frac{\text{29.42}}{\text{29.42}} \times (100\% + \frac{\text{20}}{\text{20}}\%) / 11.7 \text{ kW} = \text{2.82} \text{ units}$$

↓
 units are required

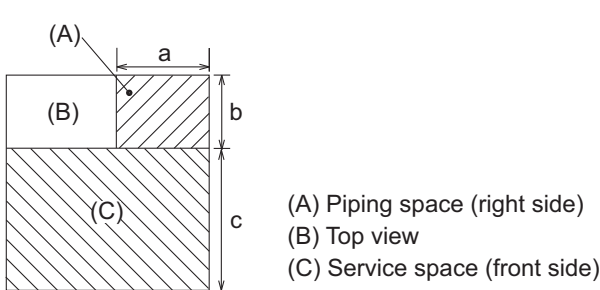
* The value shown here is the rated capacity, and varies depending on the installation conditions.

15-2. Selecting an installation site

- 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.

15-3. Securing installation and service space

- Please secure the following service spaces after installation.
(All servicing can be performed from the front of the unit)
- PWFY unit



Unit: in (mm)

Model	PW-FY-P36NMU-E-BU	PW-FY-P36NMU-E2-AU	PW-FY-P72NMU-E2-AU
a	15-3/4 (400)	15-3/4 (400)	15-3/4 (400)
b	11-13/16 (300)	11-13/16 (300)	11-13/16 (300)
c	23-5/8 (600)	23-5/8 (600)	23-5/8 (600)

⚠ 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.

15-4. Installing the unit

15-4-1. Lifting method

⚠ CAUTION

Be very careful when carrying the product.

- Do not have only one person to carry product if it is more than 45 lbs (20 kg).
- Do not tilt the unit while transporting.
- PP bands are used to pack some products. Do not use them as a mean for transportation because they are dangerous.
- Tear plastic packaging bag and scrap it so that children cannot play with it. Otherwise plastic packaging bag may suffocate children to death.

Product net weight

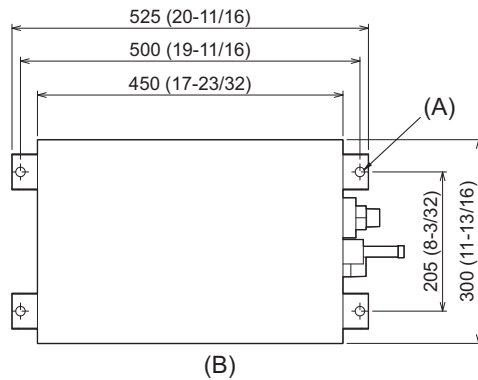
Model	PWFY-P36NMU-E-BU	PWFY-P36NMU-E2-AU	PWFY-P72NMU-E2-AU
Net weight	131 lbs (59 kg)	73 lbs (33 kg)	80 lbs (36 kg)

15-4-2. Installation method

- Using the anchoring holes shown below, firmly bolt the unit to the base.

▪ PWFY unit

unit: mm (in)



(A) $2 \times 2\text{-}\phi 14$ (9/16) (Anchoring hole)

(B) (Top view)

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.

15-5. Refrigerant pipe and drain pipe specifications

15-5-1. Refrigerant pipe and drain pipe specifications

To avoid dew drops, provide sufficient anti-sweating 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 212 °F (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.

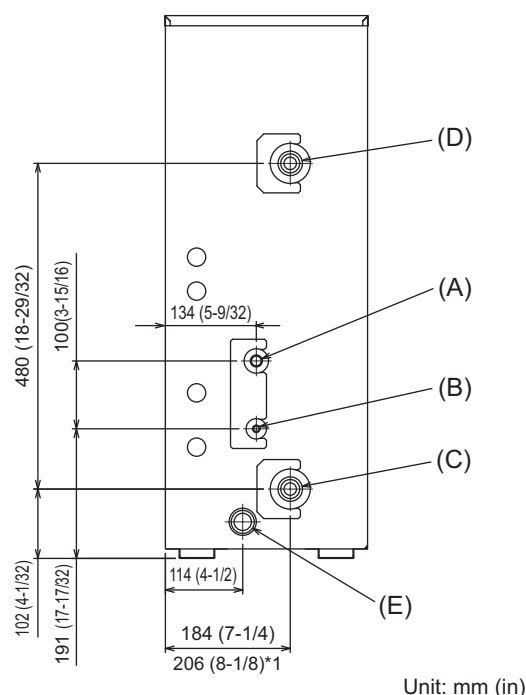
Unit: mm (in)

Model	PWFY-P36NMU-E-BU	PWFY-P36NMU-E2-AU	PWFY-P72NMU-E2-AU
Gas	ø15.88 (5/8)	ø15.88 (5/8)	ø19.05 (3/4)
Liquid	ø9.52 (3/8)	ø9.52 (3/8)	ø9.52 (3/8)
Drain	ø32 (1-1/4)		
Insulating material's thickness	More than 10 mm (13/32 in)		

- 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.

15-5-2. Refrigerant pipe, drain pipe and filling port

- PWFY unit



- (A) Refrigerant piping (gas)
- (B) Refrigerant piping (liquid)
- (C) Water inlet
- (D) Water outlet
- (E) Drain outlet
- *1: PWFY-P36, P72NMU-E2-AU

15-6. Connecting refrigerant pipes and drain pipes

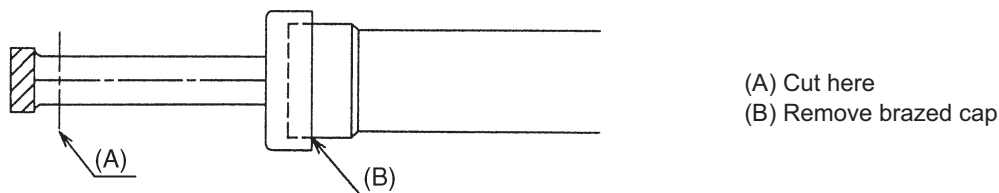
15-6-1. Refrigerant piping work

This piping work must be done in accordance with the installation manuals for both outdoor unit and BC controller (simultaneous cooling and heating R2-Series).

- R2-Series is designed to operate in a system that the refrigerant pipe from an outdoor unit is received by BC controller and branches at the BC controller to connect between indoor units.
- The PWFY unit should be connected to 2 ports on the BC controller. (Set BC controller DIP SW 4-6 to ON)
- 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

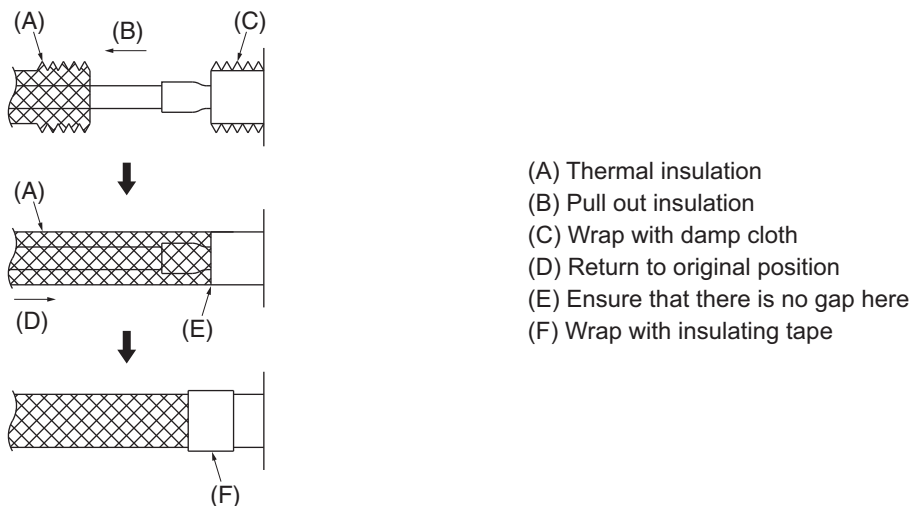
- Install the refrigerant piping for the indoor unit in accordance with the following.
- 1) Cut the tip of the indoor unit piping, remove the gas, and then remove the brazed cap.



- 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.



15-6-2. PWFY-AU in cooling operation (Y, H2i Y, WY system)

Add brine, assuming that the temperature will drop to -4°F (-20°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 50°F (10°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 (19-11/16 in) 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.

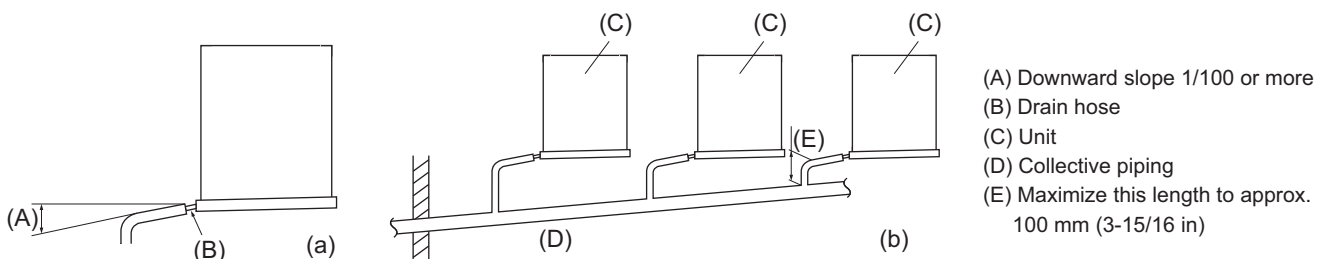
- Mixing of a different refrigerant, air, etc. may cause the refrigerant cycle to malfunction and result in severe damage.

⚠ 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.

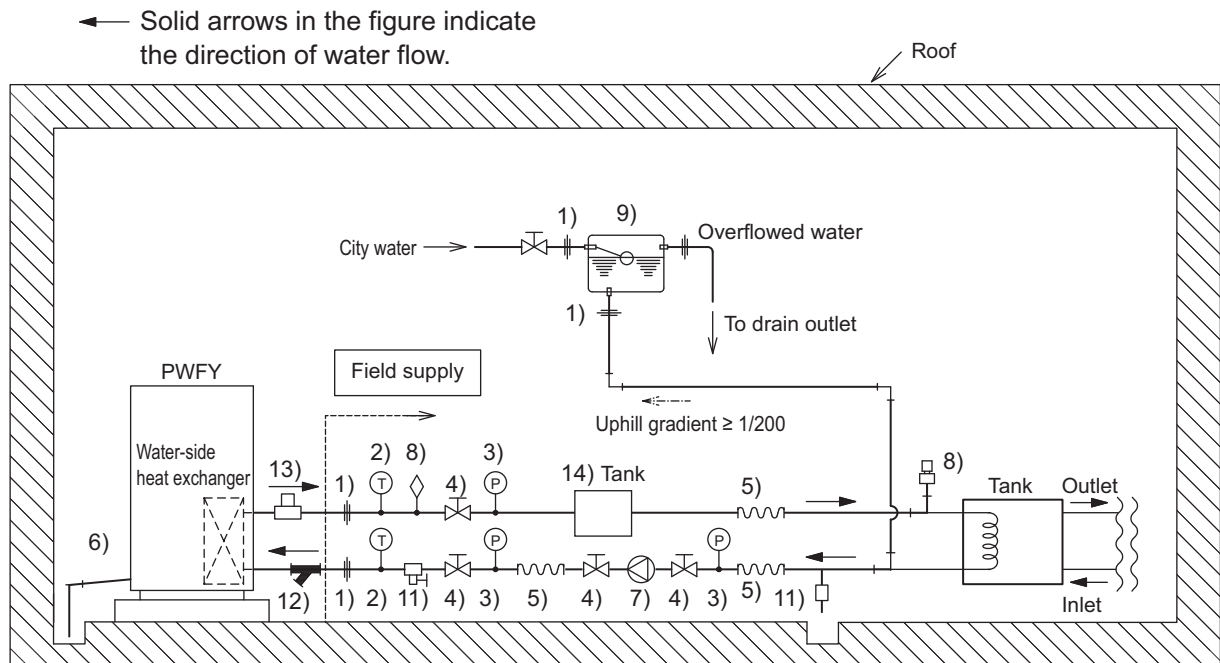
15-6-3. Drain piping work

- 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 (65 ft) (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 (1-9/32 in)) for drain piping.
- 4) Ensure that collected pipes are 100 mm (3-15/16 in) 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.



15-7. Water pipe installation

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. 3-1-D])

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 (32 °F) 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-P36NMU-E-BU	PT 3/4 Screw	PT 3/4 Screw
PWFY-P36NMU-E2-AU	PT 3/4 Screw	PT 3/4 Screw
PWFY-P72NMU-E2-AU	PT 1 Screw *1	PT 1 Screw *1

*1 When the attached expansion joints are installed.

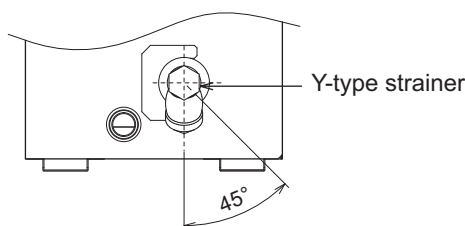
Selecting a water pump

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

Installing the strainer

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

[Fig. 3-1-A]

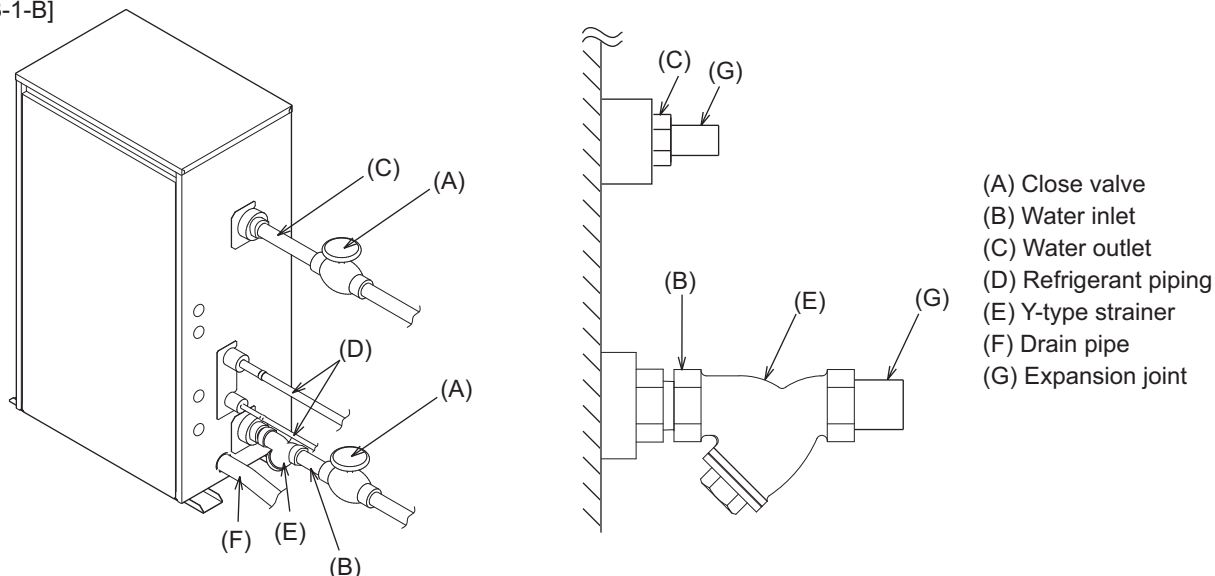


Precautions during installation

- 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. 3-1-B].
- Install a suitable air vent on the water pipe. After sending water through the pipe, be sure to vent the excess air.
- Condensed 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.
- 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.

Example of unit installation

[Fig. 3-1-B]



Insulation installation

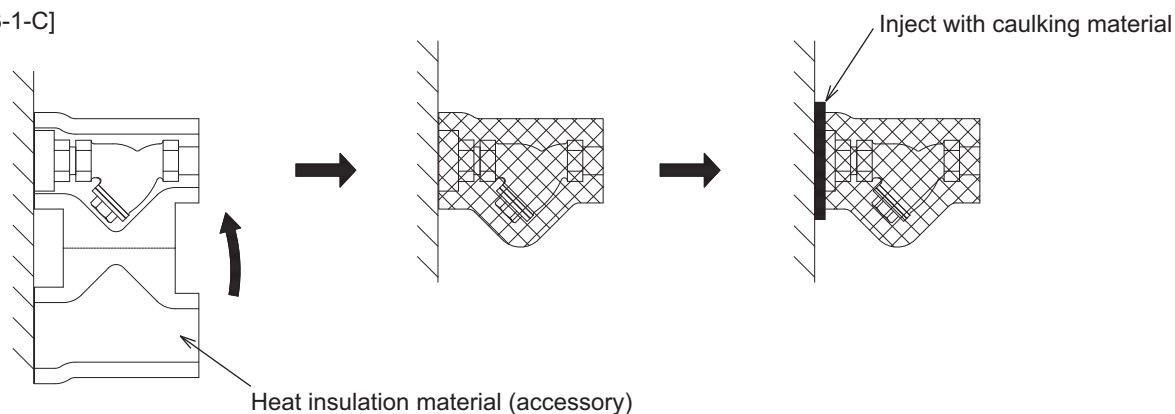
The surface temperature of the water pipe would be very high, depending on the set temperature.

Insulate the pipe to prevent burns.

When operating PWFY-P36, 72NMU-E2-AU with cold water, insulate the water pipe to prevent condensation. Wrap insulation material around water pipes as shown in [Fig. 3-1-C].

- 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. 3-1-C]



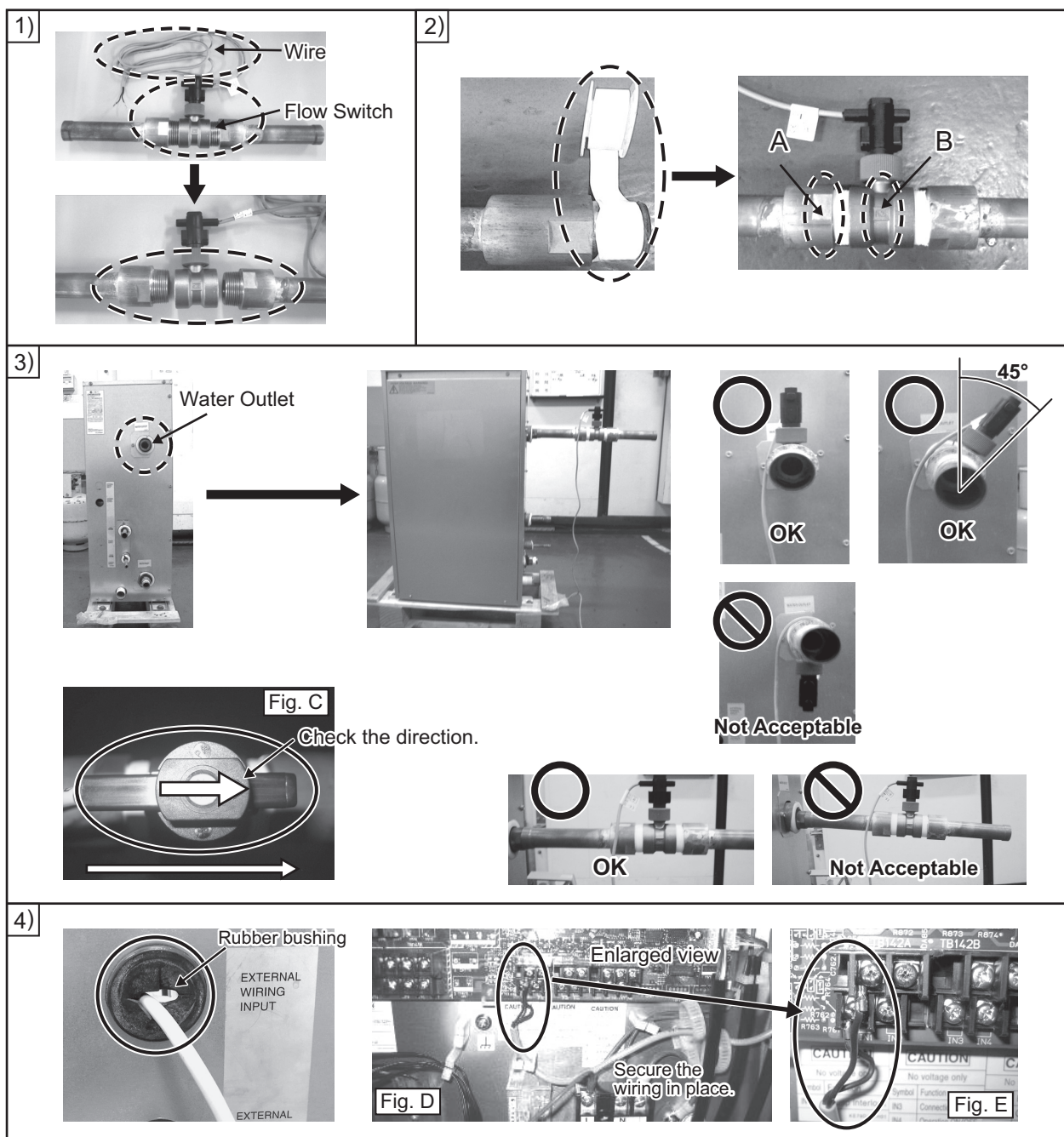
Flow switch installation

⚠ 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.



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. ≤ 140 °F (60 °C)		Higher mid-range temperature water system Water Temp. > 140 °F (60 °C)		Tendency	
		Recirculating water	Make-up water	Recirculating water	Make-up water	Corrosive	Scale-forming
Standard items	pH 77 °F (25 °C)	7.0 ~ 8.0	7.0 ~ 8.0	7.0 ~ 8.0	7.0 ~ 8.0	○	○
	Electric conductivity(mS/m) 77 °F (25 °C)	30 or less	30 or less	30 or less	30 or less	○	○
	(μ s/cm) 77 °F (25 °C)	[300 or less]	[300 or less]	[300 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 ₄ ²⁻ /liter)	50 or less	50 or less	30 or less	30 or less	○	
	Acid consumption (pH4.8) (mg CaCO ₃ /liter)	50 or less	50 or less	50 or less	50 or less		○
	Total hardness (mg CaCO ₃ /liter)	70 or less	70 or less	70 or less	70 or less		○
	Calcium hardness (mg CaCO ₃ /liter)	50 or less	50 or less	50 or less	50 or less		○
Reference items	Ionic silica (mg SiO ₂ /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 ²⁻ /liter)	not to be detected	not to be detected	not to be detected	not to be detected	○	
	Ammonium ion (mg NH ₄ ⁺ /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 ₂ /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)

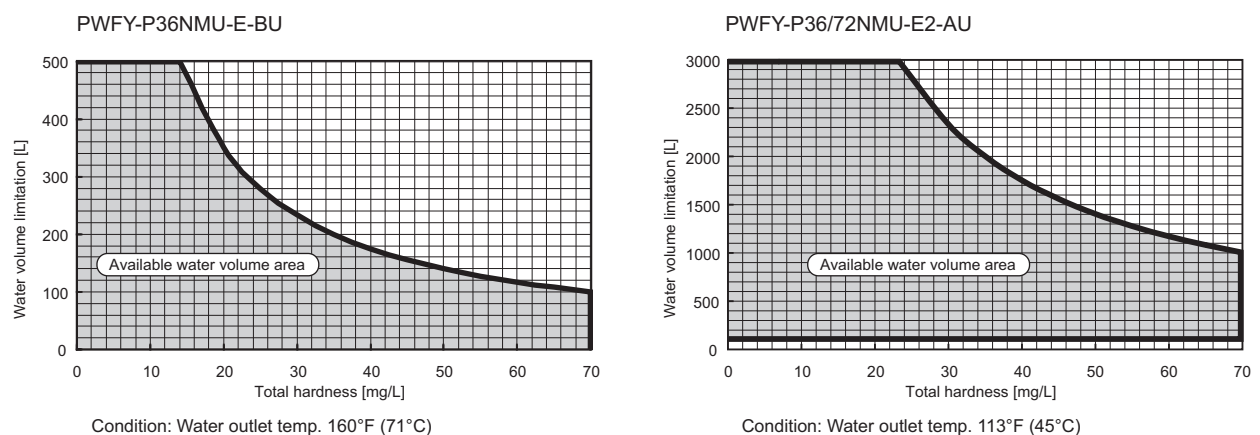
c) Please consult with a water quality control specialist about water quality control methods and water quality calculations before using anti-corrosive solutions for water quality management.

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. 3-1-D] Maximum circulating water

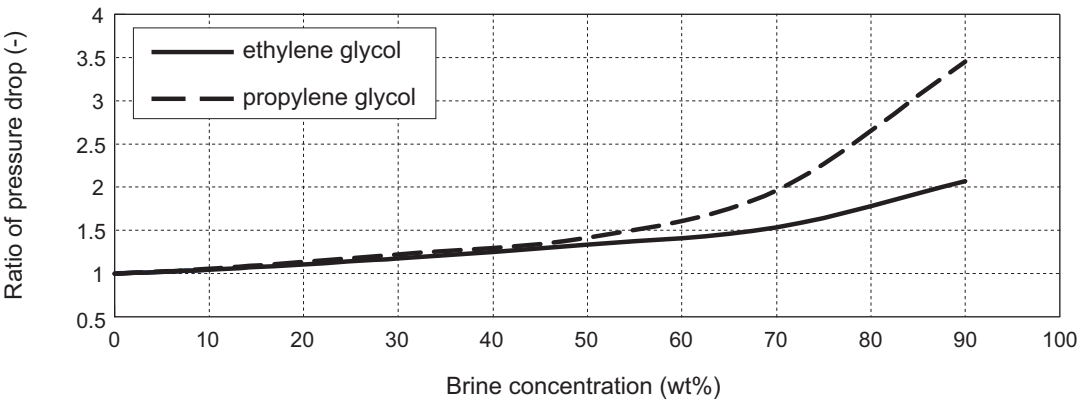
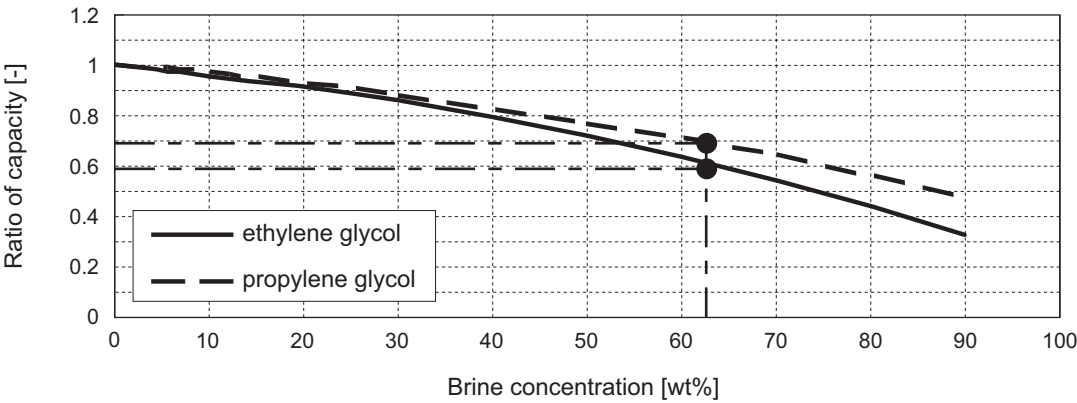
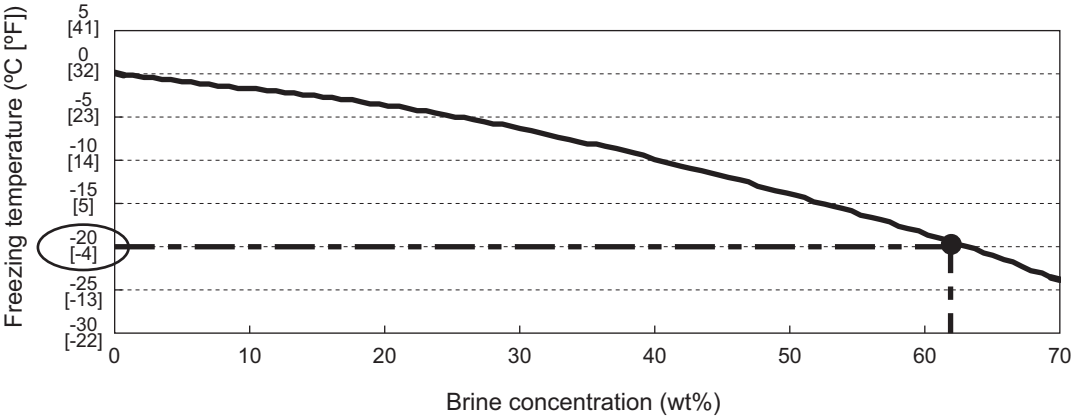


Brine

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.

PWFY-P-NMU-E-BU, P-NMU-E2-AU

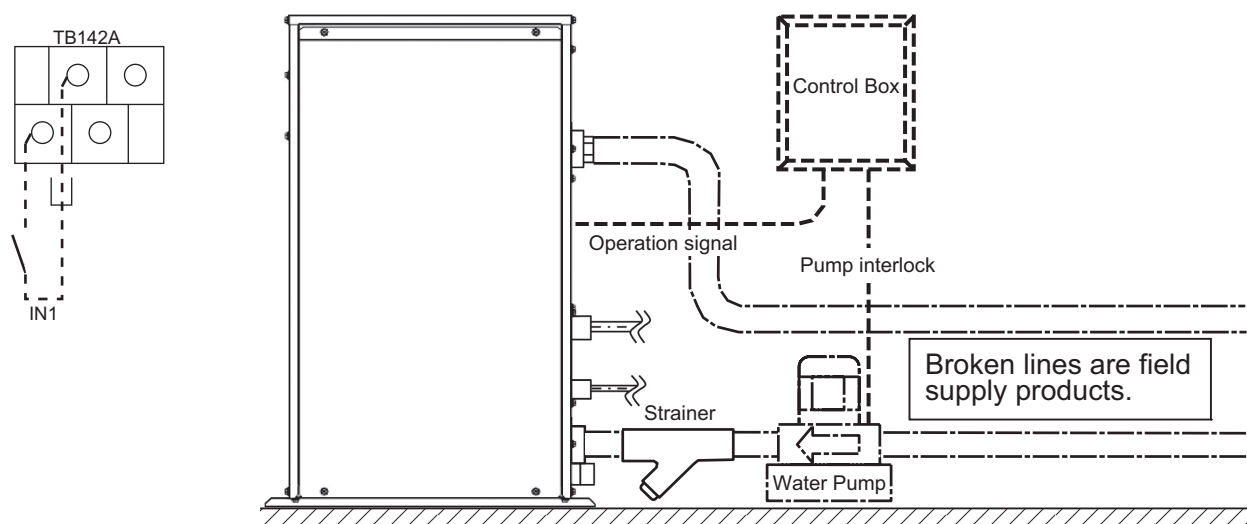


Pump interlock

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.

In the system including PWFY-P36NMU-E-BU, use the terminal blocks for interlocking TB142A (IN1) that can be found on the unit.

[Fig. 3-1-E]



Example drawing for pump interlock

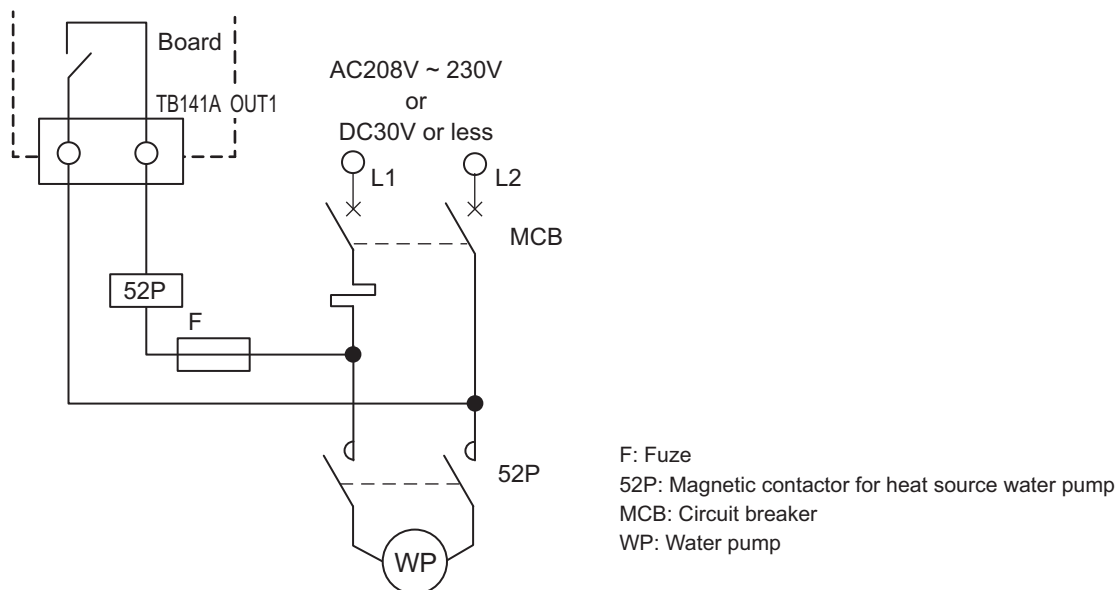
In the system including PWFY-P36/P72NMU-E2-AU, the circulating water may freeze, and result in a unit malfunction. Perform the electrical work as shown in [Fig. 3-1-F] to prevent water from freezing. Set the Dip SW as shown in the table below.

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 P59 "Flow switch installation" for details.

[Fig. 3-1-F]



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 50°F~113°F (10°C~45°C) enabling the unit to maintain low water temperature to prevent water pipes from freezing.



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, 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.
- Our air conditioning equipment and heat pumps contain a fluorinated greenhouse gas, R134a or R410A depending on the product.

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