TOSHIBA
Leading Innovation

E13-3W1

Engineering Data Book

ESTIA

Air to Water Heat Pump

Hydro Unit

HWS-804XWHM3-E
HWS-804XWHT6-E
HWS-804XWHT9-E
HWS-1404XWHM3-E
HWS-1404XWHT6-E
HWS-1404XWHT9-E

8 kw *11/14/16 kW*

Outdoor Unit

HWS-804H-E
HWS-1104H-E
HWS-1404H-E
HWS-1104H8-E
HWS-1404H8-E
HWS-1604H8-E
HWS-1104H8R-E
HWS-1404H8R-E
HWS-1604H8R-E

Hot Water Cylinder

HWS-1501CSHM3-E
HWS-2101CSHM3-E
HWS-3001CSHM3-E

Airtrend Limited

Kumanovska 14, 11000 Beograd, Srbija
Tel.: 011 383 68 86, 308 57 40
Faks: 011 344 41 13
E-mail: gobrid@eunet.rs
www.airtrend.rs
www.toshiba-klima.rs
www.toshiba-estia.rs

Ovlašćeni Toshiba distributer:

KOVENT
Kumanovska 14, 11000 Beograd
Tel.:011 308 57 40
Faks 011 344 41 13
E-mail: office@kovent.rs
www.kovent.rs

Contents

1. INTRODUCTION


TOSHIBA AIRCONDITIONING
Advancing the eco-evolution
Air to water
Heat Pump System
World-leading energy efficiency — COP of 4.77*
Comfortable heating and hot water supply
Versatile installation and operation
* 11 kW model
Welcome Estía to your home!
Air-to-water Heat Pump System
Introducing Toshiba's super-efficient space heating and hot water supply system for homes and businesses. Estía represents breakthrough thinking in intelligent heat pump and inverter technologies, by efficiently transferring ambient thermal heat from outside air to heat water indoors. Based on Toshiba's proven light commercial air conditioning system, the Super Digital Inverter, this innovative unit features DC twin rotary compressor, DC inverter and R410A refrigerant, providing the highest coefficient of performance (COP) in its class. This means more power from less energy consumption, and the ideal ecological and economical solution for your home.
Hot water cylinder
Hydro unit
Outdoor unit
ESTIA
8 kW
11/14/16 kW
Outdoor unit
Hot water cylinder
Hydro unit

Advantages

World-leading energy efficiency - COP of 4.88*

With its best in class COP performance, Estía air to water heat pump system delivers more heating power with less energy consumption.
Estía uses high quality components and material which contribute to the overall savings in energy consumption.
With the Toshiba advanced inverter, Estía air to water heat pump system only delivers the heating capacity required; thus consuming only the necessary electricity.
The hot water temperature is also optimized thanks to Toshiba advanced control depending on the outside air temperature. The milder outside, the air-to-water systems automatically produces lower water temperature to anticipate decreased needs of space heating. The same control logic allows to anticipate as well increasing heating needs when weather conditions become extreme; this overall temperature management gives the best conditions of comfort.
All this saving has a positive impact on the personal electricity bill and the whole community by reducing the CO_2 emissions in the atmosphere.

*11kW model

Easy to install

Quick and easy to install. The hydro module unit can be placed safely in the most suitable place within the house.
There's no need for chimney or underground captors which require additional works on site.
The compact outdoor unit can be placed anywhere outside the house or on a balcony, thanks to extensive piping options.

Environment conscious

The use of Toshiba Estía heat pump contribute to the reduction of global CO_2 emissions in the atmosphere and limit the use of fossil fuels or other non-renewable energy primary sources.
Whenever required for maintenance purpose, all the R410A refrigerant (non ozone depleting) can be completely sucked back to the outdoor unit through the powerful embedded Toshiba "pump down" operation.

One system, multiple solutions

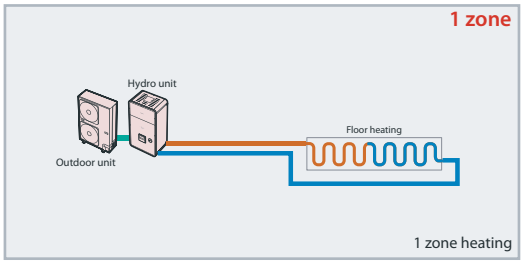
Estía heat pump systems can be used in combination with different types of emitters: existing heating low temperature radiators, floor heating or fan coil units.

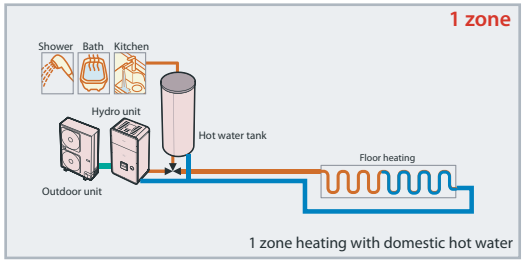
The right temperature at the right time

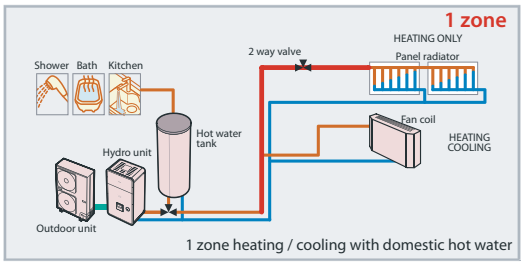
It can produce water at different temperatures for several applications simultaneously.
Toshiba Estía air to water heat pump system operates smoothly both with low outdoor air temperature down to -20 °C in winter and up to 43 °C in the summer season. The system has a unique anti-ice build-up protection embedded.

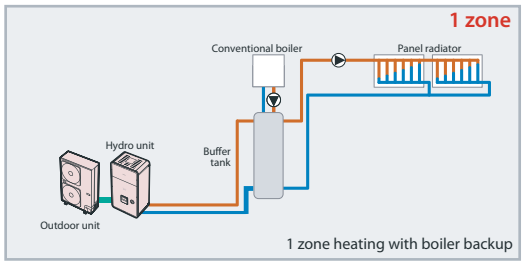
One system, full combination flexibility

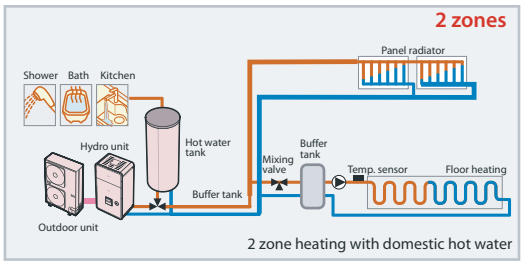
For new houses or refurbishment Estía heat pump offers a variety of combinations, some examples are shown below:

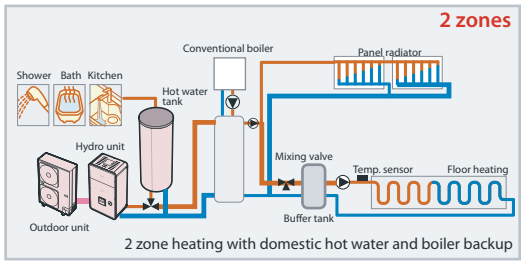












In existing dwellings already equipped with traditional gas or fuel boilers, Toshiba Estía air to water heat pump system can be combined with the existing heating system to cover exclusively and in an optimized way all the heating needs, all year round. Then, the boiler is only used as a back-up source during some extreme weather days of the winter.

The intelligent Toshiba control balances the energy source in the most efficient way.

2. SYSTEM OVERVIEW

2-1. System Combination

Combination

	Outdoor Unit									
Hydro Unit	**HWS-804H-E**	**HWS-1104H-E**	**HWS-1404H-E**	**HWS-1104H8-E**	**HWS-1404H8-E**	**HWS-1604H8-E**	**HWS-1104H8R-E**	**HWS-1404H8R-E**	**HWS-1604H8R-E**	**Backup heater**
HWS-804XWHM3-E	●	–	–	–	–	–	–	–	–	~, 3kW
HWS-804XWHT6-E	●	–	–	–	–	–	–	–	–	3N ~, 6kW
HWS-804XWHT9-E	●	–	–		–	–	–	–	–	3N~, 9kW
HWS-1404XWHM3-E	–	●	●	●	●	●	●	●	●	~, 3kW
HWS-1404XWHT6-E	–	●	●	●	●	●	●	●	●	3N~, 6kW
HWS-1404XWHT9-E	–	●	●	●	●	●	●	●	●	3N~, 9kW
	Single phase model			3 phase model			3 phase with bottom plate heater			

		Hot water cylinder		
		HWS-1501 CSHM3-E	**HWS-2101 CSHM3-E**	**HWS-3001 CSHM3-E**
Hydro unit	HWS-804XWHM3-E	●		
	HWS-804XWHT6-E			
	HWS-804XWHT9-E			
	HWS-1404XWHM3-E			
	HWS-1404XWHT6-E			
	HWS-1404XWHT9-E			

2-2. Hydro Unit

80 class

Hydro Unit		**HWS-804XWHM3-E**	**HWS-804XWHT6-E**	**HWS-804XWHT9-E**
Back up heater capacity		3.0	6.0	9.0
Power supply	for back up heater	220-230V ~ 50Hz	380-400V 3N~ 50Hz	380-400V 3N~ 50Hz
	for hot water cylinder heater (option)	220-230V ~ 50Hz		
Leaving water temperature	Heating (°C)	20-55		
	Cooling (°C)	7-30		

112,140,160 class

Hydro Unit		**HWS-1404XWHM3-E**	**HWS-1404XWHT6-E**	**HWS-1404XWHT9-E**
Back up heater capacity		3.0	6.0	9.0
Power supply	for back up heater	220-230V ~ 50Hz	380-400V 3N~ 50Hz	380-400V 3N~ 50Hz
	for hot water cylinder heater (option)	220-230V ~ 50Hz		
Leaving water temperature	Heating (°C)	20-55		
	Cooling (°C)	7-30		

2-3. Outdoor Unit

Single Phase model

Outdoor unit			HWS-804H-E	HWS-1104H-E	HWS-1404H-E
Power supply			220-230V ~ 50Hz		
Type			INVERTER		
Function			Heating & Cooling		
Heating	Capacity	(kW)	8.0	11.2	14.0
	Input	(kW)	1.79	2.30	3.11
	COP	(W/W)	4.46	4.88	4.50
Cooling	Capacity	(kW)	6.0	10.0	11.0
	Input	(kW)	1.94	3.26	3.81
	EER	(W/W)	3.10	3.07	2.89
Refrigerant			R410A		
Dimension	HxWxD	(mm)	890x900x320	1,340x900x320	

3 Phase model

Outdoor unit						with bottom plate heater		
			HWS-1104H8-E	HWS-1404H8-E	HWS-1604H8-E	HWS-1104H8R-E	HWS-1404H8R-E	HWS-1604H8R-E
Power supply			380-400V 3N~ 50Hz					
Type			INVERTER					
Function			Heating & Cooling					
Heating	Capacity	(kW)	11.2	14.0	16.0	11.2	14.0	16.0
	Input	(kW)	2.34	3.16	3.72	2.34	3.16	3.72
	COP		4.80	4.44	4.30	4.80	4.44	4.30
Cooling	Capacity	(kW)	10.0	11.0	13.0	10.0	11.0	13.0
	Input	(kW)	3.26	3.81	4.80	3.26	3.81	4.80
	EER		3.07	2.89	2.71	3.07	2.89	2.71
Refrigerant			R410A					
Dimension	HxWxD	(mm)	1,340x900x320					

2-4. Hot Water Cylinder

Hot water cylinder (option)		HWS-1501CSHM3-E	HWS-2101CSHM3-E	HWS-3001CSHM3-E
Water volume	litres	150	210	300
Max water temperature	(°C)	75		
Electric heater	(kW)	2.75 (230 V ~)		
Height	(mm)	1,090	1,474	2,040
Diameter	(mm)	550		
Material		Stainless steel		

2-5. Options

No.	Part name	Model name	Application	Remarks
1	External output board	TCB-PCIN3E	Boiler-linked output, Alarm output	Up to two boards (according to applications)
			Defrost signal output, compressor operation signal output	
2	External input board	TCB-PCMO3E	Cooling/heating thermostat input	Up to two boards (according to applications)
			Forced-stop signal input	
3	Second Remote Controller	HWS-AMS11E	Wired Remote Controller for Room air temperature control	

3. SYSTEM SPECIFICATION

Outdoor unit			HWS-804H-E	HWS-1104H-E	HWS-1404H-E
Hydro unit			HWS-804XWH**-E	HWS-1404XWH**-E	
Rated Heating condition 1 LWT=35°C dT=5deg	Capacity	kW	8.0	11.20	14.0
	Power input	kW	1.79	2.30	3.11
	COP	W/W	4.46	4.88	4.50
	Rated water flow	ℓ/min	22.90	32.10	40.10
Rated Cooling condition 1 LWT=7°C dT=5deg	Capacity	kW	6.0	10.0	11.0
	Power input	kW	1.94	3.26	3.81
	EER	W/W	3.10	3.07	2.89
	Rated water flow rate	ℓ/min	17.20	28.90	31.50
Power supply			1~ 230V 50Hz		
Maximum current		A	19.20	22.80	22.80

* Rated condition capacity and power input are the data at rated compressor operating frequency.
* Power input does not include water pump power.
* Capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (°C)
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Leaving water temperature - return water temperature (Heating)
Return water temperature - leaving water temperature (Cooling)

Outdoor unit			HWS-1104H8-E	HWS-1404H8-E	HWS-1604H8-E
Hydro unit			HWS-1404XWH**-E	HWS-1404XWH**-E	HWS-1404XWH**-E
Rated Heating condition 1 LWT=35°C dT=5deg	Capacity	kW	11.20	14.0	16.0
	Power input	kW	2.34	3.16	3.72
	COP	W/W	4.80	4.44	4.30
	Rated water flow rate	ℓ/min	32.10	40.10	45.80
Rated Cooling condition 1 LWT=7°C dT=5deg	Capacity	kW	10.0	11.0	13.0
	Power input	kW	3.26	3.81	4.80
	EER	W/W	3.07	2.89	2.71
	Rated water flow rate	ℓ/min	28.90	31.50	37.30
Power supply			3N ~ 380-400V 50Hz		
Maximum current			14.60	14.60	14.60

4. HYDRO UNIT

4-1. Specification

4-1-1. Hydro unit specifications

Hydro unit			HWS-804XWHM3-E	HWS-804XWHT6-E	HWS-804XWHT9-E
Back up heater	back up heater	kW	3.0	6.0	9.0
	Power supply		1 ~ 220-230V 50Hz	3N~ 380-400V 50Hz	3N~ 380-400V 50Hz
	Maximum current	A	13	13 (13A*2P)	13 (13A*3P)
Hot water cylinder heater*	Power supply		1 ~ 220-230V 50Hz		
	Maximum current	A	12.0		
Appearance	Color		Silky shade (Muncel 1Y8.5-0.5)		
	Material		PCM		
Outer dimension	Height	mm	925		
	Width	mm	525		
	Depth	mm	355		
Unit weight		kg	50		
Packing dimension	Height	mm	1070		
	Width	mm	608		
	Depth	mm	436		
Total weight	Unit and packing	kg	54		
Heat exchanger	Type		Brazed plate		
	Water volume	litres	0.67		
	Minimum flow rate	ℓ/min	13		
Water pump	Power input	W	48		
	Delivery head	m	6.3		
Expansion vessel	Volume	litres	12		
	Initial pressure	MPa(bar)	0.1 (1)		
Pressure relief valve	Operating pressure	MPa(bar)	0.3 (3)		
Sound pressure level		dBA	27		
Operation water temp.	Heating	°C	20~55		
	Cooling	°C	7~25		
Water pipe	Outlet	mm	34.92		
	Inlet	mm	34.92		
Refrigerant pipe	Gas	mm	15.9		
	Liquid	mm	9.5		
Drain port		mm	16.0 inner diameter for drain hose		
Note			* The electric heater, incorporated in the hot water cylinder, requires separete supply to hydro unit.		

Hydro unit			HWS-1404XWHM3-E	HWS-1404XWHT6-E	HWS-1404XWHT9-E
Back up heater	back up heater	kW	3	6	9
	Power supply		1 ~ 220-230V 50Hz	3N~ 380-400V 50Hz	3N~ 380-400V 50Hz
	Maximum current	A	13	13 (13A*2P)	13 (13A*3P)
Hot water cylinder heater*	Power supply		1 ~ 220-230V 50Hz		
	Maximum current	A	12.0		
Appearance	Color		Silky shade (Muncel 1Y8.5-0.5)		
	Material		PCM		
Outer dimension	Height	mm	925		
	Width	mm	525		
	Depth	mm	355		
Unit weight		kg	54		
Packing dimension	Height	mm	1070		
	Width	mm	608		
	Depth	mm	436		
Total weight	Unit and packing	kg	58		
Heat exchanger	Type		Brazed plate		
	Water volume	litres	1.18		
	Minimum flow rate	ℓ/min	17.5		
Water pump	Power input	W	87		
	Delivery head	m	8.8		
Expansion vessel	Volume	litres	12		
	Initial pressure	MPa(bar)	0.1 (1)		
Pressure relief valve	Operating pressure	MPa(bar)	0.3 (3)		
Sound pressure level		dBA	29		
Operation water temp.	Heating	°C	20~55		
	Cooling	°C	7~25		
Water pipe	Outlet	mm	34.92		
	Inlet	mm	34.92		
Refrigerant pipe	Gas	mm	15.9		
	Liquid	mm	9.5		
Drain port		mm	16.0 inner diameter for drain hose		
Note			* The electric heater, incorporated in the hot water cylinder, requires separete supply to hydro unit.		

4-1-2. Power Wiring specifications

Description		Model name HWS-	POWER SUPPLY	Maximum current	Installation fuse rating	Power Cable	Connection destination	
Outdoor unit power	Power input	1404H-E	220-230 V ~ 50 Hz	22.8A	25 A	2.5 mm² or more	Ⓛ, Ⓝ	—
		1104H-E	220-230 V ~ 50 Hz	22.8A	25 A	2.5 mm² or more		
		804H-E	220-230 V ~ 50 Hz	19.2A	20A	2.5 mm² or more		
		1604H8-E, 1604H8R-E	380-400V 3N~ 50Hz	14.6A	16A	2.5 mm² or more	Ⓛ1, Ⓛ2, Ⓛ3, Ⓝ	—
		1404H8-E, 1404H8R-E	380-400V 3N~ 50Hz	14.6A	16A	2.5 mm² or more		
		1104H8-E, 1104H8R-E	380-400V 3N~ 50Hz	14.6A	16A	2.5 mm² or more		
Hydro inlet heater power	Power input for backup heater	1404XWHM3-E	220-230V ~ 50Hz	13A	16A	1.5 mm² or more	Ⓛ, Ⓝ	TB02
		1404XWHT6-E	380-400V 3N~ 50Hz	13A(13A x 2P)	16A	1.5 mm² or more	Ⓛ1, Ⓛ2, Ⓛ3, Ⓝ	
		1404XWHT9-E	380-400V 3N~ 50Hz	13A(13A x 3P)	16A	1.5 mm² or more		
		804XWHM3-E	220-230V ~ 50Hz	13A	16A	1.5 mm² or more	Ⓛ, Ⓝ	
		804XWHT6-E	380-400V 3N~ 50Hz	13A(13A x 2P)	16A	1.5 mm² or more	Ⓛ1, Ⓛ2, Ⓛ3, Ⓝ	
		804XWHT9-E	380-400V 3N~ 50Hz	13A(13A x 3P)	16A	1.5 mm² or more		
	Power input for cylinder heater		220-230V ~ 50Hz	12A	16A	1.5 mm² or more	Ⓛ, Ⓝ	TB03
Outdoor-Hydro unit	Connection		—	—	—	1.5 mm² or more	①, ②, ③	TB01
Hydro -Cylinder	Connection		—	—	—	1.5 mm² or more	①, ②	TB03

4-1-3. External Device specifications

	Power	Maximum current	Type
Motorized 3-way valve (for hot water)	AC 230 V	100 mA	Spring return type Note: 3-wire SPST and SPDT type can be used by changing the DPSW 13-1.
Motorized 2-way valve (for cooling)	AC 230 V	100 mA	spring return type (normally open)
Motorized mixing valve type 1 (for 2-zone)	AC 230 V	100 mA	60 sec 90º. SPDT type Note: 3 wire SPST or SPDT valves, with drive times between 30 and 240 seconds, can be used. Valve drive time can be changed using function code 0C.

4-1-4. External Device Wiring specifications

Description	Line spec	Maximum current	Maximum length	Cable size	Connection destination
3-way valve control	2 line or 3 line	100 mA	12 m	1.0 mm² or more	⑦, ⑧, ⑨ (TB05)
2-way valve control	2 line	100 mA	12 m	1.0 mm² or more	③, ④ (TB05)
Mixing valve control	3 line	100 mA	12 m	1.0 mm² or more	①, ②, ③ or ②, ③, ④ (TB04)
2-zone thermo sensor	2 line	100 mA	5 m	1.0 mm² or more	Ⓒ, Ⓓ (TB06)
Cylinder thermo sensor	2+GND(shield wire)	100 mA	5 m	1.0 mm² or more	Ⓐ, Ⓑ (TB06)
Second remote controller	2 line	50 mA	50 m	0.5 mm² or more	①, ② (TB07)

4-1-5. External Output specifications

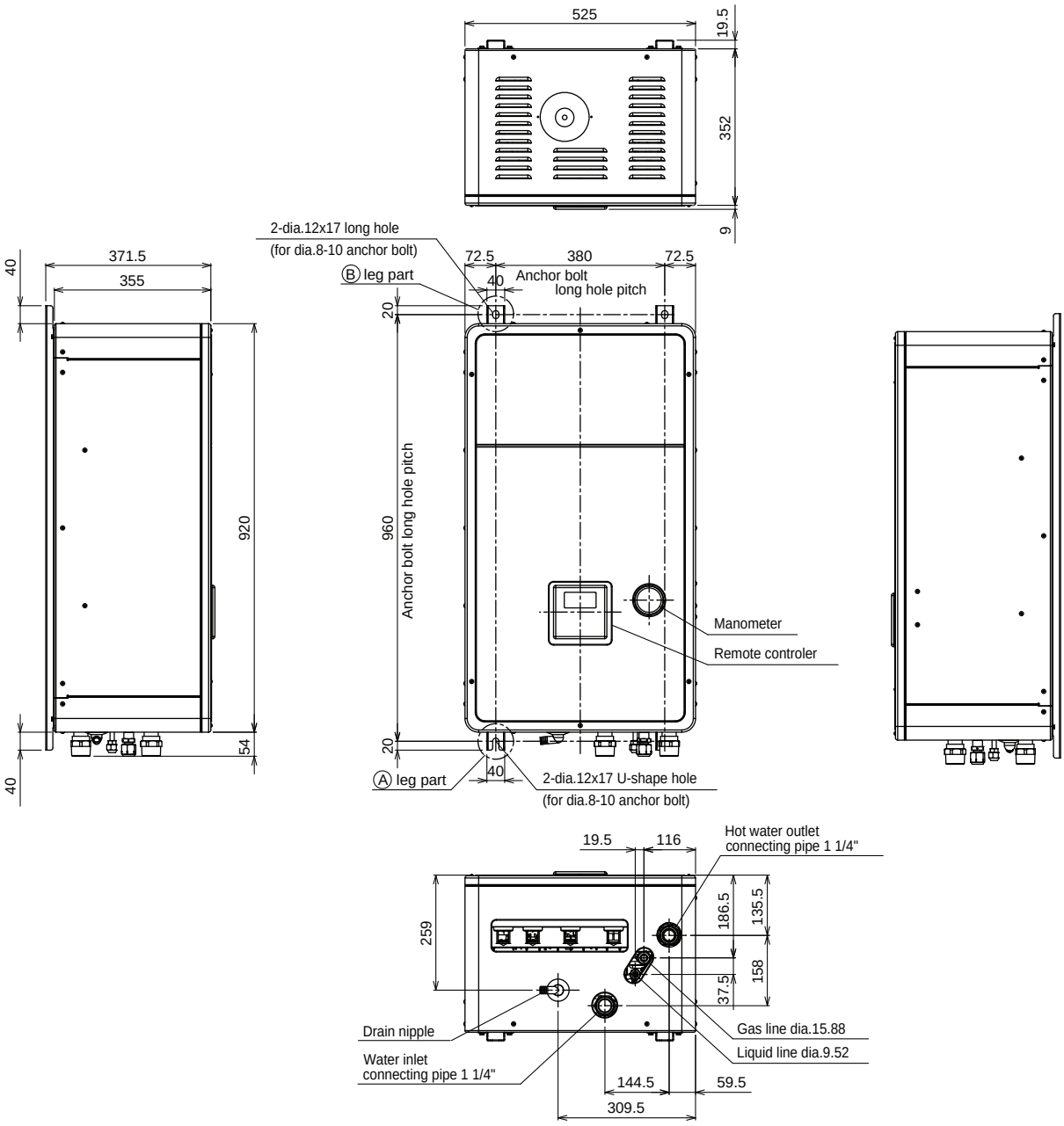
Description	Output	Maximum current	Max voltage	Maximum length	
External pump	AC230V	1 A	–	12 m	
External boost heater	AC230V	1 A	–	12 m	Output as required when outdoor air temperature is -20°C or less
Boiler control	Non-voltage contacts	0.5 A	AC230 V	12 m	Output as required when outdoor air temperature is -10°C or less (output trigger temperature can be changed using FC23)
		1 A	DC24 V	12 m	
ALARM Output	Non-voltage contacts	0.5 A	AC230 V	12 m	
		1 A	DC24 V	12 m	
Compressor Operation Output	Non-voltage contacts	0.5 A	AC230 V	12 m	
		1 A	DC24 V	12 m	
Defrost Output	Non-voltage contacts	0.5 A	AC230 V	12 m	
		1 A	DC24 V	12 m	

4-1-6. External Input specifications

Description	Input	Maximum length
Emergency stop control	Non-voltage	12 m
Cooling thermostat input	Non-voltage	12 m
Heating thermostat input	Non-voltage	12 m

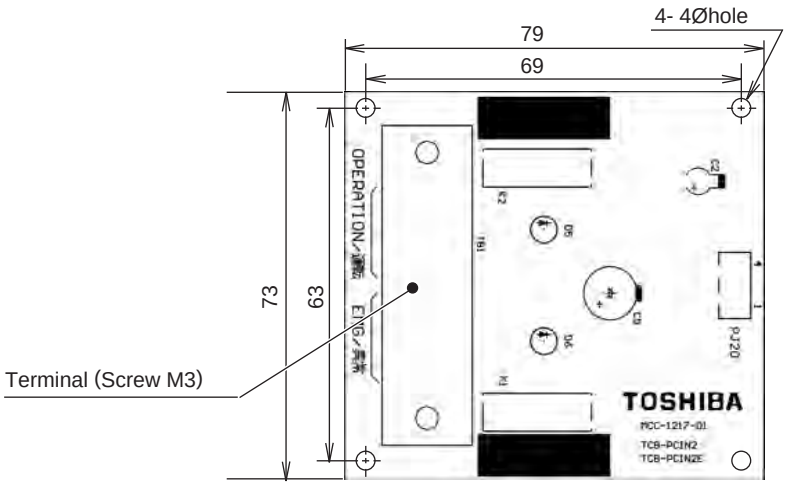
4-2. Dimension

▼Hydro unit



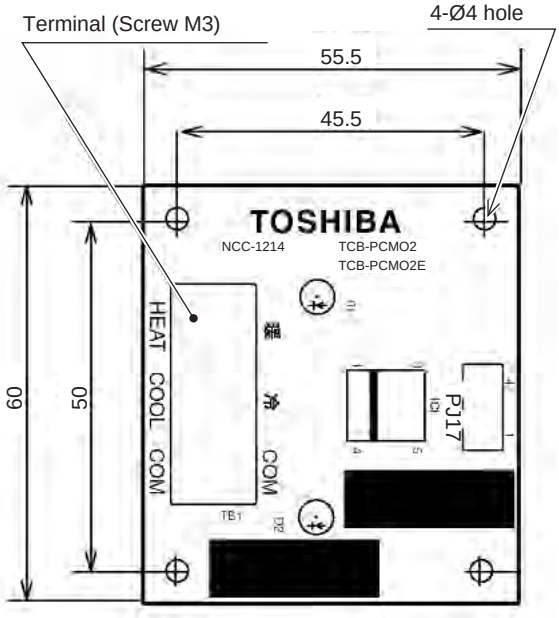
▼External output board (TCB-PCIN3E)

Size (mm) : H22 x L73 x W79
Weight (g) : 57



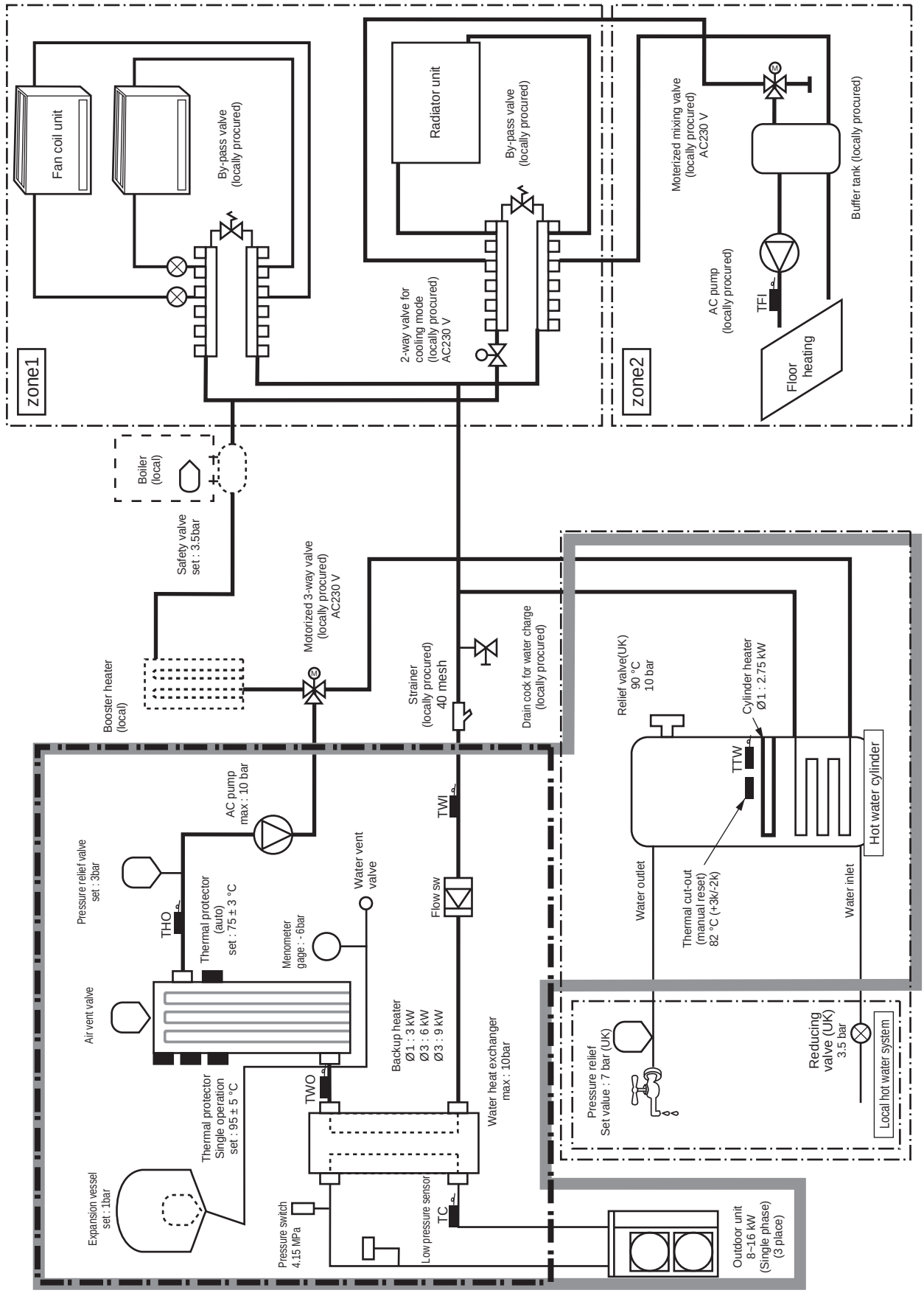
▼External input board (TCB-PCMO3E)

Size (mm) : H18 x L55.5 x W60
Weight (g) : 20

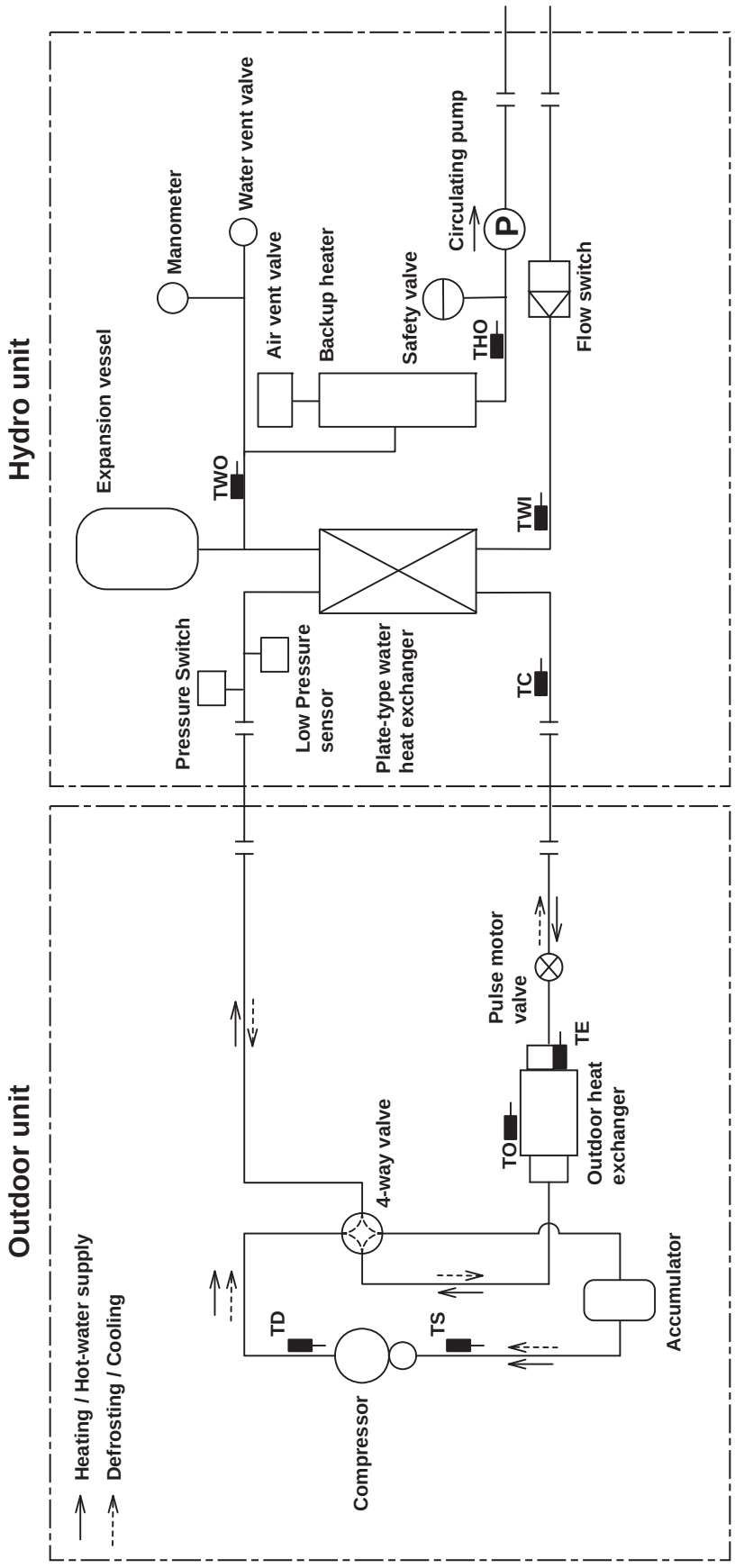


4-3. Piping Diagram

Water system diagram

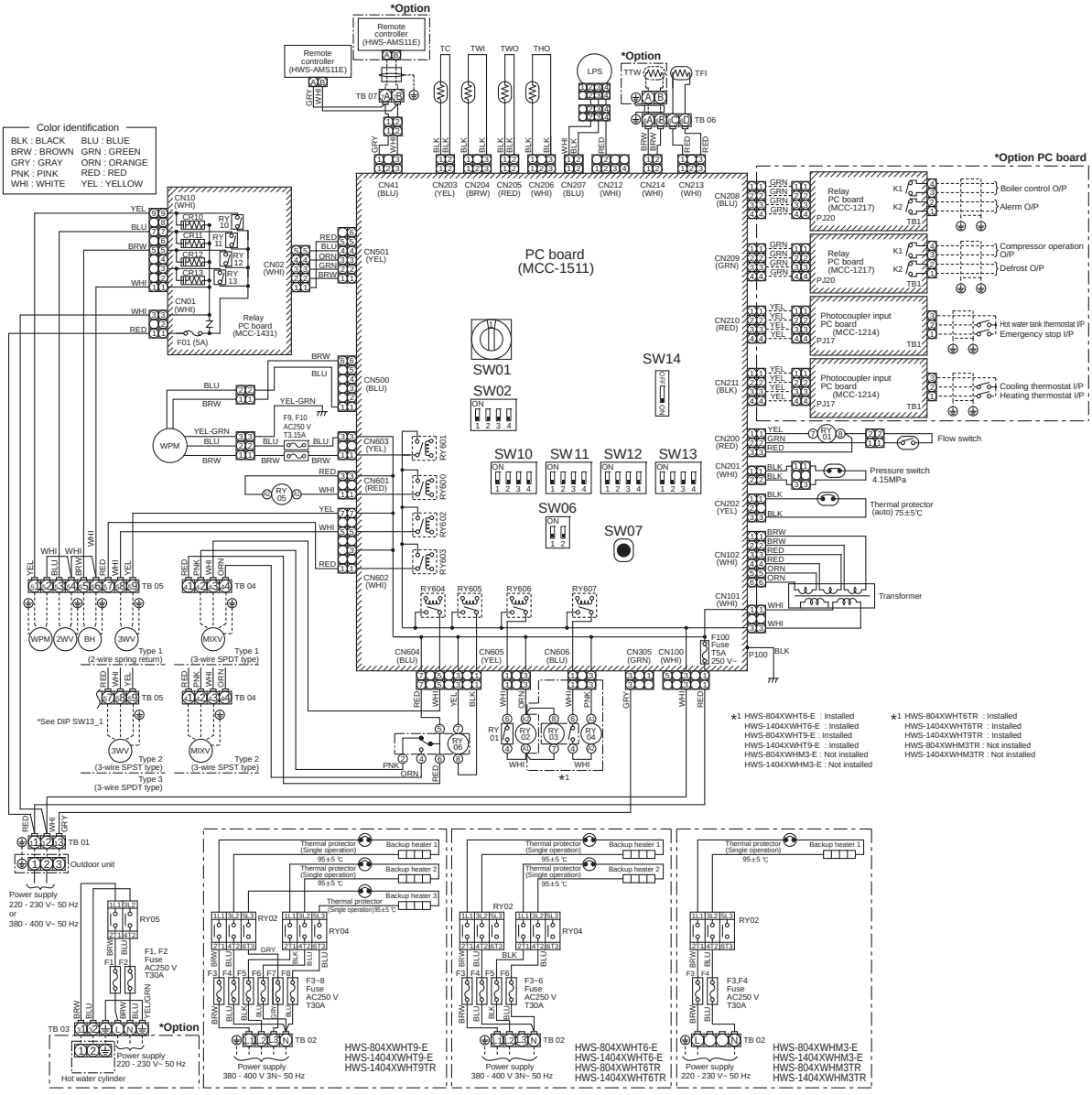


Refrigeration cycle system diagram



4-4. Wiring Diagram

4-4-1. Hydro unit



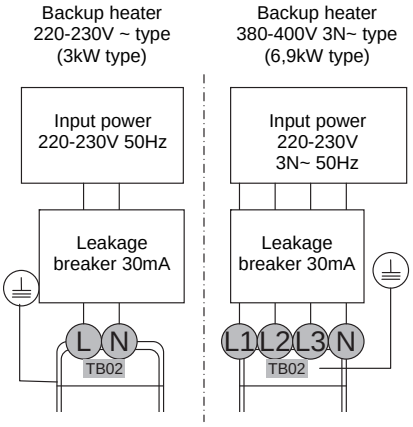
Symbol	Parts name	Symbol	Parts name
WPM	Water pump motor	TC	Water heat exchanger temperature sensor
3WV	3-way valve (locally procured)	TWI	Water inlet temperature sensor
2WV	2-way valve (locally procured)	TWO	Water outlet temperature sensor
MIXV	Mixing valve (locally procured)	THO	Heater outlet temperature sensor
BH	Booster heater	TTW	Hot water cylinder temperature sensor
RY01~RY06	Relay01~Relay06	TFI	Floor heating inlet temperature sensor
LPS	Low pressure sensor	TB	Terminal block
Backup heater1, 2, 3	Heater AC230V, 3kW		

1. The one-dot chain line indicates wiring at the local site, and the dashed line indicates accessories sold separately and service wires, respectively.
2. ○, and □ indicates the terminal board and the numberals indicate the terminal numbers.
3. ▨ indicates P.C. board.

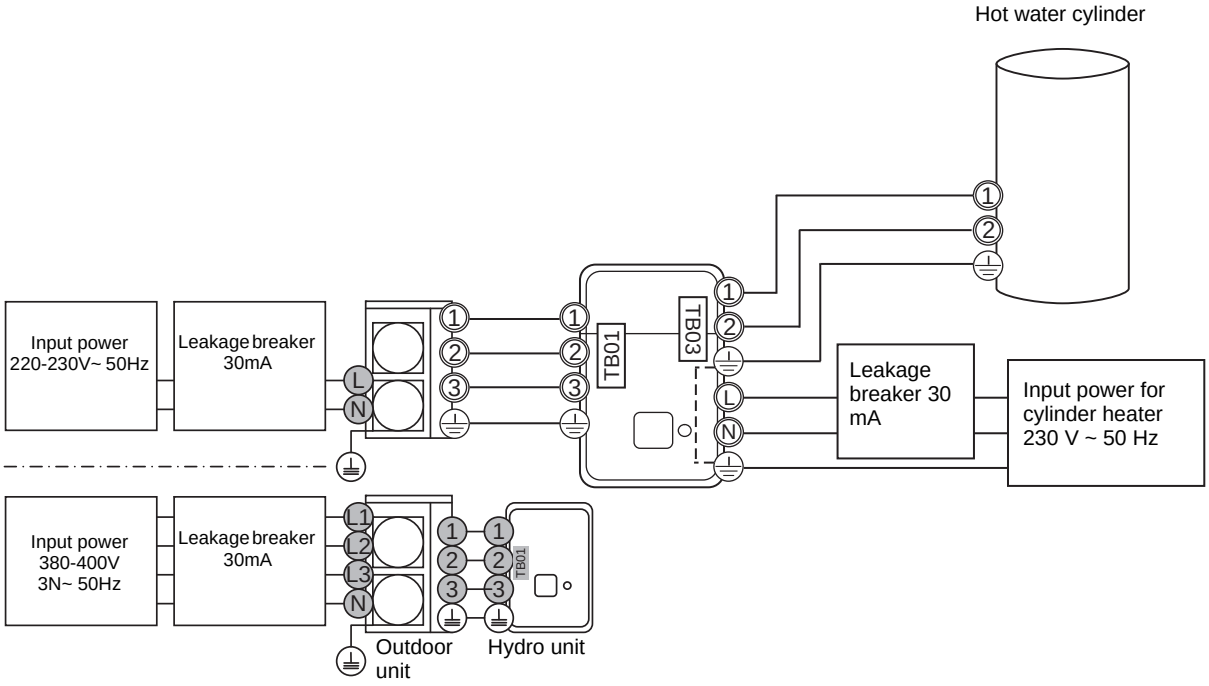
* Be sure to fix the electric parts cover surely with screws. (Otherwise water enters into the box resulting in malfunction.)

4-4-2. Power line

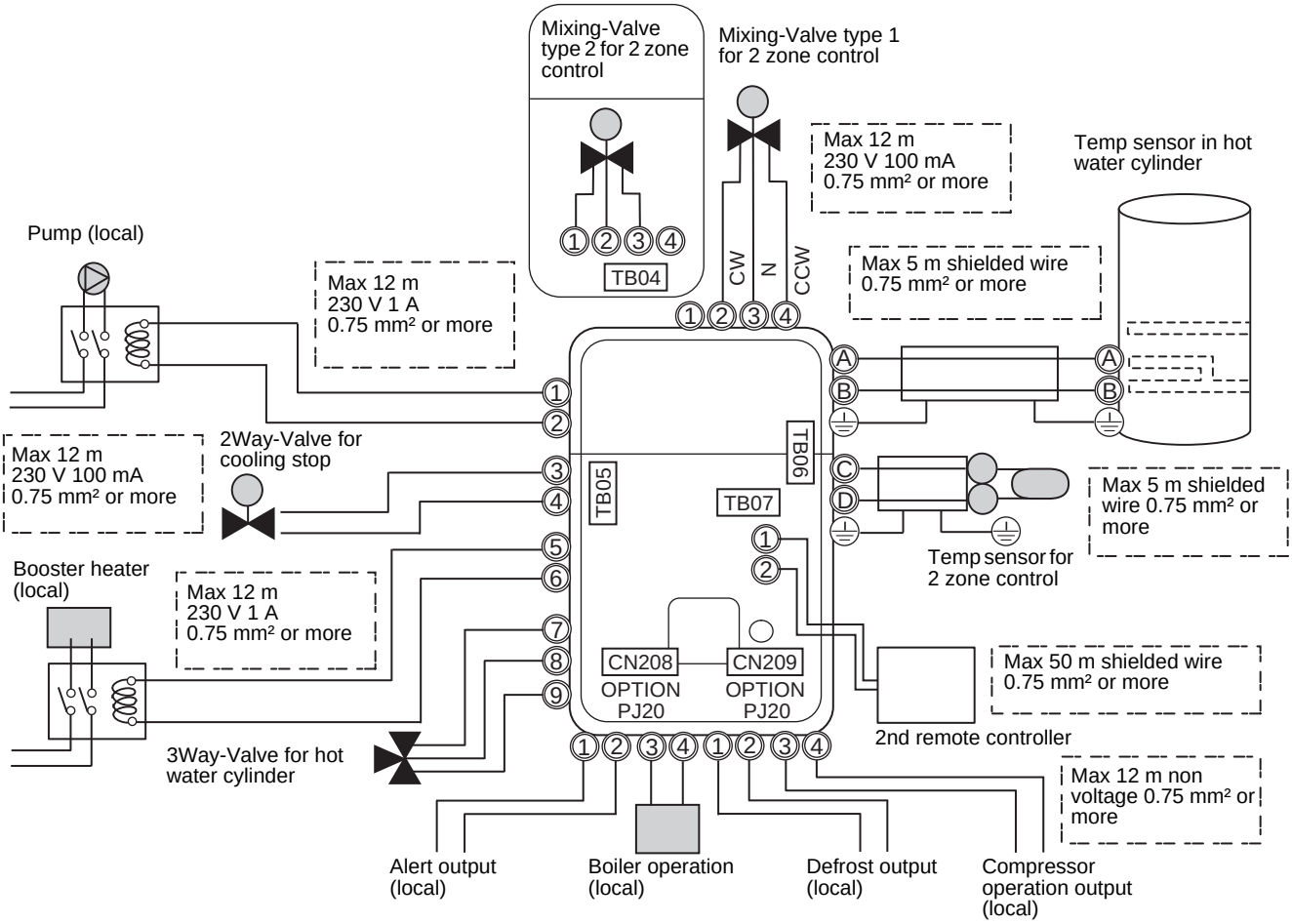
Electrical connection to hydro unit

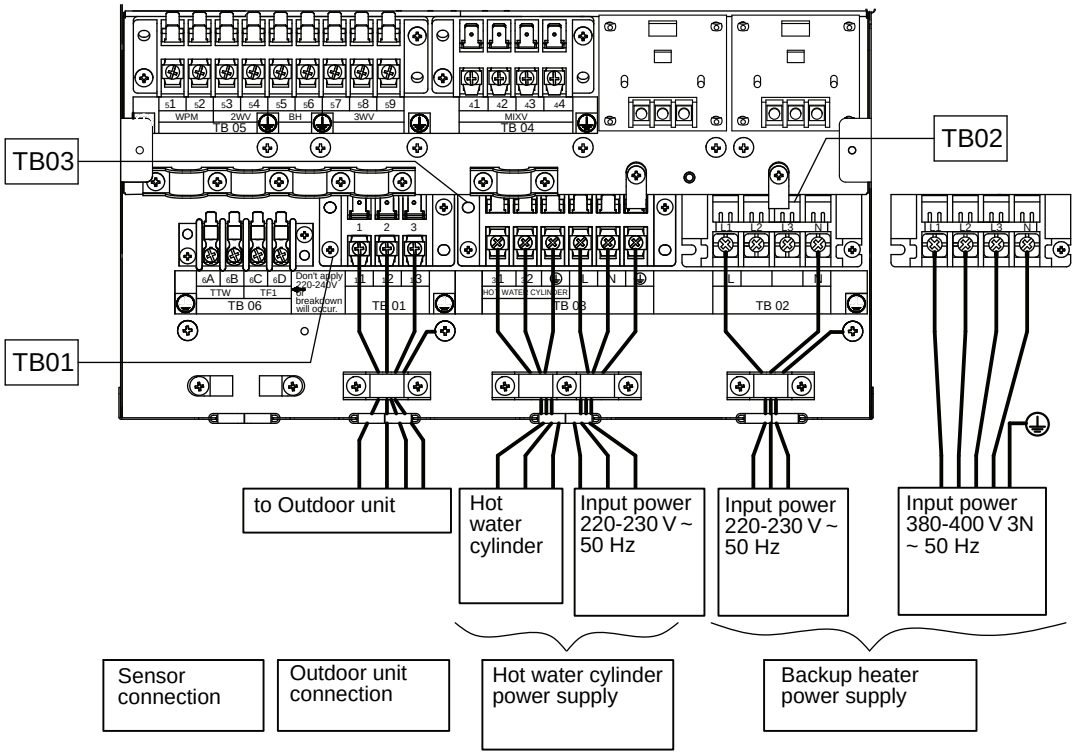


Outdoor unit to hydro unit electrical connection



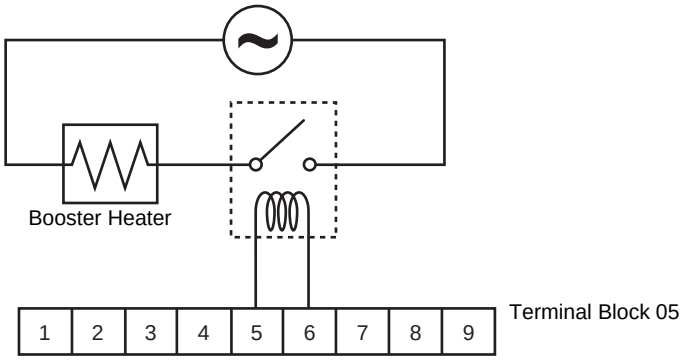
4-4-3. Control line



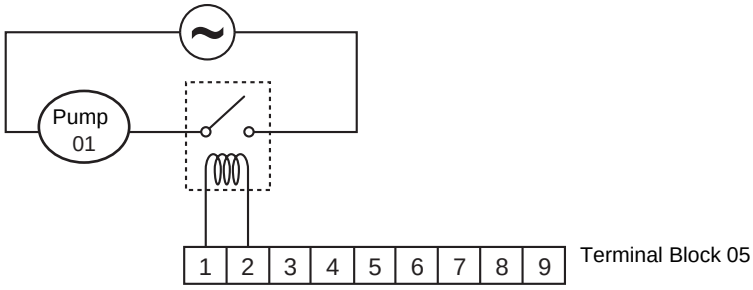


4-4-4. External Device

Electrical connection for external booster heater



Electrical connection for external additional pumps



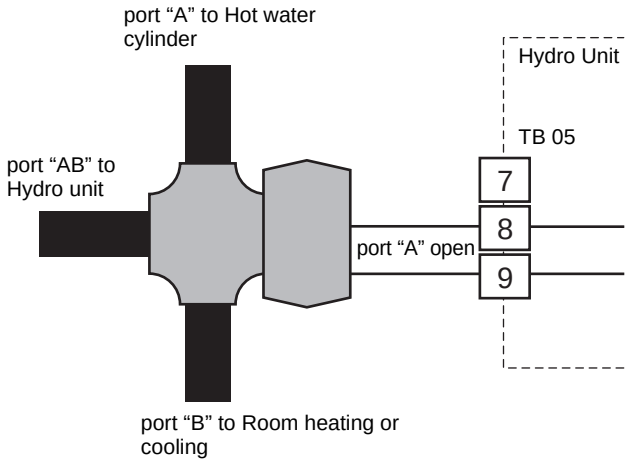
3-way valve (diverter) connection

Required Valve Specification:

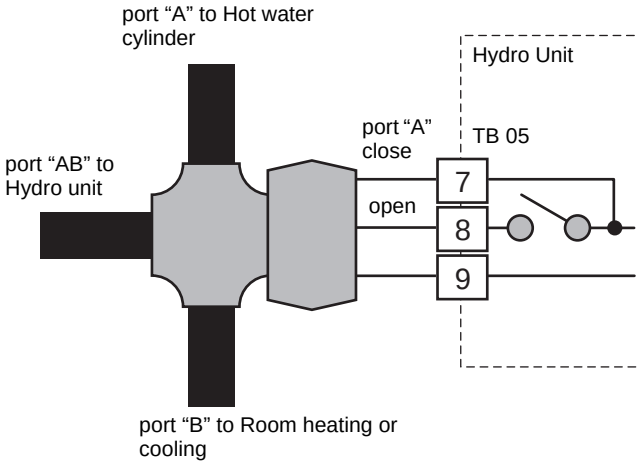
Electrical Specification: 230 V; 50 Hz; <100 mA
Valve Diameters: Port A, Port B: Ø 1 1/4"
Return Mechanism: 3 types of 3-way valve (diverter) can be used.
Set the 3-way valve in use with the DIP switch SW13-1 on the Hydro Unit board.

		SW13-1
Type 1	2-wire spring return	OFF
Type 2	3-wire SPST	OFF
Type 3	3-wire SPDT	ON

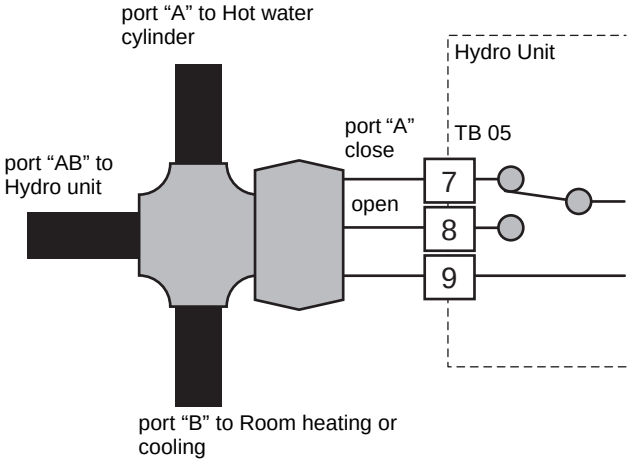
Type 1: SPRING RETURN



Type 2: SPST



Type 3: SPDT



3-way mixing valve connection

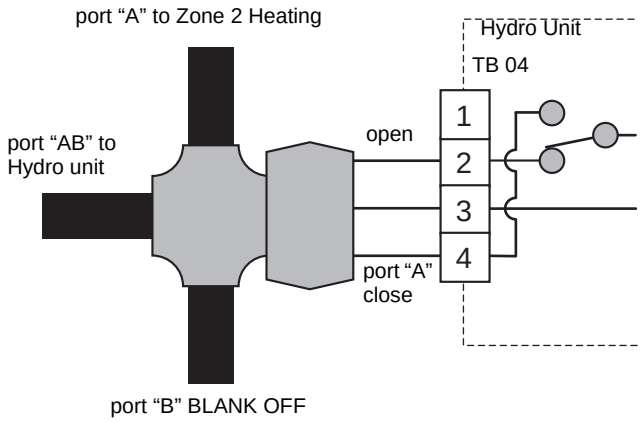
Required Actuator Specification

Electrical Specification:230 V; 50 Hz; <100 mA

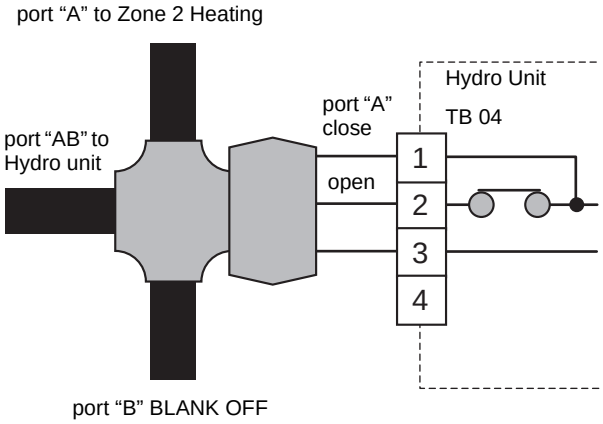
The 3-way mixing valve is used to achieve the temperature differential needed in a 2-zone heating system.

- Connect the 3-way mixing valve to terminals 2, 3 and 4 on Terminal Block 04 (for Type 1 mixing valve) or on terminals 1, 2 and 3 on Terminal Block 04 (for Type 2 mixing valve).
- Connect the 3-way mixing valve in accordance with the diagrams below:-

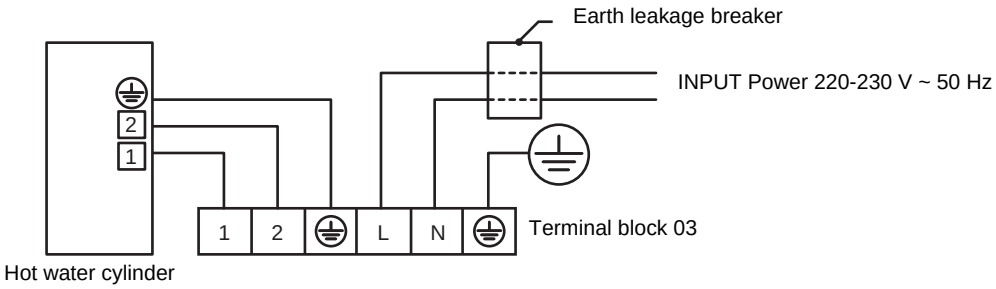
Type 1: SPDT



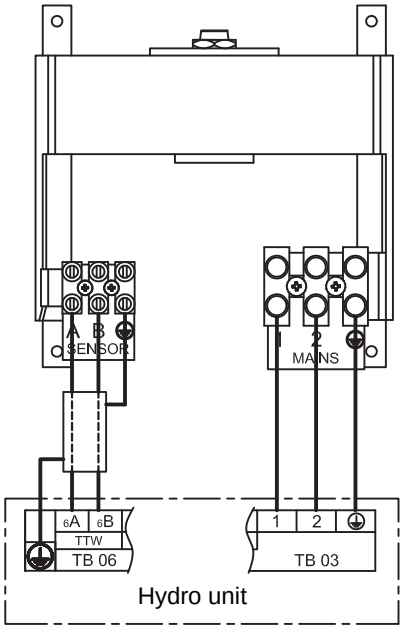
Type 2: SPST



Hot water cylinder connection (optional)



Hot water cylinder electrical box connections



4-5. Capacity Tables

▼Outdoor unit HWS-804H-E
Hydro unit HWS-804XWH**-E

Rated heating capacity and power input

Rated condition LWT=35°C dT=5deg	Capacity	kW	8.0
	Power input	kW	1.79
	COP	W/W	4.46
	Rated water flow rate	ℓ/min	22.9

* Rated heating capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Leaving water temperature - return water temperature

Average heating capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	3.71	3.61	3.57	—	—	—
	-15	4.40	4.28	4.23	4.13	—	—
	-7	5.15	5.00	4.91	4.82	4.73	—
	-2	5.88	5.76	5.69	5.63	5.56	5.43
	2	6.48	6.37	6.35	6.34	6.33	6.24
	7	8.75	8.52	8.32	8.13	7.93	7.70
	10	9.28	9.01	8.76	8.50	8.24	8.11
	12	9.81	9.52	9.25	8.99	8.72	8.67
	15	10.33	10.01	9.73	9.46	9.18	9.03
	20	11.73	11.32	11.03	10.75	10.46	10.22

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	1.42	1.52	1.76	—	—	—
	-15	1.49	1.60	1.85	2.12	—	—
	-7	1.73	1.85	2.15	2.45	2.75	—
	-2	1.76	1.89	2.20	2.51	2.82	3.10
	2	1.77	1.91	2.22	2.53	2.85	3.13
	7	1.82	2.01	2.21	2.42	2.62	2.81
	10	1.79	1.97	2.17	2.38	2.58	2.82
	12	1.78	1.96	2.16	2.36	2.56	2.83
	15	1.76	1.94	2.19	2.43	2.68	2.97
	20	1.75	1.93	2.17	2.42	2.66	3.00

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.61	2.37	2.03	—	—	—
	-15	2.95	2.68	2.29	1.95	—	—
	-7	2.98	2.70	2.28	1.97	1.72	—
	-2	3.35	3.04	2.59	2.24	1.97	1.75
	2	3.67	3.34	2.86	2.50	2.22	2.00
	7	4.81	4.24	3.76	3.36	3.03	2.74
	10	5.18	4.57	4.03	3.58	3.20	2.87
	12	5.50	4.85	4.28	3.80	3.40	3.06
	15	5.88	5.16	4.45	3.88	3.42	3.04
	20	6.71	5.87	5.08	4.45	3.93	3.41

* Heating capacity and power input are include defrost cycle data.
* Heating capacity and power input are shown at maximum compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Heating peak capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	3.88	3.78	3.74	—	—	—
	-15	4.59	4.47	4.41	4.31	—	—
	-7	5.89	5.74	5.65	5.55	5.29	—
	-2	6.81	6.60	6.48	6.35	6.23	5.84
	2	7.70	7.46	7.34	7.23	7.01	6.77
	7	8.75	8.52	8.32	8.13	7.93	7.70
	10	9.28	9.01	8.76	8.50	8.24	8.11
	12	9.81	9.52	9.25	8.99	8.72	8.67
	15	10.33	10.01	9.73	9.46	9.18	9.03
	20	11.73	11.32	11.03	10.75	10.46	10.22

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	1.44	1.55	1.89	—	—	—
	-15	1.53	1.65	2.01	2.28	—	—
	-7	1.55	1.68	2.04	2.41	2.56	—
	-2	1.57	1.71	2.06	2.42	2.62	2.74
	2	1.56	1.71	2.05	2.38	2.62	2.76
	7	1.82	2.01	2.21	2.42	2.62	2.81
	10	1.79	1.97	2.17	2.38	2.58	2.82
	12	1.78	1.96	2.16	2.36	2.56	2.83
	15	1.76	1.94	2.19	2.43	2.68	2.97
	20	1.75	1.93	2.17	2.42	2.66	3.00

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.68	2.44	1.98	—	—	—
	-15	3.00	2.71	2.20	1.89	—	—
	-7	3.79	3.41	2.76	2.30	2.07	—
	-2	4.34	3.86	3.15	2.63	2.38	2.13
	2	4.94	4.37	3.59	3.03	2.68	2.45
	7	4.81	4.24	3.76	3.36	3.03	2.74
	10	5.18	4.57	4.03	3.58	3.20	2.87
	12	5.50	4.85	4.28	3.80	3.40	3.06
	15	5.88	5.16	4.45	3.88	3.42	3.04
	20	6.71	5.87	5.08	4.45	3.93	3.41

* Heating capacity and power input are shown peak value during operation.
* Heating capacity and power input are shown at maximum compressor operating requency
* Power input does not include water pump power.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

▼Outdoor unit HWS-804H-E
Hydro unit HWS-804XWH**-E

Rated cooling capacity and power input

Rated condition LWT=7°C dT=5deg	Capacity	kW	6.0
	Power input	kW	1.94
	EER	W/W	3.10
	Rated water flow rate	ℓ/min	17.2

* Rated cooling capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Return water temperature - leaving water temperature

Cooling capacity and power input

Capacity (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	7.34	7.91	8.49	8.95	9.64
	27	7.18	7.74	8.30	8.75	9.43
	30	7.11	7.67	8.23	8.67	9.34
	35	7.00	7.55	8.10	8.53	9.19
	40	6.41	6.91	7.42	7.82	8.42
	43	5.39	5.75	6.13	6.43	6.85

Power input (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	1.65	1.68	1.71	1.73	1.77
	27	2.01	2.04	2.08	2.11	2.15
	30	2.16	2.20	2.24	2.27	2.32
	35	2.42	2.46	2.51	2.54	2.59
	40	2.62	2.66	2.71	2.74	2.80
	43	2.37	2.38	2.38	2.38	2.40

COP		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	4.45	4.71	4.97	5.17	5.46
	27	3.57	3.79	3.99	4.15	4.38
	30	3.29	3.48	3.67	3.82	4.03
	35	2.89	3.06	3.23	3.36	3.55
	40	2.45	2.60	2.74	2.85	3.01
	43	2.27	2.42	2.58	2.71	2.85

* Cooling capacity and power input are the data at rated compressor operating frequency of rated condition 1
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)

Heating capacity and input specifications

▼Outdoor unit HWS-1104H-E
Hydro unit HWS-1404XWH**-E

Rated heating capacity and power input

Rated condition LWT=35°C dT=5deg	Capacity	kW	11.2
	Power input	kW	2.30
	COP	W/W	4.88
	Rated water flow rate	ℓ/min	32.1

* Rated heating capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Leaving water temperature - return water temperature

Average heating capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	5.42	5.25	5.10	4.94	—	—
	-15	6.79	6.57	6.38	6.19	—	—
	-7	8.31	8.04	7.81	7.58	7.35	—
	-2	9.79	9.48	9.21	8.94	8.67	7.62
	2	10.44	10.10	9.81	9.53	9.24	8.12
	7	15.12	14.63	14.12	13.62	13.11	10.98
	10	16.03	15.51	14.97	14.43	13.89	11.64
	12	16.95	16.24	15.68	15.12	14.55	12.19
	15	18.30	17.20	16.13	15.07	14.00	11.72
	20	21.09	19.44	18.24	17.03	15.83	13.26

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.34	2.52	2.91	3.31	—	—
	-15	2.44	2.62	3.03	3.44	—	—
	-7	2.68	2.89	3.34	3.79	4.23	—
	-2	2.64	2.84	3.29	3.73	4.17	4.13
	2	2.60	2.80	3.24	3.67	4.11	4.07
	7	3.00	3.24	3.50	3.76	4.02	3.99
	10	2.99	3.22	3.48	3.74	4.00	3.96
	12	2.98	3.20	3.47	3.73	3.99	3.95
	15	2.93	3.16	3.33	3.50	3.67	3.64
	20	2.91	3.14	3.31	3.48	3.65	3.61

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.31	2.08	1.75	1.49	—	—
	-15	2.78	2.50	2.10	1.80	—	—
	-7	3.10	2.78	2.34	2.00	1.74	—
	-2	3.71	3.33	2.80	2.40	2.08	1.85
	2	4.01	3.60	3.03	2.59	2.25	1.99
	7	5.03	4.52	4.04	3.62	3.26	2.75
	10	5.37	4.82	4.31	3.86	3.48	2.94
	12	5.70	5.07	4.52	4.06	3.65	3.09
	15	6.24	5.45	4.85	4.31	3.82	3.22
	20	7.25	6.20	5.51	4.90	4.34	3.67

* Heating capacity and power input are include defrost cycle data.
* Heating capacity and power input are shown at maximum compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Heating peak capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	6.36	6.20	6.08	5.84	—	—
	-15	7.72	7.52	7.36	7.12	—	—
	-7	9.95	9.67	9.44	9.16	8.83	—
	-2	11.52	11.18	10.89	10.57	10.26	8.60
	2	12.84	12.42	12.07	11.72	11.38	9.53
	7	15.12	14.63	14.12	13.62	13.11	10.98
	10	16.03	15.51	14.97	14.43	13.89	11.64
	12	16.95	16.24	15.68	15.12	14.55	12.19
	15	18.30	17.20	16.13	15.07	14.00	11.72
	20	21.09	19.44	18.24	17.03	15.83	13.26

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.23	2.36	2.75	3.11	—	—
	-15	2.39	2.53	2.95	3.34	—	—
	-7	2.47	2.64	3.06	3.48	3.89	—
	-2	2.51	2.69	3.12	3.54	3.97	3.92
	2	2.51	2.71	3.13	3.56	3.98	3.95
	7	3.00	3.24	3.50	3.76	4.02	3.99
	10	2.99	3.22	3.48	3.74	4.00	3.96
	12	2.98	3.20	3.47	3.73	3.99	3.95
	15	2.93	3.16	3.33	3.50	3.67	3.64
	20	2.91	3.14	3.31	3.48	3.65	3.61

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.85	2.63	2.21	1.88	—	—
	-15	3.24	2.97	2.49	2.13	—	—
	-7	4.03	3.66	3.09	2.63	2.27	—
	-2	4.59	4.15	3.49	2.98	2.59	2.19
	2	5.11	4.59	3.86	3.29	2.86	2.42
	7	5.03	4.52	4.04	3.62	3.26	2.75
	10	5.37	4.82	4.31	3.86	3.48	2.94
	12	5.70	5.07	4.52	4.06	3.65	3.09
	15	6.24	5.45	4.85	4.31	3.82	3.22
	20	7.25	6.20	5.51	4.90	4.34	3.67

* Heating capacity and power input are shown peak value during operation
* Heating capacity and power input are shown at maximum compressor operating requency
* Power input does not include water pump power.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Cooling capacity and input specifications

▼Outdoor unit HWS-1104H-E
Hydro unit HWS-1404XWH**-E

Rated cooling capacity and power input

Rated condition 1 LWT=7°C dT=5deg	Capacity	kW	10.0
	Power input	kW	3.26
	EER	W/W	3.07
	Rated water flow rate	ℓ/min	28.9

* Rated cooling capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Return water temperature - leaving water temperature

Cooling capacity and power input

Capacity (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	11.14	12.04	12.95	13.67	14.75
	27	10.72	11.62	12.52	13.24	14.32
	30	10.54	11.44	12.34	13.05	14.13
	35	10.24	11.14	12.03	12.75	13.82
	40	9.18	9.98	10.78	11.42	12.38
	43	7.06	7.67	8.29	8.78	9.53

Power input (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	2.15	2.16	2.17	2.17	2.19
	27	2.68	2.71	2.74	2.76	2.79
	30	2.91	2.95	2.98	3.01	3.05
	35	3.29	3.34	3.39	3.43	3.49
	40	3.57	3.57	3.58	3.62	3.69
	43	3.06	3.05	3.05	3.07	3.10

COP		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	5.18	5.58	5.97	6.29	6.75
	27	4.00	4.29	4.57	4.80	5.12
	30	3.62	3.88	4.14	4.34	4.63
	35	3.11	3.33	3.55	3.72	3.96
	40	2.57	2.79	3.01	3.16	3.36
	43	2.30	2.51	2.72	2.86	3.07

* Cooling capacity and power input are the data at rated compressor operating frequency of rated condition 1
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)

Heating capacity and input specifications

▼Outdoor unit HWS-1404H-E
Hydro unit HWS-1404XWH**-E

Rated heating capacity and power input

Rated condition 1 LWT=35°C dT=5deg	Capacity	kW	14.0
	Power input	kW	3.11
	COP	W/W	4.50
	Rated water flow rate	ℓ/min	40.1

* Rated heating capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Leaving water temperature - return water temperature

Average heating capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	5.92	5.69	5.36	5.03	—	—
	-15	7.61	7.31	6.89	6.47	—	—
	-7	8.98	8.63	8.13	7.64	7.14	—
	-2	10.47	10.07	9.49	8.91	8.33	7.84
	2	11.08	10.65	10.04	9.43	8.81	8.30
	7	17.42	16.74	15.50	14.26	13.02	11.67
	10	18.29	17.58	16.28	14.97	13.67	12.26
	12	19.53	18.58	17.21	15.83	14.45	12.96
	15	20.96	19.56	17.68	15.80	13.92	12.48
	20	23.26	21.29	19.24	17.20	15.15	13.58

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.60	2.81	3.07	3.32	—	—
	-15	2.74	2.96	3.23	3.51	—	—
	-7	3.05	3.29	3.59	3.89	4.19	—
	-2	3.01	3.25	3.54	3.84	4.13	4.16
	2	2.96	3.20	3.49	3.78	4.07	4.10
	7	3.65	3.95	3.97	4.00	4.03	4.06
	10	3.66	3.95	3.97	4.00	4.03	4.06
	12	3.64	3.93	3.93	3.94	3.95	3.98
	15	3.62	3.90	3.89	3.88	3.87	3.89
	20	3.42	3.68	3.67	3.65	3.64	3.66

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.27	2.02	1.75	1.52	—	—
	-15	2.77	2.47	2.13	1.85	—	—
	-7	2.94	2.62	2.26	1.96	1.70	—
	-2	3.48	3.10	2.68	2.32	2.02	1.88
	2	3.74	3.33	2.88	2.49	2.16	2.02
	7	4.77	4.24	3.90	3.56	3.23	2.87
	10	5.00	4.45	4.09	3.74	3.39	3.02
	12	5.36	4.73	4.38	4.02	3.66	3.26
	15	5.79	5.01	4.54	4.07	3.60	3.21
	20	6.80	5.78	5.25	4.71	4.17	3.71

* Heating capacity and power input are include defrost cycle data.
* Heating capacity and power input are shown at maximum operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Heating peak capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	6.56	6.36	6.04	5.64	—	—
	-15	8.62	8.34	7.90	7.37	—	—
	-7	11.19	10.79	10.21	9.59	8.93	—
	-2	12.98	12.50	11.80	11.09	10.37	8.88
	2	14.14	13.59	12.81	12.02	11.26	9.63
	7	17.42	16.74	15.50	14.26	13.02	11.67
	10	18.29	17.58	16.28	14.97	13.67	12.26
	12	19.53	18.58	17.21	15.83	14.45	12.96
	15	20.96	19.56	17.68	15.80	13.92	12.48
	20	23.26	21.29	19.24	17.20	15.15	13.58

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.51	2.65	2.92	3.15	—	—
	-15	2.66	2.83	3.11	3.36	—	—
	-7	2.83	3.03	3.32	3.59	3.87	—
	-2	2.89	3.11	3.40	3.69	3.98	4.00
	2	2.89	3.11	3.40	3.68	3.98	4.01
	7	3.65	3.95	3.97	4.00	4.03	4.06
	10	3.66	3.95	3.97	4.00	4.03	4.06
	12	3.64	3.93	3.93	3.94	3.95	3.98
	15	3.62	3.90	3.89	3.88	3.87	3.89
	20	3.42	3.68	3.67	3.65	3.64	3.66

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.62	2.39	2.07	1.79	—	—
	-15	3.24	2.95	2.54	2.19	—	—
	-7	3.96	3.56	3.08	2.67	2.31	—
	-2	4.49	4.02	3.47	3.01	2.61	2.22
	2	4.89	4.36	3.77	3.27	2.83	2.40
	7	4.77	4.24	3.90	3.56	3.23	2.87
	10	5.00	4.45	4.09	3.74	3.39	3.02
	12	5.36	4.73	4.38	4.02	3.66	3.26
	15	5.79	5.01	4.54	4.07	3.60	3.21
	20	6.80	5.78	5.25	4.71	4.17	3.71

* Heating capacity and power input are shown peak value during operation
* Heating capacity and power input are shown at maximum compressor operating requency
* Power input does not include water pump power.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Cooling capacity and input specifications

▼Outdoor unit HWS-1404H-E
Hydro unit HWS-1404XWH**-E

Rated cooling capacity and power input

Rated condition 1 LWT=7°C dT=5deg	Capacity	kW	11.0
	Power input	kW	3.81
	EER	W/W	2.89
	Rated water flow rate	ℓ/min	31.5

* Rated cooling capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Return water temperature - Leaving water temperature

Cooling capacity and power input

Capacity (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	13.29	14.40	15.50	16.38	17.71
	27	12.59	13.55	14.52	15.29	16.45
	30	12.28	13.19	14.09	14.82	15.90
	35	11.78	12.59	13.39	14.03	15.00
	40	9.46	10.10	10.75	11.26	12.05
	43	7.29	7.79	8.28	8.69	8.90

Power input (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	2.88	2.88	2.88	2.88	2.88
	27	3.44	3.44	3.44	3.44	3.44
	30	3.67	3.67	3.67	3.67	3.67
	35	4.07	4.07	4.07	4.07	4.07
	40	3.83	3.76	3.70	3.71	3.68
	43	3.24	3.15	3.11	3.08	3.05

EER		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	4.61	5.00	5.38	5.69	6.15
	27	3.66	3.94	4.23	4.45	4.79
	30	3.34	3.59	3.84	4.03	4.33
	35	2.89	3.09	3.29	3.45	3.69
	40	2.47	2.69	2.90	3.04	3.27
	43	2.25	2.47	2.67	2.82	2.91

* Cooling capacity and power input are the data at rated compressor operating frequency of rated condition 1
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)

Heating capacity and input specifications

▼Outdoor unit HWS-1104H8-E, HWS-1104H8R-E
Hydro unit HWS-1404XWH**-E

Rated heating capacity and power input

Rated condition 1 LWT=35°C dT=5deg	Capacity	kW	11.2
	Power input	kW	2.34
	COP	W/W	4.80
	Rated water flow rate	ℓ/min	32.1

* Rated heating capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Leaving water temperature - return water temperature

Average heating capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	5.39	5.20	5.13	5.06	—	—
	-15	7.05	6.79	6.71	6.61	—	—
	-7	8.35	8.04	7.93	7.81	7.70	—
	-2	9.51	9.13	8.98	8.84	8.69	8.13
	2	11.15	10.46	10.13	9.81	9.48	8.86
	7	15.32	14.73	14.33	13.93	13.53	12.56
	10	16.36	15.73	15.37	15.02	14.66	13.85
	12	17.05	16.39	16.02	15.64	15.26	14.57
	15	17.90	17.21	16.76	16.30	15.85	15.03
	20	20.04	19.27	18.83	18.38	17.94	16.85

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.15	2.31	2.59	2.88	—	—
	-15	2.40	2.58	2.91	3.23	—	—
	-7	2.68	2.88	3.26	3.64	4.01	—
	-2	2.64	2.84	3.22	3.59	3.97	4.17
	2	2.70	2.90	3.24	3.59	3.93	4.13
	7	2.92	3.14	3.45	3.76	4.08	4.36
	10	2.92	3.14	3.46	3.79	4.12	4.43
	12	2.91	3.13	3.47	3.81	4.15	4.48
	15	2.90	3.11	3.47	3.82	4.17	4.48
	20	2.88	3.10	3.46	3.83	4.20	4.55

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.51	2.25	1.98	1.76	—	—
	-15	2.94	2.63	2.31	2.04	—	—
	-7	3.11	2.79	2.43	2.15	1.92	—
	-2	3.60	3.21	2.79	2.46	2.19	1.95
	2	4.13	3.61	3.12	2.73	2.41	2.14
	7	5.24	4.69	4.15	3.70	3.32	2.88
	10	5.61	5.02	4.44	3.96	3.56	3.13
	12	5.85	5.23	4.61	4.10	3.68	3.25
	15	6.18	5.53	4.83	4.27	3.80	3.36
	20	6.96	6.22	5.44	4.80	4.28	3.70

* Heating capacity and power input are include defrost cycle data.
* Heating capacity and power input are shown at maximum compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Heating peak capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	6.38	6.12	6.01	5.90	—	—
	-15	7.60	7.29	7.16	7.03	—	—
	-7	9.90	9.50	9.33	9.17	8.92	—
	-2	11.30	10.86	10.69	10.52	10.22	9.44
	2	12.99	12.49	12.13	11.78	11.26	10.40
	7	15.32	14.73	14.33	13.93	13.53	12.56
	10	16.36	15.73	15.37	15.02	14.66	13.85
	12	17.05	16.39	16.02	15.64	15.26	14.57
	15	17.90	17.21	16.76	16.30	15.85	15.03
	20	20.04	19.27	18.83	18.38	17.94	16.85

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	1.91	2.06	2.37	2.69	—	—
	-15	2.21	2.38	2.74	3.11	—	—
	-7	2.37	2.55	2.94	3.34	3.73	—
	-2	2.42	2.60	3.00	3.42	3.82	4.06
	2	2.54	2.74	3.12	3.52	3.90	4.14
	7	2.92	3.14	3.45	3.76	4.08	4.36
	10	2.92	3.14	3.46	3.79	4.12	4.43
	12	2.91	3.13	3.47	3.81	4.15	4.48
	15	2.90	3.11	3.47	3.82	4.17	4.48
	20	2.88	3.10	3.46	3.83	4.20	4.55

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	3.34	2.97	2.54	2.19	—	—
	-15	3.44	3.07	2.61	2.26	—	—
	-7	4.18	3.73	3.18	2.75	2.39	—
	-2	4.68	4.17	3.56	3.07	2.67	2.33
	2	5.12	4.56	3.89	3.35	2.89	2.51
	7	5.24	4.69	4.15	3.70	3.32	2.88
	10	5.61	5.02	4.44	3.96	3.56	3.13
	12	5.85	5.23	4.61	4.10	3.68	3.25
	15	6.18	5.53	4.83	4.27	3.80	3.36
	20	6.96	6.22	5.44	4.80	4.28	3.70

* Heating capacity and power input are shown peak value during operation.
* Heating capacity and power input are shown at maximum compressor operating requency
* Power input does not include water pump power.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Cooling capacity and input specifications

▼Outdoor unit HWS-1104H8-E, HWS-1104H8R-E
Hydro unit HWS-1404XWH**-E

Rated cooling capacity and power input

Rated condition 1 LWT=7°C dT=5deg	Capacity	kW	10.0
	Power input	kW	3.26
	EER	W/W	3.07
	Rated water flow rate	ℓ/min	28.9

* Rated cooling capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Return water temperature - leaving water temperature

Cooling capacity and power input

Capacity (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	11.15	11.95	12.75	13.38	14.34
	27	10.69	11.46	12.24	12.86	13.78
	30	10.49	11.25	12.02	12.63	13.55
	35	10.16	10.91	11.66	12.25	13.15
	40	9.39	10.09	10.78	11.33	12.01
	43	8.93	9.59	10.25	10.78	11.33

Power input (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	2.10	2.11	2.12	2.13	2.14
	27	2.60	2.62	2.65	2.67	2.70
	30	2.81	2.84	2.87	2.90	2.94
	35	3.17	3.21	3.25	3.29	3.34
	40	3.50	3.55	3.59	3.63	3.67
	43	3.70	3.75	3.80	3.84	3.87

COP		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	5.32	5.67	6.02	6.29	6.70
	27	4.12	4.37	4.62	4.82	5.11
	30	3.73	3.96	4.18	4.36	4.61
	35	3.21	3.40	3.58	3.73	3.94
	40	2.68	2.84	3.00	3.12	3.27
	43	2.41	2.56	2.70	2.81	2.93

* Cooling capacity and power input are the data at rated compressor operating frequency of rated condition 1
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)

Heating capacity and input specifications

▼Outdoor unit HWS-1404H8-E, HWS-1404H8R-E
Hydro unit HWS-1404XWH**-E

Rated heating capacity and power input

Rated condition 1 LWT=35°C dT=5deg	Capacity	kW	14.0
	Power input	kW	3.16
	COP	W/W	4.44
	Rated water flow rate	ℓ/min	40.1

* Rated heating capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Leaving water temperature - return water temperature

Average heating capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	5.79	5.59	5.48	5.36	—	—
	-15	7.58	7.30	7.15	7.00	—	—
	-7	8.98	8.64	8.46	8.27	8.09	—
	-2	10.22	9.81	9.59	9.36	9.13	8.53
	2	11.74	11.01	10.66	10.31	9.96	9.30
	7	16.35	15.77	15.42	15.07	14.72	13.64
	10	17.61	17.14	16.74	16.35	15.95	15.04
	12	18.37	17.86	17.50	17.14	16.77	15.81
	15	19.39	18.86	18.31	17.77	17.22	17.21
	20	21.41	20.90	20.37	19.83	19.30	18.75

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.39	2.51	2.81	3.11	—	—
	-15	2.66	2.80	3.15	3.49	—	—
	-7	2.97	3.14	3.53	3.93	4.32	—
	-2	2.92	3.09	3.48	3.88	4.27	4.49
	2	3.03	3.21	3.55	3.89	4.23	4.45
	7	3.29	3.55	3.89	4.24	4.58	4.86
	10	3.29	3.55	3.91	4.27	4.63	4.93
	12	3.29	3.55	3.91	4.29	4.67	4.98
	15	3.31	3.55	3.93	4.31	4.68	5.09
	20	3.34	3.58	3.97	4.36	4.75	5.18

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.42	2.23	1.95	1.73	—	—
	-15	2.84	2.60	2.27	2.00	—	—
	-7	3.02	2.76	2.39	2.11	1.87	—
	-2	3.50	3.18	2.75	2.41	2.14	1.90
	2	3.88	3.44	3.00	2.65	2.35	2.09
	7	4.98	4.44	3.96	3.56	3.21	2.81
	10	5.36	4.83	4.29	3.83	3.44	3.05
	12	5.59	5.03	4.47	3.99	3.59	3.17
	15	5.86	5.31	4.66	4.13	3.68	3.38
	20	6.41	5.83	5.13	4.55	4.06	3.62

* Heating capacity and power input are include defrost cycle data.
* Heating capacity and power input are shown at maximum compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Heating peak capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	7.15	6.85	6.68	6.50	—	—
	-15	8.51	8.16	7.96	7.75	—	—
	-7	11.08	10.64	10.38	10.12	9.76	—
	-2	12.66	12.16	11.88	11.61	11.19	10.33
	2	14.25	13.70	13.30	12.90	12.33	11.39
	7	16.35	15.77	15.42	15.07	14.72	13.64
	10	17.61	17.14	16.74	16.35	15.95	15.04
	12	18.37	17.86	17.50	17.14	16.77	15.81
	15	19.39	18.86	18.31	17.77	17.22	17.21
	20	21.41	20.90	20.37	19.83	19.30	18.75

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.24	2.41	2.76	3.13	—	—
	-15	2.59	2.78	3.19	3.62	—	—
	-7	2.77	2.98	3.42	3.88	4.32	—
	-2	2.83	3.05	3.50	3.98	4.43	4.71
	2	3.01	3.25	3.67	4.11	4.52	4.80
	7	3.29	3.55	3.89	4.24	4.58	4.86
	10	3.29	3.55	3.91	4.27	4.63	4.93
	12	3.29	3.55	3.91	4.29	4.67	4.98
	15	3.31	3.55	3.93	4.31	4.68	5.09
	20	3.34	3.58	3.97	4.36	4.75	5.18

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	3.19	2.85	2.42	—	—	—
	-15	3.29	2.94	2.49	2.14	—	—
	-7	4.00	3.57	3.03	2.61	2.26	—
	-2	4.48	3.99	3.39	2.92	2.53	2.20
	2	4.73	4.21	3.62	3.14	2.73	2.37
	7	4.98	4.44	3.96	3.56	3.21	2.81
	10	5.36	4.83	4.29	3.83	3.44	3.05
	12	5.59	5.03	4.47	4.00	3.59	3.17
	15	5.86	5.31	4.66	4.13	3.68	3.38
	20	6.41	5.83	5.13	4.55	4.06	3.62

* Heating capacity and power input are shown peak value during operation
* Heating capacity and power input are shown at maximum compressor operating requency
* Power input does not include water pump power.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Cooling capacity and input specifications

▼Outdoor unit HWS-1404H8-E, HWS-1404H8R-E
Hydro unit HWS-1404XWH**-E

Rated cooling capacity and power input

Rated condition 1 LWT=7°C dT=5deg	Capacity	kW	11.0
	Power input	kW	3.81
	EER	W/W	2.89
	Rated water flow rate	ℓ/min	31.5

* Rated cooling capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Return water temperature - leaving water temperature

Cooling capacity and power input

Capacity (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	13.27	14.18	15.10	15.83	16.92
	27	12.69	13.57	14.46	15.17	16.23
	30	12.44	13.31	14.19	14.88	15.93
	35	12.02	12.88	13.73	14.41	15.44
	40	11.27	12.07	12.87	13.38	14.18
	43	10.82	11.59	12.36	12.75	13.43

Power input (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	2.82	2.82	2.82	2.82	2.82
	27	3.43	3.46	3.49	3.52	3.55
	30	3.70	3.74	3.78	3.82	3.87
	35	4.13	4.20	4.26	4.31	4.39
	40	4.58	4.65	4.72	4.75	4.80
	43	4.84	4.92	5.00	5.00	5.04

COP		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	4.70	5.02	5.35	5.61	6.00
	27	3.69	3.92	4.14	4.31	4.57
	30	3.37	3.56	3.75	3.90	4.12
	35	2.91	3.07	3.22	3.34	3.52
	40	2.46	2.60	2.73	2.82	2.96
	43	2.23	2.35	2.47	2.55	2.67

* Cooling capacity and power input are the data at rated compressor operating frequency of rated condition 1
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)

Heating capacity and input specifications

▼Outdoor unit HWS-1604H8-E, HWS-1604H8R-E
Hydro unit HWS-1404XWH**-E

Rated heating capacity and power input

Rated condition 1 LWT=35°C dT=5deg	Capacity	kW	16.0
	Power input	kW	3.72
	COP	W/W	4.30
	Rated water flow rate	ℓ/min	45.8

* Rated heating capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Leaving water temperature - return water temperature

Average heating capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	6.07	5.85	5.72	5.58	—	—
	-15	7.94	7.65	7.47	7.28	—	—
	-7	9.40	9.05	8.83	8.61	8.39	—
	-2	10.71	10.28	10.01	9.74	9.47	8.85
	2	12.38	11.61	11.18	10.76	10.33	9.65
	7	17.43	16.76	16.26	15.77	15.28	14.12
	10	18.63	17.92	17.47	17.01	16.56	15.57
	12	19.41	18.68	18.23	17.78	17.32	16.53
	15	20.63	19.82	19.30	18.78	18.27	17.23
	20	23.10	22.08	21.54	21.01	20.47	19.13

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.59	2.72	3.02	3.32	—	—
	-15	2.88	3.03	3.39	3.73	—	—
	-7	3.21	3.39	3.79	4.20	4.60	—
	-2	3.16	3.34	3.74	4.15	4.55	4.78
	2	3.27	3.46	3.81	4.16	4.51	4.74
	7	3.61	3.89	4.24	4.58	4.93	5.22
	10	3.61	3.89	4.25	4.62	4.98	5.30
	12	3.61	3.89	4.26	4.64	5.02	5.35
	15	3.63	3.90	4.30	4.70	5.10	5.46
	20	3.66	3.93	4.34	4.76	5.17	5.55

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.35	2.15	1.89	1.68	—	—
	-15	2.75	2.52	2.21	1.95	—	—
	-7	2.93	2.67	2.33	2.05	1.82	—
	-2	3.39	3.08	2.67	2.35	2.08	1.85
	2	3.79	3.36	2.94	2.59	2.29	2.04
	7	4.83	4.30	3.84	3.44	3.10	2.70
	10	5.17	4.61	4.11	3.69	3.32	2.94
	12	5.38	4.80	4.28	3.83	3.45	3.09
	15	5.69	5.09	4.49	4.00	3.58	3.16
	20	6.31	5.62	4.96	4.42	3.96	3.45

* Heating capacity and power input are include defrost cycle data.
* Heating capacity and power input are shown at maximum operating frequency
* Power input does not include water pump power.
* Heating capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Heating peak capacity and power input

Capacity (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	7.56	7.25	7.04	6.84	—	—
	-15	9.00	8.63	8.39	8.15	—	—
	-7	11.73	11.25	10.94	10.64	10.22	—
	-2	13.39	12.87	12.53	12.20	11.72	10.82
	2	15.17	14.59	14.09	13.60	12.91	11.93
	7	17.43	16.76	16.26	15.77	15.28	14.12
	10	18.63	17.92	17.47	17.01	16.56	15.57
	12	19.41	18.68	18.23	17.78	17.32	16.53
	15	20.63	19.82	19.30	18.78	18.27	17.23
	20	23.10	22.08	21.54	21.01	20.47	19.13

Power input (kW)		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	2.45	2.63	3.00	3.38	—	—
	-15	2.83	3.04	3.46	3.91	—	—
	-7	3.03	3.26	3.71	4.19	4.64	—
	-2	3.09	3.33	3.80	4.29	4.76	5.06
	2	3.28	3.54	3.98	4.43	4.86	5.16
	7	3.61	3.89	4.24	4.58	4.93	5.22
	10	3.61	3.89	4.25	4.61	4.98	5.30
	12	3.61	3.89	4.26	4.64	5.02	5.35
	15	3.63	3.90	4.30	4.70	5.10	5.46
	20	3.66	3.93	4.34	4.76	5.17	5.55

COP		LWT (°C)					
		30	35	40	45	50	55
TO (°C)	-20	3.09	2.76	2.35	2.02	—	—
	-15	3.19	2.84	2.42	2.09	—	—
	-7	3.87	3.46	2.95	2.54	2.20	—
	-2	4.34	3.87	3.30	2.84	2.46	2.14
	2	4.62	4.12	3.54	3.07	2.66	2.31
	7	4.83	4.30	3.84	3.44	3.10	2.70
	10	5.17	4.61	4.11	3.69	3.33	2.94
	12	5.38	4.81	4.28	3.83	3.45	3.09
	15	5.69	5.09	4.49	4.00	3.58	3.16
	20	6.31	5.62	4.96	4.42	3.96	3.45

* Heating capacity and power input are shown peak value during operation
* Heating capacity and power input are shown at maximum compressor operating requency
* Power input does not include water pump power.

TO : Outdoor temperature (DB°C) RH85%
LWT : Leaving water temperature (°C)

Cooling capacity and input specifications

▼Outdoor unit HWS-1604H8-E, HWS-1604H8R-E
Hydro unit HWS-1404XWH**-E

Rated cooling capacity and power input

Rated condition 1 LWT=7°C dT=5deg	Capacity	kW	13.0
	Power input	kW	4.80
	EER	W/W	2.71
	Rated water flow rate	ℓ/min	37.3

* Rated cooling capacity and power input are the data at rated compressor operating frequency
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)
dT : Delta temperature (deg)
Return water temperature - Leaving water temperature

Cooling capacity and power input

Capacity (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	14.39	15.37	16.34	17.12	18.29
	27	13.67	14.60	15.54	16.28	17.40
	30	13.36	14.27	15.19	15.92	17.02
	35	12.84	13.73	14.62	15.33	16.39
	40	11.53	12.32	13.29	14.12	14.92
	43	10.72	11.53	12.49	13.33	14.24

Power input (kW)		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	3.25	3.26	3.27	3.28	3.29
	27	3.89	3.94	3.99	4.02	4.08
	30	4.17	4.23	4.29	4.34	4.42
	35	4.63	4.72	4.81	4.88	4.98
	40	4.95	5.05	5.15	5.24	5.35
	43	5.16	5.28	5.42	5.51	5.68

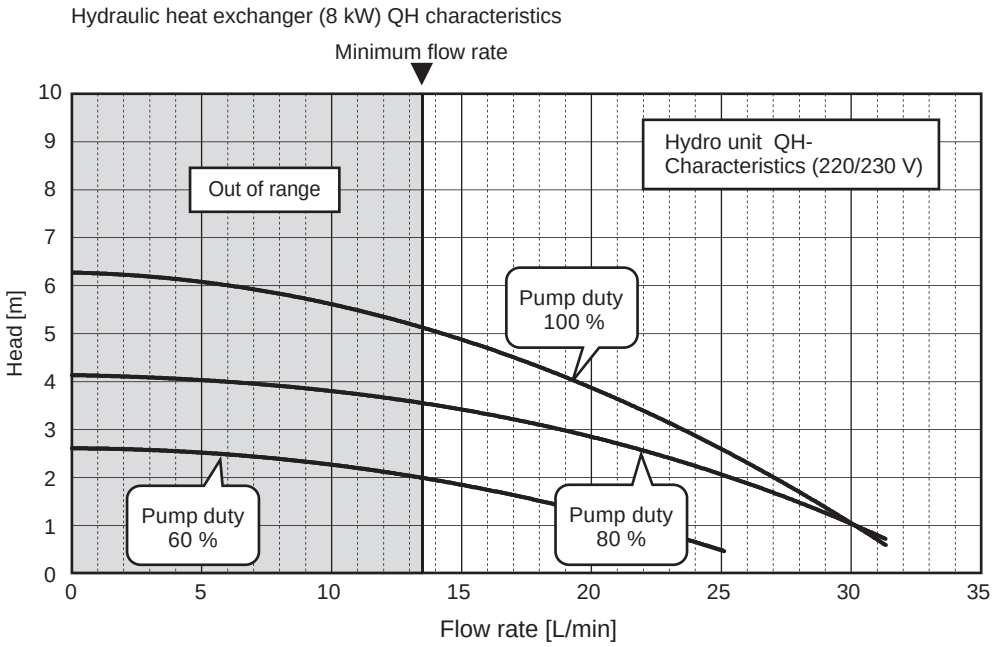
EER		LWT (°C)				
		7	10	13	15	18
TO (°C)	20	4.43	4.71	5.00	5.22	5.56
	27	3.51	3.71	3.90	4.05	4.27
	30	3.20	3.37	3.54	3.67	3.85
	35	2.78	2.91	3.04	3.14	3.29
	40	2.33	2.44	2.58	2.69	2.79
	43	2.08	2.18	2.31	2.42	2.50

* Cooling capacity and power input are the data at rated compressor operating frequency of rated condition 1
* Power input does not include water pump power.
* Cooling capacity and power input are measured in accordance with EN14511.

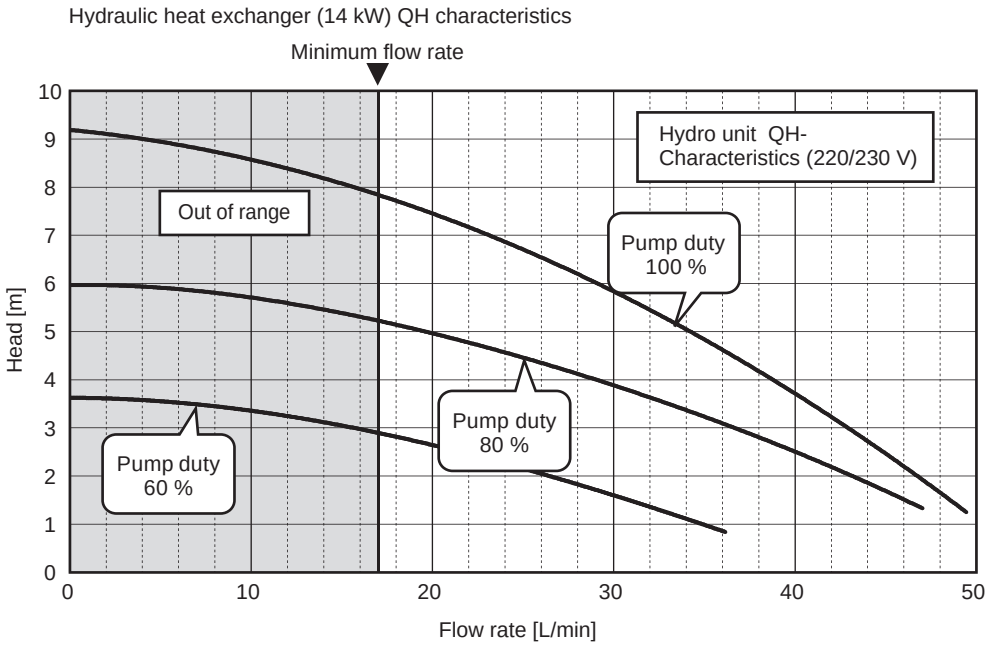
TO : Outdoor temperature (DB°C)
LWT : Leaving water temperature (°C)

4-6. Q-H characteristics of hydro unit

4-6-1. HWS-804XWHM3-E, T6-E, T9-E



4-6-2. HWS-1404XWHM3-E, T6-E, T9-E



4-7. Options

Optional parts

No.	Part name	Model name	Application	Remarks
1	External output board	TCB-PCIN3E	Boiler-linked output, Alarm output	Up to two boards (according to applications)
			Defrost signal output, Compressure operation signal output	
2	External input board	TCB-PCMO3E	Cooling/heating thermostat input	Up to two boards (according to applications)
			Forced-stop signal input	

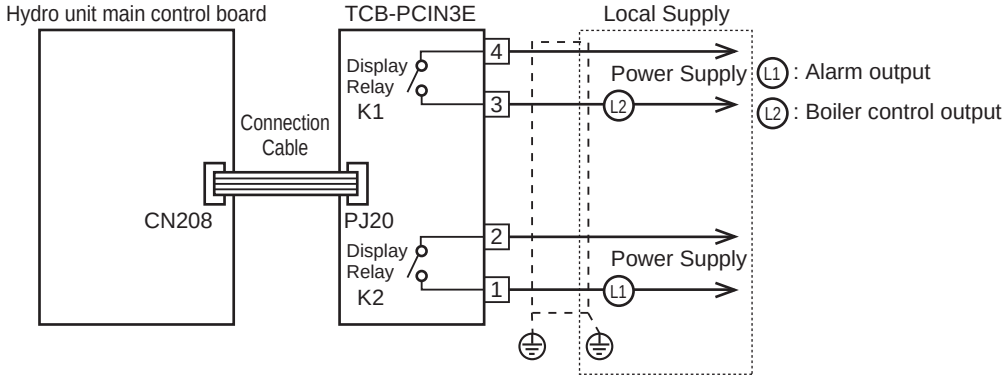
▼External output board

Feature

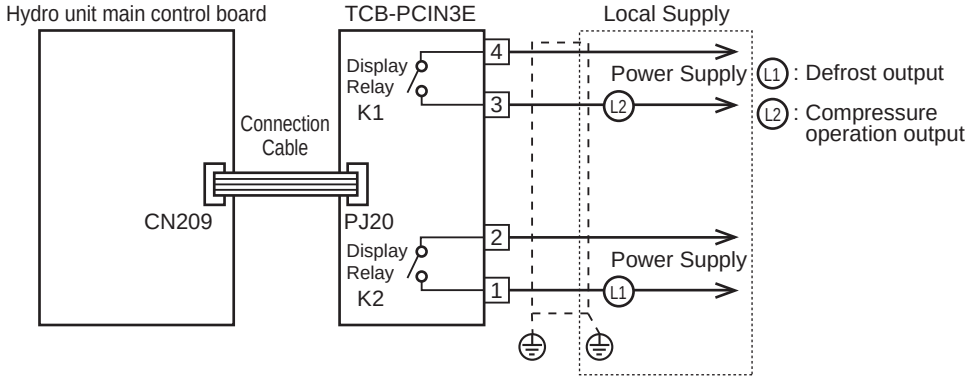
Operation and Error monitoring is possible by using Error output control board “TCB-PCIN3E“

Function / Electric wiring diagram

Alarm output : Output enabled when the system is in alarm / fault condition.
Boiler control output : Output enabled when outdoor ambient temperature <-10 °C



Operation output : Display relay is ON with outdoor unit compressor operation.
Defrost output : Display relay is ON when the system in defrost.



⚠ CAUTION

- Be sure to prepare a non-voltage point for each terminal.
- Display Relay capacity of "ALERM" and "BOILER", "OPERATION" and "DEFROST"
  Below AC230V 0.5A (COS Ø =100%). when connecting load such as relay coil to "L1,L2" load, insert the noise surge absorber.
  Below DC24V 1A (Non-inductive load). when connecting load such as relay coil to "L1,L2" load, insert the bypass circuit.

▼External input board

Feature

* “TCB-PCMO3E“ is used for the following external master controls.

1. Room thermostat input
2. Emergency shutdown input

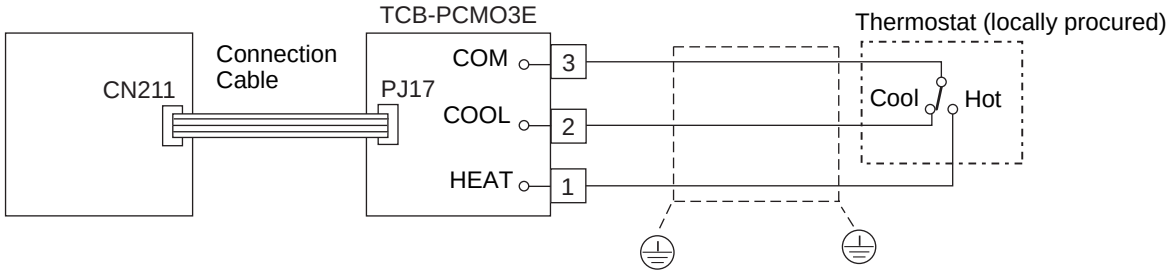
Refer to “Function/Electric wiring diagram“ for feature of each control because connection is different according to the control.

Function / Electric wiring diagram

Room thermostat input

2-3 : Room thermostat input for cooling mode
1-3 : Room thermostat input for heating mode

- Output enabled when either heating or cooling mode selected on room thermostat. (locally procured)
- Volt free details :
- Connection details :
  Cooling connection :Terminals 3 (COM) and 2 (COOL) on TCB-PCMO3E (See Schematic below)
  Heating connection :Terminals 3 (COM) and 1 (HEAT) on TCB-PCMO3E (See Schematic below)



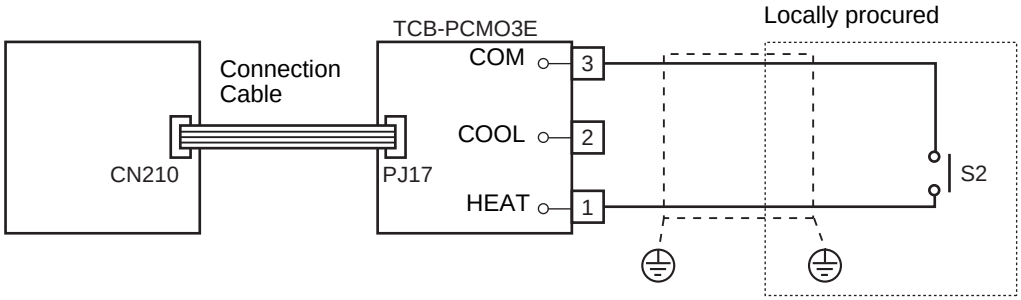
Thermostat operation

	Cooling		Heating	
	on	off	on	off
2 - 3	open	close	–	–
1 - 3	–	–	close	open

Emergency shutdown input

S2 : Emergency stop input

- Non-voltage contacts
- Connection details :
  Emergency stop :Terminals 3 (COM) and 1 (HEAT) on TCB-PCMO3E (See Schematic below)



⚠CAUTION

- Be sure to prepare non voltage continuous point of contact for each terminal.
- Supplementary Insulation must be added to user touched to user touchabel part of switches.

5. OUTDOOR UNIT

5-1. Specification

5-1-1. Outdoor unit specifications

Unit name	Hydro unit		HWS-804XWHM3-E, 804XWHT6-E, 804XWHT9-E	
	Outdoor unit		HWS-804H-E	
Heating capacity *1 (kW)			8.0	
Cooling capacity *2 (kW)			6.0	
Variable range of compressor frequency			10 - 70 Hz	
Power source			Single phase 50 Hz 220-230 V	
Operation mode			Heating	Cooling
Electric characteristic *1 *2	Hydro unit	Current (A)	0.44	0.44
		Power (kW)	0.06	0.06
		Power factor (%)	59.3	59.3
	Outdoor unit	Current (A)	79.7	8.50
		Power (kW)	1.73	1.88
		Power factor (%)	94.4	96.2
	Total	Starting current (A)	8.41	8.94
Operating noise *1 *2 *4	Hydro unit (dB (A))		27	27
	Outdoor unit (dB (A))		49	49
Coefficient of performance *1 *2			4.40	2.82
Hydro unit	Outer dimension	Height (mm)	925	
		Width (mm)	525	
		Depth (mm)	355	
	Net weight (kg)		49	
	Color		Silky shade (Munsell 1Y8.5/0.5)	
	Remote controller Outer dimension *3	Height (mm)	120	
		Width (mm)	120	
		Depth (mm)	16	
	Circulating pump	Motor output (W)	125 (MAX)	
		Flow rate (L/min)	22.9	17.2
		Type	Non-self-suction centrifugal pump	
	Heat exchanger		Plate-type heat exchange	
Outdoor unit	Outer dimension	Height (mm)	890	
		Width (mm)	900	
		Depth (mm)	320	
	Net weight (kg)		63	
	Color		Silky shade (Munsell 1Y8.5/0.5)	
	Compressor	Motor output (W)	1400	
		Type	Twin rotary type with DC-inverter variable speed control	
		Model	DA220A2F-22L	
	Fan motor	Standard air capacity (m^3/min)	50.0	
		Motor output (W)	60	
Refrigerant piping	Connection method		Flare connection	
	Hydro unit	Liquid	Ø9.52	
		Gas	Ø15.9	
	Outdoor unit	Liquid	Ø9.52	
		Gas	Ø15.9	
	Maximum length (m)		30	
	Maximum chargeless length (m)		30	
	Maximum height difference (m)		±30	
	Minimum length (m)		5	
Refrigerant	Refrigerant name		R410A	
	Charge amount (kg)		1.8	
Water piping	Pipe diameter		R1 1/4	
	Maximum length (m)		None (Need the flow rate 13ℓ/min or more)	
	Maximum height difference (m)		±7	
	Maximum working water pressure (kPa)		300	
Operating temperature range	Hydro unit (°C)		5-32	
	Outdoor unit (°C)		-20-43	
Operating humidity range	Hydro unit (%)		15-85	
	Outdoor unit (%)		15-100	
Wiring connection	Power wiring		3 wires: including earth wire (Outdoor unit)	
	Connecting line		4 wires: including earth wire	

*1 Heating performance measurement conditions: outside air temperature 7 °C, water supply temperature 30 °C, outlet temperature 35 °C, refrigerant piping length 7.5 m (no height difference).
*2 Cooling performance measurement conditions: outside air temperature 35 °C, water supply temperature 12 °C, outlet temperature 7 °C, refrigerant piping length 7.5 m (no height difference).
*3 • The remote controller should be shipped with the hydro unit.
• Use two 1.5-meter wires to connect the hydro unit with the remote controller.
*4 The outdoor unit operating noise is measured at the point of 1 m away from the unit back surface centre and 1 m high from the ground. The hydro unit operating noise is measured at the point of 1 m away from the unit front surface centre.
The value of the operating noise varies depending on room structure where the unit is installed.
*5 Do not leave the hydro unit at 5 °C or below.
*6 Check the water piping for leakage under the maximum operating pressure.

Unit name	Hydro unit		HWS-1404XWHM3-E, 1404XWHT6-E, 1404XWHT9-E			
	Outdoor unit		HWS-1104H-E		HWS-1404H-E	
Heating capacity *1 (kW)			11.2		14.0	
Cooling capacity *2 (kW)			10.0		11.0	
Variable range of compressor frequency			10 - 60 Hz		10 - 70 Hz	
Power source			Single phase 50 Hz 220-230 V			
Operation mode			Heating	Cooling	Heating	Cooling
Electric characteristic *1 *2	Hydro unit	Current (A)	0.66	0.66	0.66	0.66
		Power (kW)	0.09	0.09	0.09	0.09
		Power factor (%)	59.2	59.2	59.2	59.2
	Outdoor unit	Current (A)	10.08	14.71	13.74	17.19
		Power (kW)	2.21	3.17	3.02	3.72
		Power factor (%)	95.3	93.7	95.6	94.1
	Total	Starting current (A)	10.74	15.37	14.40	17.85
Operating noise *1 *2 *4	Hydro unit (dB (A))		29	29	29	29
	Outdoor unit (dB (A))		49	49	51	51
Coefficient of performance *1 *2			4.88	3.07	4.50	2.89
Hydro unit	Outer dimension	Height (mm)	925			
		Width (mm)	525			
		Depth (mm)	355			
	Net weight (kg)		52			
	Color		Silky shade (Munsell 1Y8.5/0.5)			
	Remote controller Outer dimension *3	Height (mm)	120			
		Width (mm)	120			
		Depth (mm)	16			
	Circulating pump	Motor output (W)	190 (MAX)			
		Flow rate (L/min)	32.1	28.9	40.1	31.5
		Type	Non-self-suction centrifugal pump			
	Heat exchanger		Plate-type heat exchange			
Outdoor unit	Outer dimension	Height (mm)	1340			
		Width (mm)	900			
		Depth (mm)	320			
	Net weight (kg)		92			
	Color		Silky shade (Munsell 1Y8.5/0.5)			
	Compressor	Motor output (W)	2500			
		Type	Twin rotary type with DC-inverter variable speed control			
		Model	DA422A3F-26M			
	Fan motor	Standard air capacity (m^3/min)	103.0			
		Motor output (W)	100 × 2			
Refrigerant piping	Connection method		Flare connection			
	Hydro unit	Liquid	Ø9.52			
		Gas	Ø15.9			
	Outdoor unit	Liquid	Ø9.52			
		Gas	Ø15.9			
	Maximum length (m)		30			
	Maximum chargeless length (m)		30			
	Maximum height difference (m)		±30			
	Minimum length (m)		5			
Refrigerant	Refrigerant name		R410A			
	Charge amount (kg)		2.7			
Water piping	Pipe diameter		R1 1/4			
	Maximum length (m)		None (Need the flow rate 17.5ℓ/min or more)			
	Maximum height difference (m)		±7			
	Maximum working water pressure (kPa)		300			
Operating temperature range	Hydro unit (°C)		5-32			
	Outdoor unit (°C)		-20-43			
Operating humidity range	Hydro unit (%)		15-85			
	Outdoor unit (%)		15-100			
Wiring connection	Power wiring		3 wires: including earth wire (Outdoor unit)			
	Connecting line		4 wires: including earth wire			

*1 Heating performance measurement conditions: outside air temperature 7 °C, water supply temperature 30 °C, outlet temperature 35 °C, refrigerant piping length 7.5 m (no height difference).
*2 Cooling performance measurement conditions: outside air temperature 35 °C, water supply temperature 12 °C, outlet temperature 7 °C, refrigerant piping length 7.5 m (no height difference).
*3 • The remote controller should be shipped with the hydro unit.
• Use two 1.5-meter wires to connect the hydro unit with the remote controller.
*4 The outdoor unit operating noise is measured at the point of 1 m away from the unit back surface centre and 1 m high from the ground. The hydro unit operating noise is measured at the point of 1 m away from the unit front surface centre.
The value of the operating noise varies depending on room structure where the unit is installed.
*5 Do not leave the hydro unit at 5 °C or below.
*6 Check the water piping for leakage under the maximum operating pressure.

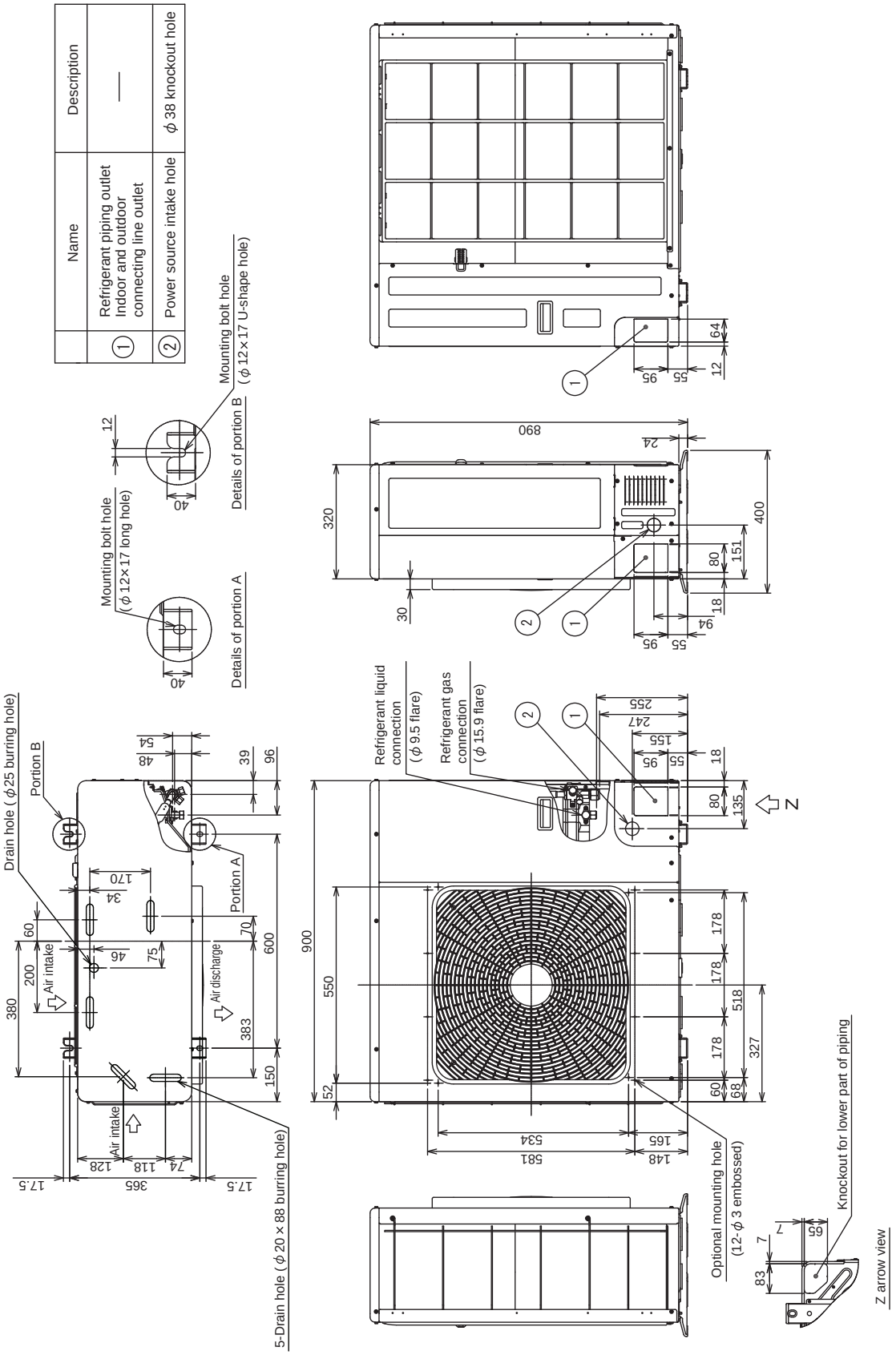
Unit name	Hydro unit		HWS-1404XWHM3-E, 1404XWHT6-E, 1404XWHT9-E					
	Outdoor unit		HWS-1104H8(R)-E		HWS-1404H8(R)-E		HWS-1604H8(R)-E	
Heating capacity *1 (kW)			11.2		14.0		16.0	
Cooling capacity *2 (kW)			10.0		11.0		13.0	
Variable range of compressor frequency			10 - 60 Hz		10 - 66 Hz		10 - 70 Hz	
Power source			3 phase 50 Hz 380-400 V					
Operation mode			Heating	Cooling	Heating	Cooling	Heating	Cooling
Electric characteristic *1 *2	Hydro unit	Current (A)	0.66	0.66	0.66	0.66	0.66	0.66
		Power (kW)	0.09	0.09	0.09	0.09	0.09	0.09
		Power factor (%)	59.2	59.2	59.2	59.2	59.2	59.2
	Outdoor unit	Current (A)	3.73	5.08	5.01	5.71	5.94	7.51
		Power (kW)	2.25	3.17	3.07	3.72	3.63	4.71
		Power factor (%)	87.4	90.4	88.5	94.4	88.6	90.9
	Total	Starting current (A)	4.39	5.74	5.67	6.37	6.60	7.60
Operating noise *1 *2 *4	Hydro unit (dB (A))		29	29	29	29	29	29
	Outdoor unit (dB (A))		49	50	51	51	52	52
Coefficient of performance *1 *2			4.80	3.07	4.44	2.89	4.30	2.71
Hydro unit	Outer dimension	Height (mm)	925					
		Width (mm)	525					
		Depth (mm)	355					
	Net weight (kg)		52					
	Color		Silky shade (Munsell 1Y8.5/0.5)					
	Remote controller Outer dimension *3	Height (mm)	120					
		Width (mm)	120					
		Depth (mm)	16					
	Circulating pump	Motor output (W)	190 (MAX)					
		Flow rate (L/min)	32.1	28.9	40.1	31.5	45.8	37.3
		Type	Non-self-suction centrifugal pump					
	Heat exchanger		Plate-type heat exchange					
Outdoor unit	Outer dimension	Height (mm)	1340					
		Width (mm)	900					
		Depth (mm)	320					
	Net weight (kg)		93					
	Color		Silky shade (Munsell 1Y8.5/0.5)					
	Compressor	Motor output (W)	2500					
		Type	Twin rotary type with DC-inverter variable speed control					
		Model	DA422A3F-27M					
	Fan motor	Standard air capacity (m^3/min)	103.0					
		Motor output (W)	100 × 2					
Refrigerant piping	Connection method		Flare connection					
	Hydro unit	Liquid	Ø9.52					
		Gas	Ø15.9					
	Outdoor unit	Liquid	Ø9.52					
		Gas	Ø15.9					
	Maximum length (m)		30					
	Maximum chargeless length (m)		30					
	Maximum height difference (m)		±30					
	Minimum length (m)		5					
Refrigerant	Refrigerant name		R410A					
	Charge amount (kg)		2.7					
Water piping	Pipe diameter		R1 1/4					
	Maximum length (m)		None (Need the flow rate 17.5ℓ/min or more)					
	Maximum height difference (m)		±7					
	Maximum working water pressure (kPa)		300					
Operating temperature range	Hydro unit (°C)		5-32					
	Outdoor unit (°C)		-20-43					
Operating humidity range	Hydro unit (%)		15-85					
	Outdoor unit (%)		15-100					
Wiring connection	Power wiring		5 wires: including earth wire (Outdoor unit)					
	Connecting line		4 wires: including earth wire					

*1 Heating performance measurement conditions: outside air temperature 7 °C, water supply temperature 30 °C, outlet temperature 35 °C, refrigerant piping length 7.5 m (no height difference).
*2 Cooling performance measurement conditions: outside air temperature 35 °C, water supply temperature 12 °C, outlet temperature 7 °C, refrigerant piping length 7.5 m (no height difference).
*3 • The remote controller should be shipped with the hydro unit.
• Use two 1.5-meter wires to connect the hydro unit with the remote controller.
*4 The outdoor unit operating noise is measured at the point of 1 m away from the unit back surface centre and 1 m high from the ground. The hydro unit operating noise is measured at the point of 1 m away from the unit front surface centre.
The value of the operating noise varies depending on room structure where the unit is installed.
*5 Do not leave the hydro unit at 5 °C or below.
*6 Check the water piping for leakage under the maximum operating pressure.

5-2. Dimension

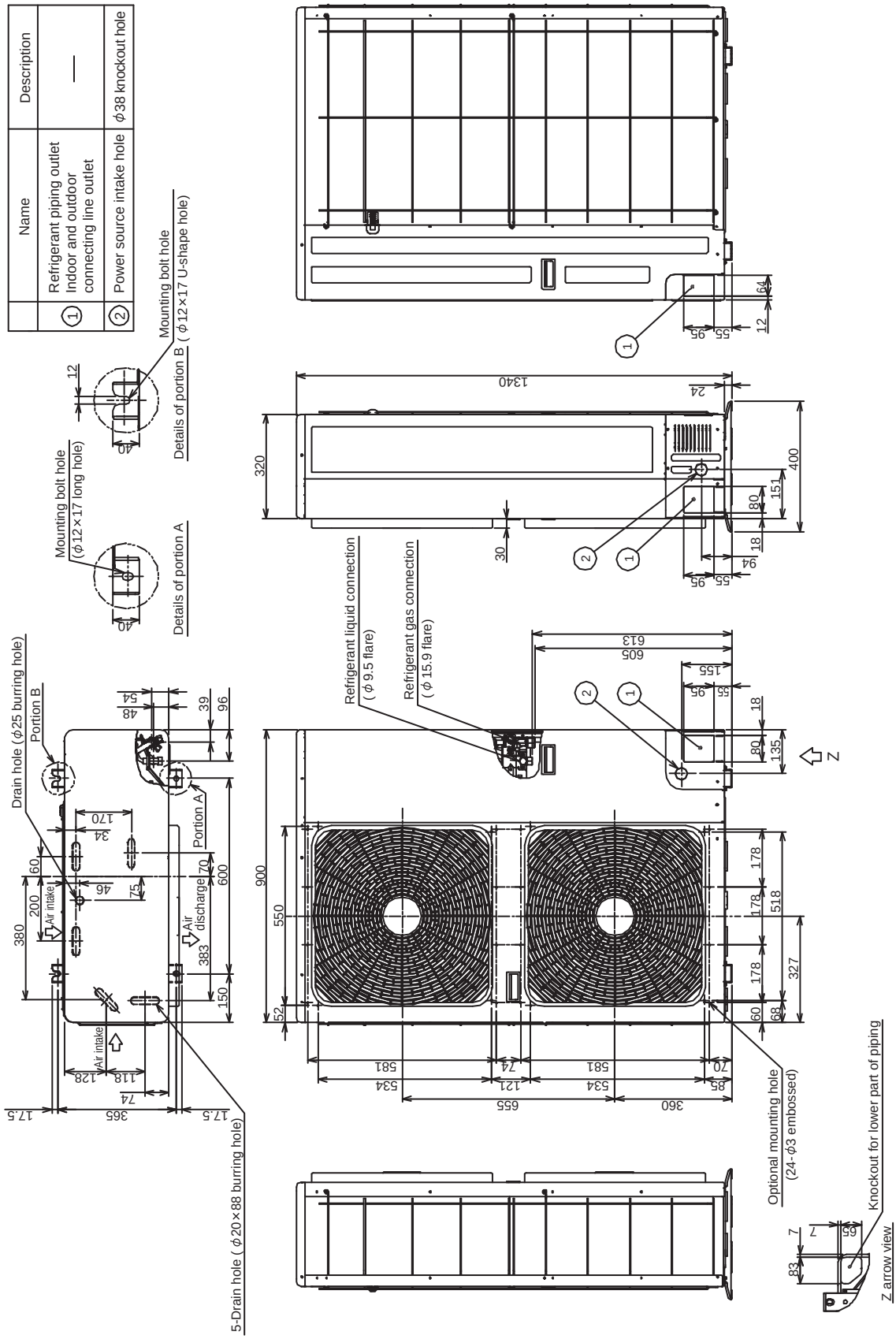
5-2-1. HWS-804H-E

Unit: mm



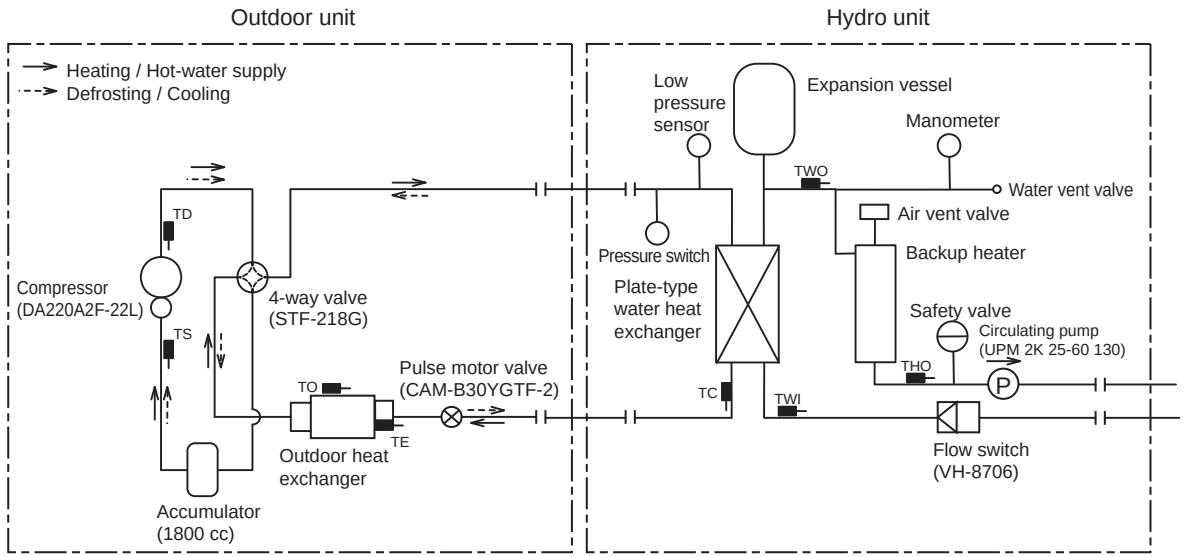
5-2-2. HWS-1104H-E, HWS-1404H-E, HWS-1104H8(R)-E, HWS-1404H8(R)-E, HWS-1604H8(R)-E

Unit: mm

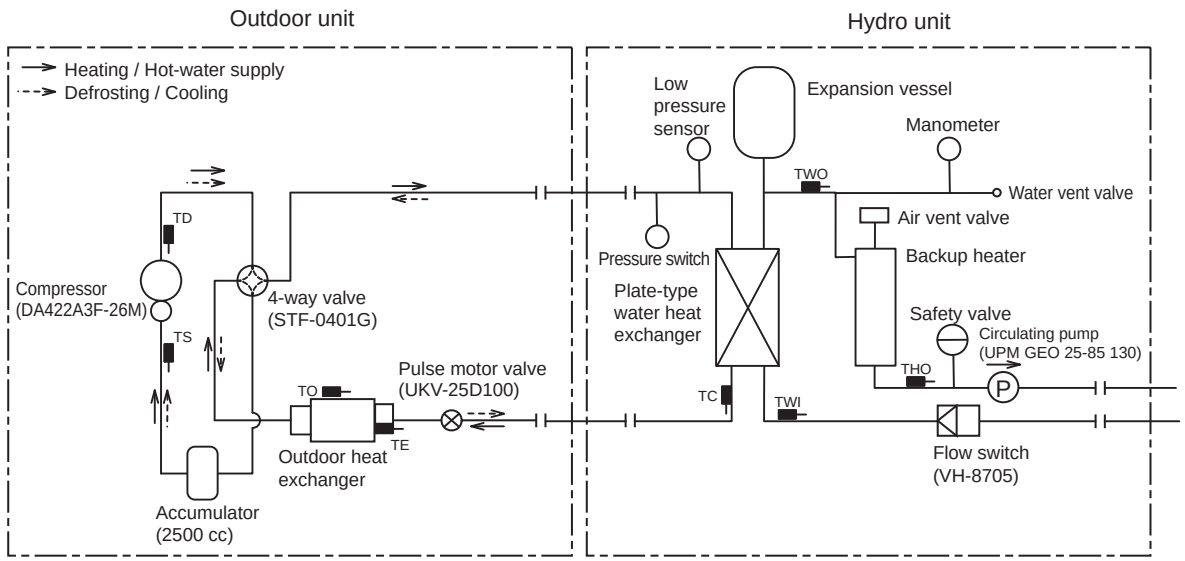


5-3. Piping Diagram

HWS-804XWHM3-E, HWS-804XWHT6-E, HWS-804XWHT9-E / HWS-804H-E



HWS-1404XWHM3-E, HWS-1404XWHT6-E, HWS-1404XWHT9-E / HWS-1104H-E, HWS-1404H-E



5-4. Wiring Diagram

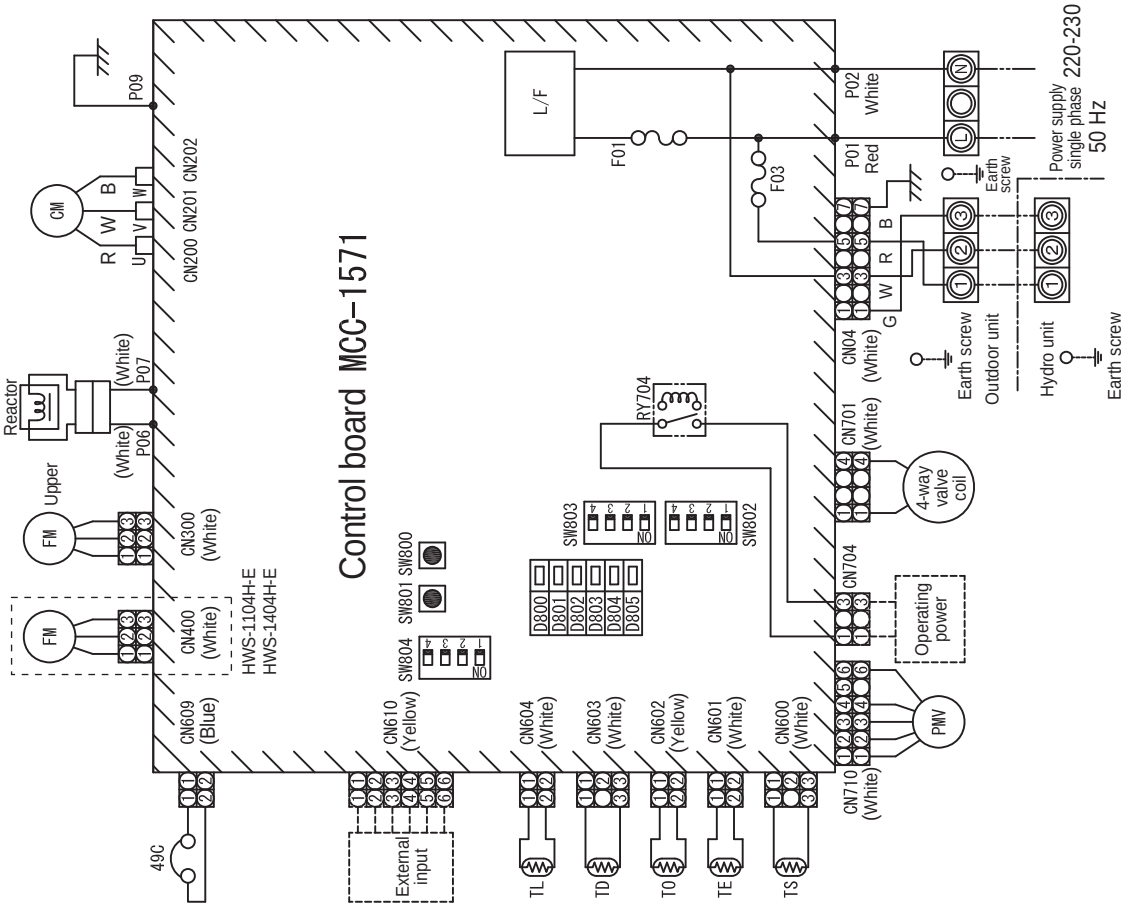
5-4-1. Outdoor Unit (Single phase type)

▼HWS-804H-E, HWS-1104H-E, HWS-1404H-E

Symbol	Item name
CM	Compressor
FM1,2*	Fan motor
PMV	Pulse motor valve coil
TD	Discharge temperature sonsor
TS	Suction temperature sensor
TE	Heat exchange sensor 1
TL	Heat exchange sensor 2
T0	Outdoor temperature sensor
4F	Linetiter
20SF	4-way valve coil
49C	Compressor case thermostat
F01	Fuse 25 A, 250 VAC
F03	Fuse 10 A, 250 VAC

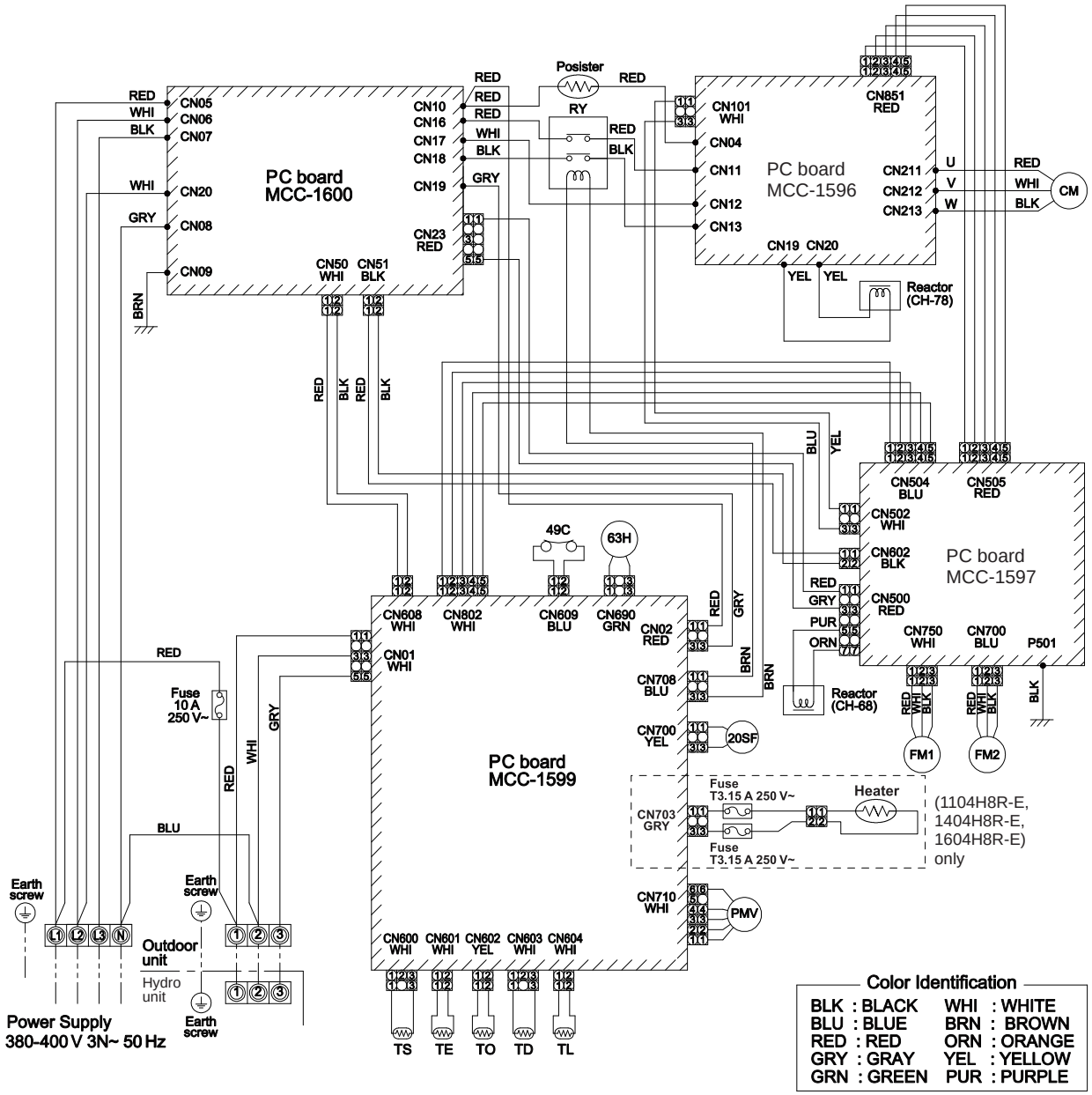
*HWS-1104H-E, HWS-1404H-E

1. ◎ indicates a terminal plate. The number inside indicates the terminal number.
2. The double-dashed line indicates a local wiring while the dashed line indicates an optional accessory or service wiring.
3. ▨ indicates a printed board.
4. For the hydro unit circuit, see the hydro unit wiring diagram.



5-4-2. Outdoor unit (3 phase type)

▼HWS-1104H8(R)-E, -1404H8(R)-E, -1604H8(R)-E

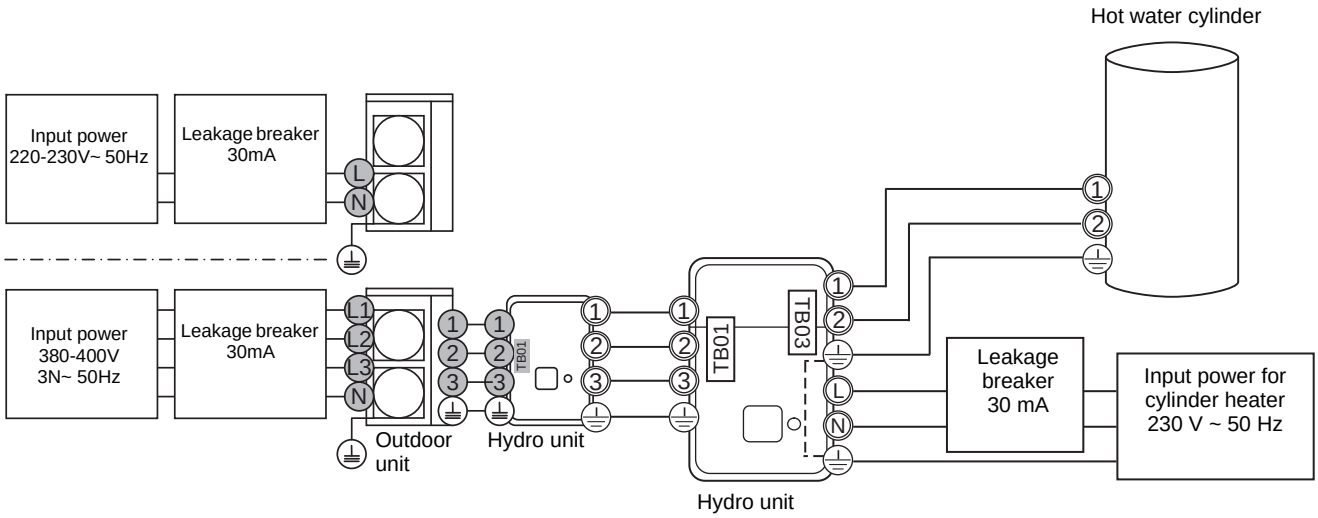


Symbol	Part name
CM	Compressor
FM1,2*	Fan motor
PMV	Pulse motor valve
TD	Pipe temperature sensor (Discharge)
TS	Pipe temperature sensor (Suction)
TE	Heat exchanger sensor 1
TL	Heat exchanger sensor 2
TO	Outside temperature sensor
20SF	4-way valve coil
49C	Compressor case thermostat
63H	High-pressure switch
RY	Relay

*HWS-1104H-E, HWS-1404H-E

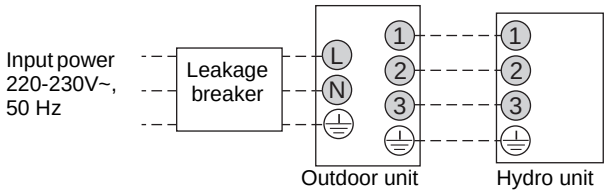
1. ◎ indicates the teminal block. Alphanumeric characters in the cycle indicate terminal No.
2. The two-dot chain line indicates the wiring procured locally.
3. ▨ indicates the PC board.
4. For the hydro unit circuit, refer to the wiring diagram of the indoor unit.

5-4-3. Power line

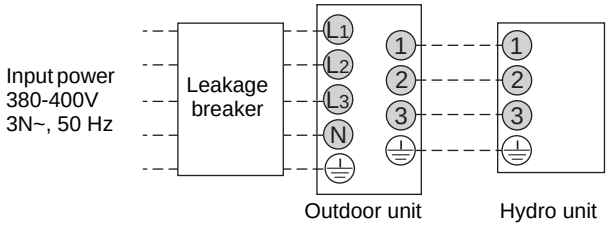


5-4-4. Wiring between Hydro Unit and Outdoor Unit

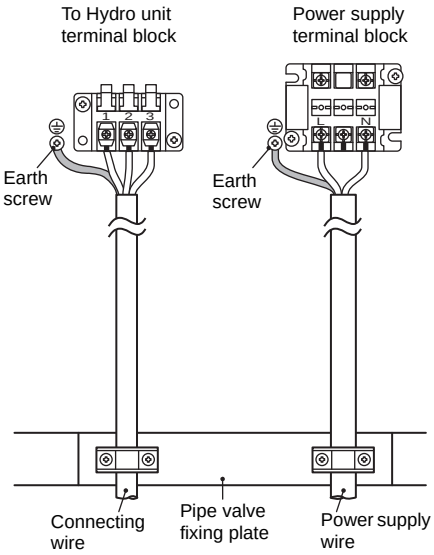
▼ HWS-804H-E, HWS-1104H-E, HWS-1404H-E



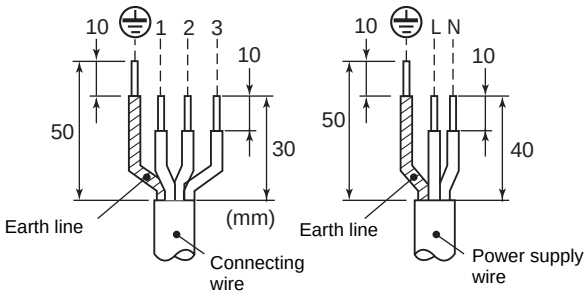
▼ HWS-1104H8-E, H8R-E
HWS-1404H8-E, H8R-E
HWS-1604H8-E, H8R-E



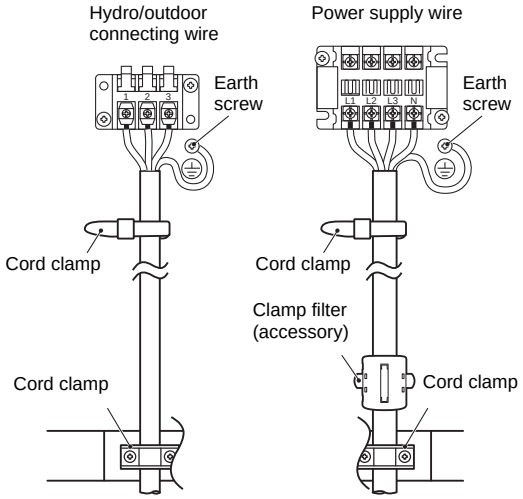
▼HWS-804H-E
HWS-1104H-E
HWS-1404H-E



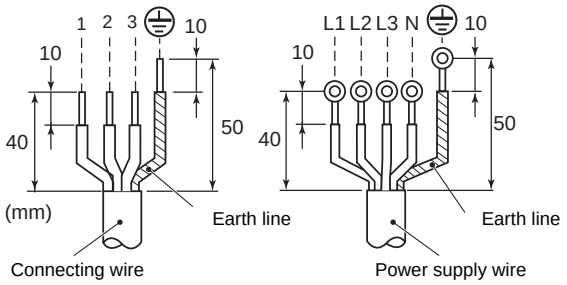
Stripping length power cord and connecting wire



▼HWS-1104H8-E, H8R-E
HWS-1404H8-E, H8R-E
HWS-1604H8-E, H8R-E



Stripping length power cord and connecting wire

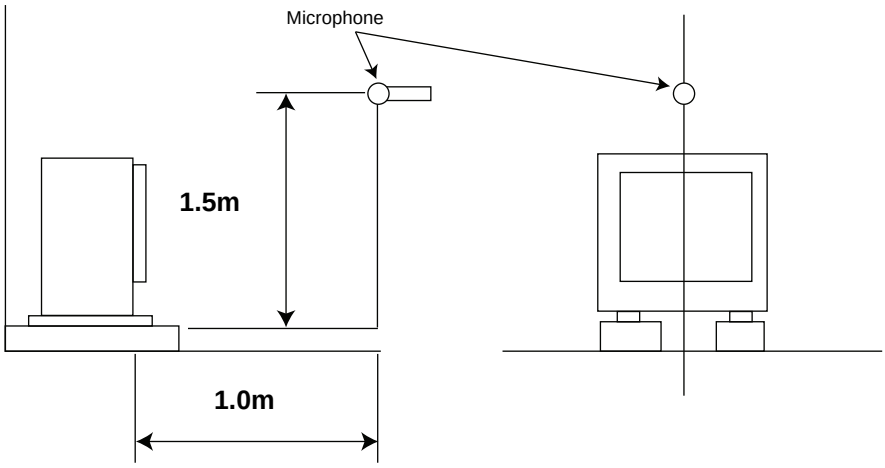


5

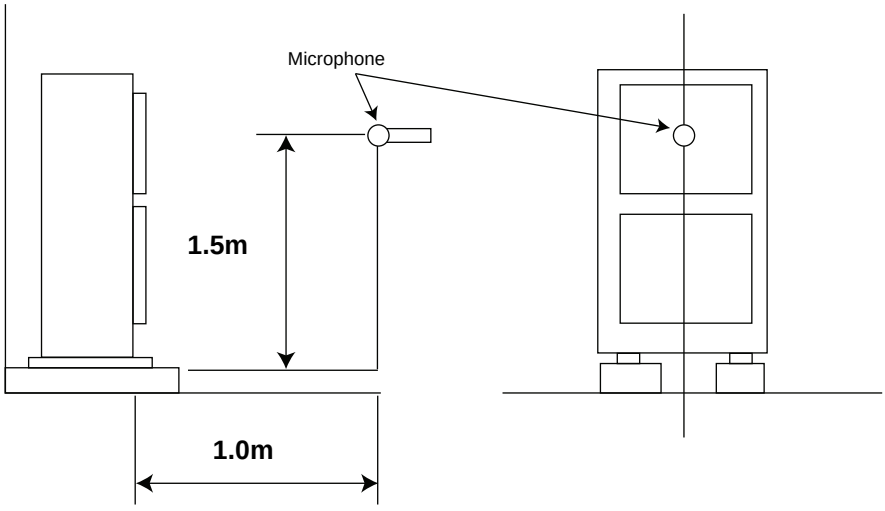
5-5. Sound Data

5-5-1. Sound pressure level measurement

▼HWS-804H-E



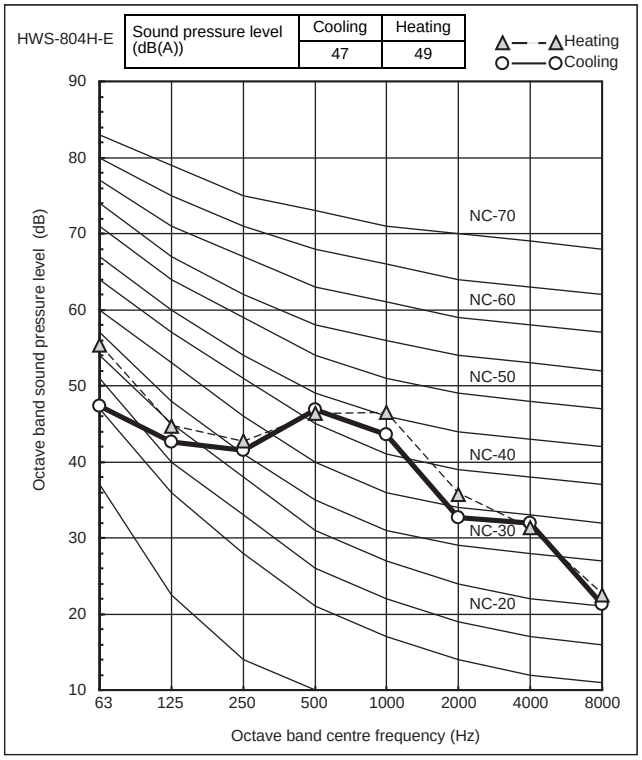
▼HWS-1104H-E, HWS-1404H-E, HWS-1104H8(R)-E, HWS-1404H8(R)-E, HWS-1604H8(R)-E



5-5-2. Sound Characteristics (NC Curve)

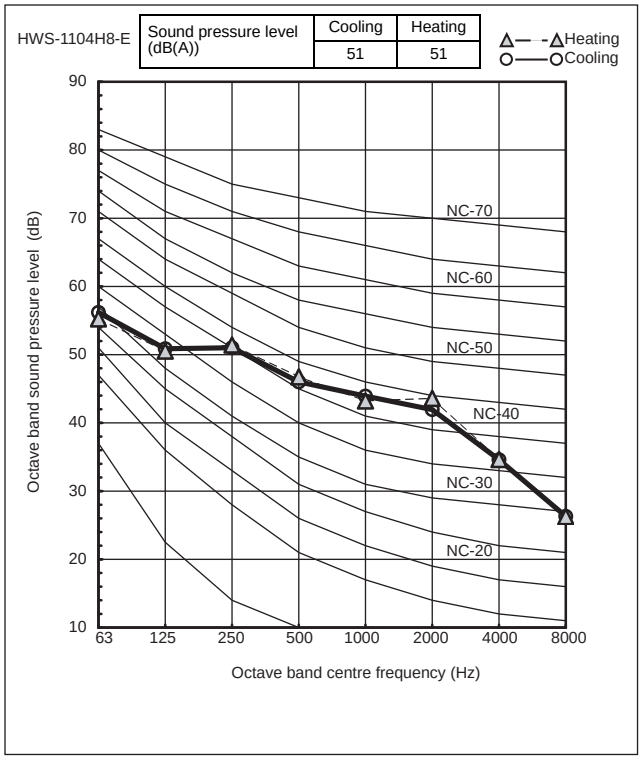
▼HWS-804H-E

(8 kw, 230 V ~ 50Hz)



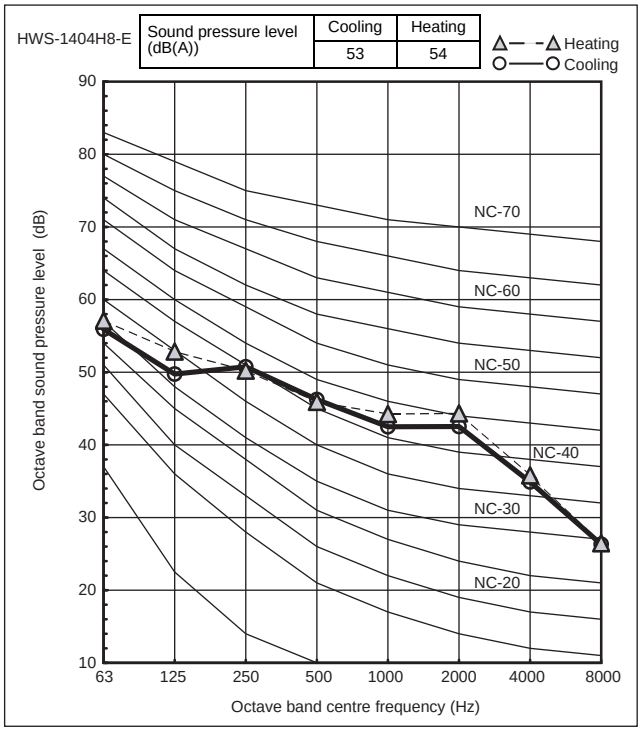
▼HWS-1104H-E, 1104H8(R)-E

(11 kw, 380-400V 3N~ 50Hz)



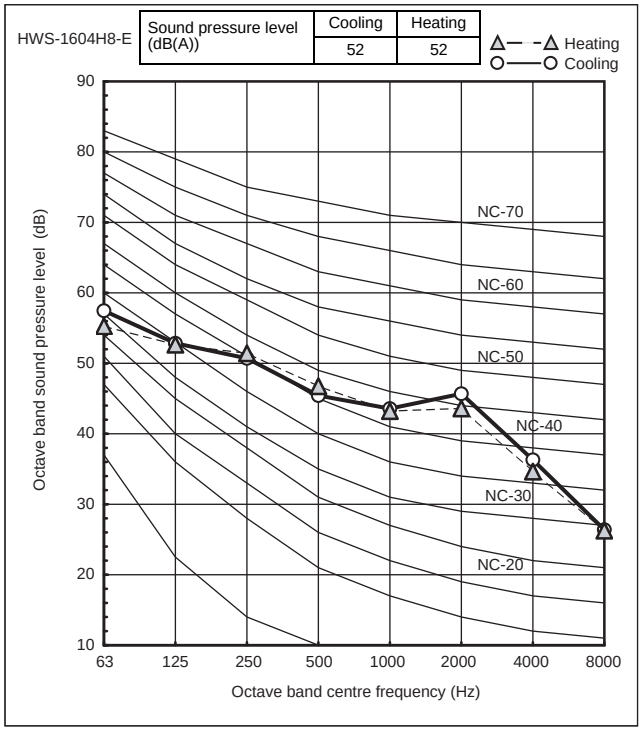
▼HWS-1404H-E, 1404H8(R)-E

(14kw, 380-400V 3N~ 50Hz)



▼HWS-1604H8(R)-E

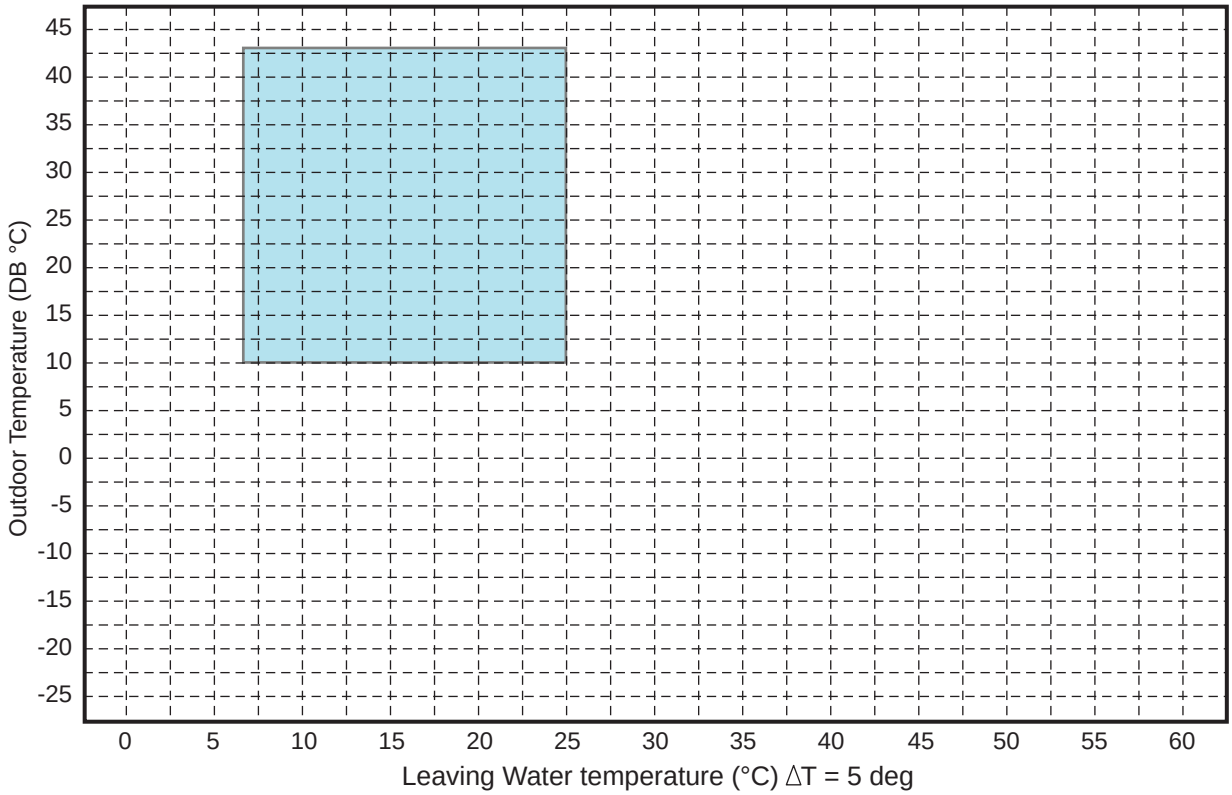
(16kw, 380-400V 3N~ 50Hz)



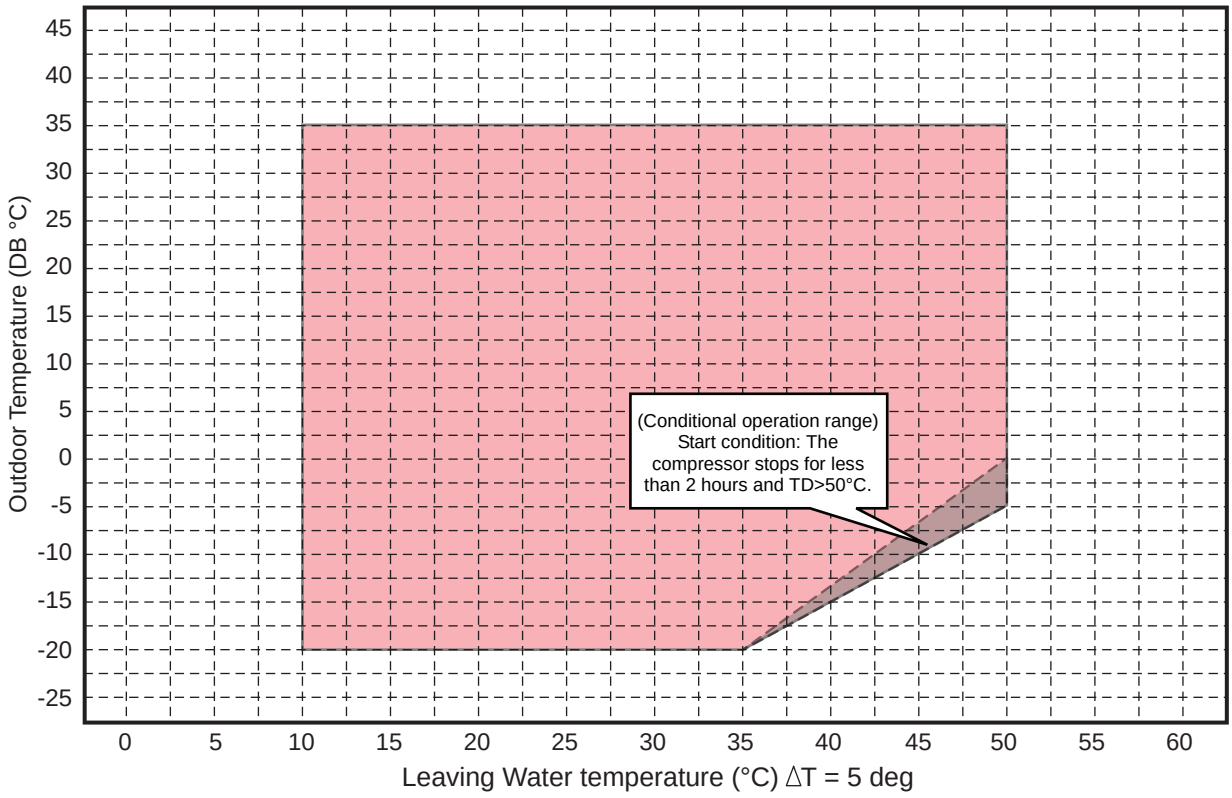
5-6. Operation Range

8 kW class

Cooling operation

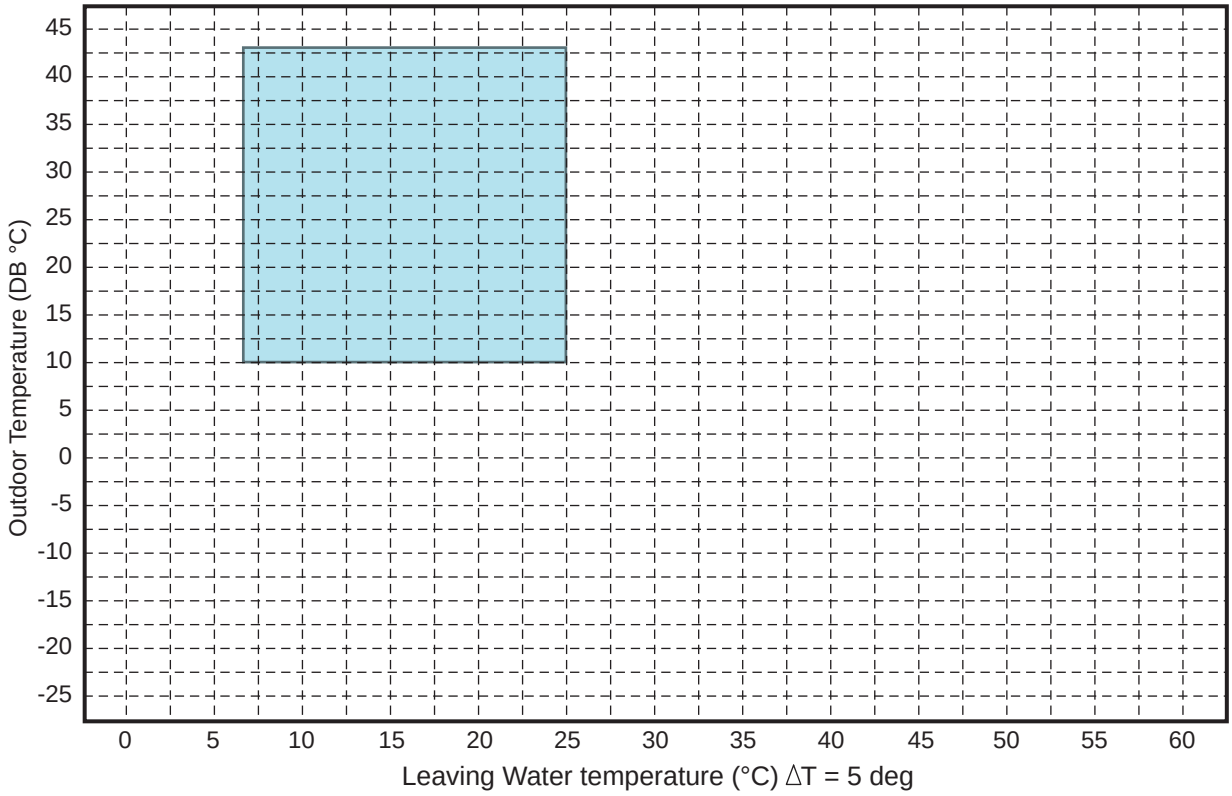


Heating and hot water operation

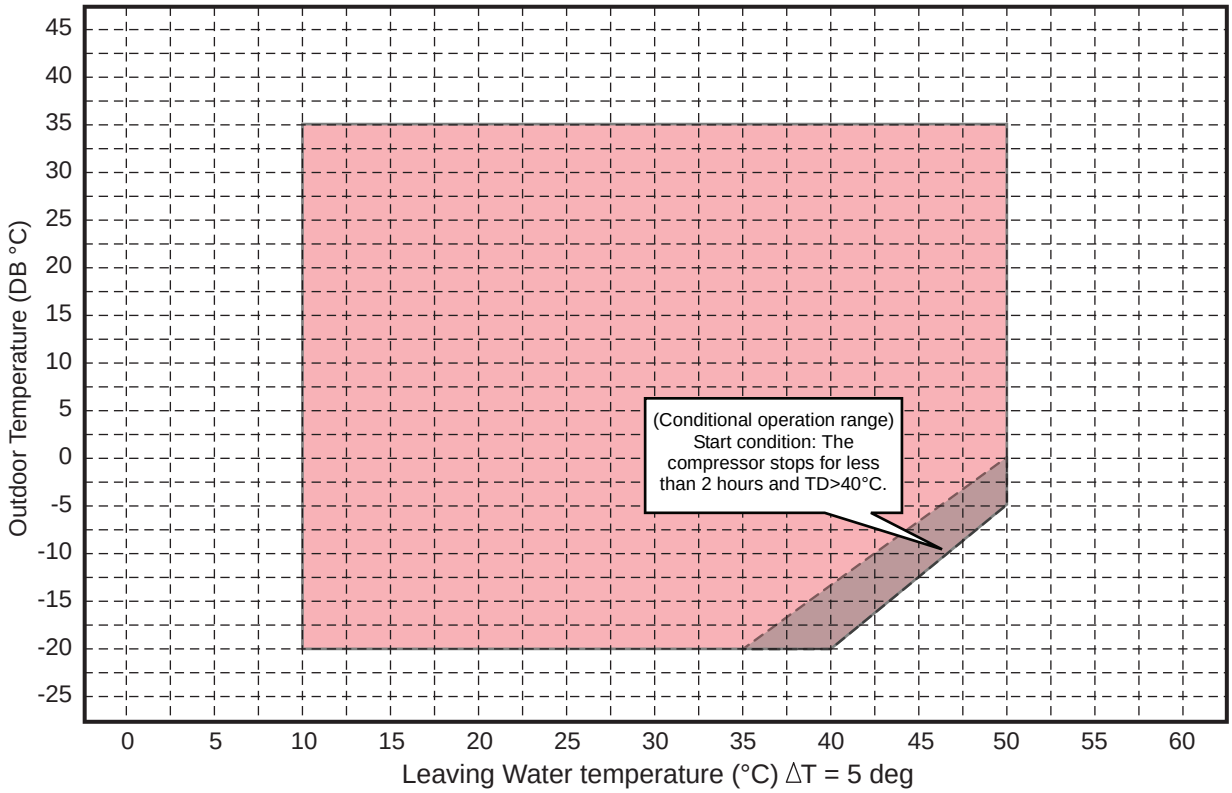


11, 14, 16 kW class

Cooling operation



Heating and hot water operation



NOTE

Hot water produced only by cylinder heater when both cooling and hot water operation demanded.

6. HOT WATER CYLINDER

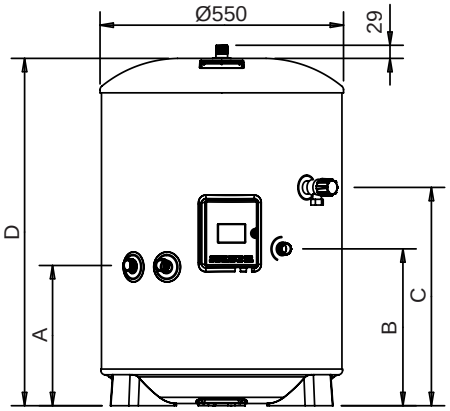
6-1. Specification

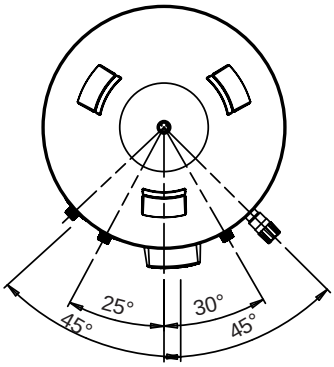
Hot water cylinder specifications

Hot water cylinder			HWS-1501 CSHM3-E	HWS-2101 CSHM3-E	HWS-3001 CSHM3-E
Water volume		litres	150	210	300
Appearance	Color		White		
	Material		Plastic coated steel		
Cylinder	Material		Stainless steel		
Insulation	Material		Flame retardent expanded polyurethane foam		
	Thickness	mm	50		
Heat exchanger	Material		Stainless steel tube		
Immersion heater	Type		Single straight, Alloy 825 sheathed		
	Capacity	kW	2.75		
Outer dimension	Height	mm	1,090	1,474	2,040
	Diameter	mm	550		
Unit weight		kg	31	41	59
Packing dimension	Height	mm	1,213	1,781	2,118
	Width	mm	576		
	Depth	mm	640		
Total weight	unit and packing	kg	37	44	59
Maximum water temperature		°C	75		
Maximum water pressure		bar	10		
Water pipe Hydro-cylinder	Inlet	mm	22		
	Outlet	mm	22		
Water pipe Domestic water-cylinder	Inlet	mm	22		
	Outlet	mm	22		
Standard accessories	Expansion Vessel	litres	Not included		
			Installation manual		
			Safety group NF7bar		
			Compression nuts and olives		
			Cylinder heater key spanner		

6-2. Dimension

General dimensions and performance

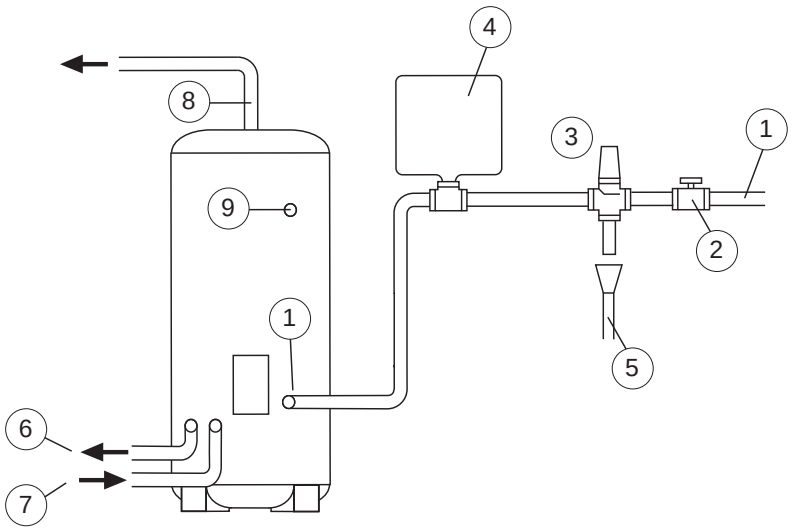




MODEL	HWS-1501CSHM3-E	HWS-2101CSHM3-E	HWS-3001CSHM3-E
NOMINAL CAPACITY (litres)	150	210	300
A (mm)	315	315	315
B (mm)	354	354	354
C (mm)	800	1184	1474
D (mm)	1090	1474	2040
SURFACE AREA (sq.m)	0.65	0.79	0.79
HOT WATER OUTPUT AT 60ºC (litres)	102	163	254
MIXED HOT WATER OUTPUT AT 40ºC (litres)	243	329.5	476
HEATLOSS (kWh/24h)	1.45	1.91	2.52
HEATING TIME 15ºC TO 60ºC - USING ELECTRIC CYLINDER HEATER ONLY (mins)	123	188	262
CAPACITY HEATED USING ELECTRIC CYLINDER HEATER ONLY (litres)	102	163	254

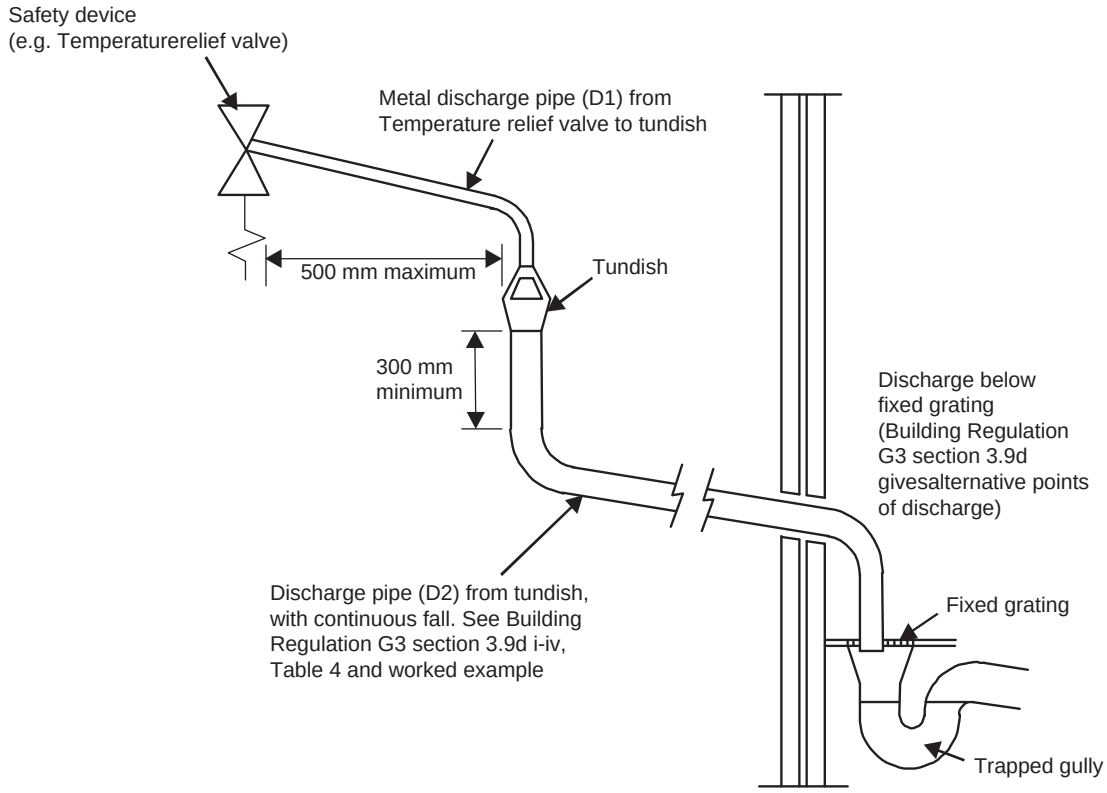
6-3. Piping Diagram

▼HWS-1501CSHM3-E, HWS-2101CSHM3-E, HWS-3001CAHM3-E



1. COLD WATER INLET
2. ISOLATING VALVE
3. SAFETY GROUP NF7 BAR
4. SANITARY WATER EXPANSION VESSEL
5. DISCHARGE PIPE
6. PRIMARY CIRCUIT RETURI
7. PRIMARY CIRCUIT FLOW
8. HOT WATER OUTLET
9. SANITARY WATERRE-CIRCULATION CONNECTION

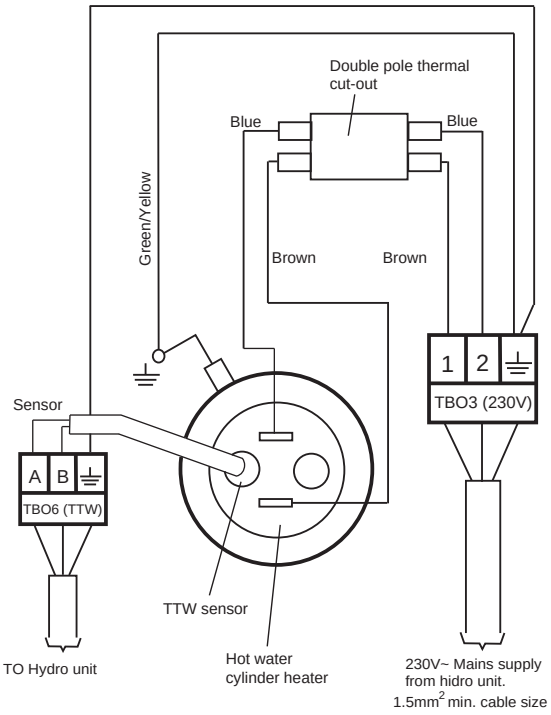
Typical discharge pipe arrangement (extract from Building Regulation G3 Guidance section 3.9)



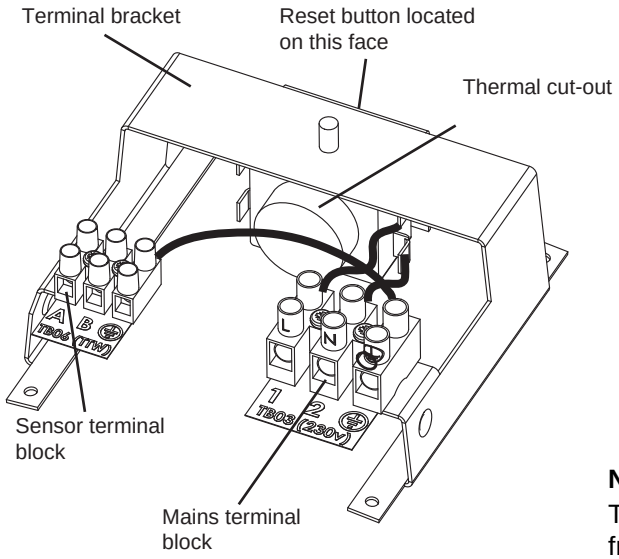
6-4. Wiring Diagram

▼HWS-1501CSHM3-E, HWS-2101CSH3-E, HWS-3001CSHM3-E

Electrical Connections (Schematic)



Thermal cut-out



NOTE:
The cover and element assembly have been removed from this view for clarity

MEMO

MEMO

Ovlašćeni Toshiba distributer:

KOVENT
Kumanovska 14, 11000 Beograd
Tel.:011 308 57 40
Faks 011 344 41 13
E-mail: office@kovent.rs
www.kovent.rs

Airtrend Limited

Kumanovska 14, 11000 Beograd, Srbija
Tel.: 011 383 68 86, 308 57 40
Faks: 011 344 41 13
E-mail: gobrid@eunet.rs
www.airtrend.rs
www.toshiba-klima.rs
www.toshiba-estia.rs

Air to Water Heat Pump
Engineering Data Book

Oct. 2013 First Edition

Model name:

HWS-804H-E	HWS-1404H8R-E	HWS-804XWHM3-E	HWS-1501CSHM3-E
HWS-1104H-E	HWS-1604H8-E	HWS-804XWHT6-E	HWS-2101CSHM3-E
HWS-1404H-E	HWS-1604H8R-E	HWS-804XWHT9-E	HWS-3001CSHM3-E
HWS-1104H8-E		HWS-1404XWHM3-E	
HWS-1104H8R-E		HWS-1404XWHT6-E	
HWS-1404H8-E		HWS-1404XWHT9-E	

TOSHIBA CARRIER CORPORATION