

# TOSHIBA

Leading Innovation >>>

E13-3W1



## Engineering Data Book

# 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

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# **1. INTRODUCTION**



**TOSHIBA AIRCONDITIONING**  
Advancing the **eco**-evolution

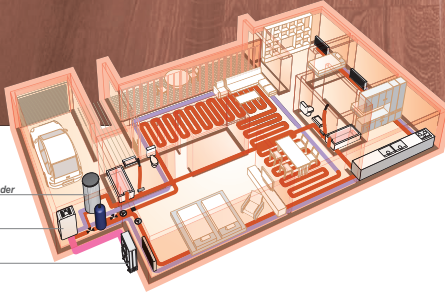
# Air to water Heat Pump System

- World-leading energy efficiency — COP of 4.77\*
- Comfortable heating and hot water supply
- Versatile installation and operation

\* 11 kW model

**Welcome Estia 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. Estia 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**





## 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<sub>2</sub> 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<sub>2</sub> 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

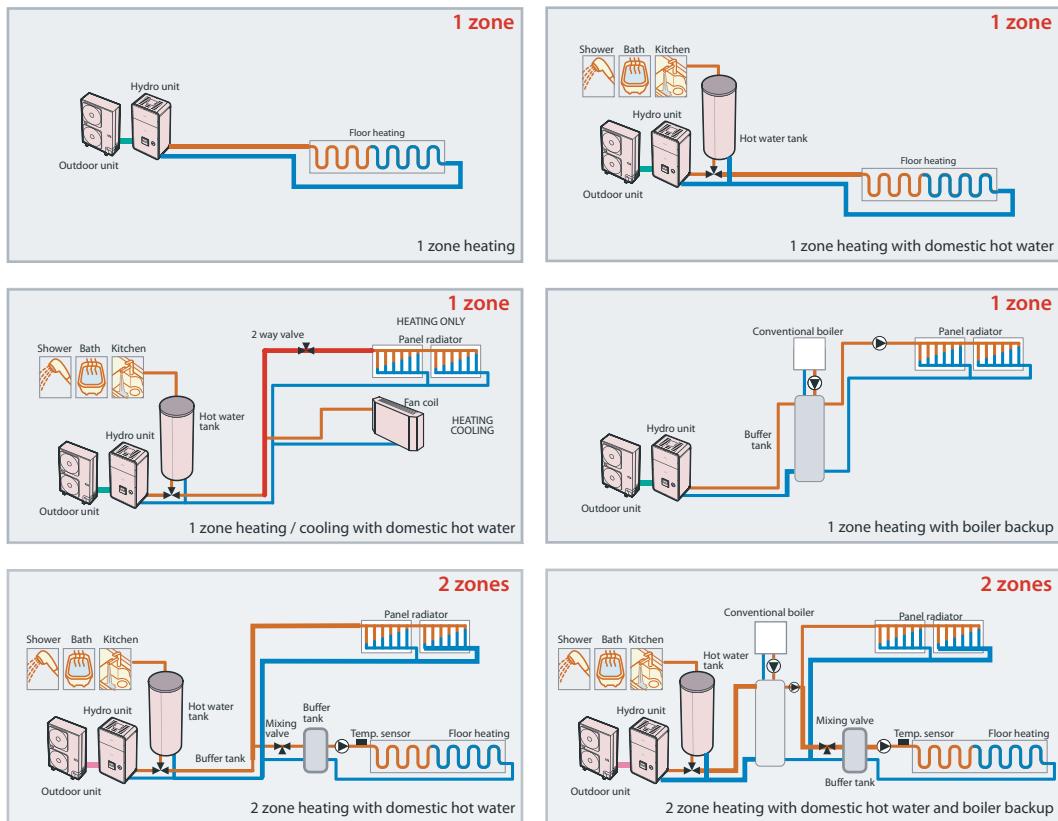
It can produce water at different temperatures for several applications simultaneously.

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 Estia heat pump offers a variety of combinations, some examples are shown below:



In existing dwellings already equipped with traditional gas or fuel boilers, Toshiba Estia 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.



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## **2. SYSTEM OVERVIEW**

## 2-1. System Combination

### Combination

| Hydro Unit         | Outdoor Unit |             |             |               |              |              |                                  |               |               | Backup heater |
|--------------------|--------------|-------------|-------------|---------------|--------------|--------------|----------------------------------|---------------|---------------|---------------|
|                    | 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 |               |
| 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            |              |              |               |               |               |

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## 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  |                                              |

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### **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<br>LWT=35°C<br>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<br>LWT=7°C<br>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<br>LWT=35°C<br>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<br>LWT=7°C<br>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           |

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## **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               |          | Brazen 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 separate 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               |          | Brazen 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 separate supply to hydro unit. |                   |                   |

## 4-1-2. Power Wiring specifications

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

## 4-1-3. External Device specifications

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

## 4-1-4. External Device Wiring specifications

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

### 4-1-5. External Output specifications

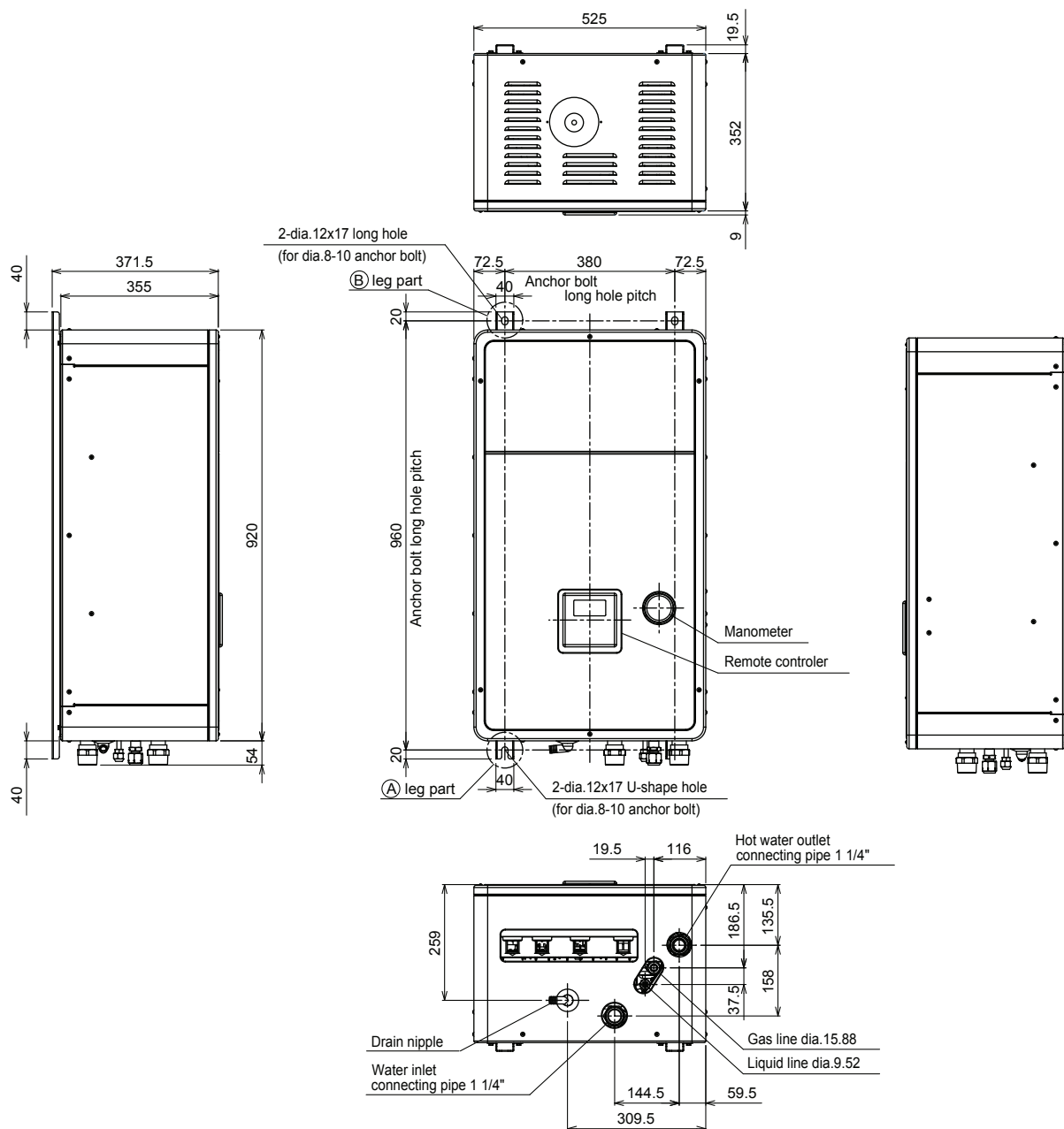
| Description                 | Output               | Maximum current | Max voltage | Maximum length |                                                                                                                         |
|-----------------------------|----------------------|-----------------|-------------|----------------|-------------------------------------------------------------------------------------------------------------------------|
| 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

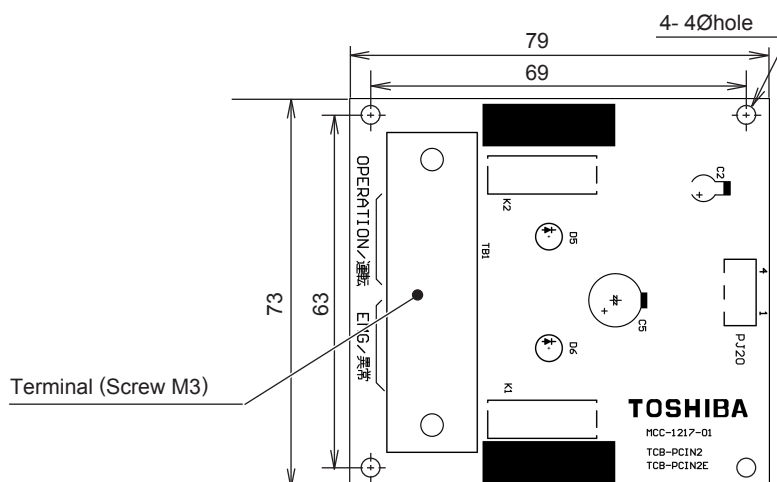
### ▼Hydro unit



### ▼External output board (TCB-PCIN3E)

Size (mm) : H22 x L73 x W79

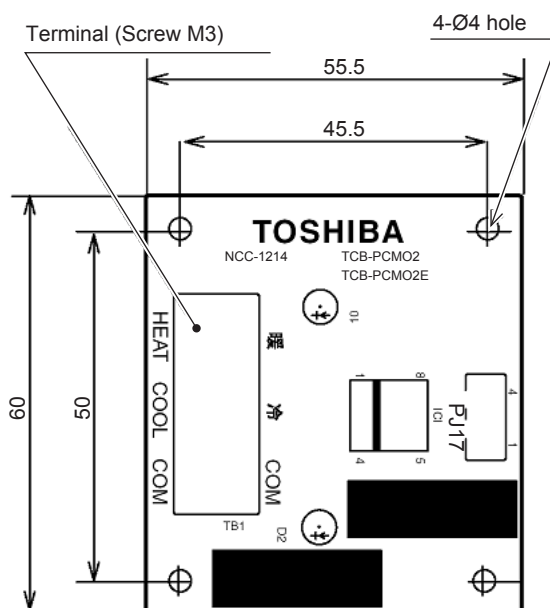
Weight (g) : 57



### ▼External input board (TCB-PCMO3E)

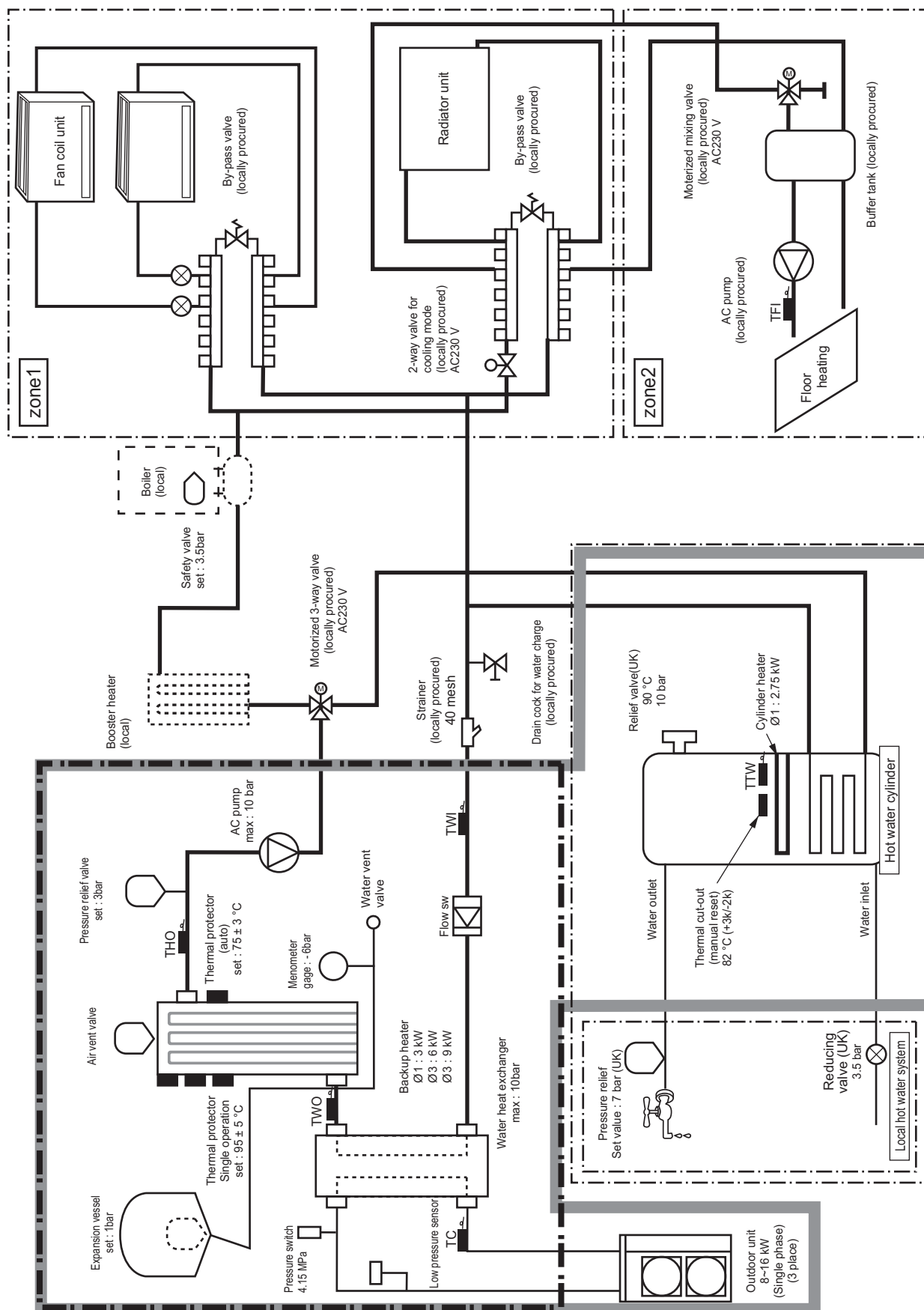
Size (mm) : H18 x L55.5 x W60

Weight (g) : 20



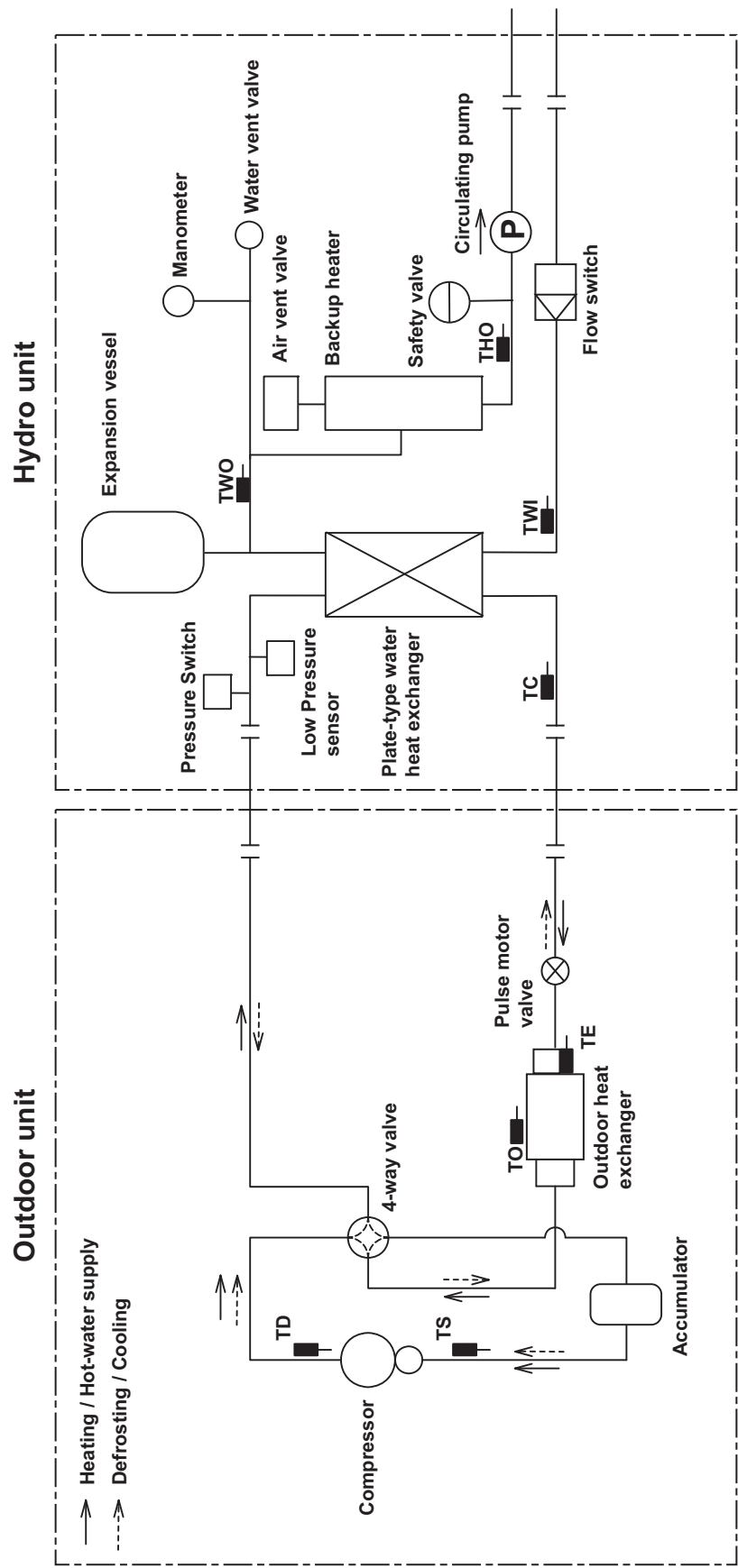
## 4-3. Piping Diagram

### Water system diagram



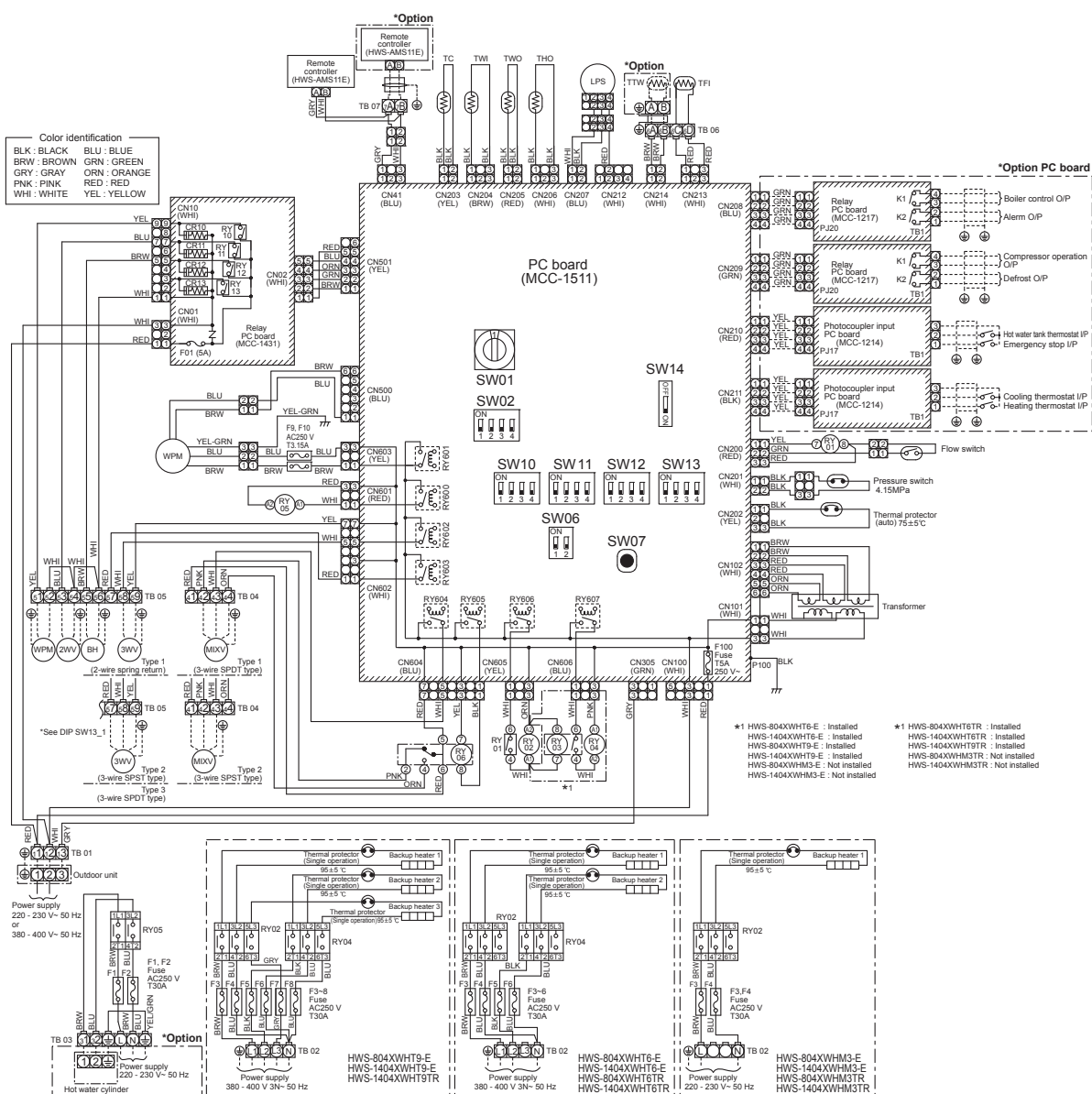


Refrigeration cycle system diagram



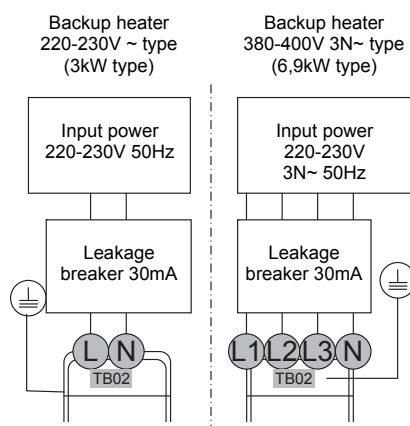
## 4-4. Wiring Diagram

### 4-4-1. Hydro unit

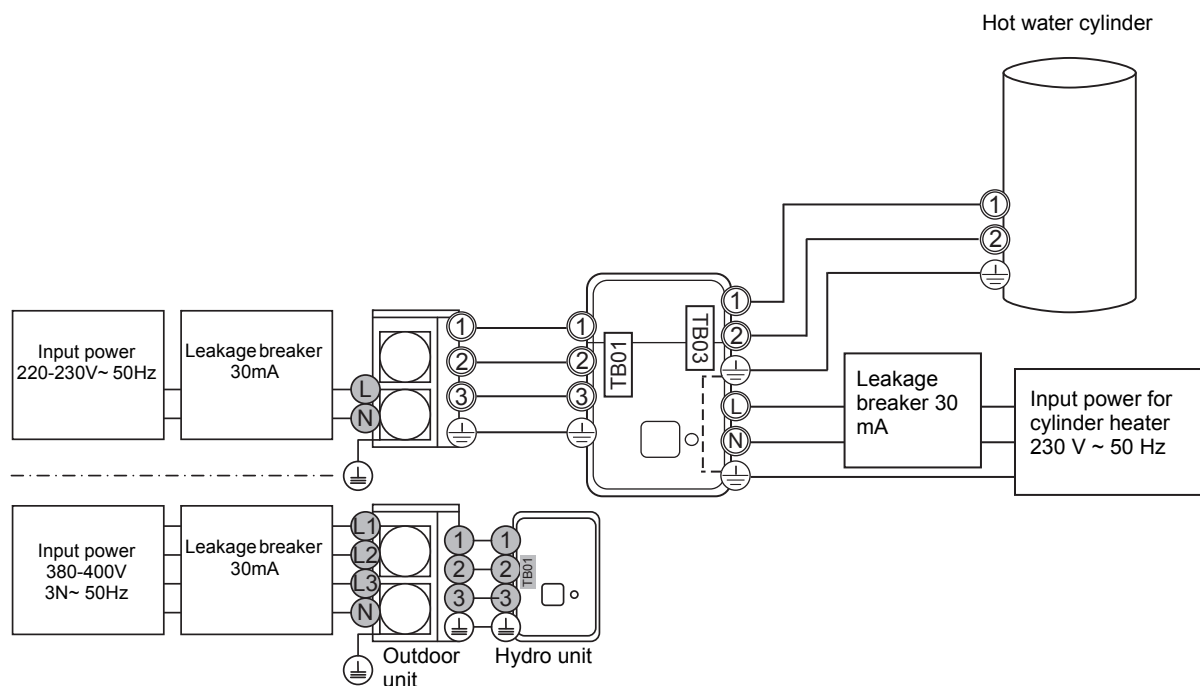


## 4-4-2. Power line

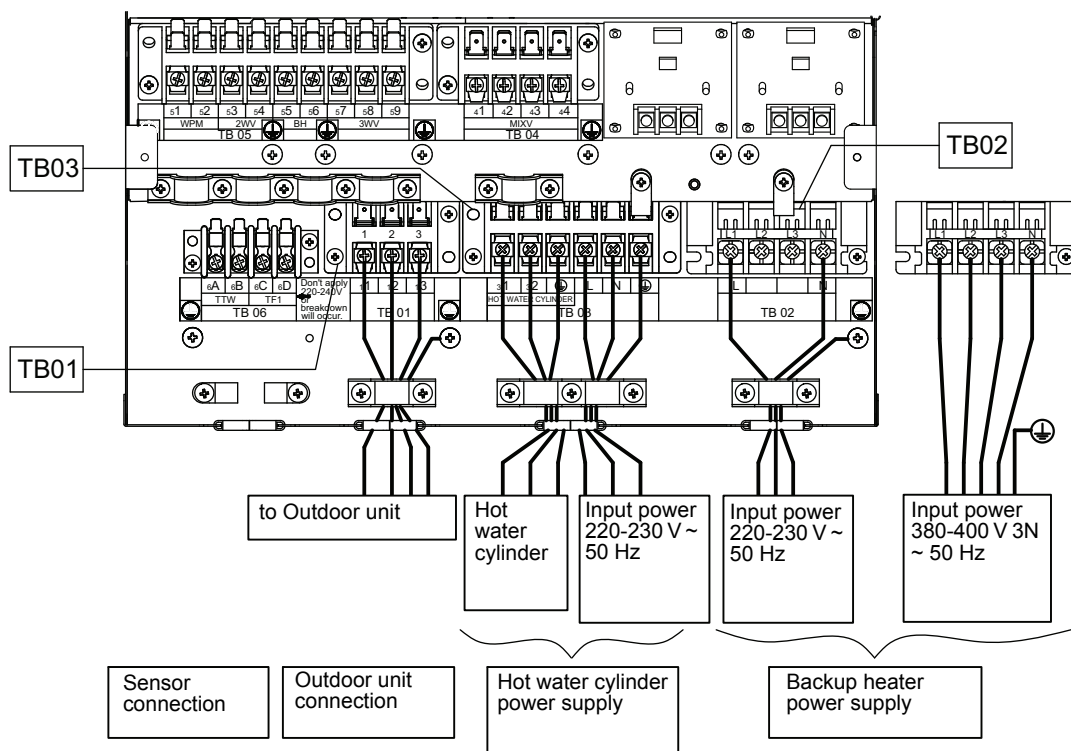
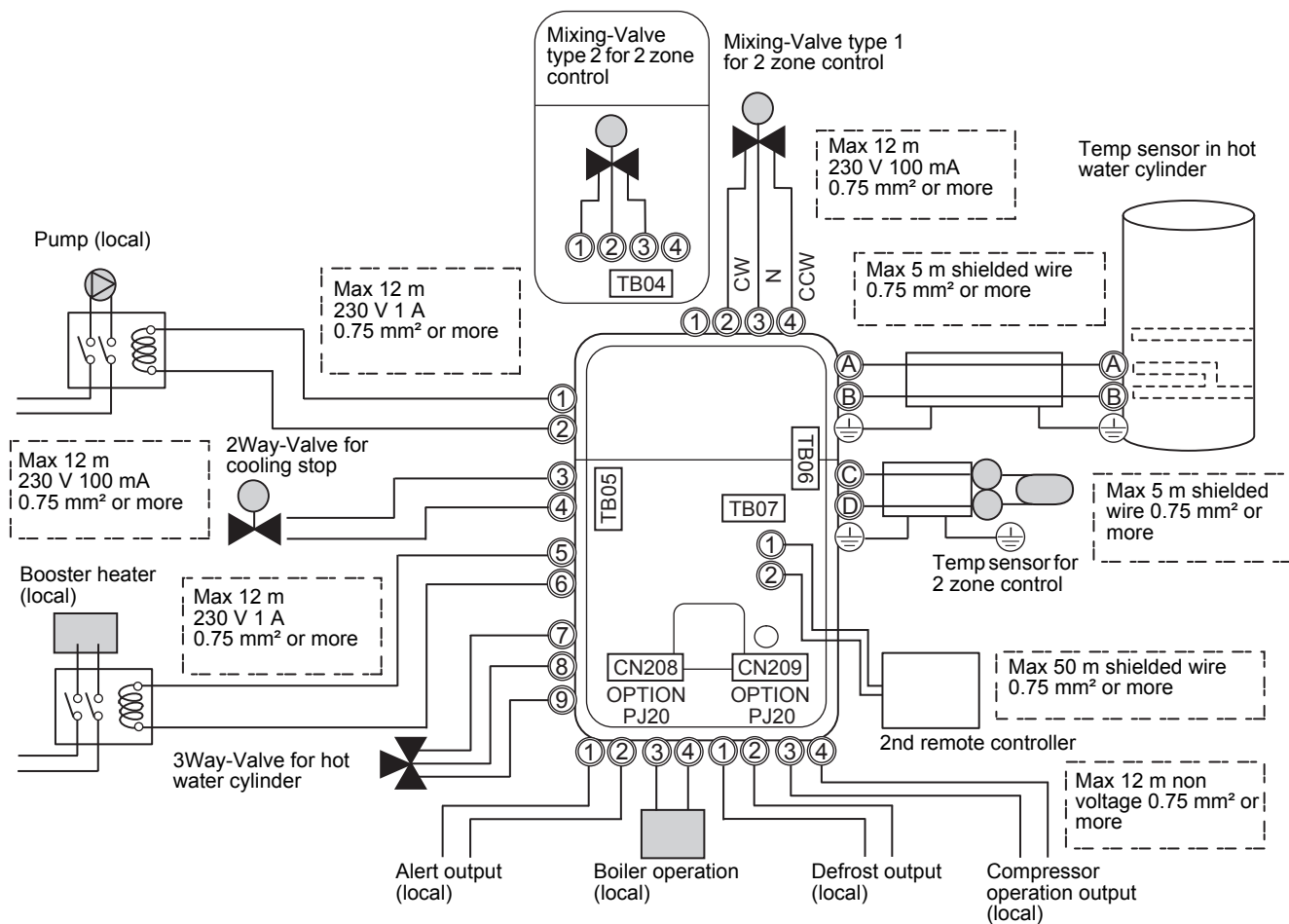
### Electrical connection to hydro unit



### Outdoor unit to hydro unit electrical connection

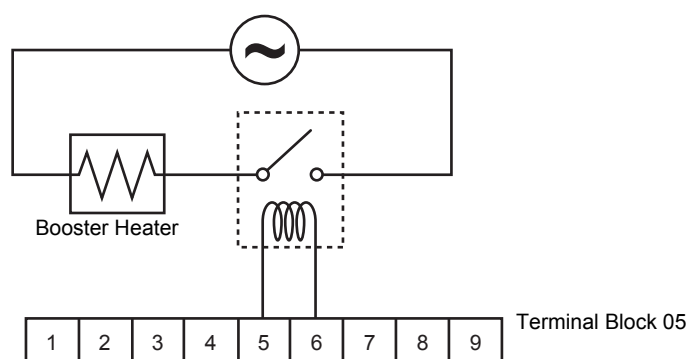


## 4-4-3. Control line

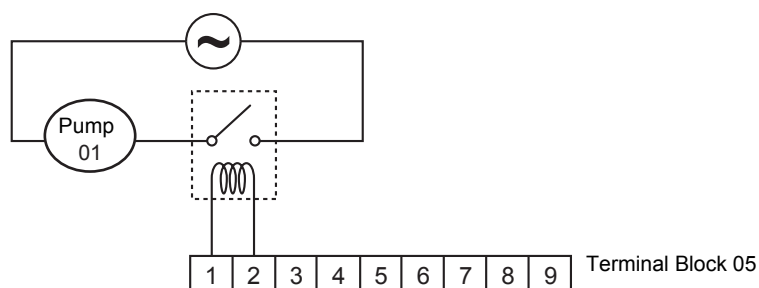


#### 4-4-4. External Device

##### 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

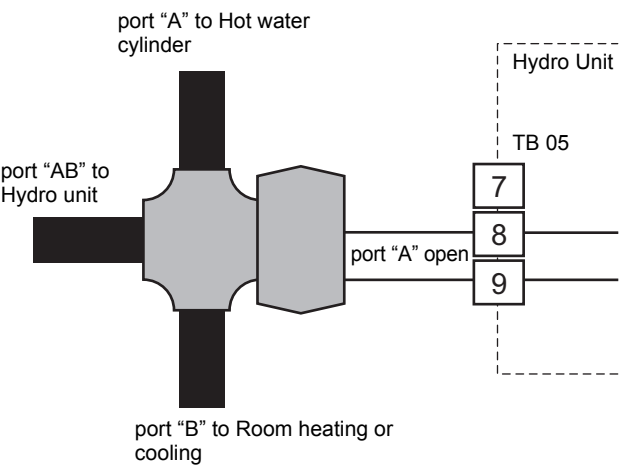
Valve Diameters: Port A, Port B: Ø 1 1/4"

Return Mechanism: 3 types of 3-way valve (diverter) can be used.

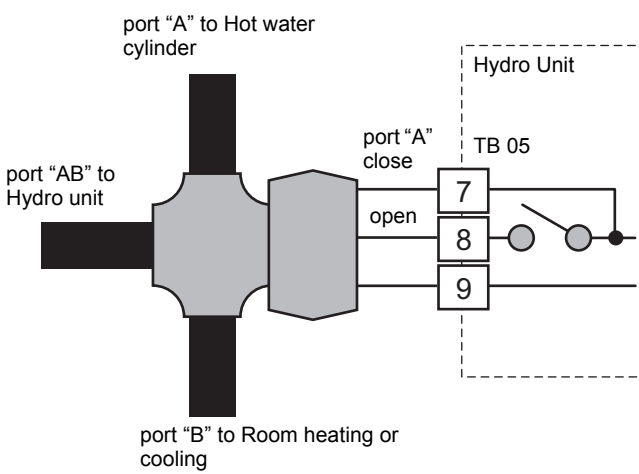
Set the 3-way valve in use with the DIP switch SW13-1 on the Hydro Unit board.

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

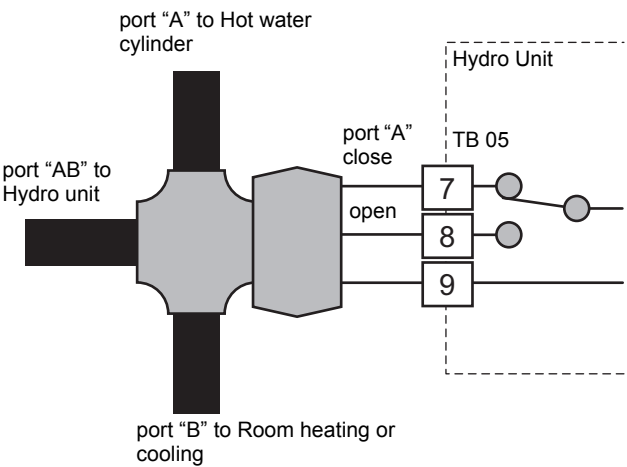
Type 1: SPRING RETURN



Type 2: SPST



Type 3: SPDT



### 3-way mixing valve connection

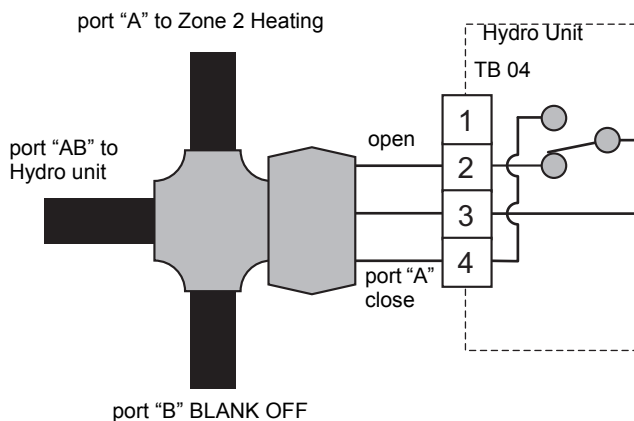
#### Required Actuator Specification

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

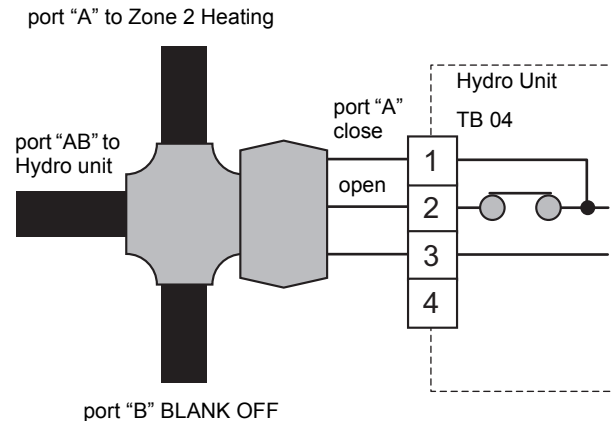
The 3-way mixing valve is used to achieve the temperature differential needed in a 2-zone heating system.

- 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:-

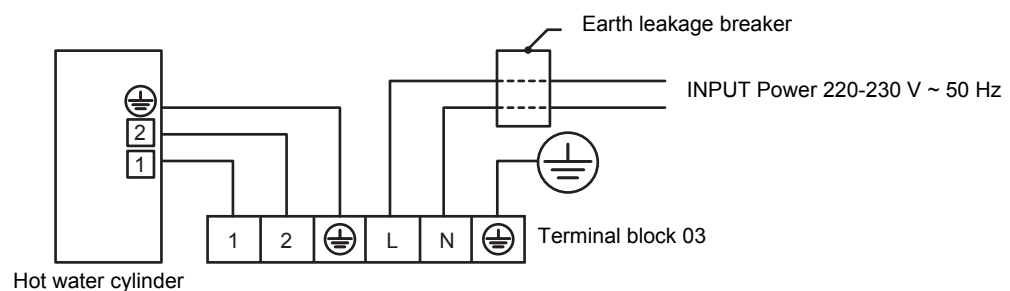
#### Type 1: SPDT



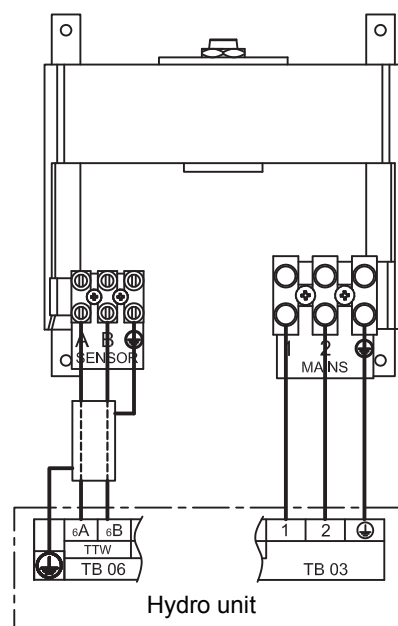
#### Type 2: SPST



### 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<br>LWT=35°C<br>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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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 frequency

\* 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<br>LWT=7°C<br>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<br>(°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<br>(°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<br>(°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<br>LWT=35°C<br>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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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 frequency

\* 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<br>LWT=7°C<br>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<br>(°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<br>(°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<br>(°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<br>LWT=35°C<br>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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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 frequency

\* 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<br>LWT=7°C<br>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<br>(°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<br>(°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<br>(°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<br>LWT=35°C<br>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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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 frequency

\* 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<br>LWT=7°C<br>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<br>(°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<br>(°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<br>(°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<br>LWT=35°C<br>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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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 frequency

\* 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<br>LWT=7°C<br>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<br>(°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<br>(°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<br>(°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<br>LWT=35°C<br>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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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<br>(°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 frequency

\* 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<br>LWT=7°C<br>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<br>(°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<br>(°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<br>(°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.

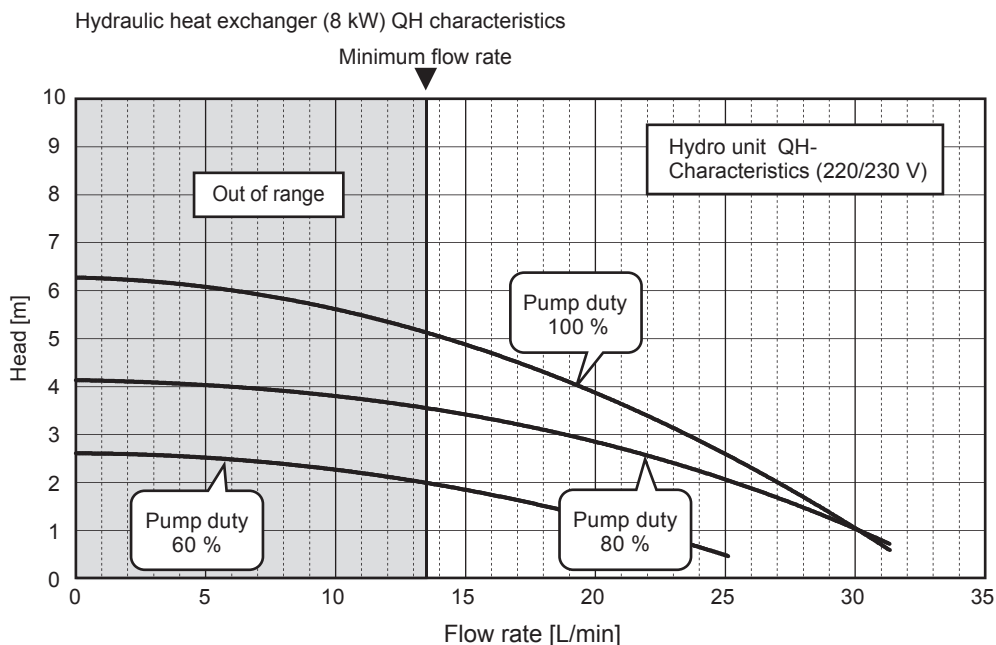
\* Cooling capacity and power input are measured in accordance with EN14511.

TO : Outdoor temperature (DB°C)

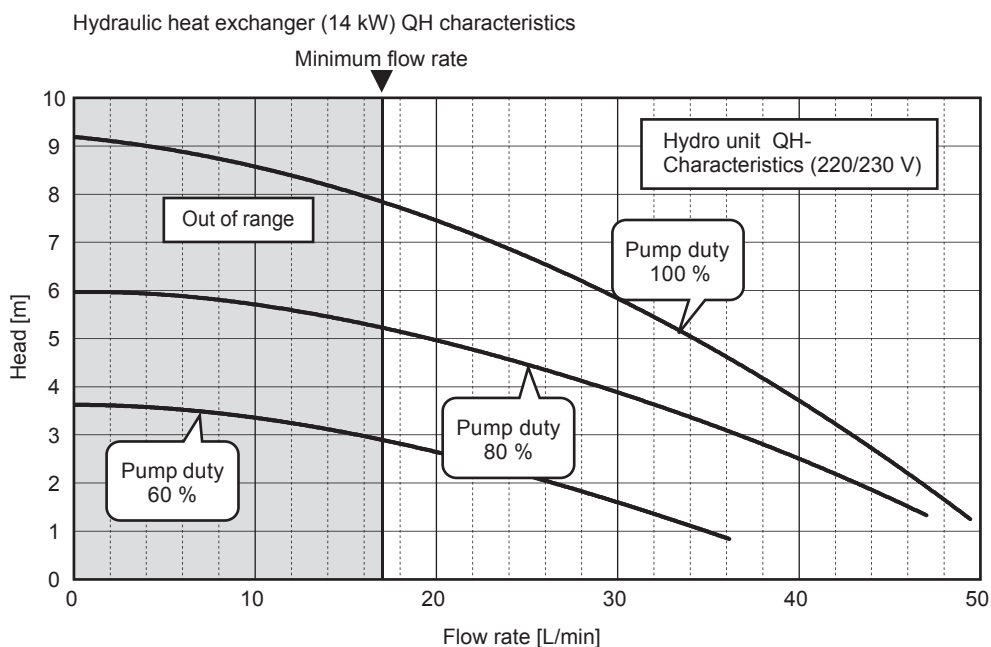
LWT : Leaving water temperature (°C)

## 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, 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                                  |                                              |

### ▼External output board

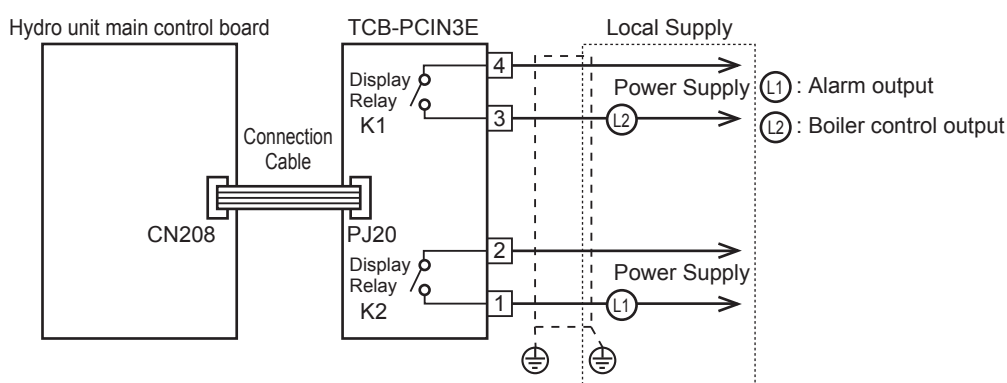
#### Feature

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

#### Function / Electric wiring diagram

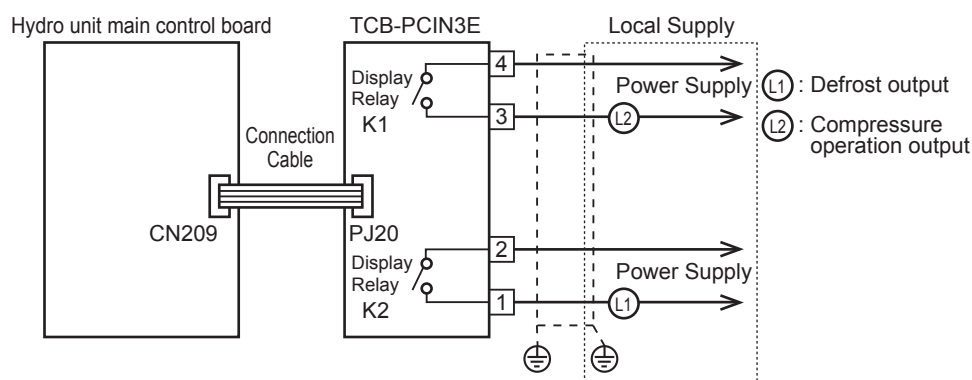
Alarm output : Output enabled when the system is in alarm / fault condition.

Boiler control output : Output enabled when outdoor ambient temperature  $\leq -10\text{ }^{\circ}\text{C}$



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 "ALARM", "BOILER", "OPERATION" and "DEFROST"  
Below AC230V 0.5A (COS  $\phi$  =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.

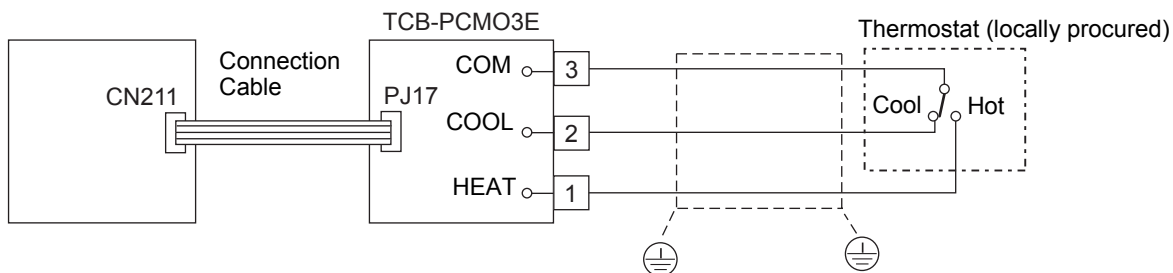
### Function / Electric wiring diagram

#### 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)



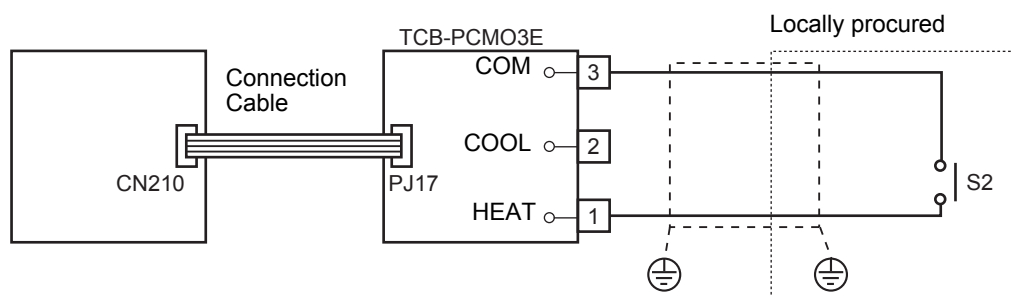
#### Thermostat operation

|       | 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.



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## **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<br>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 (m³/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<br>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 (m³/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<br>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 (m³/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.

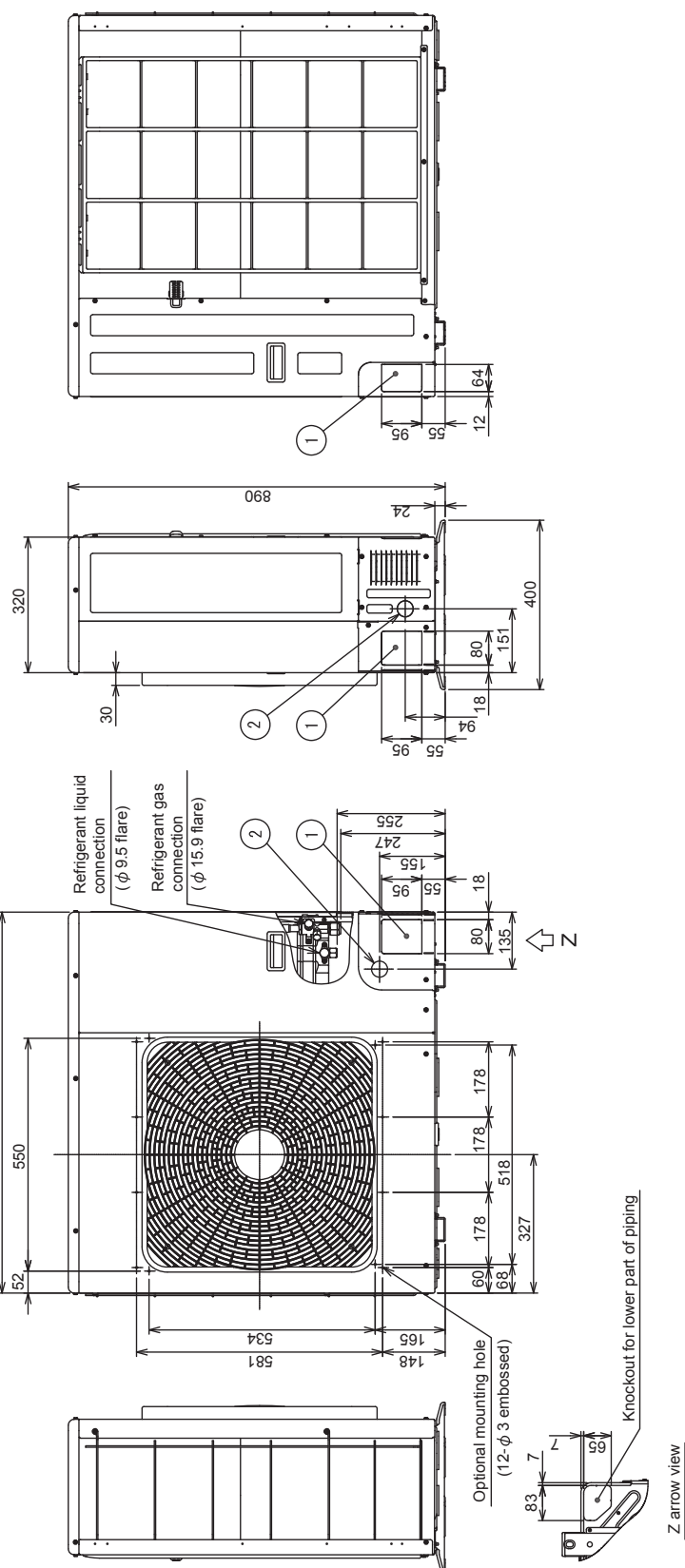
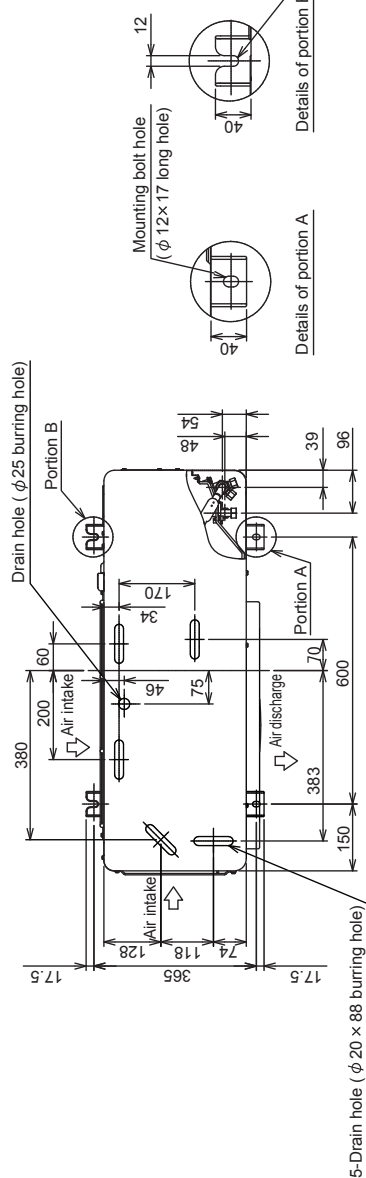
\*6 Check the water piping for leakage under the maximum operating pressure.

## 5-2. Dimension

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

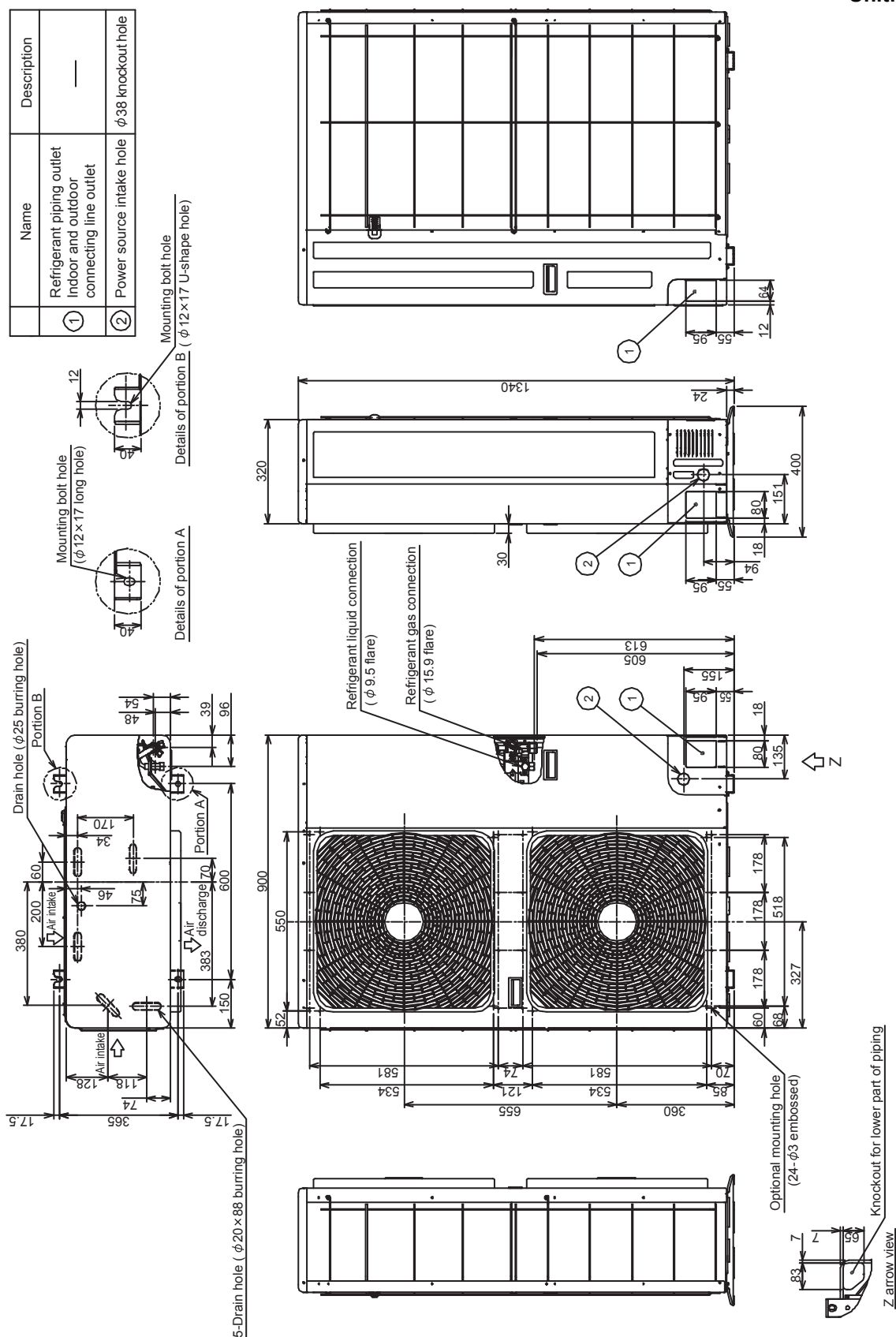
Unit: mm

|   | Name                                                                      | Description        |
|---|---------------------------------------------------------------------------|--------------------|
| ① | Refrigerant piping outlet<br>Indoor and outdoor<br>connecting line outlet | —                  |
| ② | Power source intake hole                                                  | φ 38 knockout hole |



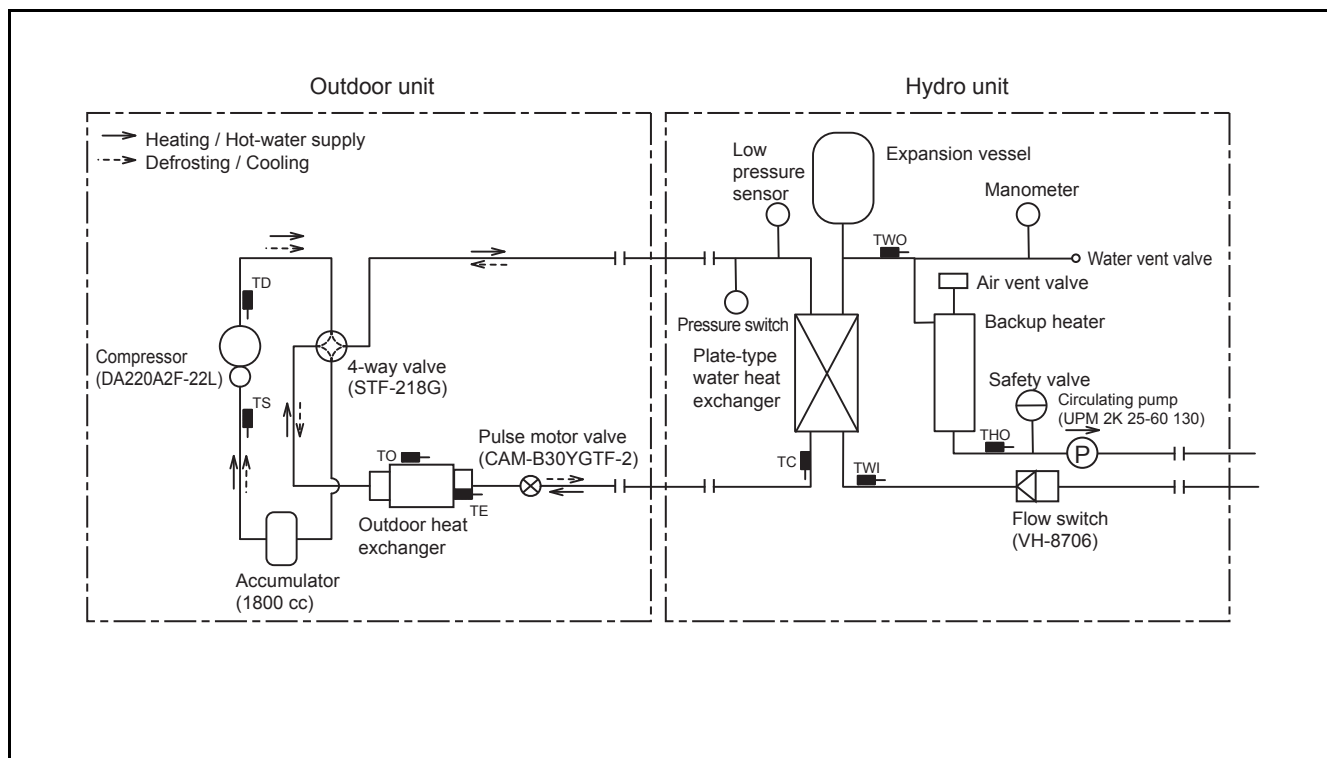
## 5-2-2. HWS-1104H-E, HWS-1404H-E, HWS-1104H8(R)-E, HWS-1404H8(R)-E, HWS-1604H8(R)-E

Unit: mm

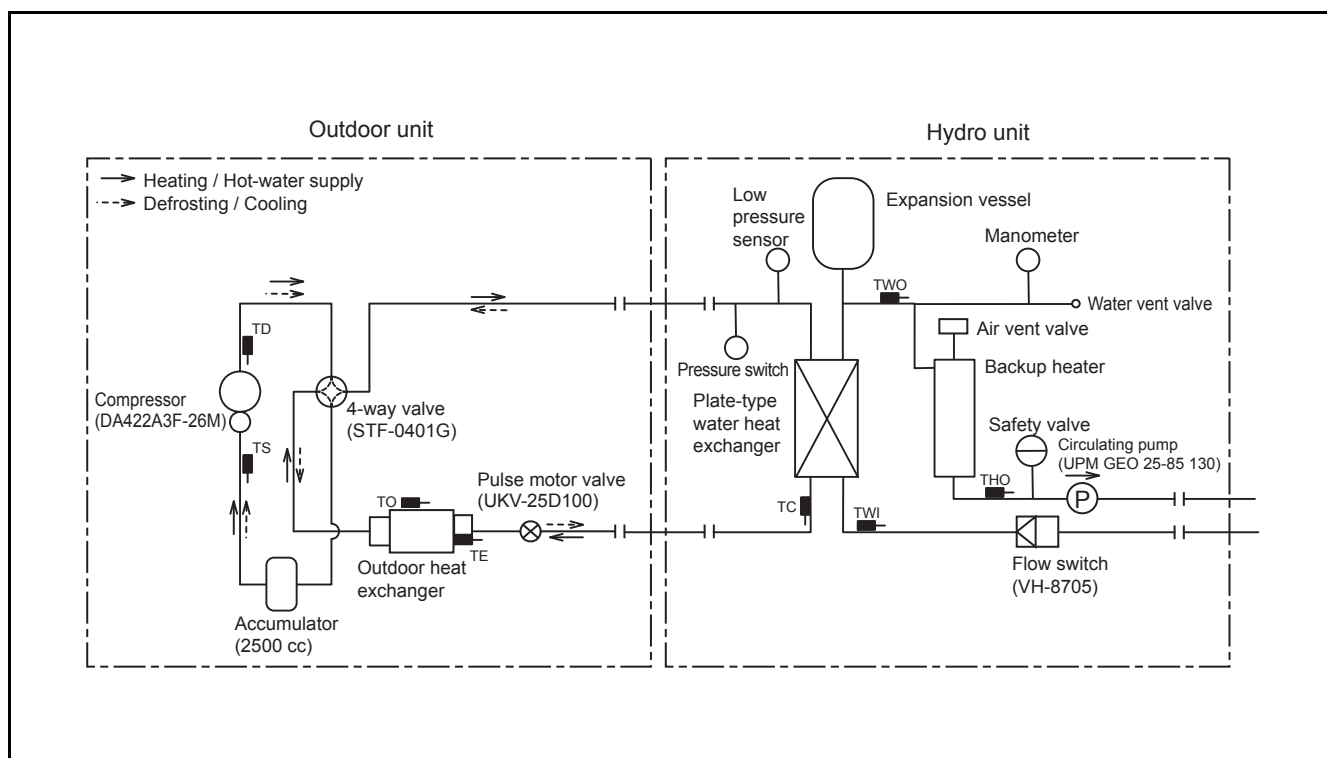


## 5-3. Piping Diagram

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

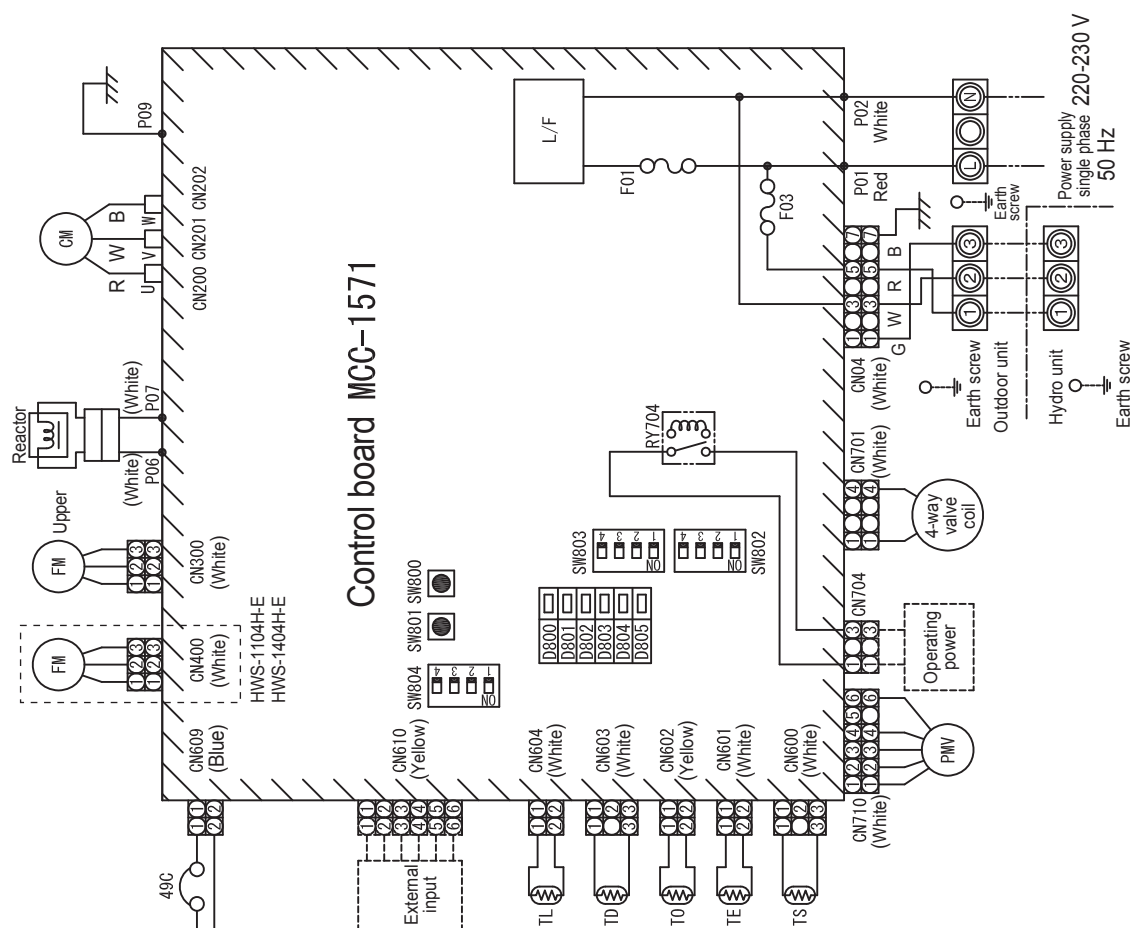
### 5-4-1. Outdoor Unit (Single phase type)

#### ▼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 sensor |
| TS     | Suction temperature sensor   |
| TE     | Heat exchange sensor 1       |
| TL     | Heat exchange sensor 2       |
| T0     | Outdoor temperature sensor   |
| 4F     | Linefilter                   |
| 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

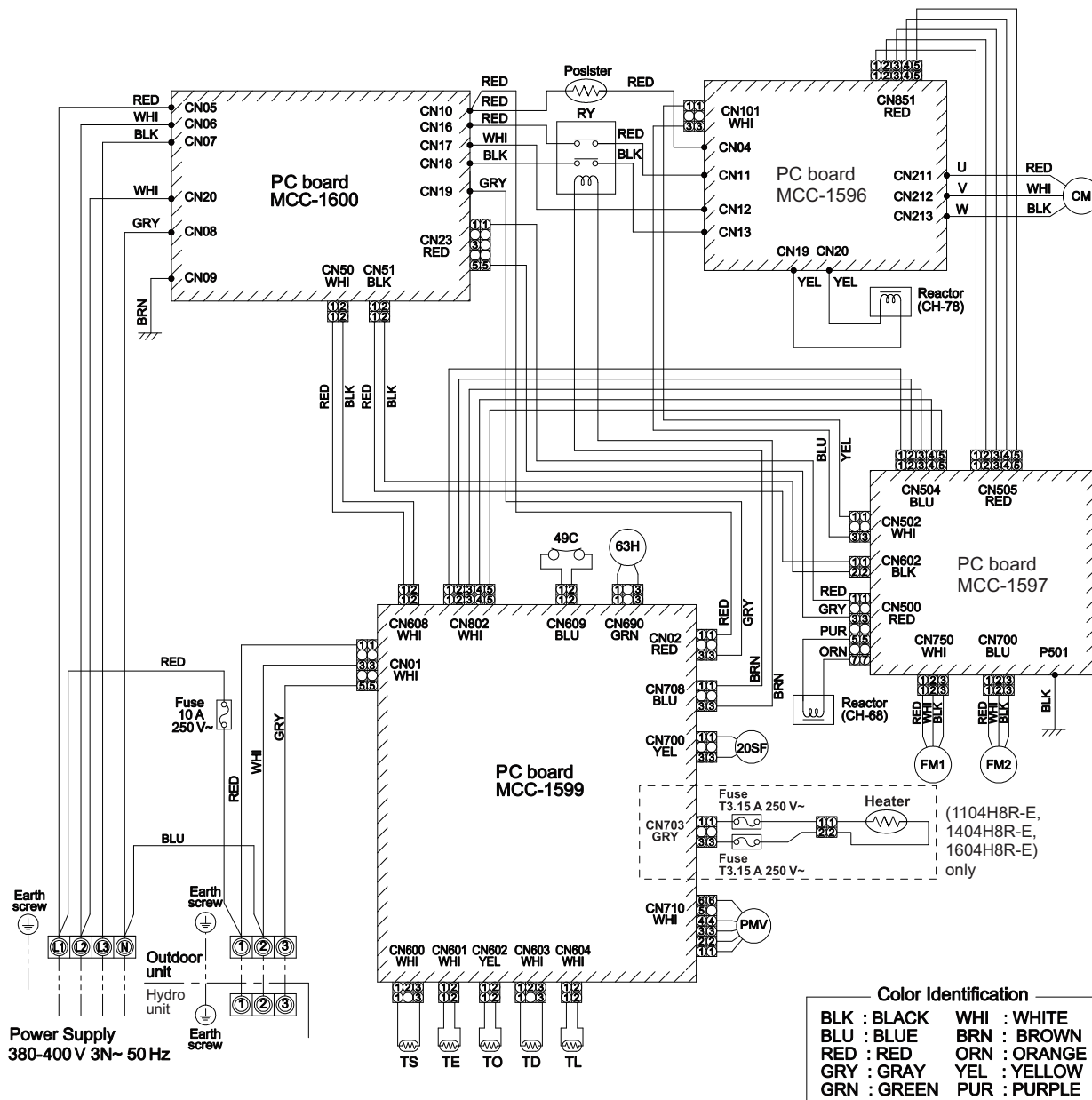
1. ◎ indicates a terminal plate. The number inside indicates the terminal number.
2. The double-dashed line indicates a local wiring while the dashed line indicates an optional accessory or service wiring.
3.  indicates a printed board.
4. For the hydro unit circuit, see the hydro unit wiring diagram.





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

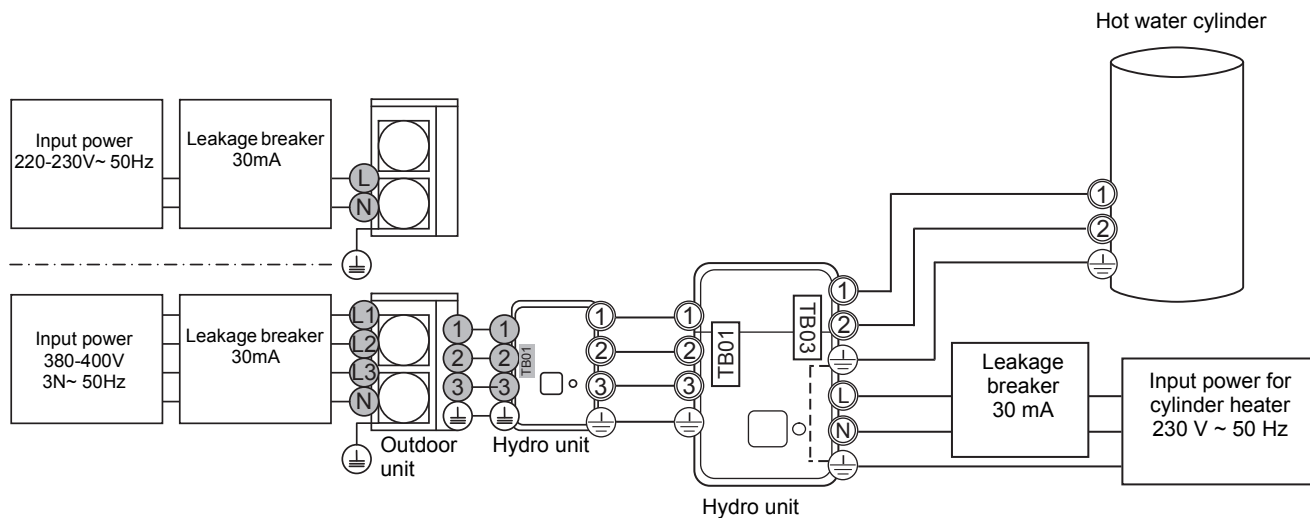
### ▼HWS-1104H8(R)-E, -1404H8(R)-E, -1604H8(R)-E



| 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                               |

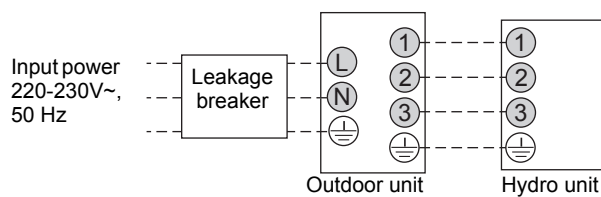
\*HWS-1104H-E, HWS-1404H-E

### 5-4-3. Power line

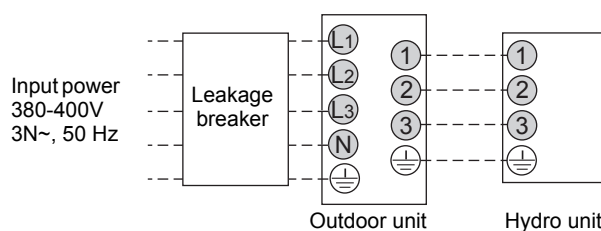


### 5-4-4. Wiring between Hydro Unit and Outdoor Unit

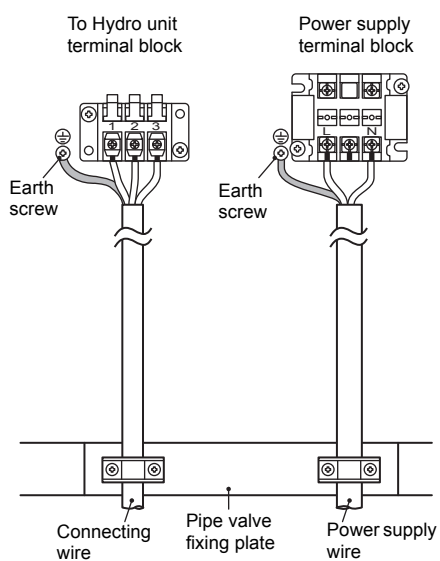
#### ▼ HWS-804H-E, HWS-1104H-E, HWS-1404H-E



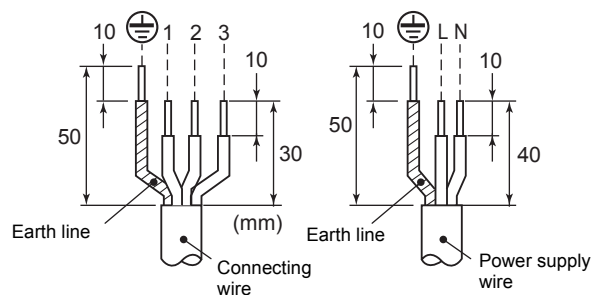
#### ▼ HWS-1104H8-E, H8R-E HWS-1404H8-E, H8R-E HWS-1604H8-E, H8R-E



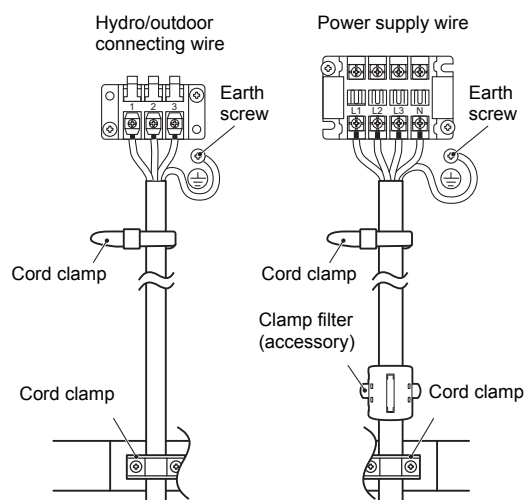
▼ HWS-804H-E  
HWS-1104H-E  
HWS-1404H-E



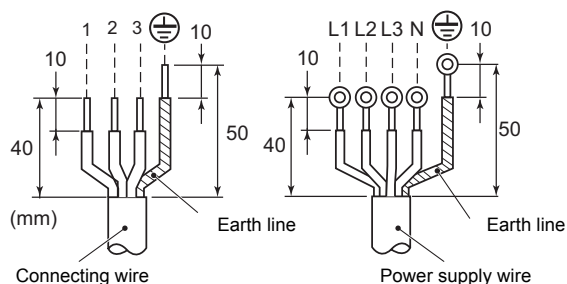
**Stripping length power cord and connecting wire**



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



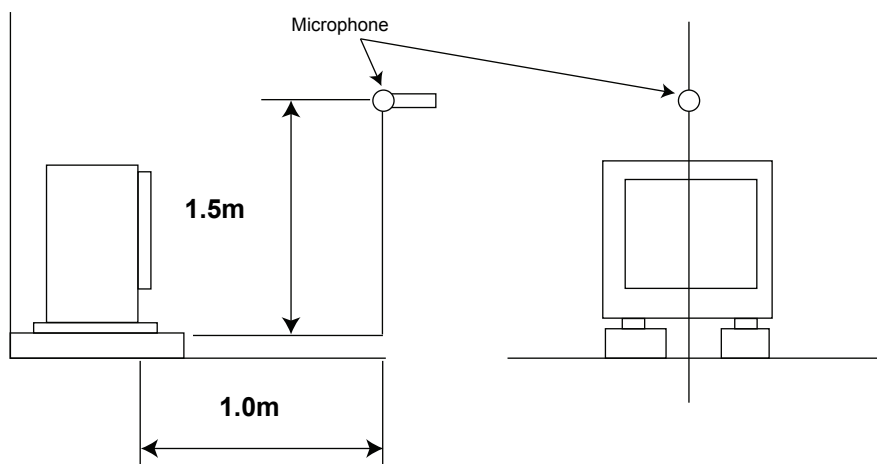
**Stripping length power cord and connecting wire**



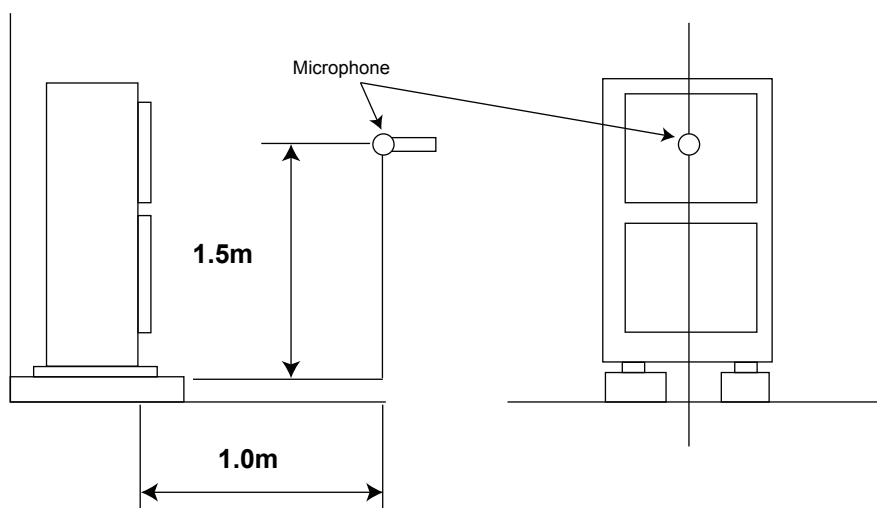
## 5-5. Sound Data

### 5-5-1. Sound pressure level measurement

#### ▼HWS-804H-E



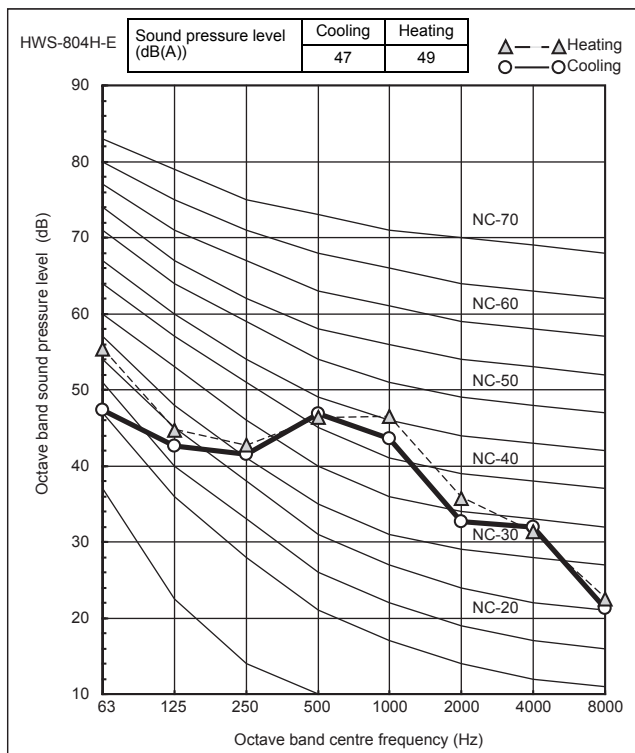
#### ▼HWS-1104H-E, HWS-1404H-E, HWS-1104H8(R)-E, HWS-1404H8(R)-E, HWS-1604H8(R)-E



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

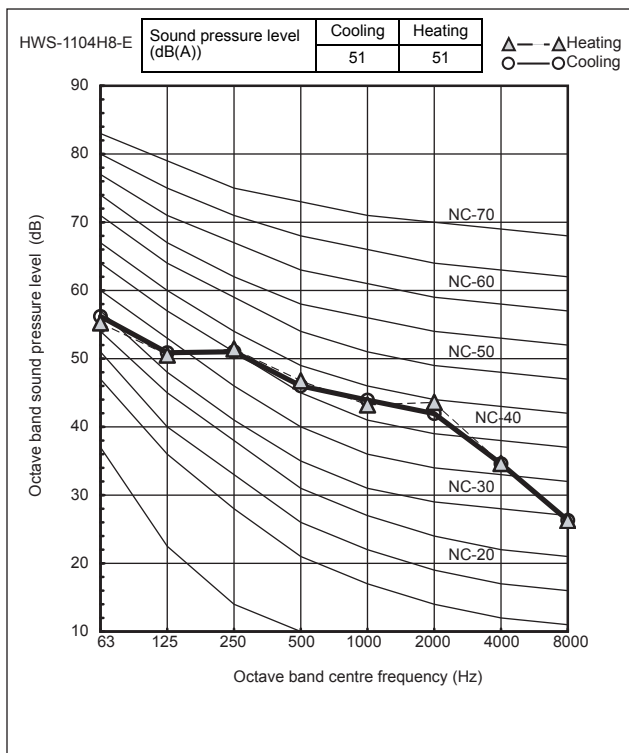
### ▼HWS-804H-E

(8 kw, 230 V ~ 50Hz)



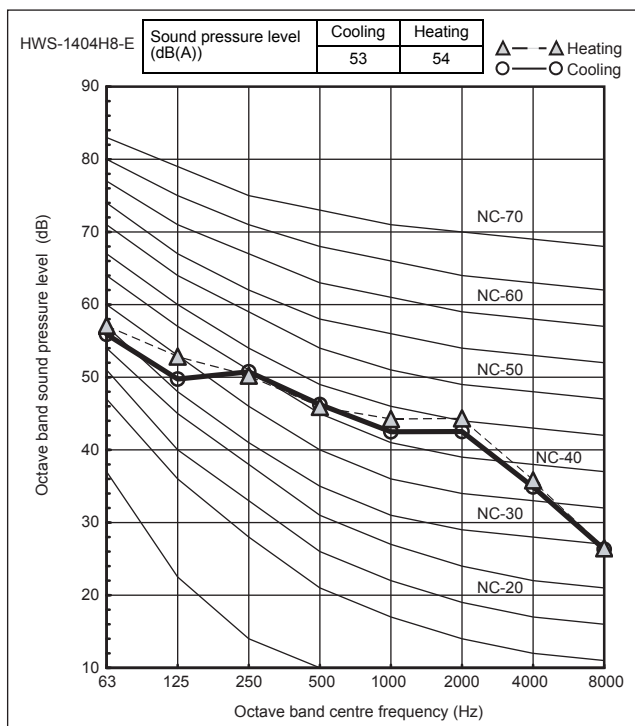
### ▼HWS-1104H-E, 1104H8(R)-E

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



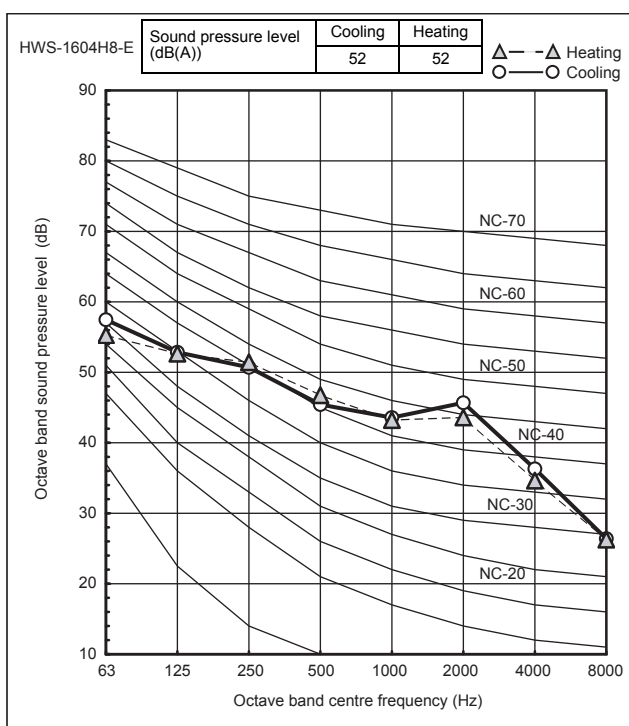
### ▼HWS-1404H-E, 1404H8(R)-E

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



### ▼HWS-1604H8(R)-E

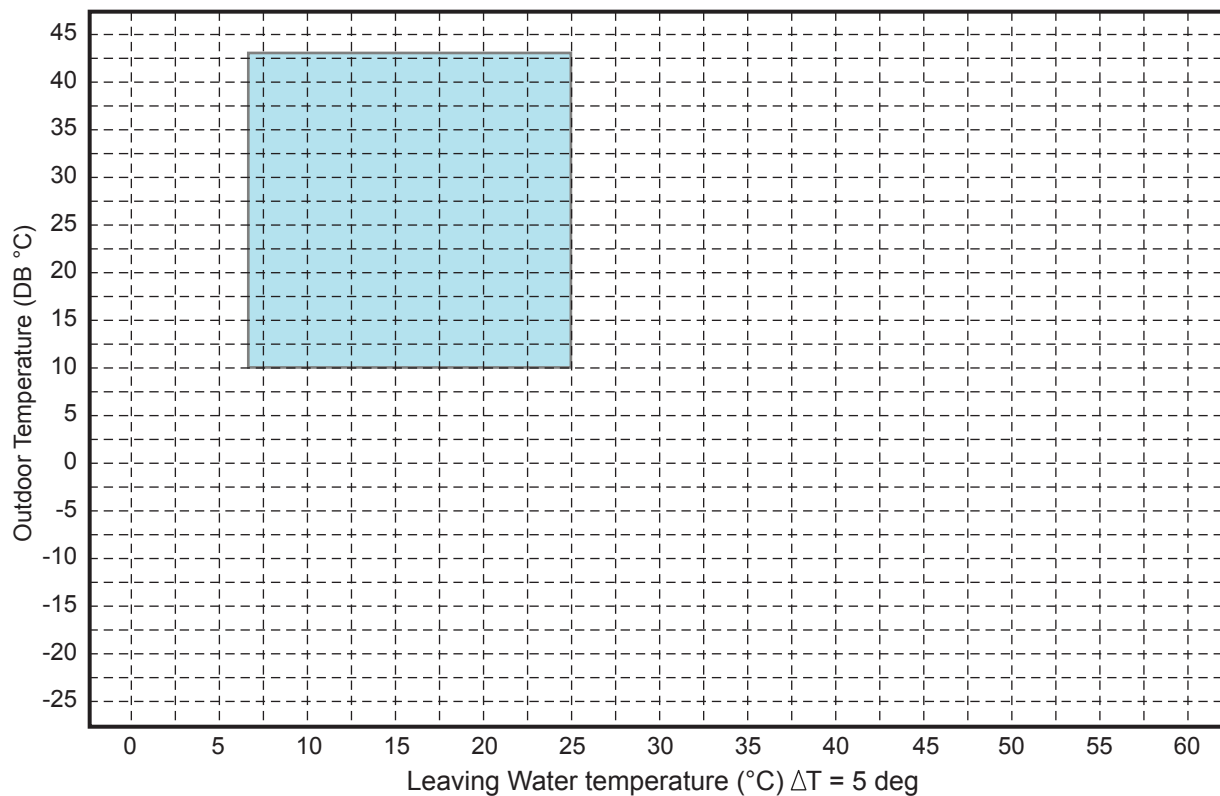
(16kw, 380-400V 3N~ 50Hz)



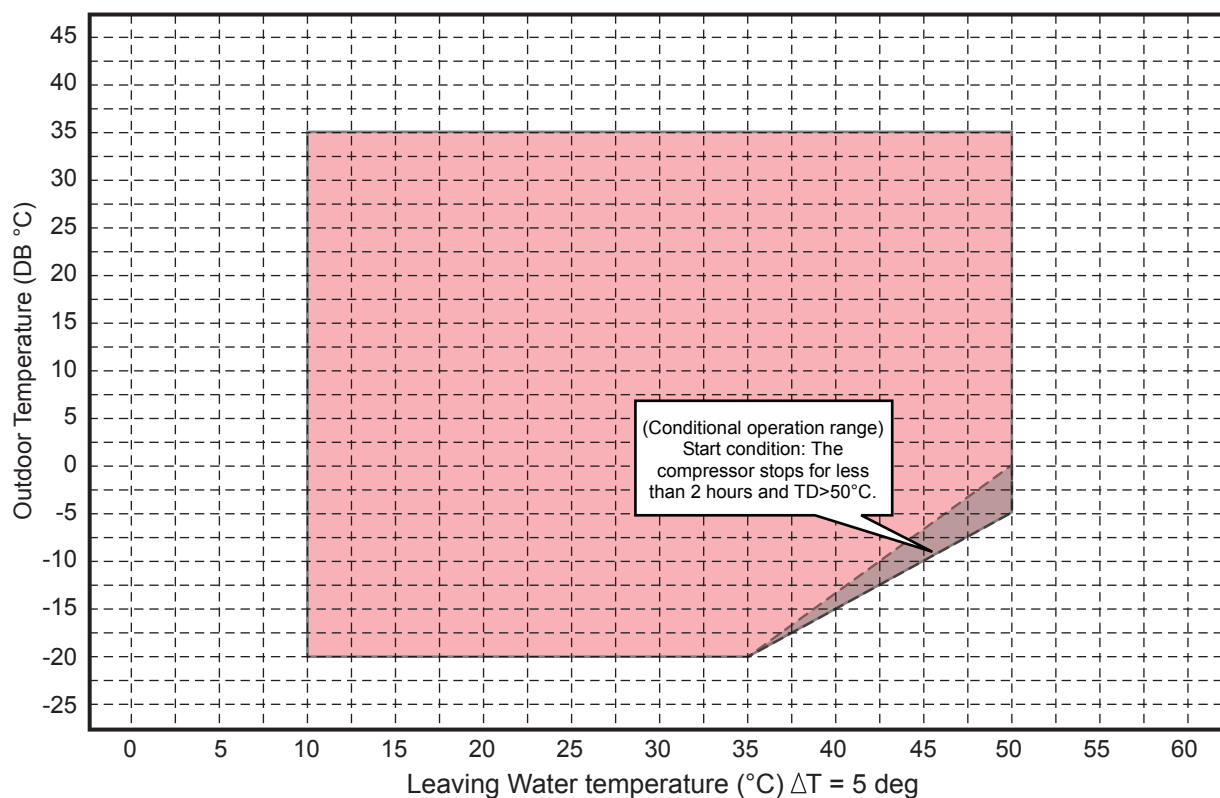
## 5-6. Operation Range

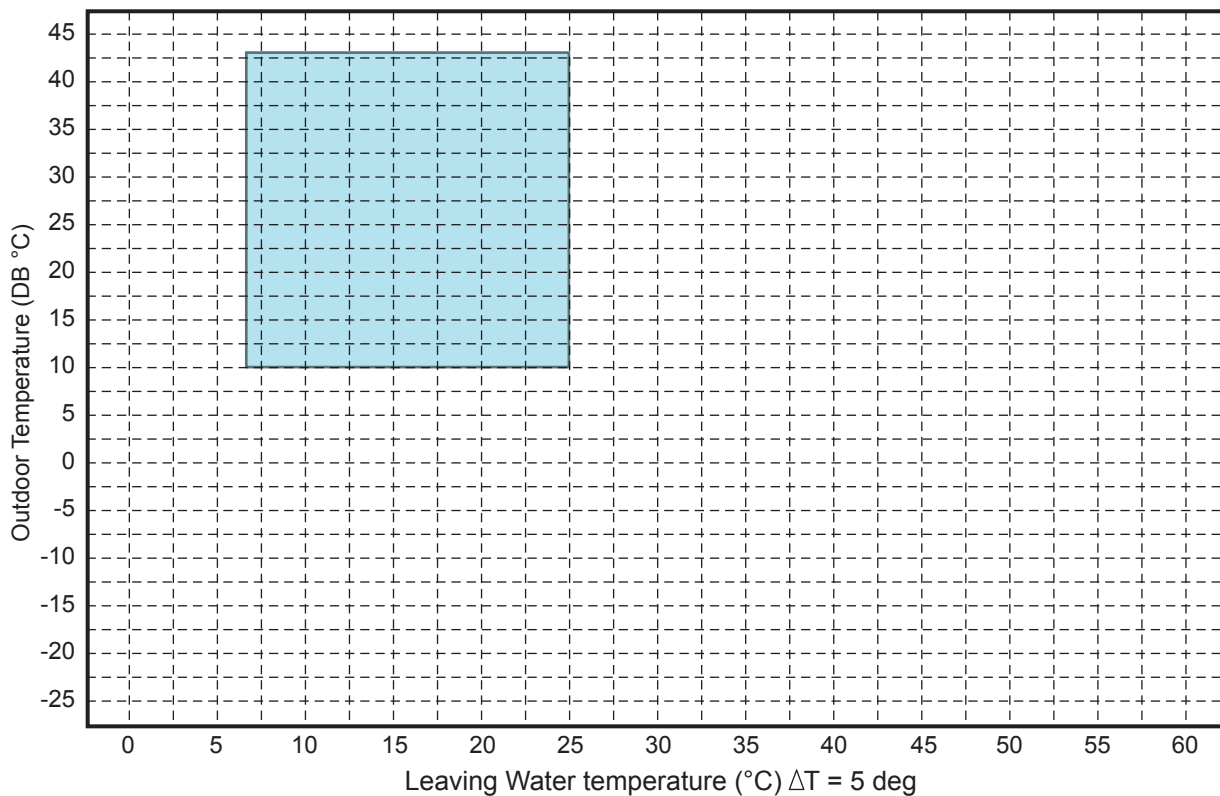
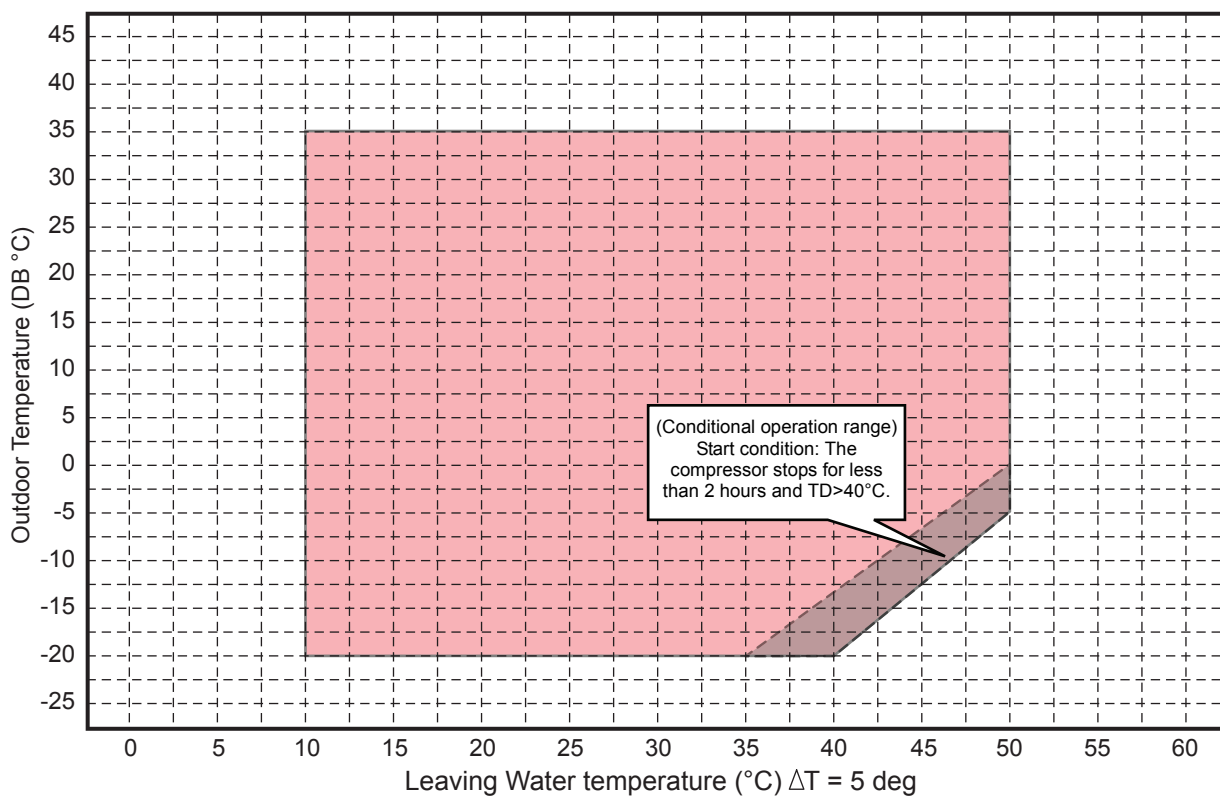
8 kW class

Cooling operation



Heating and hot water operation



**11, 14, 16 kW class****Cooling operation****Heating and hot water operation**

5

**NOTE**

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

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## **6. HOT WATER CYLINDER**



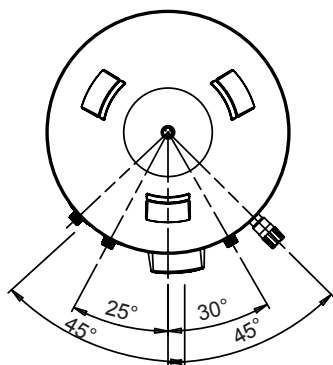
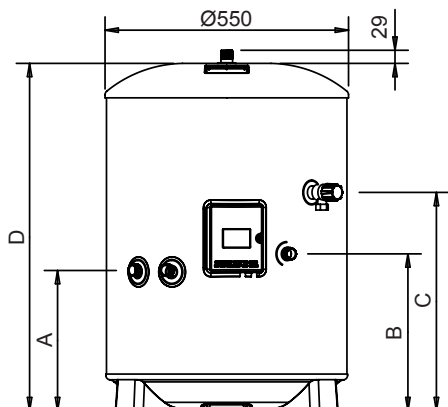
## 6-1. Specification

### Hot water cylinder specifications

| Hot water cylinder                    |                  |        | HWS-1501<br>CSHM3-E                        | HWS-2101<br>CSHM3-E | HWS-3001<br>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<br>Hydro-cylinder          | Inlet            | mm     | 22                                         |                     |                     |
|                                       | Outlet           | mm     | 22                                         |                     |                     |
| Water pipe<br>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

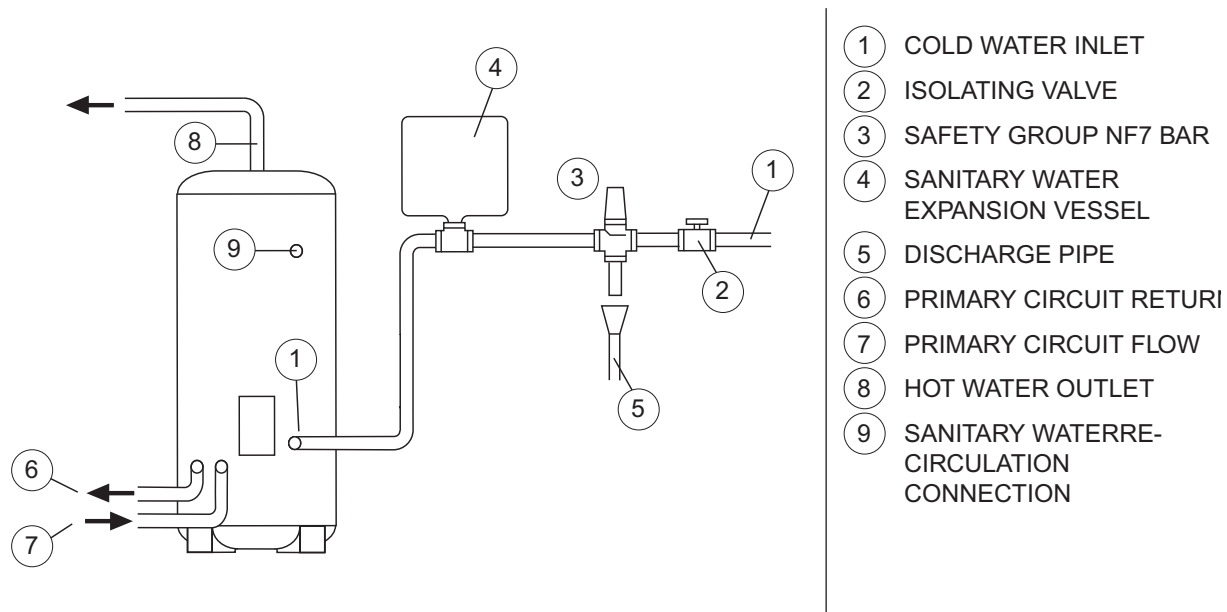
### General dimensions and performance



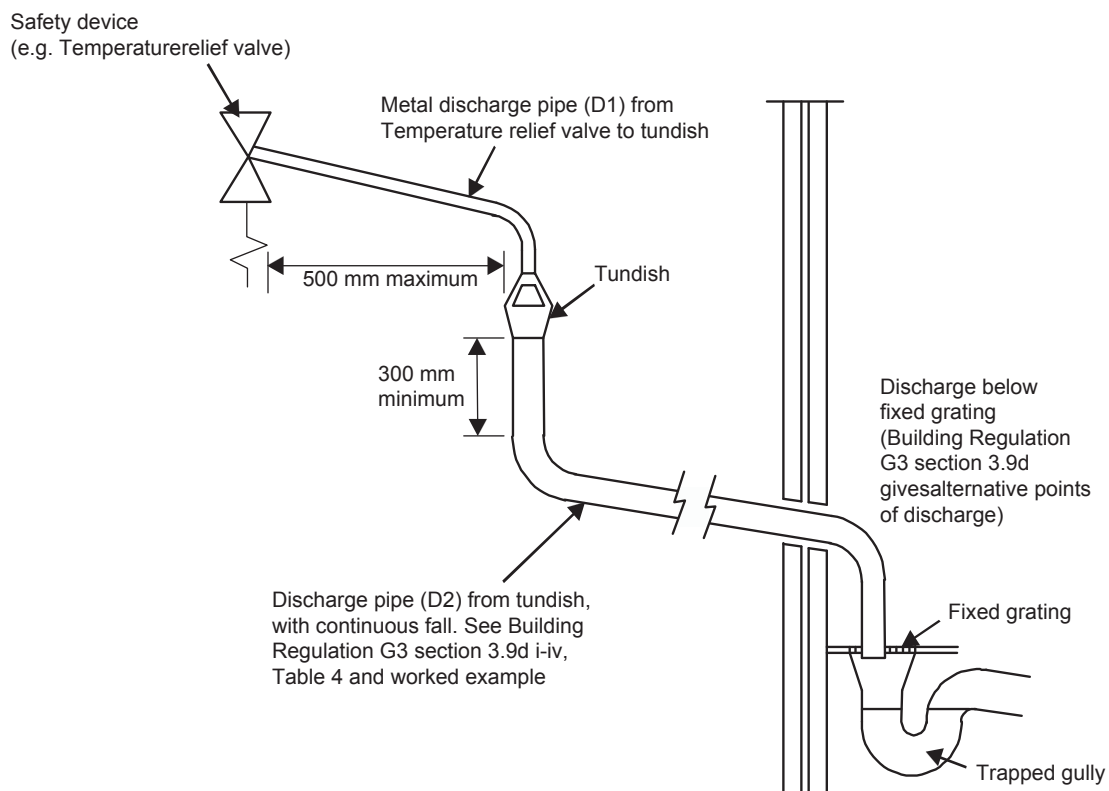
| MODEL                                                                  | HWS-1501CSHM3-E | HWS-2101CSHM3-E | HWS-3001CSHM3-E |
|------------------------------------------------------------------------|-----------------|-----------------|-----------------|
| NOMINAL CAPACITY (litres)                                              | 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 60°C (litres)                                      | 102             | 163             | 254             |
| MIXED HOT WATER OUTPUT AT 40°C (litres)                                | 243             | 329.5           | 476             |
| HEATLOSS (kWh/24h)                                                     | 1.45            | 1.91            | 2.52            |
| HEATING TIME 15°C TO 60°C - 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

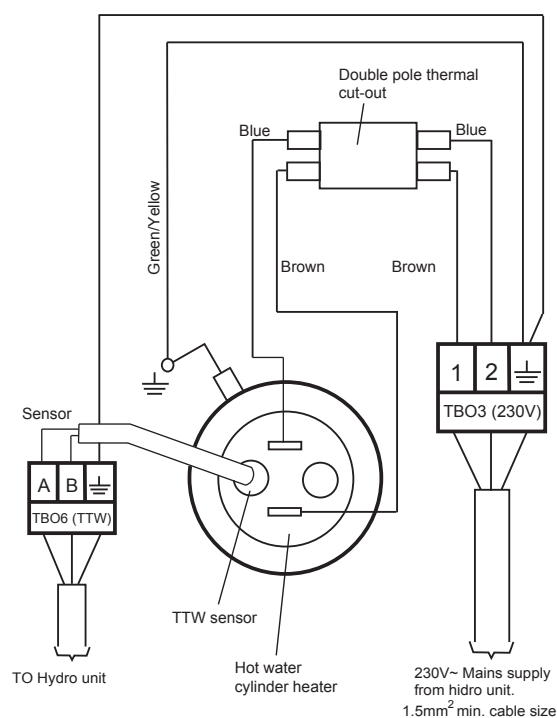


### Typical discharge pipe arrangement (extract from Building Regulation G3 Guidance section 3.9)

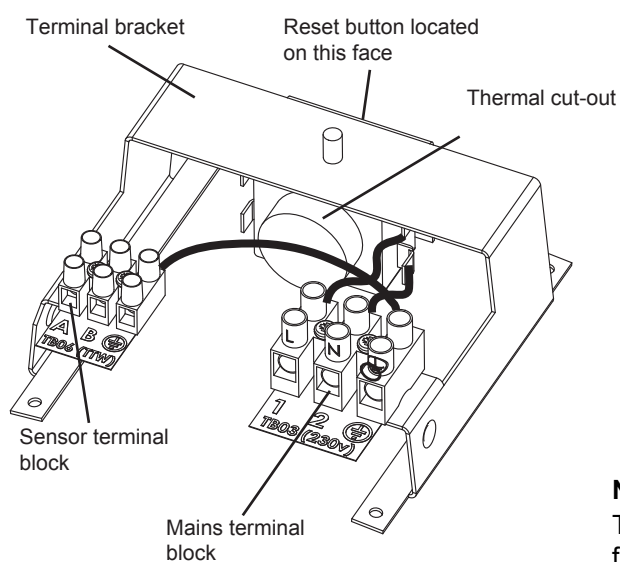


## 6-4. Wiring Diagram

### ▼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

[illegible]

# MEMO

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting or typing. There are no margins, text, or other markings on the page.

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# 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 |                 |

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