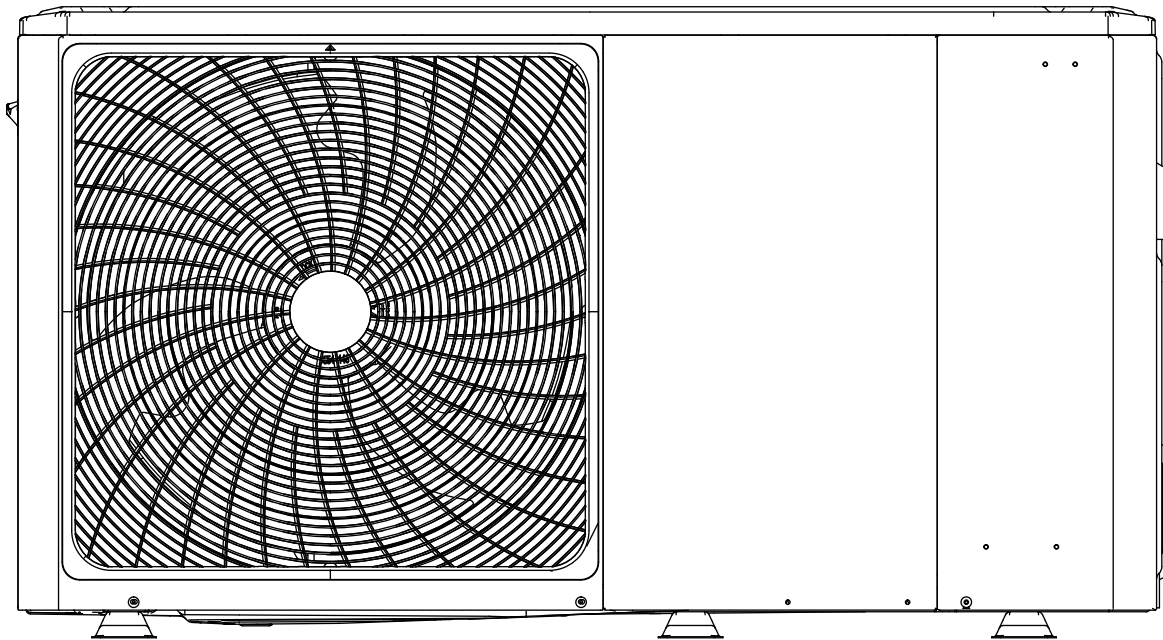


# HYDRO UNIT M

Heat pumps



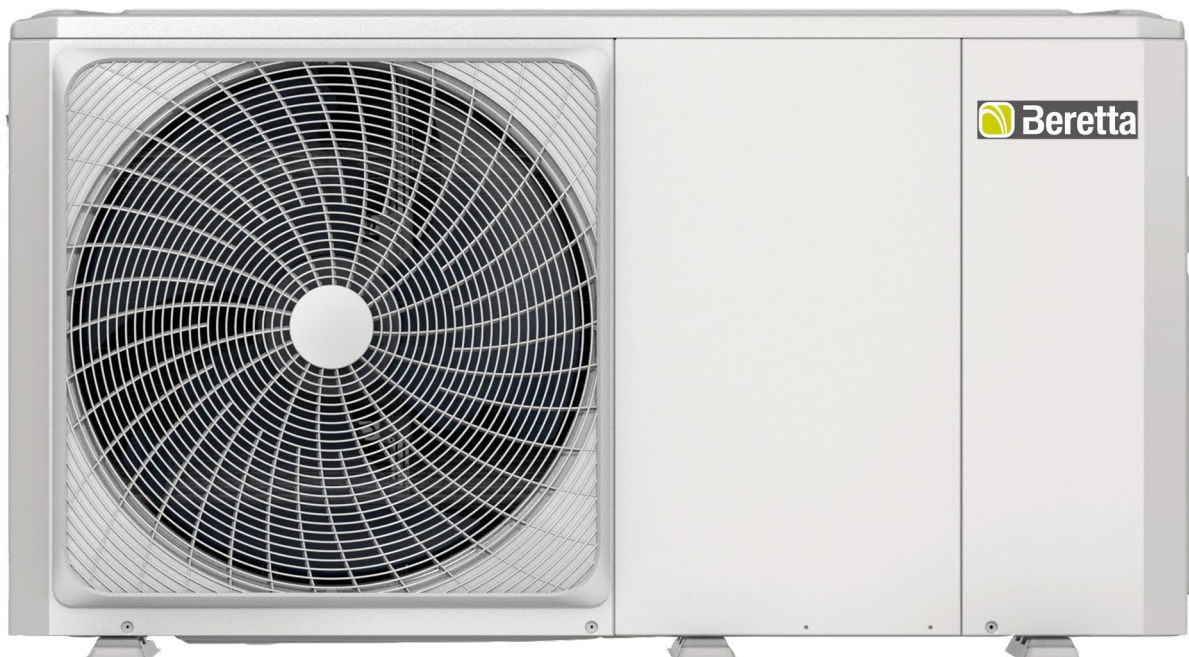


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## General introduction

- These units are used for both heating and cooling applications and for DHW tanks. They can be combined with fan coils, floor heating applications, specific radiators guaranteeing high efficiency at low temperatures, DHW tanks and solar kits (all powered on-site).
- The unit comes with a wired control panel.
- If a built-in backup heater is installed, it can increase the heating capacity when outdoor temperatures are particularly low. It also acts as a backup in the event of operating faults, and as an anti-freeze protection for the external water piping during the winter.



# Specifications guide

Outdoor monobloc air-water heat pump, single-phase and three-phase, with DC-inverter control and MITSUBISHI twin rotary compressor for all sizes to guarantee optimum dynamic balancing and reduce vibration, with continuous modulation from approx. 40% to 120%, designed to work with R32 refrigerant gas.

Given the wide operating range, it's ideal for every type of system, whether hybrid or monovalent. In heating mode in fact, it can supply water at 60°C with an outdoor temperature as low as -15°C, and in cooling mode water at 7°C with an outdoor temperature up to 43°C, and can also produce domestic hot water thanks to storage tanks and fixed coils or heat exchangers for instantaneous DHW production, as it can supply delivery water at 55°C with a temperature of 43°C outside. Top level performance. Up to A+++ for low temperatures and A++ for medium temperatures in temperate zones, according to EN 14825\_2016. All the performance values are certified by HP Keymark, MCS.

Built in accordance with the European eco-design regulations, that define the requisites for the ERP (Energy Related Products) standard in order to improve energy efficiency.

## Unit components

### Structure

- Cabinet made of sheet steel painted with neutral-coloured powders (RAL 7035) to enhance resistance to corrosion caused by atmospheric agents. All the panels are removable.

### Compressor

- A high-efficiency MITSUBISHI twin rotary DC inverter compressor is installed on every size. The two rotating blades of the compressor are dephased by 180°. Along with the DC brushless motor, fitted with a perfectly balanced shaft, they guarantee that noise and vibrations are kept at a minimum even at extremely low operating speeds.
- The compressor has a double protective sound insulation shield to further reduce the noise levels.
- Advanced technology ensuring optimum energy efficiency and characterised by high output levels in peak conditions and optimised efficiency at low and medium compressor speeds. The HDYRO UNIT M heat pump uses DC inverter technology that combines two electronic adjustment logics, pulse amplitude modulation (PAM) and pulse width modulation (PWM), to guarantee optimised compressor operation in all working conditions, minimise temperature fluctuation and ensure perfect comfort adjustment whilst at the same time considerably reducing energy consumption.
- PAM: the modulation of the direct current pulse amplitude commands the compressor to work in maximum load conditions (start-up and peak load) so as to increase the voltage in the case of a fixed frequency. The compressor works at high speed to quickly reach the required temperature.
- PWM: the modulation of the direct current pulse width commands the compressor to work in partial load conditions, adapting the frequency in the case of a fixed voltage. The compressor speed is precisely adjusted and the system offers a high comfort level (no temperature fluctuations) in working conditions of outstanding efficiency.
- The compressor frequency increases constantly until it reaches the maximum level. This ensures that there are no intensity

peaks during the start-up phase, and also means a secure connection to the single-phase current supply even for high-output systems. This compressor start logic makes “soft start” starter devices unnecessary, at the same time guaranteeing that the maximum output is available immediately.

### External coil

The external coil is made of copper pipes and hydrophilic aluminium fins. This solution makes it easier for the water to move towards the bottom of the heat exchanger, by means of gravity.

In particular, this innovation means:

- frost takes longer to form, so it doesn't build up so much on the coil;
- the defrosting phase is more efficient thanks to improved water runoff on the fins (and this boosts operation in heating mode).
- Blue Coating treatment is applied as standard to improve the resistance of the coils to corrosive agents, and is recommended in all applications where there is a moderate risk of corrosion.

### External fan

Single DC brushless fan motor with variable speed for optimum air distribution and extremely low noise levels. The possibility to set two different maximum noise levels.

### Electronic expansion valve

The electronic expansion valve is a dual flow electronic expansion device whose job is to optimise the volume of the refrigerant fluid in the circuit and therefore the overheating issue, preventing the fluid from returning to the compressor. This device further boosts the high efficiency and reliability of the system as it enables it to work even with very low condensation pressure values across the whole operating range.

### Solenoid valve

Given the wide operating range of the unit, the solenoid valve (fully managed by the unit itself) allows the compressor to work at optimum temperature levels at all times.

## General introduction

### Plate heat exchanger

Vertical plate heat exchanger in AISI 316 stainless steel.

### Built-in hydronic unit

The hydronic module is always installed. It's supplied with a variable speed circulation pump, a flow switch, a 3 bar safety valve, an expansion tank and water temperature probes (inlet and outlet). A backup electric heater is available as an accessory. In domestic applications, there is the possibility to connect the inertial storage tank directly underneath the unit to minimise the space taken up.

All the internal hydronic parts are insulated to reduce heat loss. The anti-freeze program contains special functions that use the heat pump and backup heater (if installed) to protect the entire system from the risk of freezing. When the water flow temperature in the system falls to a certain value, the unit heats the water using both the heat pump and the electric heating tap (and also the backup heater, if installed). The anti-freeze protection function is only deactivated when the temperature rises to a certain value.

### Main characteristics

- HYDRO UNIT M provides an extremely high level of energy efficiency in both heating and cooling mode, thereby guaranteeing significant energy savings. The large, high-efficiency coils, together with the optimised circuits, ensure results that meet the European tax relief requisites. Efficiency levels in partial load conditions (seasonal energy efficiency) are the highest in this industrial sector.
- Comfort throughout the year: the ground-breaking technology employed for HYDRO UNIT M means boosted comfort levels for users in terms of both water temperature control and quiet operation. The required temperature is reached quickly and kept constant, without any fluctuations. HYDRO UNIT M offers optimised, personalised comfort levels both in winter and in summer.
- HYDRO UNIT M can work in cooling mode even with low outdoor temperatures (from -25°C, and up to 43°C). To ensure the maximum comfort for the user, the units work in heating mode with outdoor temperatures down to -25°C, whereas in summer

they can produce hot water up to 50°C for DHW applications, with the outdoor temperature as high as 43°C.

- In the ambient comfort modes (both heating and cooling), weekly programming is a standard feature.
- In the DHW modes, weekly programming and an anti-legionella function - with thermal disinfection - are available as standard.
- A multitude of possible system layouts. Thanks to the sensors available as accessories, the unit can manage - for example - a solar system, one or two zones (one of them mixed) and DHW recirculation.
- The possibility to link up to 6 units in a cascade. In cascade configurations, the master unit can be dedicated to DHW production.
- USB port available for updating the technical board software.
- A clean input is available, dedicated to smart grid functions.
- Operation guaranteed with at least 40lt of water in the system.

### Standards

The HYDRO UNIT M heat pumps comply with the following European directives:

- Electromagnetic Compatibility Directive (EMC) 2014/30/EU, and subsequent variations.
- Low Voltage Directive 2014/35/EU.
- Machinery Directive 2006/42/EC, and subsequent variations (only for the 12-16kW model).
- Pressure Equipment Directive (PED) 2014/68/EU (only for the 12-16kW model).
- RoHS Directive 2011/65/EU.
- ErP Directive 2009/125/EC and Regulation (EU) 813/2013.
- F-gas Regulation 2014/517/EU.
- Energy Labelling Regulation 2017/1369/EU.

# Technical data

| Description  | UM                                | HYDRO<br>UNIT M 4             | HYDRO<br>UNIT M 6             | HYDRO<br>UNIT M 8             | HYDRO<br>UNIT M 10            |
|--|-----------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| <b>Performance data in heating</b>                 |                                   |                               |                               |                               |                               |
| <b>Performance in heating (A7°C; W35°C)</b>        |                                   |                               |                               |                               |                               |
| Nominal capacity                                   | kW                                | 4,20                          | 6,35                          | 8,40                          | 10,00                         |
| Input power  | kW                                | 0,82                          | 1,28                          | 1,63                          | 2,02                          |
| COP  |                                   | 5,10                          | 4,95                          | 5,15                          | 4,95                          |
| SCOP (temperate zone)                              |                                   | 4,85                          | 4,95                          | 5,21                          | 5,19                          |
| Seasonal energy efficiency                         | %                                 | 191                           | 195                           | 205                           | 204                           |
| Energy class                                       |                                   | A+++                          | A+++                          | A+++                          | A+++                          |
| <b>Performance in heating (A7°C; W45°C)</b>        |                                   |                               |                               |                               |                               |
| Nominal capacity                                   | kW                                | 4,30                          | 6,30                          | 8,10                          | 10,00                         |
| Input power  | kW                                | 1,13                          | 1,70                          | 2,10                          | 2,67                          |
| COP  |                                   | 3,80                          | 3,70                          | 3,85                          | 3,75                          |
| <b>Performance in heating (A7°C; W55°C)</b>        |                                   |                               |                               |                               |                               |
| Nominal capacity                                   | kW                                | 4,40                          | 6,00                          | 7,50                          | 9,50                          |
| Input power  | kW                                | 1,49                          | 2,03                          | 2,36                          | 3,06                          |
| COP  |                                   | 2,95                          | 2,95                          | 3,18                          | 3,10                          |
| SCOP (temperate zone)                              |                                   | 3,31                          | 3,52                          | 3,36                          | 3,49                          |
| Seasonal energy efficiency                         | %                                 | 130                           | 139                           | 132                           | 137                           |
| Energy class                                       |                                   | A++                           | A++                           | A++                           | A++                           |
| <b>Performance data in cooling</b>                 |                                   |                               |                               |                               |                               |
| <b>Performance in cooling (A35°C; W7°C)</b>        |                                   |                               |                               |                               |                               |
| Nominal capacity                                   | kW                                | 4,70                          | 7,00                          | 7,45                          | 8,20                          |
| Input power  | kW                                | 1,36                          | 2,33                          | 2,22                          | 2,52                          |
| EER  |                                   | 3,45                          | 3,00                          | 3,35                          | 3,25                          |
| SEER   |                                   | 4,99                          | 5,34                          | 5,83                          | 5,98                          |
| Seasonal energy efficiency                         | %                                 | 196                           | 210                           | 230                           | 235                           |
| <b>Performance in cooling (A35°C; W18°C)</b>       |                                   |                               |                               |                               |                               |
| Nominal capacity                                   | kW                                | 4,50                          | 6,50                          | 8,30                          | 9,90                          |
| Input power  | kW                                | 0,82                          | 1,35                          | 1,64                          | 2,18                          |
| EER  |                                   | 5,50                          | 4,80                          | 5,05                          | 4,55                          |
| <b>Electrical characteristics</b>                  |                                   |                               |                               |                               |                               |
| Electrical supply                                  | V/ph/Hz                           | 230/1/50                      | 230/1/50                      | 230/1/50                      | 230/1/50                      |
| Total maximum input power <sup>(1)</sup>           | kW                                | 2,30                          | 2,70                          | 3,40                          | 3,70                          |
| Total maximum input current <sup>(2)</sup>         | A                                 | 12,00                         | 14,00                         | 16,00                         | 17,00                         |
| <b>Compressor</b>                                  |                                   |                               |                               |                               |                               |
| Compressor   | Type/brand                        | DC twin rotary/<br>Mitsubishi | DC twin rotary/<br>Mitsubishi | DC twin rotary/<br>Mitsubishi | DC twin rotary/<br>Mitsubishi |
| Adjustment   | Type                              | Inverter<br>modulating        | Inverter<br>modulating        | Inverter<br>modulating        | Inverter<br>modulating        |
| Minimum capacity control                           | %                                 | 55                            | 43                            | 40                            | 38                            |
| Refrigerant  | Type                              | R32                           | R32                           | R32                           | R32                           |
| GWP  | CO <sub>2</sub> equiv.<br>in t/kg | 675                           | 675                           | 675                           | 675                           |
| Refrigerant load                                   | kg                                | 1,40                          | 1,40                          | 1,40                          | 1,40                          |
| Control box load                                   | CO <sub>2</sub> equiv.<br>in t    | 0,95                          | 0,95                          | 0,95                          | 0,95                          |
| Number of circuits                                 | no.                               | 1                             | 1                             | 1                             | 1                             |
| Hermetically sealed control box (EU reg. 517_2014) | yes / no                          | yes                           | yes                           | yes                           | yes                           |

## Technical data

| Description                         | UM                | HYDRO<br>UNIT M 4  | HYDRO<br>UNIT M 6  | HYDRO<br>UNIT M 8  | HYDRO<br>UNIT M 10   |
|-------------------------------------|-------------------|--|--|--|--|
| <b>Fan</b>                          |                   |  |  |  |  |
| Fan                                 | Type              | DC axial   | DC axial   | DC axial   | DC axial   |
| Quantity                            | no.               | 1  | 1  | 1  | 1  |
| Maximum air flow rate               | m <sup>3</sup> /h | 2770   | 2770   | 4030   | 4030   |
| <b>Heat exchanger (source side)</b> |                   |  |  |  |  |
| Heat exchanger (source side)        | Type              | Pipes in copper, fins in aluminium with anti-corrosion treatment | Pipes in copper, fins in aluminium with anti-corrosion treatment | Pipes in copper, fins in aluminium with anti-corrosion treatment | Pipes in copper, fins in aluminium with anti-corrosion treatment |
| <b>Circulation pump</b>             |                   |  |  |  |  |
| Circulation pump                    | Type              | Variable speed centrifuge  | Variable speed centrifuge  | Variable speed centrifuge  | Variable speed centrifuge  |
| Nominal delivery                    | m <sup>3</sup> /h | 0,72   | 1,09   | 1,44   | 1,72   |
| Maximum operating pressure          | bar               | 3  | 3  | 3  | 3  |
| Maximum input power                 | kW                | 0,043  | 0,043  | 0,043  | 0,043  |
| Maximum input current               | A                 | 0,44   | 0,44   | 0,44   | 0,44   |
| Expansion tank volume               | l                 | 8,00   | 8,00   | 8,00   | 8,00   |
| <b>Heat exchanger (system side)</b> |                   |  |  |  |  |
| Heat exchanger (system side)        | Type              | Plate, in stainless steel  | Plate, in stainless steel  | Plate, in stainless steel  | Plate, in stainless steel  |
| Total water content                 | l                 | 2,16   | 2,16   | 2,44   | 2,44   |
| <b>Sound data</b>                   |                   |  |  |  |  |
| Sound output <sup>(3)</sup>         | dB(A)             | 55   | 58   | 59   | 60   |
| Sound pressure at 1m <sup>(4)</sup> | dB(A)             | 45   | 47,5   | 48,5   | 50,5   |
| <b>Weight</b>                       |                   |  |  |  |  |
| Net weight                          | kg                | 86   | 86   | 105  | 105  |

The performance values comply with Standards UNI EN 14511:2018 and UNI EN 14825:2016. Performance data certified by HP Keymark.

(1) Input power from compressors and from fans and circulator in the maximum operating conditions, with the nominal power supply voltage.

(2) Maximum unit operating current with the nominal power supply voltage.

(3) Sound emission values declared, in accordance with standard EN 12102-1.

(4) Measured in a semi-anechoic chamber, at a distance of 1m from the front of the unit and a height from the floor equal to (1+H)/2, where H is the height of the unit expressed in metres.

## Technical data

| Description  | UM                             | HYDRO<br>UNIT M 12            | HYDRO<br>UNIT M 14            | HYDRO<br>UNIT M 16            | HYDRO<br>UNIT M 12T | HYDRO<br>UNIT M 14T | HYDRO<br>UNIT M 16T           |
|--|--------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------|---------------------|-------------------------------|
| <b>Performance data in heating</b>                 |                                |                               |                               |                               |                     |                     |                               |
| <b>Performance in heating (A7°C; W35°C)</b>        |                                |                               |                               |                               |                     |                     |                               |
| Nominal capacity                                   | kW                             | 12,10                         | 14,50                         | 15,90                         | 12,10               | 14,50               | 15,90                         |
| Input power  | kW                             | 2,44                          | 3,15                          | 3,53                          | 2,44                | 3,15                | 3,53                          |
| COP  |                                | 4,95                          | 4,60                          | 4,50                          | 4,95                | 4,60                | 4,50                          |
| SCOP (temperate zone)                              |                                | 4,81                          | 4,72                          | 4,62                          | 4,81                | 4,72                | 4,62                          |
| Seasonal energy efficiency                         | %                              | 189                           | 186                           | 182                           | 189                 | 186                 | 182                           |
| Energy class                                       |                                | A+++                          | A+++                          | A+++                          | A+++                | A+++                | A+++                          |
| <b>Performance in heating (A7°C; W45°C)</b>        |                                |                               |                               |                               |                     |                     |                               |
| Nominal capacity                                   | kW                             | 12,30                         | 14,10                         | 16,00                         | 12,30               | 14,10               | 16,00                         |
| Input power  | kW                             | 3,32                          | 3,92                          | 4,57                          | 3,32                | 3,92                | 4,57                          |
| COP  |                                | 3,70                          | 3,60                          | 3,50                          | 3,70                | 3,60                | 3,50                          |
| <b>Performance in heating (A7°C; W55°C)</b>        |                                |                               |                               |                               |                     |                     |                               |
| Nominal capacity                                   | kW                             | 11,90                         | 13,80                         | 16,00                         | 11,90               | 13,80               | 16,00                         |
| Input power  | kW                             | 3,90                          | 4,68                          | 5,61                          | 3,90                | 4,68                | 5,61                          |
| COP  |                                | 3,05                          | 2,95                          | 2,85                          | 3,05                | 2,95                | 2,85                          |
| SCOP (temperate zone)                              |                                | 3,45                          | 3,47                          | 3,41                          | 3,45                | 3,47                | 3,41                          |
| Seasonal energy efficiency                         | %                              | 136                           | 137                           | 134                           | 136                 | 137                 | 134                           |
| Energy class                                       |                                | A++                           | A++                           | A++                           | A++                 | A++                 | A++                           |
| <b>Performance data in cooling</b>                 |                                |                               |                               |                               |                     |                     |                               |
| <b>Performance in cooling (A35°C; W7°C)</b>        |                                |                               |                               |                               |                     |                     |                               |
| Nominal capacity                                   | kW                             | 11,50                         | 12,40                         | 14,00                         | 11,50               | 12,40               | 14,00                         |
| Input power  | kW                             | 4,18                          | 4,96                          | 5,60                          | 4,18                | 4,96                | 5,60                          |
| EER  |                                | 2,75                          | 2,50                          | 2,50                          | 2,75                | 2,50                | 2,50                          |
| SEER   |                                | 4,89                          | 4,86                          | 4,69                          | 4,86                | 4,83                | 4,67                          |
| Seasonal energy efficiency                         | %                              | 193                           | 191                           | 185                           | 191                 | 190                 | 184                           |
| <b>Performance in cooling (A35°C; W18°C)</b>       |                                |                               |                               |                               |                     |                     |                               |
| Nominal capacity                                   | kW                             | 12,00                         | 13,50                         | 14,20                         | 12,00               | 13,50               | 14,20                         |
| Input power  | kW                             | 3,04                          | 3,75                          | 4,38                          | 3,04                | 3,75                | 4,38                          |
| EER  |                                | 3,95                          | 3,61                          | 3,61                          | 3,95                | 3,61                | 3,61                          |
| <b>Electrical characteristics</b>                  |                                |                               |                               |                               |                     |                     |                               |
| Electrical supply                                  | V/ph/Hz                        | 230/1/50                      | 230/1/50                      | 230/1/50                      | 400/3/50            | 400/3/50            | 400/3/50                      |
| Total maximum input power <sup>(1)</sup>           | kW                             | 5,50                          | 5,80                          | 6,20                          | 5,50                | 5,80                | 6,20                          |
| Total maximum input current <sup>(2)</sup>         | A                              | 25,00                         | 26,00                         | 27,00                         | 10,00               | 11,00               | 12,00                         |
| <b>Compressor</b>                                  |                                |                               |                               |                               |                     |                     |                               |
| Compressor   | Type/brand                     | DC twin rotary/<br>Mitsubishi | DC twin rotary/<br>Mitsubishi | DC twin rotary/<br>Mitsubishi |                     |                     | DC twin rotary/<br>Mitsubishi |
| Adjustment   | Type                           | Inverter modulating           | Inverter modulating           | Inverter modulating           |                     |                     | Inverter modulating           |
| Minimum capacity control                           | %                              | 46                            | 41                            | 40                            | 46                  | 41                  | 40                            |
| Refrigerant  | Type                           | R32                           | R32                           | R32                           | R32                 | R32                 | R32                           |
| GWP  | CO <sub>2</sub> equiv. in t/kg | 675                           | 675                           | 675                           | 675                 | 675                 | 675                           |
| Refrigerant load                                   | kg                             | 1,75                          | 1,75                          | 1,75                          | 1,75                | 1,75                | 1,75                          |
| Control box load                                   | CO <sub>2</sub> equiv. in t    | 1,18                          | 1,18                          | 1,18                          | 1,18                | 1,18                | 1,18                          |
| Number of circuits                                 | no.                            | 1                             | 1                             | 1                             | 1                   | 1                   | 1                             |
| Hermetically sealed control box (EU reg. 517_2014) | yes / no                       | yes                           | yes                           | yes                           | yes                 | yes                 | yes                           |
| <b>Fan</b>   |                                |                               |                               |                               |                     |                     |                               |
| Fan  | Type                           | DC axial                      | DC axial                      | DC axial                      | DC axial            | DC axial            | DC axial                      |
| Quantity   | no.                            | 1                             | 1                             | 1                             | 1                   | 1                   | 1                             |
| Maximum air flow rate                              | m <sup>3</sup> /h              | 4060                          | 4060                          | 4650                          | 4060                | 4060                | 4650                          |

## Technical data

| Description                         | UM                | HYDRO<br>UNIT M 12   | HYDRO<br>UNIT M 14   | HYDRO<br>UNIT M 16   | HYDRO<br>UNIT M 12T  | HYDRO<br>UNIT M 14T  | HYDRO<br>UNIT M 16T  |
|-------------------------------------|-------------------|--|--|--|--|--|--|
| <b>Heat exchanger (source side)</b> |                   |  |  |  |  |  |  |
| Heat exchanger (source side)        | Type              | Pipes in copper, fins in aluminium with anti-corrosion treatment | Pipes in copper, fins in aluminium with anti-corrosion treatment | Pipes in copper, fins in aluminium with anti-corrosion treatment | Pipes in copper, fins in aluminium with anti-corrosion treatment | Pipes in copper, fins in aluminium with anti-corrosion treatment | Pipes in copper, fins in aluminium with anti-corrosion treatment |
| <b>Circulation pump</b>             |                   |  |  |  |  |  |  |
| Circulation pump                    | Type              | Variable speed centrifuge  | Variable speed centrifuge  | Variable speed centrifuge  | Variable speed centrifuge  | Variable speed centrifuge  | Variable speed centrifuge  |
| Nominal delivery                    | m <sup>3</sup> /h | 2,08   | 2,49   | 2,73   | 2,08   | 2,49   | 2,73   |
| Maximum operating pressure          | bar               | 3  | 3  | 3  | 3  | 3  | 3  |
| Maximum input power                 | kW                |  |  |  |  |  |  |
| Maximum input current               | A                 |  |  |  |  |  |  |
| Expansion tank volume               | l                 | 8,00   | 8,00   | 8,00   | 8,00   | 8,00   | 8,00   |
| <b>Heat exchanger (system side)</b> |                   |  |  |  |  |  |  |
| Heat exchanger (system side)        | Type              | Plate, in stainless steel  | Plate, in stainless steel  | Plate, in stainless steel  | Plate, in stainless steel  | Plate, in stainless steel  | Plate, in stainless steel  |
| Total water content                 | l                 | 4,2  | 4,2  | 4,2  | 4,2  | 4,2  | 4,2  |
| <b>Sound data</b>                   |                   |  |  |  |  |  |  |
| Sound output <sup>(3)</sup>         | dB(A)             | 65   | 65   | 68   | 65   | 65   | 68   |
| Sound pressure at 1m <sup>(4)</sup> | dB(A)             | 53   | 53,5   | 57,5   | 53,5   | 54   | 58   |
| <b>Weight</b>                       |                   |  |  |  |  |  |  |
| Net weight                          | kg                | 129  | 129  | 129  | 144  | 144  | 144  |

The performance values comply with Standards UNI EN 14511:2018 and UNI EN 14825:2016. Performance data certified by HP Keymark.

(1) Input power from compressors and from fans and circulator in the maximum operating conditions, with the nominal power supply voltage.

(2) Maximum unit operating current with the nominal power supply voltage.

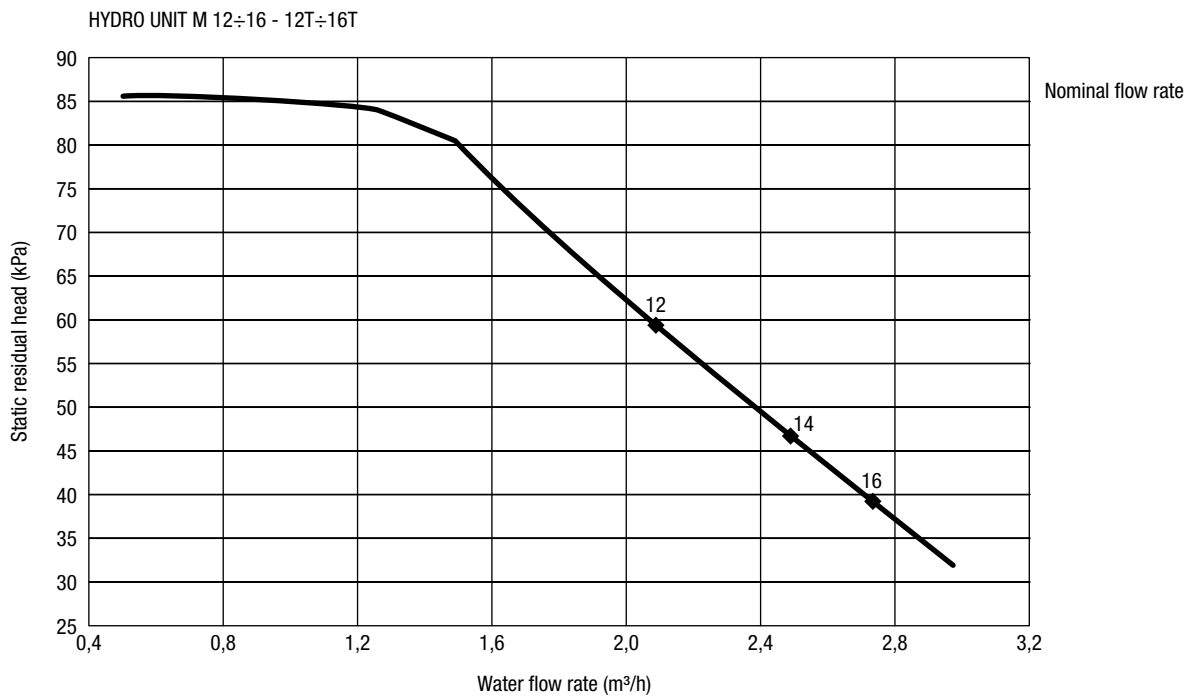
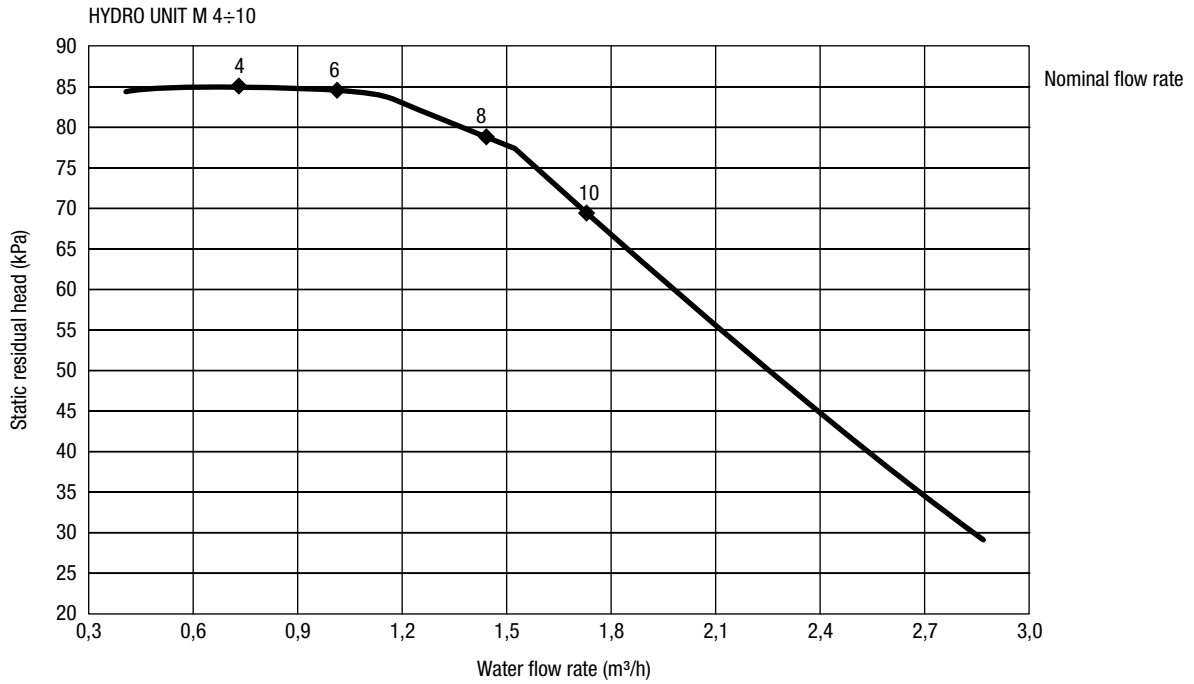
(3) Sound emission values declared, in accordance with standard EN 12102-1.

(4) Measured in a semi-anechoic chamber, at a distance of 1m from the front of the unit and a height from the floor equal to  $(1+H)/2$ , where H is the height of the unit expressed in metres.

Technical data

# Flow rate-pressure drop diagrams

HYDRO UNIT M is equipped with a variable speed circulation pump.  
When dimensioning the system, consider the residual head, shown in the diagrams below.



| Model                          | UM  | HYDRO UNIT M |    |    |    |    |    |    |     |     |     |
|--------------------------------|-----|--------------|----|----|----|----|----|----|-----|-----|-----|
|                                |     | 4            | 6  | 8  | 10 | 12 | 14 | 16 | 12T | 14T | 16T |
| Useful pump head (A7; W35) (1) | kPa | 85           | 84 | 78 | 69 | 59 | 47 | 39 | 59  | 47  | 39  |

(1) Outdoor air temperature 7°C BS, 6°C BU; 30/35°C water inlet/outlet.

## Technical data

# Performance values in accordance with standards EN 14511:2018 and EN 14825:2016.

### HYDRO UNIT M 4 - HEATING

| Performance with full load    |                       |      |                       |      |                       |      |
|-------------------------------|-----------------------|------|-----------------------|------|-----------------------|------|
| Delivery temperature          | 35°C                  |      | 45°C                  |      | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW) | COP  | Nominal capacity (kW) | COP  | Nominal capacity (kW) | COP  |
| -7                            | 4,70                  | 3,10 | 4,30                  | 2,35 | 4,00                  | 1,95 |
| 2                             | 4,40                  | 4,00 | 5,10                  | 3,00 | 5,10                  | 2,45 |
| 7                             | 4,20                  | 5,10 | 4,30                  | 3,80 | 4,40                  | 2,95 |
| 12                            | 5,26                  | 5,61 | 5,59                  | 4,22 | 4,98                  | 3,38 |
| 15                            | 5,14                  | 4,84 | 5,67                  | 4,37 | 4,96                  | 3,53 |
| 20                            | 5,09                  | 5,46 | 5,63                  | 4,88 | 4,89                  | 3,84 |
| 35                            | 5,54                  | 7,89 | 5,70                  | 6,47 | 5,14                  | 4,92 |
| Performance with partial load |                       |      |                       |      |                       |      |
| Tbival (-7°C)                 | A                     | B    | C                     | D    | -                     | -    |
| Outdoor temperature (°C)      | -7                    | 2    | 7                     | 12   | -                     | -    |
| PLR - Climate load factor     | 0,88                  | 0,54 | 0,35                  | 0,15 | -                     | -    |
| DC - Output with full load    | 4,70                  | 4,40 | 4,20                  | 5,26 | -                     | -    |
| COP with full load            | 3,10                  | 4,00 | 5,10                  | 5,61 | -                     | -    |
| COP with partial load         | 3,10                  | 4,78 | 6,13                  | 8,05 | -                     | -    |
| CR - Load factor              | 1,00                  | 0,66 | 0,45                  | 0,15 | -                     | -    |
| f COP - Corrective factor     | 1,00                  | 1,20 | 1,20                  | 1,43 | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

### HYDRO UNIT M 4 - COOLING

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 3,45 | 4,70                |
| EER2 | 75%         | 30                       | 4,76 | 3,53                |
| EER3 | 50%         | 25                       | 5,72 | 2,35                |
| EER4 | 25%         | 20                       | 5,72 | 1,18                |

### HYDRO UNIT M 6 - HEATING

| Performance with full load    |                       |      |                       |      |                       |      |
|-------------------------------|-----------------------|------|-----------------------|------|-----------------------|------|
| Delivery temperature          | 35°C                  |      | 45°C                  |      | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW) | COP  | Nominal capacity (kW) | COP  | Nominal capacity (kW) | COP  |
| -7                            | 6,00                  | 3,00 | 5,40                  | 2,40 | 5,15                  | 2,00 |
| 2                             | 5,50                  | 3,90 | 5,80                  | 3,00 | 5,65                  | 2,45 |
| 7                             | 6,35                  | 4,95 | 6,30                  | 3,70 | 6,00                  | 2,95 |
| 12                            | 6,51                  | 5,38 | 6,83                  | 4,09 | 6,12                  | 3,27 |
| 15                            | 6,48                  | 5,57 | 6,98                  | 4,32 | 6,15                  | 3,42 |
| 20                            | 6,27                  | 6,28 | 6,82                  | 4,62 | 6,03                  | 3,76 |
| 35                            | 6,46                  | 8,87 | 6,55                  | 5,79 | 6,02                  | 4,75 |
| Performance with partial load |                       |      |                       |      |                       |      |
| Tbival (-7°C)                 | A                     | B    | C                     | D    | -                     | -    |
| Outdoor temperature (°C)      | -7                    | 2    | 7                     | 12   | -                     | -    |
| PLR - Climate load factor     | 0,88                  | 0,54 | 0,35                  | 0,15 | -                     | -    |
| DC - Output with full load    | 6,00                  | 5,50 | 6,35                  | 6,51 | -                     | -    |
| COP with full load            | 3,00                  | 3,90 | 4,95                  | 5,38 | -                     | -    |
| COP with partial load         | 3,00                  | 4,85 | 6,63                  | 7,93 | -                     | -    |
| CR - Load factor              | 1,00                  | 0,67 | 0,38                  | 0,16 | -                     | -    |
| f COP - Corrective factor     | 1,00                  | 1,24 | 1,34                  | 1,47 | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

### HYDRO UNIT M 6 - COOLING

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 3,00 | 7,00                |
| EER2 | 75%         | 30                       | 4,00 | 5,25                |
| EER3 | 50%         | 25                       | 6,45 | 3,50                |
| EER4 | 25%         | 20                       | 7,73 | 1,75                |

**Technical data**

**HYDRO UNIT M 8 - HEATING**

| Performance with full load    |                       |      |                       |      |                       |      |
|-------------------------------|-----------------------|------|-----------------------|------|-----------------------|------|
| Delivery temperature          | 35°C                  |      | 45°C                  |      | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW) | COP  | Nominal capacity (kW) | COP  | Nominal capacity (kW) | COP  |
| -7                            | 7,00                  | 3,20 | 6,60                  | 2,55 | 6,15                  | 2,05 |
| 2                             | 7,10                  | 4,10 | 7,40                  | 3,25 | 7,10                  | 2,60 |
| 7                             | 8,40                  | 5,15 | 8,10                  | 3,85 | 7,50                  | 3,18 |
| 12                            | 8,03                  | 5,99 | 8,06                  | 4,26 | 7,26                  | 3,54 |
| 15                            | 8,11                  | 6,37 | 8,15                  | 4,55 | 7,33                  | 3,68 |
| 20                            | 8,37                  | 7,53 | 8,36                  | 5,25 | 7,47                  | 4,14 |
| 35                            | 7,89                  | 8,74 | 8,83                  | 6,77 | 7,48                  | 5,03 |
| Performance with partial load |                       |      |                       |      |                       |      |
| Tbival (-7°C)                 | A                     | B    | C                     | D    | -                     | -    |
| Outdoor temperature (°C)      | -7                    | 2    | 7                     | 12   | -                     | -    |
| PLR - Climate load factor     | 0,88                  | 0,54 | 0,35                  | 0,15 | -                     | -    |
| DC - Output with full load    | 7,00                  | 7,10 | 8,40                  | 8,03 | -                     | -    |
| COP with full load            | 3,20                  | 4,10 | 5,15                  | 5,99 | -                     | -    |
| COP with partial load         | 3,20                  | 5,09 | 6,82                  | 8,35 | -                     | -    |
| CR - Load factor              | 1,00                  | 0,60 | 0,33                  | 0,15 | -                     | -    |
| f COP - Corrective factor     | 1,00                  | 1,24 | 1,32                  | 1,39 | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

**HYDRO UNIT M 8 - COOLING**

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 3,39 | 7,45                |
| EER2 | 75%         | 30                       | 4,71 | 5,59                |
| EER3 | 50%         | 25                       | 6,65 | 3,73                |
| EER4 | 25%         | 20                       | 8,55 | 1,86                |

**HYDRO UNIT M 10 - HEATING**

| Performance with full load    |                       |      |                       |      |                       |      |
|-------------------------------|-----------------------|------|-----------------------|------|-----------------------|------|
| Delivery temperature          | 35°C                  |      | 45°C                  |      | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW) | COP  | Nominal capacity (kW) | COP  | Nominal capacity (kW) | COP  |
| -7                            | 8,00                  | 3,05 | 7,35                  | 2,55 | 6,85                  | 2,00 |
| 2                             | 8,20                  | 4,00 | 7,85                  | 3,20 | 8,10                  | 2,56 |
| 7                             | 10,00                 | 4,95 | 10,00                 | 3,75 | 9,50                  | 3,10 |
| 12                            | 9,03                  | 5,77 | 9,11                  | 4,06 | 8,50                  | 3,41 |
| 15                            | 9,13                  | 6,22 | 9,22                  | 4,38 | 8,60                  | 3,67 |
| 20                            | 9,58                  | 7,14 | 9,46                  | 5,08 | 8,73                  | 4,05 |
| 35                            | 8,59                  | 9,01 | 9,81                  | 6,84 | 8,63                  | 5,29 |
| Performance with partial load |                       |      |                       |      |                       |      |
| Tbival (-7°C)                 | A                     | B    | C                     | D    | -                     | -    |
| Outdoor temperature (°C)      | -7                    | 2    | 7                     | 12   | -                     | -    |
| PLR - Climate load factor     | 0,88                  | 0,54 | 0,35                  | 0,15 | -                     | -    |
| DC - Output with full load    | 8,00                  | 8,20 | 10,00                 | 9,03 | -                     | -    |
| COP with full load            | 3,05                  | 4,00 | 4,95                  | 5,77 | -                     | -    |
| COP with partial load         | 3,05                  | 5,01 | 7,08                  | 8,58 | -                     | -    |
| CR - Load factor              | 1,00                  | 0,60 | 0,32                  | 0,15 | -                     | -    |
| f COP - Corrective factor     | 1,00                  | 1,25 | 1,43                  | 1,49 | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

**HYDRO UNIT M 10 - COOLING**

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 3,21 | 8,20                |
| EER2 | 75%         | 30                       | 4,47 | 6,15                |
| EER3 | 50%         | 25                       | 7,02 | 4,10                |
| EER4 | 25%         | 20                       | 9,54 | 2,05                |

## Technical data

### HYDRO UNIT M 12 - HEATING

| Delivery temperature          | Performance with full load |      |                       |       |                       |      |
|-------------------------------|----------------------------|------|-----------------------|-------|-----------------------|------|
|                               | 35°C                       |      | 45°C                  |       | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW)      | COP  | Nominal capacity (kW) | COP   | Nominal capacity (kW) | COP  |
| -7                            | 10,00                      | 3,00 | 10,20                 | 2,40  | 9,80                  | 2,05 |
| 2                             | 9,20                       | 3,90 | 10,60                 | 3,00  | 11,30                 | 2,50 |
| 7                             | 12,10                      | 4,95 | 12,30                 | 3,70  | 11,90                 | 3,05 |
| 12                            | 10,98                      | 5,75 | 11,10                 | 4,26  | 9,53                  | 3,17 |
| 15                            | 11,00                      | 5,97 | 11,20                 | 4,52  | 9,12                  | 3,20 |
| 20                            | 10,80                      | 7,18 | 11,20                 | 5,16  | 9,00                  | 3,61 |
| 35                            | 11,50                      | 8,78 | 11,50                 | 6,17  | 10,00                 | 4,86 |
| Performance with partial load |                            |      |                       |       |                       |      |
| Tbival (-7°C)                 | A                          | B    | C                     | D     | -                     | -    |
| Outdoor temperature (°C)      | -7                         | 2    | 7                     | 12    | -                     | -    |
| PLR - Climate load factor     | 0,88                       | 0,54 | 0,35                  | 0,15  | -                     | -    |
| DC - Output with full load    | 10,00                      | 9,20 | 12,10                 | 10,98 | -                     | -    |
| COP with full load            | 3,00                       | 3,90 | 4,95                  | 5,75  | -                     | -    |
| COP with partial load         | 3,00                       | 4,65 | 6,62                  | 8,47  | -                     | -    |
| CR - Load factor              | 1,00                       | 0,67 | 0,33                  | 0,16  | -                     | -    |
| f COP - Corrective factor     | 1,00                       | 1,19 | 1,34                  | 1,47  | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

### HYDRO UNIT M 12 - COOLING

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 2,61 | 11,50               |
| EER2 | 75%         | 30                       | 3,93 | 8,63                |
| EER3 | 50%         | 25                       | 5,73 | 5,75                |
| EER4 | 25%         | 20                       | 6,75 | 2,88                |

### HYDRO UNIT M 14 - HEATING

| Delivery temperature          | Performance with full load |       |                       |       |                       |      |
|-------------------------------|----------------------------|-------|-----------------------|-------|-----------------------|------|
|                               | 35°C                       |       | 45°C                  |       | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW)      | COP   | Nominal capacity (kW) | COP   | Nominal capacity (kW) | COP  |
| -7                            | 12,00                      | 2,85  | 11,80                 | 2,35  | 11,00                 | 2,05 |
| 2                             | 11,00                      | 3,60  | 11,50                 | 2,85  | 12,40                 | 2,45 |
| 7                             | 14,50                      | 4,60  | 14,10                 | 3,60  | 13,80                 | 2,95 |
| 12                            | 11,51                      | 5,46  | 11,69                 | 4,12  | 10,28                 | 3,32 |
| 15                            | 11,60                      | 5,67  | 11,90                 | 4,25  | 9,84                  | 3,41 |
| 20                            | 11,10                      | 6,27  | 11,50                 | 4,87  | 9,53                  | 3,74 |
| 35                            | 11,80                      | 8,63  | 12,00                 | 6,10  | 10,10                 | 4,93 |
| Performance with partial load |                            |       |                       |       |                       |      |
| Tbival (-7°C)                 | A                          | B     | C                     | D     | -                     | -    |
| Outdoor temperature (°C)      | -7                         | 2     | 7                     | 12    | -                     | -    |
| PLR - Climate load factor     | 0,88                       | 0,54  | 0,35                  | 0,15  | -                     | -    |
| DC - Output with full load    | 12,00                      | 11,00 | 14,50                 | 11,51 | -                     | -    |
| COP with full load            | 2,85                       | 3,60  | 4,60                  | 5,46  | -                     | -    |
| COP with partial load         | 2,85                       | 4,52  | 6,68                  | 8,52  | -                     | -    |
| CR - Load factor              | 1,00                       | 0,67  | 0,33                  | 0,18  | -                     | -    |
| f COP - Corrective factor     | 1,00                       | 1,26  | 1,45                  | 1,56  | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

### HYDRO UNIT M 14 - COOLING

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 2,50 | 12,40               |
| EER2 | 75%         | 30                       | 3,85 | 9,30                |
| EER3 | 50%         | 25                       | 5,80 | 6,20                |
| EER4 | 25%         | 20                       | 6,74 | 3,10                |

## Technical data

### HYDRO UNIT M 16 - HEATING

| Delivery temperature          | Performance with full load |       |                       |       |                       |      |
|-------------------------------|----------------------------|-------|-----------------------|-------|-----------------------|------|
|                               | 35°C                       |       | 45°C                  |       | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW)      | COP   | Nominal capacity (kW) | COP   | Nominal capacity (kW) | COP  |
| -7                            | 13,10                      | 2,70  | 12,80                 | 2,25  | 12,50                 | 2,00 |
| 2                             | 13,00                      | 3,45  | 12,70                 | 2,85  | 13,30                 | 2,40 |
| 7                             | 15,90                      | 4,50  | 16,00                 | 3,50  | 16,00                 | 2,85 |
| 12                            | 14,03                      | 5,58  | 13,76                 | 4,22  | 12,69                 | 3,44 |
| 15                            | 14,50                      | 5,97  | 14,20                 | 4,46  | 13,20                 | 3,61 |
| 20                            | 12,70                      | 6,88  | 12,20                 | 4,71  | 11,20                 | 3,68 |
| 35                            | 12,80                      | 9,06  | 12,50                 | 6,02  | 10,40                 | 4,57 |
| Performance with partial load |                            |       |                       |       |                       |      |
| Tbival (-7°C)                 | A                          | B     | C                     | D     | -                     | -    |
| Outdoor temperature (°C)      | -7                         | 2     | 7                     | 12    | -                     | -    |
| PLR - Climate load factor     | 0,88                       | 0,54  | 0,35                  | 0,15  | -                     | -    |
| DC - Output with full load    | 13,10                      | 13,00 | 15,90                 | 14,03 | -                     | -    |
| COP with full load            | 2,70                       | 3,45  | 4,50                  | 5,58  | -                     | -    |
| COP with partial load         | 2,70                       | 4,41  | 6,56                  | 8,51  | -                     | -    |
| CR - Load factor              | 1,00                       | 0,62  | 0,33                  | 0,16  | -                     | -    |
| f COP - Corrective factor     | 1,00                       | 1,28  | 1,46                  | 1,53  | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

### HYDRO UNIT M 16 - COOLING

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 2,47 | 14,00               |
| EER2 | 75%         | 30                       | 3,63 | 10,50               |
| EER3 | 50%         | 25                       | 5,27 | 7,00                |
| EER4 | 25%         | 20                       | 7,29 | 3,50                |

### HYDRO UNIT M 12T - HEATING

| Delivery temperature          | Performance with full load |      |                       |       |                       |      |
|-------------------------------|----------------------------|------|-----------------------|-------|-----------------------|------|
|                               | 35°C                       |      | 45°C                  |       | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW)      | COP  | Nominal capacity (kW) | COP   | Nominal capacity (kW) | COP  |
| -7                            | 10,00                      | 3,00 | 10,20                 | 2,40  | 9,80                  | 2,05 |
| 2                             | 9,20                       | 3,90 | 10,60                 | 3,00  | 11,30                 | 2,50 |
| 7                             | 12,10                      | 4,95 | 12,30                 | 3,70  | 11,90                 | 3,05 |
| 12                            | 10,98                      | 5,75 | 11,10                 | 4,26  | 9,53                  | 3,17 |
| 15                            | 11,00                      | 5,97 | 11,20                 | 4,52  | 9,12                  | 3,20 |
| 20                            | 10,80                      | 7,18 | 11,20                 | 5,16  | 9,00                  | 3,61 |
| 35                            | 11,50                      | 8,78 | 11,50                 | 6,17  | 10,00                 | 4,86 |
| Performance with partial load |                            |      |                       |       |                       |      |
| Tbival (-7°C)                 | A                          | B    | C                     | D     | -                     | -    |
| Outdoor temperature (°C)      | -7                         | 2    | 7                     | 12    | -                     | -    |
| PLR - Climate load factor     | 0,88                       | 0,54 | 0,35                  | 0,15  | -                     | -    |
| DC - Output with full load    | 10,00                      | 9,20 | 12,10                 | 10,98 | -                     | -    |
| COP with full load            | 3,00                       | 3,90 | 4,95                  | 5,75  | -                     | -    |
| COP with partial load         | 3,00                       | 4,65 | 6,62                  | 8,47  | -                     | -    |
| CR - Load factor              | 1,00                       | 0,67 | 0,33                  | 0,16  | -                     | -    |
| f COP - Corrective factor     | 1,00                       | 1,19 | 1,34                  | 1,47  | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

### HYDRO UNIT M 12T - COOLING

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 2,61 | 11,50               |
| EER2 | 75%         | 30                       | 3,93 | 8,63                |
| EER3 | 50%         | 25                       | 5,73 | 5,75                |
| EER4 | 25%         | 20                       | 6,75 | 2,88                |

## Technical data

### HYDRO UNIT M 14T - HEATING

| Delivery temperature          | Performance with full load |       |                       |       |                       |      |
|-------------------------------|----------------------------|-------|-----------------------|-------|-----------------------|------|
|                               | 35°C                       |       | 45°C                  |       | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW)      | COP   | Nominal capacity (kW) | COP   | Nominal capacity (kW) | COP  |
| -7                            | 12,00                      | 2,85  | 11,80                 | 2,35  | 11,00                 | 2,05 |
| 2                             | 11,00                      | 3,60  | 11,50                 | 2,85  | 12,40                 | 2,45 |
| 7                             | 14,50                      | 4,60  | 14,10                 | 3,60  | 13,80                 | 2,95 |
| 12                            | 11,51                      | 5,46  | 11,69                 | 4,12  | 10,28                 | 3,32 |
| 15                            | 11,60                      | 5,67  | 11,90                 | 4,25  | 9,84                  | 3,41 |
| 20                            | 11,10                      | 6,27  | 11,50                 | 4,87  | 9,53                  | 3,74 |
| 35                            | 11,80                      | 8,63  | 12,00                 | 6,10  | 10,10                 | 4,93 |
| Performance with partial load |                            |       |                       |       |                       |      |
| Tbival (-7°C)                 | A                          | B     | C                     | D     | -                     | -    |
| Outdoor temperature (°C)      | -7                         | 2     | 7                     | 12    | -                     | -    |
| PLR - Climate load factor     | 0,88                       | 0,54  | 0,35                  | 0,15  | -                     | -    |
| DC - Output with full load    | 12,00                      | 11,00 | 14,50                 | 11,51 | -                     | -    |
| COP with full load            | 2,85                       | 3,60  | 4,60                  | 5,46  | -                     | -    |
| COP with partial load         | 2,85                       | 4,52  | 6,68                  | 8,52  | -                     | -    |
| CR - Load factor              | 1,00                       | 0,67  | 0,33                  | 0,18  | -                     | -    |
| f COP - Corrective factor     | 1,00                       | 1,26  | 1,45                  | 1,56  | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

### HYDRO UNIT M 14T - COOLING

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 2,46 | 12,40               |
| EER2 | 75%         | 30                       | 3,85 | 9,30                |
| EER3 | 50%         | 25                       | 5,80 | 6,20                |
| EER4 | 25%         | 20                       | 6,74 | 3,10                |

### HYDRO UNIT M 16T - HEATING

| Delivery temperature          | Performance with full load |       |                       |       |                       |      |
|-------------------------------|----------------------------|-------|-----------------------|-------|-----------------------|------|
|                               | 35°C                       |       | 45°C                  |       | 55°C                  |      |
| Outdoor temperature           | Nominal capacity (kW)      | COP   | Nominal capacity (kW) | COP   | Nominal capacity (kW) | COP  |
| -7                            | 13,10                      | 2,70  | 12,80                 | 2,25  | 12,50                 | 2,00 |
| 2                             | 13,00                      | 3,45  | 12,70                 | 2,85  | 13,30                 | 2,40 |
| 7                             | 15,90                      | 4,50  | 16,00                 | 3,50  | 16,00                 | 2,85 |
| 12                            | 14,03                      | 5,58  | 13,76                 | 4,22  | 12,69                 | 3,44 |
| 15                            | 14,50                      | 5,97  | 14,20                 | 4,46  | 13,20                 | 3,61 |
| 20                            | 12,70                      | 6,88  | 12,20                 | 4,71  | 11,20                 | 3,68 |
| 35                            | 12,80                      | 9,06  | 12,50                 | 6,02  | 10,40                 | 4,57 |
| Performance with partial load |                            |       |                       |       |                       |      |
| Tbival (-7°C)                 | A                          | B     | C                     | D     | -                     | -    |
| Outdoor temperature (°C)      | -7                         | 2     | 7                     | 12    | -                     | -    |
| PLR - Climate load factor     | 0,88                       | 0,54  | 0,35                  | 0,15  | -                     | -    |
| DC - Output with full load    | 13,10                      | 13,00 | 15,90                 | 14,03 | -                     | -    |
| COP with full load            | 2,70                       | 3,45  | 4,50                  | 5,58  | -                     | -    |
| COP with partial load         | 2,70                       | 4,41  | 6,56                  | 8,51  | -                     | -    |
| CR - Load factor              | 1,00                       | 0,62  | 0,33                  | 0,16  | -                     | -    |
| f COP - Corrective factor     | 1,00                       | 1,28  | 1,46                  | 1,53  | -                     | -    |

NOTE: the performance values with a partial load refer to an output water temperature of 35°C.

### HYDRO UNIT M 16T - COOLING

|      | Load factor | Outdoor temperature (°C) | EER  | cooling output (kW) |
|------|-------------|--------------------------|------|---------------------|
| EER1 | 100%        | 35                       | 2,47 | 14,00               |
| EER2 | 75%         | 30                       | 3,63 | 10,50               |
| EER3 | 50%         | 25                       | 5,27 | 7,00                |
| EER4 | 25%         | 20                       | 7,29 | 3,50                |

## Technical data

# Technical characteristics

| HYDRO UNIT M 4                             |  |
|--|--|
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1295×792×429 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 4.85 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 4,20 kW                                |
| Input power (A7/W35)                       | 0,82 kW                                |
| COP (A7/W35)                               | 5,10                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 55 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 4,70 kW                                |
| Input power (A35/W7)                       | 1,36 kW                                |
| EER (A35/W7)                               | 3,45                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 55 dB(A)                               |
| HYDRO UNIT M 6                             |  |
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1295×792×429 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 4,95 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 6,35 kW                                |
| Input power (A7/W35)                       | 1,28 kW                                |
| COP (A7/W35)                               | 4,95                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 58 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 7,00 kW                                |
| Input power (A35/W7)                       | 2,33 kW                                |
| EER (A35/W7)                               | 3,00                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 58 dB(A)                               |

## Technical data

| <b>HYDRO UNIT M 8</b>                      |  |
|--|--|
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1385×945×526 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 5,22 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 8,40 kW                                |
| Input power (A7/W35)                       | 1,63 kW                                |
| COP (A7/W35)                               | 5,15                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 59 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 7,45 kW                                |
| Input power (A35/W7)                       | 2,22 kW                                |
| EER (A35/W7)                               | 3,35                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 59 dB(A)                               |
| <b>HYDRO UNIT M 10</b>                     |  |
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1385×945×526 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 5,20 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 10,00 kW                               |
| Input power (A7/W35)                       | 2,02 kW                                |
| COP (A7/W35)                               | 4,95                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 60 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 8,20 kW                                |
| Input power (A35/W7)                       | 2,52 kW                                |
| EER (A35/W7)                               | 3,25                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 60 dB(A)                               |

## Technical data

| HYDRO UNIT M 12                            |  |
|--|--|
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1385×945×526 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 4,81 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 12,10 kW                               |
| Input power (A7/W35)                       | 2,44 kW                                |
| COP (A7/W35)                               | 4,95                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 65 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 11,50 kW                               |
| Input power (A35/W7)                       | 4,18 kW                                |
| EER (A35/W7)                               | 2,75                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 65 dB(A)                               |

| HYDRO UNIT M 14                            |  |
|--|--|
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1385×945×526 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 4,72 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 14,50 kW                               |
| Input power (A7/W35)                       | 3,15 kW                                |
| COP (A7/W35)                               | 4,60                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 65 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 12,40 kW                               |
| Input power (A35/W7)                       | 4,96 kW                                |
| EER (A35/W7)                               | 2,50                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 65 dB(A)                               |

## Technical data

| <b>HYDRO UNIT M 16</b>                     |  |
|--|--|
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1385×945×526 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 4,62 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 15,90 kW                               |
| Input power (A7/W35)                       | 3,53 kW                                |
| COP (A7/W35)                               | 4,50                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 68 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 14,00 kW                               |
| Input power (A35/W7)                       | 5,60 kW                                |
| EER (A35/W7)                               | 2,50                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 68 dB(A)                               |

| <b>HYDRO UNIT M 12T</b>                    |  |
|--|--|
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1385×945×526 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 4,81 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 12,10 kW                               |
| Input power (A7/W35)                       | 2,44 kW                                |
| COP (A7/W35)                               | 4,95                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 65 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 11,50 kW                               |
| Input power (A35/W7)                       | 4,18 kW                                |
| EER (A35/W7)                               | 2,75                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 65 dB(A)                               |

## Technical data

| <b>HYDRO UNIT M 14T</b>                    |  |
|--|--|
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1385×945×526 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 4,72 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 14,50 kW                               |
| Input power (A7/W35)                       | 3,15 kW                                |
| COP (A7/W35)                               | 4,60                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 65 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 12,40 kW                               |
| Input power (A35/W7)                       | 4,96 kW                                |
| EER (A35/W7)                               | 2,50                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 65 dB(A)                               |

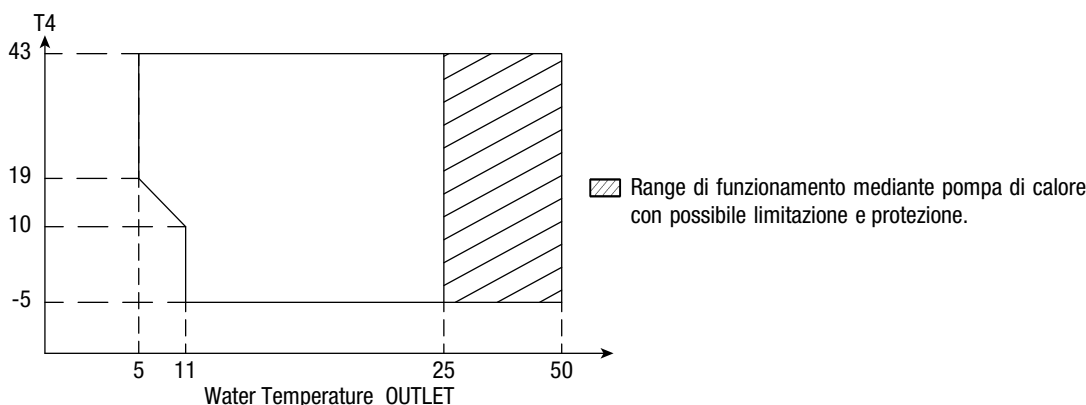
| <b>HYDRO UNIT M 16T</b>                    |  |
|--|--|
| Power Supply                               | 230/1/50V/ph/Hz                        |
| Dimensions (H×W×D):                        | approx. 1385×945×526 mm                |
| <b>Heating</b>                             |  |
| SCOP                                       | 4,62 (medium climate, low temperature) |
| Class                                      | A+++                                   |
| Heating capacity (A7/W35)                  | 15,90 kW                               |
| Input power (A7/W35)                       | 3,53 kW                                |
| COP (A7/W35)                               | 4,50                                   |
| Outside air temperature operating range    | -25°C - +35°C                          |
| Water delivery temperature operating range | +12°C - +65°C                          |
| Sound output                               | 68 dB(A)                               |
| <b>Cooling</b>                             |  |
| Cooling capacity (A35/W7)                  | 14,00 kW                               |
| Input power (A35/W7)                       | 5,60 kW                                |
| EER (A35/W7)                               | 2,50                                   |
| Outside air temperature operating range    | -5°C - +43°C                           |
| Water delivery temperature operating range | +5°C - +25°C                           |
| Sound output                               | 68 dB(A)                               |

# Operating range

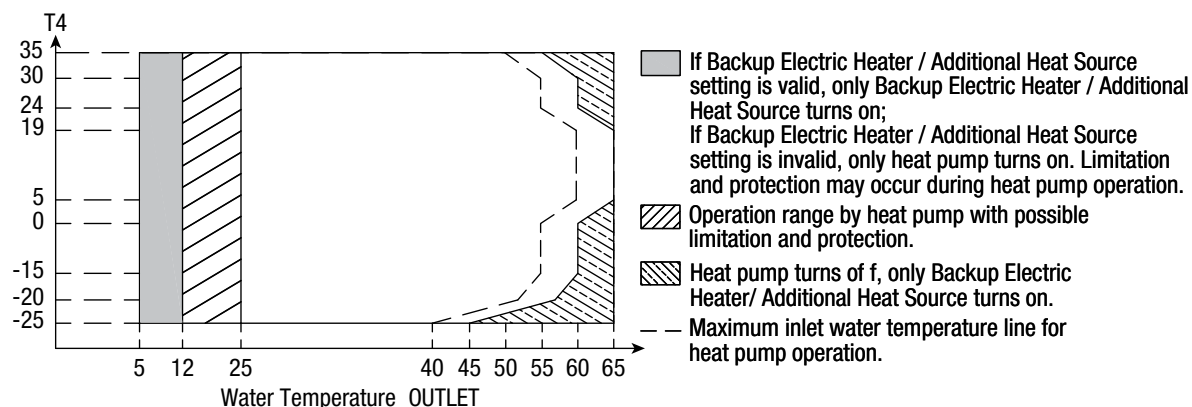
|                             |                |                |
|-----------------------------|----------------|----------------|
| Outlet water (heating mode) | +12 ~ +65°C    |                |
| Outlet water (cooling mode) | +5 ~ +25°C     |                |
| Domestic hot water          | +12 ~ +60°C    |                |
| Ambient temperature         | -25 ~ +43°C    |                |
| Water pressure              | 0,1~0,3 MPa(g) |                |
| Water flow rate             | 4kW            | 0,40~0,90 m³/h |
|                             | 6kW            | 0,40~1,25 m³/h |
|                             | 8kW            | 0,40~1,65 m³/h |
|                             | 10kW           | 0,40~2,10 m³/h |
|                             | 12kW           | 0,70~2,50 m³/h |
|                             | 14kW           | 0,70~2,75 m³/h |
|                             | 16kW           | 0,70~3,00 m³/h |

The unit has an anti-freeze function that uses the heat pump or backup heater (personalised model) to protect the water system from freezing in all conditions. There is always the risk that a power blackout may occur when the unit is unsupervised, so you are advised to use the anti-freeze flow switch in the water system.

The temperature ranges of the flowing water (TW\_outlet) in cooling mode, with various outdoor temperatures (T4), are shown below:

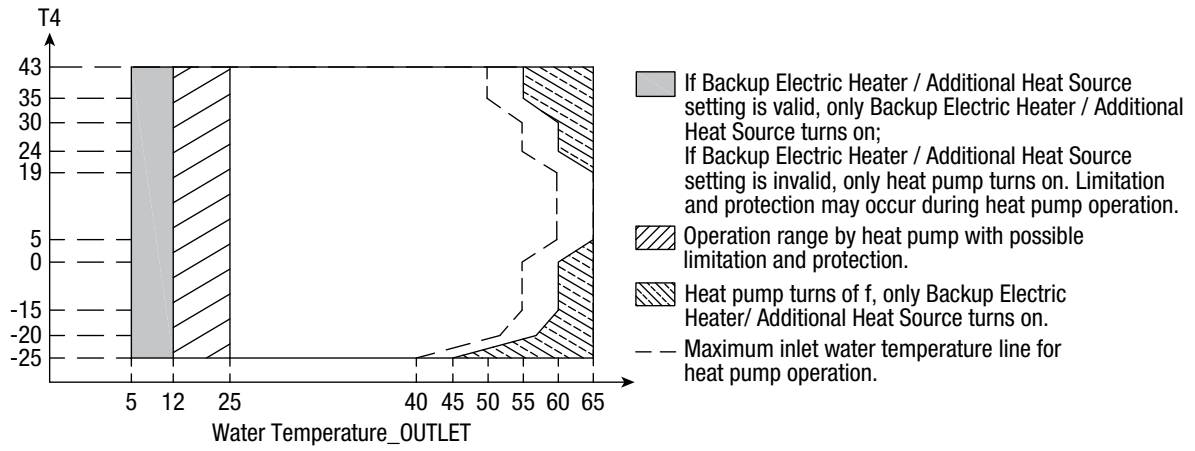


The temperature ranges of the flowing water (TW\_outlet) in heating mode, with various ambient temperatures (T4), are shown below:



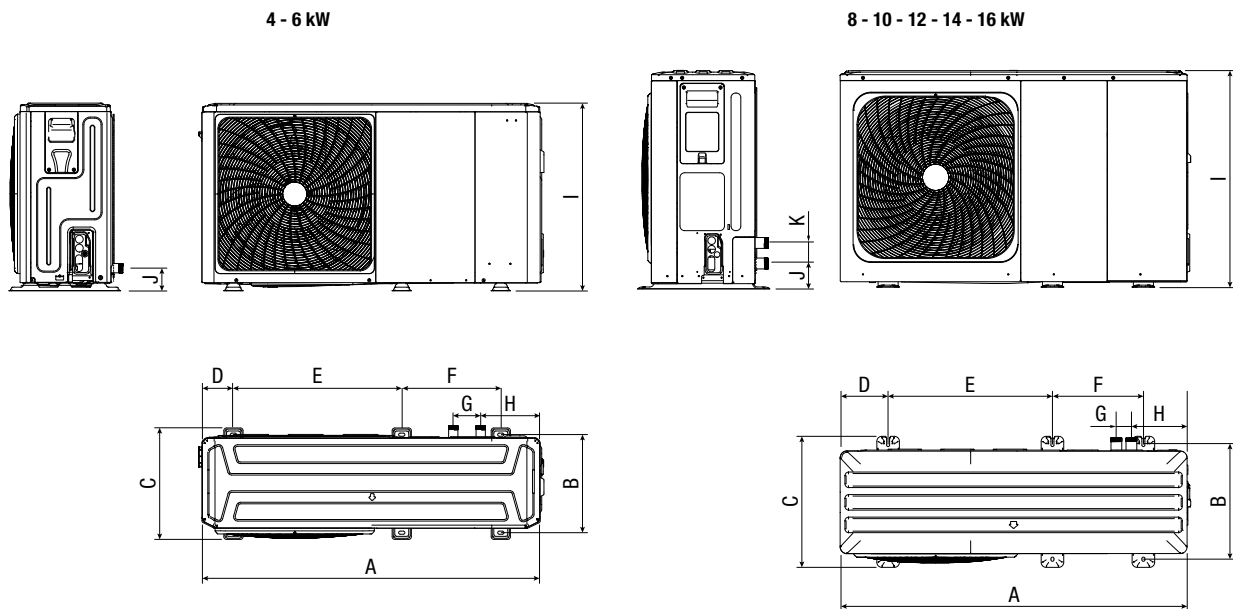
### Operating range

The temperature ranges of the flowing water (TW\_outlet) in DHW mode, with various ambient temperatures (T4), are shown below:



# Description and use of the appliance

## Overall dimensions



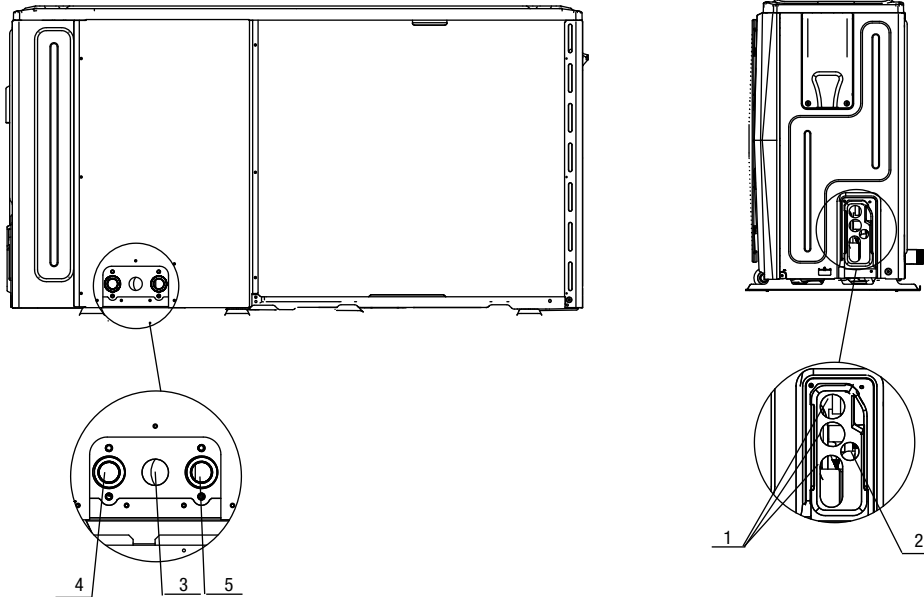
| Model            | A    | B   | C   | D   | E   | F   | G   | H   | I   | J   | K  |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| 4-6 kW           | 1295 | 375 | 426 | 120 | 644 | 379 | 105 | 225 | 718 | 87  | /  |
| 8-10-12-14-16 kW | 1385 | 458 | 523 | 192 | 656 | 363 | 60  | 221 | 865 | 101 | 81 |

Units expressed in millimetres

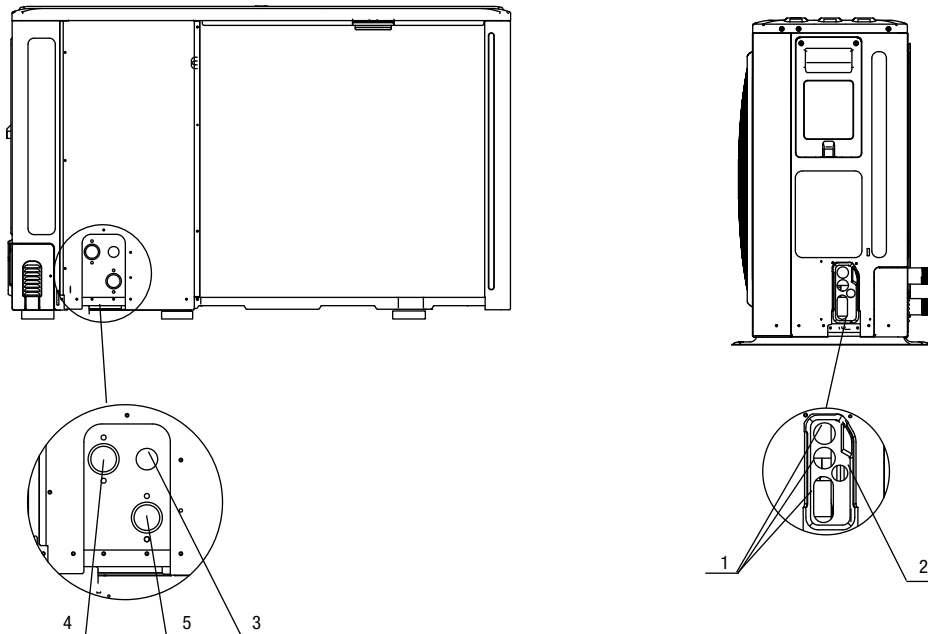
Description and use of the appliance

# Hydraulic connections

4÷6 kW



8÷16 kW

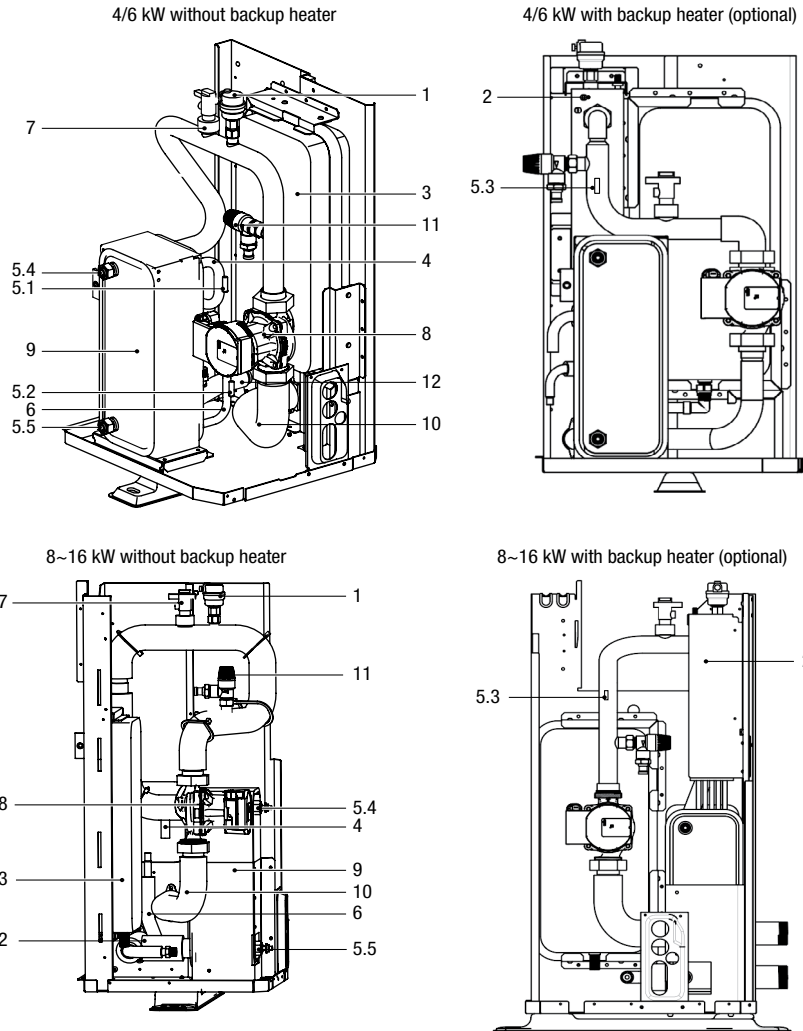


|   |                                      |
|---|--------------------------------------|
| 1 | High voltage cable routing           |
| 2 | Low voltage cable routing            |
| 3 | Hole for safety valve discharge pipe |
| 4 | System delivery connection (*)       |
| 5 | System return connection (*)         |

(\*) R1" (4÷6 kW), R1"¼ (8÷16 kW) diameter.

Description and use of the appliance

# Technical characteristics



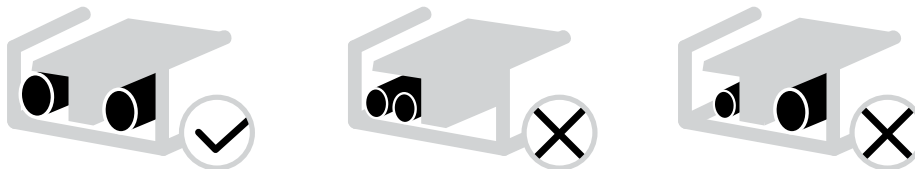
| Code | Assembly unit            | Explanation   |
|------|--------------------------|---|
| 1    | Air purge valve          | The residual air in the water circuit is automatically removed.   |
| 2    | Backup heater (optional) | Provides additional heating capacity when that of the heat pump is insufficient due to very low outdoor temperatures. Also protects the outdoor water piping from freezing.     |
| 3    | Expansion tank           | Balances the water system pressure.   |
| 4    | Refrigerant gas pipe     | /   |
| 5    | Temperature sensors      | Four temperature sensors measure the temperature of the water and refrigerant in various points of the water circuit. 5.1-T2B; 5.2-T2; 5.3-T1 (optional); 5.4-TW_out; 5.5-TW_in |
| 6    | Liquid refrigerant pipe  | /   |
| 7    | Flow meter               | Measures the water flow rate to protect the compressor and water pump in the event of an insufficient water flow.   |
| 8    | Pump                     | Enables the water to circulate in the dedicated circuit.  |
| 9    | Plate heat exchanger     | Transfers heat from the refrigerant to the water.   |
| 10   | Water outlet pipe        | /   |
| 11   | Overpressure valve       | Avoids any excessive water pressure by opening at 3 bar and draining the water from the dedicated circuit.  |
| 12   | Water inlet pipe         | /   |

# Electric wiring

## Precautions for the electricity supply wiring

When making the connection to the power supply terminal board, use a round crimped terminal. If this is impossible, follow the instructions below.

- Do not connect cables of different sizes to the same power supply terminal (loose connections may lead to overheating).
- When connecting cables of the same size, do so as shown below.



- Use the right screwdriver to tighten the terminal screws; small screwdrivers may damage the head of the screw and prevent it from being properly tightened.
- Do not over-tighten the terminal screws, as this may damage them.
- Connect an earth circuit switch and a fuse to the power supply line.
- Making sure the appropriate wires are used, make the complete connections and fix the wires so that the external force cannot affect the terminals.

## Safety device requisites

1. Select the cable diameters (minimum value) individually for each unit on the basis of tables 1 and 2, where the nominal current in table 1 means MCA in table 2. If the MCA is higher than 63A, the wire diameters must be selected in accordance with the national wiring regulations.
2. The maximum permitted variation between the phases in the voltage field is 2%.
3. Select the circuit breaker that separates the contacts by at least 3mm on all the poles and allows for complete disconnection, where the MFA is used to select the current circuit breakers and the residual current circuit breakers.

| TABLE 1                               |   |                    |
|---------------------------------------|---|--------------------|
| Nominal current of the appliance: (A) | Nominal cross section area (mm <sup>2</sup> ) |                    |
|                                       | Flexible cables                               | Fixed wiring cable |
| ≤3                                    | 0,5 and 0,75                                  | 1 and 2,5          |
| >3 and ≤6                             | 0,75 and 1                                    | 1 and 2,5          |
| >6 and ≤10                            | 1 and 1,5                                     | 1 and 2,5          |
| >10 and ≤16                           | 1,5 and 2,5                                   | 1,5 and 4          |
| >16 and ≤25                           | 2,5 and 4                                     | 2,5 and 6          |
| >25 and ≤32                           | 4 and 6                                       | 4 and 10           |
| >32 and ≤50                           | 6 and 10                                      | 6 and 16           |
| >50 and ≤63                           | 10 and 16                                     | 10 and 25          |

**Electric wiring**

**TABLE 2 (Standard 4 - 16 kW single-phase and standard 12 - 16 kW three-phase)**

| System            | Voltage (V) | Outdoor unit |          |          | Supply current |          |         | Compressor |         | OFM  |         |
|-------------------|-------------|--------------|----------|----------|----------------|----------|---------|------------|---------|------|---------|
|                   |             | Hz           | Min. (V) | Max. (V) | MCA (A)        | TOCA (A) | MFA (A) | MSC (A)    | RLA (A) | KW   | FLA (A) |
| 4kW               | 220-240     | 50           | 198      | 264      | 12             | 18       | 25      | -          | 11,50   | 0,10 | 0,50    |
| 6kW               | 220-240     | 50           | 198      | 264      | 14             | 18       | 25      | -          | 13,50   | 0,10 | 0,50    |
| 8kW               | 220-240     | 50           | 198      | 264      | 16             | 19       | 25      | -          | 14,50   | 0,17 | 1,50    |
| 10kW              | 220-240     | 50           | 198      | 264      | 17             | 19       | 25      | -          | 15,50   | 0,17 | 1,50    |
| 12kW              | 220-240     | 50           | 198      | 264      | 25             | 30       | 35      | -          | 23,50   | 0,17 | 1,50    |
| 14kW              | 220-240     | 50           | 198      | 264      | 26             | 30       | 35      | -          | 24,50   | 0,17 | 1,50    |
| 16kW              | 220-240     | 50           | 198      | 264      | 27             | 30       | 35      | -          | 25,50   | 0,17 | 1,50    |
| 12 kW three-phase | 380-415     | 50           | 342      | 456      | 10             | 14       | 16      | -          | 9,15    | 0,17 | 1,50    |
| 14 kW three-phase | 380-415     | 50           | 342      | 456      | 11             | 14       | 16      | -          | 10,15   | 0,17 | 1,50    |
| 16 kW three-phase | 380-415     | 50           | 342      | 456      | 12             | 14       | 16      | -          | 11,15   | 0,17 | 1,50    |

**TABLE 2 (4 - 16 kW single-phase and 12 - 16 kW three-phase standard with 3 kW backup heater)**

| System            | Voltage (V) | Outdoor unit |          |          | Supply current |          |         | Compressor |         | OFM  |         |
|-------------------|-------------|--------------|----------|----------|----------------|----------|---------|------------|---------|------|---------|
|                   |             | Hz           | Min. (V) | Max. (V) | MCA (A)        | TOCA (A) | MFA (A) | MSC (A)    | RLA (A) | KW   | FLA (A) |
| 4kW               | 220-240     | 50           | 198      | 264      | 25             | 31       | 38      | -          | 11,50   | 0,10 | 0,50    |
| 6kW               | 220-240     | 50           | 198      | 264      | 27             | 31       | 38      | -          | 13,50   | 0,10 | 0,50    |
| 8kW               | 220-240     | 50           | 198      | 264      | 29             | 32       | 38      | -          | 14,50   | 0,17 | 1,50    |
| 10kW              | 220-240     | 50           | 198      | 264      | 30             | 32       | 38      | -          | 15,50   | 0,17 | 1,50    |
| 12kW              | 220-240     | 50           | 198      | 264      | 38             | 43       | 48      | -          | 23,50   | 0,17 | 1,50    |
| 14kW              | 220-240     | 50           | 198      | 264      | 39             | 43       | 48      | -          | 24,50   | 0,17 | 1,50    |
| 16kW              | 220-240     | 50           | 198      | 264      | 40             | 43       | 48      | -          | 25,50   | 0,17 | 1,50    |
| 12 kW three-phase | 380-415     | 50           | 342      | 456      | 23             | 27       | 29      | -          | 9,15    | 0,17 | 1,50    |
| 14 kW three-phase | 380-415     | 50           | 342      | 456      | 24             | 27       | 29      | -          | 10,15   | 0,17 | 1,50    |
| 16 kW three-phase | 380-415     | 50           | 342      | 456      | 25             | 27       | 29      | -          | 11,15   | 0,17 | 1,50    |

**TABLE 2 (8 - 16 kW single-phase and 12 - 16 kW three-phase standard with 9 kW backup heater)**

| System            | Voltage (V) | Outdoor unit |          |          | Supply current |          |         | Compressor |         | OFM  |         |
|-------------------|-------------|--------------|----------|----------|----------------|----------|---------|------------|---------|------|---------|
|                   |             | Hz           | Min. (V) | Max. (V) | MCA (A)        | TOCA (A) | MFA (A) | MSC (A)    | RLA (A) | KW   | FLA (A) |
| 8kW               | 380-415     | 50           | 342      | 456      | 29             | 32       | 38      | -          | 14,50   | 0,17 | 1,50    |
| 10kW              | 380-415     | 50           | 342      | 456      | 30             | 32       | 38      | -          | 15,50   | 0,17 | 1,50    |
| 12kW              | 380-415     | 50           | 342      | 456      | 38             | 43       | 48      | -          | 23,50   | 0,17 | 1,50    |
| 14kW              | 380-415     | 50           | 342      | 456      | 39             | 43       | 48      | -          | 24,50   | 0,17 | 1,50    |
| 16kW              | 380-415     | 50           | 342      | 456      | 40             | 43       | 48      | -          | 25,50   | 0,17 | 1,50    |
| 12 kW three-phase | 380-415     | 50           | 342      | 456      | 23             | 27       | 29      | -          | 9,15    | 0,17 | 1,50    |
| 14 kW three-phase | 380-415     | 50           | 342      | 456      | 24             | 27       | 29      | -          | 10,15   | 0,17 | 1,50    |
| 16 kW three-phase | 380-415     | 50           | 342      | 456      | 25             | 27       | 29      | -          | 11,15   | 0,17 | 1,50    |

MCA: Maximum circuit ampacity (A)  
 TOCA: Total overcurrent amps (A)  
 MFA: Maximum fuse amps (A)  
 MSC: Maximum starting current (A)  
 RLA: In test conditions with nominal cooling or heating, the compressor input amps where MAX. Hz can work with the nominal load amps (A)  
 KW: Nominal motor output  
 FLA: Amperage with full load (A).

Electric wiring

# Removing the switch box cover

Standard 4 - 16 kW single-phase and standard 12 - 16 kW three-phase

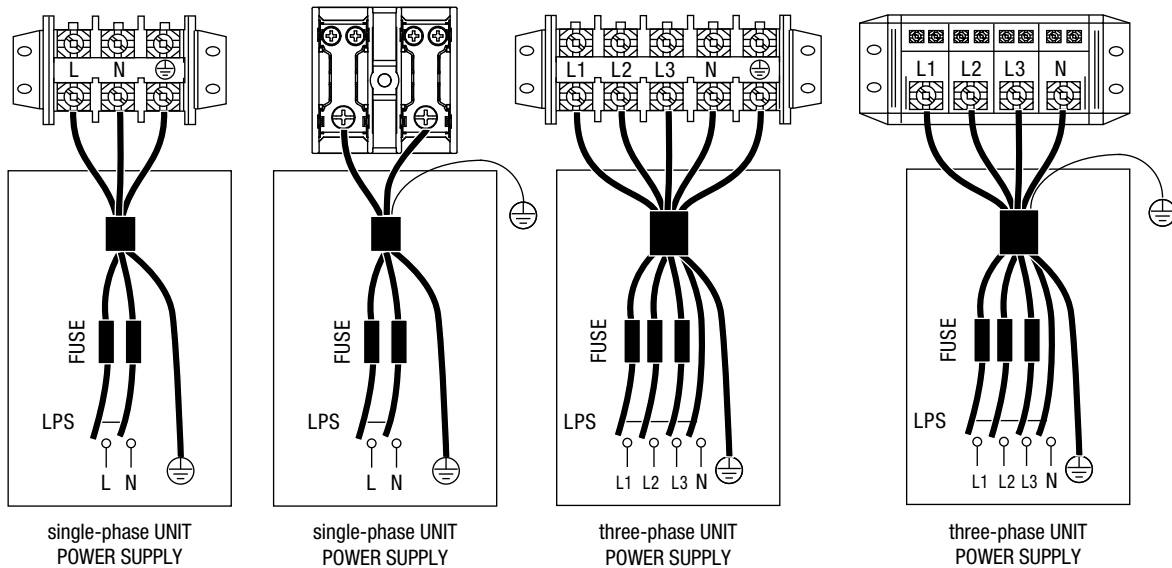
| Unit                                     | 4kW | 6kW | 8kW | 10kW | 12kW | 14kW | 16kW | 12kW<br>Three-<br>phase | 14kW<br>Three-<br>phase | 16kW<br>Three-<br>phase |
|--|-----|-----|-----|------|------|------|------|-------------------------|-------------------------|-------------------------|
| Maximum overcurrent protection (MOP) (A) | 18  | 18  | 19  | 19   | 30   | 30   | 30   | 14                      | 14                      | 14                      |
| Cable dimensions (mm <sup>2</sup> )      | 4,0 | 4,0 | 4,0 | 4,0  | 6,0  | 6,0  | 6,0  | 2,5                     | 2,5                     | 2,5                     |

Standard 4 - 16 kW single-phase and 12 - 16 kW three-phase standard with 3 kW backup heater (single-phase)

| Unit                                     | 4kW | 6kW | 8kW | 10kW | 12kW | 14kW | 16kW | 12kW<br>Three-<br>phase | 14kW<br>Three-<br>phase | 16kW<br>Three-<br>phase |
|--|-----|-----|-----|------|------|------|------|-------------------------|-------------------------|-------------------------|
| Maximum overcurrent protection (MOP) (A) | 31  | 31  | 32  | 32   | 43   | 43   | 43   | 27                      | 27                      | 27                      |
| Cable dimensions (mm <sup>2</sup> )      | 6,0 | 6,0 | 8,0 | 8,0  | 10,0 | 10,0 | 10,0 | 4,0                     | 4,0                     | 4,0                     |

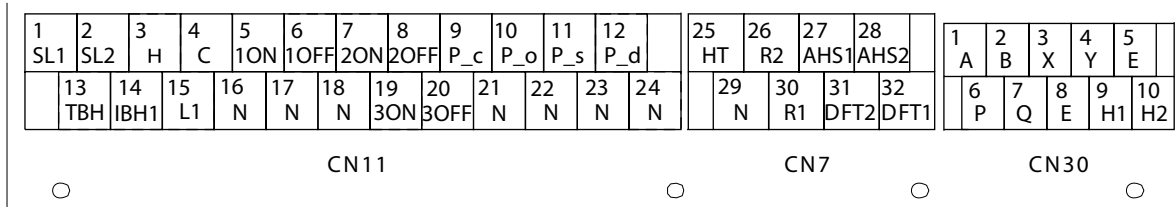
Standard 8 - 16 kW single-phase and 12 - 16 kW three-phase standard with 9 kW backup heater (three-phase)

| Unit                                     | 8kW | 10kW | 12kW | 14kW | 16kW | 12kW<br>Three-<br>phase | 14kW<br>Three-<br>phase | 16kW<br>Three-<br>phase |
|--|-----|------|------|------|------|-------------------------|-------------------------|-------------------------|
| Maximum overcurrent protection (MOP) (A) | 32  | 32   | 43   | 43   | 43   | 27                      | 27                      | 27                      |
| Cable dimensions (mm <sup>2</sup> )      | 8,0 | 8,0  | 10,0 | 10,0 | 10,0 | 4,0                     | 4,0                     | 4,0                     |



Electric wiring

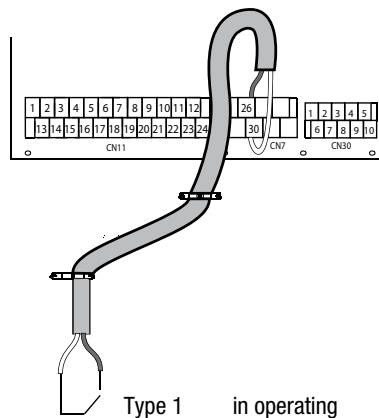
# Connections for other components



| CODE | PRINT   | CONNECTION TO                           |
|------|---------|---|
| 1    | 1 SL1   | Solar energy input signal               |
|      | 2 SL2   |   |
|      | 3 H     |   |
| 2    | 4 C     | Room thermostat input (high voltage)    |
|      | 15 L1   |   |
| 3    | 5 1ON   | SV1 (3-way valve)                       |
|      | 6 1OFF  |   |
| 4    | 7 2ON   | SV2 (3-way valve)                       |
|      | 8 2OFF  |   |
| 5    | 9 P_c   | Pump c (zone 2 pump)                    |
|      | 21 N    |   |
| 6    | 10 P_o  | External circulation pump (zone 1 pump) |
|      | 22 N    |   |
| 7    | 11 P_s  | Solar energy pump                       |
|      | 23 N    |   |
| 8    | 12 P_d  | DHW tube pump                           |
|      | 24 N    |   |
| 9    | 13 TBH  | Tank booster heater                     |
|      | 16 N    |   |
| 10   | 14 IBH1 | Internal backup heater 1                |
|      | 17 N    |   |
| 11   | 18 N    | SV3 (3-way valve)                       |
|      | 19 3ON  |   |
|      | 20 3OFF |   |

| CODE | PRINT | CONNECTION TO             |
|------|-------|---------------------------|
| 1    | 1 E   | Wired control panel       |
|      | 2 P   |                           |
|      | 3 Q   |                           |
|      | 4 H1  |                           |
|      | 5 H2  |                           |
| 2    | 6 A   | Outdoor unit              |
|      | 7 B   |                           |
| 3    | 9 X   | Internal parallel machine |
|      | 10 Y  |                           |

| CODE | PRINT   | CONNECTION TO             |
|------|---------|---------------------------|
| 1    | 26 R2   | Compressor operation      |
|      | 30 R1   |                           |
|      | 31 DFT2 |                           |
| 2    | 32 DFT1 | Defrosting operation      |
|      | 25 HT   |                           |
|      | 29 N    |                           |
| 3    | 27 AHS1 | Additional heating source |
|      | 28 AHS2 |                           |



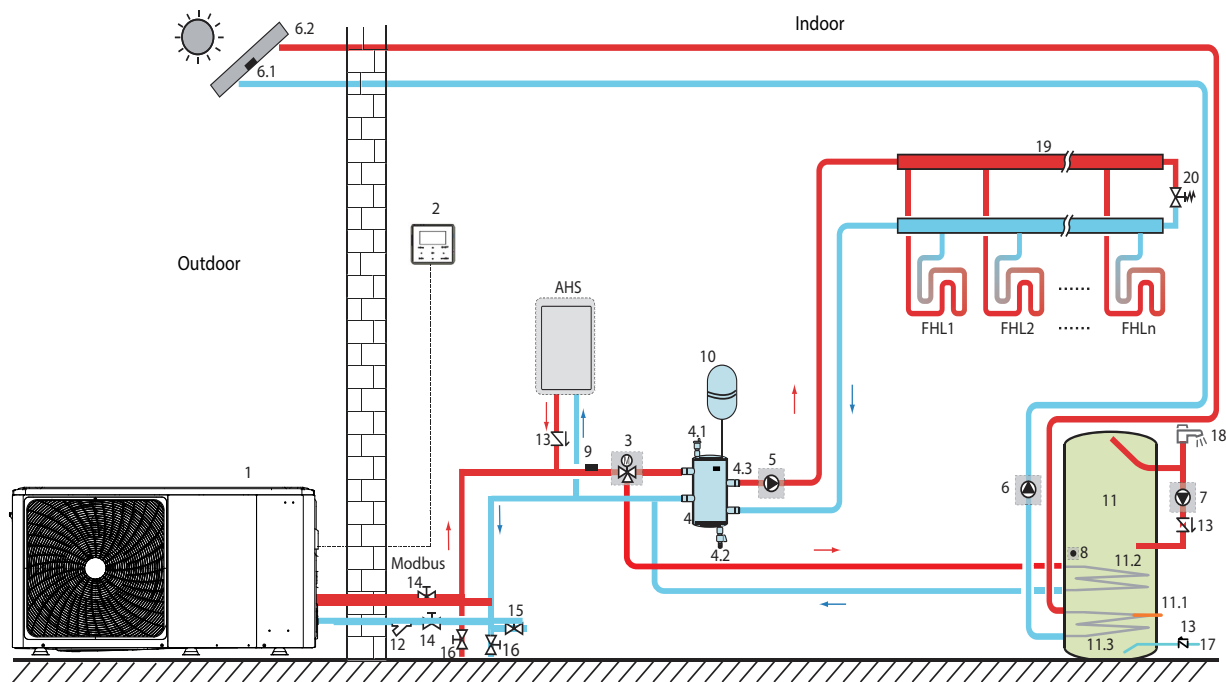
The port supplies the load with the control signal. Two types of control signal port:

Type 1: dry voltage-free connector.

Type 2: the port supplies the signal with a 220V voltage. If the load current is <math>< 0,2 A</math>, the load can be connected directly to the port. If the load current is >= 0,2A, the AC contactor must be connected for the load.

# Typical applications

## Application 1

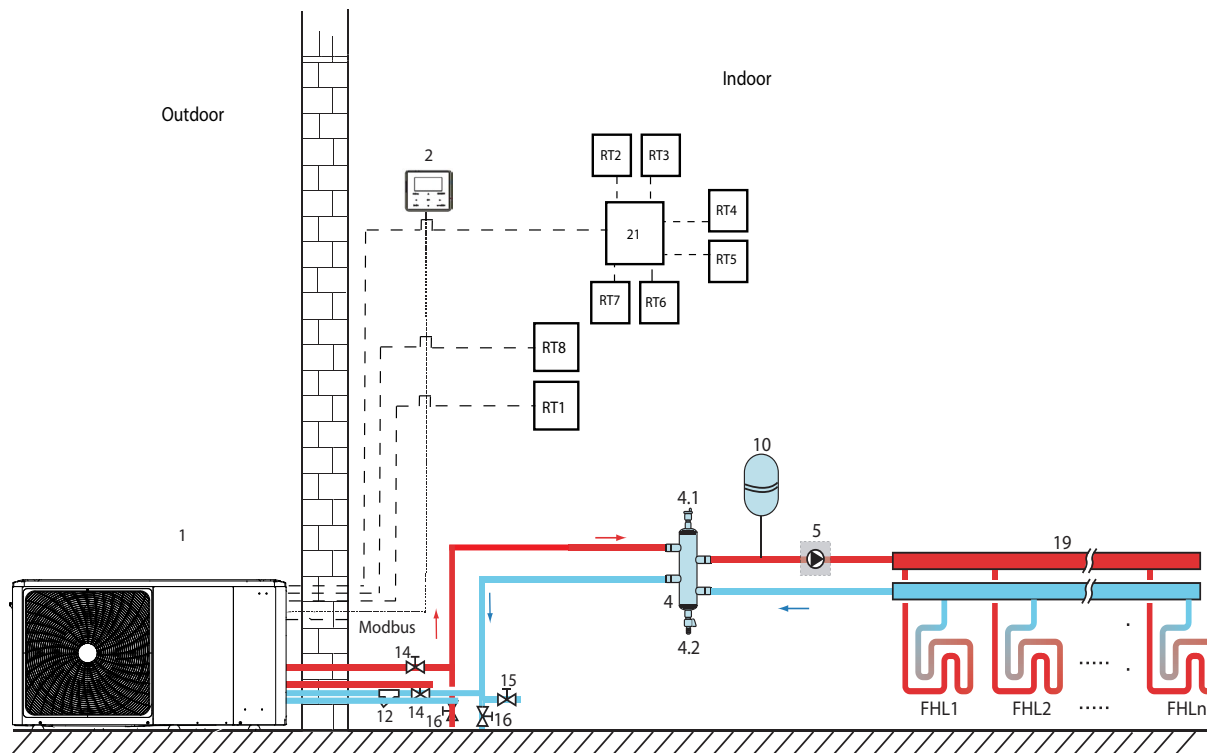


| Code | Assembly unit   |
|------|---|
| 1    | Main unit   |
| 2    | User interface  |
| 3    | Sv1: 3-way valve (field power supply)                           |
| 4    | Balancing tank (field power supply)                             |
| 4.1  | Automatic air purge valve                                       |
| 4.2  | Drain valve   |
| 4.3  | Tbt1: Upper temperature sensor of the balancing tank (optional) |
| 4.4  | Tbt2: Lower temperature sensor of the balancing tank (optional) |
| 5    | P_o: External circulation pump (field power supply)             |
| 6    | P_s: Solar pump (field power supply)                            |
| 6.1  | Tsolar: Solar temperature sensor (optional)                     |
| 6.2  | Solar panel (field power supply)                                |
| 7    | P_d: Pump for DHW pipes (field power supply)                    |
| 8    | T5: DHW tank temperature sensor (accessory)                     |
| 9    | T1: Total water flow temperature sensor (optional)              |
| 10   | Expansion tank (field power supply)                             |

|            |   |
|------------|---|
| 11         | DHW tank (field power supply)                     |
| 11.1       | TBH: DHW storage tank heater (field power supply) |
| 11.2       | Coil 1, heat exchanger for heat pump              |
| 11.3       | Coil 2, heat exchanger for solar energy           |
| 12         | Filter (accessory)                                |
| 13         | Control valve (field power supply)                |
| 14         | Shut-off valve (field power supply)               |
| 15         | Filler valve (field power supply)                 |
| 16         | Discharge valve (field power supply)              |
| 17         | Tap water inlet pipe (field power supply)         |
| 18         | Hot water tap (field power supply)                |
| 19         | Manifold/distributor (field power supply)         |
| 20         | Bypass valve (field power supply)                 |
| FHL 1... n | Floor heating circuit (field power supply)        |
| AHS        | Auxiliary heat source (field power supply)        |

Typical applications

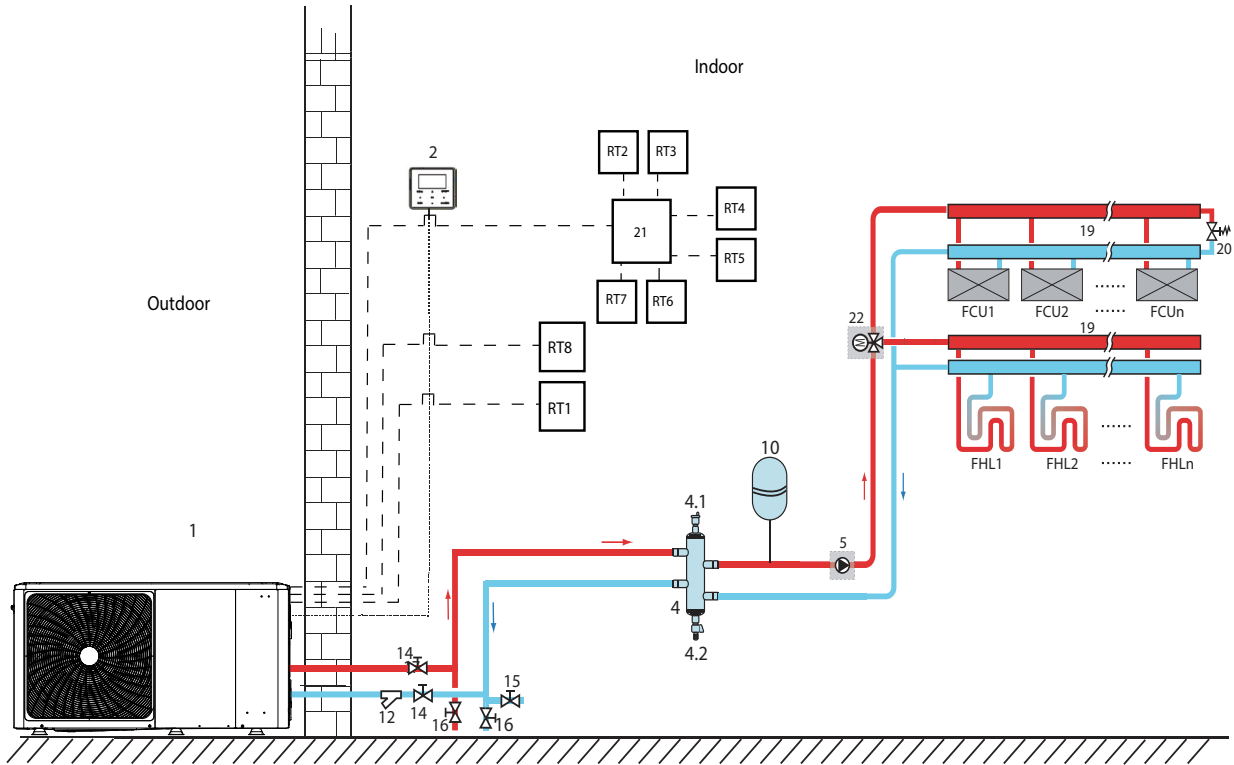
# Application 2 - One zone control



| Code          | Assembly unit                                       |
|---------------|---|
| 1             | Main unit   |
| 2             | User interface                                      |
| 4             | Balancing tank (field power supply)                 |
| 4.1           | Automatic air purge valve                           |
| 4.2           | Drain valve   |
| 5             | P_o: External circulation pump (field power supply) |
| 10            | Expansion tank (field power supply)                 |
| 12            | Filter (accessory)                                  |
| 14            | Shut-off valve (field power supply)                 |
| 15            | Filler valve (field power supply)                   |
| 16            | Discharge valve (field power supply)                |
| 19            | Manifold/distributor (field power supply)           |
| 21            | Thermostat transfer board (optional)                |
| RT 1...7      | Low voltage room thermostat (field power supply)    |
| RT8           | High voltage room thermostat (field power supply)   |
| FHL<br>1... n | Floor heating circuit (field power supply)          |

Typical applications

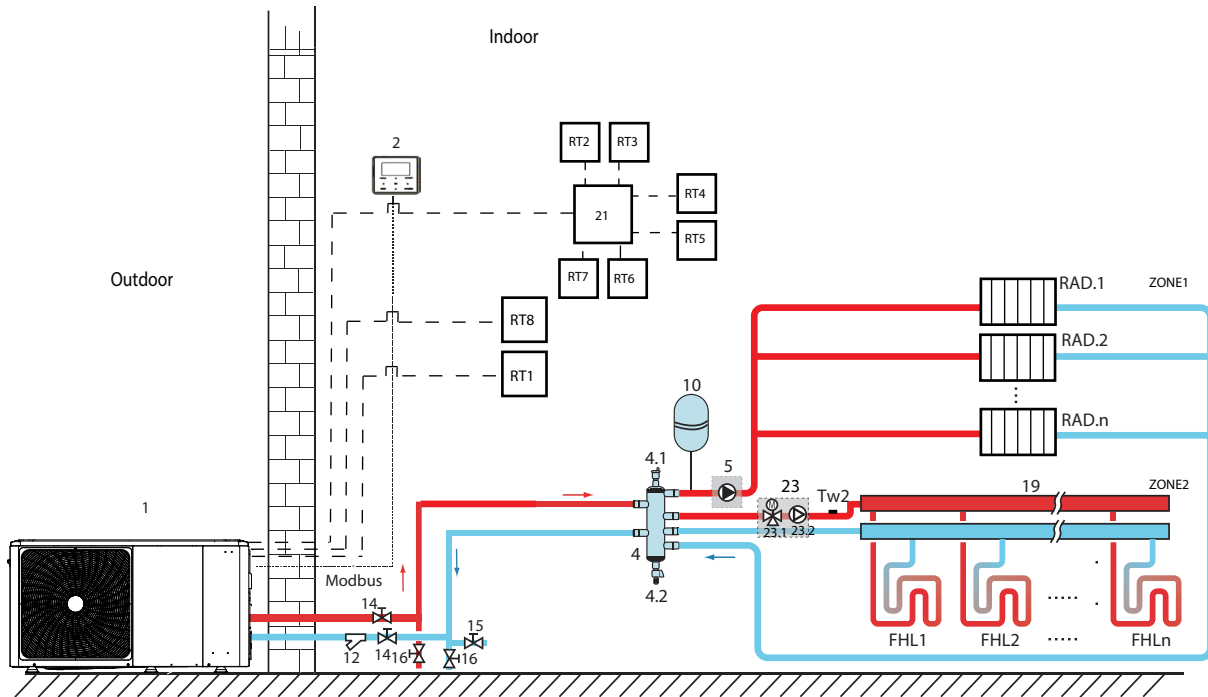
# Application 3 - Mode setting control



| Code   | Assembly unit                                       |
|--------|---|
| 1      | Main unit   |
| 2      | User interface                                      |
| 4      | Balancing tank (field power supply)                 |
| 4.1    | Automatic air purge valve                           |
| 4.2    | Drain valve   |
| 5      | P_o: External circulation pump (field power supply) |
| 10     | Expansion tank (field power supply)                 |
| 12     | Filter (accessory)                                  |
| 14     | Shut-off valve (field power supply)                 |
| 16     | Discharge valve (field power supply)                |
| 19     | Manifold/distributor (field power supply)           |
| 20     | Bypass valve (field power supply)                   |
| 21     | Thermostat transfer board (optional)                |
| 22     | SV2: 3-way valve (field power supply)               |
| RT     | Low voltage room thermostat                         |
| RT8    | High voltage room thermostat (field power supply)   |
| FHL    | Floor heating circuit                               |
| 1... n | (field power supply)                                |
| FCU    | Fan coil (field power supply)                       |
| 1... n |   |

Typical applications

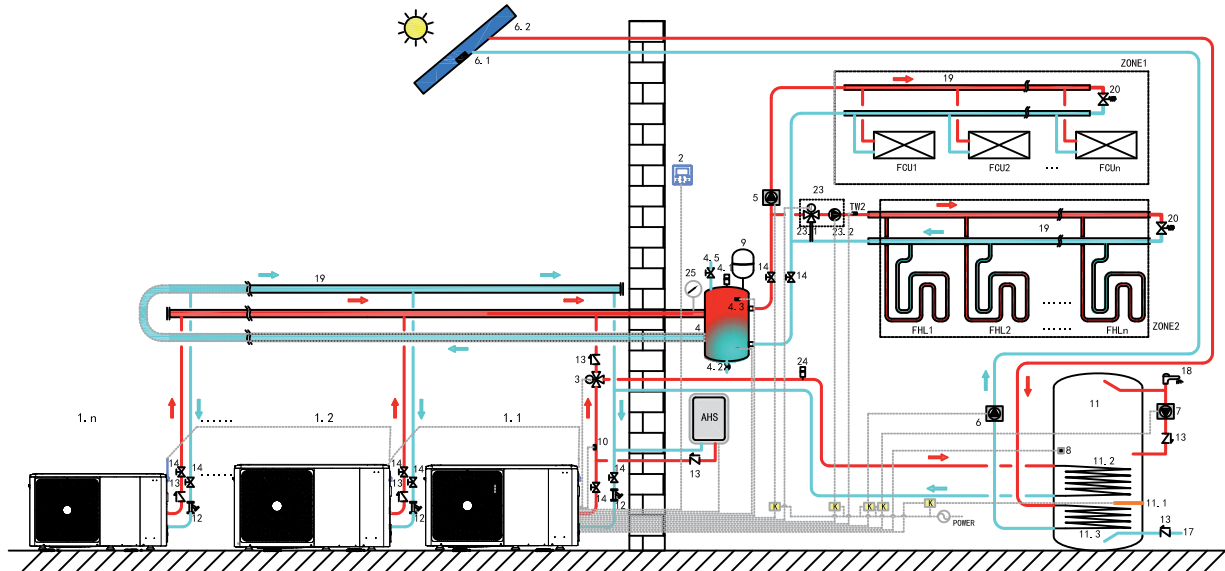
# Application 4 - Dual zone control



| Code     | Assembly unit                                       |
|----------|---|
| 1        | Main unit   |
| 2        | User interface                                      |
| 4        | Balancing tank (field power supply)                 |
| 4.1      | Automatic air purge valve                           |
| 4.2      | Drain valve   |
| 5        | P_o: External circulation pump (field power supply) |
| 10       | Expansion tank (field power supply)                 |
| 12       | Filter (accessory)                                  |
| 14       | Shut-off valve (field power supply)                 |
| 15       | Filler valve (field power supply)                   |
| 16       | Discharge valve (field power supply)                |
| 19       | Manifold/distributor (field power supply)           |
| 21       | Thermostat transfer board (optional)                |
| 23       | Mixing station (field power supply)                 |
| 23.1     | SV3: Mixer valve (field power supply)               |
| 23.2     | P_c: Zone 2 circulation pump (field power supply)   |
| RT 1...7 | Low voltage room thermostat (field power supply)    |
| RT8      | High voltage room thermostat (field power supply)   |
| Tw2      | Zone 2 water flow temperature sensor (optional)     |
| FHL      | Floor heating circuit                               |
| 1... n   | (field power supply)                                |
| RAD.     | Radiator (field power supply)                       |
| 1... n   |   |

Typical applications

# Application 5 - Parallel system



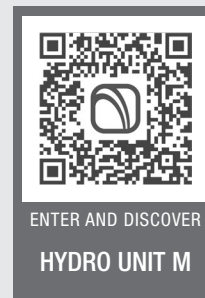
| Code     | Assembly unit   |
|----------|---|
| 1.1      | Master unit   |
| 1.2... n | Slave unit  |
| 2        | User interface  |
| 3        | Sv1: 3-way valve (field power supply)                           |
| 4        | Balancing tank (field power supply)                             |
| 4.1      | Automatic air purge valve                                       |
| 4.2      | Drain valve   |
| 4.3      | Tbt1: Upper temperature sensor of the balancing tank (optional) |
| 4.5      | Tbt2: Lower temperature sensor of the balancing tank (optional) |
| 5        | P_o: External circulation pump (field power supply)             |
| 6        | P_s: Solar pump (field power supply)                            |
| 6.1      | T solar: Solar temperature sensor (optional)                    |
| 6.2      | Solar panel (field power supply)                                |
| 7        | P_D: Pump for DHW pipes (field power supply)                    |
| 8        | T5: DHW tank temperature sensor (accessory)                     |
| 9        | Expansion tank (field power supply)                             |
| 10       | T1: Total water flow temperature sensor (optional)              |
| 11       | DHW tank (field power supply)                                   |
| 11.1     | TBH: DHW storage tank heater                                    |
| 11.2     | Coil 1, heat exchanger for heat pump                            |
| 11.3     | Coil 2, heat exchanger for solar energy                         |
| 12       | Filter (accessory)  |
| 13       | Control valve (field power supply)                              |

|           |  |
|-----------|--|
| 14        | Shut-off valve (field power supply)                    |
| 17        | Tap water inlet pipe (field power supply)              |
| 18        | Hot water tap (field power supply)                     |
| 19        | Manifold/distributor (field power supply)              |
| 20        | Bypass valve (field power supply)                      |
| 23        | Mixing station (field power supply)                    |
| 23.1      | SV3: Mixer valve (field power supply)                  |
| 23.2      | P_C: Zone 2 circulation pump (field power supply)      |
| 24        | Automatic air purge valve (field power supply)         |
| 25        | Water pressure gauge (field power supply)              |
| TW2       | Temperature sensor on zone 2 water delivery (optional) |
| FCU1... n | Fan coil (field power supply)                          |
| FHL1... n | Floor heating circuit (field power supply)             |
| K         | Meter (field power supply)                             |
| ZONE1     | The space works in cooling or heating mode             |
| ZONE2     | The room works in heating mode only                    |
| AHS       | Auxiliary heat source (field power supply)             |



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