



# AWR MTD2 XE



0011 - 0091  
6,3 ÷ 25,1 kW

Medium temperature reverse-cycle units for the production of hot water up to 58°C and domestic hot water with priority



(The photo of the unit is indicative and may change depending on the model)

- High efficiency
- Adaptability
- Silent operation
- Heat pump function
- Hot water production



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This company participates in the Eurovent Certification Programme. The products are listed in the Directory of certified products. Eurovent certification applied to units with cooling capacity up to 1500 kW for air cooled water chillers and water cooled liquid chillers.



Company quality system certified to UNI EN ISO 9001 and environmental certification UNI EN ISO 14001

### Waiver of liability

This document cannot be considered comprehensive for the purposes of: installation, operation, precautions against risks, handling and transport. See the "General installation manual" for further information.

This document refers to standard configurations, in particular regarding dimensions, weights, electrical, refrigerant, water and air duct connections (where applicable). For further information, drawings and diagrams contact the Climaveneta Sales Office.

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## 1. DESCRIPTION OF THE UNIT

### High efficiency range

This new series of units features high efficiency values, both in heating (COP) and cooling (EER), in compliance with recent national and European directives.

This excellent result has been achieved by carefully sizing all the components. Special attention has been paid to all heat exchange surfaces and the fans.

The use of newly designed condensing coils, with larger surfaces and special layout, new asymmetrical evaporators with better and more efficient refrigerant distribution, both in the liquid and gas phase, and high efficiency fans are some of the important innovations included with this product.

Careful sizing of the systems this series of units are used with can mean significant savings in energy consumed and consequently a major reduction in running costs.

### Smart Defrost (Climaveneta patent)

The heat pumps come with an innovative and patented self-adaptive defrost system that optimises defrost times, improving overall unit efficiency.

The strength of this new logic is the ability to automatically adjust parameters used by the algorithms in each cycle, based on the outside conditions.

Controlling the evaporation pressure, outside air temperature and defrost time, give an excellent estimate of ice on the coil, thus guaranteeing an effective and efficient defrost cycle.

### Air-water heat pump

Reverse-cycle air-water heat pump.

Unit supplied complete with non-freezing oil and refrigerant charge, and factory tested. Only water and electrical connections are required on site. Unit charged with R410A ecological refrigerant.

## COMPOSITION OF STANDARD UNIT

### Structure

Structure made from hot galvanised steel load-bearing base and panels, painted with polyester power coat. The load-bearing structure that holds together and supports the main components is designed to guarantee maximum access for service and maintenance.

### Compressor

Hermetic rotary scroll compressors.

All compressors come complete with sump heater, electronic thermal overload protection with centralised manual reset, and two-pole electric motor.

### Utility-side heat exchanger

Braze welded AISI 316 steel plate heat exchanger. The heat exchangers are lined on the outside with a layer of closed-cell neoprene to prevent condensation. When the unit is not operating, the heat exchangers are protected against frost on the inside by an electric heater with thermostat, while, when the unit is operating, protection is ensured by a water differential pressure switch. The unit is also ready to operate, using non-freezing fluid mixes, down to exchanger outlet temperatures of -8°C.

### Source-side heat exchanger

Finned coil heat exchanger made from copper tubes and aluminium fins, spaced apart so as to guarantee maximum heat exchange efficiency. The unit is fitted as standard of the grills of protection coil and of the tray condensate drain (up to model 0051).

### Electric frost protection heater for the base

Modulating electric frost protection heater for the base, positioned between the finned heat exchanger and the base to improve and assist drainage of water during defrosts (up to model 0051).

### Fans

Axial-flow fans with IP 54 index of protection, external impeller, with pressed plate blades, housed in aerodynamic tubes with accident prevention grill. Six-pole electric motor with built-in thermal cut-out. Fans with continuous speed control by pressure transducer.

### Refrigerant circuit

Main components in the refrigerant circuit:

- refrigerant R410A
- dewatering filter,
- liquid flow indicator with moisture signal,
- thermostatic valve with external equaliser,
- high and low safety pressure switches,
- liquid receiver,
- 4-way reversing valve.

### Power and control electrical panel

Electrical control panel built in compliance with EN 60204-1/IEC 204-1, complete with:

- Main door lock disconnect switch,
- Thermal cut-out switches for compressors and fans,
- Cumulative alarm terminals (BCA),
- Remote ON/OFF terminals,
- Spring terminal blocks for the control circuits,
- Electrical panel for outdoor installation, with two doors and gaskets,
- Electronic controller,
- Numbered control circuit cables,
- Pump enabling relay,
- Continuous fan speed control,
- Remote COOL/HEAT terminals,
- Peak limiter (as standard on single-phase units),
- Compressor and fan start capacitor,
- System water pump protection fuse,
- Auxiliary circuit protection fuse,
- Fan protection fuse,
- Board power supply protection fuse,
- Autotransformer,
- Phase sequence control relay
- Auxiliary heater relay (MTD2 XE/H version only),
- High pressure switch relay,
- Alarm/secondary pump/dehumidifier relay,
- Outlet heater or boiler relay,
- Compressor control relay,
- Auxiliary heater contact (MTD2 XE/H version only),
- Compressor thermal overload switch,
- Auxiliary heating element thermal overload switch (MTD2 XE/H version only).

### The water circuit is completed by:

- Variable flow-rate pump for all models.
- Differential pressure switch on water side.
- Expansion vessel (2 litres)
- Safety valve. (6 bar)
- Manual fill assembly.
- Pressure gauge.
- Vent valve.

**Auxiliary heating element for AWR MTD2 XE/H models only (system side)**

The AWR MTD2 XE/H heat pump is supplied as standard with an electric heater enabled as a supplementary heat source and all-electric system operation.

The electric heater is activated below a certain outside temperature to satisfy the building's heat load that the heat pump alone cannot manage, as described in the paragraph on "Auxiliary Resources".

Electric heater operation can also be set so as to replace the heat pump, with bivalent system operation.

On version AWR MTD2 XE/H, management of system operation on a second auxiliary source is not available, as the electric heater is already fitted. The contact for the DHW storage electric heater is still available.

The units are fitted as standard with the following electric heaters:

MODEL	ELECTRIC HEATER
AWR MTD XE/H 0011ms	2 kW
AWR MTD XE/H 0025ms	3 kW
AWR MTD XE/H 0031ms	3 kW
AWR MTD XE/H 0041ms	6 kW
AWR MTD XE/H 0031t	3 kW
AWR MTD XE/H 0041t	6 kW
AWR MTD XE/H 0051t	6 kW
AWR MTD XE/H 0061t	6 kW
AWR MTD XE/H 0091t	9 kW

- Domestic hot water storage tank, 300, 500 and 1000 litres with solar heating coil, to be combined with the DOMH2O instant domestic hot water production kit.
- DOMH2O15 and DOMH2O24 instant domestic hot water production kit.

**VERSIONS AVAILABLE**

**AWR MTD2 XE/H** Reverse-cycle air/water heat pump with domestic hot water production. Built-in water circuit assembly complete with electric heaters.

**AWR MTD2 XE** Reverse-cycle air/water heat pump with domestic hot water production. Built-in water circuit assembly without electric heaters

**SUPPLIED AS STANDARD**

- N-THC remote control complete with backlit display, temperature probe, humidity probe, knob and 4 buttons (must be installed)
- Outside air temperature probe for climate compensation (must be installed)
- Domestic hot water probe
- Storage tank probe
- Coil protection grills

**ACCESSORIES**

- N-THC wired room timer thermostat with backlit display, complete with temperature and humidity probe for system configuration.
- N-EM1 expansion module for system configuration.
- 3-way selector valve for domestic hot water production.
- Supplementary electric heater for the heating system.
- DHW storage electric heater, as supplementary heat source and for Legionella prevention.
- N-CM kit for managing heat pumps in cascade.
- N-RS RS485 serial card for ModBus protocol.
- Low-loss header, 35, 100 or 200 litres.
- Domestic hot water cylinder, 300 or 500 litres.
- Domestic hot water storage tank, 300 litres, to be combined with the DOMH2O instant domestic hot water production kit.

## 2. ELECTRONIC CONTROLLER

The NADISYSTEM electronic controller is based on an innovative and efficient approach to building air-conditioning.

Energy is only consumed when necessary and the energy sources are used based on availability, efficiency and cost, giving priority to renewable sources, where available.

The first significant advantage of introducing a single integrated control system is optimisation of energy savings through coordination between the different system components, eliminating inefficiencies in communication, simplifying installation and reducing the number of controllers.

NADISYSTEM ensures dynamic control of water outlet temperature according to real needs in the building and the outside air temperature, optimising comfort and reducing wasted energy.

The remote keypad supplied with the unit can be used to freely set the room temperature, humidity, operating mode, domestic hot water production and operating times for each zone.

The NADISYSTEM control system for residential applications gives high operating flexibility by controlling the secondary circuits, that is, activating zone pumps and valves depending on the room temperature set on the remote keypad, and by controlling mixing valves to ensure the correct water temperature in radiant systems according to the climate conditions set for each circuit.

There are 15 different types of pre-configured system for quick and easy installation, with the possibility to manage up to 5 remote keypads for controlling thermal load in likewise zones.

The advanced PRANA controller also allows integration of solar panels for the domestic hot water production, giving priority to direct solar energy, if available, and increasing the use of renewable sources while also managing traditional sources, such as electric heaters or boilers.

The controller can manage up to four 4 heat pumps connected in cascade to increase capacity in applications with multiple occupied areas, such as hotels, schools, apartment blocks, offices and shopping centres.

The units are managed in master-slave mode, with the master unit responsible for processing the information and sending it to the slave units.

This ensures fine control over the capacity delivered, without decreasing performance, and more precise system sizing.

NADISYSTEM can determine how many cascaded units are needed to guarantee domestic hot water production, all or just one, according to requirements.

The controller also balances compressor operating hours based on time logic, activating the units in rotation, and where necessary excluding any units that are momentarily out of service, without interrupting operation of the cascade as a whole.

Moreover, the controller modulates fan operation for optimum condensation or evaporation, depending on the operating mode, allowing domestic hot water production even in summer with outside temperatures up to 45°C, and reducing noise at night.

NADISYSTEM also allows easy service, being interfaceable to supervision systems for remote maintenance by specialist technicians, as well as remote control of certain functions, such as:

- la remotazione di alcuni comandi come:
  - on/off
  - cooling/heating operation
  - heating system/domestic hot water priority
  - shutdown due to electricity rate



### Main functions

- Wired remote keypad with backlit display, complete with temperature and humidity probe
- Calculation of dew point and increase in water outlet temperature for underfloor systems, possibility to enable a dehumidifier
- Operating parameters with dedicated user and installer menus to configure the type of system
- Weekly timer for setting 6 daily time bands
- Outside air temperature probe to control the system water temperature set point based on heating and cooling compensation curves. Fixed point operation also available.
- Cooling, heating operating modes, automatic mode changeover
- Domestic hot water production
- Supplementary electric heater management for domestic hot water storage and Legionella prevention cycle
- Domestic hot water recirculation by timer or flow switch
- External resource (boiler or electric heater) management as supplementary or sole source of heat
- Cascaded management of up to 4 heat pumps
- Different systems solutions by configuring the controller and using dedicated expansion modules (accessories), up to 5 zones with the possibility to control different temperature according to the selected compensation curves.
- Alarm signals
- Frost protection management based on inside or outside air temperature or water temperature, to protect the system pipes and heat exchangers inside the unit.

### 3. OPERATING CHARACTERISTICS

#### TEMPERATURE CONTROL

The water temperature delivered to the heating and cooling circuit is calculated by the controller and depends on the selected cooling and heating compensation curve.

A building's thermal requirements do not remain constant throughout the day or the year, but rather increase or decrease based on the outside air temperature.

It's therefore a waste of energy to keep the water at a constant temperature. Delivering water at different temperatures to the terminals based on the outside air temperature achieves high seasonal efficiency ratios and brings considerable savings in running costs.

The compensation curve in heating and cooling mode can be adjusted to allow correct heat pump operation according to the system (radiant panels, radiators, fan coils).

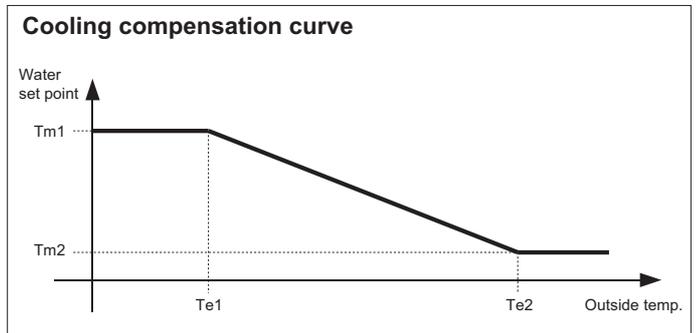
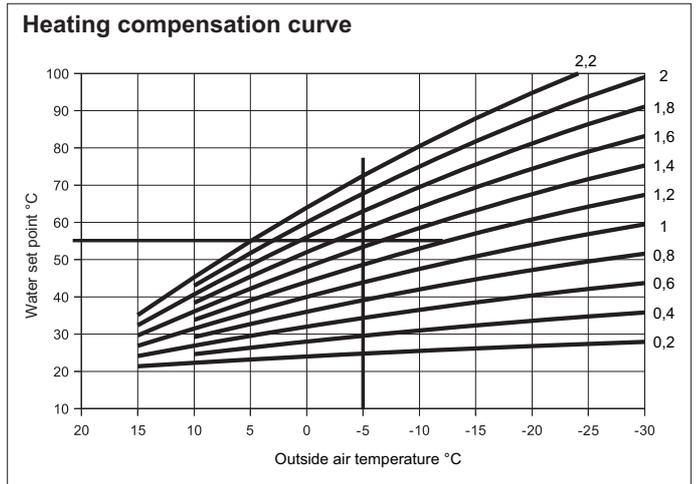
Example: Selecting heating curve 1.4 with an outside air temperature of  $-5^{\circ}\text{C}$  gives a water temperature of  $+55^{\circ}\text{C}$ .

Dedicated compensation curves can be set for each zone, depending on the type of terminal unit, or alternatively a fixed point temperature can be selected.

A function called "room temperature influence" is available to quickly adapt the water temperature by modifying the compensation curve when the indoor conditions change, for example when there are more occupants in the room.

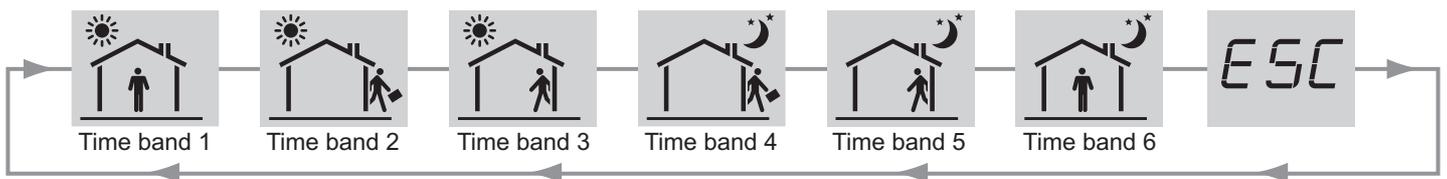
This function is only available in heating mode.

In cooling operation during summer, the controller calculates the dew point using temperature and humidity probe on the remote terminal, which determines an increase in the water temperature to deliver to the radiant system and activation of the dehumidifier (one dehumidifier contact only for all zones).



#### PROGRAMMING THE TIME BANDS

A timer is available to customise differentiated activation and deactivation for each individual zone of the system, creating an operating profile with up to 6 daily time bands.



#### SYSTEM PUMP OPERATION

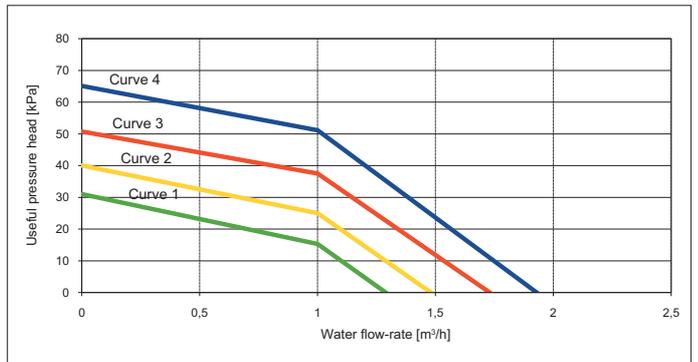
When reaching the system water temperature set point, the compressor stops and the system pump is activated periodically, so as to minimise energy consumption and ensure correct measurement of the water temperature.

The pump on and off times can be set using a parameter, according to the type of system.

In systems with fan coils, the time between one sniffing cycle and the next should be reduced in order to avoid excessive cooling of the water, in heating operation, and if and if the system water content is equal to the minimum value shown in the paragraph on "Minimum and maximum system water content".

Up to four operating curves can be selected, depending on the pressure drop in the system, so as to optimise pump operation and reduce power consumption.

The pumps are class A with EC motors.



**FAN SPEED CONTROL**

To enable the unit to function correctly at different outside temperatures, a microprocessor with pressure reading via pressure transducer controls fan rotation speed. This allows the exchange of heat to be increased and/or decreased, maintaining condensing or evaporation pressures essentially constant. The fan operates independently of the compressor.

**DOMESTIC HOT WATER PRODUCTION**

The controller manages domestic hot water production using a 3-way valve installed outside of the unit, deviating the flow of hot water to the DHW storage tank, which must be suitably sized according to the type of usage.

Production is enabled when the water temperature inside the DHW storage tank (probe BT8) is less than the DHW set point. The production of domestic hot water is guaranteed in both summer and winter, according to the operating limits shown in this manual.

If heat pump operation is expected outside of the limits, consider using a supplementary source of heat, managed directly by the controller.

An electric heater should be installed inside the DHW storage tank to ensure the temperature does not fall below 10°C in the event of extended periods of heat pump inactivity (standby).

**LEGIONELLA PREVENTION FUNCTION**

The Legionella prevention function ensures the elimination of the Legionella bacteria that reside in domestic water storage tanks.

The temperature and duration of the Legionella prevention cycles to eliminate bacteria are typically:

- 2 minutes > 70°C
- 4 minutes > 65°C
- 60 minutes > 60°C

The Legionella prevention cycles are managed directly by the controller, enabling the heater in the domestic hot water storage tank domestic, with the possibility to set the duration, temperature, day and time.

**AUXILIARY RESOURCES**

System operation can be distinguished as monovalent, all-electric or bivalent. The controller can activate the external source to achieve one of the functions listed above.

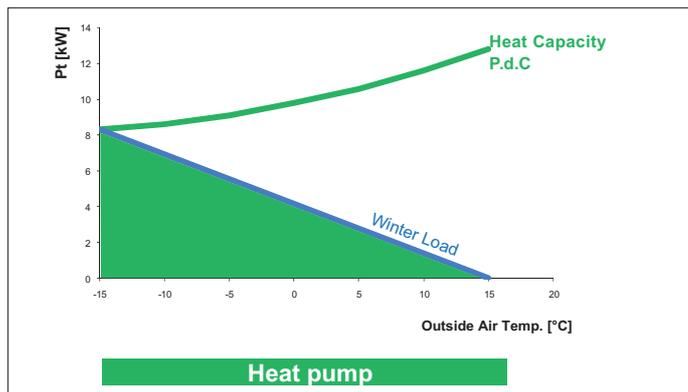
**Monovalent operation**

For monovalent operation, the heat pump has to meet the entire demand of the building.

There may be excessive heating capacity of the heat pump above all when the outside air temperature is above zero, as well as high power consumption.

Make sure the home's energy meter is correctly sized.

Solution suggested for new homes.



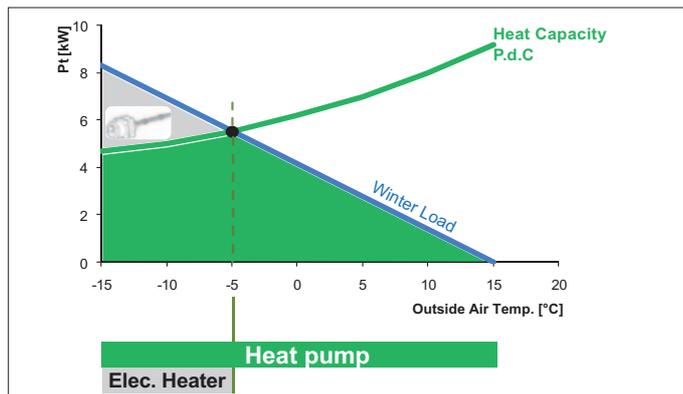
**All-electric operation**

In all-electric operation the heat pump is integrated with an electric heater to meet the entire demand of the building. The electric heater is activated below certain outside temperatures so as to satisfy demand in the building that the heat pump cannot manage on its own.

Considering the reduced number of hours of heat pump operation at low outside temperatures during the winter period, operation of the supplementary heater will also be reduced, and consequently power consumption will be negligible.

Therefore the system's seasonal energy efficiency remains unchanged.

This solution is suggested for new homes and lower investments than monovalent heat pumps.

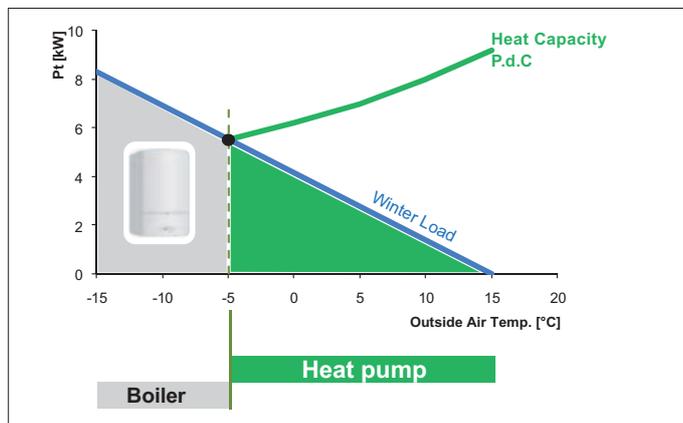


**Bivalent operation**

In the case of bivalent operation the heat pump meets the needs of the building down to a certain outside temperature, called the bivalence point.

Below the bivalence point the heat pump switches off and only the auxiliary source (e.g. boiler) provides heat for the building.

This solution is ideal for traditional systems and renovations.



**SYSTEM MANAGEMENT**

The NADISYSTEM control system for residential applications gives high operating flexibility by controlling the secondary circuits, that is, activating zone pumps and valves depending on the room temperature set on the remote keypad, and by controlling mixing valves to ensure the correct water temperature in radiant systems according to the climate conditions set for each circuit.

There are 15 different types of pre-configured system for quick and easy installation, with the possibility to manage up to 5 remote keypads for controlling thermal load in likewise zones.

If the radiant system also needs to meet cooling demand, humidity control is guaranteed by activating the dehumidifier contact, while calculation of the dew point, measured by the N-THC controller, ensures the correct water outlet temperature defined by the cooling compensation curve, thus avoiding formation of condensate on the floor.

Remember to suitably insulate the pipes in contact with the air, if air-conditioning is used in summer.

The following table indicates the different type of systems that can be controlled directly by the NadiSystem.

N. System Configuration	Remote Keypad	Expansion Module	High Temp. Zone <small>(ex. Radiator/ Fan Coil)</small>	High Temp. Zone <small>(ex. Radiator/ Fan Coil)</small>	High Temp. Zone <small>(ex. Radiator/ Fan Coil)</small>	Low Temp. Zone <small>(ex. Floor Heating)</small>	Low Temp. Zone <small>(ex. Floor Heating)</small>	Low Temp. Zone <small>(ex. Floor Heating)</small>	DHW Recirculation
	N-THC	N-EM1							
0	x1 standard								
1	x1 standard	x1							
2	x1 standard	x1							
3	x1 standard + x1 optional	x1							
4	x1 standard + x1 optional	x2							
5	x1 standard + x3 optional	x2							
6	x1 standard + x3 optional	x2							
7	x1 standard + x3 optional	x2							

The controller can manage the valves in each individual zone or alternatively pumps, depending on the set temperature. The system decides whether to activate the unit or the most energy efficient resources to meet demand.

NadiSystem manages different temperature levels based on the terminal units used.

The heat pump directly produces water at the right temperature for the system terminals connected to the high temperature circuits (e.g. fan coils, radiators, towel rails in bathrooms), while low temperature radiant panels are controlled by the mixing valves according to the specific compensation curves.

This means a compensation curve can be applied to the high temperature zones and different compensation curves for each low temperature zone (maximum three).

Depending on the type and complexity of the system, expansion modules are required for connection of the components managed by the system (pumps, valves, probes etc.), as indicated in the table.

Simple installation by serial connection of the components making up the NadiSystem.

N. System Configuration	Remote Keypad	Expansion Module	High Temp. Zone (ex. Radiator/ Fan Coil)	High Temp. Zone (ex. Radiator/ Fan Coil)	High Temp. Zone (ex. Radiator/ Fan Coil)	Low Temp. Zone (ex. Floor Heating)	Low Temp. Zone (ex. Floor Heating)	Low Temp. Zone (ex. Floor Heating)	DHW Recirculation
	N-THC	N-EM1							
8	x1 standard + x3 optional	x2							
9	x1 standard + x1 optional	x2							
10	x1 standard + x1 optional	x2							
11	x1 standard + x2 optional	x2							
12	x1 standard + x3 optional	x3							
13	x1 standard + x4 optional	x3							
14	x1 standard + x2 optional	x3							

**Key**

Mixing valve floor heating

Circulation Zone pump or motorized valve

Water probe

DHW pump circulation

Ambiente thermostat

\* N.1 ambiente thermostat available with the heat pump

\*\* Configurations from 4 to 14 are required additional N-THC as accessories

## FROST PROTECTION

The frost protection function is active even when the heat pump is OFF.

### DOMESTIC HOT WATER FROST PROTECTION STORAGE

The domestic hot water frost protection function is only active if an auxiliary resource is installed for the domestic hot water storage tank.

The additional heater is activated if the water temperature, measured by sensor BT8, is less than +5°C, and is deactivated at +8°C.

### PRIMARY CIRCUIT FROST PROTECTION SYSTEM

#### Version AWR MTD2 XE/H (complete with built-in heaters)

The frost protection function is guaranteed by activation of the heater inside the unit and system pump if the water temperature (measured by the probe at the heat exchanger outlet) is less than 4.5°C, with deactivation when the water temperature reaches +7°C.

#### Version AWR MTD2 XE

The frost protection function is guaranteed by activation of the 200 W electric heater used to protect the heat exchanger and the system pump.

The pump and the electric heater are activated if the water temperature (measured by the probe at the heat exchanger outlet) is less than 4.5°C and deactivated when the water temperature reaches +7°C.

### SECONDARY CIRCUIT FROST PROTECTION SYSTEM

The pumps on the system's secondary circuit are activated together with the primary pump, according to the criterion described in the previous paragraph.

### FROST PROTECTION BASED ON OUTSIDE AIR TEMPERATURE

The system pump is activated according to the outside air temperature to prevent ice forming in the pipes.

The pump is activated if the outside air temperature is less than 4°C and deactivated when it rises back over 5°C.

### FROST PROTECTION BASED ON INSIDE AIR TEMPERATURE

The heat pump and/or supplementary heat sources (outlet heater or boiler) are activated if the inside temperature falls below 14°C, to prevent the pipes inside the home from freezing.

### ALARM SIGNALS

Correct unit operation and any alarms are displayed on the room thermostat, the latter by the  symbol.

The diagnostics functions include complete alarm management, with an alarm log (via service keypad) for more detailed analysis of unit behaviour.

#### 4. ACCESSORIES

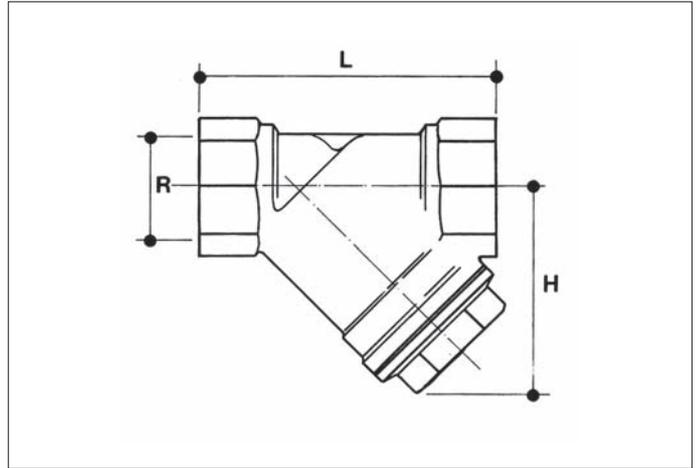
The accessories listed below are supplied separately.

##### METAL MESH WATER FILTER

This filter **MUST** be installed on the heat pump return pipe to trap any impurities in the water circuit that may damage the unit's heat exchanger.

Characteristics	
Body	Brass
Finish	Sanded
Body gasket	Betaflex 71
Thread	ISO 228/1
Filter	AISI 304 stainless steel micro-perforated sheet metal
Hole pitch	2 mm
Inscribed hole diameter	500 micron
Number of holes per cm <sup>2</sup>	80

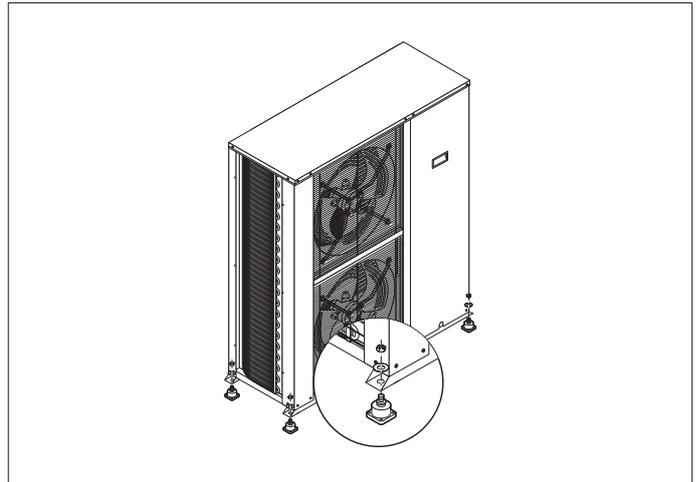
Dimensions				
DN		32	40	50
R	inch	1 1/4	1 1/2	2
L	mm	96	106	126
H	mm	68	75	90



Pressure drop				
R	inch	1 1/4	1 1/2	2
Kv		17	24,5	36

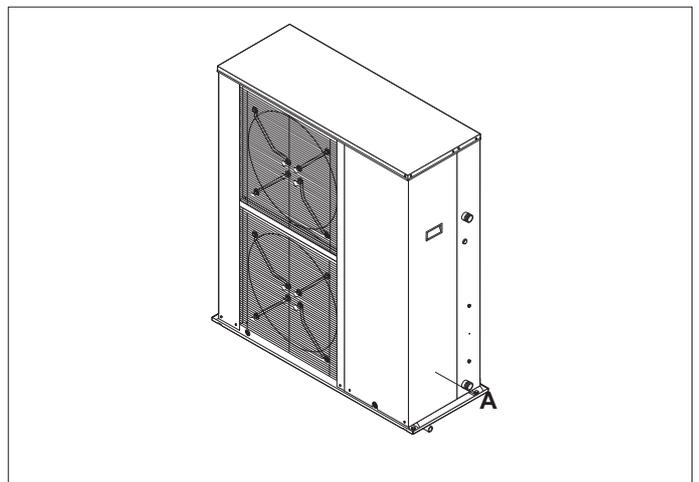
##### VIBRATION DAMPERS

Used between the heat pump and the support plane. Vibration dampers made from rubber, elastomer and aluminium alloy casing for fastening to the floor.



##### CONDENSATE DRAIN PAN FOR MODELS 0061-0091

Condensate drain pan to be used on models 0061 and 0091 only when needing to collect in one single point the condensate produced by the heat pump during operation in heating mode. The water collected can be carried to a suitable place via a plastic hose connected to drain **A** on the pan. Use hot wires on the condensate drain hoses to prevent freezing.



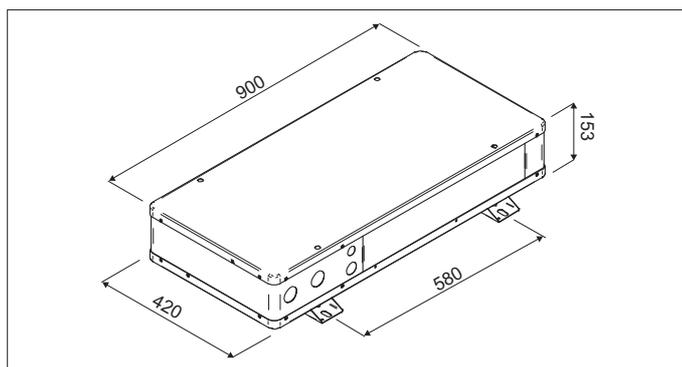
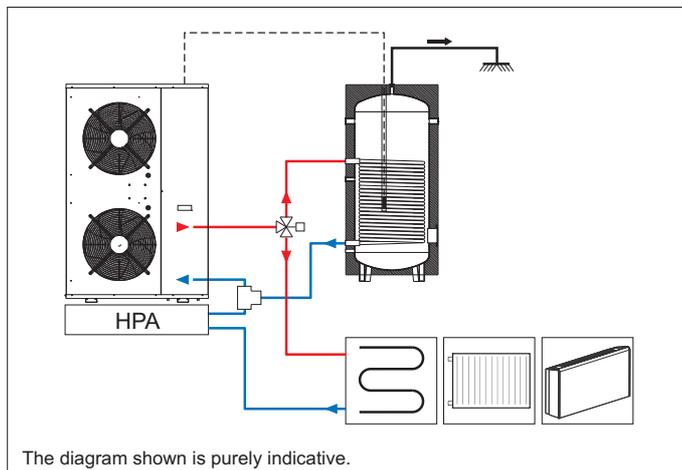
**HPA STORAGE TANK AND STANDARD CONNECTION PIPE KIT**

Storage tank, 30 litres, HPA30B, or 60 litres, HPA 60A, to be installed under the heat pump and connected by standard suitably configured pipe kit (see the drawing enclosed).

This accessory is essential to guarantee correct unit operation when the volume of water available in the system is too low (see “Water circuit data”).

If the heat pump is used for domestic hot water production, a ‘T’ connection must be fitted, as shown in the following diagram.

Dimensions			
HPA	mm	30B	60B
A	mm	900	1570
B	mm	420	548
C	mm	580	1541
D	mm	153	185



**BT AND PT STORAGE TANKS**

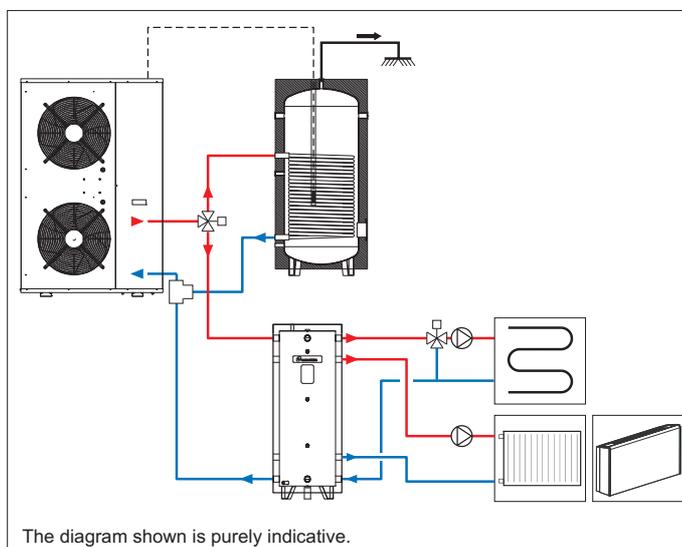
Storage tanks to be used in heating and cooling systems, to ensure minimum heat pump operating time in all operating conditions and avoid excessive starts and stops. It can also be used to isolate the water circuit from the heat pump and to partially meet energy demand during periods in which the unit is shutdown due to the electricity rate. For indoor installation.

Models available	Volume
BT35	35 litres
BT100	100 litres
BT200	200 litres
TP300	300 litres

The diagram illustrates the use of the BT/TP storage tank as a low-loss header to separate the heat pump primary circuit from the secondary circuit to the terminal units.

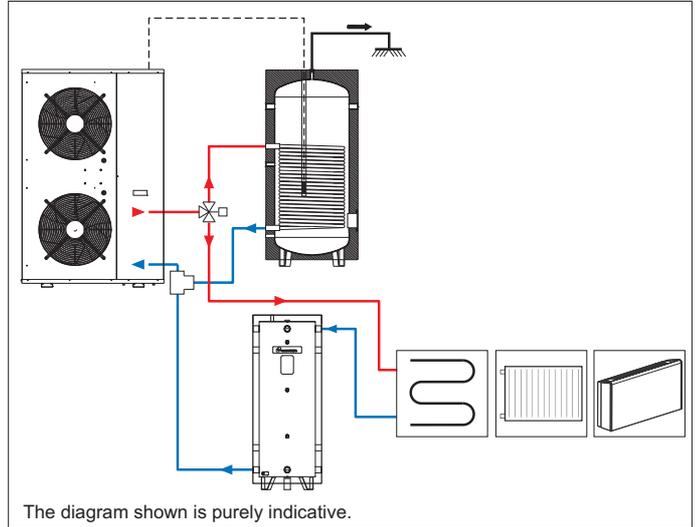
This allows different flow-rates and temperatures to be managed depending on the type of terminal used.

Correctly sized, it guarantees the minimum water volume required by the heat pump.



The diagram illustrates the use of the BT/TP storage tank as a storage tank on the heat pump return pipe so as to increase the volume of water available in the system, avoiding excessive starts and stops.

In this case, make sure the available pressure head of the pump on the unit is sufficient to guarantee correct system operation.

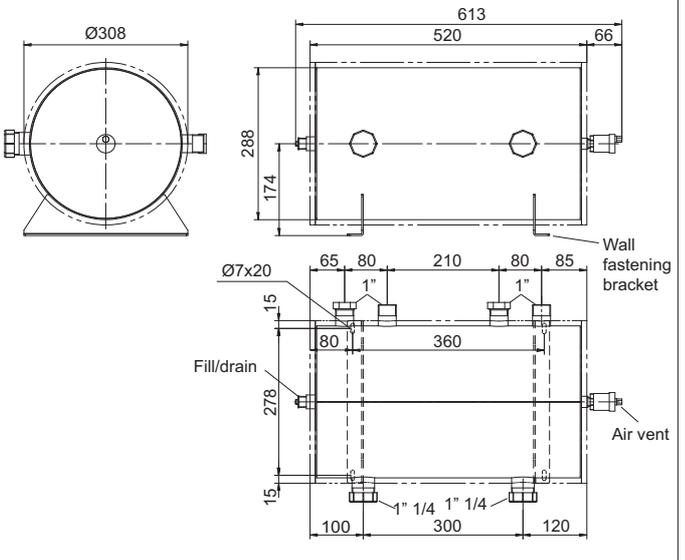


**Technical specifications**

The storage tanks are made from carbon steel plate welded using the best technology and undergo strict water pressure tests (9 bars, allowing an operating pressure of 6 bars). Being a container of water for heating and cooling, this product does not require internal treatment, while the outside is coated with rustproof paint.

The tanks are protected on the outside with a closed cell elastomeric foam lining, 50 mm thick, with soft blue PVC exterior finish, for models BT 100/200 and TP300; polyethylene foam insulation, 10 mm thick, with metallic exterior finish for models BT35.

**Dimensions - Model BT35**

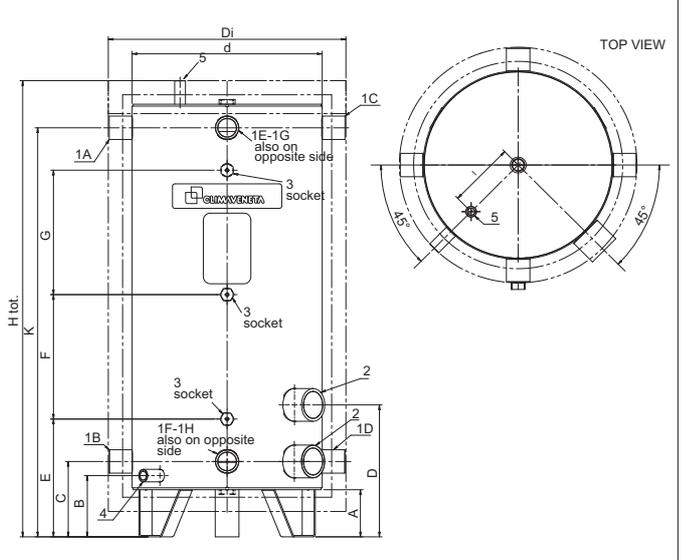


Volume	Storage tank dimensions											
	Di	d	Htot	A	B	C	D	E	F	G	K	I
litres	mm											
100	500	400	970	100	130	160	280	250	264	264	868	140
200	550	450	1410	100	130	160	280	430	374	386	1298	170
300	700	600	1235	100	130	160	280	320	321	332	1133	200

Volume	Fittings				
	1	2	3	4	5
litres	inch				
100	1" 1/4	2"	1/2"	1/2"	3/8"
200	1" 1/4	2"	1/2"	1/2"	3/8"
300	1" 1/4	2"	1/2"	1/2"	3/8"

Pos.	Description
1A	Heat pump outlet
1B	Heat pump return
1C	System outlet
1D	System return
1E- G	Supplementary source outlet
1F-1H	Supplementary source return
2	Electric heater attachment
3	Probe socket
4	Drain/load
5	Vent

**Dimensions - Model BT100, BT200, TP300**



**OUTLET ELECTRIC HEATER**

The outlet electric heaters are available with power ratings of 3 kW single-phase and 3, 6 and 9 kW three-phase.

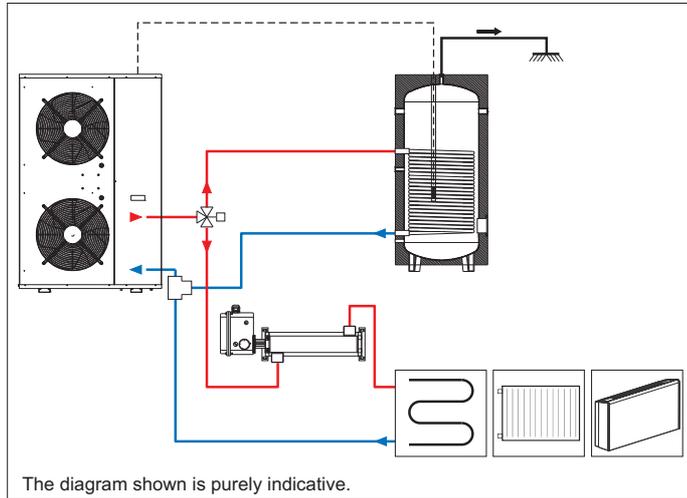
Used on the system outlet, these guarantee the heating demand of the building at low outside temperatures by supplementing the heating capacity of the heat pump.

The electric heaters are deactivated as soon as the heat pump alone can meet heating demand.

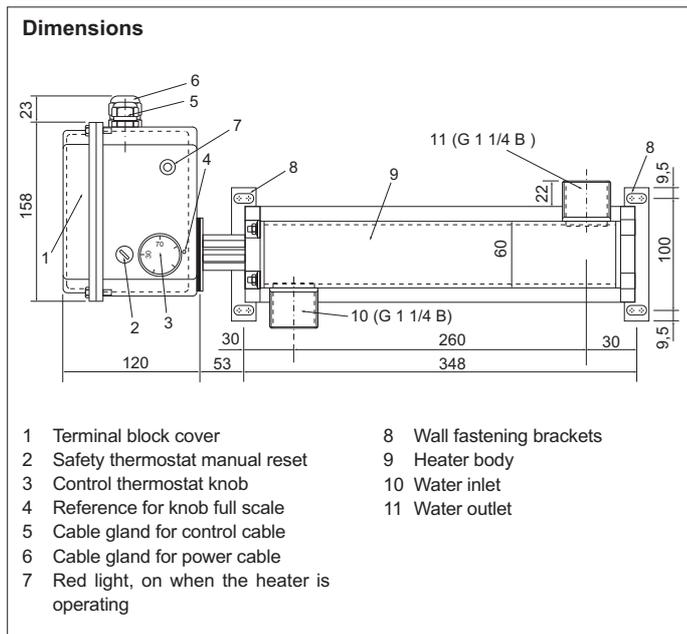
Considering that normally the heat pump operates only a short time at low outside temperatures, operation of the supplementary heater is also reduced and consequently power consumption is negligible.

Therefore, the system's seasonal efficiency ratio remains unchanged.

Wall-mounted installation using the fastening brackets.



Technical specifications		
Power supply	230V/50Hz	400V/50Hz
Power	3000 W	3000-6000-9000 W
Maximum pressure	6 Bar	
Min/max operating temperature	5...90°C	
Safety thermostat	90 +/- 5°C	
Adjustable thermostat	30...70°C	
Heating element material	Incoloy 800	
Threaded attachment	1" 1/4 M GAS	
Index of protection	IP 55	
Indicator light	Red; on when heater operating	

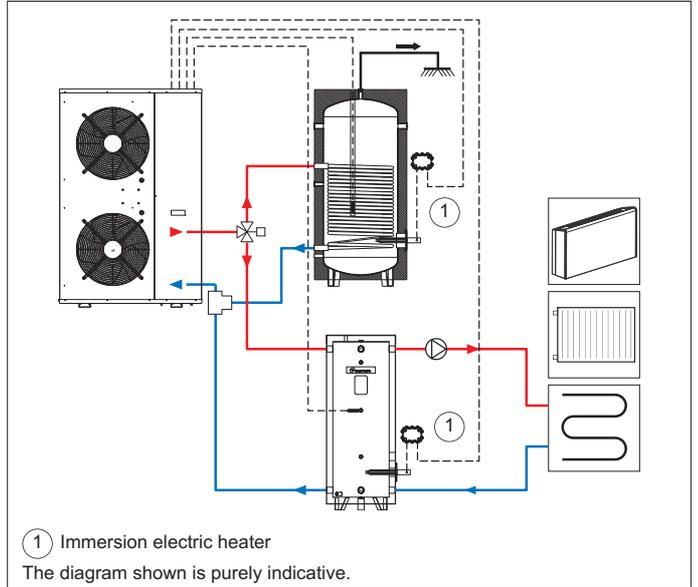


**IMMERSION ELECTRIC HEATER**

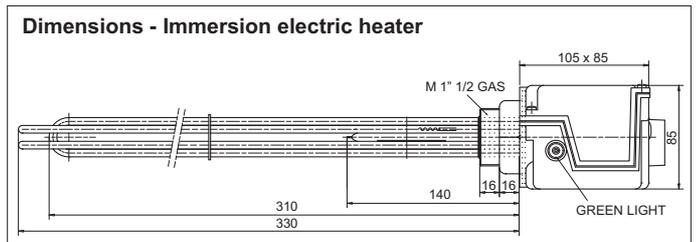
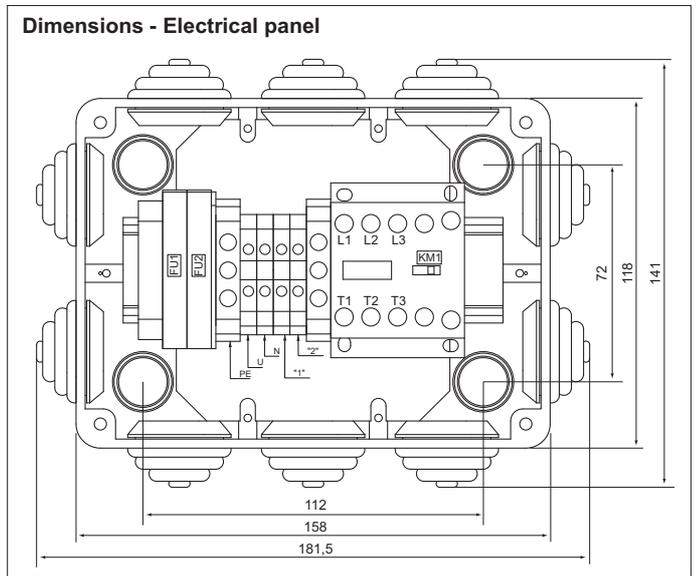
The single-phase immersion electric heater can deliver 1 kW, 2k W or 3 kW depending on the electrical connections, and must only be used in immersion, via the water connections provided on the HWC storage cylinders or the BT, TP and TPS storage tanks.

The electric heater guarantees Legionella prevention or works to supplement domestic hot water production at low outside temperatures.

If used inside the TP storage tanks it can help meet building heating demand in the event of operation outside of the heat pump operating limits.



Technical specifications	
Power supply	230V/50Hz
Power	1000, 2000, 3000 W (+5%/ -10%); power in relation to the electrical connection.
Maximum pressure	6 Bar
Max temperature, heating area	300°C
Max temperature, seal area	120°C
Adjustable safety thermostat	9....75°C
Heating element material	Incoloy 800
Terminal block protection material	PVC
Threaded attachment	1" 1/2 M GAS
Gasket	ASBERIT 60*48*3
Index of protection	IP 44
Indicator light	Green; on when heater operating



**1"¼ 3-WAY VALVE FOR DOMESTIC HOT WATER PRODUCTION:**

The 3-way valve deviates the flow of water to the domestic hot water storage tank when the temperature read by probe BT8 falls below the set point.

The servomotor is also fitted with an auxiliary contact.

Contact closed when the valve is open and contact open when the valve is closed. The 3-way selector valve for domestic hot water production must have the following characteristics for correct heat pump operation:

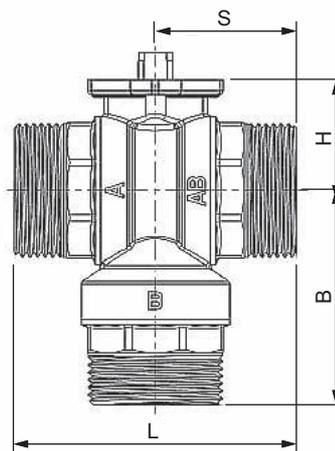
- Voltage 230V AC, 50/60 Hz
- If valve rotation takes more than 10 s, the time can be set by parameter.
- Delta P 500 kPa
- Fluid temperature 0°C to 90°C
- Pressure drop below 20 kPa.

In the total height of the valve (body + servo control) also take into account 40 mm for the extension supplied with the kit, required for correct insulation of the pipes.

Technical specifications - Valve body	
Operating pressure	PN16 for water at 90°C. PN20 for chilled water
Leaks	None
Fluid temperature	Water 0°C to 90°C
Angle of rotation	90°
Thread	Gas UNI ISO 228
Valve body and fitting	Brass OT58, UNI575/65
Stem	Brass
Gasket	PTFE seat, EPDM O-ring
Ball	Chrome-plated brass
Weight	1,28 Kg

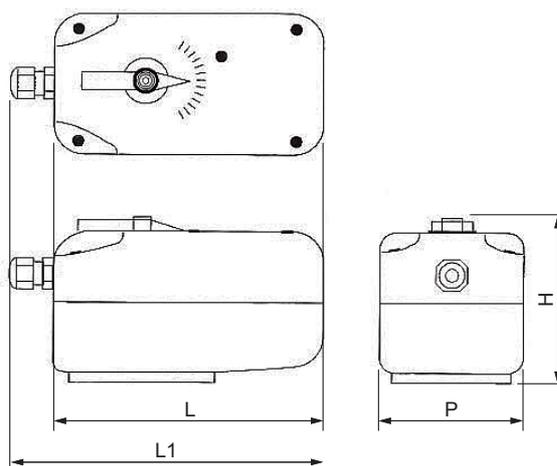
Technical specifications - Servomotor	
Power supply	230VAC, +10% - 15%
Frequency	50Hz
Power consumption	4 VA
Travel time (open/close)	10s
Free auxiliary contact (end travel)	230V - 1A (resistive)
Allowable operating temperature	0 ... + 50 °C
Allowable transport and storage temperature	- 10 ... + 80 °C
Allowable humidity	Class G, DIN 40040
Index of protection	IP 54
Connection cable	6 x1 mm², 0.8 m long
Manual control	manual open/close control
Weight	0,45 Kg

Dimensions - Valve body



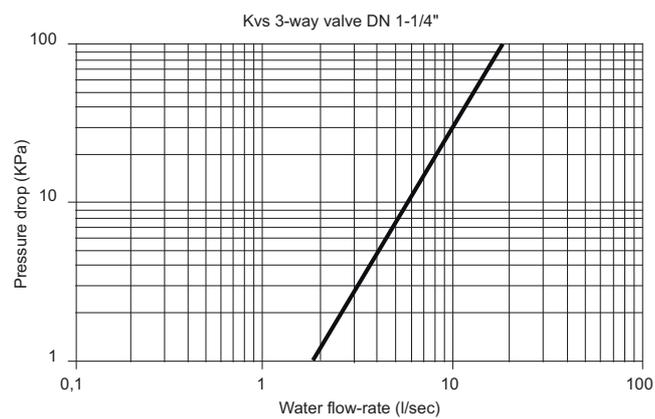
Fittings	inch	1"¼ G
L	mm	102,6
B	mm	76,8
H	mm	51,3
S	mm	39,8

Dimensions - Servo control



L	mm	131
L1	mm	156
H	mm	75
P	mm	70

Graph of valve pressure drop



**HWC DOMESTIC HOT WATER CYLINDER**

The HWC storage cylinders are made especially for domestic hot water production in combination with heat pumps, thanks to the inside coil with large heat exchange area.

The heat pump is connected to the inside coil that heats the domestic hot water contained in the storage tank.

Legionella prevention cycles are managed by an electric heater that can be installed in the fitting provided on the flange.

The Legionella prevention cycles are managed by the NadiSystem controller on the heat pump.

**Technical specifications**

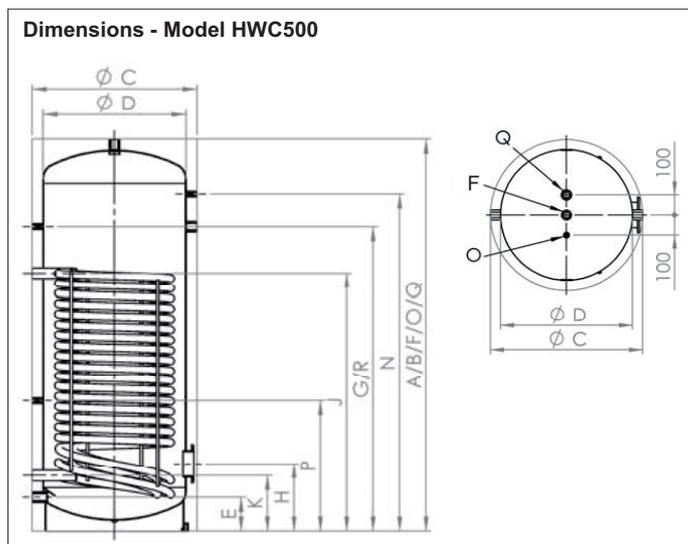
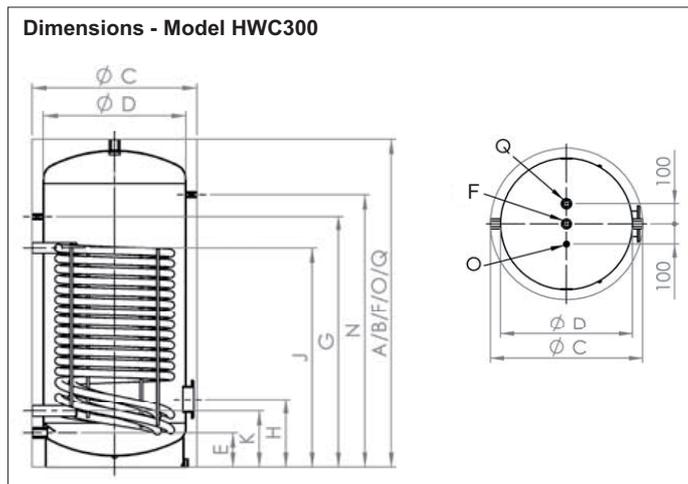
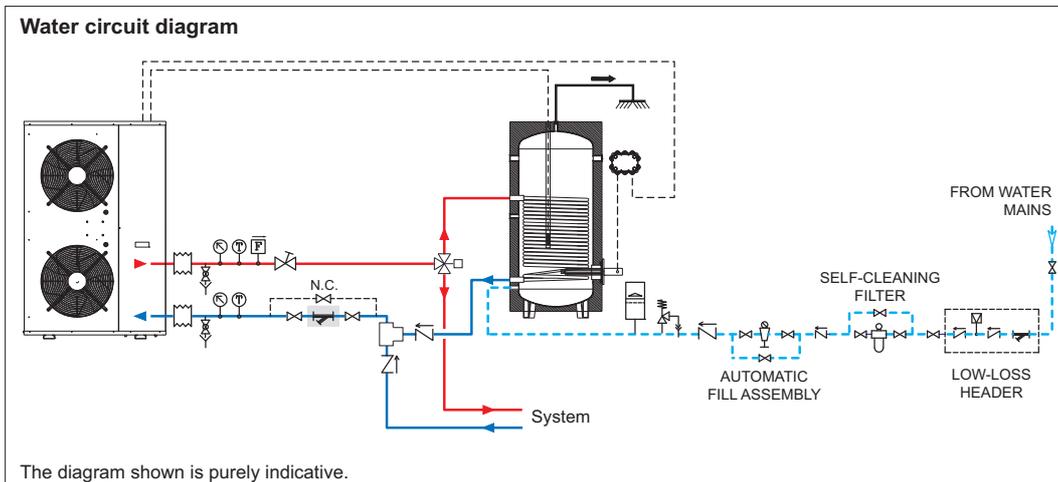
The cylinders are made from S275JR steel plate in accordance with DIN 4753 and undergo strict water pressure tests (9 bars, allowing an operating pressure of 6 bars). Lined on the inside with double layer of enamel in accordance with DIN 4753.

Protection against corrosion guaranteed by the magnesium anode, provided with the accessories supplied as standard with the storage cylinder. The cylinders are protected on the outside by 50 mm rigid CFC-free PUR lining with white skai casing.

Models available	Volume
HWC300	300 litres
HWC500	500 litres

Storage cylinder and heat pump combinations									
Storage cylinder	Coil water content	Coil surface area	Combined heat pumps						
			11	25	31	41	51	61	91
	(l)	(m <sup>2</sup> )							
HWC 300	22,3	3,5	x	x	x			N.A	N.A
HWC 500	38,5	5,9	x	x	x	x	x	N.A	N.A

The combinations proposed exclude the 0061 and 0091 heat pumps, which require the TPS series storage tanks.



Use	Dimensions	300	500
A Height	with insulation - mm	1570	1800
	without insulation - mm	-	-
C Diameter	with insulation - mm	650	750
	without insulation - mm	550	650
E Cold water	height - mm	140	155
	fitting - R"	1 1/4"	1 1/4"
F Hot water	height - mm	1570	1800
	fitting - R"	1 1/4"	1 1/4"
G Recirculation	height - mm	1200	1400
	fitting - R"	1/2"	1/2"
H Flange with 2" bushing for electric heater	height - mm	295	310
	Ø - mm	180/120	180/120
	fitting - R"	2"	2"
J Heat pump outlet	height - mm	920	1185
	fitting - R"	1 1/4"	1 1/4"
K Heat pump return	height - mm	240	255
	fitting - R"	1 1/4"	1 1/4"
N Thermometer	height - mm	1350	1550
	fitting - R"	1/2"	1/2"
O Probe socket	height - mm	1570	1800
	fitting - R"	1/2"	1/2"
P Probe socket	height - mm	-	600
	fitting - R"	-	1/2"
Q Magnesium anode	height - mm	1570	1800
	fitting - R"	1 1/4"	1 1/4"
R Magnesium anode	height - mm	-	1400
	fitting - R"	-	1 1/4"

Weight with insulation	kg	145	220
Water content heat exchange	l	22,3	38,5
Surface area heat exchanger	m <sup>2</sup>	3,5	5,9

**TPS STORAGE TANKS AND DOMH2O INSTANT DOMESTIC HOT WATER PRODUCTION KIT**

The TPS storage tank is used to store water heated by a heat pump, and allow further supplementary heat from the solar heating coils fitted inside. In addition, tank connections are also available for other sources of heating, for example gas- or wood-fired appliances. Two electric heaters can be installed using the 2" fittings provided.

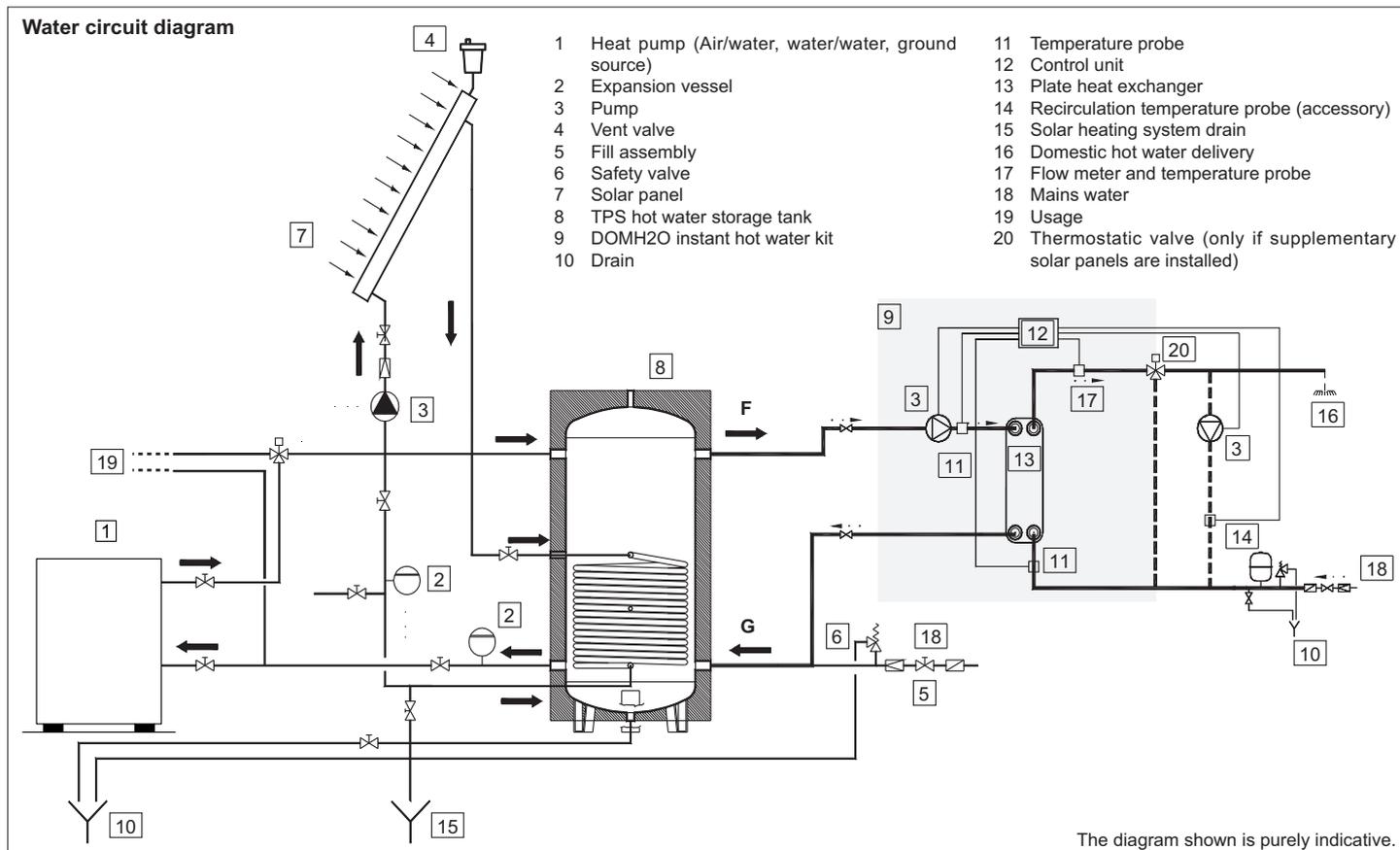
Domestic hot water production is guaranteed by the DOMH2O15 and DOMH2O24 instant kits combined with the storage tanks.

The instant domestic hot water production kit draws energy from the storage tank and via heat exchange with the plate heat exchanger ensures the correct domestic hot water temperature, controlled by modulation of the primary circuit pump.

The control unit with graphic display allows the user to monitor operation, as well as set the set point and operating parameters.

Storage tank model available	Volume
TPS300	300 Litres
TPS500	500 Litres
TPS1000	1000 Litres

Instant domestic hot water production kit model available
DOMH20 15
DOMH20 24



**Technical specifications**

**TPS storage tanks**

The storage tanks are made from carbon steel plate welded using the best technology and undergo strict water pressure tests (9 bars, allowing an operating pressure of 6 bars). Being a container of hot and cold water, this product does not require internal treatment, while the outside is coated with rust-proof paint.

The tanks are protected on the outside with a closed cell elastomeric foam lining, 70 mm thick, with soft blue PVC exterior finish.

**DOMH2O instant domestic hot water production kit**

The instant domestic hot water production kit features the following components:

- AISI 316 stainless steel plate heat exchanger, insulated
- Circulating pump with low power consumption and electronic speed control
- Control unit with graphic display indicating the temperature and heat delivered
- Insulated copper pipes and connectors
- Sheet metal structure and thermoformed RAL panels, wall-mounted installation.

The control unit adjusts the speed of the primary circuit pump to maintain the set domestic hot water temperature, adjustable from 30°C to 65°C. If the domestic hot water temperature leaving the heat exchanger reaches Tmax (between 60°C and 75°C) the primary circuit pump is switched off.

When the temperature falls below the threshold (Tmax) the pump is started again.

**For systems with supplementary solar heating, the primary circuit temperature may exceed the maximum limit of 65°C and pump speed modulation may not guarantee the DHW set point.**

**Selection guide**

To choose the best system made up of storage tank and external instant hot water production unit, the following three parameters need to be verified:

1. Tank volume is sufficient to produce the DHW required by the system.
2. Instant flow-rate of the external unit is higher than peak delivery flow-rate.
3. Storage tank volume is higher than the minimum recommended volume for correct heat pump operation (based on heat output).

This condition is normally verified as the volume is quite low.

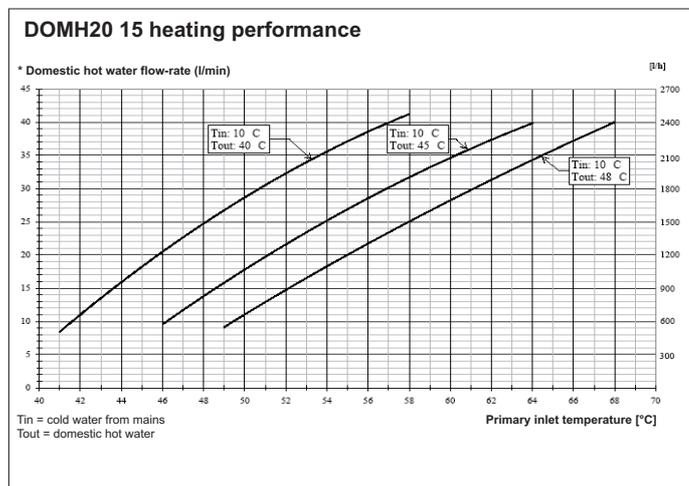
**1. Storage tank volume**

Tank volume and the characteristics of the primary source (heat output and outlet temperature) are the parameters that determine the amount of water that can be delivered in a certain unit of time. The following equation can be used to size the tank in terms of volume.

$$V = [Wf \cdot (T_{out} - T_{in}) / (T_0 - T_f)] - [(P \cdot t_m \cdot 1000) / (C_p \cdot (T_0 - T_f))]$$

Where:

- V: Required storage tank volume in litres
- Wf: Amount of domestic hot water required in the peak period, in litres
- Tm: Duration of the peak period in minutes
- T0: Temperature inside the storage tank [°C]
- Tf: Minimum usable storage tank temperature [°C]
- Tin: Mains water inlet temperature [°C]
- Tout: DHW delivery temperature [°C]
- Cp: Specific heat of water 4.186 kJ/kg °K
- P: Primary source heat output [kW]



**In this case, a thermostatic valve should be used at the instant domestic hot water production kit outlet to avoid excessive domestic hot water temperatures.**

The DHW recirculating pump can be managed (maximum power 185 W) by setting the water temperature in the recirculation circuit.

When the temperature falls below the set point the recirculating pump is activated, and vice-versa.

In addition, on and off times can be set for the recirculation circuit and a custom program created for each day of the week.

**2. Instant DHW production**

The amount of domestic hot water required at the points of delivery must be less than the amount produced by the unit.

The graphs on the previous pages illustrate the amount of water produced by the units as the primary circuit temperature changes.

**3. Thermal inertia**

The storage tank, as well as accumulating energy to be used when necessary, also acts as a buffer for the primary source of energy, reducing the number of starts and stops.

The volume of the storage tank must therefore be greater than the value recommended by the manufacturer of the primary source (heat pump or other appliance).

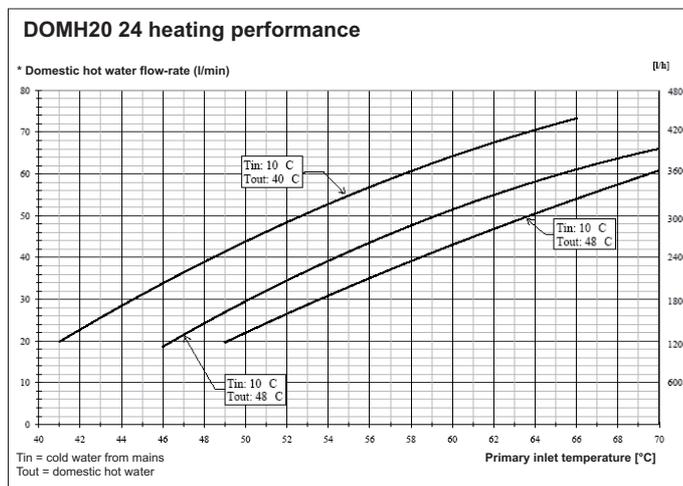
**Typical combinations**

Below are some combinations for typical residential applications with heat pumps.

Type of home	no. of people	no. of bathrooms	Heat pump heat output	Storage tank volume	DOMH20 model
Single home	<3	1	4 - 6 kW	300	15
Single home	4 - 5	2	6 - 8 kW	500	15
Single home	5 - 6	2	10 - 13 kW	1000	24
Single home	6 - 7	3	15 - 18 kW	1000	24
2 apartments	4 - 5	2	6 - 8 kW	500	15
2 apartments	7 - 8	5	15 - 18 kW	1000	24
3 apartments	7 - 8	3	15 - 18 kW	1000	24
3 apartments	9 - 12	6	20 - 22 kW	1000	24

The combinations are calculated based on the following peak consumption:

- 60 l per person in single homes,
- 250 l per apartment with one bathroom,
- 350 l per apartment with two bathrooms,
- Simultaneous use factor



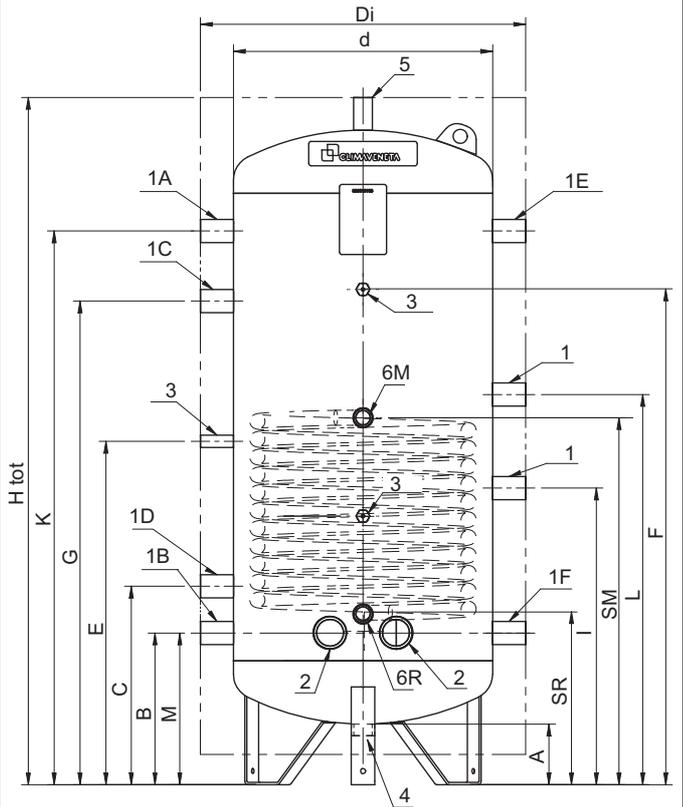
\* The domestic hot water flow-rate shown on the performance curves remains constant for a variable time, depending on the volume of the storage tank. Also see the instructions in the "Selection guide".

Volume	Storage tank dimensions															
	Di	d	Htot	A	B	C	D	E	F	G	K	I	L	M	SR	SM
litres	mm															
300	690	550	1470	130	325	425	575	735	1060	1035	1185	635	835	325	370	785
500	790	650	1755	135	375	685	630	880	1336	1295	1445	780	980	330	375	870
1000	1050	850	2100	120	410	950	765	1105	1476	1560	1710	950	1150	380	425	1105

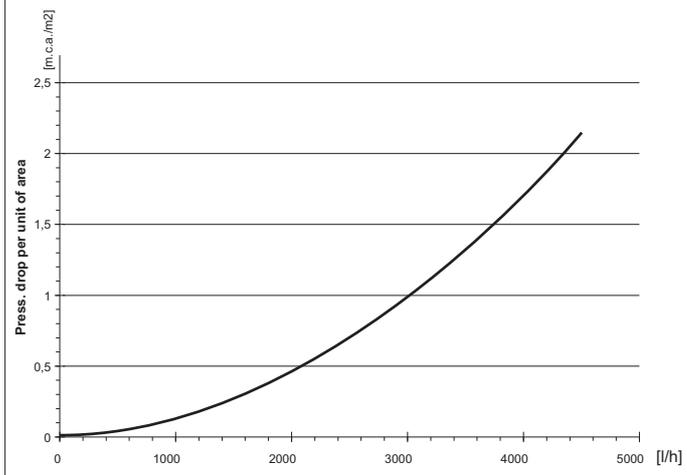
Volume	Fittings						Fixed coil	
	1	2	3	4	5	6	Surface area	Internal volume
litres	inch						m <sup>2</sup>	l
300	1"1/4	2"	1/2"	1"1/4	1"	1"	1,5	9
500	1"1/4	2"	1/2"	1"1/4	1"	1"	2,1	13
1000	1"1/4	2"	1/2"	1"1/4	1"	1"	4	25

Pos.	Description
1A	Heat pump outlet
1B	Heat pump return
1C	Supplementary source outlet
1D	Supplementary source return
1E	Instant DHW kit outlet
1F	Instant DHW kit return
2	Electric heater attachment
3	Probe socket
4	Drain/fill
5	Vent
6M	Solar collector circuit outlet
6R	Solar collector circuit return

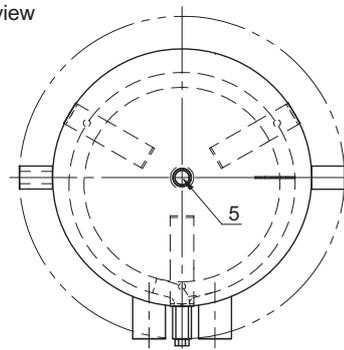
Dimensions - TPS storage tank



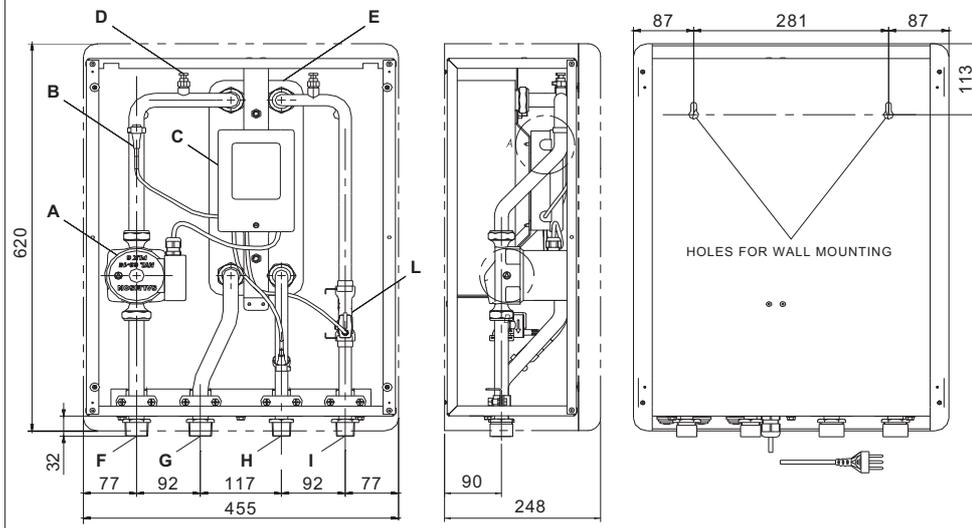
Solar heating coil pressure drop in TPS storage tanks



Top view



Dimensions - DOMH2O instant domestic hot water production kit



Pos.	Description
A	Primary circuit pump
B	Primary circuit temperature probe
C	Control unit
D	Manual vent valve
E	Plate heat exchanger
F	Primary circuit outlet
G	Primary circuit return
H	Mains water inlet
I	Domestic hot water outlet
L	Flow meter and temperature probe

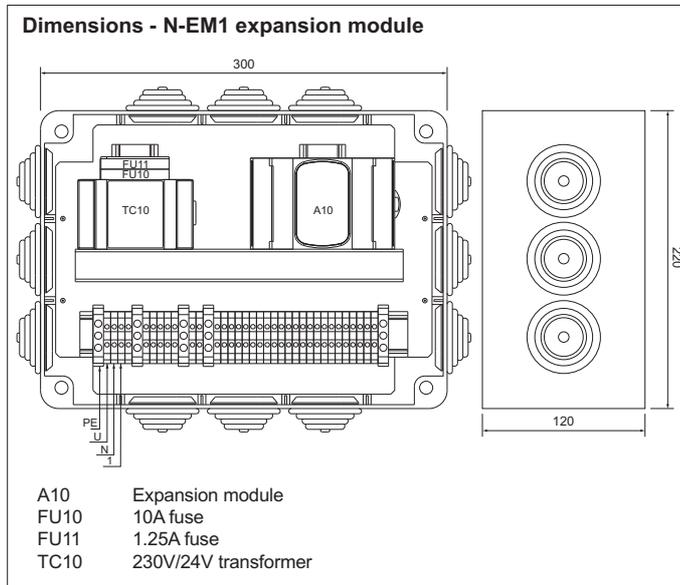
### N-EM1 EXPANSION MODULE FOR SYSTEM CONFIGURATION

The NADISYSTEM control system for residential applications gives high operating flexibility, activating zone pumps and valves depending on the set room temperature, and controlling mixing valves to ensure the correct water temperature in radiant systems according to the climate conditions set for each circuit. With NADISYSTEM there up to 15 different types of system pre-configurations for quick and easy installation, and up to 5 remote keypads for controlling thermal load in likewise zones.

The N-EM1 expansion module is used to connect the secondary circuit components and corresponding zone thermostats depending on the selected configuration.

Up to 3 expansion modules can be used to create more complex systems.

The meaning of the terminals may change based on the selected configuration, the connections are shown on the instruction sheet provided with the expansion module.



### N-THC ROOM TIMER THERMOSTAT

The temperature and humidity settings are simple and intuitive using the knob on the front, while the operating mode and time bands can be selected using the 4 buttons.

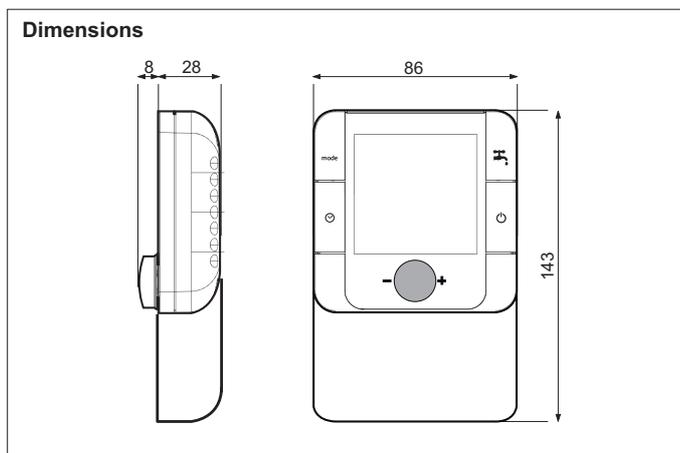
The N-THC thermostat is fitted as standard with temperature and humidity probe for correct control of the temperature-humidity conditions inside the room.

By using the N-THC thermostat in the system, NadiSystem can control 5 different zones, managing temperature, humidity and time bands independently.

The simple and functional backlit display allows rapid viewing of the settings and environmental conditions.

The main settings are:

- Room temperature and humidity setting (temperature and humidity probe supplied as standard)
- Operating mode setting: heating, cooling, automatic mode changeover
- Enable domestic hot water production
- Served zone on/off
- Program time bands
- Wall-mounted installation (maximum distance 500 metres)



**N-CM CASCADE MANAGEMENT KEYPAD**

The N-CM keypad allows cascaded connection of up to 4 heat pumps to increase capacity delivered in applications with multiple occupied areas, such as hotels, schools, apartment blocks, offices and shopping centres.

The units are managed in master-slave mode, with the master unit responsible for processing the information and sending it to the slave units.

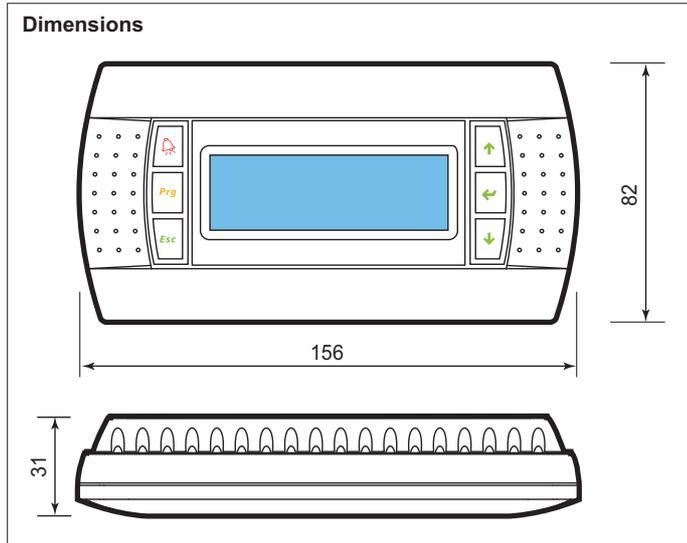
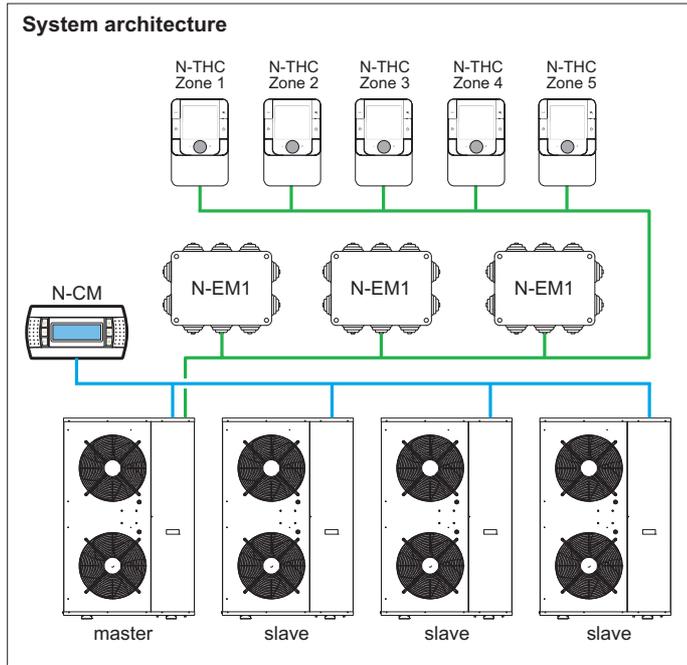
This ensures fine control over the capacity delivered, without decreasing performance, and more precise system sizing.

NADISYSTEM can determine how many cascaded units are needed to guarantee domestic hot water production, all or just one, according to requirements.

The controller also balances compressor operating hours based on time logic, activating the units in rotation, and where necessary excluding any units that are momentarily out of service, without interrupting operation of the cascade as a whole.

If the malfunctioning unit is the master, the operating parameters are transferred to another unit in the cascade, thus restoring partial operation.

The N-CM keypad can also display the operation of each heat pump connected to the cascade and the N-THC room terminals assigned to the zone in question, up to a maximum of 5 zones.



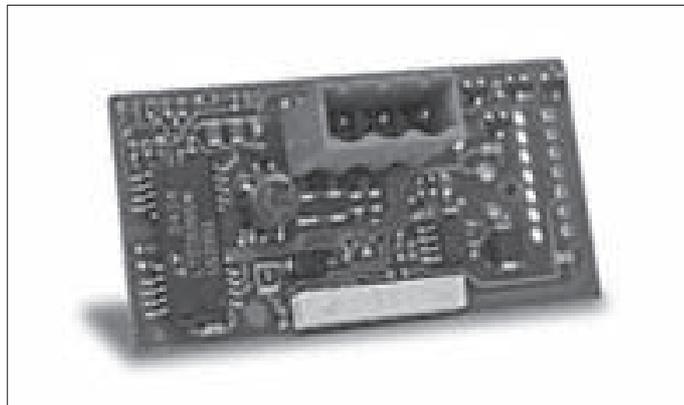
**N-RS RS485 SERIAL CARD**

The N-RS is an optional card for directly interfacing the heat pumps to an RS485 network.

The card guarantees opto-isolation of the controller from the RS485 serial network.

The maximum baud rate available is 19200 baud.

The optional card is fitted in the comb connector on the unit's board.



5. GENERAL TECHNICAL DATA

AWR MTD2 XE 230V RADIANT PANEL APPLICATION

SIZE		0011	0025	0031	0041			
AWR MTD2 XE/230 /B								
COOLING <sup>(1)</sup>								
Cooling capacity	kW	7,17	8,33	12,3	15,7			
Total power input (unit)	kW	1,86	2,16	3,27	4,08			
EER		3,79	3,77	3,73	3,83			
ESEER		3,62	3,63	3,52	3,46			
Heat exchanger water flow	m³/h	1,24	1,44	2,13	2,70			
Heat exchanger pressure drop	kPa	23,5	25,1	23,1	28,9			
AWR MTD2 XE/230 /B								
HEATING <sup>(2)</sup>								
Heating capacity	kW	6,30	7,40	11,2	14,0			
Total power input (unit)	kW	1,49	1,75	2,62	3,33			
COP		4,20	4,11	4,31	4,24			
Heat exchanger water flow	m³/h	1,09	1,28	1,93	2,42			
Heat exchanger pressure drop	kPa	18,3	19,9	19,0	23,2			
COMPRESSORS								
Number	N°.	1	1	1	1			
Number of capacity	N°.	1	1	1	1			
Number of circuits	N°.	1	1	1	1			
Type of regulation		ON-OFF	ON-OFF	ON-OFF	ON-OFF			
Minimum capacity steps	%	100	100	100	100			
Type of refrigerant		R410A	R410A	R410A	R410A			
Refrigerant charge	kg.	0	0	0	0			
Oil charge	kg.	0,74	0,74	1,25	1,24			
FANS								
Number	N°.	1	1	2	2			
Air flow	m³/s	1,09	1,09	1,75	1,86			
Singol power input	kW	0,15	0,15	0,15	0,15			
NOISE LEVELS <sup>(3)</sup>								
Total sound power	dB(A)	69	69	71	71			
Total sound pressure	dB(A)	54	54	56	56			
DIMENSIONS AND WEIGHTS <sup>(4)</sup>								
Length	mm.	900	900	900	900			
Width	mm.	420	420	420	420			
Height	mm.	1240	1240	1240	1390			
Weight	kg.	145	150	155	170			

1 Plant (side) cooling exchanger water (in/out) 23/18 °C  
Heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 30/35 °C  
Source (side) heat exchanger air (in) 7 °C 87% R.H.

3 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units  
Average sound pressure level, at 1 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

4 Standard configuration

- Not available

**AWR MTD2 XE 400V RADIANT PANEL APPLICATION**

SIZE		0031	0041	0051	0061	0091		
<b>AWR MTD2 XE /B</b>								
<b>COOLING</b> <sup>(1)</sup>								
<b>Cooling capacity</b>	<b>kW</b>	<b>11,7</b>	<b>15,8</b>	<b>17,7</b>	<b>20,2</b>	<b>29,2</b>		
Total power input (unit)	kW	3,09	4,18	4,67	5,33	7,78		
EER		3,77	3,76	3,77	3,81	3,74		
ESEER		3,42	3,65	3,24	3,55	3,57		
Heat exchanger water flow	m <sup>3</sup> /h	2,01	2,73	3,06	3,49	5,04		
Heat exchanger pressure drop	kPa	20,5	29,5	24,7	27,0	22,7		
<b>AWR MTD2 XE /B</b>								
<b>HEATING</b> <sup>(2)</sup>								
<b>Heating capacity</b>	<b>kW</b>	<b>10,9</b>	<b>14,0</b>	<b>15,9</b>	<b>17,9</b>	<b>25,1</b>		
Total power input (unit)	kW	2,60	3,35	3,85	4,18	5,99		
COP		4,19	4,24	4,18	4,26	4,18		
Heat exchanger water flow	m <sup>3</sup> /h	1,89	2,43	2,76	3,09	4,34		
Heat exchanger pressure drop	kPa	18,1	23,3	20,0	21,2	16,9		
<b>COMPRESSORS</b>								
Number	N°.	1	1	1	1	1		
Number of capacity	N°.	1	1	1	1	1		
Number of circuits	N°.	1	1	1	1	1		
Type of regulation		ON-OFF	ON-OFF	ON-OFF	ON-OFF	ON-OFF		
Minimum capacity steps	%	100	100	100	100	100		
Type of refrigerant		R410A	R410A	R410A	R410A	R410A		
Refrigerant charge	kg.	0	0	0	0	0		
Oil charge	kg.	1,25	1,93	1,66	1,77	3,25		
<b>FANS</b>								
Number	N°.	2	2	2	2	3		
Air flow	m <sup>3</sup> /s	1,75	1,86	1,86	2,01	2,98		
Singol power input	kW	0,15	0,15	0,15	0,15	0,15		
<b>NOISE LEVELS</b> <sup>(3)</sup>								
Total sound power	dB(A)	71	71	71	72	74		
Total sound pressure	dB(A)	56	56	56	57	58		
<b>DIMENSIONS AND WEIGHTS</b> <sup>(4)</sup>								
Length	mm.	900	900	900	1550	1550		
Width	mm.	420	420	420	450	450		
Height	mm.	1240	1390	1390	1200	1700		
Weight	kg.	155	170	180	250	335		

1 Plant (side) cooling exchanger water (in/out) 23/18 °C  
Heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 30/35 °C  
Source (side) heat exchanger air (in) 7 °C 87% R.H.

3 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units  
Average sound pressure level, at 1 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

4 Standard configuration

- Not available

**AWR MTD2 XE 230V HYDRONIC TERMINAL APPLICATION**

SIZE		0011	0025	0031	0041			
AWR MTD2 XE/230 /B								
COOLING <sup>(1)</sup>								
Cooling capacity	kW	5,22	6,33	9,22	11,7			
Total power input (unit)	kW	1,73	2,15	3,08	3,99			
EER		3,06	2,86	2,97	2,93			
ESEER		3,62	3,63	3,52	3,46			
Heat exchanger water flow	m³/h	0,898	1,09	1,59	2,02			
Heat exchanger pressure drop	kPa	12,4	14,4	12,8	16,2			
AWR MTD2 XE/230 /B								
HEATING <sup>(2)</sup>								
Heating capacity	kW	6,13	7,33	10,8	13,6			
Total power input (unit)	kW	1,86	2,26	3,27	4,13			
COP		3,21	3,17	3,27	3,32			
Heat exchanger water flow	m³/h	1,06	1,27	1,88	2,37			
Heat exchanger pressure drop	kPa	17,4	19,7	18,0	22,2			
COMPRESSORS								
Number	N°.	1	1	1	1			
Number of capacity	N°.	1	1	1	1			
Number of circuits	N°.	1	1	1	1			
Type of regulation		ON-OFF	ON-OFF	ON-OFF	ON-OFF			
Minimum capacity steps	%	100	100	100	100			
Type of refrigerant		R410A	R410A	R410A	R410A			
Refrigerant charge	kg.	0	0	0	0			
Oil charge	kg.	0,74	0,74	1,25	1,24			
FANS								
Number	N°.	1	1	2	2			
Air flow	m³/s	1,09	1,09	1,75	1,86			
Singol power input	kW	0,15	0,15	0,15	0,15			
NOISE LEVELS <sup>(3)</sup>								
Total sound power	dB(A)	69	69	71	71			
Total sound pressure	dB(A)	54	54	56	56			
DIMENSIONS AND WEIGHTS <sup>(4)</sup>								
Length	mm.	900	900	900	900			
Width	mm.	420	420	420	420			
Height	mm.	1240	1240	1240	1390			
Weight	kg.	145	150	155	170			

1 Plant (side) cooling exchanger water (in/out) 12/7 °C  
Heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 40/45 °C  
Source (side) heat exchanger air (in) 7 °C 87% R.H.

3 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units  
Average sound pressure level, at 1 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

4 Standard configuration

- Not available

**AWR MTD2 XE 400V HYDRONIC TERMINAL APPLICATION**

SIZE		0031	0041	0051	0061	0091		
<b>AWR MTD2 XE /B</b>								
<b>COOLING</b> <sup>(1)</sup>								
<b>Cooling capacity</b>	<b>kW</b>	<b>8,65</b>	<b>11,9</b>	<b>13,2</b>	<b>15,2</b>	<b>22,1</b>		
Total power input (unit)	kW	3,00	3,98	4,61	5,01	7,21		
EER		2,87	2,98	2,87	3,04	3,07		
ESEER		3,42	3,65	3,24	3,55	3,57		
Heat exchanger water flow	m <sup>3</sup> /h	1,49	2,05	2,27	2,62	3,81		
Heat exchanger pressure drop	kPa	11,3	16,7	13,6	15,3	13,0		
<b>AWR MTD2 XE /B</b>								
<b>HEATING</b> <sup>(2)</sup>								
<b>Heating capacity</b>	<b>kW</b>	<b>10,6</b>	<b>13,8</b>	<b>15,4</b>	<b>17,5</b>	<b>24,6</b>		
Total power input (unit)	kW	3,22	4,26	4,59	5,17	7,39		
COP		3,31	3,21	3,35	3,37	3,32		
Heat exchanger water flow	m <sup>3</sup> /h	1,84	2,40	2,67	3,04	4,27		
Heat exchanger pressure drop	kPa	17,1	22,8	18,8	20,4	16,3		
<b>COMPRESSORS</b>								
Number	N°.	1	1	1	1	1		
Number of capacity	N°.	1	1	1	1	1		
Number of circuits	N°.	1	1	1	1	1		
Type of regulation		ON-OFF	ON-OFF	ON-OFF	ON-OFF	ON-OFF		
Minimum capacity steps	%	100	100	100	100	100		
Type of refrigerant		R410A	R410A	R410A	R410A	R410A		
Refrigerant charge	kg.	0	0	0	0	0		
Oil charge	kg.	1,25	1,93	1,66	1,77	3,25		
<b>FANS</b>								
Number	N°.	2	2	2	2	3		
Air flow	m <sup>3</sup> /s	1,75	1,86	1,86	2,01	2,98		
Singol power input	kW	0,15	0,15	0,15	0,15	0,15		
<b>NOISE LEVELS</b> <sup>(3)</sup>								
Total sound power	dB(A)	71	71	71	72	74		
Total sound pressure	dB(A)	56	56	56	57	58		
<b>DIMENSIONS AND WEIGHTS</b> <sup>(4)</sup>								
Length	mm.	900	900	900	1550	1550		
Width	mm.	420	420	420	450	450		
Height	mm.	1240	1390	1390	1200	1700		
Weight	kg.	155	170	180	250	335		

1 Plant (side) cooling exchanger water (in/out) 12/7 °C  
Heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 40/45 °C  
Source (side) heat exchanger air (in) 7 °C 87% R.H.

3 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units  
Average sound pressure level, at 1 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

4 Standard configuration

- Not available

COOLING PERFORMANCE AWR MTD2 XE 230V

0011																		
Ta	20	25	30	35	40	45	20	25	30	35	40	45	20	25	30	35	40	45
Tev	7						9						12					
Pf	6,13	5,83	5,53	5,22	4,91	4,59	6,52	6,21	5,89	5,57	5,24	4,90	7,11	6,79	6,45	6,10	5,73	5,34
Pat	1,24	1,38	1,54	1,73	1,94	2,17	1,25	1,39	1,56	1,75	1,96	2,19	1,25	1,41	1,59	1,78	1,99	2,21
Qev	1,06	1,00	0,951	0,898	0,845	0,791	1,12	1,07	1,02	0,959	0,902	0,844	1,23	1,17	1,11	1,05	0,987	0,920
Dpev	17,1	15,5	13,9	12,4	11,0	9,60	19,4	17,6	15,8	14,1	12,5	10,9	23,1	21,0	19,0	16,9	14,9	13,0
Tev	13						15						18					
Pf	7,31	6,98	6,64	6,27	5,89	5,48	7,70	7,38	7,02	6,63	6,21	5,77	8,29	7,97	7,60	7,17	6,70	6,18
Pat	1,24	1,42	1,60	1,80	2,00	2,21	1,23	1,43	1,62	1,82	2,02	2,22	1,21	1,44	1,66	1,86	2,06	2,24
Qev	1,26	1,20	1,14	1,08	1,02	0,946	1,33	1,27	1,21	1,14	1,07	0,995	1,43	1,38	1,31	1,24	1,16	1,07
Dpev	24,4	22,2	20,1	18,0	15,8	13,7	27,1	24,8	22,5	20,1	17,6	15,2	31,4	29,0	26,4	23,5	20,5	17,4
0025																		
Ta	20	25	30	35	40	45	20	25	30	35	40	45	20	25	30	35	40	45
Tev	7						9						12					
Pf	7,35	7,04	6,70	6,33	5,95	5,54	7,77	7,44	7,08	6,70	6,30	5,88	8,40	8,03	7,64	7,25	6,83	6,41
Pat	1,41	1,66	1,91	2,15	2,40	2,64	1,42	1,67	1,92	2,17	2,42	2,67	1,46	1,69	1,93	2,18	2,44	2,71
Qev	1,27	1,21	1,15	1,09	1,02	0,953	1,34	1,28	1,22	1,15	1,09	1,01	1,45	1,38	1,32	1,25	1,18	1,10
Dpev	19,4	17,8	16,1	14,4	12,7	11,0	21,8	19,9	18,0	16,2	14,3	12,4	25,5	23,2	21,1	18,9	16,8	14,8
Tev	13						15						18					
Pf	8,61	8,23	7,83	7,43	7,01	6,58	9,03	8,62	8,21	7,79	7,37	6,94	9,65	9,20	8,76	8,33	7,90	7,48
Pat	1,47	1,69	1,93	2,18	2,45	2,73	1,49	1,70	1,92	2,18	2,45	2,76	1,53	1,70	1,91	2,16	2,46	2,80
Qev	1,48	1,42	1,35	1,28	1,21	1,14	1,56	1,49	1,42	1,34	1,27	1,20	1,67	1,59	1,51	1,44	1,36	1,29
Dpev	26,7	24,4	22,1	19,9	17,7	15,6	29,4	26,8	24,3	21,9	19,6	17,4	33,6	30,6	27,7	25,1	22,6	20,2
0031																		
Ta	20	25	30	35	40	45	20	25	30	35	40	45	20	25	30	35	40	45
Tev	7						9						12					
Pf	10,7	10,3	9,75	9,22	8,66	8,07	11,3	10,9	10,3	9,78	9,20	8,59	12,2	11,7	11,2	10,6	10,0	9,36
Pat	2,24	2,47	2,75	3,08	3,46	3,88	2,24	2,49	2,78	3,11	3,49	3,92	2,25	2,52	2,82	3,17	3,55	3,97
Qev	1,85	1,77	1,68	1,59	1,49	1,39	1,95	1,87	1,78	1,68	1,58	1,48	2,11	2,02	1,93	1,83	1,73	1,61
Dpev	17,3	15,8	14,3	12,8	11,3	9,81	19,4	17,7	16,1	14,4	12,8	11,1	22,6	20,8	19,0	17,1	15,1	13,2
Tev	13						15						18					
Pf	12,5	12,0	11,5	10,9	10,3	9,62	13,1	12,6	12,1	11,5	10,8	10,1	14,0	13,5	13,0	12,3	11,7	10,9
Pat	2,25	2,53	2,84	3,18	3,56	3,98	2,25	2,54	2,87	3,22	3,60	4,00	2,24	2,57	2,91	3,27	3,64	4,04
Qev	2,16	2,08	1,98	1,88	1,77	1,66	2,27	2,18	2,08	1,98	1,87	1,75	2,42	2,34	2,24	2,13	2,01	1,88
Dpev	23,8	21,9	20,0	18,0	16,0	14,0	26,1	24,1	22,1	19,9	17,7	15,5	29,8	27,7	25,5	23,1	20,6	18,0
0041																		
Ta	20	25	30	35	40	45	20	25	30	35	40	45	20	25	30	35	40	45
Tev	7						9						12					
Pf	13,7	13,1	12,5	11,7	11,0	10,1	14,6	13,9	13,2	12,5	11,6	10,8	15,8	15,1	14,4	13,5	12,6	11,7
Pat	2,88	3,22	3,60	3,99	4,41	4,85	2,91	3,25	3,63	4,02	4,45	4,90	2,96	3,29	3,66	4,06	4,50	4,97
Qev	2,36	2,26	2,14	2,02	1,89	1,74	2,51	2,40	2,28	2,15	2,00	1,85	2,72	2,60	2,47	2,33	2,18	2,01
Dpev	22,1	20,2	18,2	16,2	14,1	12,1	24,9	22,7	20,5	18,2	15,9	13,6	29,4	26,9	24,2	21,5	18,8	16,0
Tev	13						15						18					
Pf	16,2	15,5	14,7	13,9	13,0	12,0	17,0	16,3	15,5	14,6	13,6	12,6	18,3	17,5	16,6	15,7	14,6	13,4
Pat	2,97	3,30	3,67	4,07	4,51	4,99	3,01	3,32	3,68	4,08	4,54	5,04	3,06	3,33	3,67	4,08	4,56	5,10
Qev	2,80	2,67	2,54	2,39	2,24	2,06	2,94	2,81	2,67	2,52	2,35	2,17	3,15	3,02	2,87	2,70	2,52	2,32
Dpev	30,9	28,3	25,5	22,7	19,8	16,9	34,2	31,3	28,3	25,1	21,8	18,6	39,4	36,1	32,6	28,9	25,1	21,3

Ta [°C] - Air temperature

Tev [°C] - Plant (side) cooling exchanger output water temperature

Pat [kW] - Total power input

Qev [m³/h] - Plant (side) heat exchanger water flow

Dpev [kPa] - Plant (side) cooling exchanger pressure drop

Pf [kW] - Cooling capacity

'-' Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

COOLING PERFORMANCE AWR MTD2 XE 400V

0031																		
Ta	20	25	30	35	40	45	20	25	30	35	40	45	20	25	30	35	40	45
Tev	7						9						12					
Pf	10,1	9,65	9,16	8,65	8,12	7,57	10,7	10,2	9,72	9,19	8,64	8,07	11,7	11,1	10,6	10,0	9,42	8,81
Pat	2,16	2,41	2,69	3,00	3,34	3,70	2,18	2,43	2,72	3,03	3,36	3,73	2,19	2,46	2,74	3,06	3,40	3,76
Qev	1,74	1,66	1,58	1,49	1,40	1,30	1,85	1,76	1,67	1,58	1,49	1,39	2,01	1,92	1,82	1,72	1,62	1,52
Dpev	15,4	14,0	12,6	11,3	9,93	8,64	17,4	15,8	14,2	12,7	11,2	9,81	20,5	18,7	16,9	15,1	13,4	11,7
Tev	13						15						18					
Pf	12,0	11,4	10,9	10,3	9,68	9,06	12,6	12,0	11,4	10,8	10,2	9,56	13,5	12,9	12,3	11,7	11,0	10,3
Pat	2,20	2,46	2,75	3,07	3,41	3,77	2,21	2,47	2,76	3,08	3,42	3,79	2,21	2,48	2,78	3,09	3,43	3,80
Qev	2,06	1,97	1,87	1,77	1,67	1,56	2,17	2,07	1,97	1,87	1,76	1,65	2,33	2,23	2,12	2,01	1,90	1,78
Dpev	21,6	19,7	17,8	16,0	14,1	12,4	23,9	21,8	19,7	17,7	15,7	13,8	27,6	25,2	22,9	20,5	18,3	16,1
0041																		
Ta	20	25	30	35	40	45	20	25	30	35	40	45	20	25	30	35	40	45
Tev	7						9						12					
Pf	13,9	13,3	12,6	11,9	11,2	10,5	14,8	14,1	13,4	12,6	11,9	11,1	16,0	15,2	14,5	13,7	12,9	12,1
Pat	2,80	3,15	3,54	3,98	4,47	5,00	2,83	3,19	3,59	4,03	4,51	5,02	2,88	3,25	3,65	4,08	4,55	5,05
Qev	2,40	2,29	2,17	2,05	1,93	1,81	2,54	2,42	2,30	2,18	2,05	1,92	2,75	2,62	2,49	2,36	2,23	2,09
Dpev	22,8	20,7	18,7	16,7	14,8	12,9	25,5	23,2	21,0	18,8	16,6	14,6	30,0	27,2	24,6	22,1	19,6	17,3
Tev	13						15						18					
Pf	16,4	15,6	14,8	14,1	13,3	12,5	17,2	16,4	15,6	14,8	13,9	13,1	18,4	17,5	16,7	15,8	15,0	14,1
Pat	2,90	3,27	3,67	4,10	4,56	5,06	2,93	3,30	3,71	4,13	4,59	5,06	2,97	3,35	3,76	4,18	4,61	5,06
Qev	2,82	2,69	2,56	2,42	2,29	2,15	2,96	2,82	2,69	2,55	2,40	2,26	3,17	3,02	2,88	2,73	2,58	2,43
Dpev	31,5	28,6	25,9	23,2	20,7	18,3	34,7	31,6	28,5	25,7	22,9	20,2	39,7	36,2	32,8	29,5	26,4	23,4
0051																		
Ta	20	25	30	35	40	45	20	25	30	35	40	45	20	25	30	35	40	45
Tev	7						9						12					
Pf	15,4	14,7	14,0	13,2	12,3	11,3	16,3	15,6	14,9	14,0	13,1	12,1	17,7	16,9	16,1	15,3	14,3	13,2
Pat	3,56	3,87	4,22	4,61	5,03	5,48	3,59	3,90	4,25	4,64	5,06	5,52	3,61	3,93	4,28	4,67	5,09	5,55
Qev	2,64	2,53	2,41	2,27	2,12	1,95	2,80	2,69	2,56	2,41	2,26	2,08	3,05	2,92	2,78	2,63	2,46	2,28
Dpev	18,4	16,9	15,3	13,6	11,8	10,0	20,7	19,0	17,2	15,3	13,4	11,4	24,4	22,5	20,4	18,2	16,0	13,7
Tev	13						15						18					
Pf	18,1	17,4	16,6	15,7	14,7	13,6	19,1	18,3	17,4	16,5	15,5	14,4	20,5	19,6	18,7	17,7	16,7	15,6
Pat	3,62	3,93	4,28	4,67	5,10	5,56	3,63	3,94	4,29	4,68	5,10	5,57	3,63	3,94	4,28	4,67	5,10	5,56
Qev	3,13	3,00	2,86	2,70	2,53	2,35	3,29	3,15	3,01	2,84	2,67	2,48	3,53	3,39	3,23	3,06	2,88	2,69
Dpev	25,7	23,7	21,5	19,2	16,9	14,5	28,5	26,2	23,8	21,3	18,8	16,2	32,9	30,2	27,5	24,7	21,8	19,0
0061																		
Ta	20	25	30	35	40	45	20	25	30	35	40	45	20	25	30	35	40	45
Tev	7						9						12					
Pf	17,8	17,0	16,1	15,2	14,3	13,3	18,8	18,0	17,1	16,1	15,1	14,1	20,4	19,5	18,5	17,5	16,4	15,2
Pat	3,66	4,06	4,51	5,01	5,56	6,16	3,73	4,13	4,58	5,08	5,64	6,24	3,81	4,22	4,67	5,18	5,74	6,34
Qev	3,06	2,93	2,78	2,62	2,46	2,29	3,24	3,10	2,95	2,78	2,61	2,42	3,51	3,36	3,19	3,02	2,83	2,63
Dpev	20,8	19,0	17,1	15,3	13,4	11,6	23,3	21,3	19,2	17,1	15,1	13,0	27,3	25,0	22,6	20,2	17,7	15,3
Tev	13						15						18					
Pf	20,9	20,0	19,0	18,0	16,8	15,6	21,9	21,0	20,0	18,9	17,7	16,4	23,5	22,5	21,4	20,2	18,9	17,5
Pat	3,84	4,25	4,70	5,21	5,77	6,37	3,89	4,30	4,76	5,26	5,82	6,43	3,97	4,37	4,83	5,33	5,89	6,49
Qev	3,60	3,45	3,28	3,10	2,90	2,69	3,78	3,62	3,44	3,25	3,05	2,83	4,06	3,88	3,70	3,49	3,27	3,03
Dpev	28,8	26,3	23,8	21,2	18,6	16,1	31,7	29,1	26,3	23,5	20,6	17,7	36,4	33,4	30,3	27,0	23,7	20,3
0091																		
Ta	20	25	30	35	40	45	20	25	30	35	40	45	20	25	30	35	40	45
Tev	7						9						12					
Pf	25,9	24,7	23,4	22,1	20,8	19,4	27,4	26,1	24,8	23,4	22,1	20,7	29,6	28,2	26,8	25,4	24,0	22,6
Pat	5,32	5,89	6,53	7,21	7,95	8,75	5,42	6,00	6,64	7,33	8,07	8,87	5,56	6,15	6,79	7,49	8,24	9,05
Qev	4,45	4,25	4,03	3,81	3,58	3,34	4,71	4,49	4,27	4,04	3,80	3,56	5,10	4,85	4,61	4,37	4,13	3,90
Dpev	17,8	16,2	14,6	13,0	11,5	9,99	19,9	18,1	16,3	14,6	12,9	11,4	23,3	21,1	19,1	17,1	15,3	13,6
Tev	13						15						18					
Pf	30,3	28,9	27,4	26,0	24,6	23,3	31,8	30,2	28,7	27,3	25,9	24,6	33,9	32,2	30,7	29,2	27,8	26,6
Pat	5,61	6,20	6,84	7,54	8,30	9,11	5,70	6,29	6,93	7,64	8,41	9,23	5,85	6,42	7,06	7,78	8,56	9,41
Qev	5,22	4,97	4,73	4,48	4,25	4,01	5,48	5,21	4,95	4,71	4,47	4,24	5,85	5,56	5,29	5,04	4,80	4,59
Dpev	24,5	22,2	20,0	18,0	16,2	14,4	26,9	24,3	22,0	19,9	17,9	16,1	30,7	27,7	25,1	22,7	20,7	18,9

Ta [°C] - Air temperature

Tev [°C] - Plant (side) cooling exchanger output water temperature

Pat [kW] - Total power input

Qev [m³/h] - Plant (side) heat exchanger water flow

Dpev [kPa] - Plant (side) cooling exchanger pressure drop

Pf [kW] - Cooling capacity

'-' Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

AWR MTD2 XE 230V HEATING PERFORMANCE

0011																		
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	30						35						40					
Pt	-	-	-	-	-	-	4,32	4,39	4,68	5,20	5,47	6,30	4,40	4,41	4,66	5,14	5,40	6,20
Qcd	-	-	-	-	-	-	0,749	0,761	0,811	0,901	0,948	1,09	0,764	0,766	0,808	0,892	0,936	1,08
Pcd	-	-	-	-	-	-	8,61	8,88	10,1	12,4	13,8	18,3	8,95	8,99	10,0	12,2	13,4	17,8
Pat	-	-	-	-	-	-	1,66	1,60	1,55	1,51	1,50	1,49	1,95	1,84	1,75	1,70	1,68	1,66
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	45						50						55					
Pt	-	4,32	4,59	5,08	5,33	6,13	-	-	4,47	5,01	5,28	6,07	-	-	-	-	5,23	6,04
Qcd	-	0,750	0,797	0,882	0,927	1,06	-	-	0,778	0,872	0,919	1,06	-	-	-	-	0,913	1,05
Pcd	-	8,63	9,75	11,9	13,2	17,4	-	-	9,28	11,7	13,0	17,1	-	-	-	-	12,8	17,0
Pat	-	2,04	1,95	1,89	1,88	1,86	-	-	2,15	2,11	2,10	2,09	-	-	-	-	2,34	2,34
0025																		
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	30						35						40					
Pt	-	-	-	-	-	-	4,68	5,03	5,54	6,20	6,52	7,40	4,76	5,10	5,60	6,24	6,53	7,38
Qcd	-	-	-	-	-	-	0,810	0,871	0,959	1,07	1,13	1,28	0,826	0,885	0,971	1,08	1,13	1,28
Pcd	-	-	-	-	-	-	7,96	9,20	11,2	14,0	15,4	19,9	8,27	9,51	11,4	14,2	15,6	19,9
Pat	-	-	-	-	-	-	1,61	1,66	1,70	1,73	1,74	1,75	1,79	1,88	1,95	1,99	2,00	2,01
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	45						50						55					
Pt	-	5,28	5,69	6,26	6,54	7,33	-	-	5,82	6,29	6,53	7,26	-	-	-	-	6,50	7,15
Qcd	-	0,917	0,989	1,09	1,14	1,27	-	-	1,01	1,09	1,14	1,26	-	-	-	-	1,13	1,25
Pcd	-	10,2	11,9	14,4	15,7	19,7	-	-	12,5	14,5	15,7	19,4	-	-	-	-	15,6	18,9
Pat	-	2,22	2,25	2,27	2,27	2,26	-	-	2,62	2,57	2,56	2,52	-	-	-	-	2,85	2,77
0031																		
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	30						35						40					
Pt	-	-	-	-	-	-	6,89	7,56	8,41	9,43	9,89	11,2	6,93	7,54	8,33	9,31	9,75	11,0
Qcd	-	-	-	-	-	-	1,19	1,31	1,46	1,63	1,71	1,93	1,20	1,31	1,45	1,61	1,69	1,91
Pcd	-	-	-	-	-	-	7,23	8,71	10,8	13,5	14,9	19,0	7,35	8,69	10,6	13,2	14,5	18,4
Pat	-	-	-	-	-	-	2,86	2,77	2,70	2,65	2,64	2,62	3,17	3,06	2,99	2,94	2,93	2,92
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	45						50						55					
Pt	-	7,49	8,26	9,21	9,64	10,8	-	-	8,18	9,12	9,54	10,7	-	-	-	-	9,47	10,6
Qcd	-	1,30	1,43	1,60	1,67	1,88	-	-	1,42	1,59	1,66	1,86	-	-	-	-	1,65	1,85
Pcd	-	8,60	10,5	13,0	14,2	18,0	-	-	10,3	12,8	14,0	17,7	-	-	-	-	13,9	17,4
Pat	-	3,40	3,32	3,28	3,27	3,27	-	-	3,71	3,68	3,67	3,67	-	-	-	-	4,12	4,12
0041																		
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	30						35						40					
Pt	-	-	-	-	-	-	7,91	8,94	10,2	11,6	12,3	14,0	7,88	8,90	10,1	11,5	12,1	13,8
Qcd	-	-	-	-	-	-	1,37	1,55	1,76	2,01	2,12	2,42	1,37	1,54	1,76	2,00	2,11	2,40
Pcd	-	-	-	-	-	-	7,42	9,48	12,3	16,0	17,8	23,2	7,40	9,44	12,2	15,8	17,6	22,7
Pat	-	-	-	-	-	-	3,14	3,20	3,25	3,29	3,30	3,33	3,46	3,55	3,62	3,67	3,69	3,72
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	45						50						55					
Pt	-	8,92	10,1	11,4	12,0	13,6	-	-	10,1	11,3	11,9	13,4	-	-	-	-	11,7	13,1
Qcd	-	1,55	1,75	1,99	2,09	2,37	-	-	1,75	1,97	2,07	2,33	-	-	-	-	2,04	2,29
Pcd	-	9,51	12,1	15,6	17,3	22,2	-	-	12,1	15,4	16,9	21,5	-	-	-	-	16,5	20,8
Pat	-	4,04	4,08	4,11	4,12	4,13	-	-	4,62	4,59	4,58	4,57	-	-	-	-	5,09	5,03

Ta [°C] - Air temperature

Tcd (°C) - Plant (side) heating exchanger output water temperature

Pt (kW) - Heating capacity

Pat (kW) - Total power input

Qcd (m³/h) - Plant (side) heating exchanger water flow

Dpcd (kPa) - Plant (side) heating exchanger pressure drop

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

AWR MTD2 XE 400V HEATING PERFORMANCE

0031																		
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	30						35						40					
Pt	-	-	-	-	-	-	6,23	7,02	7,97	9,07	9,56	10,9	6,23	6,99	7,91	8,97	9,44	10,7
Qcd	-	-	-	-	-	-	1,08	1,22	1,38	1,57	1,66	1,89	1,08	1,21	1,37	1,56	1,64	1,86
Pcd	-	-	-	-	-	-	5,91	7,51	9,67	12,5	13,9	18,1	5,94	7,48	9,56	12,3	13,6	17,6
Pat	-	-	-	-	-	-	2,56	2,57	2,58	2,59	2,59	2,60	2,85	2,86	2,87	2,88	2,88	2,90
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	45						50						55					
Pt	-	7,01	7,88	8,89	9,34	10,6	-	-	7,87	8,83	9,26	10,4	-	-	-	-	9,19	10,3
Qcd	-	1,22	1,37	1,55	1,62	1,84	-	-	1,37	1,54	1,61	1,81	-	-	-	-	1,60	1,79
Pcd	-	7,53	9,51	12,1	13,4	17,1	-	-	9,54	12,0	13,2	16,7	-	-	-	-	13,0	16,3
Pat	-	3,19	3,20	3,21	3,21	3,22	-	-	3,57	3,57	3,57	3,58	-	-	-	-	3,97	3,96
0041																		
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	30						35						40					
Pt	-	-	-	-	-	-	8,64	9,47	10,5	11,8	12,4	14,0	8,84	9,60	10,6	11,8	12,4	13,9
Qcd	-	-	-	-	-	-	1,50	1,64	1,82	2,05	2,15	2,43	1,53	1,67	1,84	2,05	2,14	2,41
Pcd	-	-	-	-	-	-	8,86	10,6	13,2	16,6	18,3	23,3	9,32	11,0	13,4	16,6	18,2	23,0
Pat	-	-	-	-	-	-	3,45	3,40	3,36	3,34	3,34	3,35	3,95	3,88	3,82	3,79	3,78	3,77
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	45						50						55					
Pt	-	9,73	10,7	11,8	12,3	13,8	-	-	10,7	11,8	12,3	13,8	-	-	-	-	12,4	13,7
Qcd	-	1,69	1,85	2,05	2,15	2,40	-	-	1,87	2,06	2,15	2,39	-	-	-	-	2,16	2,39
Pcd	-	11,3	13,6	16,7	18,2	22,8	-	-	13,8	16,8	18,3	22,7	-	-	-	-	18,4	22,6
Pat	-	4,44	4,36	4,30	4,28	4,26	-	-	4,97	4,88	4,85	4,80	-	-	-	-	5,49	5,39
0051																		
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	30						35						40					
Pt	-	-	-	-	-	-	9,29	10,4	11,7	13,3	14,0	15,9	9,14	10,2	11,6	13,1	13,8	15,7
Qcd	-	-	-	-	-	-	1,61	1,80	2,03	2,30	2,43	2,76	1,59	1,78	2,01	2,28	2,39	2,72
Pcd	-	-	-	-	-	-	6,81	8,52	10,9	14,0	15,5	20,0	6,62	8,30	10,6	13,6	15,1	19,5
Pat	-	-	-	-	-	-	3,94	3,92	3,90	3,88	3,87	3,85	4,30	4,28	4,26	4,24	4,23	4,20
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	45						50						55					
Pt	-	10,1	11,4	12,9	13,6	15,4	-	-	11,2	12,6	13,3	15,0	-	-	-	-	12,9	14,7
Qcd	-	1,75	1,98	2,24	2,36	2,67	-	-	1,94	2,20	2,31	2,62	-	-	-	-	2,26	2,56
Pcd	-	8,08	10,3	13,2	14,6	18,8	-	-	9,93	12,7	14,0	18,0	-	-	-	-	13,4	17,2
Pat	-	4,67	4,65	4,63	4,62	4,59	-	-	5,08	5,05	5,04	5,01	-	-	-	-	5,49	5,46
0061																		
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	30						35						40					
Pt	-	-	-	-	-	-	11,2	12,1	13,3	14,9	15,7	17,9	11,5	12,2	13,3	14,8	15,6	17,7
Qcd	-	-	-	-	-	-	1,94	2,09	2,30	2,59	2,72	3,09	2,00	2,12	2,31	2,58	2,70	3,06
Pcd	-	-	-	-	-	-	8,35	9,66	11,8	14,8	16,4	21,2	8,84	9,95	11,8	14,7	16,2	20,8
Pat	-	-	-	-	-	-	4,03	4,05	4,07	4,11	4,13	4,18	4,48	4,50	4,53	4,57	4,59	4,65
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	45						50						55					
Pt	-	12,3	13,4	14,8	15,5	17,5	-	-	13,4	14,7	15,4	17,3	-	-	-	-	15,3	17,2
Qcd	-	2,14	2,32	2,57	2,69	3,04	-	-	2,33	2,56	2,68	3,01	-	-	-	-	2,67	2,99
Pcd	-	10,2	11,9	14,6	16,0	20,4	-	-	12,0	14,6	15,9	20,1	-	-	-	-	15,8	19,8
Pat	-	5,02	5,06	5,10	5,12	5,17	-	-	5,64	5,68	5,70	5,75	-	-	-	-	6,33	6,38
0091																		
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	30						35						40					
Pt	-	-	-	-	-	-	15,1	16,6	18,5	20,9	22,0	25,1	15,4	16,7	18,5	20,8	21,9	24,8
Qcd	-	-	-	-	-	-	2,62	2,87	3,20	3,62	3,81	4,34	2,68	2,90	3,22	3,61	3,79	4,31
Pcd	-	-	-	-	-	-	6,16	7,39	9,20	11,7	13,0	16,9	6,42	7,56	9,27	11,7	12,9	16,6
Pat	-	-	-	-	-	-	5,92	5,88	5,88	5,90	5,92	5,99	6,64	6,60	6,58	6,59	6,60	6,65
Ta	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7	-15	-10	-5	0	2	7
Tcd	45						50						55					
Pt	-	17,0	18,6	20,7	21,7	24,6	-	-	18,7	20,6	21,5	24,3	-	-	-	-	21,3	24,0
Qcd	-	2,95	3,23	3,60	3,77	4,27	-	-	3,25	3,59	3,75	4,22	-	-	-	-	3,72	4,18
Pcd	-	7,80	9,35	11,6	12,8	16,3	-	-	9,45	11,5	12,6	16,0	-	-	-	-	12,4	15,6
Pat	-	7,48	7,40	7,37	7,36	7,39	-	-	8,35	8,24	8,21	8,18	-	-	-	-	9,14	9,04

Ta [°C] - Air temperature

Tcd (°C) - Plant (side) heating exchanger output water temperature

Pt (kW) - Heating capacity

Pat (kW) - Total power input

Qcd (m³/h) - Plant (side) heating exchanger water flow

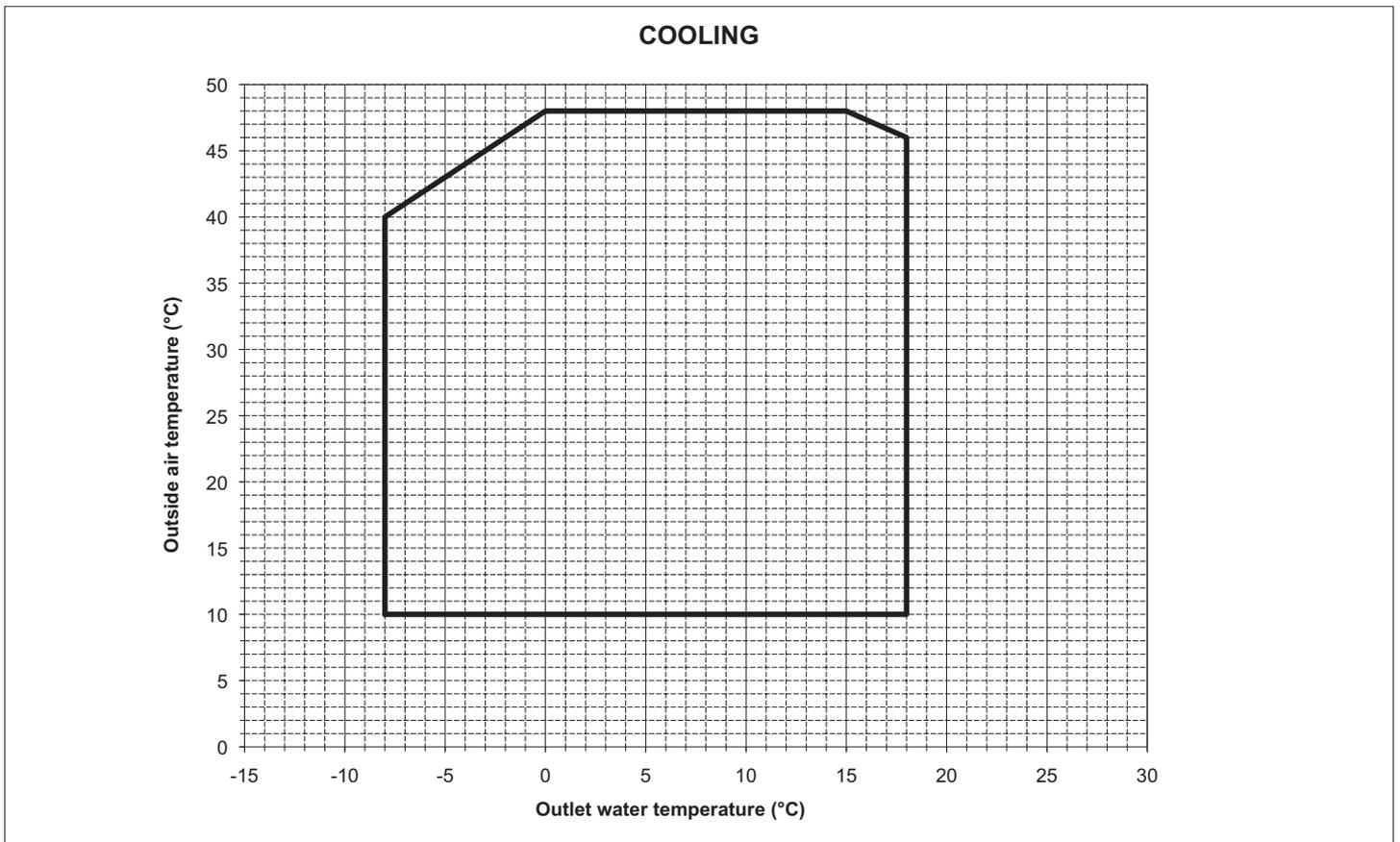
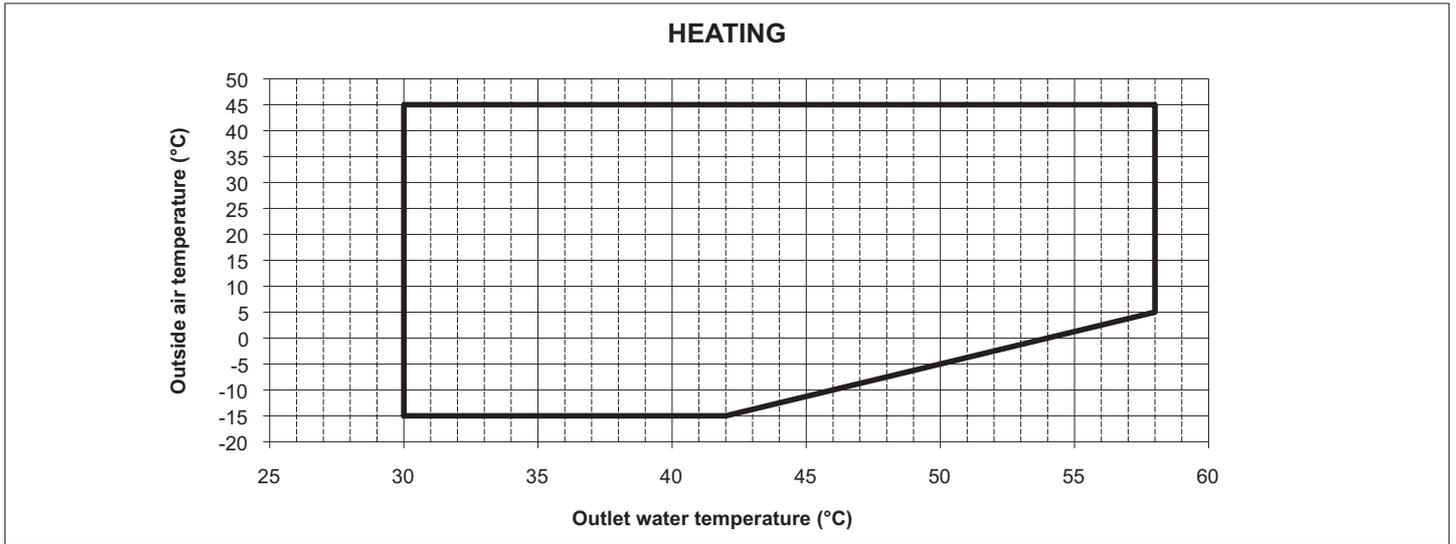
Dpcd (kPa) - Plant (side) heating exchanger pressure drop

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

6. OPERATING LIMITS



Water temperature head min/max= 3/8 °C  
 Water circuit pressure min/max = 1/6 bar  
 Maximum percentage of glycol = 40%

## 7. ETHYLENE GLYCOL MIXTURE

Ethylene glycol and water mixture, used as a heat-conveying fluid, cause a variation in unit performance. For correct data, use the factors indicated in the following table.

	Freezing point (°C)							
	0	-5	-10	-15	-20	-25	-30	-35
	Ethylene glycol percentage by weight							
	0	12%	20%	30%	35%	40%	45%	50%
cPf	1	0,985	0,98	0,974	0,97	0,965	0,964	0,96
cQ	1	1,02	1,04	1,075	1,11	1,14	1,17	1,2
cdp	1	1,07	1,11	1,18	1,22	1,24	1,27	1,3

cPf: cooling power correction factor  
 cQ: flow correction factor  
 cdp: pressure drop correction factor

For data concerning other kind of anti-freeze solutions (e.g. propylene glycol) please contact our Sale Department.

## 8. FOULING FACTORS

Performances are based on clean condition of tubes (fouling factor = 1). For different fouling values, performance should be adjusted using the correction factors shown in the following table.

FOULING FACTORS ff (m <sup>2</sup> °C/W)	EVAPORATOR			CONDENSER/RECOVERY			DESUPERHEATER
	F1	FK1	KE [°C]	F2	FK2	KC [°C]	R3
0	1,000	1,000	0,0	1,000	1,000	0,0	1,000
1,80 x 10 <sup>-5</sup>	1,000	1,000	0,0	1,000	1,000	0,0	1,000
4,40 x 10 <sup>-5</sup>	1,000	1,000	0,0	0,990	1,030	1,0	0,990
8,80 x 10 <sup>-5</sup>	0,960	0,990	0,7	0,980	1,040	1,5	0,980
13,20 x 10 <sup>-5</sup>	0,944	0,985	1,0	0,964	1,050	2,3	0,964
17,20 x 10 <sup>-5</sup>	0,930	0,980	1,5	0,950	1,060	3,0	0,950

ff: fouling factors  
 f1 - f2: potential correction factors  
 fk1 - fk2: compressor power input correction factors  
 r3: capacity correction factors

KE: minimum condenser outlet temperature increase  
 KC: maximum condenser outlet temperature decrease

## 9. HYDRAULIC DATA

### Water flow and pressure drop

Water flow in the heat exchangers is given by:  $Q = P \times 0,86 / Dt$

Q: water flow (m<sup>3</sup>/h)

Dt: difference between inlet and outlet water temp. (°C)

P: heat exchanger capacity (kW)

Pressure drop is given by:  $Dp = K \times Q^2 / 1000$

Q: water flow (m<sup>3</sup>/h)

Dp: pressure drop (kPa)

K: unit size ratio

SIZE	PLANT SIDE COLD HEAT EXCHANGER						PLANT SIDE HOT HEAT EXCHANGER				AUXILIARY SIDE HEAT EXCHANGER			
	K	Q min m <sup>3</sup> /h	Q max m <sup>3</sup> /h	C.A.S. dm <sup>3</sup>	C.a. min m <sup>3</sup>		K	Q min m <sup>3</sup> /h	C.A.S. dm <sup>3</sup>	Q max m <sup>3</sup> /h	K	Q min m <sup>3</sup> /h	C.A.S. dm <sup>3</sup>	Q max m <sup>3</sup> /h
0011 230V	15342	0,56	2,06	-	0,018		15342	-	-	-	-	-	-	-
0025 230V	12130	0,68	2,38	-	0,022		12130	-	-	-	-	-	-	-
0031 230V	5080	0,99	3,53	-	0,032		5080	-	-	-	-	-	-	-
0041 230V	3958	1,26	4,5	-	0,041		3958	-	-	-	-	-	-	-
0031 400V	5080	0,92	3,35	-	0,03		5080	-	-	-	-	-	-	-
0041 400V	3958	1,28	4,53	-	0,042		3958	-	-	-	-	-	-	-
0051 400V	2633	1,42	5,07	-	0,046		2633	-	-	-	-	-	-	-
0061 400V	2216	1,63	5,79	-	0,053		2216	-	-	-	-	-	-	-
0091 400V	896	2,38	8,37	-	0,077		896	-	-	-	-	-	-	-

Q min: minimum water flow admitted to the heat exchanger  
 Q max: maximum water flow admitted to the heat exchanger  
 C.a. min: minimum water content admitted in the plant, using traditional control logic  
 C.A.S.: heat exchanger water content  
 ---

## 10. MINIMUM AND MAXIMUM SYSTEM WATER CONTENT

### Minimum system water content

The minimum water content for the system shown in table 1 allows the number of compressor starts and stops to be limited.

Tab. 1	Size		0011	0025	0031	0041	0051	0061	0091
	Minimum water content	l	24	31,5	40	46	65	74	110

### Maximum system water content

The heat pumps are fitted as standard with an expansion vessel and safety valve. The maximum system water content depends on the capacity of the expansion vessel (see **table 2**) and the calibration of the safety valve (see **table 3**).

Tab. 2	Size		0011	0025	0031	0041	0051	0061	0091
	Expansion vessel	l	2	2	2	2	2	2	2

Tab. 3	Size		0011	0025	0031	0041	0051	0061	0091
	Safety valve	bar	6	6	6	6	6	6	6

**Table 4** shows an example of the maximum water content in the specified normal operating conditions. If the volume of water in the system is higher, an additional, correctly sized expansion vessel is required.

Tab. 4	<b>System water temperature</b>	°C	<b>20</b>						
	<b>Hydraulic head</b>	m	30	25	20	15			
	<b>Expansion vessel pre-charge</b>	bar	3,2	2,8	2,3	1,8			
	<b>Maximum water content</b>	l	435	515	595	670			
	<b>System water temperature</b>	°C	<b>35</b>						
	<b>Hydraulic head</b>	m	30	25	20	15			
	<b>Expansion vessel pre-charge</b>	bar	3,2	2,8	2,3	1,8			
	<b>Maximum water content</b>	l	135	160	180	205			
	<b>System water temperature</b>	°C	<b>45</b>						
	<b>Hydraulic head</b>	m	30	25	20	15			
	<b>Expansion vessel pre-charge</b>	bar	3,2	2,8	2,3	1,8			
	<b>Maximum water content</b>	l	80	95	110	120			
	<b>System water temperature</b>	°C	<b>55</b>						
	<b>Hydraulic head</b>	m	30	25	20	15			
	<b>Expansion vessel pre-charge</b>	bar	3,2	2,8	2,3	1,8			
	<b>Maximum water content</b>	l	55	65	75	85			

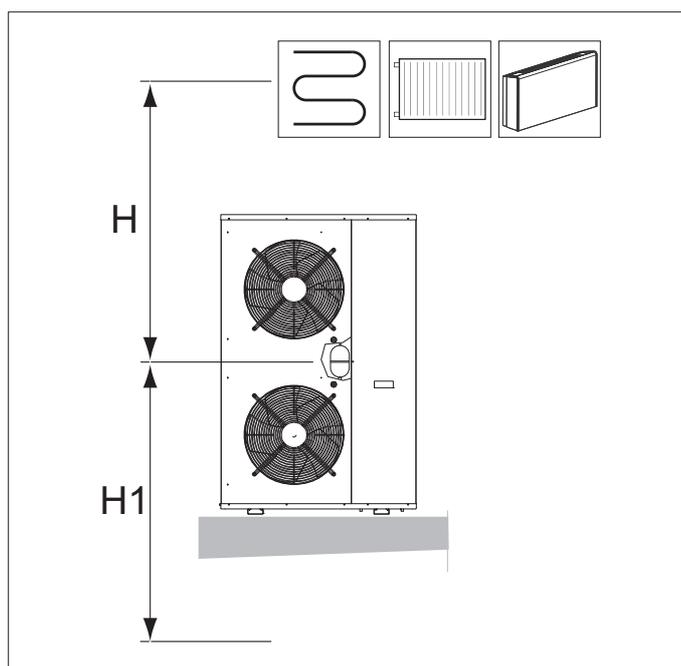
### Expansion vessel calibration

The expansion vessels are pre-charged to a standard pressure of 1 bar.

The pre-charge pressure is chosen depending on the maximum difference in height between the system terminal and the heat pump, as shown in the figure.

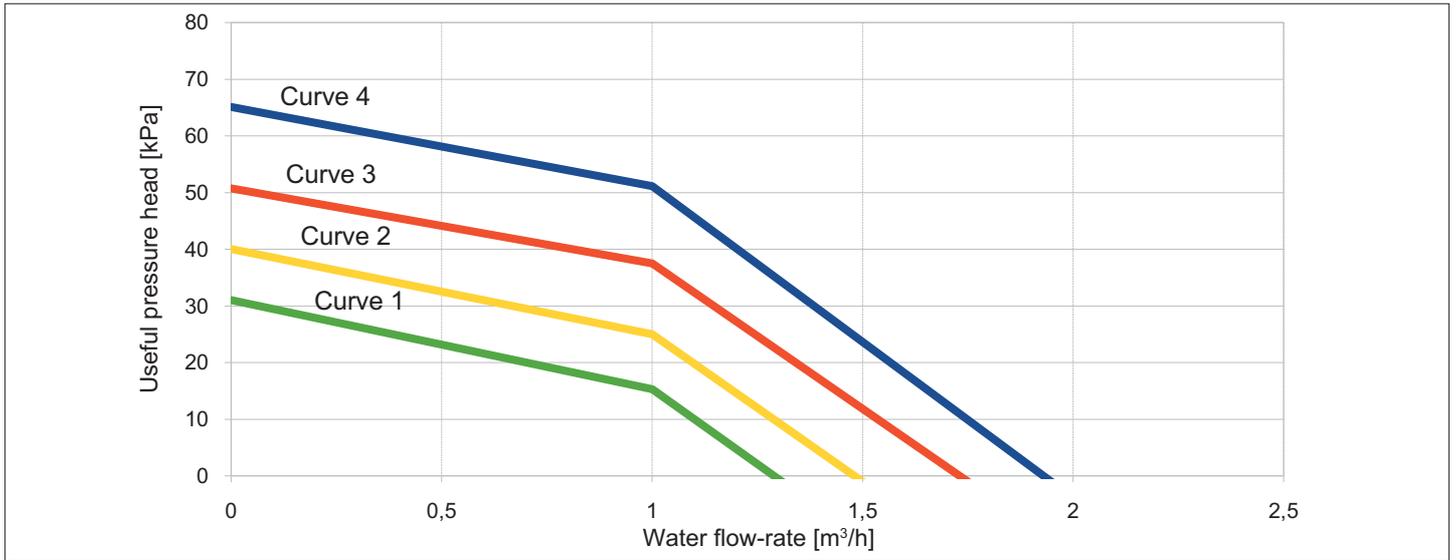
The maximum height must not exceed 55 metres due to the maximum vessel pre-charge pressure of 6 bars.

Make sure that the system terminal at the lowest point H1 can withstand the pressure of the water column at that point.

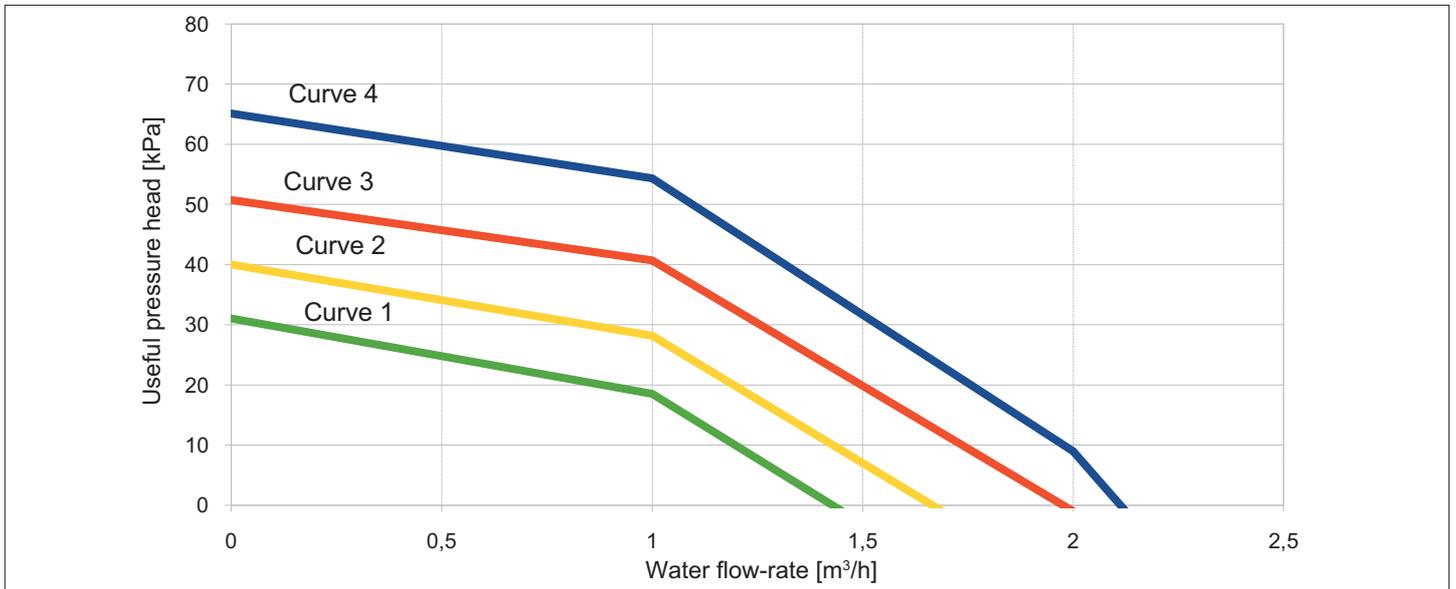


11. VARIABLE SPEED SYSTEM PUMP CURVES

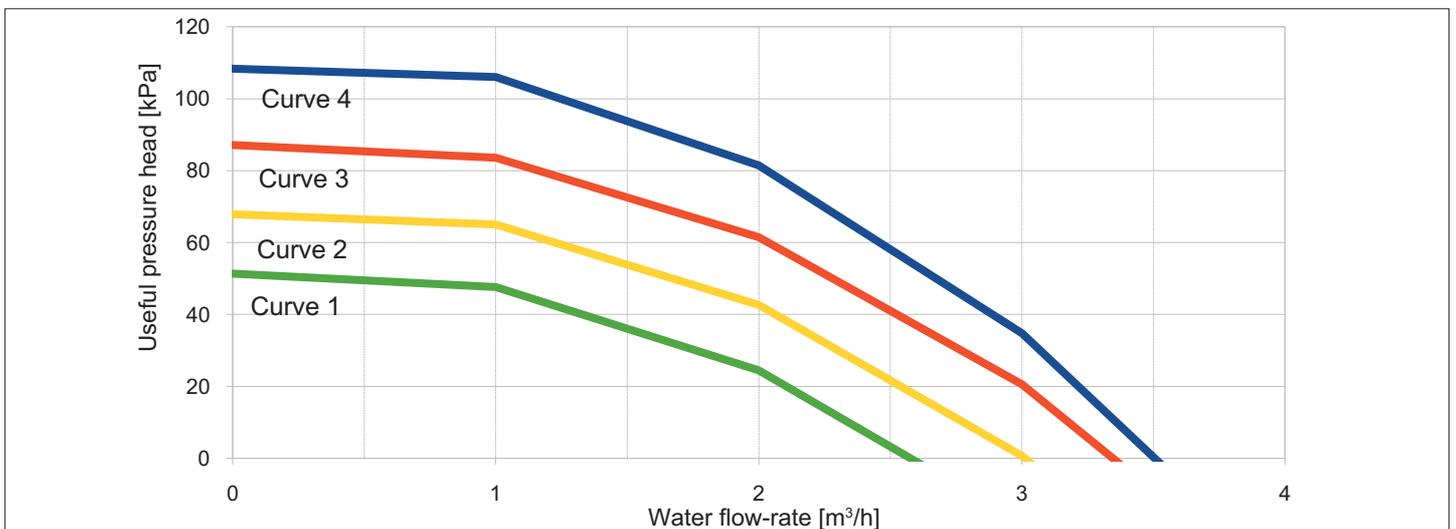
SYSTEM PUMP CURVE 0011m



SYSTEM PUMP CURVE 0025m

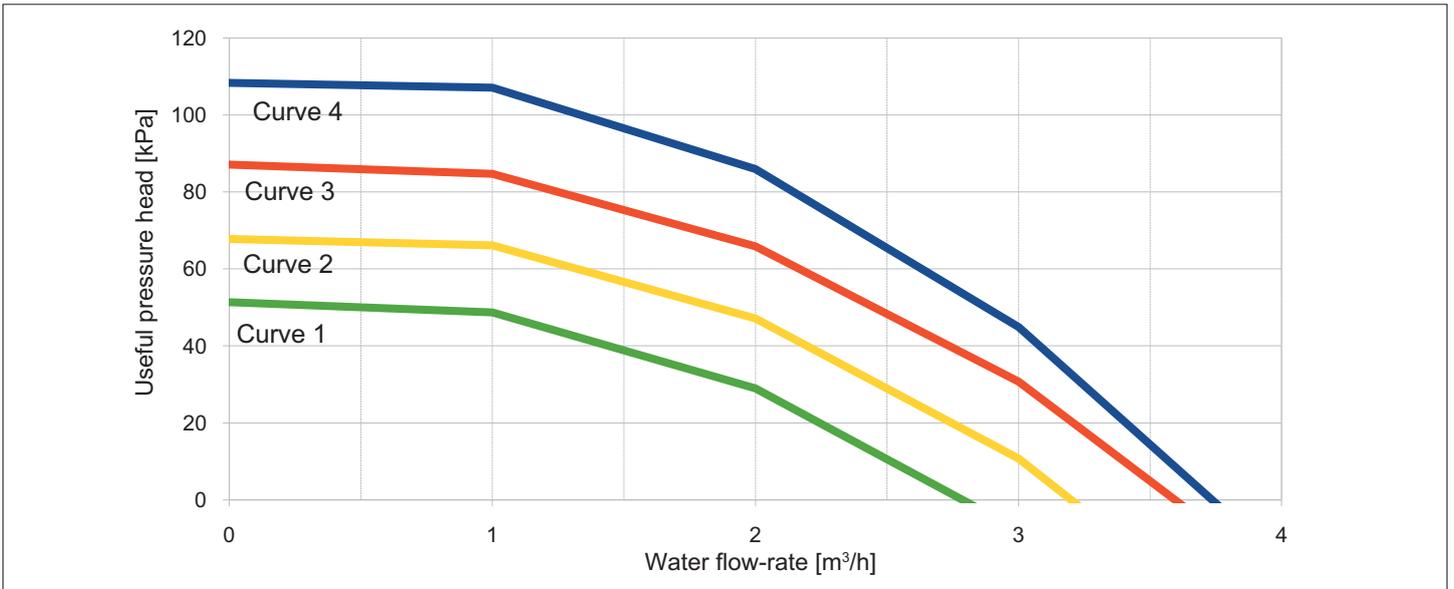


SYSTEM PUMP CURVE 0031m-0031t

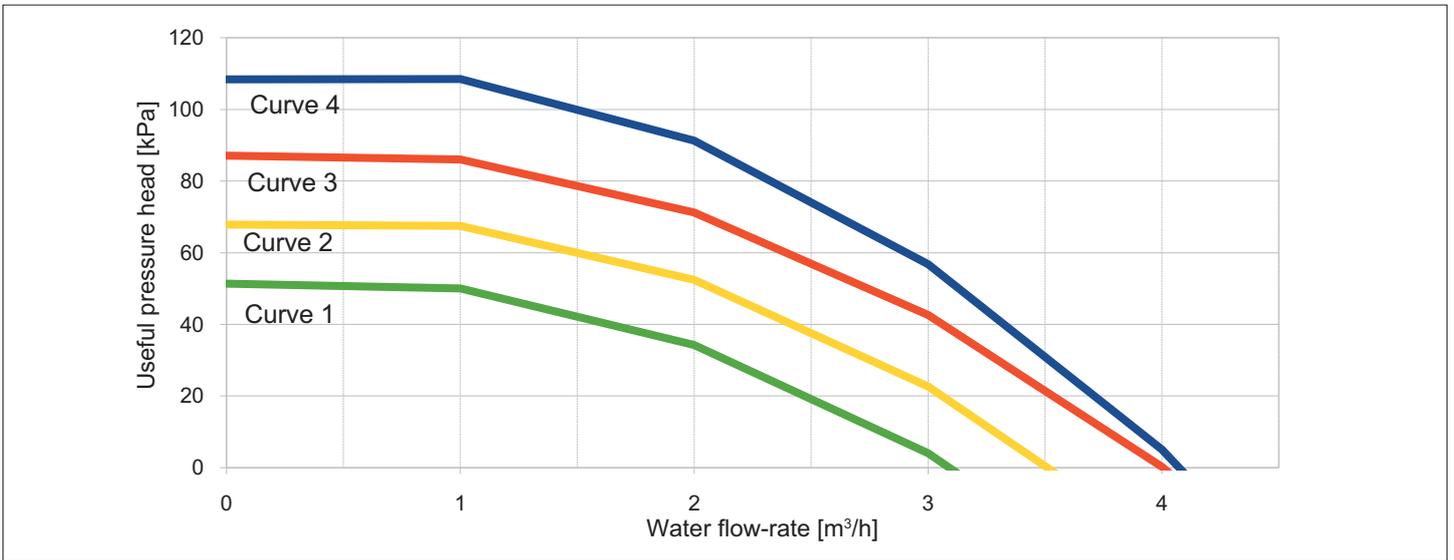


The pressure head refers to the values at the fittings.

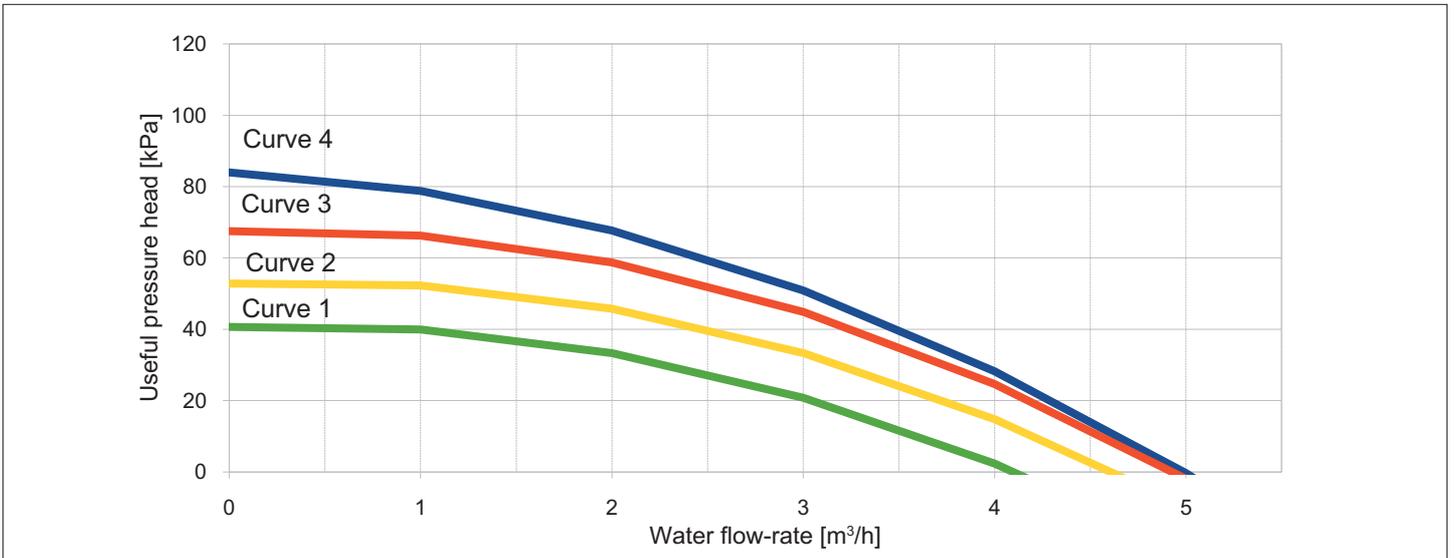
SYSTEM PUMP CURVE 0041m-0041t



SYSTEM PUMP CURVE 0051t

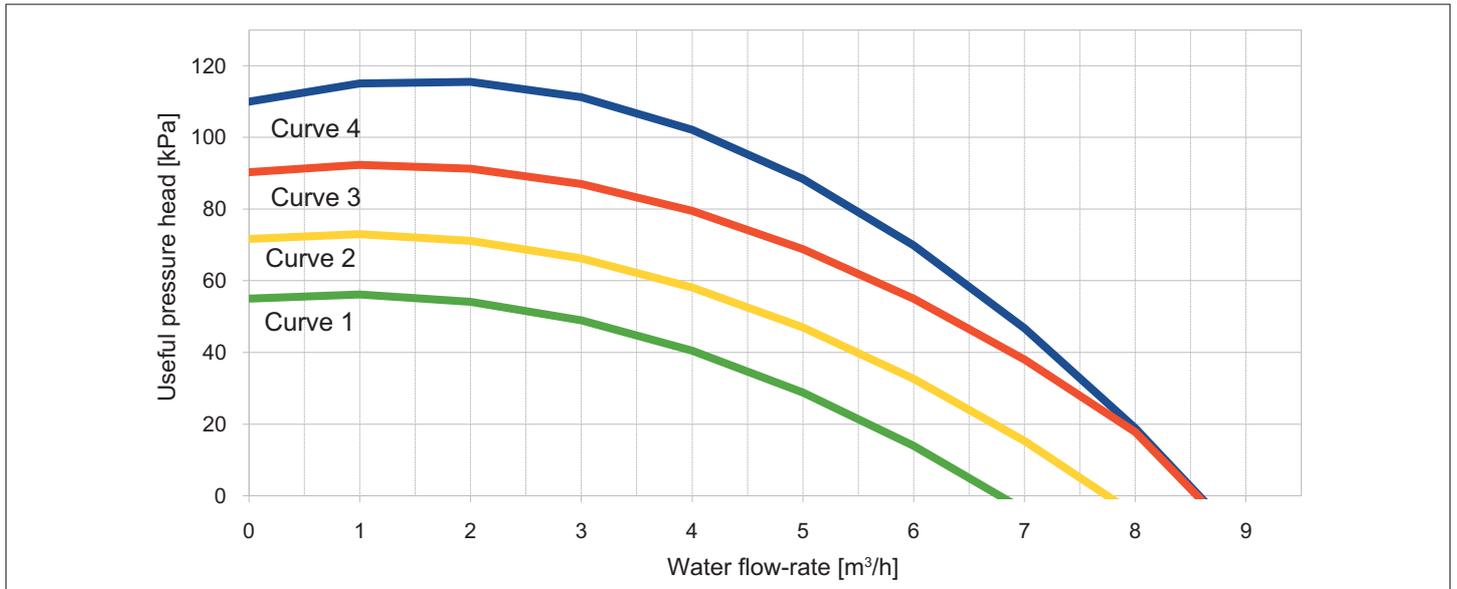


SYSTEM PUMP CURVE 0061t



The pressure head refers to the values at the fittings.

SYSTEM PUMP CURVE 0091t



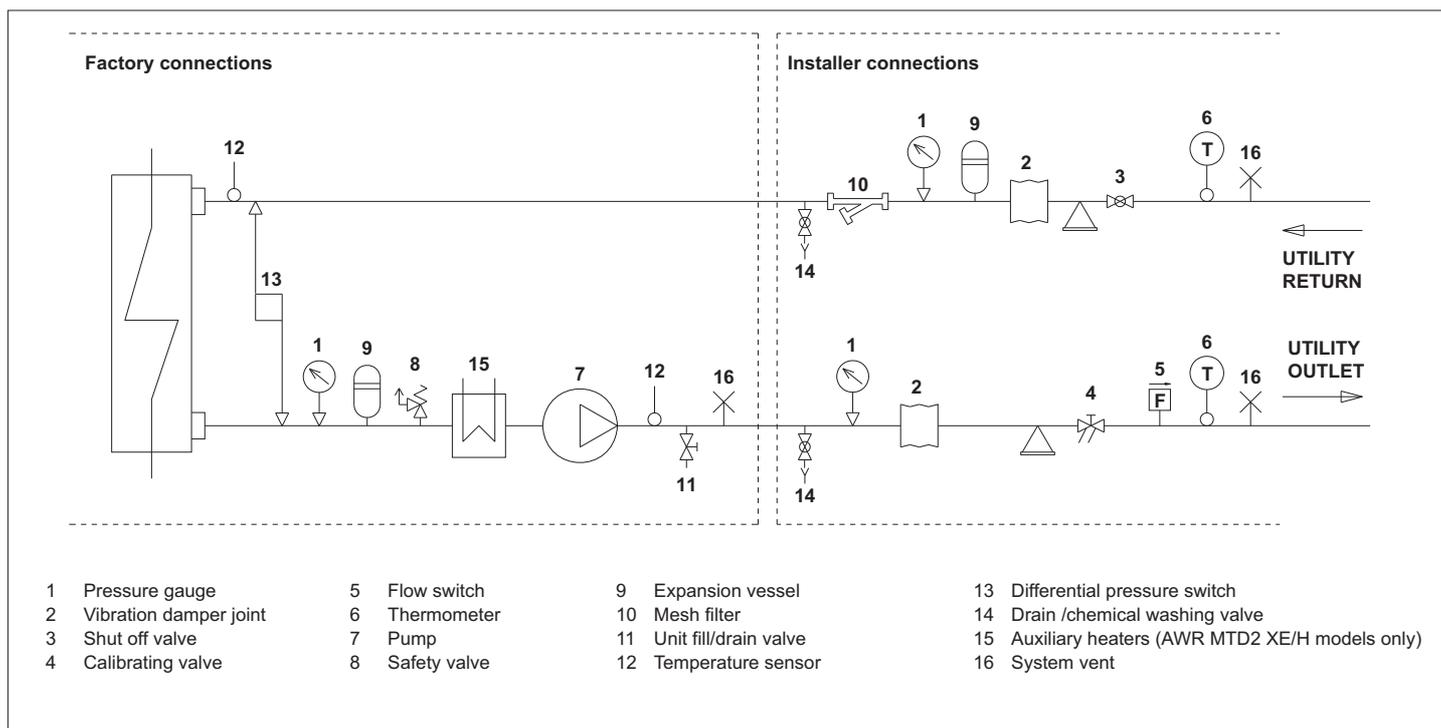
The pressure head refers to the values at the fittings.

Model	Pump power supply	Pf (1) kW	Q (1) m³/h	H (1) kPa	Pt (2) kW	Q (2) m³/h	H (2) kPa	F.L.I. kW	Pump
AWR MTD2 XE 0011	230v-50Hz-1Ph	7,2	1,2	42	6,3	1,1	48	0,07	inverter Para Stratos 1-7
AWR MTD2 XE 0025	230v-50Hz-1Ph	8,3	1,4	38	7,4	1,3	45	0,07	inverter Para Stratos 1-7
AWR MTD2 XE 0031	230v-50Hz-1Ph	12,3	2,1	79	11,2	1,9	86	0,14	inverter Para Stratos 1-11
AWR MTD2 XE 0041	230v-50Hz-1Ph	15,7	2,7	51	14	2,4	66	0,14	inverter Para Stratos 1-11
AWR MTD2 XE 0051	230v-50Hz-1Ph	17,7	3,0	45	15,9	2,7	59	0,14	inverter Para Stratos 1-11
AWR MTD2 XE 0061	230v-50Hz-1Ph	20,2	3,5	41	17,9	3,1	52	0,14	inverter Para Stratos 1-8
AWR MTD2 XE 0091	230v-50Hz-1Ph	29,2	5,0	87	25,1	4,3	101	0,31	inverter Para Stratos 1-12

(1) System water temperature 23/18°C, outside air temperature 35°C DB  
 (2) System water temperature 30/35°C, outside air temperature 7°C DB/ 6°C WB

Pf Cooling capacity of unit  
 Pt Heating capacity of unit  
 Q Flow of water to evaporator  
 F.L.I. Power absorbed by pump  
 H Residual head

12. UTILITY WATER CIRCUIT CONNECTION DIAGRAM



13. ELECTRICAL DATA AT MAXIMUM CONDITIONS ALLOWED (FULL LOAD)

AWR MTD2 XE	Power supply (V-Ph-Hz)	Maximum values			Fuses (5x20T 250V)				
		F.L.I. (kW)	F.L.A. (A)	L.R.A. (A)	FU1 (A)	FU2 (A)	FU3 (A)	FU4 (A)	FU5 (A)
0011ms	230~50	2,8	13,4	27	1,25	8	1,25	1	1
0025ms	230~50	3,4	15,9	30	1,25	8	1,25	1	1
0031ms	230~50	5,1	23,4	45	1,6	8	1,25	1	1
0041ms	230~50	6,1	29,8	45	1,6	8	1,25	1	1
0031t	400-3N~50	4,7	9,9	48	1,6	8	1,25	1	1
0041t	400-3N~50	6,3	12,2	64	1,6	8	1,25	1	1
0051t	400-3N~50	6,4	12,6	64	1,6	8	1,25	1	1
0061t	400-3N~50	7,7	14,7	75	1,6	8	1,25	1	1
0091t	400-3N~50	10,7	19,8	111	1,6	8	1,25	1	1

AWR MTD2 XE/H with electric heater	Power supply (V-Ph-Hz)	ELECTRIC HEATER		Total power consumption (Electric heater OFF)		Total power consumption (Electric heater ON)			Fuses (5x20T 250V)		
		F.L.I. (kW)	F.L.A. (A)	F.L.I. (kW)	F.L.A. (A)	F.L.I. (kW)	F.L.A. (A)	L.R.A. (A)	FU1 (A)	FU5 (A)	FU6 (A)
0011ms	230~50	2,00	8,7	2,8	13,5	4,82	22,2	27	1,6	4	1,25
0025ms	230~50	3,00	13,0	3,6	16,7	6,56	29,7	30	1,6	4	1,25
0031ms	230~50	3,00	13,0	5,1	23,6	8,11	36,6	45	1,6	4	1,25
0041ms	230~50	6,00	26,0	6,2	30,1	12,2	56,1	45	1,6	4	1,25
0031t	400-3N~50	3,00	7,5	4,8	10,0	7,76	17,5	48	1,6	4	1,25
0041t	400-3N~50	6,00	15,0	6,4	12,4	12,4	27,4	64	1,6	4	1,25
0051t	400-3N~50	6,00	15,0	6,4	12,7	12,4	27,7	64	1,6	4	1,25
0061t	400-3N~50	6,00	15,0	7,8	14,8	13,8	29,8	75	1,6	4	1,25
0091t	400-3N~50	9,00	22,5	10,9	24,6	19,9	47,1	111	2A	4	1,25

F.L.I. Maximum power input  
 F.L.A. Maximum current input  
 L.R.A. Start-up current

Maximum values for sizing the protection switches and power supply cables.

Give the typical operating conditions of units designed for outdoor installation, which can be associated (according to reference document IEC 60721) to the following classes:

- climatic conditions class 4K4H: air temperature range from -20 up to 55°C (\*), relative humidity range from 4 up to 100%, with possible precipitations, at air pressure from 70 and 106 kPa and a maximum solar radiation of 1120 W/m<sup>2</sup>
- special climatic conditions negligible
- biological conditions class 4B1 and 4C2: locations in a generic urban area
- mechanically active substances class 4S2: locations in areas with sand or dust representative of urban areas
- mechanical conditions class 4M1: locations protected from significant vibrations or shocks

The required protection level for safe operation, according to reference document IEC 60529, is IP43XW (protection against access, to the most critical unit's parts, of external devices with diameter larger than 1 mm and rain).

The unit can be considered IP44XW protected, i.e. protected against access of external devices (with diameter larger than 1 mm) and water in general.

(\*) for the unit's operating limits, see "selection limits" section

## 14. FULL LOAD SOUND LEVEL

SIZE	SOUND POWER								Total sound level
	Octave band [Hz]								
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB(A)								
0011 230V	68	70	71	66	65	60	52	44	69
0025 230V	68	70	71	66	65	60	52	44	69
0031 230V	73	72	71	69	67	62	54	49	71
0041 230V	73	72	71	69	67	62	54	49	71
0031 400V	73	72	71	69	67	62	54	49	71
0041 400V	73	72	71	69	67	62	54	49	71
0051 400V	73	72	71	69	67	62	54	49	71
0061 400V	74	73	72	70	68	63	55	50	72
0091 400V	76	75	74	72	70	65	57	52	74

### Working conditions

Plant (side) cooling exchanger water (in/out) 12/7 °C

Heat exchanger air (in) 35 °C

Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units

Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SIZE	SOUND PRESSURE LEVEL								Total sound level
	Octave band [Hz] at 1 m								
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
0011 230V	53	55	56	51	50	45	37	29	54
0025 230V	53	55	56	51	50	45	37	29	54
0031 230V	58	57	56	54	52	47	39	34	56
0041 230V	58	57	56	54	52	47	39	34	56
0031 400V	58	57	56	54	52	47	39	34	56
0041 400V	58	57	56	54	52	47	39	34	56
0051 400V	58	57	56	54	52	47	39	34	56
0061 400V	59	58	57	55	53	48	40	35	57
0091 400V	60	59	58	56	54	49	41	36	58

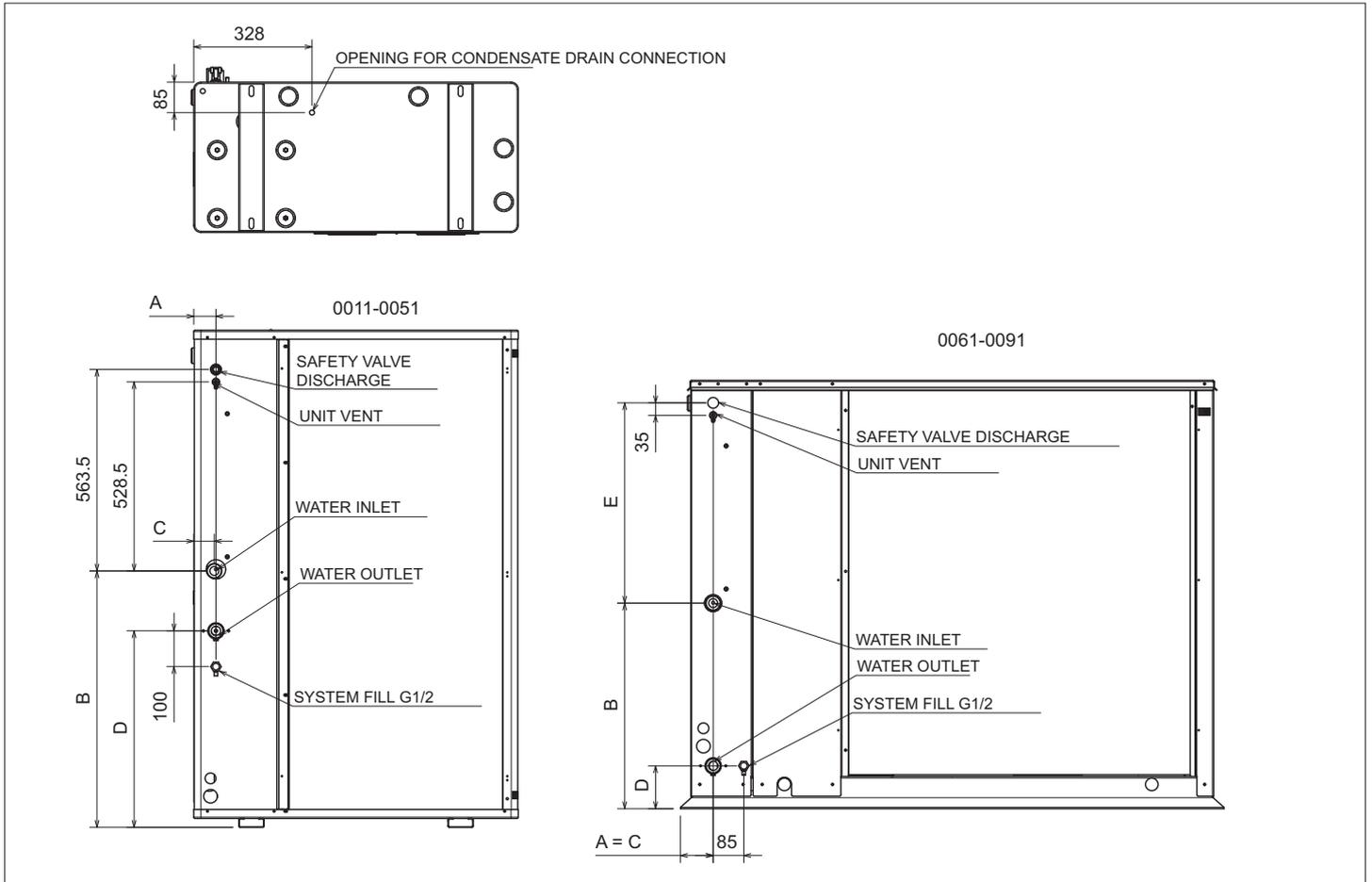
### Working conditions

Plant (side) cooling exchanger water (in/out) 12/7 °C

Heat exchanger air (in) 35 °C

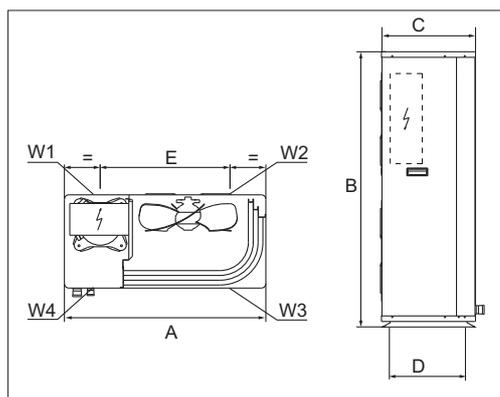
Average sound pressure level, at 1 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.

15. POSITION OF THE WATER CONNECTIONS



Dimensions		0011	0025	0031	0041	0051	0061	0091
A	mm	61,5	61,5	61,5	61,5	61,5	90,5	90,5
B	mm	617	617	617	717,5	717,5	575	770
C	mm	57	57	57	57	57	90,5	90,5
D	mm	454,5	454,5	454,5	549,5	549,5	120	120
E	mm	-	-	-	-	-	560	551
Water connections in	Ø	1"	1"	1"	1" 1/4	1" 1/4	1" 1/4	1" 1/4
Water connections out	Ø	1"	1"	1"	1" 1/4	1" 1/4	1" 1/4	1" 1/4

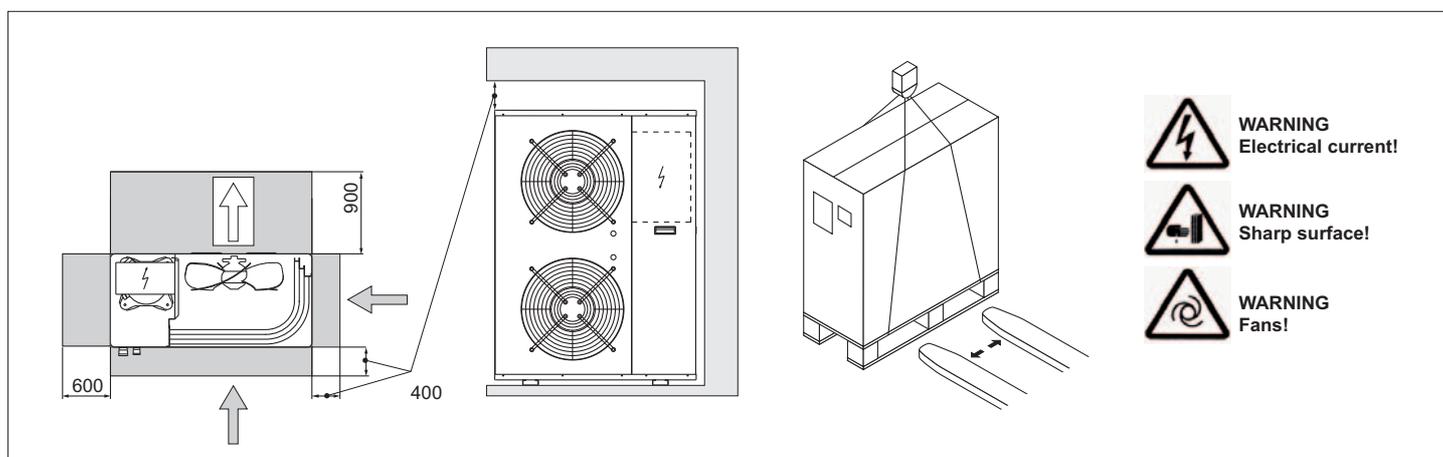
16. DIMENSIONAL DRAWINGS



Dimensions		0011	0025	0031	0041	0051	0061	0091
A	mm	900	900	900	900	900	1550	1550
B	mm	1240	1240	1240	1390	1390	1200	1700
C	mm	420	420	420	420	420	450	450
D	mm	370	370	370	370	370	497	497
E	mm	580	580	580	580	580	1477	1477

Weight distribution		0011	0025	0031	0041	0051	0061	0091
W1 lato rear dx	kg	60	62	64	67	71	88	117
W2 lato rear sx	kg	17	18	20	23	24	39	54
W3 front sx	kg	17	18	18	22	22	36	51
W4 front dx	kg	51	52	53	58	63	87	113
tot	kg	145	150	155	170	180	250	335

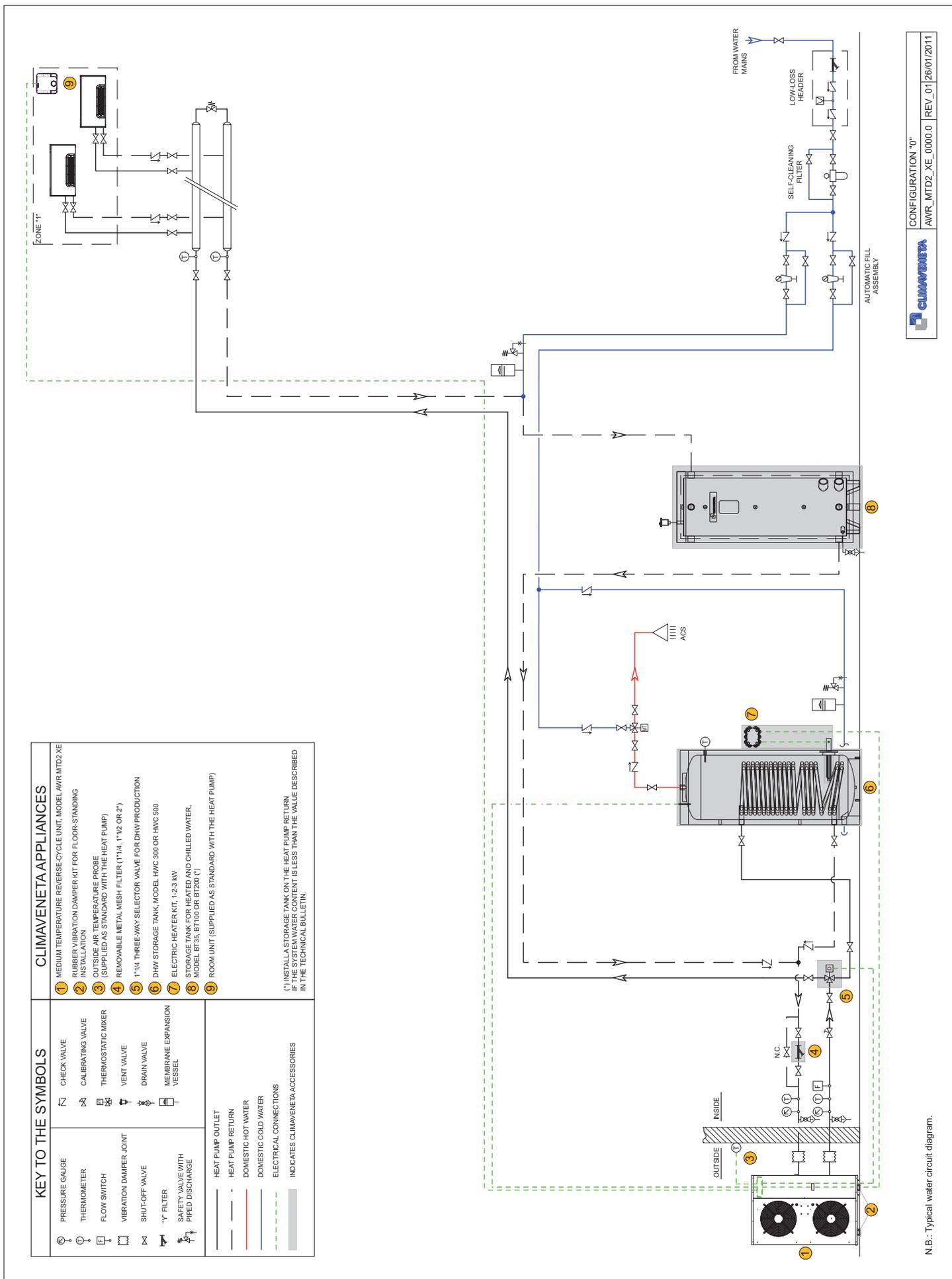
17. CLEARANCES - HOISTING - SYMBOLS



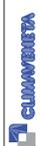
HOISTING INSTRUCTIONS

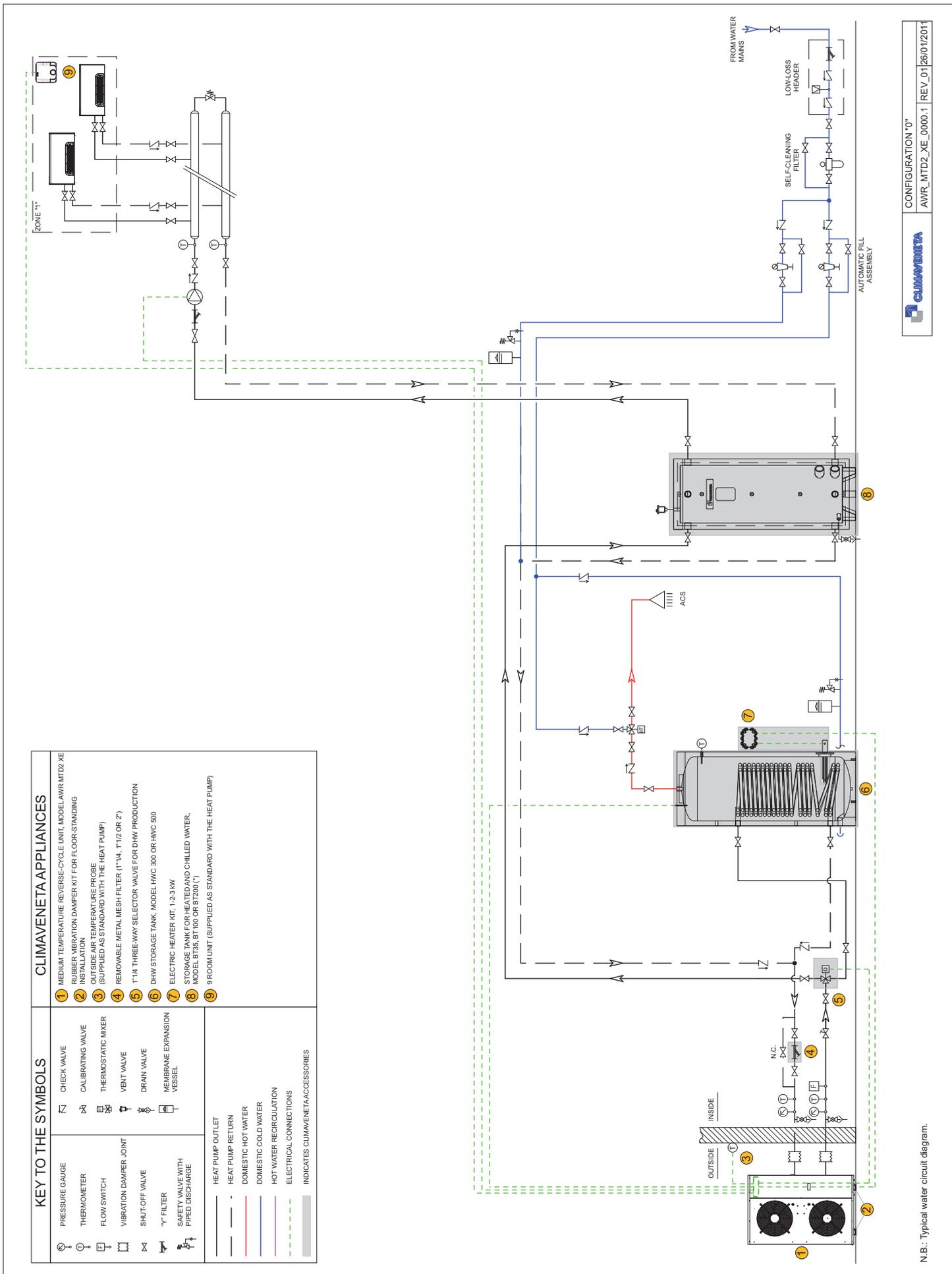
- Make sure all the panels are securely fastened before handling the unit.
- Before hoisting, check the weight of the unit on the CE rating label.
- Use all of the hoisting points indicated, and no others,
- Use equal length cables or slings.
- Use a spreader bar (not included)
- Handle the unit with care and without sudden or jerky movements.

18. OPERATING DIAGRAMS



CONFIGURATION "0"  
AWR\_MTD2\_XE\_0000.0 | REV\_01 | 26/01/2011





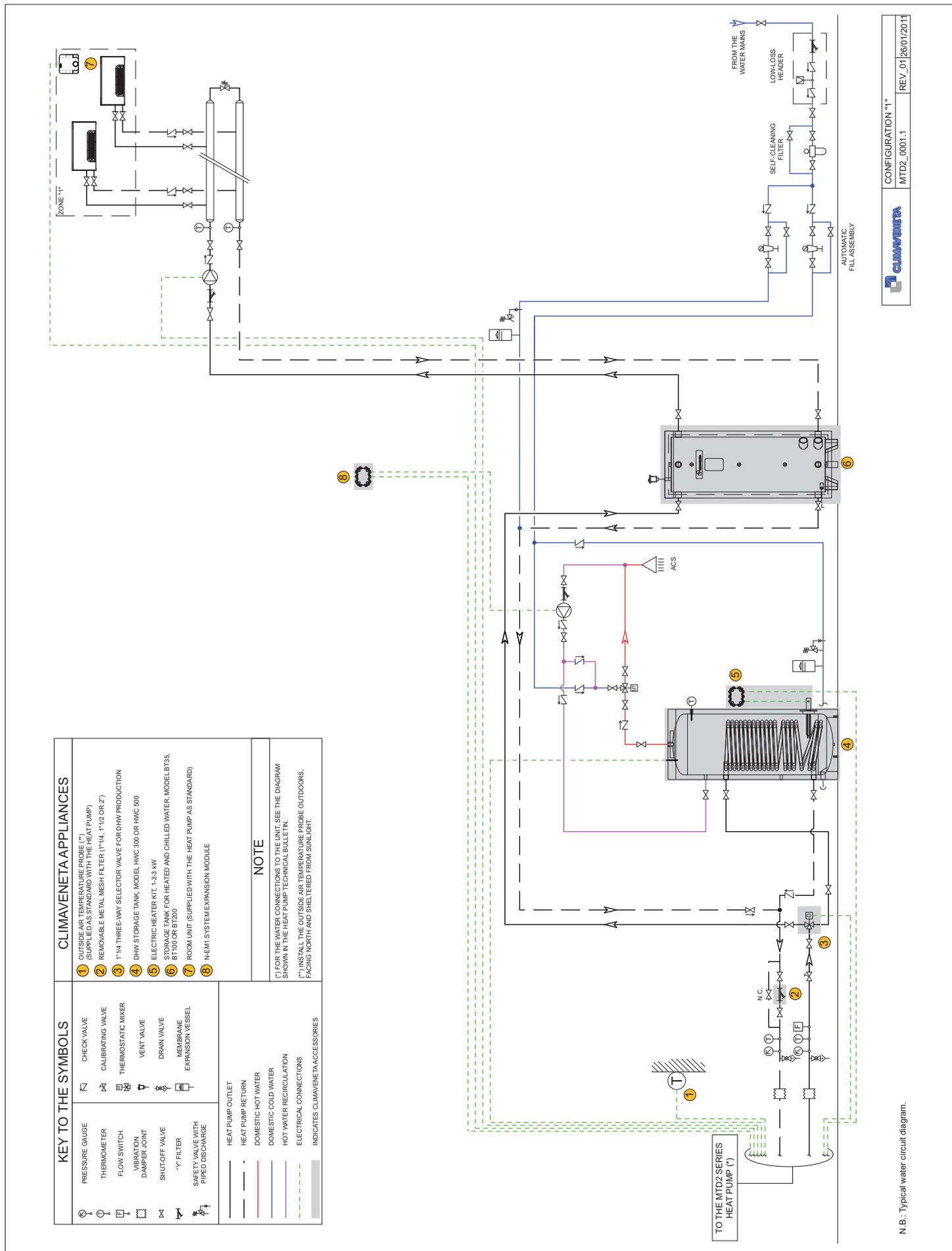
KEY TO THE SYMBOLS		CLIMAVENETA APPLIANCES	
	PRESSURE GAUGE		MEDIUM TEMPERATURE REVERSE-CYCLE UNIT, MODEL AWR MTD2 XE
	THERMOMETER		RUBBER VIBRATION DAMPER KIT FOR FLOOR-STANDING INSTALLATION
	FLOW SWITCH		OUTSIDE AIR TEMPERATURE PROBE (SUPPLIED AS STANDARD WITH THE HEAT PUMP)
	VIBRATION DAMPER JOINT		REMOVABLE METAL MESH FILTER (1"1/4, 1"1/2 OR 2")
	SHUT-OFF VALVE		1"1/4 THREE-WAY SELECTOR VALVE FOR DHW PRODUCTION
	Y-FILTER		DHW STORAGE TANK, MODEL HMC 300 OR HMC 500
	SAFETY VALVE WITH PIPED DISCHARGE		ELECTRIC HEATER KIT 1.4-2.3 KW
	HEAT PUMP OUTLET		STORAGE TANK FOR HEATED AND CHILLED WATER, MODEL B155, B160 OR B1200(1)
	HEAT PUMP RETURN		ROOM UNIT (SUPPLIED AS STANDARD WITH THE HEAT PUMP)
	DOMESTIC HOT WATER		
	DOMESTIC COLD WATER		
	HOT WATER RECIRCULATION		
	ELECTRICAL CONNECTIONS		
	INDICATES CLIMAVENETA ACCESSORIES		

CLIMAVENETA  
 CONFIGURATION "0"  
 AWR\_MTD2\_XE\_0000.1 | REV\_01 | 26/01/2011

N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 1 (parameter 0101= 1)



N.B.: Typical water circuit diagram.

CLIMVENETA

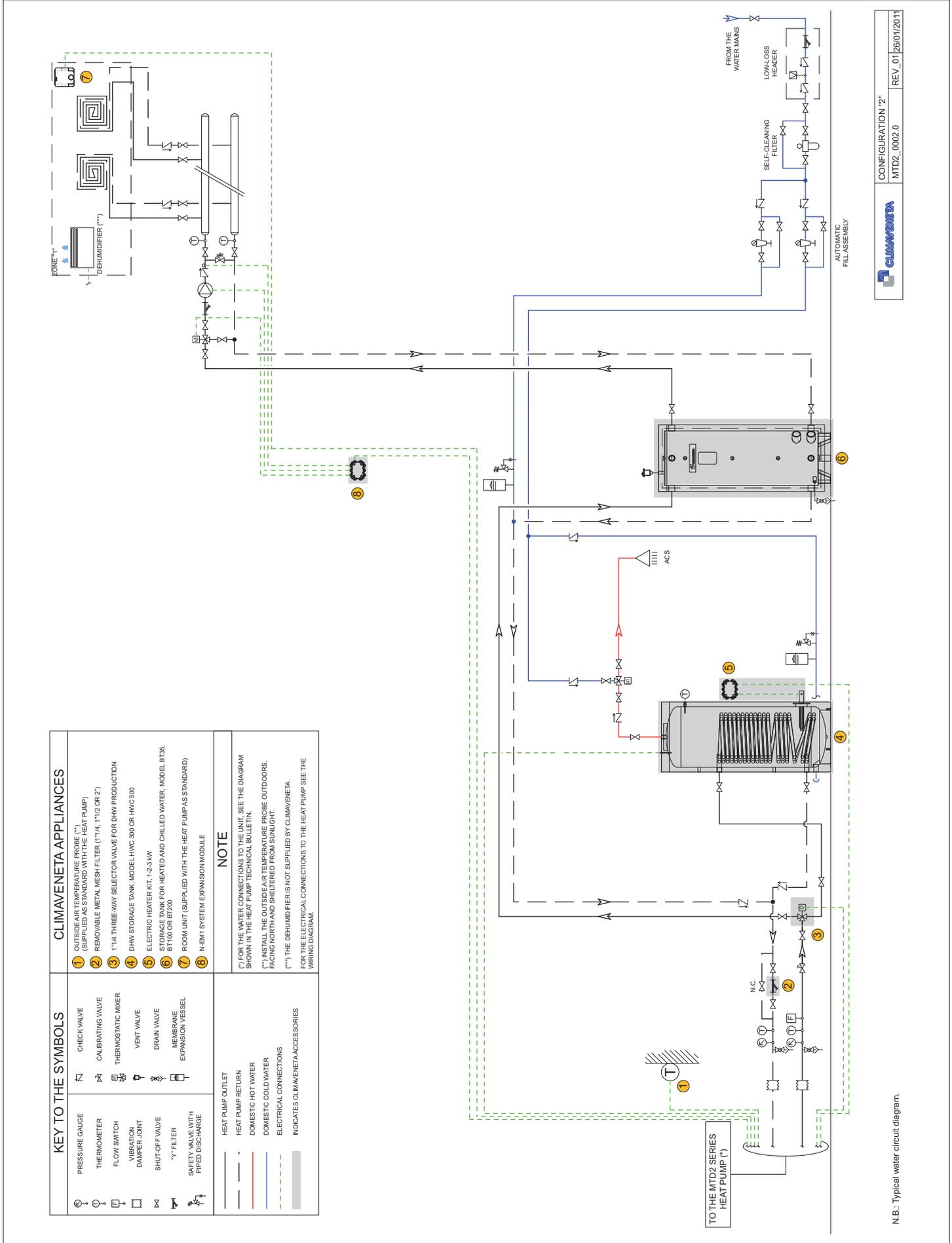
CONFIGURATION "1"

MTD2\_0001.1

REV. 01/26/01/2011

WATER CIRCUIT DIAGRAM

Configuration number 2 (parameter 0101= 2)



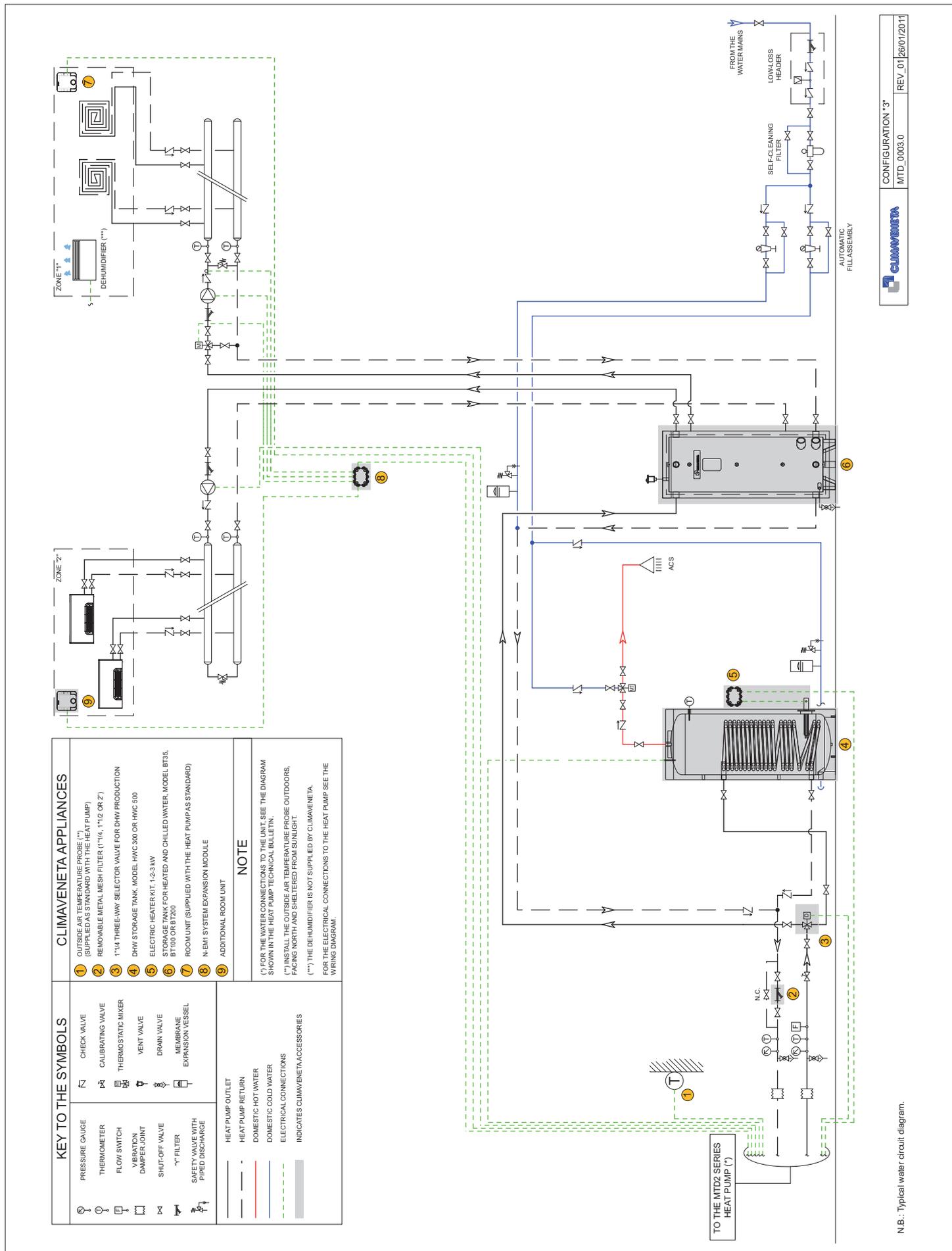
CONFIGURATION "2"  
IMTD2\_0002.0  
REV\_01[26/01/2011]  
CLIMVENETA

KEY TO THE SYMBOLS		CLIMAVENETA APPLIANCES	
	PRESSURE GAUGE		CHECK VALVE
	THERMOMETER		CALIBRATING VALVE
	FLOW SWITCH		THERMOSTATIC MIXER
	LUBRICATION DAMPER JOINT		VENT VALVE
	SHUT-OFF VALVE		DRAIN VALVE
	Y-FILTER		MICROBORE EXPANSION VESSEL
	SAFETY VALVE WITH PIPED DISCHARGE		
	HEAT PUMP OUTLET		
	HEAT PUMP RETURN		
	DOMESTIC HOT WATER		
	DOMESTIC COLD WATER		
	ELECTRICAL CONNECTIONS		
	INDICATES CLIMAVENETA ACCESSORIES		
		<b>NOTE</b>	
		(*) FOR THE WATER CONNECTIONS TO THE UNIT, SEE THE DIAGRAM SHOWN IN THE HEAT PUMP TECHNICAL BULLETIN.	
		(**) INSTALL THE OUTSIDE AIR TEMPERATURE PROBE OUTDOORS, FACING NORTH AND SHELTERED FROM SUNLIGHT.	
		(***) THE DEHUMIDIFIER IS NOT SUPPLIED BY CLIMAVENETA. FOR THE ELECTRICAL CONNECTIONS TO THE HEAT PUMP SEE THE WIRING DIAGRAM.	

N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 3 (parameter 0101= 3)

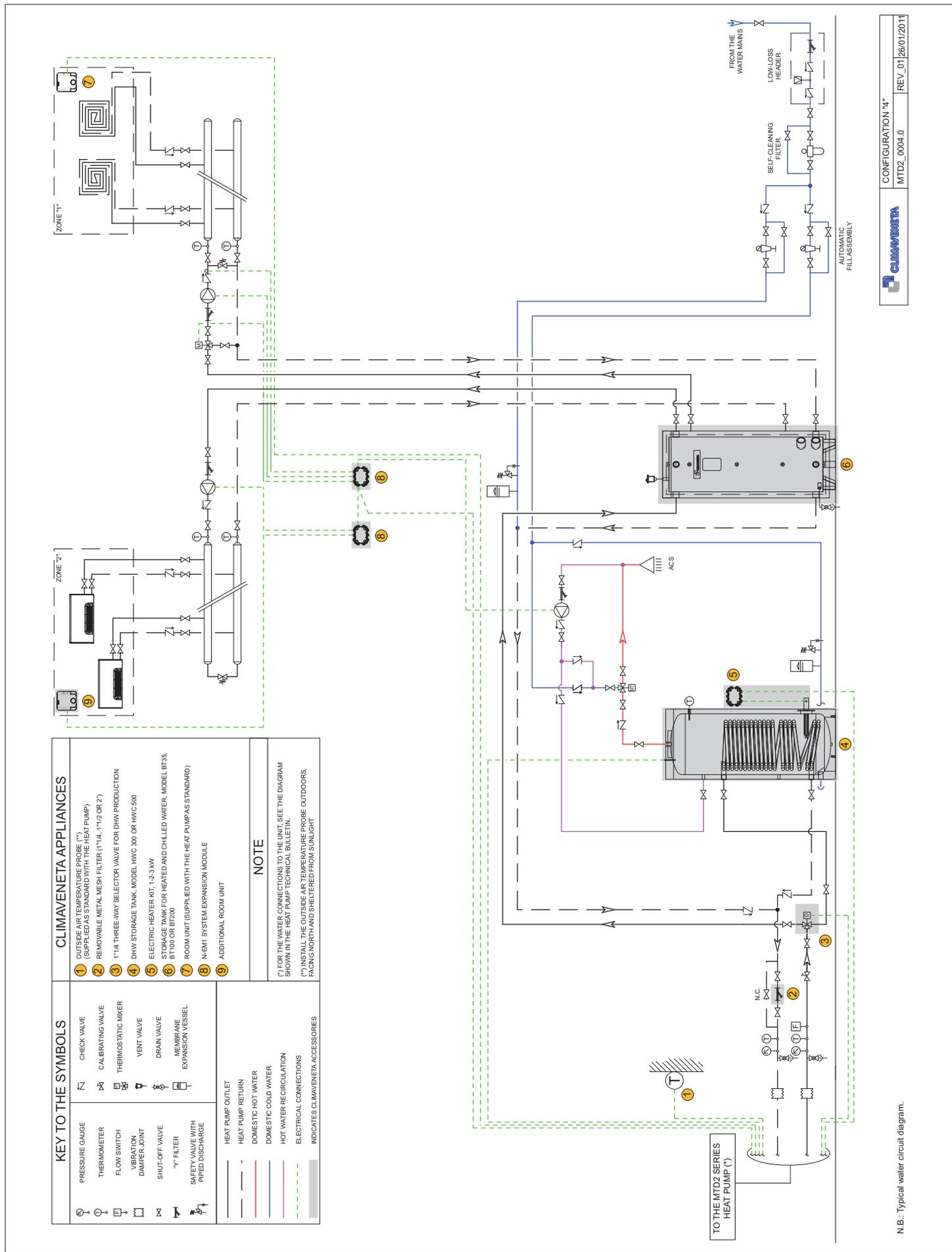


N.B.: Typical water circuit diagram.

CONFIGURATION "3"  
IMTD\_0003.0  
REV\_01/26/01/2011

WATER CIRCUIT DIAGRAM

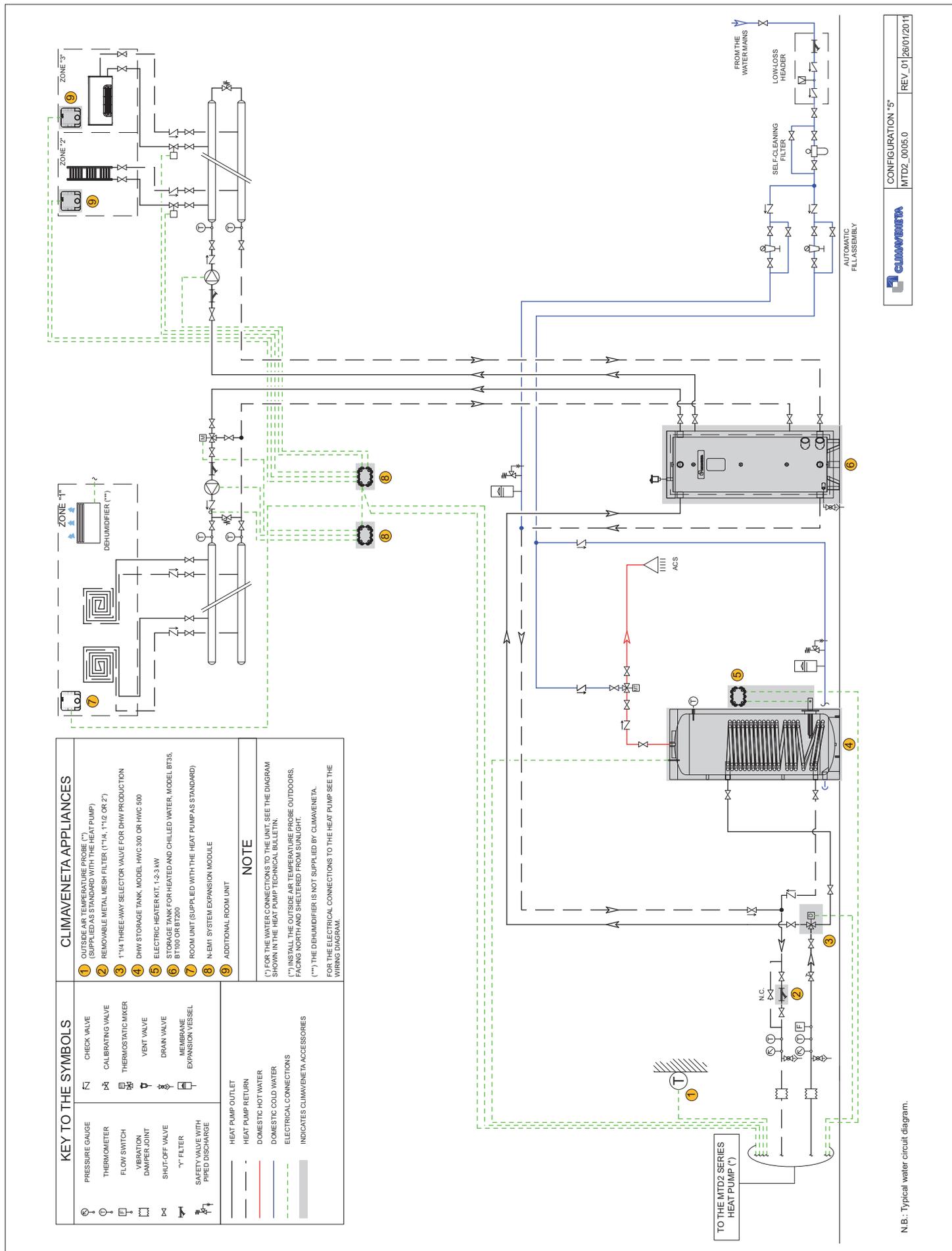
Configuration number 4 (parameter 0101= 4)



CONFIGURATION "4"  
 MTD2\_0004.0  
 REV\_01/26/01/2011

WATER CIRCUIT DIAGRAM

Configuration number 5 (parameter 0101= 5)



KEY TO THE SYMBOLS	
	PRESSURE GAUGE
	THERMOMETER
	FLOW SWITCH
	DAMPER JOINT
	SHUT-OFF VALVE
	Y-FILTER
	SAFETY VALVE WITH PIPED DISCHARGE
	CHECK VALVE
	CALIBRATING VALVE
	THERMOSTATIC MIXER
	VENT VALVE
	DRAIN VALVE
	MEMBRANE EXPANSION VESSEL
	HEAT PUMP OUTLET
	HEAT PUMP RETURN
	DOMESTIC HOT WATER
	DOMESTIC COLD WATER
	ELECTRICAL CONNECTIONS
	INDICATES CLIMAVENETA ACCESSORIES

CLIMAVENETA APPLIANCES	
<b>1</b>	OUTSIDE AIR TEMPERATURE PROBE (*) (SUPPLIED AS STANDARD WITH THE HEAT PUMP)
<b>2</b>	REMOVABLE METAL MESH FILTER (1"1/4, 1"1/2 OR 2")
<b>3</b>	1"1/4 THREE-WAY SELECTOR VALVE FOR DHW PRODUCTION
<b>4</b>	DHW STORAGE TANK, MODEL HWC 300 OR HWC 500
<b>5</b>	ELECTRIC HEATER KIT, 1-2-3 kW
<b>6</b>	STORAGE TANK FOR HEATED AND CHILLED WATER, MODEL BT35, BT100 OR BT200
<b>7</b>	ROOM UNIT (SUPPLIED WITH THE HEAT PUMP AS STANDARD)
<b>8</b>	N-SM1 SYSTEM EXPANSION MODULE
<b>9</b>	ADDITIONAL ROOM UNIT

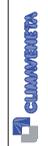
**NOTE**

(\*) FOR THE WATER CONNECTIONS TO THE UNIT, SEE THE DIAGRAM SHOWN IN THE HEAT PUMP TECHNICAL BULLETIN.

(\*\*) INSTALL THE OUTSIDE AIR TEMPERATURE PROBE OUTDOORS, FACING NORTH AND SHELTERED FROM SUNLIGHT.

(\*\*\*) THE DEHUMIDIFIER IS NOT SUPPLIED BY CLIMAVENETA. FOR THE ELECTRICAL CONNECTIONS TO THE HEAT PUMP SEE THE WIRING DIAGRAM.

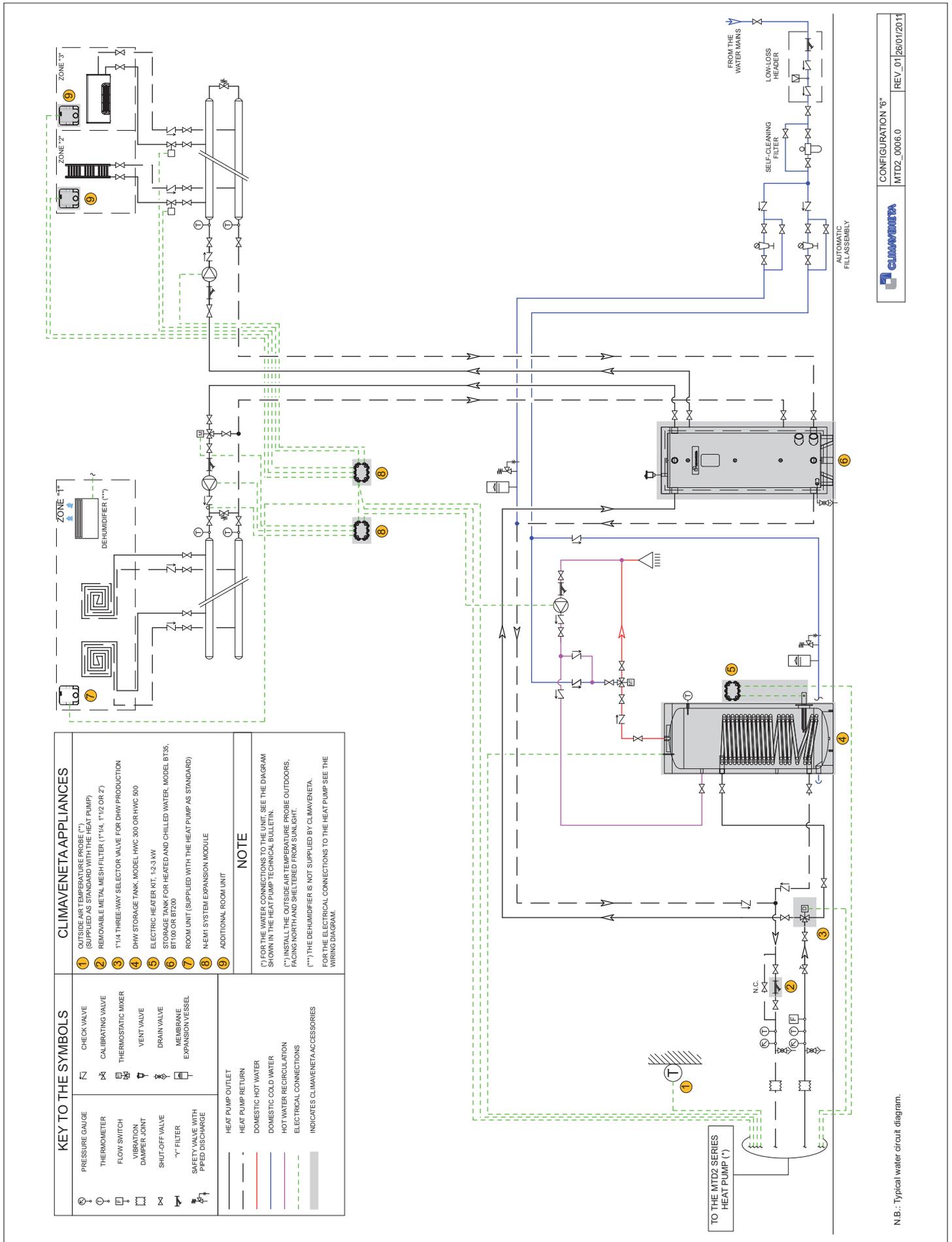
CONFIGURATION "5"  
MTD2\_0005.0  
REV\_01/26/01/2011



N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 6 (parameter 0101= 6)



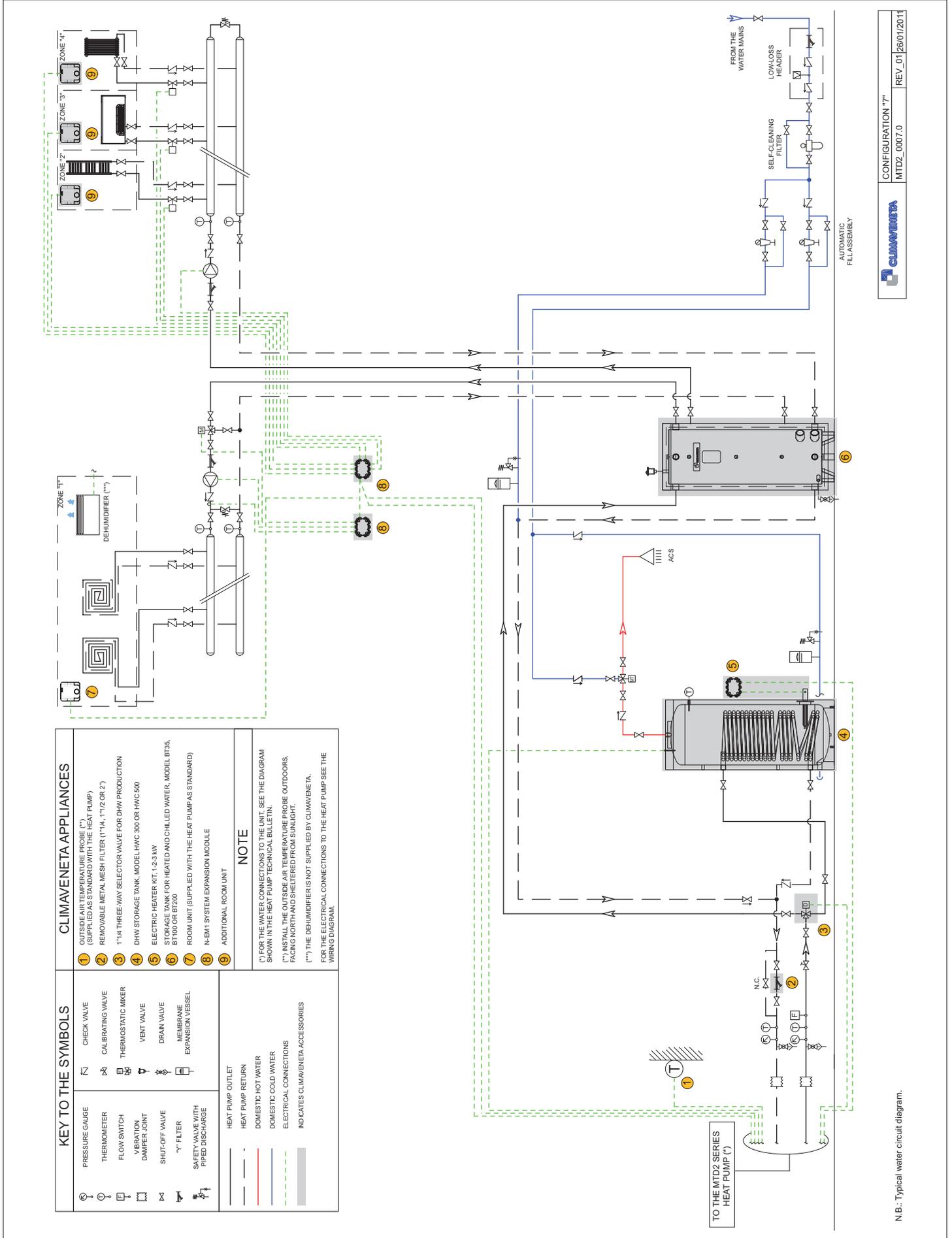
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MTD2\_0006.0  
REV\_01/26/01/2011



N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 7 (parameter 0101= 7)



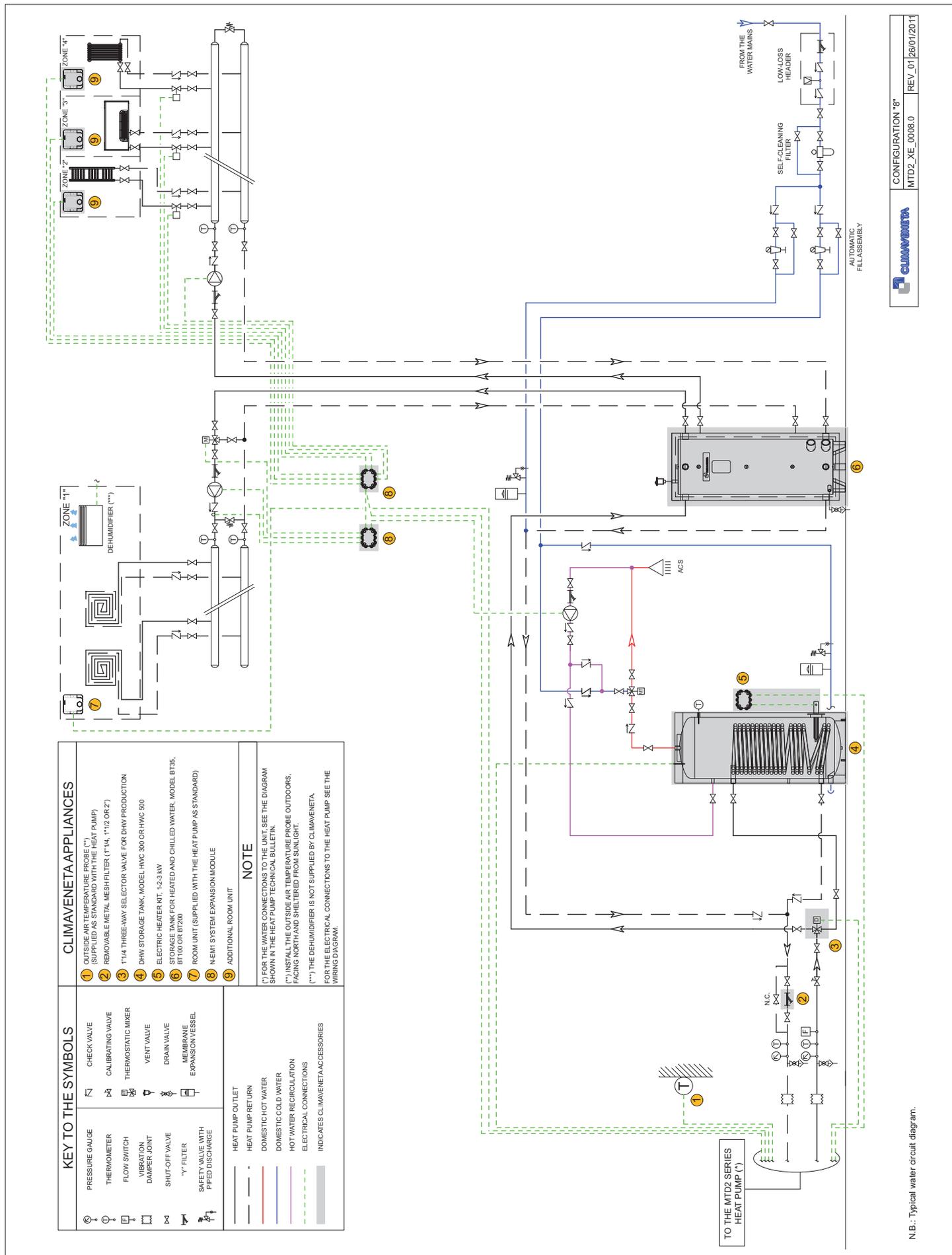
CONFIGURATION 7  
MTD2\_0007.0  
REV\_01/26/01/2011



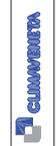
N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 8 (parameter 0101= 8)



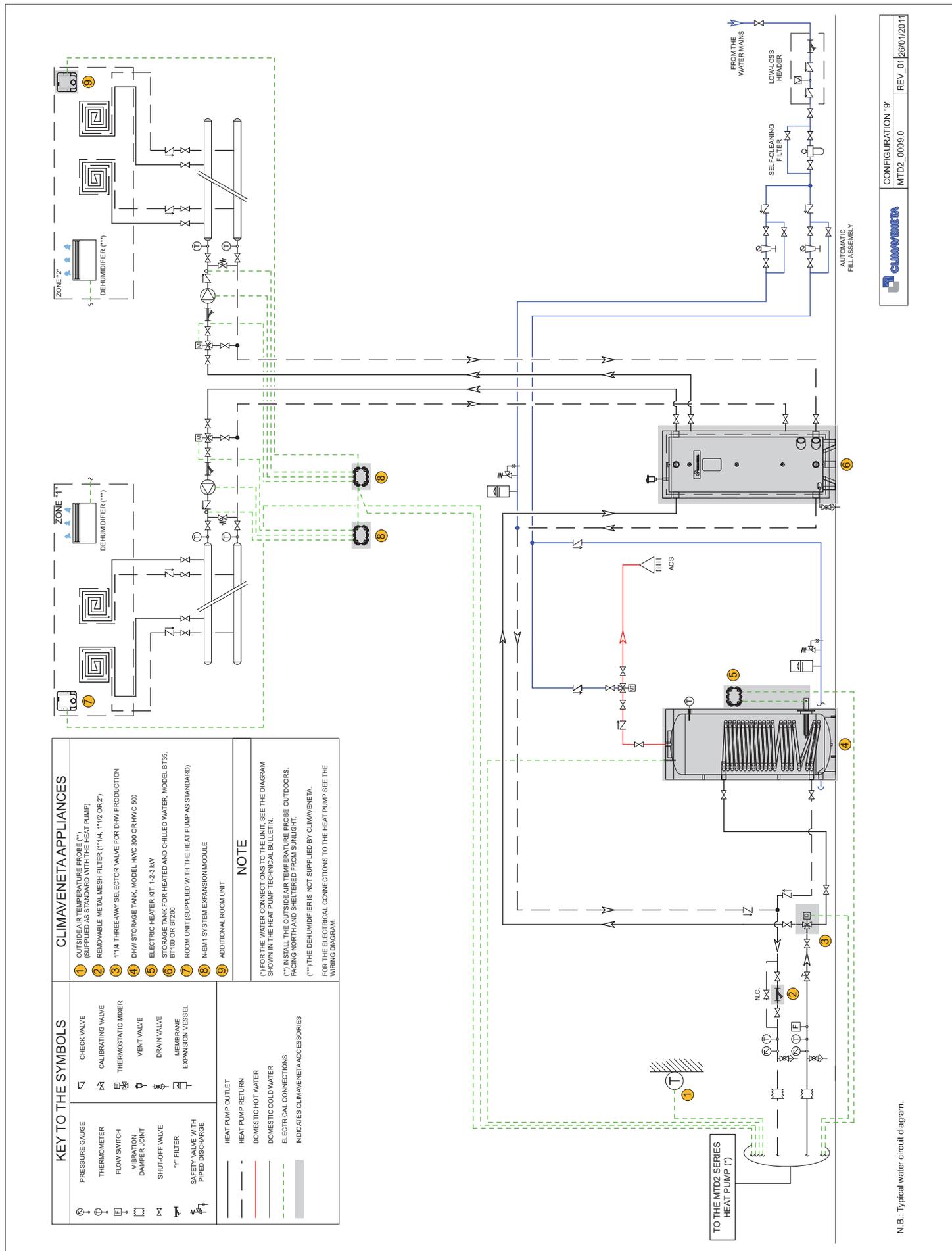
CONFIGURATION "8"  
 MTD2\_XE\_0008.0  
 REV\_01/26/01/2011



N.B.: Typical water-circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 9 (parameter 0101= 9)



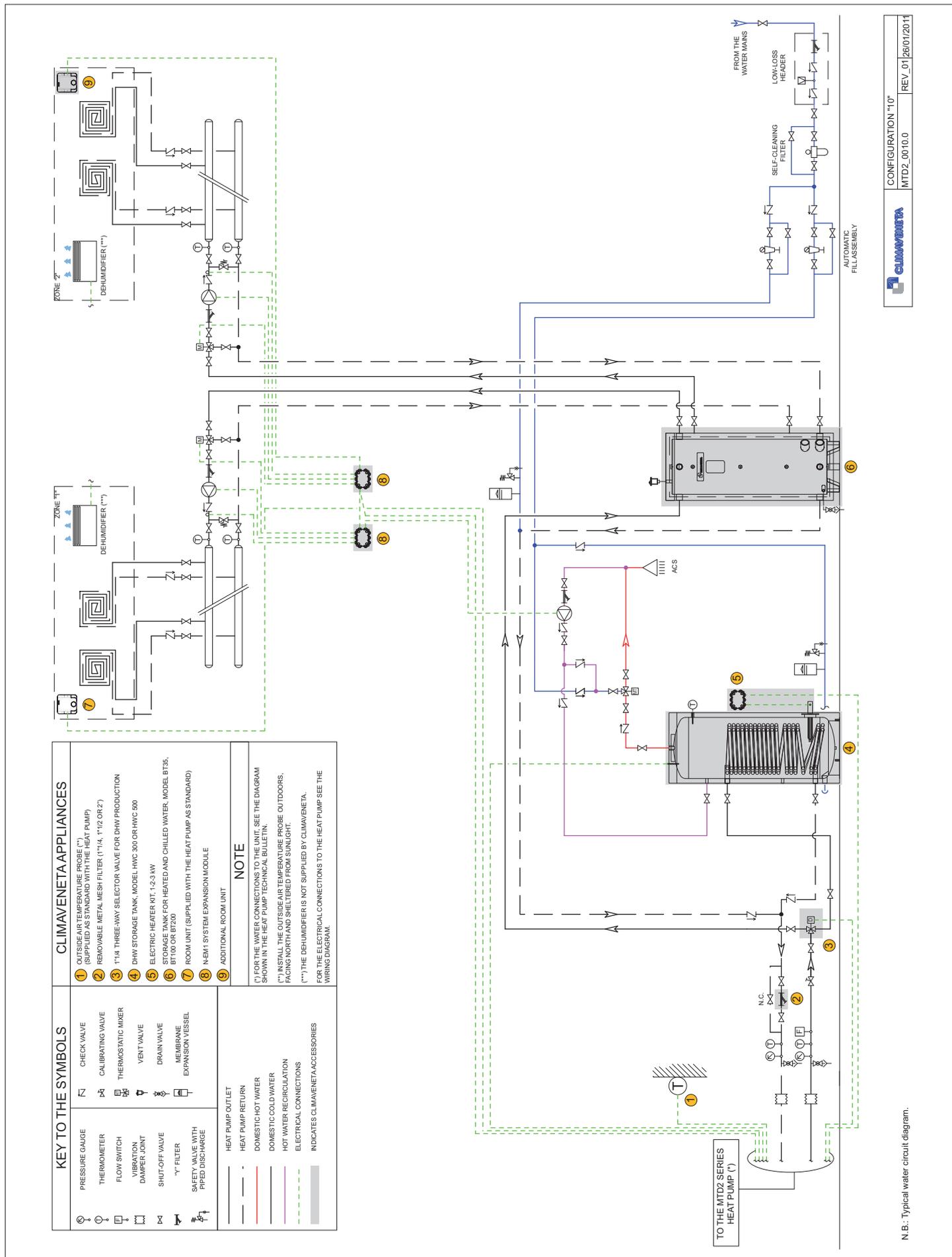
CONFIGURATION "9"  
MTD2\_009.0  
REV. 01/26/01/2011  
CLIMVENETA

KEY TO THE SYMBOLS		CLIMAVENETA APPLIANCES	
	PRESSURE GAUGE		1 OUTSIDE AIR TEMPERATURE PROBE (**) (SUPPLIED AS STANDARD WITH THE HEAT PUMP)
	THERMOMETER		2 REMOVABLE METAL MESH FILTER (1"1/4, 1"1/2 OR 2")
	FLOW SWITCH		3 1"1/4 THREE-WAY SELECTOR VALVE FOR DHW PRODUCTION
	VIBRATION DAMPER JOINT		4 DHW STORAGE TANK, MODEL HVC 300 OR HVC 500
	SHUT-OFF VALVE		5 ELECTRIC HEATER KIT, 1-2,3 KW
	Y-FILTER		6 STORAGE TANK FOR HEATED AND CHILLED WATER, MODEL BT35, BT100 OR BT200
	SAFETY VALVE WITH PIPED DISCHARGE		7 ROOM UNIT (SUPPLIED WITH THE HEAT PUMP AS STANDARD)
	HEAT PUMP OUTLET		8 NEM1 SYSTEM EXPANSION MODULE
	HEAT PUMP RETURN		9 ADDITIONAL ROOM UNIT
	DOMESTIC HOT WATER	<b>NOTE</b>	
	DOMESTIC COLD WATER	(*) FOR THE WATER CONNECTIONS TO THE UNIT, SEE THE DIAGRAM SHOWN IN THE HEAT PUMP TECHNICAL BULLETIN.	
	ELECTRICAL CONNECTIONS	(**) INSTALL THE OUTSIDE AIR TEMPERATURE PROBE OUTDOORS, FACING NORTH AND SHELTERED FROM SUNLIGHT.	
	INDICATES CLIMAVENETA ACCESSORIES	(***) THE DEHUMIDIFIER IS NOT SUPPLIED BY CLIMAVENETA.	
FOR THE ELECTRICAL CONNECTIONS TO THE HEAT PUMP SEE THE WIRING DIAGRAM.			

N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 10 (parameter 0101= 10)



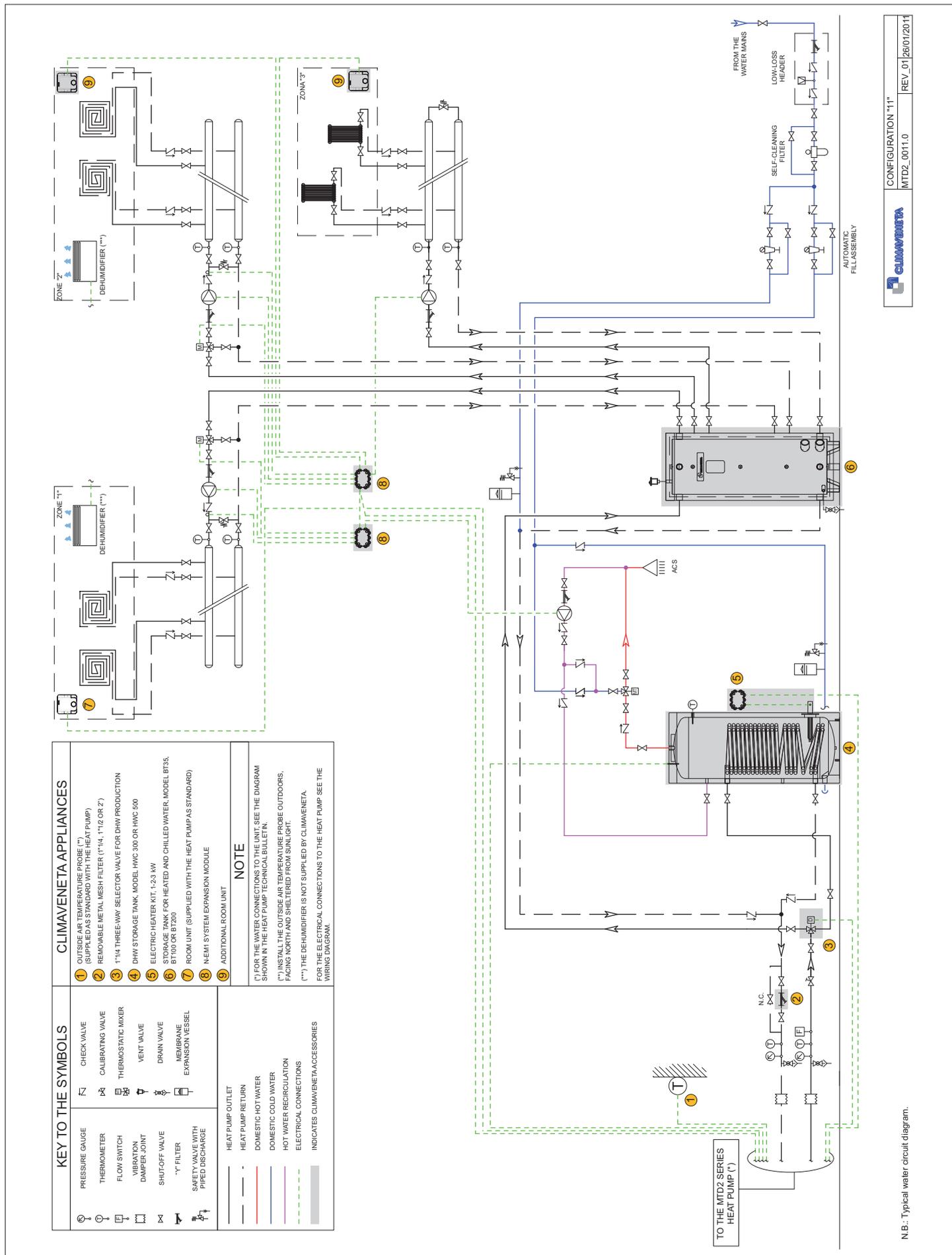
KEY TO THE SYMBOLS		CLIMAVENETA APPLIANCES	
	PRESSURE GAUGE		1 OUTSIDE AIR TEMPERATURE PROBE (**) (SUPPLIED AS STANDARD WITH THE HEAT PUMP)
	THERMOMETER		2 REMOVABLE METAL MESH FILTER (1"1/4, 1"1/2 OR 2")
	FLOW SWITCH		3 1/4" THREE-WAY SELECTOR VALVE FOR DHW PRODUCTION
	VIBRATION DAMPER JOINT		4 DHW STORAGE TANK, MODEL HWC 300 OR HWV 500
	SHUT-OFF VALVE		5 ELECTRIC HEATER KIT, 1.2-3 kW
	Y-FILTER		6 STORAGE TANK FOR HEATED AND CHILLED WATER, MODEL BT35, BT100 OR BT200
	SAFETY VALVE WITH PIPED DISCHARGE		7 ROOM UNIT (SUPPLIED WITH THE HEAT PUMP AS STANDARD)
	HEAT PUMP OUTLET		8 NEM1 SYSTEM EXPANSION MODULE
	HEAT PUMP RETURN		9 ADDITIONAL ROOM UNIT
	DOMESTIC HOT WATER	<b>NOTE</b> (*) FOR THE WATER CONNECTIONS TO THE UNIT, SEE THE DIAGRAM SHOWN IN THE HEAT PUMP TECHNICAL BULLETIN. (**) INSTALL THE OUTSIDE AIR TEMPERATURE PROBE OUTDOORS, FACING NORTH AND SHELTERED FROM SUNLIGHT. (***) THE DEHUMIDIFIER IS NOT SUPPLIED BY CLIMAVENETA. FOR THE ELECTRICAL CONNECTIONS TO THE HEAT PUMP SEE THE WIRING DIAGRAM.	
	DOMESTIC COLD WATER		
	HOT WATER RECIRCULATION		
	ELECTRICAL CONNECTIONS		
	INDICATES CLIMAVENETA ACCESSORIES		

CONFIGURATION "10"  
MTD2\_0010.0  
CLIMAVENETA  
REV. 01/26/01/2011

N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 11 (parameter 0101= 11)



KEY TO THE SYMBOLS		CLIMAVENETA APPLIANCES	
Pressure Gauge	Check Valve	1	Outside Air Temperature Probe (*) (supplied as standard with the heat pump)
Thermometer	Calibrating Valve	2	Removable Metal Mesh Filter (1"1/4, 1"1/2 OR 2")
Flow Switch	Thermostatic Mixer	3	1"1/4 Three-Way Selector Valve for DHW Production
Isolation Damper Joint	Vent Valve	4	DHW Storage Tank, Model HWC 300 OR HWC 500
Shut-Off Valve	Drain Valve	5	Electric Heater Kit, 1.23 kW
Y-Filter	Membrane Expansion Vessel	6	Storage Tank for Heated and Chilled Water, Model BT55, BT100 OR BT200
Safety Valve with Piped Discharge	Heat Pump Outlet	7	Room Unit (supplied with the heat pump as standard)
	Heat Pump Return	8	N-EM System Expansion Module
	Domestic Hot Water	9	Additional Room Unit
	Hot Water Recirculation		
	Electrical Connections		
	Indicates Climaveneta Accessories		

**NOTE**

(\*) FOR THE WATER CONNECTIONS TO THE UNIT, SEE THE DIAGRAM SHOWN IN THE HEAT PUMP TECHNICAL BULLETIN.

(\*\*) INSTALL THE OUTSIDE AIR TEMPERATURE PROBE OUTDOORS, FACING NORTH AND SHELTERED FROM SUNLIGHT.

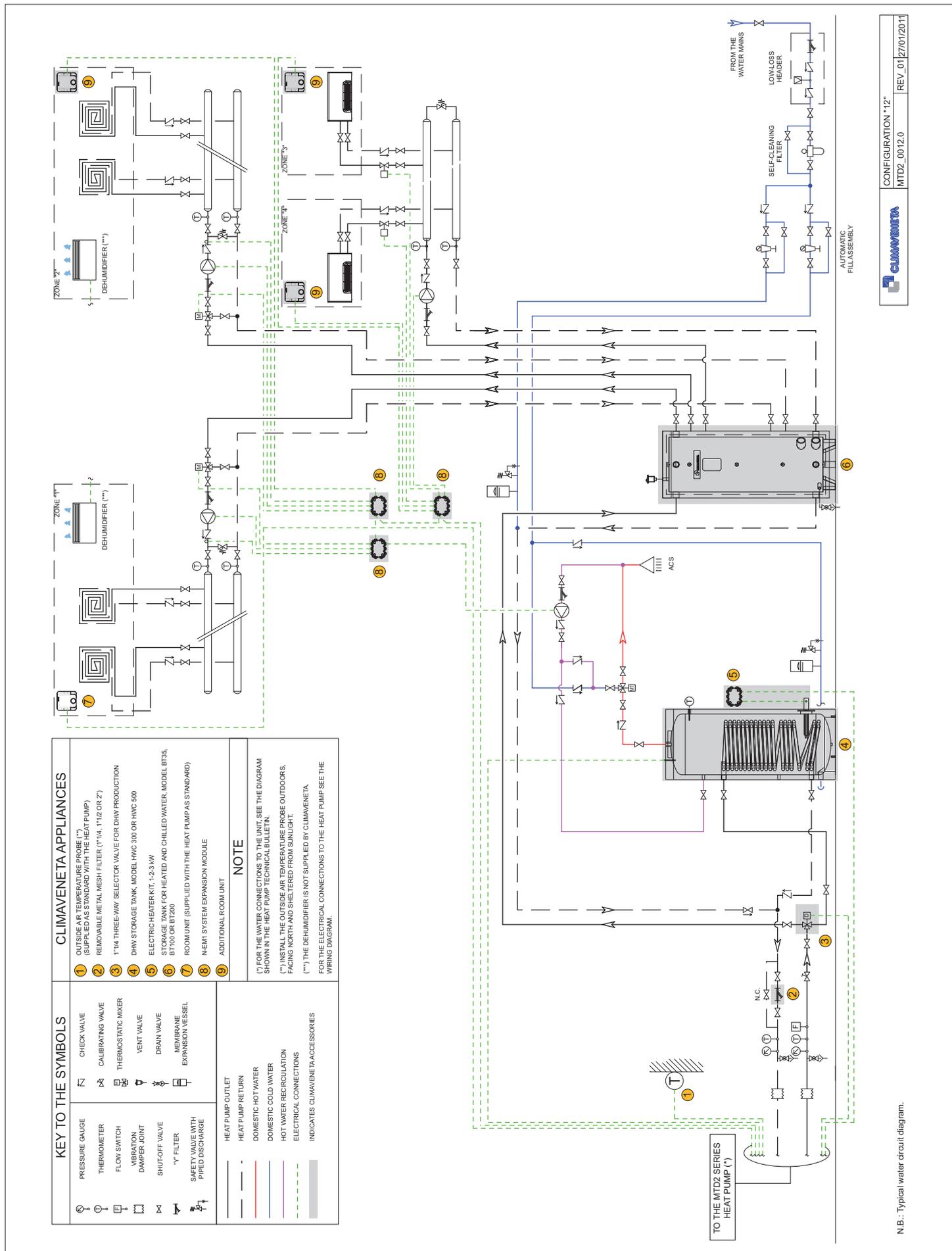
(\*\*\*) THE DEHUMIDIFIER IS NOT SUPPLIED BY CLIMAVENETA. FOR THE ELECTRICAL CONNECTIONS TO THE HEAT PUMP SEE THE WIRING DIAGRAM.

CONFIGURATION "11"  
MTD2\_0011.0  
REV. 01/26/01/2011

N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 12 (parameter 0101= 12)



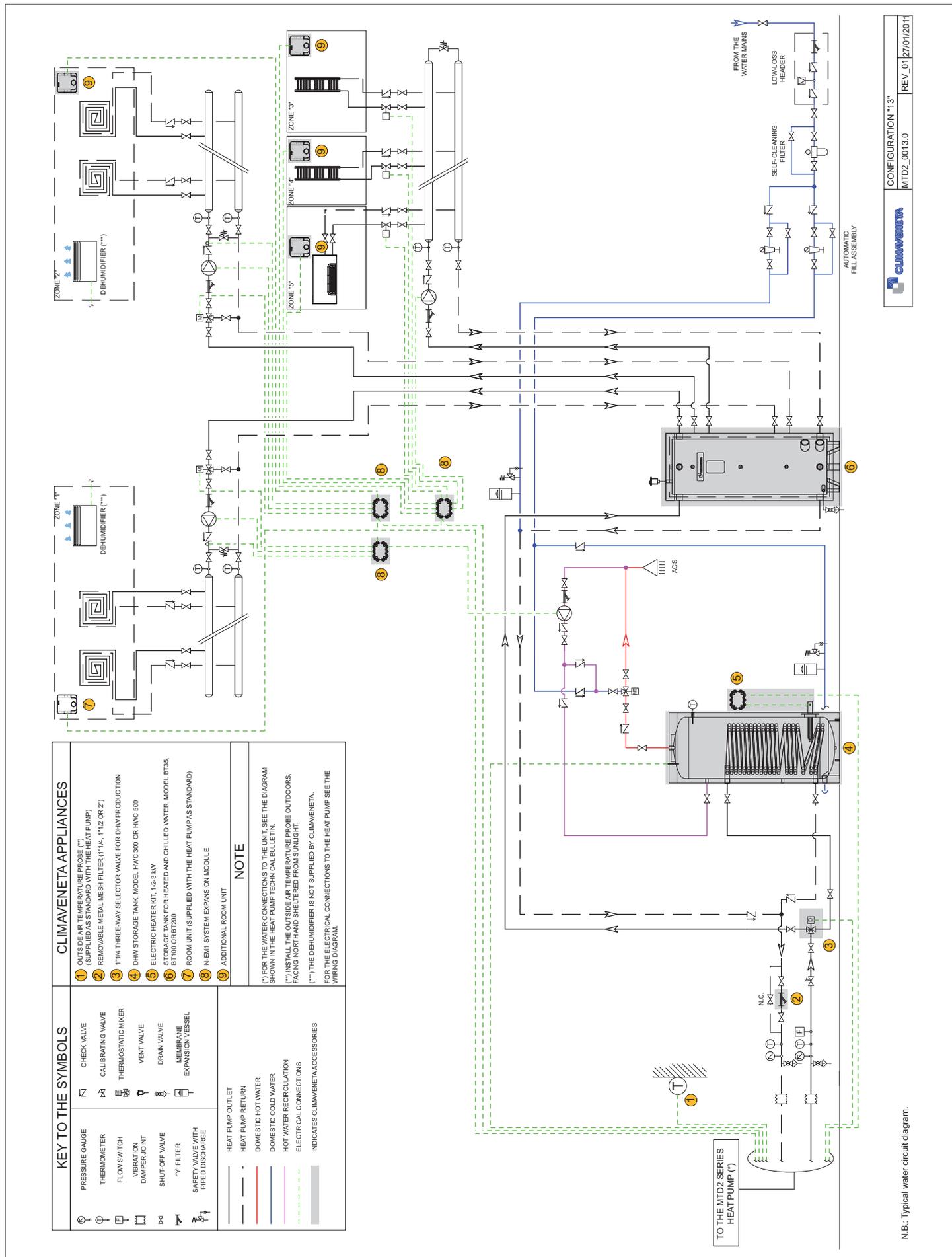
CLIMAVENETA  
 CONFIGURATION "12"  
 MTD2\_0012.0  
 REV. 01/27/01/2011

KEY TO THE SYMBOLS		CLIMAVENETA APPLIANCES	
	PRESSURE GAUGE		OUTSIDE AIR TEMPERATURE PROBE (*) (SUPPLIED AS STANDARD WITH THE HEAT PUMP)
	THERMOMETER		REMOVABLE METAL MESH FILTER (1/4, 1/2 OR 2)
	FLOW SWITCH		1/4 THREE-WAY SELECTOR VALVE FOR DHW PRODUCTION
	VIBRATION DAMPER JOINT		DHW STORAGE TANK, MODEL HWC 300 OR HWC 500
	SHUT-OFF VALVE		ELECTRIC HEATER KIT, 1-2,3 kW
	Y-FILTER		STORAGE TANK FOR HEATED AND CHILLED WATER, MODEL BT35, BT100 OR BT200
	SAFETY VALVE WITH PIPED DISCHARGE		ROOM UNIT (SUPPLIED WITH THE HEAT PUMP AS STANDARD)
	HEAT PUMP OUTLET		NEW SYSTEM EXPANSION MODULE
	HEAT PUMP RETURN		ADDITIONAL ROOM UNIT
	DOMESTIC HOT WATER	<b>NOTE</b> (*) FOR THE WATER CONNECTIONS TO THE UNIT, SEE THE DIAGRAM SHOWN IN THE HEAT PUMP TECHNICAL BULLETIN. (**) INSTALL THE OUTSIDE AIR TEMPERATURE PROBE OUTDOORS, FACING NORTH AND SHIELDED FROM SUNLIGHT. (***) THE DEHUMIDIFIER IS NOT SUPPLIED BY CLIMAVENETA. FOR THE ELECTRICAL CONNECTIONS TO THE HEAT PUMP, SEE THE WIRING DIAGRAM.	
	DOMESTIC COLD WATER		
	HOT WATER RECIRCULATION		
	ELECTRICAL CONNECTIONS		
	INDICATES CLIMAVENETA ACCESSORIES		

N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 13 (parameter 0101= 13)

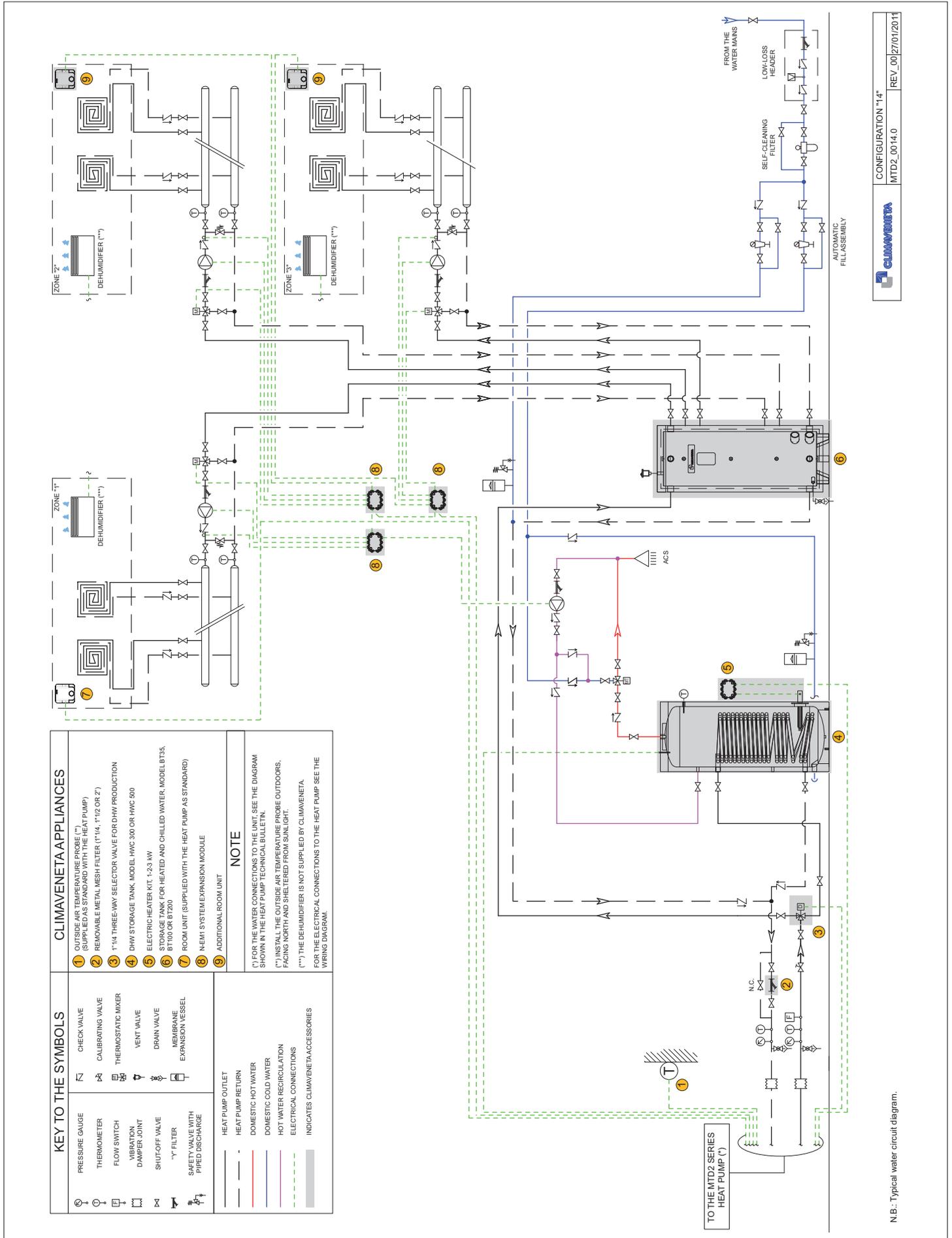


CONFIGURATION "13"  
 MTD2\_0013.0  
 REV\_01/27/01/2011

N.B.: Typical water circuit diagram.

WATER CIRCUIT DIAGRAM

Configuration number 14 (parameter 0101= 14)



CONFIGURATION "14"  
MTD2\_0014.0  
REV\_0027/01/2011  
CLIMVENETA

KEY TO THE SYMBOLS		CLIMAVENETA APPLIANCES	
	PRESSURE GAUGE		1 OUTSIDE AIR TEMPERATURE PROBE (*) (SUPPLIED AS STANDARD WITH THE HEAT PUMP)
	THERMOMETER		2 REMOVABLE METAL MESH FILTER (1"1/4, 1"1/2 OR 2")
	FLOW SWITCH		3 3/4" THREE-WAY SELECTOR VALVE FOR DHW PRODUCTION
	VIBRATION DAMPER JOINT		4 DHW STORAGE TANK, MODEL HWC 300 OR HWC 500
	SHUT-OFF VALVE		5 ELECTRIC HEATER KIT, 1-23 KW
	SAFETY VALVE WITH PIPED DISCHARGE		6 ROOM UNIT (SUPPLIED WITH THE HEAT PUMP AS STANDARD)
	CHECK VALVE		8 NEM1 SYSTEM EXPANSION MODULE
	CALIBRATING VALVE		9 ADDITIONAL ROOM UNIT
	THERMOSTATIC MIXER		
	VENT VALVE		
	DRAIN VALVE		
	MIXING TANK EXPANSION VESSEL		
	HEAT PUMP OUTLET		
	HEAT PUMP RETURN		
	DOMESTIC HOT WATER		
	DOMESTIC COLD WATER		
	HOT WATER RECIRCULATION		
	ELECTRICAL CONNECTIONS		
	INDICATES CLIMAVENETA ACCESSORIES		

**NOTE**

(\*) FOR THE WATER CONNECTIONS TO THE UNIT, SEE THE DIAGRAM SHOWN IN THE HEAT PUMP TECHNICAL BULLETIN.

(\*\*) INSTALL THE OUTSIDE AIR TEMPERATURE PROBE OUTDOORS, FACING NORTH AND SHELTERED FROM SUNLIGHT.

(\*\*\*) THE DEHUMIDIFIER IS NOT SUPPLIED BY CLIMAVENETA. FOR THE ELECTRICAL CONNECTIONS TO THE HEAT PUMP SEE THE WIRING DIAGRAM.

N.B.: Typical water circuit diagram.

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