Climaveneta **Technical Bulletin**
i-KI(R)_MTD_0011_0061_201307_EN

i-KI MTD / i-KIR MTD

0011 - 0061
5,80 - 15,7 kW

Reverse-cycle or heating only unit with DC inverter-driven compressor, for hot water production up to 60°C and operation at outside air temperatures down to -20°C. Priority domestic hot water production.

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

- DC inverter-driven compressor
- High efficiency
- Adaptability
- Silent operation
- Heat pump function
- Hot water production

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EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

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

CE

ISO 14001 TÜV SÜD ISO 9001

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.
Climaveneta accepts no liability deriving from the incorrect use of this document.

The data contained in this publication may be changed without prior notice.

1. DESCRIPTION OF THE UNIT

High efficiency range
The i-KI heating only and i-KIR reverse-cycle heat pumps feature high seasonal efficiency in both heating and cooling mode, using DC inverter technology to modulate compressor operation and deliver the exact amount of energy based on the actual needs of the building.
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
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
Air-to-water heat pump, available in heating only and reverse-cycle versions.
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
Inverter-driven DC brushless rotary compressors, complete with thermal protector.

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.

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 tray condensate drain.

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.

Fans
Axial-flow fans with DC brushless motor, external impeller, with pressed plate blades, housed in aerodynamic tubes with accident prevention grill. Fans with continuous speed control by pressure transducer.

Refrigerant circuit
Main components in the refrigerant circuit:
- refrigerant R410A
- electronic thermostatic valve,
- 4-way reversing valve.

Heat pump electrical panel:
- Compressor discharge temperature probe
- Outside air temperature probe
- Defrost temperature probe
- Compressor suction temperature probe
- Heat exchanger water inlet temperature probe
- Heat exchanger water outlet temperature probe
- Board with alarm signal display and dipswitches
- Inverter board
- Power module
- Board protection fuses

Inside module electrical panel:
- Radio interference suppresser
- Controller/unit interface
- Electronic controller
- Unit ON/OFF relay
- Outlet heater / boiler relay
- Alarm/secondary pump/dehumidifier relay
- Heat/cool relay
- Auxiliary circuit protection fuse
- Controller protection fuse
- Interface protection fuse

The water circuit is completed by:
- Pump
- Expansion vessel (7 litres for 0011 and 8 litres for 0031 and 0061)
- Safety valve (3 bar)
- Pressure gauge
- Vent valve

VERSIONS AVAILABLE

i-KI MTD air/water heat pump, heating only, with DC inverter-driven compressors, domestic hot water production, axial-flow fans and hydronic unit.

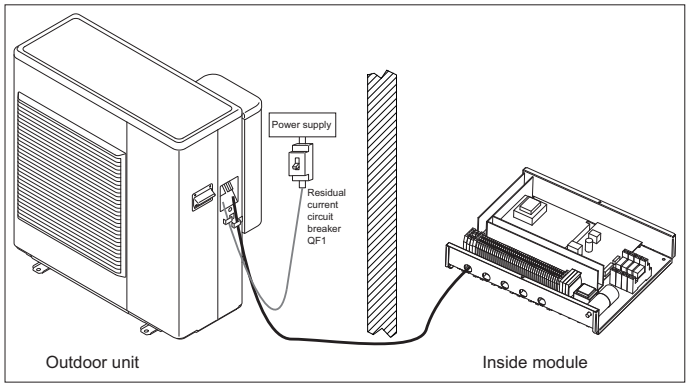
i-KIR MTD reverse-cycle air/water heat pump with DC inverter-driven compressors, domestic hot water production, axial-flow fans and hydronic unit

The heat pump consists of:

REVERSE-CYCLE heat pump	i-KIR 0011-0061m MTD	Outdoor unit
	i-EMR2	Inside module

HEATING ONLY heat pump	i-KIR 0011-0061m MTD	Outdoor unit
	i-EM2	Inside module

The inside module is installed inside the building's equipment room and is electrically connected to the outdoor unit, installed outside.



Connection example:
The remote room controller, outside air temperature probes, supplementary electric heater or boiler, expansion modules and all other accessories required by the system must only be connected to the inside module. This avoids having to run numerous cables to the outside, simplifying unit installation.

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

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.
- 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.

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

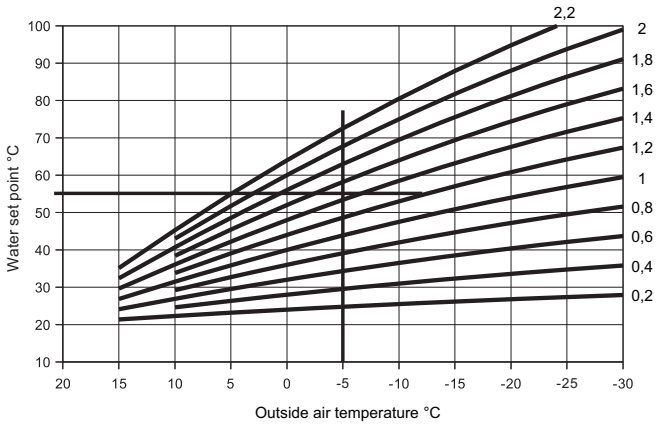
HIGH EFFICIENCY AND REDUCED CONSUMPTION

The i-KI and i-KIR reverse-cycle air-to-water heat pump is fitted with DC inverter-driven compressor and EC fan with low energy consumption.
Inverter technology continuously controls compressor speed to ensure perfect adaptation to system load, modulating the heating or cooling capacity delivered and consequently reducing power consumption and achieving the highest seasonal coefficients currently available on the market.
The seasonal coefficient of performance faithfully reflects the advantages in energy and economic terms of using the heat pump all year around, being the ratio between energy delivered and power consumed. In terms of improving performance and reducing power consumption, the electronic thermostatic valve is an important component that maximises system efficiency.
Quick and effective adaptation by the electronic thermostatic valve to variations in load allows the compressor to always work at optimum efficiency, as well as extending compressor life.

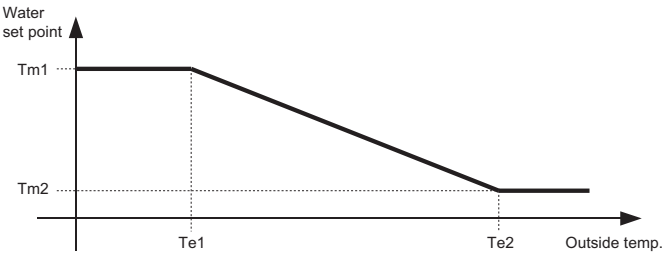
TEMPERATURE CONTROL

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°C gives a water temperature of +55°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).

Heating compensation curve

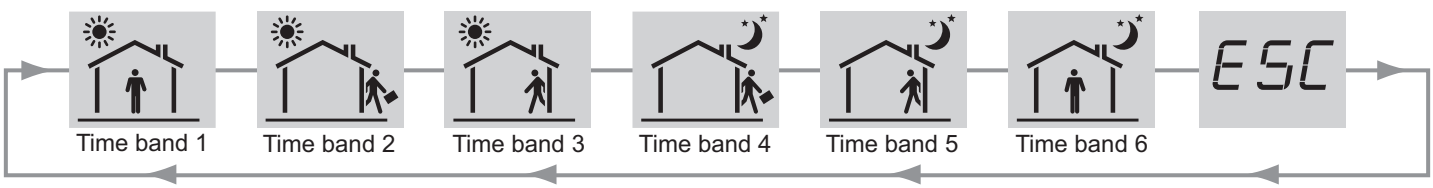


Cooling compensation curve



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”.

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

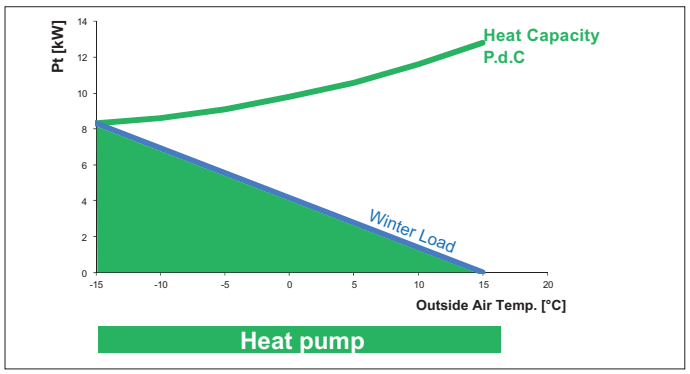
The Legionella prevention cycles are managed directly by the controller, enabling the heater in the domestic hot water storage tank domestic, with the possibility to set the duration, temperature, day and time.

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.

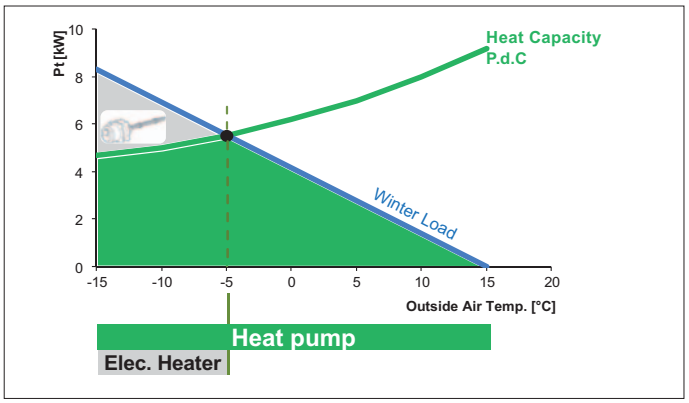
Monovalent operation

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.



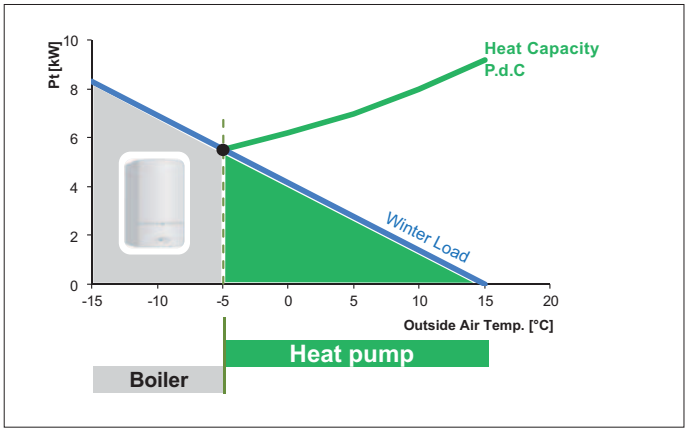
All-electric operation

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

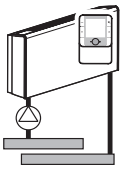
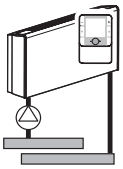
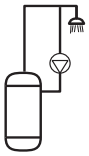
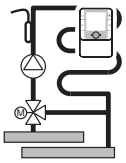
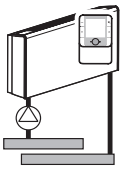
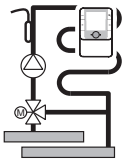
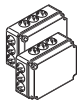
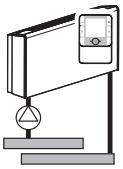
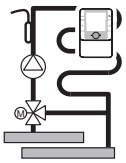
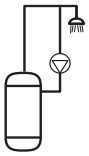
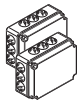
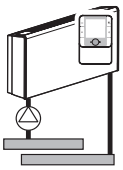
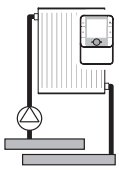
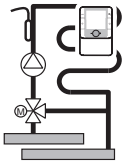
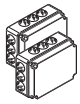
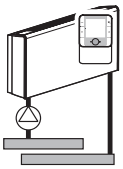
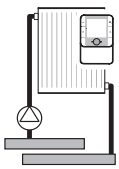
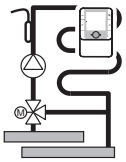
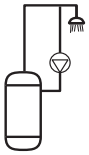
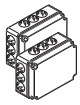
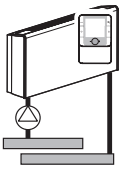
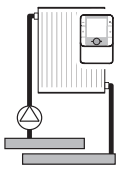
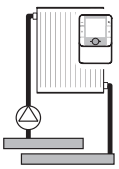
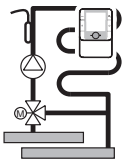
The NADISYSTEM control system for residential applications gives high operating flexibility by controlling the secondary circuits, that is, activating zone pumps and valves depending on the room temperature set on the remote keypad, and by controlling mixing valves to ensure the correct water temperature 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 in used inn summer.

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

N. System Configuration	Remote Keypad N-THC	Expansion Module N-EM1	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
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 N-THC	Expansion Module N-EM1	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
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

The frost protection function is implemented by starting the system pump and, where featured, the electric heater outside of the unit when the water temperature water (measured by the heat exchanger outlet probe) is less than 4.5°C, and switching the same devices off 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

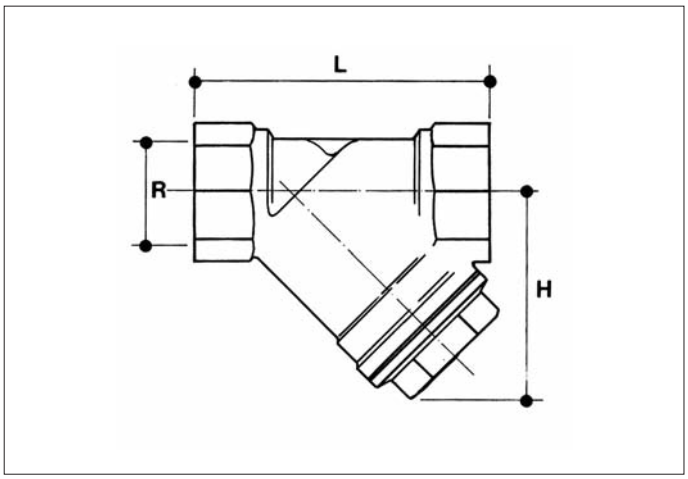
The accessories listed below are supplied separately.

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^2	80

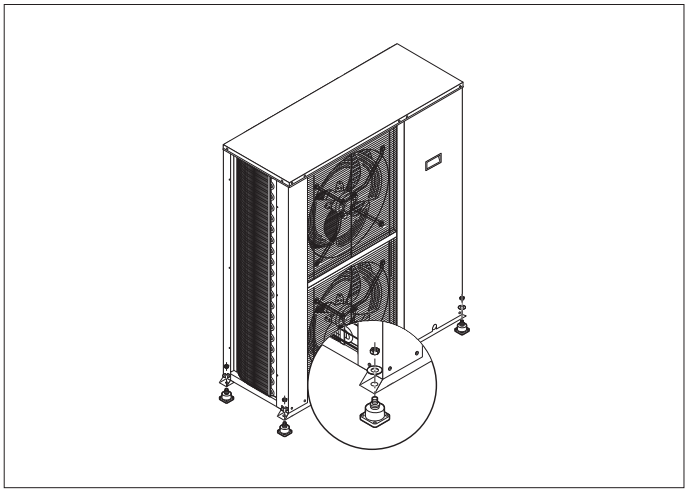
Dimensions				
DN		32	40	50
R	inch	1 1/4	1 1/2	2
L	mm	96	106	126
H	mm	68	75	90



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.

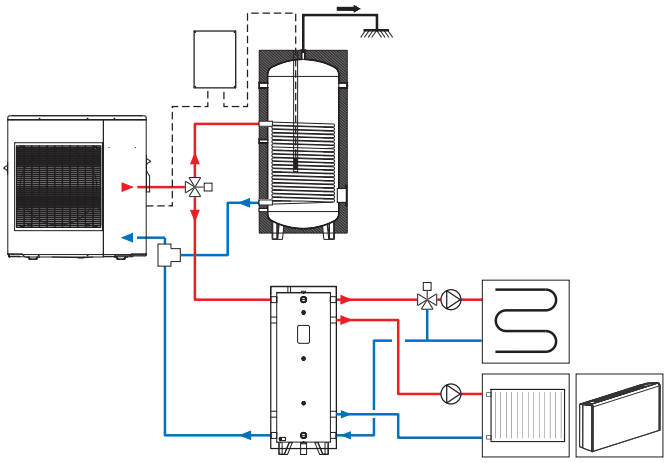


BT AND PT STORAGE TANKS

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.

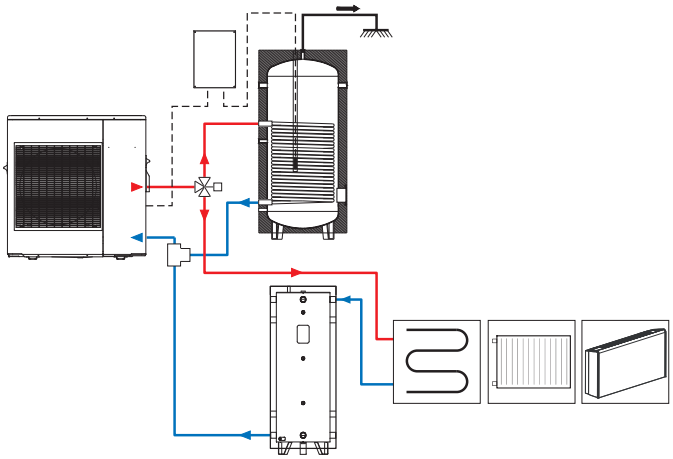
Models available	Volume
BT35	35 litres
BT100	100 litres
BT200	200 litres
TP300	300 litres

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 shown is purely indicative.

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.



The diagram shown is purely indicative.

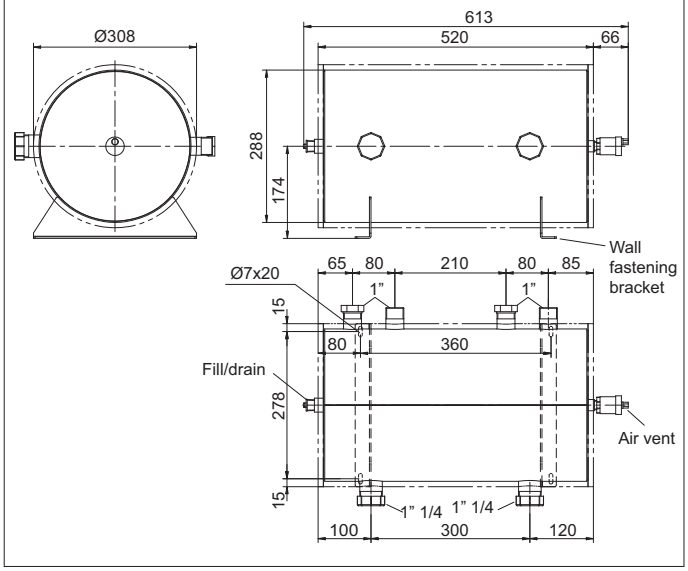
Technical specifications

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

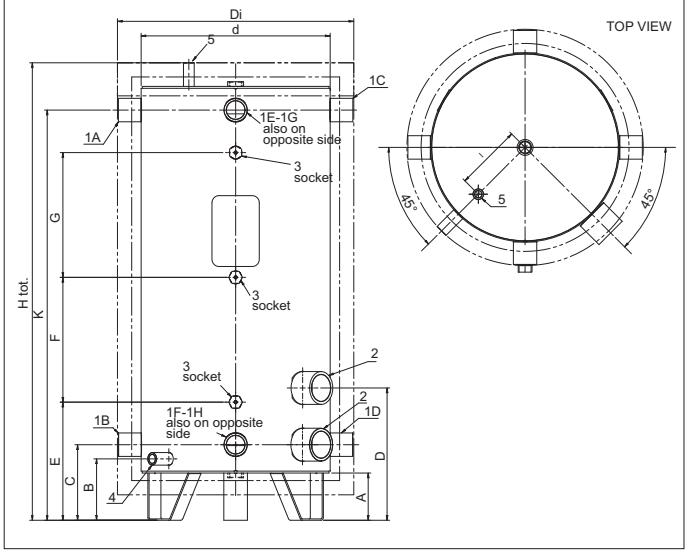


Volume	Storage tank dimensions											
	Di	d	Htot	A	B	C	D	E	F	G	K	I
litres	mm											
100	500	400	970	100	130	160	280	250	264	264	868	140
200	550	450	1410	100	130	160	280	430	374	386	1298	170
300	700	600	1235	100	130	160	280	320	321	332	1133	200

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"

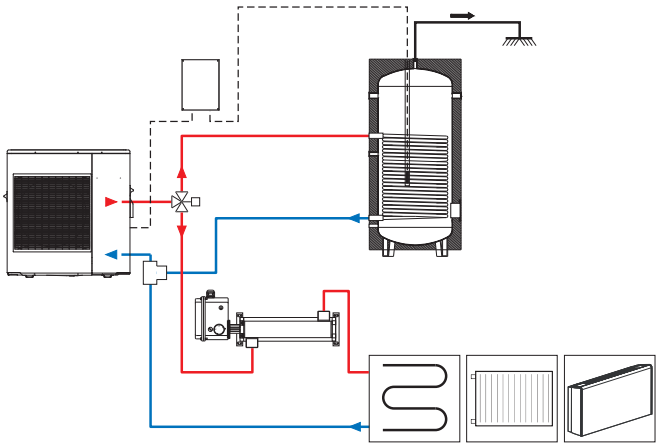
Pos.	Description
1A	Heat pump outlet
1B	Heat pump return
1C	System outlet
1D	System return
1E- G	Supplementary source outlet
1F-1H	Supplementary source return
2	Electric heater attachment
3	Probe socket
4	Drain/load
5	Vent

Dimensions - Model BT100, BT200, TP300



OUTLET ELECTRIC HEATER

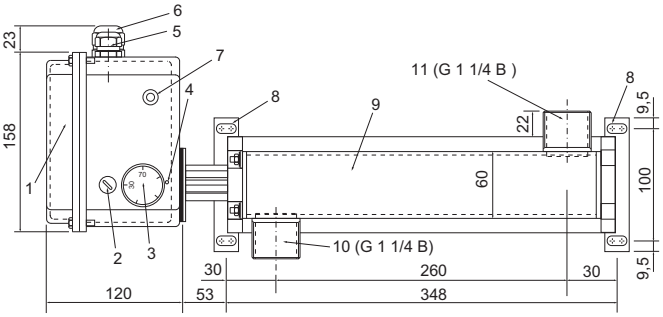
The outlet electric heaters are available with power ratings of 3 kW single-phase and 3, 6 and 9 kW three-phase.
Used on the system outlet, these guarantee the heating demand of the building at low outside temperatures by supplementing the heating capacity of the heat pump.
The electric heaters are deactivated 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.



The diagram shown is purely indicative.

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	

Dimensions



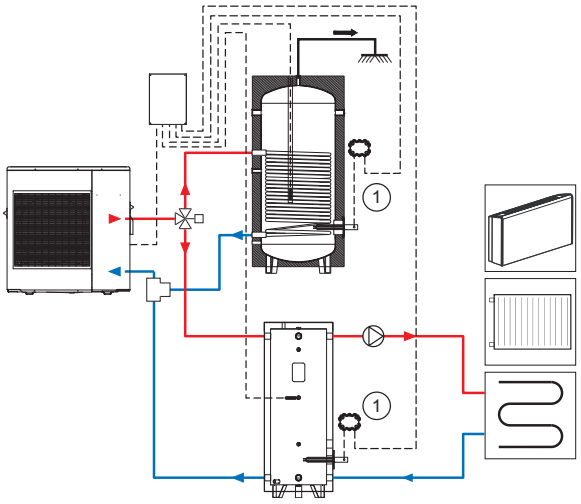
1 Terminal block cover
2 Safety thermostat manual reset
3 Control thermostat knob
4 Reference for knob full scale
5 Cable gland for control cable
6 Cable gland for power cable
7 Red light, on when the heater is operating
8 Wall fastening brackets
9 Heater body
10 Water inlet
11 Water outlet

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.

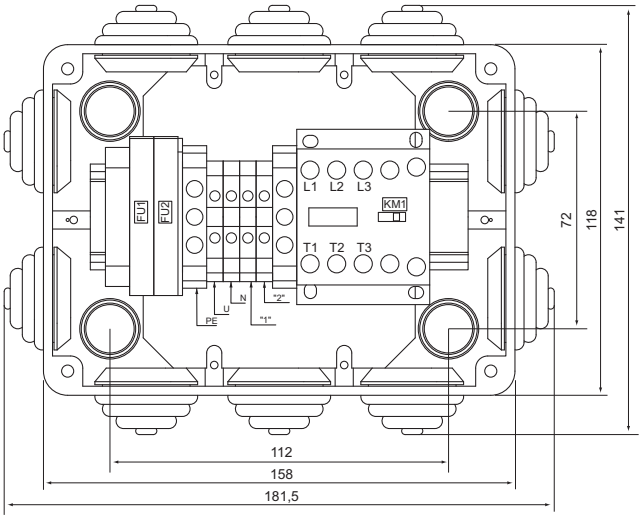


(1) Immersion electric heater

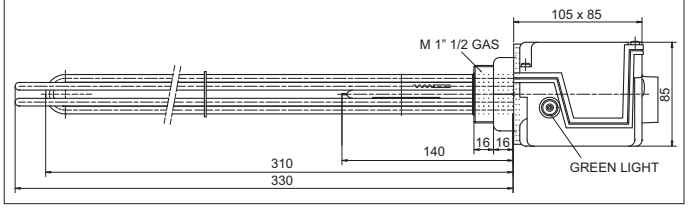
The diagram shown is purely indicative.

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" ½ M GAS
Gasket	ASBERIT 60*48*3
Index of protection	IP 44
Indicator light	Green; on when heater operating

Dimensions - Electrical panel



Dimensions - Immersion electric heater



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:

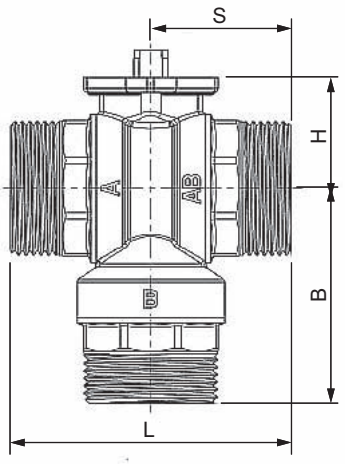
- Voltage 230V AC, 50/60 Hz
- If valve rotation takes more than 10 s, the time can be set by parameter.
- Delta P 500 kPa
- Fluid temperature 0°C to 90°C
- Pressure drop below 20 kPa.

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

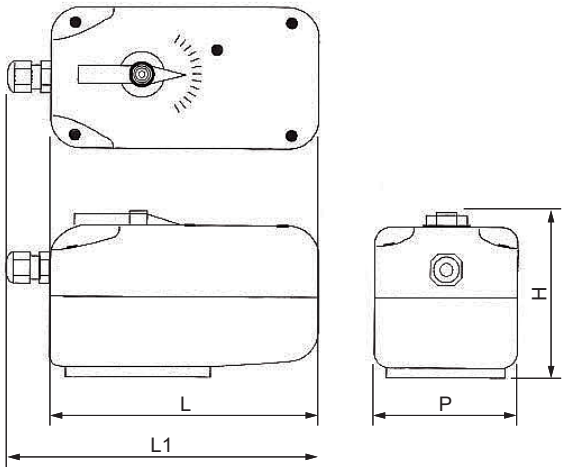
Technical specifications - Servomotor	
Power supply	230VAC, +10% - 15%
Frequency	50Hz
Power consumption	4 VA
Travel time (open/close)	10s
Free auxiliary contact (end travel)	230V - 1A (resistive)
Allowable operating temperature	0 ... + 50 °C
Allowable transport and storage temperature	- 10 ... + 80 °C
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



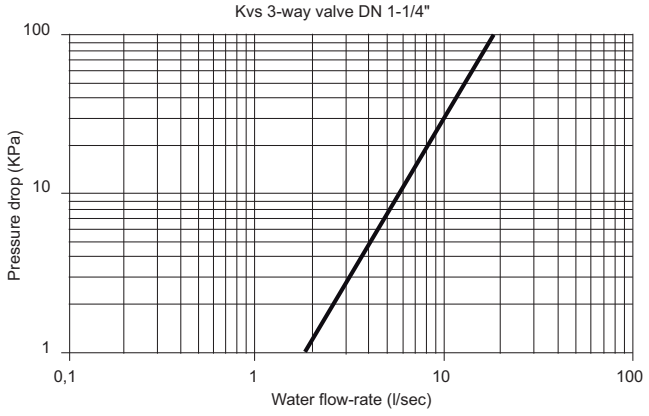
Fittings	inch	1”1/4 G
L	mm	102,6
B	mm	76,8
H	mm	51,3
S	mm	39,8

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.

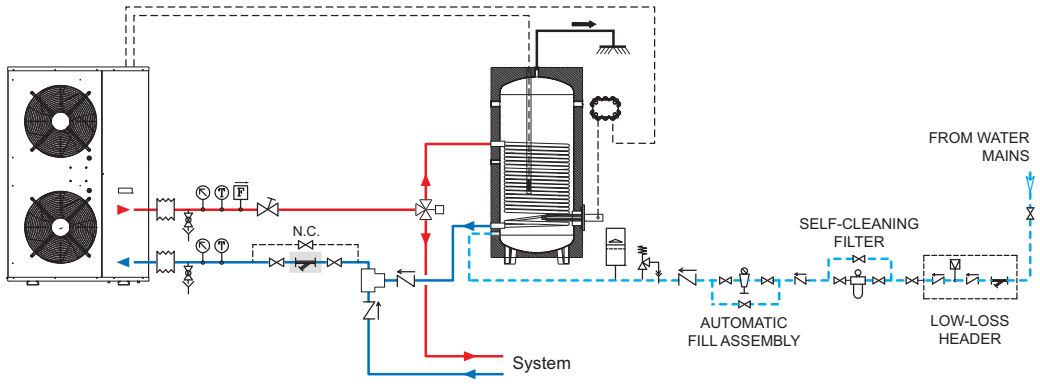
Models available	Volume
HWC300	300 litres
HWC500	500 litres

Storage cylinder and heat pump combinations					
Storage cylinder	Coil water content	Coil surface area	Combined heat pumps		
	(l)	(m^2)	11	31	61
HWC 300	22,3	3,5	x	x	x
HWC 500	38,5	5,9	x	x	x

Technical specifications

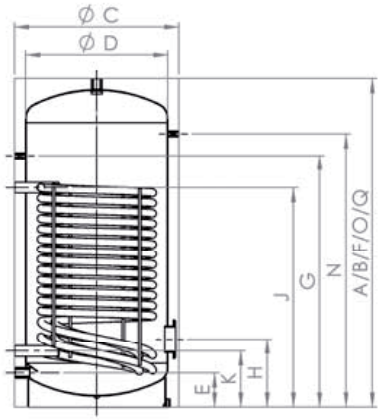
The cylinders are made from S275JR steel plate in accordance with DIN 4753 and undergo strict water pressure tests (9 bars, allowing an operating pressure of 6 bars). Lined on the inside with double layer of enamel in accordance with DIN 4753.
Protection against corrosion guaranteed by the magnesium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

Water circuit diagram

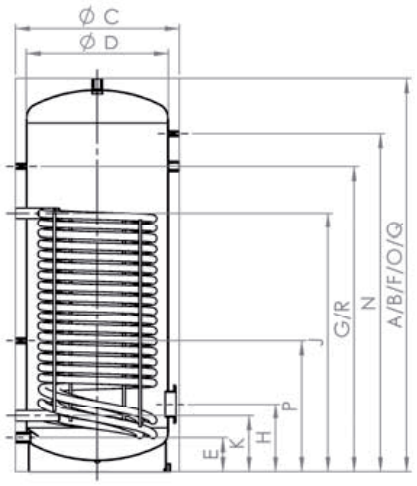


The diagram shown is purely indicative.

Dimensions - Model HWC300



Dimensions - Model HWC500



	Use	Dimensions	300	500
A	Height	with insulation - mm	1570	1800
B		without insulation - mm	-	-
C	Diameter	with insulation - mm	650	750
D		without insulation - mm	550	650
E	Cold water	height - mm	140	155
		fitting - R"	1 ¼"	1 ¼"
F	Hot water	height - mm	1570	1800
		fitting - R"	1 ¼"	1 ¼"
G	Recirculation	height - mm	1200	1400
		fitting - R"	½"	½"
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 ¼"	1 ¼"
K	Heat pump return	height - mm	240	255
		fitting - R"	1 ¼"	1 ¼"
N	Thermometer	height - mm	1350	1550
		fitting - R"	½"	½"
O	Probe socket	height - mm	1570	1800
		fitting - R"	½"	½"
P	Probe socket	height - mm	-	600
		fitting - R"	-	½"
Q	Magnesium anode	height - mm	1570	1800
		fitting - R"	1 ¼"	1 ¼"
R	Magnesium anode	height - mm	-	1400
		fitting - R"	-	1 ¼"

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

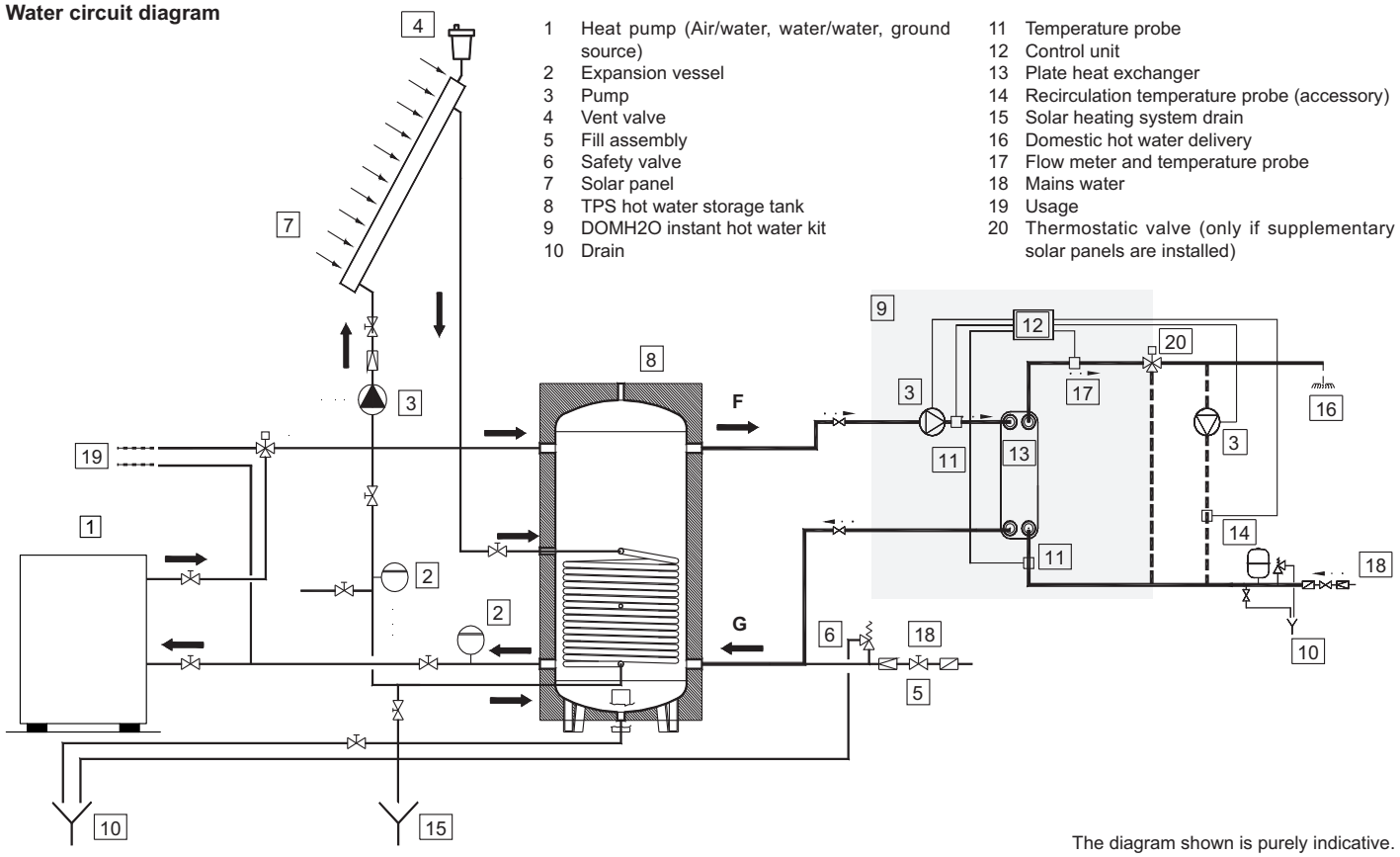
TPS STORAGE TANKS AND DOMH2O INSTANT DOMESTIC HOT WATER PRODUCTION KIT

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 DOMOH2O24 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

Water circuit diagram



The diagram shown is purely indicative.

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.

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.

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.

$$V = [Wf*(Tout-Tin)/(T0-Tf)] - [(P*tm*1000)/(Cp*(T0-Tf)]$$

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]

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).

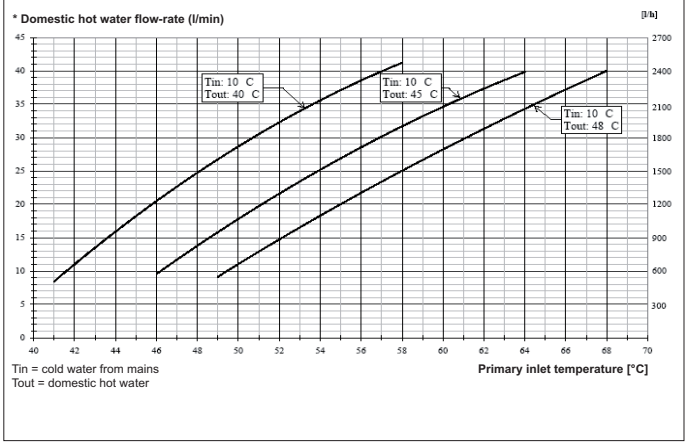
Typical combinations

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

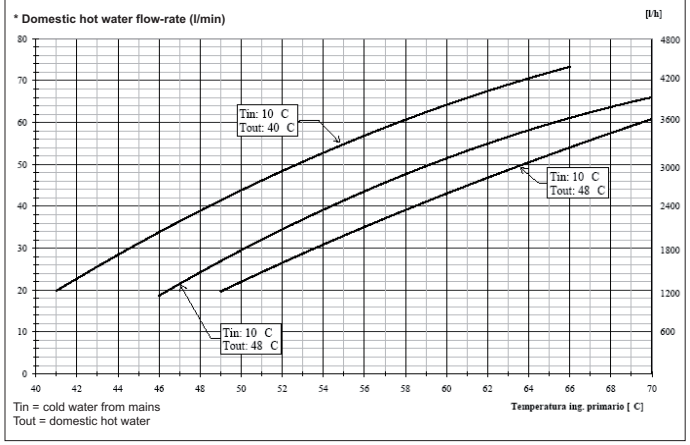
Type of home	no. of people	no. of bathrooms	Heat pump heat output	Storage tank volume	DOMH20 model
Single home	<3	1	4 - 6 kW	300	15
Single home	4 - 5	2	6 - 8 kW	500	15
Single home	5 - 6	2	10 - 13 kW	1000	24
Single home	6 - 7	3	15 - 18 kW	1000	24
2 apartments	4 - 5	2	6 - 8 kW	500	15
2 apartments	7 - 8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

DOMH20 15 heating performance



DOMH20 24 heating performance



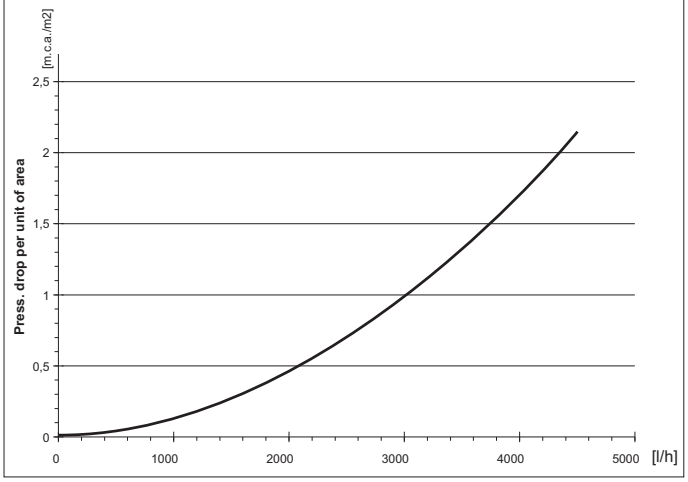
* The domestic hot water flow-rate shown on the performance curves remains constant for a variable time, depending on the volume of the storage tank. Also see the instructions in the "Selection guide".

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

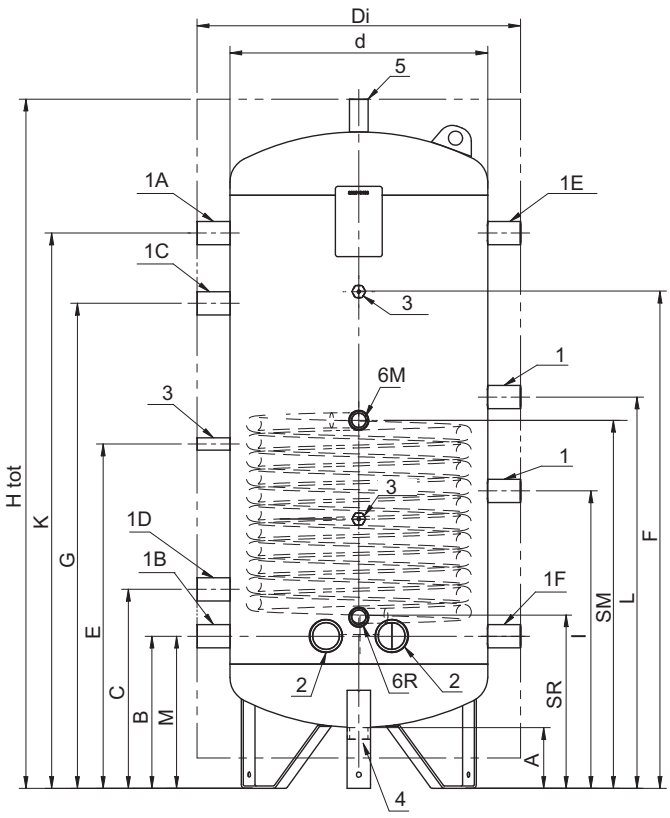
Volume	Fittings						Fixed coil	
	1	2	3	4	5	6	Surface area	Internal volume
litres	inch						m^2	l
300	1"1/4	2"	1/2"	1"1/4	1"	1"	1,5	9
500	1"1/4	2"	1/2"	1"1/4	1"	1"	2,1	13
1000	1"1/4	2"	1/2"	1"1/4	1"	1"	4	25

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

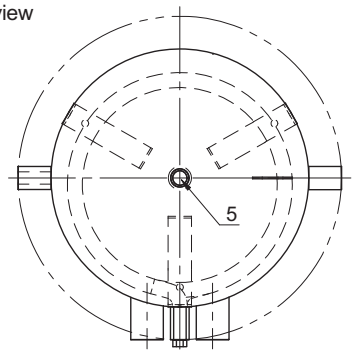
Solar heating coil pressure drop in TPS storage tanks



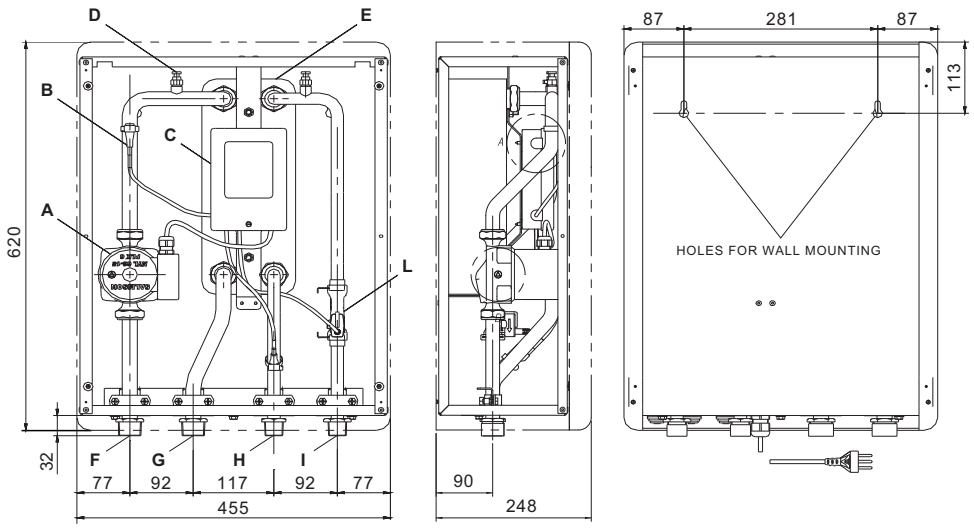
Dimensions - TPS storage tank



Top view



Dimensions - DOMH2O instant domestic hot water production kit



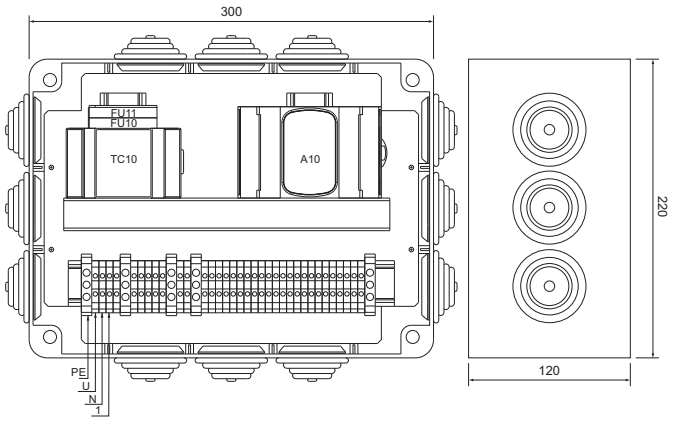
Pos.	Description
A	Primary circuit pump
B	Primary circuit temperature probe
C	Control unit
D	Manual vent valve
E	Plate heat exchanger
F	Primary circuit outlet
G	Primary circuit return
H	Mains water inlet
I	Domestic hot water outlet
L	Flow meter and temperature probe

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.

Dimensions - N-EM1 expansion module



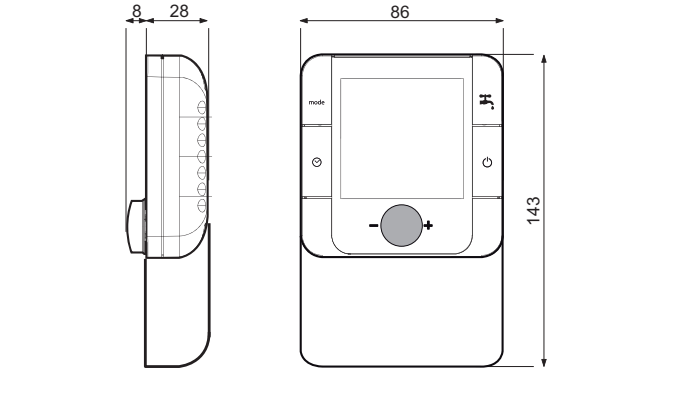
A10	Expansion module
FU10	10A fuse
FU11	1.25A fuse
TC10	230V/24V transformer

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)

Dimensions



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.

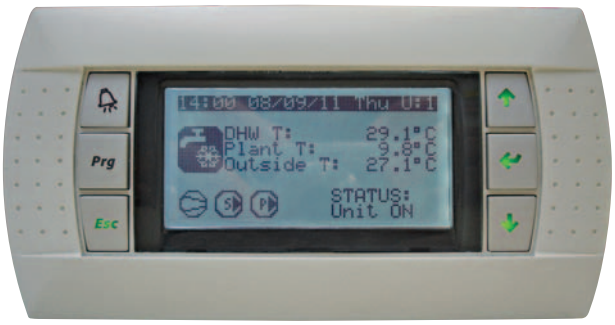
This ensures fine control over the capacity delivered, without decreasing performance, and more precise system sizing.

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

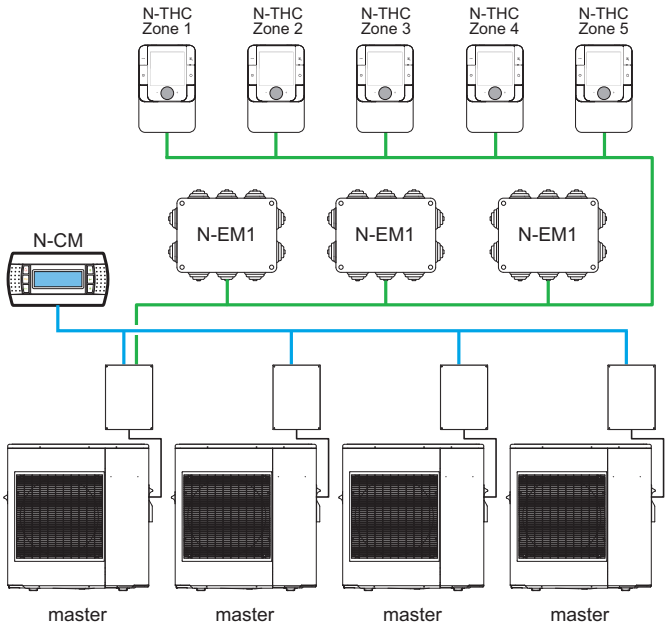
The controller also balances compressor operating hours based on time logic, activating the units in rotation, and where necessary excluding any units that are momentarily out of service, without interrupting operation of the cascade as a whole.

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

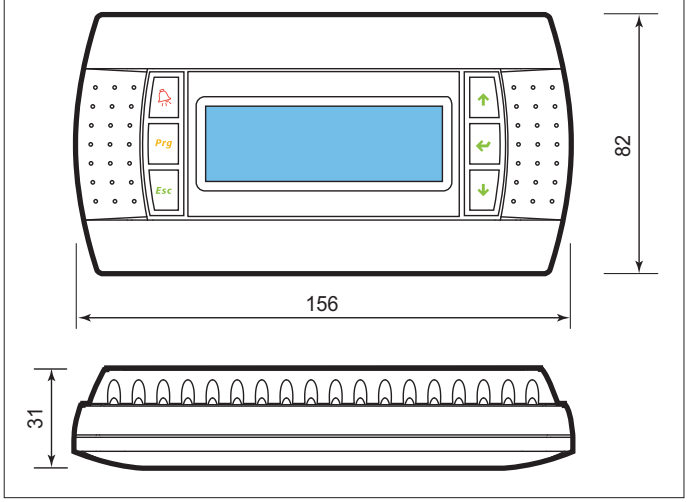
The N-CM keypad can also display the operation of each heat pump connected to the cascade and the N-THC room terminals assigned to the zone in question, up to a maximum of 5 zones.



System architecture

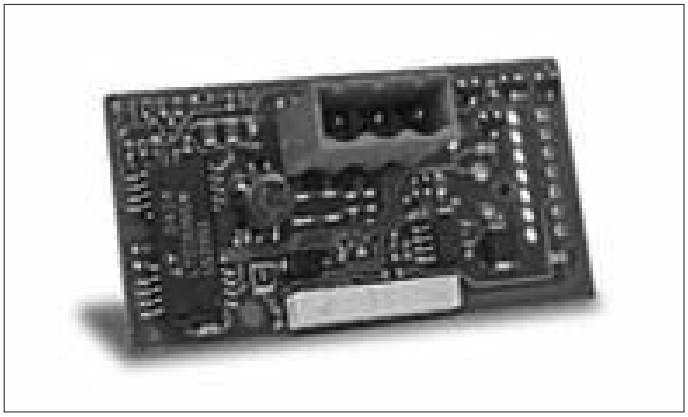


Dimensions



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

i-KIR MTD RADIANT PANEL APPLICATION

SIZE		0011	0031	0061				
I-KIR								
COOLING	(1)							
Cooling capacity	**kW**	**4,45**	**7,02**	**16,4**				
Total power input (unit)	kW	1,04	2,15	4,33				
EER		4,28	3,27	3,79				
ESEER		-	-	-				
Heat exchanger water flow	m³/h	0,76	1,21	2,82				
Heat exchanger pressure drop	kPa	73,5	49	58				
I-KIR								
HEATING	(2)							
Heating capacity	**kW**	**5,80**	**9,55**	**15,5**				
Total power input (unit)	kW	1,44	2,31	4,02				
COP		4,03	4,13	3,86				
Portata acqua scambiatore	m³/h	1,01	1,64	2,67				
Heat exchanger pressure drop	kPa	55,9	35	66				
COMPRESSORS								
Numero	N°.	1	1	1				
Number of circuits	N°.	1	1	1				
Type of regulation		INVERTER	INVERTER	NVERTER				
Minimum capacity steps	%	0-100	0-100	0-100				
Type of refrigerant		R410A	R410A	R410A				
Refrigerant charge	kg.	1,05	1,5	2,99				
Oil charge	kg.	-	-	-				
FANS								
Numero	N°.	1	1	1				
Portata aria	m³/s	-	1,00	-				
Singol power input	kW	0,07	0,10	0,14				
NOISE LEVELS	(3)							
Total sound power	dB(A)	60	64	65				
Total sound pressure	dB(A)	46	50	51				
DIMENSIONS AND WEIGHTS i-KIR outdoor unit	(4)							
Length	mm.	825	850	1000				
Larghezza	mm.	300	330	330				
Altezza	mm.	787	882	1418				
Peso	kg.	59	85	123				
DIMENSIONS AND WEIGHTS i-EM2 inside module	(4)							
Lunghezza	mm.	411	411	411				
Larghezza	mm.	75	75	75				
Height	mm.	334	334	334				
Weight	kg.	6	6	6				

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

i-KIR MTD HYDRONIC TERMINAL APPLICATION

SIZE		0011	0031	0061				
I-KIR								
COOLING	(1)							
Cooling capacity	**kW**	**3,75**	**4,91**	**12,1**				
Total power input (unit)	kW	1,26	1,96	3,98				
EER		2,98	2,51	3,04				
ESEER		4,00	3,36	3,90				
Heat exchanger water flow	m³/h	0,64	0,844	2,08				
Heat exchanger pressure drop	kPa	83,3	55,7	90				
I-KIR								
HEATING	(2)							
Heating capacity	**kW**	**5,25**	**9,00**	**14,5**				
Total power input (unit)	kW	1,72	2,87	4,75				
COP		3,05	3,14	3,05				
Portata acqua scambiatore		0,91	1,54	2,49				
Heat exchanger pressure drop	kPa	63,	40	72				
COMPRESSORS								
Numero	N°.	1	1	1				
Number of circuits	N°.	1	1	1				
Type of regulation		INVERTER	INVERTER	NVERTE				
Minimum capacity steps	%	0-100	0-100	0-100				
Type of refrigerant		R410A	R410A	R410A				
Refrigerant charge	kg.	1,05	1,5	2,99				
Oil charge	kg.	-	-	-				
FANS								
Numero	N°.	1	1	1				
Portata aria	m³/s	-	1,00	-				
Singol power input	kW	0,07	0,10	0,14				
NOISE LEVELS	(3)							
Total sound power	dB(A)	60	64	65				
Total sound pressure	dB(A)	46	50	51				
DIMENSIONS AND WEIGHTS i-KIR outdoor unit	(4)							
Length	mm.	825	850	1000				
Larghezza	mm.	300	330	330				
Altezza	mm.	787	882	1418				
Peso	kg.	59	85	123				
DIMENSIONS AND WEIGHTS i-EM2 inside module	(4)							
Length	mm.	411	411	411				
Larghezza	mm.	75	75	75				
Height	mm.	334	334	334				
Weight	kg.	6	6	6				

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

i-KI MTD RADIANT PANEL APPLICATION

SIZE		0011	0031	0061				
I-KI								
COOLING	(1)							
Cooling capacity	**kW**	**-**	**-**	**-**				
Total power input (unit)	kW	-	-	-				
EER		-	-	-				
ESEER		-	-	-				
Heat exchanger water flow	m³/h	-	-	-				
Heat exchanger pressure drop	kPa	-	-	-				
I-KI								
HEATING	(2)							
Heating capacity	**kW**	**5,80**	**9,55**	**15,5**				
Total power input (unit)	kW	1,44	2,31	4,02				
COP		4,03	4,13	3,86				
Portata acqua scambiatore	m³/h	1,01	1,64	2,67				
Heat exchanger pressure drop	kPa	55,9	35	66				
COMPRESSORS								
Numero	N°.	1	1	1				
Number of circuits	N°.	1	1	1				
Type of regulation		INVERTER	INVERTER	NVERT				
Minimum capacity steps	%	0-100	0-100	0-100				
Type of refrigerant		R410A	R410A	R410A				
Refrigerant charge	kg.	1,05	1,5	2,99				
Oil charge	kg.	-	-	-				
FANS								
Numero	N°.	1	1	1				
Portata aria	m³/s	-	1,00	-				
Singol power input	kW	0,07	0,10	0,14				
NOISE LEVELS	(3)							
Total sound power	dB(A)	60	64	65				
Total sound pressure	dB(A)	46	50	51				
DIMENSIONS AND WEIGHTS i-KI outdoor unit	(4)							
Length	mm.	825	850	1000				
Larghezza	mm.	300	330	330				
Altezza	mm.	787	882	1418				
Peso	kg.	59	85	123				
DIMENSIONS AND WEIGHTS i-EM2 inside module	(4)							
Length	mm.	411	411	411				
Larghezza	mm.	75	75	75				
Height	mm.	334	334	334				
Weight	kg.	6	6	6				

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

i-KI MTD HYDRONIC TERMINAL APPLICATION

SIZE		0011	0031	0061				
I-KI								
COOLING	(1)							
Cooling capacity	**kW**	**-**	**-**	**-**				
Total power input (unit)	kW	-	-	-				
EER		-	-	-				
ESEER		-	-	-				
Heat exchanger water flow	m³/h	-	-	-				
Heat exchanger pressure drop	kPa	-	-	-				
I-KI								
HEATING	(2)							
Heating capacity	**kW**	**5,25**	**9,00**	**14,5**				
Total power input (unit)	kW	1,72	2,87	4,75				
COP		3,05	3,14	3,05				
Portata acqua scambiatore	m³/h	0,91	1,54	2,49				
Heat exchanger pressure drop	kPa	63,7	40	72				
COMPRESSORS								
Numero	N°.	1	1	1				
Number of circuits	N°.	1	1	1				
Type of regulation		INVERTER	INVERTER	VE				
Minimum capacity steps	%	0-100	0-100	0-100				
Type of refrigerant		R410A	R410A	R410A				
Refrigerant charge	kg.	1,05	1,5	2,99				
Oil charge	kg.	-	-	-				
FANS								
Numero	N°.	1	1	1				
Portata aria	m³/s	-	1,00	-				
Singol power input	kW	0,07	0,10	0,14				
NOISE LEVELS	(3)							
Total sound power	dB(A)	60	64	65				
Total sound pressure	dB(A)	46	50	51				
DIMENSIONS AND WEIGHTS i-KI outdoor unit	(4)							
Length	mm.	825	850	1000				
Larghezza	mm.	300	330	330				
Altezza	mm.	787	882	1418				
Peso	kg.	59	85	123				
DIMENSIONS AND WEIGHTS i-EM2 inside module	(4)							
Length	mm.	411	411	411				
Larghezza	mm.	75	75	75				
Height	mm.	334	334	334				
Weight	kg.	6	6	6				

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

i-KIR 0011m MTD 230V COOLING PERFORMANCE

T out H20	T air	Cooling capacity (W)				EER			
		130,00%	100,00%	84,00%	50,00%	130,00%	100,00%	84,00%	50,00%
7	22	-	-	3,20	1,95	-	-	5,36	6,27
	33	4,07	3,89	2,70	1,55	2,97	3,19	3,46	3,55
	35	3,84	3,75	2,57	1,47	2,78	2,98	3,18	3,19
	38	3,49	3,38	2,37	1,34	2,50	2,57	2,77	2,70
	42	3,03	2,60	2,08	1,16	2,13	1,87	2,27	2,14
10	22	-	-	3,56	2,08	-	-	6,16	6,87
	33	4,56	3,74	2,89	1,70	3,30	3,47	3,71	3,91
	35	4,24	3,58	2,76	1,63	3,07	3,19	3,39	3,54
	38	3,77	3,27	2,54	1,51	2,73	2,82	2,95	3,04
	42	3,19	2,78	2,24	1,36	2,31	2,37	2,43	2,47
12	22	-	-	3,80	2,18	-	-	6,68	7,33
	33	4,84	3,79	3,05	1,80	3,49	3,72	3,91	4,16
	35	4,51	3,61	2,90	1,73	3,25	3,40	3,57	3,78
	38	4,02	3,33	2,67	1,63	2,89	2,97	3,09	3,26
	42	3,34	2,91	2,34	1,48	2,40	2,47	2,54	2,68
15	22			4,15	2,34	-	-	7,47	8,11
	33	5,19	4,08	3,31	1,96	3,73	4,18	4,30	4,57
	35	4,85	3,89	3,14	1,89	3,48	3,81	3,89	4,14
	38	4,33	3,59	2,87	1,78	3,11	3,29	3,35	3,59
	42	3,63	3,15	2,49	1,64	2,60	2,65	2,71	2,96
18	22			4,49	2,53	-	-	8,24	9,01
	33	5,45	4,64	3,62	2,12	3,92	4,67	4,77	5,00
	35	5,09	4,45	3,42	2,05	3,66	4,28	4,31	4,53
	38	4,59	4,08	3,10	1,93	3,30	3,69	3,67	3,91
	42	3,99	3,43	2,64	1,78	2,86	2,89	2,89	3,22

i-KIR 0011m MTD and i-KI 0011m MTD 230V HEATING PERFORMANCE

T out H20	T air	Heating capacity (W)							COP						
		133%	116%	100%	78%	67%	56%	33%	133%	116%	100%	78%	67%	56%	33%
25	-20	3,69	3,12	2,61	2,06	1,72	1,43	-	2,15	2,32	2,12	1,85	1,86	1,96	-
	-15	4,10	3,67	3,37	2,68	2,28	1,90	-	2,37	2,51	2,60	2,45	2,49	2,58	-
	-10	4,79	4,31	4,14	3,30	2,83	2,37	-	2,69	2,78	3,11	3,06	3,13	3,20	-
	-7	5,34	4,74	4,61	3,67	3,16	2,65	-	2,93	2,97	3,44	3,42	3,52	3,59	-
	0	-	5,85	5,69	4,54	3,92	3,30	1,88	-	3,54	4,33	4,28	4,45	4,52	3,30
	2	-	6,19	5,99	4,79	4,14	3,48	2,05	-	3,73	4,63	4,52	4,71	4,80	3,78
	7	-	7,12	6,77	5,41	4,67	3,95	2,44	-	4,30	5,53	5,12	5,39	5,55	5,07
	10	-	-	7,23	5,78	4,99	4,22	2,66	-	-	6,20	5,47	5,80	6,02	5,90
	15	-	-	-	6,40	5,52	4,68	3,00	-	-	-	6,03	6,49	6,89	7,34
	18	-	-	-	6,78	5,83	4,96	3,18	-	-	-	6,35	6,91	7,47	8,19
	20				7,03	6,04	5,14	3,30	-	-	-	6,56	7,19	7,87	8,73
30	-20	4,07	3,03	2,52	1,96	1,62	1,27	-	1,93	2,00	2,00	1,75	1,76	1,67	-
	-15	4,24	3,65	3,21	2,50	2,12	1,71	-	2,10	2,25	2,38	2,26	2,30	2,26	-
	-10	4,81	4,32	3,89	3,06	2,61	2,15	-	2,37	2,54	2,78	2,78	2,85	2,85	-
	-7	5,34	4,75	4,31	3,39	2,91	2,41	-	2,57	2,73	3,04	3,10	3,18	3,21	-
	0	-	5,80	5,27	4,19	3,61	3,03	1,84	-	3,24	3,75	3,84	3,98	4,09	3,14
	2	-	6,12	5,54	4,42	3,81	3,21	2,00	-	3,40	3,99	4,06	4,21	4,35	3,59
	7	-	6,95	6,23	5,01	4,30	3,65	2,38	-	3,86	4,71	4,59	4,79	5,03	4,82
	10	-	-	6,64	5,36	4,60	3,91	2,60	-	-	5,24	4,91	5,14	5,45	5,64
	15	-	-	-	5,96	5,10	4,35	2,96	-	-	-	5,43	5,75	6,20	7,08
	18	-	-	-	6,32	5,40	4,62	3,16	-	-	-	5,74	6,12	6,67	7,95
	20	-	-	-	6,57	5,60	4,79	3,30	-	-	-	5,94	6,37	7,00	8,52
35	-20	4,13	2,89	2,79	1,84	1,51	1,11	-	1,80	1,78	2,15	1,62	1,61	1,39	-
	-15	4,22	3,57	3,05	2,33	1,96	1,52	-	1,92	2,05	2,17	2,06	2,07	1,93	-
	-10	4,73	4,26	3,45	2,84	2,41	1,94	-	2,15	2,34	2,33	2,50	2,55	2,48	-
	-7	5,24	4,68	3,75	3,15	2,69	2,20	-	2,32	2,52	2,50	2,77	2,83	2,81	-
	0	-	5,69	4,64	3,90	3,34	2,79	1,75	-	2,98	3,08	3,42	3,51	3,62	2,86
	2	-	5,99	4,95	4,12	3,52	2,96	1,90	-	3,12	3,31	3,60	3,71	3,85	3,25
	7	-	6,74	5,80	4,67	4,00	3,39	2,26	-	3,51	4,03	4,07	4,21	4,46	4,35
	10	-	-	6,38	5,01	4,28	3,64	2,47	-	-	4,59	4,35	4,52	4,82	5,07
	15	-	-	-	5,59	4,77	4,08	2,83	-	-	-	4,82	5,04	5,46	6,36
	18	-	-	-	5,95	5,06	4,33	3,05	-	-	-	5,11	5,37	5,85	7,16
	20	-	-	-	6,19	5,25	4,51	3,19	-	-	-	5,29	5,58	6,11	7,68
45	-20	3,33	2,45	2,22	1,59	1,24	0,77		1,58	1,45	1,55	1,31	1,21	0,87	-
	-15	3,70	3,19	2,77	2,04	1,64	1,17		1,68	1,74	1,77	1,64	1,58	1,31	-
	-10	4,28	3,90	3,33	2,50	2,05	1,57		1,86	2,00	2,00	1,98	1,94	1,76	-
	-7	4,75	4,32	3,67	2,79	2,31	1,81		2,00	2,16	2,15	2,19	2,16	2,04	-
	0	-	5,26	4,46	3,48	2,92	2,39	1,41	-	2,54	2,55	2,67	2,69	2,68	2,05
	2	-	5,53	4,68	3,68	3,10	2,56	1,52	-	2,65	2,68	2,81	2,84	2,86	2,30
	7	-	6,17	5,25	4,21	3,56	2,98	1,82	-	2,95	3,05	3,16	3,22	3,33	2,98
	10	-		5,59	4,53	3,84	3,24	2,00	-	-	3,32	3,37	3,46	3,61	3,42
	15	-			5,08	4,32	3,67	2,31	-	-	-	3,73	3,87	4,08	4,20
	18	-			5,43	4,62	3,93	2,50	-	-	-	3,95	4,11	4,36	4,68
	20	-			5,66	4,82	4,11	2,62	-	-	-	4,09	4,28	4,55	5,00
50	-20	-	-	2,04	1,45	1,08	0,60	-	-	-	1,35	1,13	1,00	0,64	-
	-15	-	-	2,65	1,90	1,48	0,99	-	-	-	1,60	1,45	1,33	1,04	-
	-10	-	-	3,24	2,37	1,90	1,40	-	-	-	1,83	1,76	1,67	1,45	-
	-7	-	-	3,59	2,66	2,16	1,64	-	-	-	1,97	1,94	1,87	1,70	-
	0	-	-	4,38	3,35	2,78	2,23	1,15	-	-	2,32	2,37	2,35	2,27	1,57
	2	-	-	4,60	3,55	2,96	2,40	1,25	-	-	2,43	2,49	2,49	2,44	1,75
	7	-	-	5,13	4,08	3,43	2,83	1,50	-	-	2,72	2,80	2,84	2,85	2,22
	10	-	-	5,44	4,40	3,72	3,10	1,65	-	-	2,92	2,98	3,05	3,10	2,52
	15	-	-	-	4,94	4,22	3,54	1,91	-	-	-	3,29	3,42	3,52	3,04
	18	-	-	-	5,28	4,52	3,82	2,07	-	-	-	3,47	3,64	3,77	3,36
	20	-	-	-	5,51	4,73	4,00	2,17	-	-	-	3,60	3,79	3,93	3,58
55	-20	-	-	1,93	1,31	0,90	0,43	-	-	-	1,20	0,96	0,78	0,42	-
	-15	-	-	2,54	1,78	1,32	0,83	-	-	-	1,44	1,27	1,10	0,80	-
	-10	-	-	3,13	2,27	1,76	1,24	-	-	-	1,66	1,56	1,42	1,18	-
	-7	-	-	3,49	2,57	2,03	1,49	-	-	-	1,80	1,73	1,62	1,40	-
	0	-	-	4,31	3,28	2,68	2,10	0,85	-	-	2,12	2,12	2,07	1,92	1,07
	2	-	-	4,54	3,48	2,87	2,27	0,93	-	-	2,22	2,23	2,20	2,07	1,19
	7	-	-	5,12	4,01	3,37	2,72	1,12	-	-	2,48	2,50	2,53	2,44	1,48
	10	-	-	5,46	4,33	3,67	3,00	1,23	-	-	2,65	2,66	2,72	2,67	1,66
	15	-	-	-	4,88	4,19	3,47	1,42	-	-	-	2,92	3,06	3,05	1,97
	18	-	-	-	5,21	4,51	3,75	1,54	-	-	-	3,08	3,26	3,28	2,15
	20	-	-	-	5,43	4,73	3,95	1,61	-	-	-	3,18	3,40	3,43	2,28

i-KIR 0031m MTD 230V COOLING PERFORMANCE

T out H20	T air	Cooling capacity (W)					EER				
		141,00%	111,00%	100,00%	93,00%	65,00%	141,00%	111,00%	100,00%	93,00%	65,00%
7	22	-	6,63	6,13	5,50	3,66	-	3,70	4,10	4,16	4,69
	33	6,80	5,40	5,07	4,09	2,41	1,80	2,50	2,68	2,50	2,34
	35	6,70	5,07	4,82	3,75	2,06	1,71	2,27	2,46	2,21	1,91
	38	6,07	4,50	4,40	3,20	1,48	1,48	1,93	2,14	1,80	1,27
	42	4,32	3,64	3,78	2,38	0,57	0,99	1,47	1,73	1,25	0,45
10	22	-	7,22	6,62	6,29	4,38	-	3,94	4,53	4,73	5,70
	33	7,79	6,16	5,98	4,93	3,17	2,62	2,78	2,95	2,93	3,03
	35	7,63	5,87	5,73	4,62	2,82	2,49	2,56	2,74	2,65	2,56
	38	6,87	5,38	5,27	4,12	2,22	2,15	2,22	2,42	2,24	1,88
	42	4,89	4,61	4,52	3,38	1,27	1,46	1,77	2,01	1,72	0,98
12	22	-	7,56	6,92	6,74	4,82	-	4,09	4,72	5,04	6,31
	33	8,31	6,64	6,45	5,45	3,64	2,74	2,95	3,10	3,19	3,45
	35	8,10	6,36	6,20	5,15	3,29	2,59	2,73	2,89	2,91	2,96
	38	7,28	5,89	5,73	4,68	2,69	2,24	2,39	2,58	2,50	2,26
	42	5,25	5,15	4,93	3,98	1,74	1,54	1,95	2,16	1,99	1,34
15	22	-	7,99	7,34	7,30	5,39	-	4,30	4,87	5,42	7,12
	33	8,86	7,28	6,97	6,14	4,26	2,85	3,18	3,30	3,55	4,02
	35	8,55	7,03	6,73	5,87	3,93	2,67	2,97	3,09	3,26	3,52
	38	7,68	6,56	6,26	5,43	3,35	2,32	2,64	2,77	2,85	2,79
	42	5,73	5,81	5,44	4,77	2,44	1,67	2,20	2,34	2,34	1,86
18	22	-	8,31	7,71	7,71	5,89	-	4,52	4,84	5,68	7,80
	33	9,14	7,86	7,26	6,74	4,80	2,90	3,37	3,49	3,87	4,54
	35	8,72	7,61	7,02	6,49	4,49	2,70	3,18	3,27	3,58	4,02
	38	7,83	7,12	6,57	6,07	3,96	2,36	2,88	2,93	3,17	3,29
	42	6,17	6,28	5,81	5,44	3,14	1,82	2,46	2,47	2,64	2,37

i-KIR 0031m MTD and i-KI 0031m MTD 230V HEATING PERFORMANCE

T out H20	T air	Heating capacity (W)							COP						
		146,00%	116,00%	100,00%	73,00%	58,00%	44,00%	29,00%	146,00%	116,00%	100,00%	73,00%	58,00%	44,00%	29,00%
30	-20	7,25	4,62	3,52	1,53	-	-	-	2,32	1,99	2,01	1,15	-	-	-
	-15	8,21	5,95	4,68	2,74	-	-	-	2,60	2,53	2,55	1,99	-	-	-
	-10	9,49	7,39	5,82	3,92	-	-	-	2,98	3,11	3,05	2,76	-	-	-
	-7	10,42	8,32	6,50	4,62	-	-	-	3,26	3,48	3,33	3,21	-	-	-
	0	13,04	10,65	8,08	6,19	5,00	3,29	2,01	4,03	4,40	3,95	4,20	4,65	4,24	3,48
	2	13,90	11,37	8,53	6,62	5,40	3,63	2,32	4,28	4,68	4,12	4,48	5,04	4,65	4,12
	7	-	-	9,64	7,69	6,32	4,45	3,04	-	-	4,53	5,17	5,94	5,63	5,81
	10	-	-	10,31	8,32	6,83	4,91	3,44	-	-	4,77	5,58	6,41	6,18	6,88
	15	-	-	-	9,34	7,59	5,64	4,06	-	-	-	6,28	7,09	7,09	8,78
	18	-	-	-	9,94	7,99	6,05	4,40	-	-	-	6,71	7,41	7,62	9,99
35	-20	6,94	4,18	3,26	0,80	-	-	-	2,13	1,68	1,71	0,54	-	-	-
	-15	7,66	5,43	4,43	2,16	-	-	-	2,34	2,16	2,24	1,42	-	-	-
	-10	8,76	6,85	5,60	3,48	-	-	-	2,65	2,69	2,73	2,23	-	-	-
	-7	9,59	7,79	6,30	4,24	-	-	-	2,90	3,04	3,00	2,69	-	-	-
	0	12,07	10,23	7,93	5,95	4,59	2,90	1,89	3,61	3,93	3,60	3,72	3,85	3,22	2,77
	2	12,92	10,99	8,39	6,42	5,01	3,23	2,18	3,86	4,20	3,76	4,00	4,22	3,54	3,29
	7	-	-	9,55	7,55	6,01	4,06	2,87	-	-	4,13	4,70	5,10	4,37	4,66
	10	-	-	10,24	8,21	6,56	4,55	3,27	-	-	4,35	5,11	5,58	4,88	5,54
	15	-	-	-	9,26	7,39	5,36	3,91	-	-	-	5,79	6,29	5,81	7,13
	18	-	-	-	9,87	7,84	5,85	4,27	-	-	-	6,20	6,66	6,42	8,15
45	-20	5,73	3,98	3,46	0,69	-	-	-	1,72	1,37	1,38	0,40	-	-	-
	-15	6,29	5,03	4,30	2,01	-	-	-	1,88	1,72	1,71	1,12	-	-	-
	-10	7,11	6,20	5,22	3,26	-	-	-	2,11	2,10	2,07	1,78	-	-	-
	-7	7,73	6,96	5,81	3,97	-	-	-	2,29	2,35	2,29	2,14	-	-	-
	0	9,52	8,89	7,32	5,53	3,92	2,44	1,95	2,80	2,97	2,76	2,93	2,68	2,15	2,00
	2	10,13	9,49	7,78	5,95	4,38	2,70	2,09	2,97	3,16	2,87	3,14	2,98	2,35	2,25
	7	-	-	9,00	6,95	5,42	3,42	2,54	-	-	3,14	3,64	3,68	2,92	3,03
	10	-	-	9,77	7,52	5,97	3,89	2,86	-	-	3,27	3,93	4,05	3,31	3,60
	15	-	-	-	8,40	6,75	4,76	3,49	-	-	-	4,38	4,59	4,09	4,73
	18	-	-	-	8,90	7,14	5,32	3,93	-	-	-	4,64	4,87	4,64	5,49
50	-20	5,31	4,23	3,93	1,32	-	-	-	1,62	1,35	1,40	0,71	-	-	-
	-15	5,83	5,15	4,40	2,44	-	-	-	1,77	1,64	1,56	1,27	-	-	-
	-10	6,46	6,08	5,05	3,49	-	-	-	1,95	1,92	1,78	1,77	-	-	-
	-7	6,89	6,65	5,52	4,08	-	-	-	2,08	2,09	1,95	2,04	-	-	-
	0	8,07	7,98	6,86	5,36	3,67	2,37	2,12	2,41	2,48	2,32	2,61	2,26	1,91	1,82
	2	8,45	8,36	7,31	5,70	4,14	2,57	2,14	2,52	2,60	2,42	2,76	2,53	2,05	1,95
	7	-	-	8,54	6,50	5,15	3,17	2,37	-	-	2,77	3,10	3,12	2,48	2,45
	10	-	-	8,94	6,94	5,65	3,60	2,62	-	-	2,90	3,29	3,41	2,81	2,89
	15	-	-	-	7,63	6,31	4,42	3,23	-	-	-	3,59	3,80	3,47	3,84
	18	-	-	-	8,00	6,60	4,98	3,71	-	-	-	3,75	3,98	3,95	4,51
55	-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-15	5,78	5,72	4,62	3,20	-	-	-	1,71	1,70	1,47	1,58	-	-	-
	-10	6,33	6,33	4,90	3,94	0,44	-	-	1,86	1,86	1,55	1,87	0,27	-	-
	-7	6,71	6,71	5,20	4,35	1,47	-	-	1,96	1,96	1,64	2,03	0,87	-	-
	0	7,62	7,62	6,30	5,21	3,47	-	-	2,20	2,20	1,91	2,34	1,94	-	-
	2	7,89	7,89	6,72	5,43	3,93	-	-	2,27	2,27	1,99	2,41	2,17	-	-
	7	-	-	7,96	5,94	4,88	-	-	-	-	2,28	2,58	2,63	-	-
	10	-	-	8,29	6,21	5,31	-	-	-	-	2,37	2,67	2,84	-	-
	15	-	-	-	6,62	5,78	-	-	-	-	-	2,80	3,07	-	-
	18	-	-	-	6,83	5,92	-	-	-	-	-	2,87	3,15	-	-

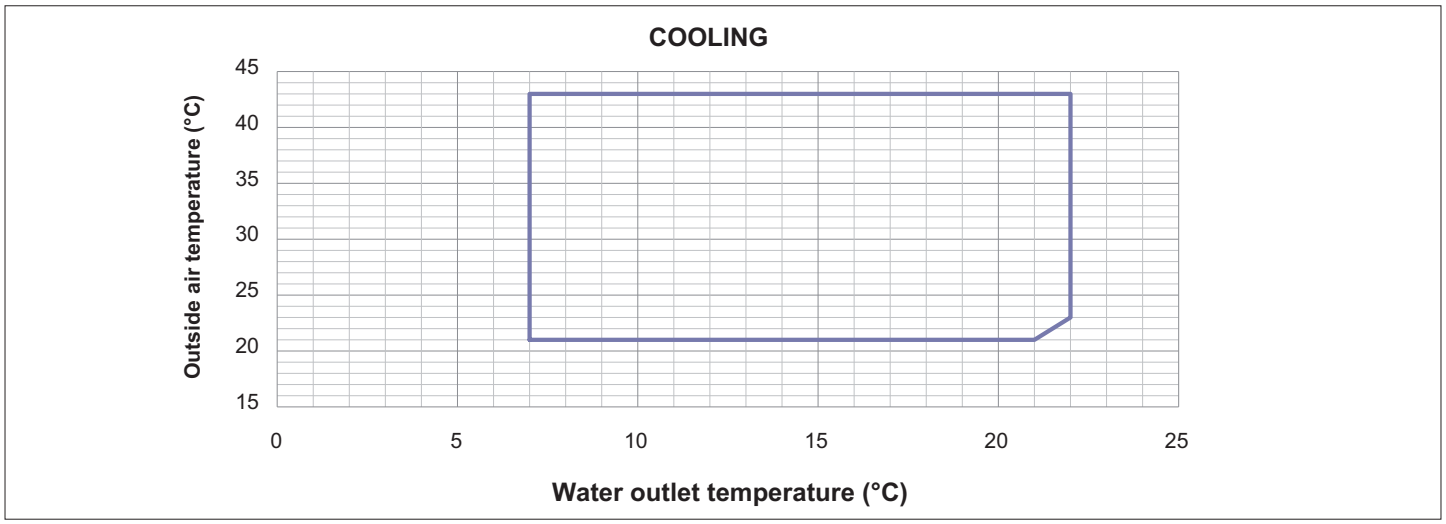
i-KIR 0061m MTD 230V COOLING PERFORMANCE

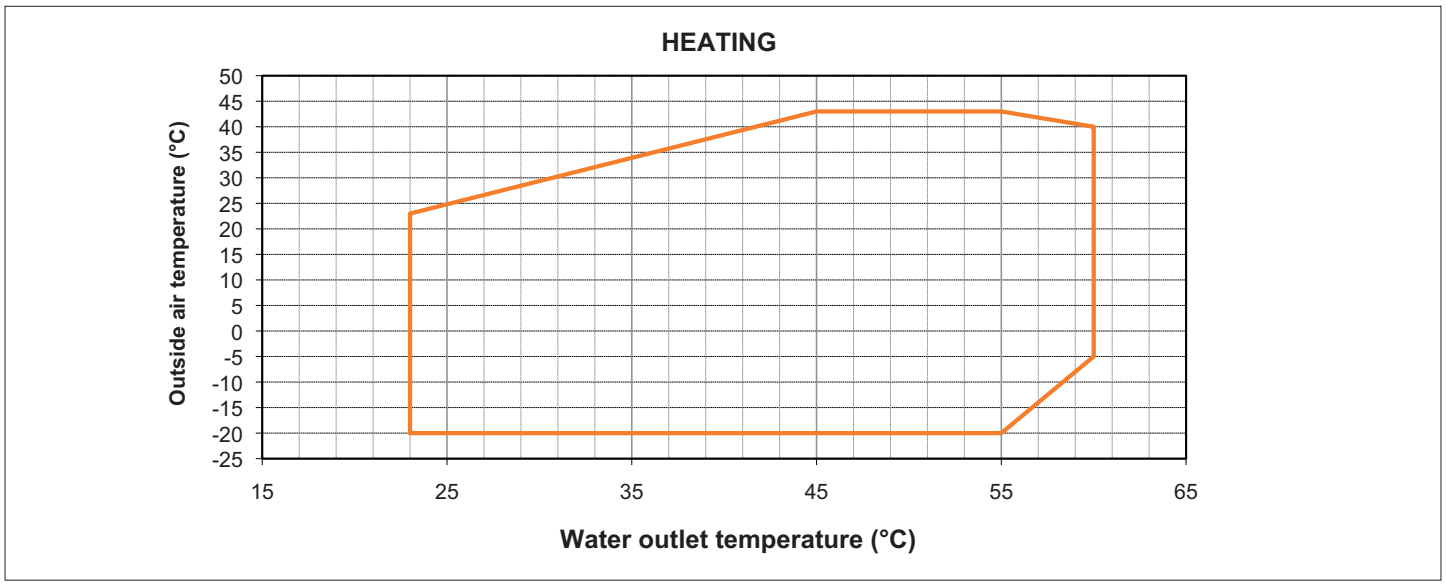
T out H20	T air	Potenza frigorifera (W)							EER						
		107%	103%	100%	86%	83%	69%	26%	107%	103%	100%	86%	83%	69%	26%
7	22	-	-	-	12,34	11,84	9,85	3,26	-	-	-	5,04	5,15	5,67	5,27
	33	13,31	12,71	12,52	10,81	10,25	8,50	2,06	3,11	3,11	3,27	3,48	3,51	3,61	2,35
	35	12,90	12,39	12,10	10,41	9,92	8,22	1,85	2,92	2,93	3,04	3,23	3,26	3,34	2,02
	38	-	11,98	11,36	9,76	9,41	7,78	1,56	-	2,71	2,70	2,87	2,92	2,97	1,60
	42	-	-	-	-	8,69	7,15	1,18	-	-	-	-	2,51	2,54	1,13
10	22	-	-	-	13,82	13,14	10,96	3,46	-	-	-	5,64	5,72	6,27	6,09
	33	14,55	14,10	13,74	11,82	11,28	9,37	2,08	3,35	3,41	3,54	3,77	3,82	3,95	2,48
	35	14,07	13,61	13,30	11,44	10,92	9,05	1,87	3,13	3,19	3,28	3,50	3,55	3,65	2,10
	38	-	12,90	12,56	10,84	10,37	8,56	1,57	-	2,91	2,89	3,12	3,17	3,24	1,64
	42	-	-	-	-	9,61	7,87	1,22	-	-	-	-	2,73	2,75	1,16
12	22	-	-	-	14,67	13,93	11,68	3,70	-	-	-	5,99	6,07	6,66	6,90
	33	15,31	15,00	14,54	12,55	11,98	9,97	2,23	3,51	3,59	3,69	3,97	4,03	4,19	2,74
	35	-	14,43	14,09	12,15	11,61	9,64	2,00	-	3,34	3,43	3,69	3,74	3,87	2,32
	38	-	-	13,33	11,55	11,03	9,11	1,70	-	-	3,03	3,29	3,35	3,43	1,80
	42	-	-	-	-	10,24	8,39	1,33	-	-	-	-	2,88	2,91	1,27
15	22	-	-	-	15,77	15,00	12,71	4,20	-	-	-	6,43	6,55	7,27	8,62
	33	16,38	16,32	15,73	13,70	13,05	10,92	2,65	3,74	3,83	3,87	4,30	4,35	4,58	3,42
	35	-	15,66	15,25	13,28	12,67	10,56	2,41	-	3,53	3,62	3,98	4,04	4,22	2,90
	38	-	-	14,44	12,62	12,07	10,01	2,07	-	-	3,24	3,54	3,62	3,74	2,26
	42	-	-	-	-	11,24	9,24	1,66	-	-	-	-	3,12	3,17	1,61
18	22	-	-	-	16,63	15,95	13,68	4,88	-	-	-	6,77	6,98	7,90	11,08
	33	-	17,61	16,91	14,93	14,15	11,90	3,31	-	4,04	4,00	4,64	4,68	4,99	4,53
	35	-	16,88	16,40	14,47	13,77	11,54	3,04	-	3,67	3,79	4,30	4,35	4,60	3,86
	38	-	-	15,50	13,69	13,16	10,96	2,66	-	-	3,48	3,80	3,90	4,08	3,02
	42	-	-	-	-	12,28	10,15	2,16	-	-	-	-	3,36	3,46	2,15

i-KIR 0061m MTD and i-KI 0061m MTD 230V HEATING PERFORMANCE

T out H20	T air	Heating capacity (W)										COP									
		134%	126%	118%	111%	100%	87%	79%	63%	57%	24%	134%	126%	118%	111%	100%	87%	79%	63%	57%	24%
25	-20	10,40	9,36	9,00	8,10	7,58	6,80	5,51	-	-	-	2,24	2,27	2,38	2,38	2,53	2,82	2,34	-	-	-
	-15	11,81	11,06	10,32	9,64	9,11	7,94	6,89	-	-	-	2,44	2,55	2,60	2,69	2,95	3,07	2,94	-	-	-
	-10	13,49	12,96	11,87	11,27	10,71	9,19	8,27	6,86	-	-	2,67	2,85	2,87	3,01	3,38	3,37	3,55	3,25	-	-
	-7	14,62	14,20	12,91	12,28	11,69	9,98	9,11	7,52	-	-	2,82	3,03	3,05	3,22	3,64	3,58	3,92	3,69	-	-
	-5	15,43	15,06	13,65	12,98	12,37	10,54	9,68	7,96	-	-	2,93	3,16	3,18	3,37	3,82	3,74	4,17	3,99	-	-
	-2	16,72	16,42	14,83	14,04	13,40	11,40	10,52	8,62	-	-	3,09	3,35	3,38	3,59	4,09	3,99	4,55	4,46	-	-
	0	17,63	17,36	15,67	14,77	14,09	12,00	11,09	9,06	8,08	-	3,21	3,48	3,52	3,75	4,27	4,17	4,81	4,78	4,60	-
	2	-	18,33	16,53	15,51	14,80	12,61	11,66	9,51	8,52	-	-	3,62	3,66	3,92	4,46	4,37	5,07	5,11	5,03	-
	7	-	-	18,87	17,42	16,62	14,21	13,10	10,61	9,61	-	-	-	4,05	4,37	4,94	4,94	5,73	5,95	6,18	-
	10	-	-	20,38	18,60	17,74	15,23	13,97	11,28	10,25	4,21	-	-	4,29	4,67	5,23	5,34	6,14	6,47	6,88	4,62
	12	-	-	21,44	19,41	18,51	15,92	14,55	11,72	10,67	4,45	-	-	4,46	4,88	5,44	5,63	6,41	6,82	7,35	5,30
	15	-	-	-	-	19,67	17,00	15,43	12,39	11,31	4,80	-	-	-	-	5,75	6,12	6,83	7,34	8,03	6,42
	18	-	-	-	-	20,85	18,12	16,31	13,06	11,93	5,14	-	-	-	-	6,07	6,67	7,25	7,86	8,67	7,63
	20	-	-	-	-	21,66	18,88	16,90	13,51	12,35	5,36	-	-	-	-	6,29	7,09	7,53	8,20	9,06	8,45
30	-20	10,02	9,19	8,81	7,89	7,28	6,35	5,50	-	-	-	2,03	2,09	2,23	2,19	2,30	2,36	2,25	-	-	-
	-15	11,41	10,53	10,18	9,40	8,66	7,45	6,82	-	-	-	2,24	2,27	2,43	2,47	2,63	2,62	2,74	-	-	-
	-10	12,90	12,13	11,69	11,00	10,15	8,67	8,16	6,48	-	-	2,45	2,51	2,66	2,77	2,98	2,92	3,24	2,98	-	-
	-7	13,84	13,22	12,68	12,00	11,10	9,46	8,97	7,18	-	-	2,58	2,67	2,81	2,96	3,20	3,12	3,54	3,36	-	-
	-5	14,48	14,00	13,37	12,68	11,75	10,01	9,52	7,64	-	-	2,66	2,78	2,92	3,09	3,35	3,27	3,75	3,62	-	-
	-2	15,47	15,24	14,44	13,73	12,77	10,88	10,34	8,34	-	-	2,80	2,97	3,10	3,30	3,59	3,51	4,05	4,02	-	-
	0	16,16	16,13	15,19	14,45	13,46	11,48	10,90	8,81	7,93	-	2,89	3,10	3,22	3,45	3,75	3,68	4,26	4,28	4,19	-
	2	-	17,05	15,96	15,18	14,18	12,11	11,46	9,27	8,34	-	-	3,24	3,35	3,60	3,92	3,87	4,47	4,56	4,51	-
	7	-	-	17,99	17,07	16,04	13,75	12,87	10,43	9,38	-	-	-	3,70	4,01	4,35	4,38	5,00	5,25	5,34	-
	10	-	-	19,29	18,24	17,21	14,80	13,72	11,13	10,02	4,13	-	-	3,93	4,28	4,63	4,73	5,32	5,66	5,85	5,23
	12	-	-	20,18	19,04	18,01	15,52	14,30	11,60	10,45	4,37	-	-	4,09	4,47	4,82	4,98	5,54	5,95	6,19	5,70
	15	-	-	-	-	19,25	16,65	15,17	12,29	11,10	4,73	-	-	-	-	5,12	5,40	5,88	6,37	6,70	6,42
	18	-	-	-	-	20,52	17,81	16,04	12,99	11,75	5,08	-	-	-	-	5,44	5,86	6,23	6,79	7,19	7,16
	20	-	-	-	-	21,39	18,62	16,63	13,45	12,19	5,30	-	-	-	-	5,65	6,20	6,46	7,07	7,51	7,65
35	-20	9,64	8,96	8,57	7,65	6,95	5,96	5,38	-	-	-	1,84	1,92	2,06	1,99	2,07	2,02	2,09	-	-	-
	-15	11,39	10,06	9,90	9,11	8,24	7,01	6,64	-	-	-	2,05	2,03	2,23	2,24	2,35	2,26	2,51	-	-	-
	-10	12,51	11,53	11,38	10,66	9,66	8,20	7,93	6,08	-	-	2,21	2,23	2,43	2,51	2,64	2,55	2,92	2,68	-	-
	-7	-	12,59	12,35	11,63	10,58	8,98	8,72	6,80	-	-	-	2,39	2,57	2,68	2,83	2,74	3,17	3,01	-	-
	-5	-	13,37	13,03	12,30	11,22	9,52	9,25	7,28	-	-	-	2,51	2,67	2,80	2,96	2,88	3,34	3,24	-	-
	-2	-	14,65	14,09	13,33	12,21	10,39	10,05	8,00	-	-	-	2,73	2,82	2,99	3,17	3,10	3,59	3,58	-	-
	0	-	15,58	14,82	14,04	12,90	10,99	10,60	8,48	7,69	-	-	2,89	2,93	3,12	3,31	3,25	3,76	3,81	3,77	-
	2	-	16,57	15,59	14,76	13,62	11,61	11,14	8,96	8,08	-	-	3,07	3,05	3,26	3,46	3,42	3,93	4,04	4,01	-
	7	-	-	17,60	16,62	15,49	13,27	12,53	10,16	9,09	-	-	-	3,36	3,62	3,86	3,88	4,37	4,62	4,63	-
	10	-	-	18,89	17,78	16,68	14,33	13,38	10,88	9,72	4,00	-	-	3,56	3,87	4,11	4,19	4,64	4,97	5,02	5,32
	12	-	-	19,78	18,58	17,50	15,06	13,95	11,36	10,15	4,25	-	-	3,70	4,04	4,28	4,41	4,83	5,20	5,29	5,59
	15	-	-	-	-	18,77	16,21	14,81	12,08	10,81	4,62	-	-	-	-	4,56	4,77	5,11	5,55	5,69	6,00
	18	-	-	-	-	20,09	17,40	15,68	12,80	11,48	4,98	-	-	-	-	4,84	5,15	5,40	5,91	6,09	6,45
	20	-	-	-	-	20,99	18,22	16,27	13,28	11,94	5,22	-	-	-	-	5,04	5,44	5,60	6,14	6,36	6,76
40	-20	9,26	8,69	8,27	7,38	6,58	5,61	5,16	-	-	-	1,67	1,76	1,87	1,81	1,85	1,77	1,88	-	-	-
	-15	-	9,66	9,48	8,75	7,83	6,62	6,36	-	-	-	-	1,81	2,01	2,02	2,09	1,99	2,24	-	-	-
	-10	-	11,16	10,94	10,23	9,22	7,77	7,60	5,66	-	-	-	2,00	2,20	2,25	2,35	2,24	2,59	2,37	-	-
	-7	-	12,30	11,93	11,18	10,12	8,53	8,36	6,39	-	-	-	2,19	2,32	2,40	2,52	2,42	2,80	2,66	-	-
	-5	-	13,18	12,64	11,82	10,75	9,07	8,87	6,88	-	-	-	2,34	2,41	2,50	2,64	2,54	2,95	2,86	-	-
	-2	-	-	13,77	12,83	11,74	9,91	9,66	7,60	-	-	-	-	2,56	2,67	2,82	2,74	3,16	3,16	-	-
	0	-	-	14,58	13,52	12,42	10,51	10,19	8,09	7,37	-	-	-	2,66	2,78	2,95	2,88	3,31	3,36	3,33	-
	2	-	-	15,42	14,23	13,12	11,12	10,73	8,58	7,75	-	-	-	2,76	2,90	3,08	3,03	3,45	3,55	3,52	-
	7	-	-	-	16,08	14,98	12,76	12,09	9,80	8,73	-	-	-	-	3,23	3,43	3,43	3,83	4,05	4,02	-
	10	-	-	-	17,24	16,16	13,81	12,93	10,53	9,35	3,82	-	-	-	3,45	3,65	3,70	4,06	4,35	4,33	4,78
	12	-	-	-	18,04	16,98	14,54	13,50	11,02	9,78	4,08	-	-	-	3,60	3,80	3,89	4,22	4,55	4,55	4,97
	15	-	-	-	-	18,24	15,68	14,36	11,75	10,44	4,47	-	-	-	-	4,04	4,20	4,47	4,85	4,88	5,28
	18	-	-	-	-	19,55	16,87	15,24	12,49	11,13	4,86	-	-	-	-	4,30	4,53	4,72	5,15	5,22	5,62
	20	-	-	-	-	20,45	17,69	15,83	12,98	11,61	5,11	-	-	-	-	4,47	4,77	4,89	5,36	5,45	5,87
45	-20	-	8,36	7,93	7,08	6,17	5,31	4,83	-	-	-	-	1,61	1,68	1,63	1,63	1,57	1,64	-	-	-
	-15	-	9,33	8,94	8,34	7,44	6,28	5,97	-	-	-	-	1,62	1,79	1,80	1,86	1,77	1,95	-	-	-
	-10	-	-	10,36	9,73	8,84	7,39	7,16	5,23	-	-	-	-	1,95	1,99	2,10	2,00	2,26	2,05	-	-
	-7	-	-	11,41	10,63	9,74	8,13	7,89	5,95	-	-	-	-	2,08	2,11	2,26	2,15	2,45	2,32	-	-
	-5	-	-	12,19	11,26	10,36	8,64	8,39	6,43	-	-	-	-	2,16	2,20	2,36	2,26	2,57	2,49	-	-
	-2	-	-	-	12,23	11,33	9,46	9,16	7,15	-	-	-	-	-	2,35	2,53	2,43	2,76	2,75	-	-
	0	-	-	-	12,91	12,01	10,04	9,67	7,63	6,97	-	-	-	-	2,45	2,64	2,55	2,89	2,93	2,91	-
	2	-	-	-	13,61	12,70	10,64	10,20	8,12	7,33	-	-	-	-	2,56	2,75	2,68	3,02	3,10	3,06	-
	7	-	-	-	15,44	14,50	12,23	11,55	9,34	8,29	-	-	-	-	2,85	3,05	3,03	3,35	3,54	3,48	-
	10	-	-	-	-	15,65	13,25	12,39	10,08	8,91	3,59	-	-	-	-	3,25	3,26	3,56	3,80	3,75	3,85
	12	-	-	-	-	16,43	13,97	12,96	10,57	9,34	3,87	-	-	-	-	3,38	3,43	3,70	3,97	3,93	4,08
	15	-	-	-	-	17,65	15,07	13,82	11,31	10,00	4,29	-	-	-	-	3,58	3,69	3,91	4,23	4,22	4,43
	18	-	-	-	-	18,91	16,24	14,70	12,06	10,70	4,70	-	-	-	-	3,79	3,97	4,13	4,50	4,51	4,79
	20	-	-	-	-	-	17,04	15,30	12,56	11,18	4,97	-	-	-	-	-	4,17	4,28	4,68	4,71	5,04
50	-20	-	-	7,54	6,75	5,72	5,07	4,40	-	-	-	-	-	1,49	1,46	1,42	1,43	1,39	-	-	-
	-15	-	-	8,26	7,87	7,08	6,00	5,47	-	-	-	-	-	1,56	1,58	1,66	1,59	1,66	-	-	-
	-10	-	-	-	9,16	8,52	7,06	6,61	4,78	-	-	-	-	-	1,73	1,89	1,79	1,93	1,75	-	-
	-7	-	-	-	10,00	9,43	7,76	7,32	5,47	-	-	-	-	-	1,84	2,04	1,92	2,10	1,98	-	-
	-5	-	-	-	10,60	10,05	8,26	7,80	5,94	-	-	-	-	-	1,91	2,13	2,01	2,21	2,14	-	-
	-2	-	-	-	11,54	11,01	9,04	8,55	6,64	-	-	-	-	-	2,04	2,28	2,16	2,39	2,37	-	-
	0	-	-	-	12,20	11,66	9,59	9,05	7,11	6,48	-	-	-	-	2,13	2,38	2,27	2,50	2,52	2,49	-
	2	-	-	-	-	12,33	10,16	9,57	7,59	6,83	-	-	-	-	-	2,48	2,38	2,62	2,68	2,63	-
	7	-	-	-	-	14,06	11,67	10,91	8,79	7,78	-	-	-	-	-	2,74	2,67	2,92	3,06	3,00	-
	10	-	-	-	-	15,14	12,65	11,75	9,52	8,40	3,30	-	-	-	-	2,89	2,87	3,10	3,29	3,23	2,88
	12	-	-	-	-	15,88	13,33	12,31	10,01	8,82	3,62	-	-	-	-	3,00	3,01	3,23	3,45	3,39	3,16
	15	-	-	-	-	-	14,38	13,18	10,76	9,49	4,08	-	-	-	-	-	3,23	3,42	3,68	3,65	3,58
	18	-	-	-	-	-	15,49	14,08	11,51	10,18	4,52	-	-	-	-	-	3,47	3,62	3,92	3,91	4,00
	20	-	-	-	-	-	16,25	14,68	12,02	10,67	4,81	-	-	-	-	-	3,64	3,76	4,07	4,09	4,28
55	-20	-	-	7,11	6,40	5,23	4,87	3,87	-	-	-	-	-	1,31	1,30	1,22	1,32	1,12	-	-	-
	-15	-	-	-	7,35	6,73	5,76	4,87	-	-	-	-	-	-	1,37	1,48	1,46	1,36	-	-	-
	-10	-	-	-	8,50	8,26	6,77	5,95	4,32	-	-	-	-	-	1,49	1,72	1,62	1,61	1,47	-	-
	-7	-	-	-	-	9,19	7,43	6,63	4,96	-	-	-	-	-	-	1,86	1,73	1,77	1,67	-	-
	-5	-	-	-	-	9,81	7,90	7,10	5,40	-	-	-	-	-	-	1,94	1,80	1,87	1,80	-	-
	-2	-	-	-	-	10,76	8,63	7,83	6,07	-	-	-	-	-	-	2,08	1,93	2,03	2,01	-	-
	0	-	-	-	-	11,40	9,15	8,33	6,52	5,90	-	-	-	-	-	2,16	2,01	2,14	2,14	2,09	-
	2	-	-	-	-	12,04	9,68	8,84	6,98	6,26	-	-	-	-	-	2,25	2,10	2,25	2,28	2,22	-
	7	-	-	-	-	-	11,10	10,17	8,15	7,20	-	-	-	-	-	-	2,35	2,52	2,62	2,56	-
	10	-	-	-	-	-	12,00	11,01	8,87	7,81	-	-	-	-	-	-	2,52	2,70	2,83	2,77	-
	12	-	-	-	-	-	12,63	11,58	9,35	8,24	-	-	-	-	-	-	2,63	2,81	2,97	2,92	-
	15	-	-	-	-	-	13,61	12,46	10,09	8,89	-	-	-	-	-	-	2,82	2,99	3,18	3,15	-
	18	-	-	-	-	-	14,63	13,36	10,85	9,58	-	-	-	-	-	-	3,01	3,17	3,39	3,38	-
	20	-	-	-	-	-	15,33	13,98	11,35	10,06	-	-	-	-	-	-	3,15	3,29	3,53	3,54	-
60	-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-10	-	-	-	-	8,05	6,53	5,19	3,83	-	-	-	-	-	-	1,57	1,48	1,31	1,20	-	-
	-7	-	-	-	-	9,02	7,15	5,84	4,42	-	-	-	-	-	-	1,70	1,56	1,45	1,37	-	-
	-5	-	-	-	-	-	7,58	6,29	4,82	-	-	-	-	-	-	-	1,62	1,55	1,49	-	-
	-2	-	-	-	-	-	8,25	7,00	5,44	-	-	-	-	-	-	-	1,72	1,69	1,67	-	-
	0	-	-	-	-	-	8,72	7,49	5,87	5,24	-	-	-	-	-	-	1,79	1,79	1,79	1,71	-
	2	-	-	-	-	-	9,21	8,00	6,30	5,60	-	-	-	-	-	-	1,86	1,90	1,91	1,83	-
	7	-	-	-	-	-	10,49	9,33	7,42	6,55	-	-	-	-	-	-	2,06	2,16	2,21	2,16	-
	10	-	-	-	-	-	11,31	10,17	8,11	7,16	-	-	-	-	-	-	2,20	2,32	2,40	2,36	-
	12	-	-	-	-	-	11,87	10,74	8,59	7,58	-	-	-	-	-	-	2,29	2,43	2,53	2,50	-
	15	-	-	-	-	-	12,75	-	9,31	8,23	-	-	-	-	-	-	2,44	-	2,71	2,70	-
	18	-	-	-	-	-	-	-	10,06	8,90	-	-	-	-	-	-	-	-	2,91	2,91	-
	20	-	-	-	-	-	-	-	10,57	9,36	-	-	-	-	-	-	-	-	3,03	3,05	-

6. OPERATING LIMITS





Min/max water temperature difference = 5/10 °C (in minimum flow conditions, 7 l/min)
MAX return temperature to heat pump = 55°C
MAX outlet temperature to heat pump for DHW production = 58°C
Water circuit pressure min/max = 1/3 bar
Maximum glycol percentage = 40%

The temperature of the fluid leaving the unit must always be within the manufacturer's specified operating range, even during start-up and when first putting into heating mode. To ensure this, the water circuit can be fitted with a bypass valve and/or other solutions, such as electric heaters with temperature control inside the storage tank.

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 tabel.

	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	EVAPORATOR			CONDENSER/RECOVERY			DESUPERHEATER
ff (m^2 °CW)	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^{-5}	1,000	1,000	0,0	1,000	1,000	0,0	1,000
4,40 x 10^{-5}	1,000	1,000	0,0	0,990	1,030	1,0	0,990
8,80 x 10^{-5}	0,960	0,990	0,7	0,980	1,040	1,5	0,980
13,20 x 10^{-5}	0,944	0,985	1,0	0,964	1,050	2,3	0,964
17,20 x 10^{-5}	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

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	0031	0061
	Minimum water content	l	26	26	60

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	0031	0061
	Expansion vessel	l	7	8	8

Tab. 3	Size		0011	0031	0061
	Safety valve	bar	3	3	3

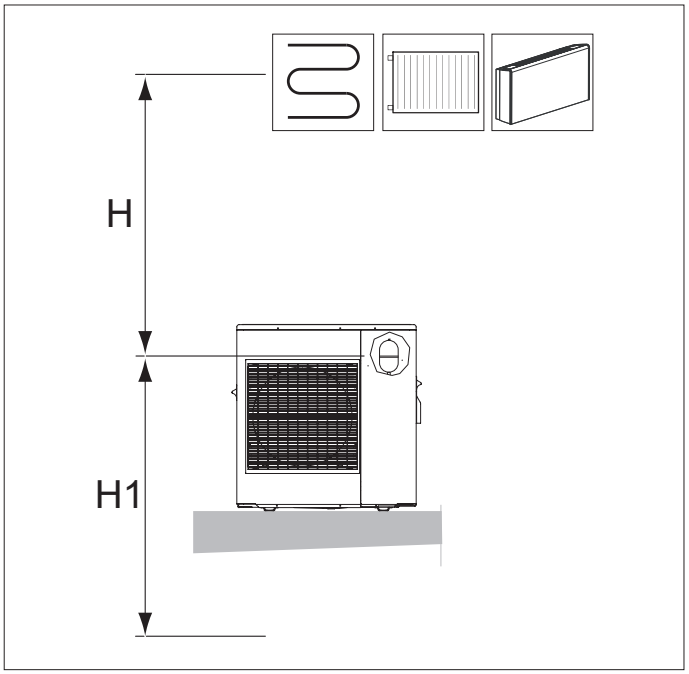
Table 4 shows an example of the maximum water content in the specified normal operating conditions.
If the volume of water in the system is higher, an additional, correctly sized expansion vessel is required.
(Example only valid for 0031 unit with expansion vessel 8 litres. For other units the water content must be calculated).

Tab. 4							
	System water temperature	**°C**	**20**				
	Hydraulic head	m	30	25	20	15	>12,25
	Expansion vessel pre-charge	bar	3,2	2,8	2,3	1,8	1,5
	Maximum water content	l	-	277	820	1365	1665
	System water temperature	**°C**	**35**				
	Hydraulic head	m	30	25	20	15	>12,25
	Expansion vessel pre-charge	bar	3,2	2,8	2,3	1,8	1,5
	Maximum water content	l	-	85	254	420	515
	System water temperature	**°C**	**45**				
	Hydraulic head	m	30	25	20	15	>12,25
	Expansion vessel pre-charge	bar	3,2	2,8	2,3	1,8	1,5
	Maximum water content	l	-	50	150	250	305
	System water temperature	**°C**	**55**				
	Hydraulic head	m	30	25	20	15	>12,25
	Expansion vessel pre-charge	bar	3,2	2,8	2,3	1,8	1,5
	Maximum water content	l	-	34	102	170	207

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.

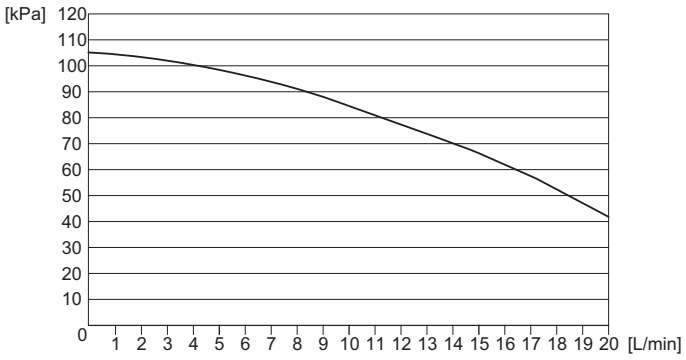
The maximum height must not exceed 55 metres due to the maximum vessel pre-charge pressure of 6 bars.

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

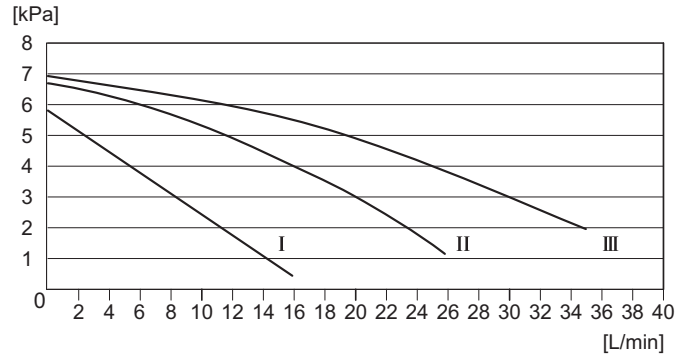


10. SYSTEM PUMP CURVES

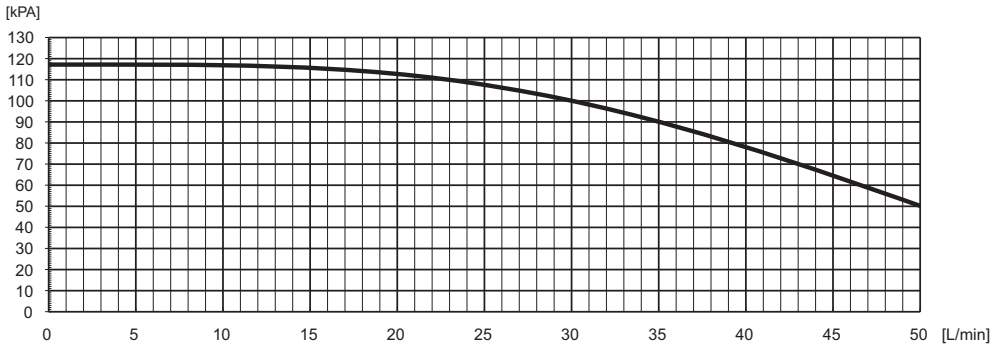
i-KI 0011 MTD and i-KIR 0011 MTD



i-KI 0031 MTD and i-KIR 0031 MTD



i-KI 0061 MTD and i-KIR 0061 MTD



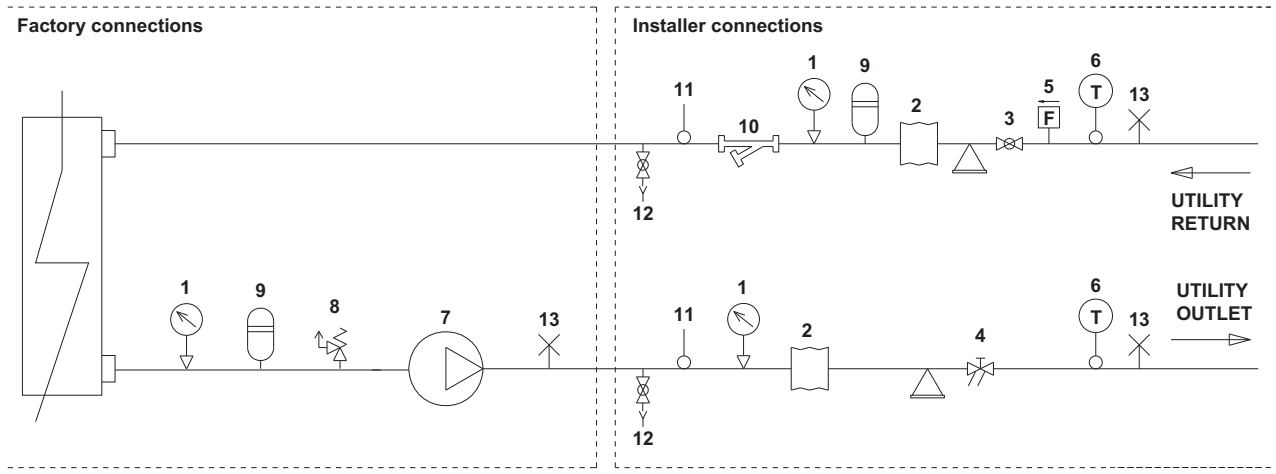
The pressure head refers to the values at the fittings.

Models	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
i-KI MTD 0011	DC 330V				5,8	1,01	55,9	0,13	PY-122NDC
i-KIR MTD 0011	DC 330V	4,45	0,76	73,5	5,8	1,01	55,9	0,13	PY-122NDC
i-KI MTD 0031	230V-50Hz-1Ph				9,55	1,64	35	0,10	Grundfoss UPSO15-70
i-KIR MTD 0031	230V-50Hz-1Ph	7,02	1,21	49	9,55	1,64	35	0,10	Grundfoss UPSO15-70
i-KI MTD 0061	DC 330V				15,7	2,67	66	0,169	PY-122NDCDA3
i-KIR MTD 0061	DC 330V	16,6	2,82	58	15,7	2,67	66	0,169	PY-122NDCDA3

(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



1	Pressure gauge	5	Flow switch (obligatory)	9	Expansion vessel	13	System vent
2	Vibration damper joint	6	Thermometer	10	Wire mesh filter		
3	Shut off valve	7	Pump	11	Temperature sensor		
4	Calibrating valve	8	Safety valve	12	Unit fill/drain valve		

12. FULL LOAD SOUND LEVEL

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB(A)								
i-KIR 0011m	63	63	60	58	55	51	43	36	60
i-KI 0011m	63	63	60	58	55	51	43	36	60
i-KIR 0031m	64	64	64	62	60	53	50	39	64
i-KI 0031m	64	64	64	62	60	53	50	39	64
i-KIR 0061m	68	67	67	62	60	56	48	40	65
i-KI 0061m	68	67	67	62	60	56	48	40	65

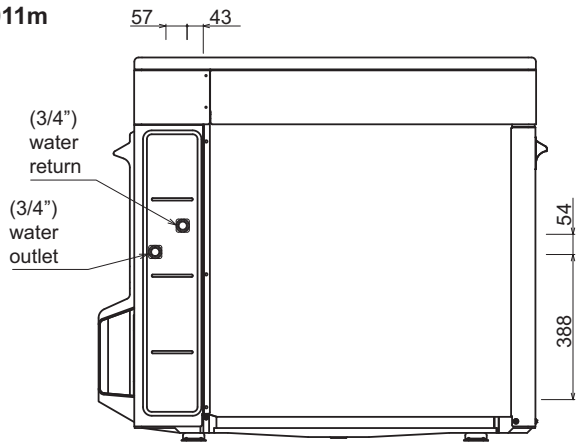
Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C
Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz] at 1 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
i-KIR 0011m	49	49	46	44	41	37	29	22	46
i-KI 0011m	49	49	46	44	41	37	29	22	46
i-KIR 0031m	50	50	50	48	46	39	36	25	50
i-KI 0031m	50	50	50	48	46	39	36	25	50
i-KIR 0061m	54	53	53	48	46	42	34	26	51
i-KI 0061m	54	53	53	48	46	42	34	26	51

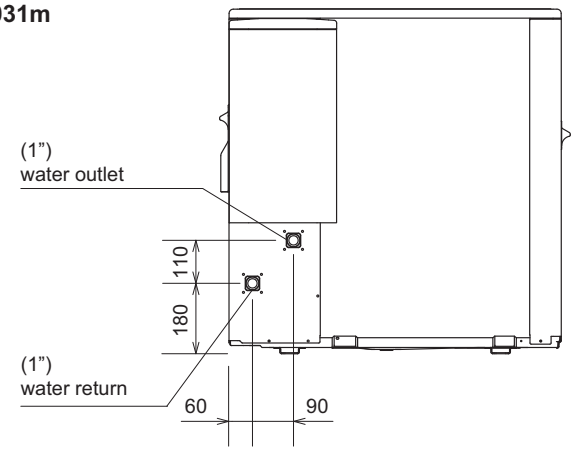
Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C
Average sound pressure level, at 1 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.

13. POSITION OF THE WATER CONNECTIONS

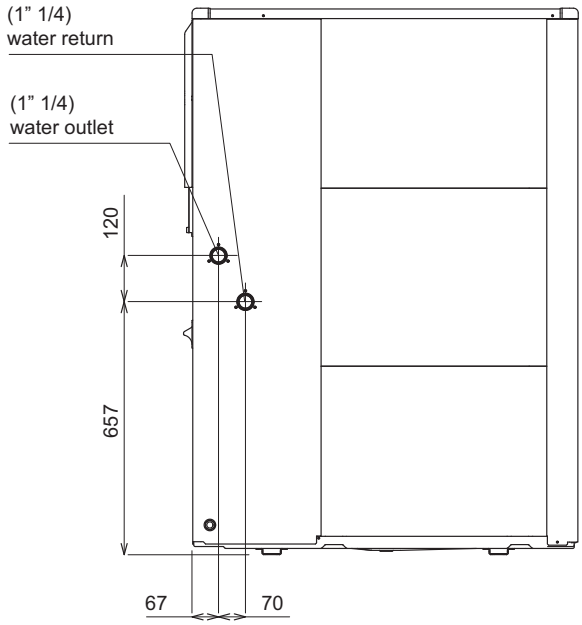
0011m



0031m

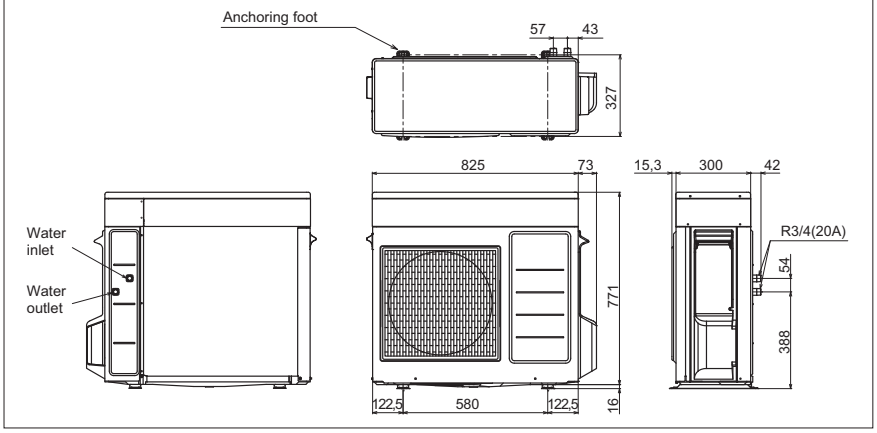


0061m

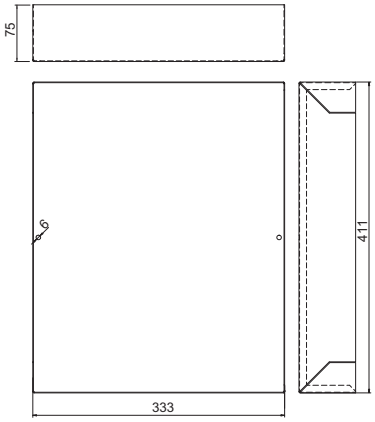


14. DIMENSIONAL DRAWINGS

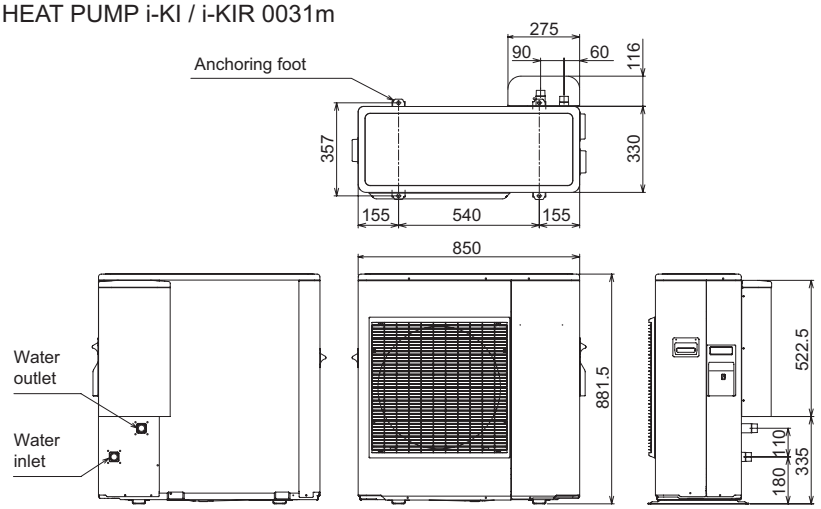
HEAT PUMP i-KI / i-KIR 0011m



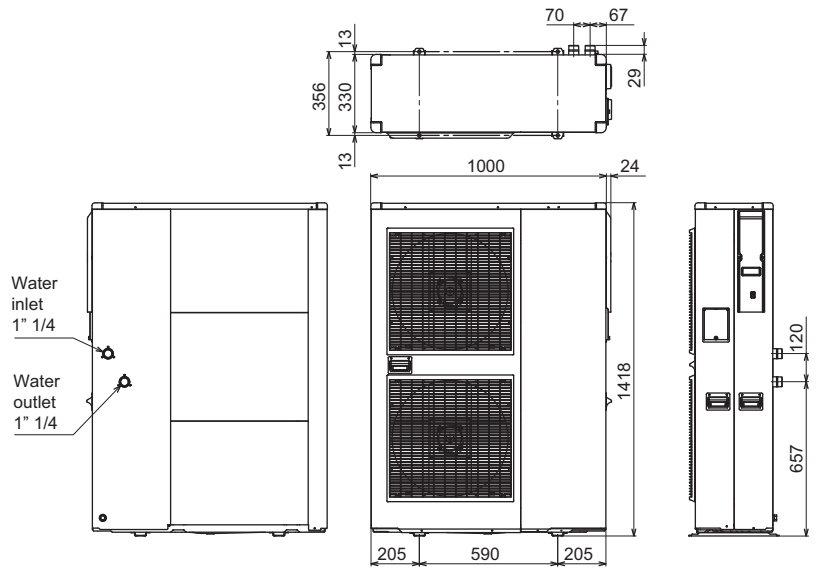
INSIDE MODULE i-EM2 / i-EMR2



HEAT PUMP i-KI / i-KIR 0031m

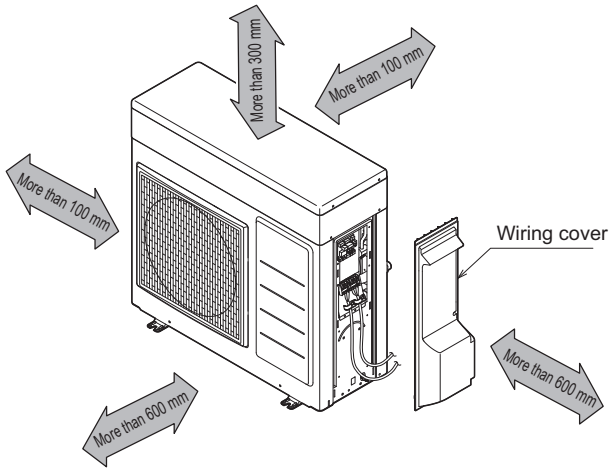


HEAT PUMP i-KI / i-KIR 0061m

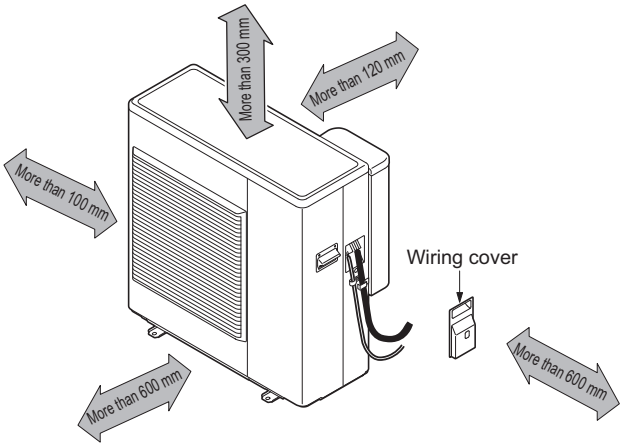


15. CLEARANCES - HOISTING

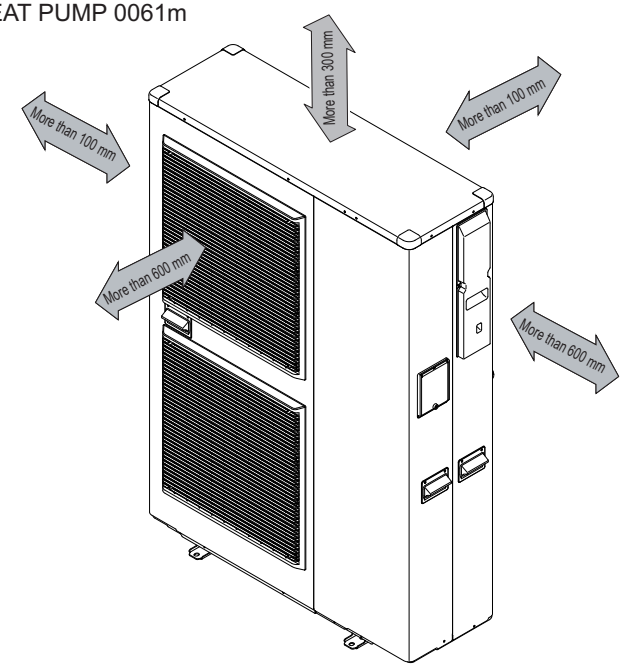
HEAT PUMP 0011m



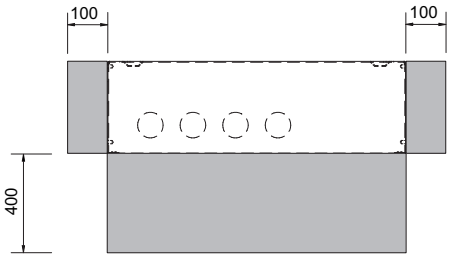
HEAT PUMP 0031m



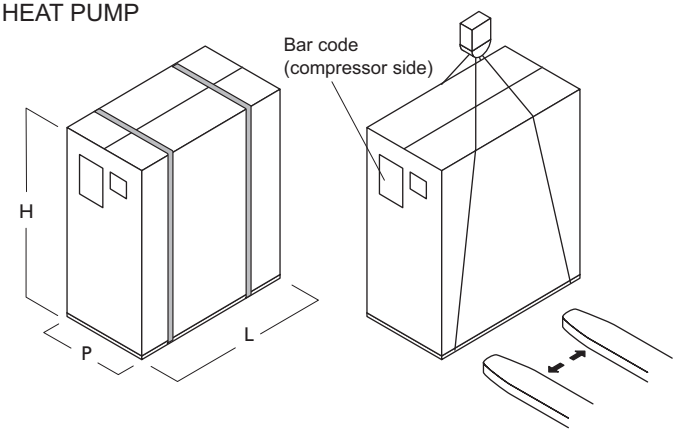
HEAT PUMP 0061m



INSIDE MODULE i-EM2 / i-EMR2

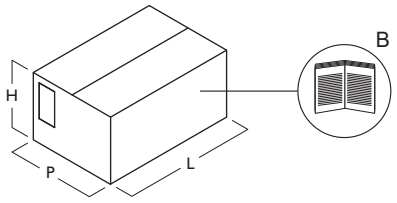


HEAT PUMP



i-KI/i-KIR Dimensions		0011m	0031m	0061m
Dimension L	mm	985	1040	1120
Dimension P	mm	425	550	470
Dimension H	mm	865	940	1610
Gross weight	Kg	62	91	136

INSIDE MODULE



i-EM2/i-EMR2 Dimensions		0011m÷0061m
Dimension L	mm	430
Dimension P	mm	350
Dimension H	mm	180
Gross weight	Kg	6,3

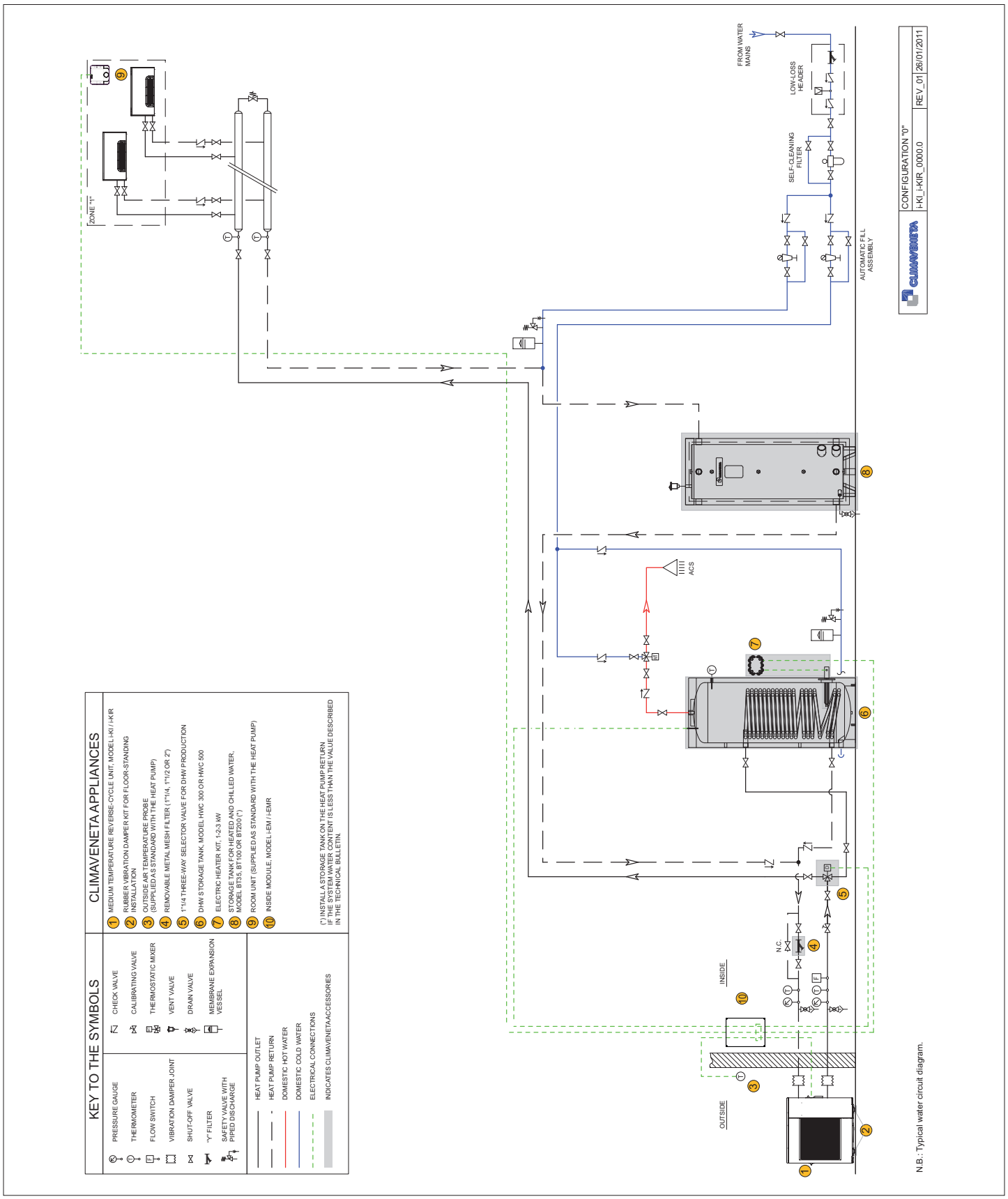
HOISTING INSTRUCTIONS

- 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.

16. OPERATING DIAGRAMS

Heat pump connection to the system without low-loss header. Make sure the useful pressure head of the circulating pump on the unit is sufficient for the pressure drop in the system. If the minimum system content does not reach values shown in this manual, install an additional storage tank on the heat pump return pipe. No system configurations are required.
For installations with heap pump connected directly to the system, without storage tanks and secondary pumps, **parameter 011D must be set to 0**. This means that heat pump operation will be managed based on the time bands.

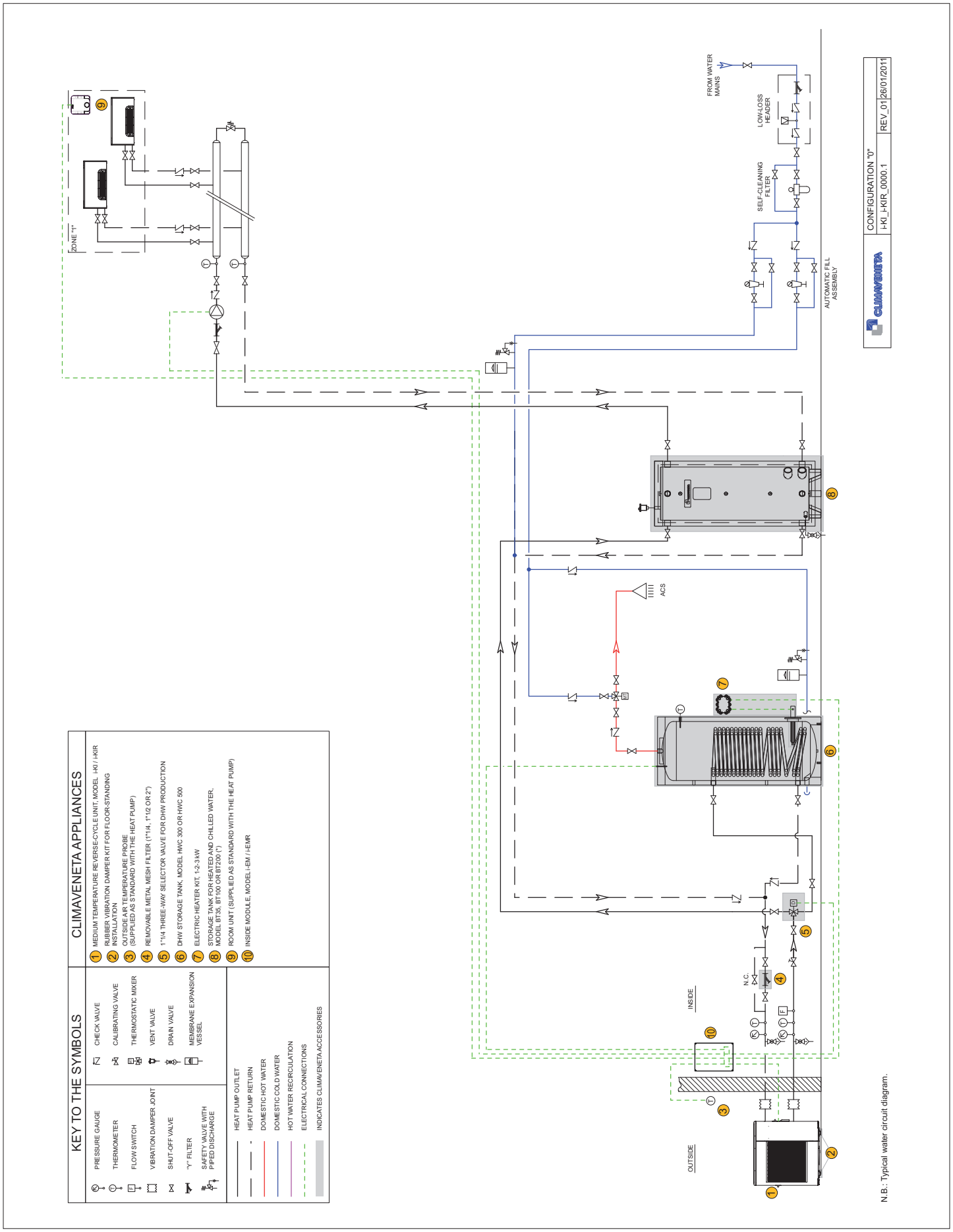
Water circuit diagram



Water circuit diagram (not a working drawing)

System number 0

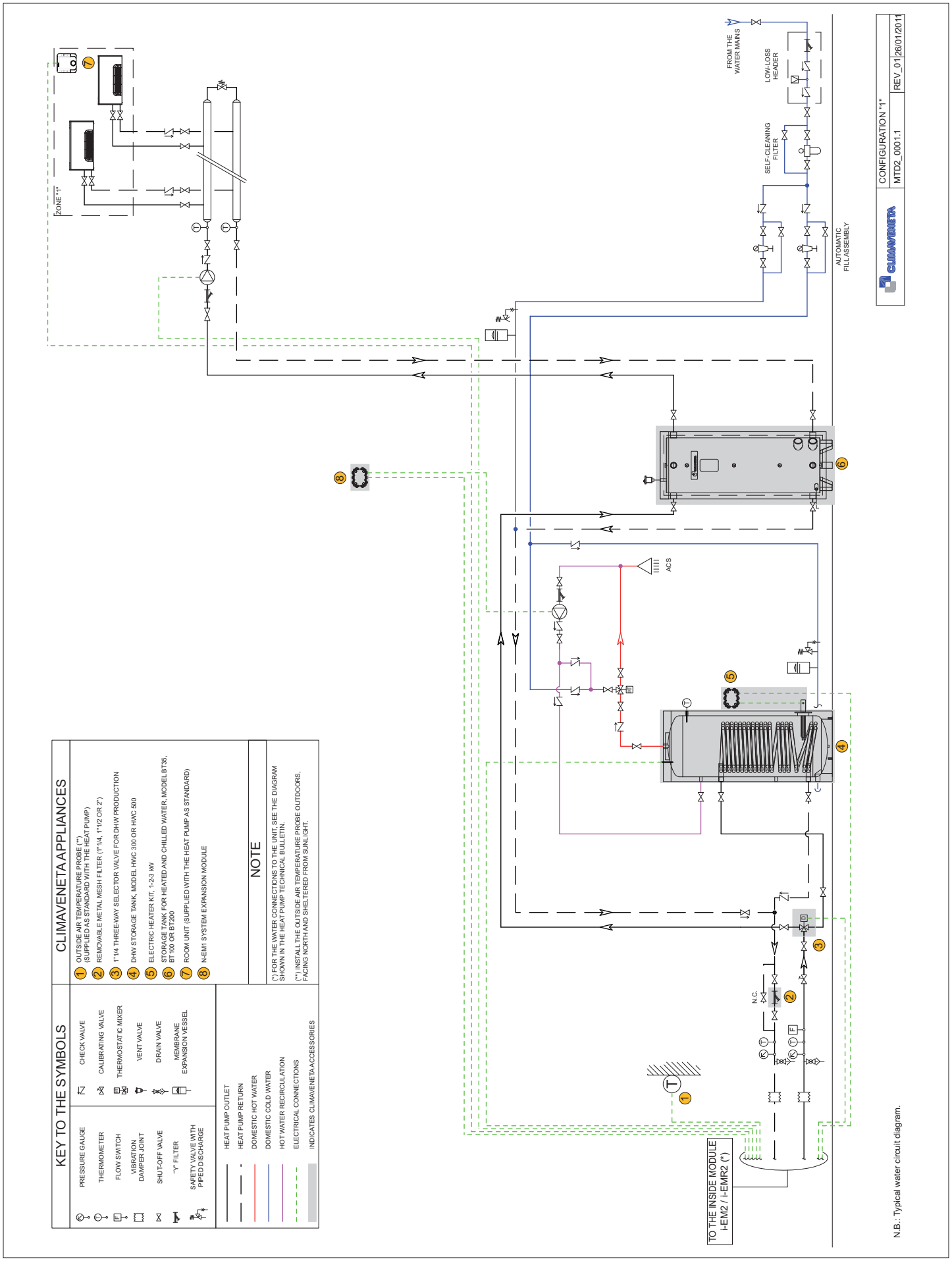
Water circuit diagram



Water circuit diagram (not a working drawing)

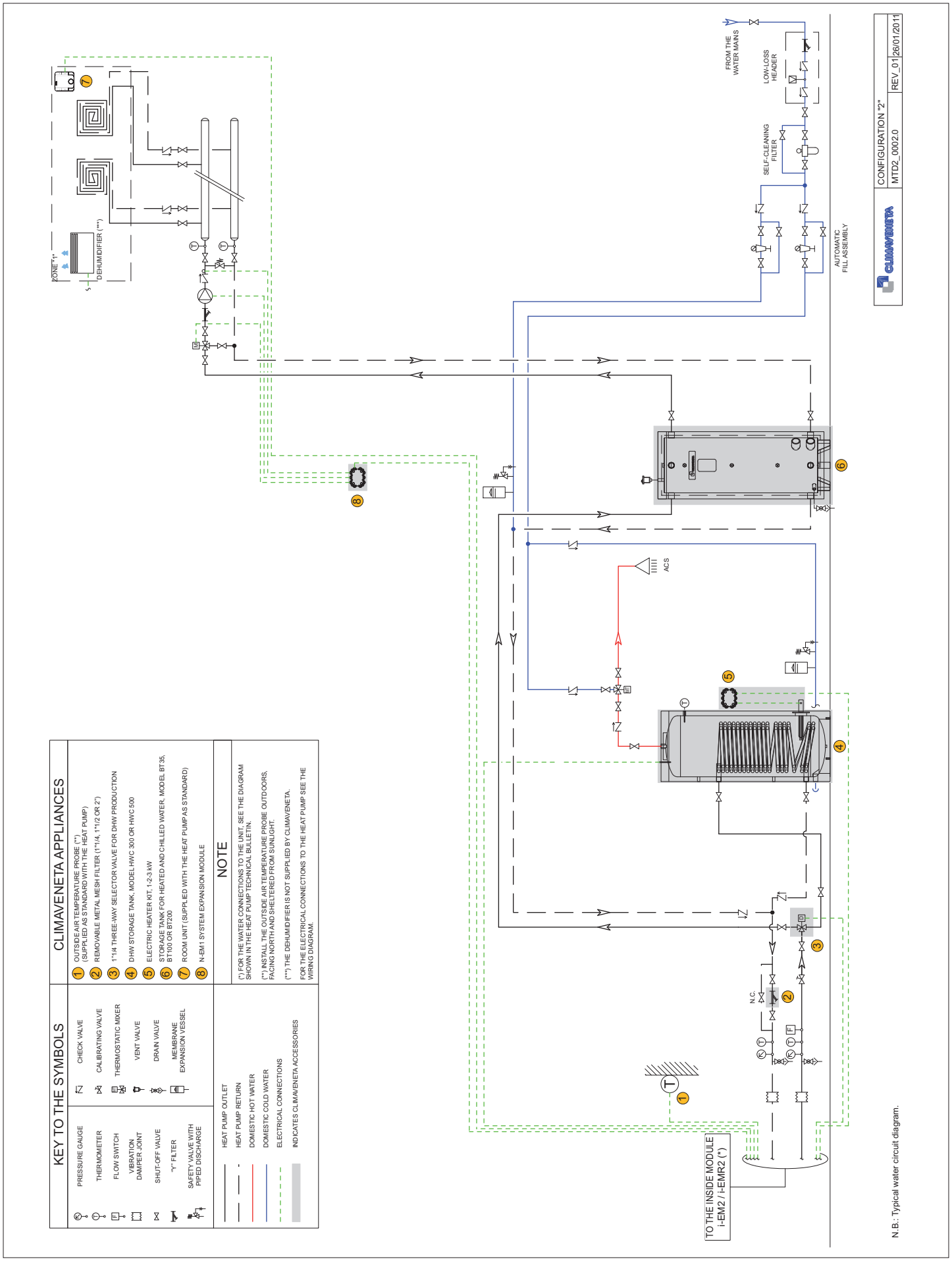
WATER CIRCUIT DIAGRAM

Configuration number 1 (parameter 0101= 1)



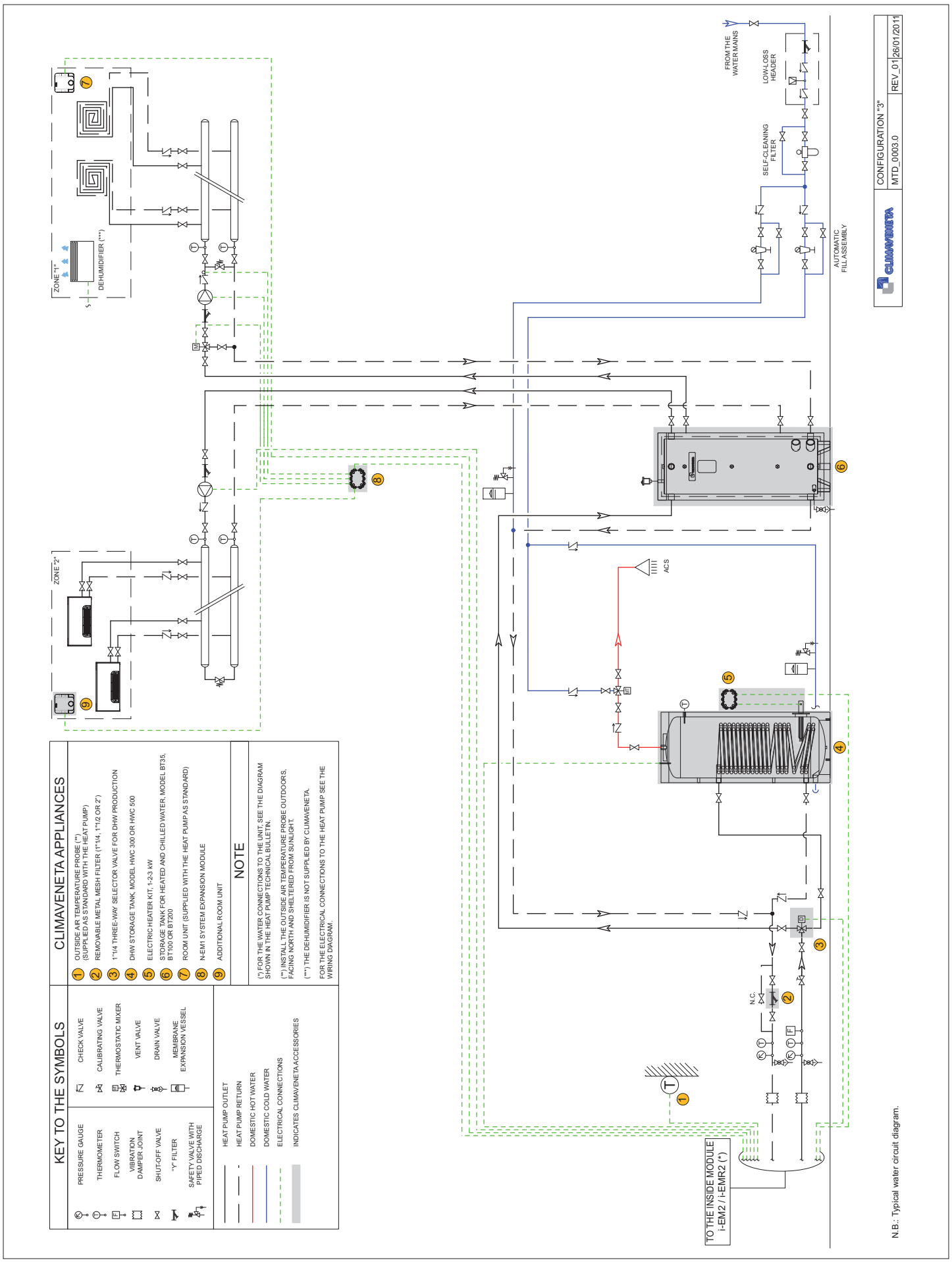
WATER CIRCUIT DIAGRAM

Configuration number 2 (parameter 0101= 2)



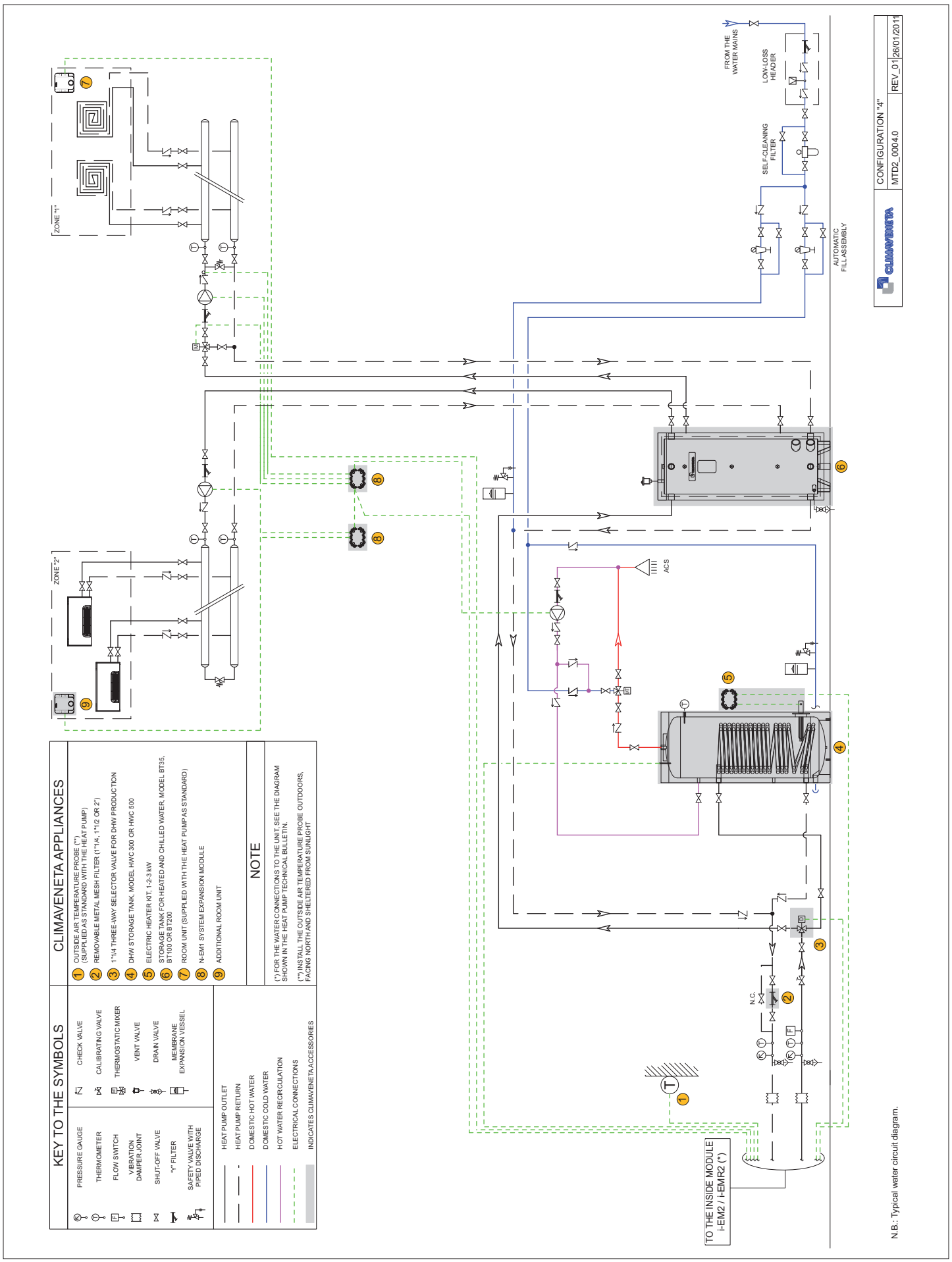
WATER CIRCUIT DIAGRAM

Configuration number 3 (parameter 0101= 3)



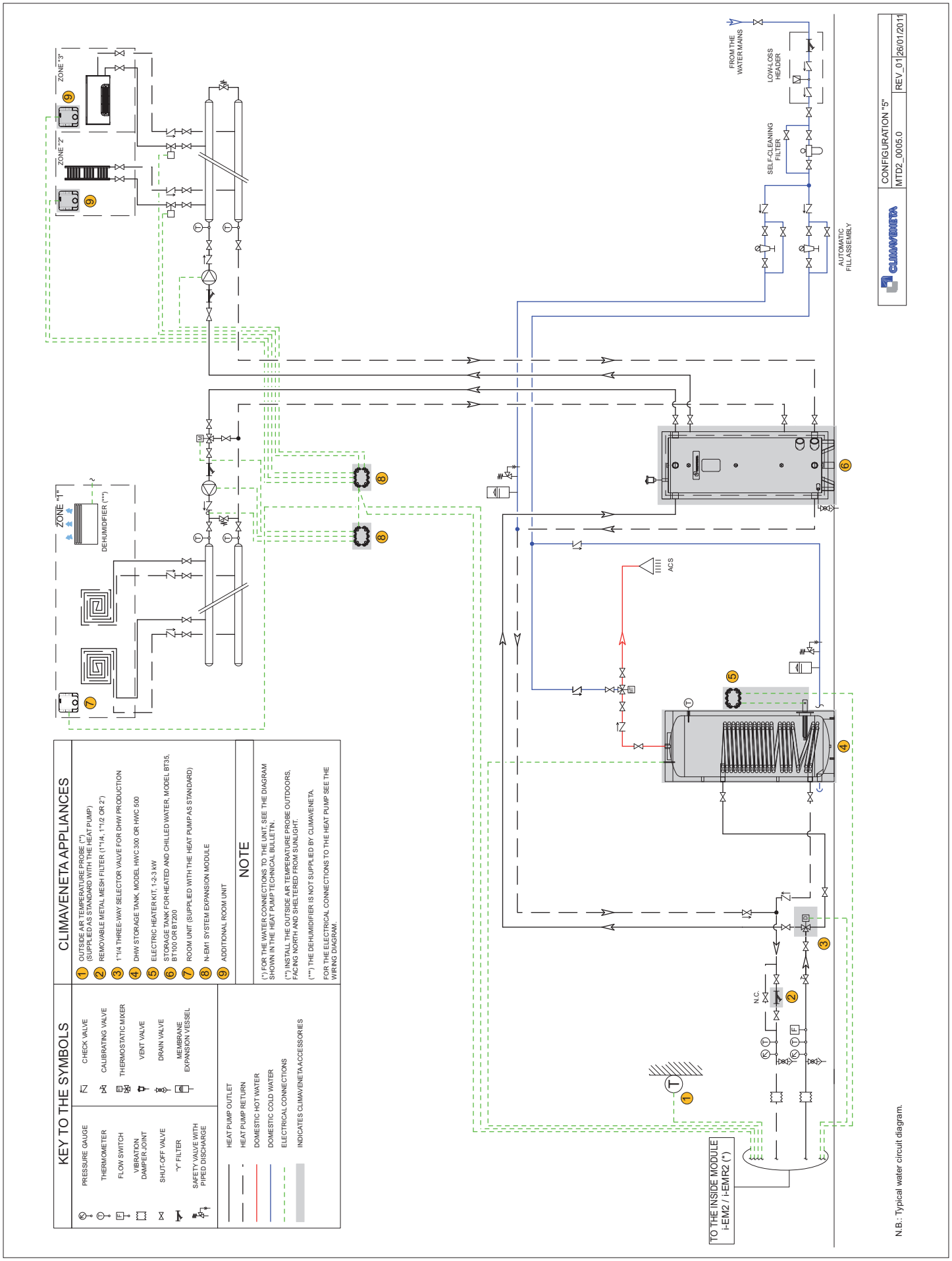
WATER CIRCUIT DIAGRAM

Configuration number 4 (parameter 0101= 4)



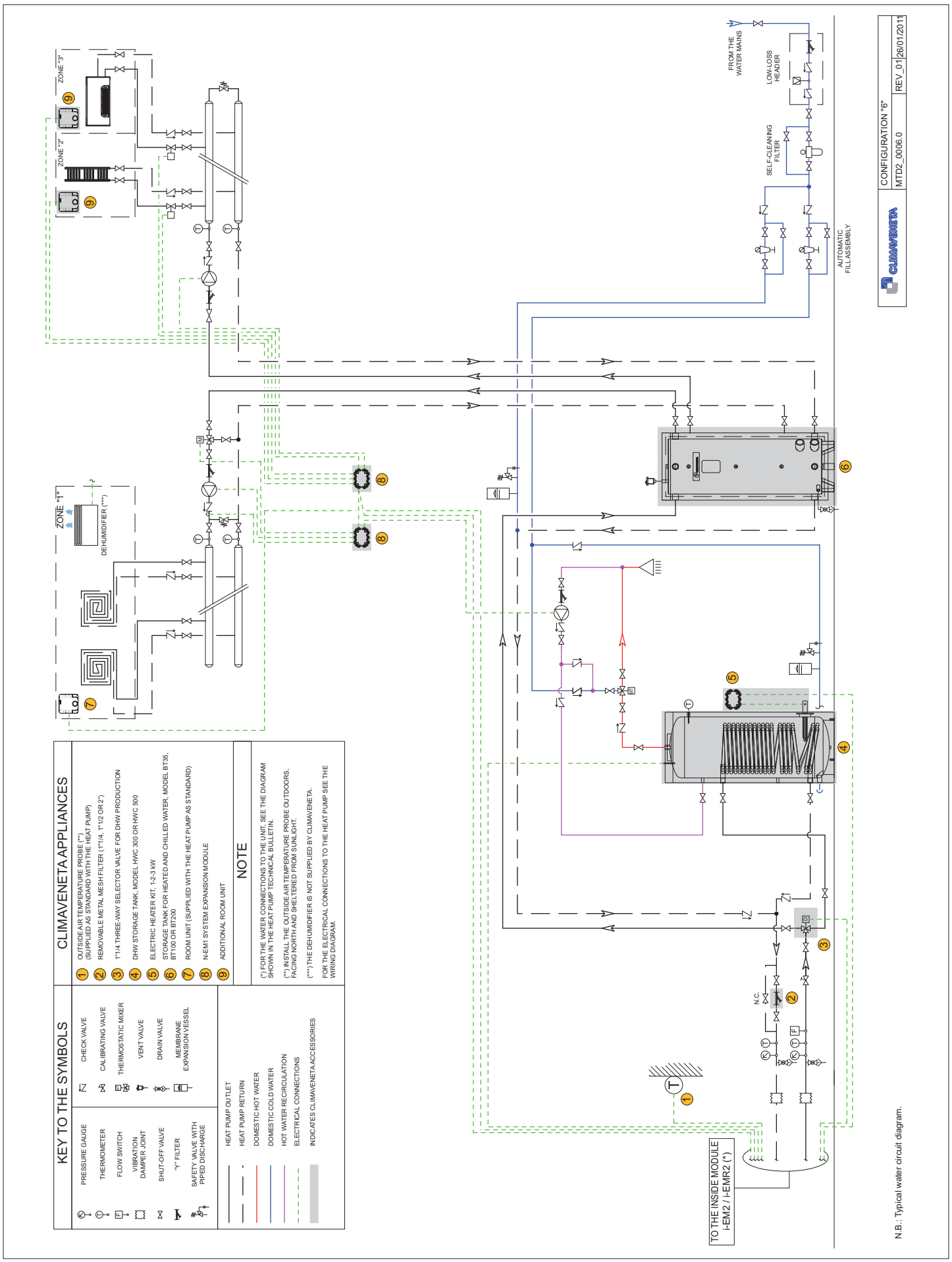
WATER CIRCUIT DIAGRAM

Configuration number 5 (parameter 0101= 5)



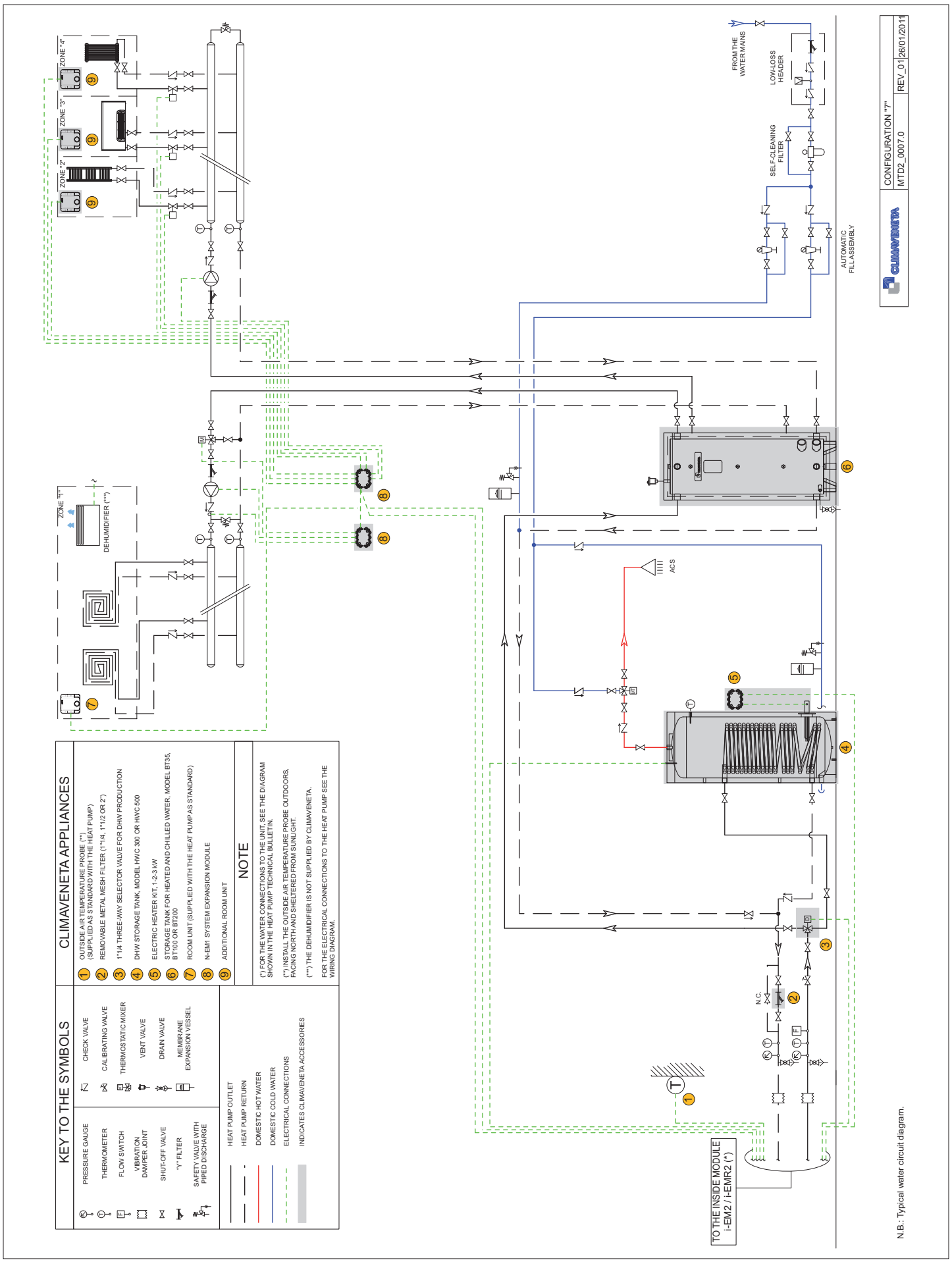
WATER CIRCUIT DIAGRAM

Configuration number 6 (parameter 0101= 6)



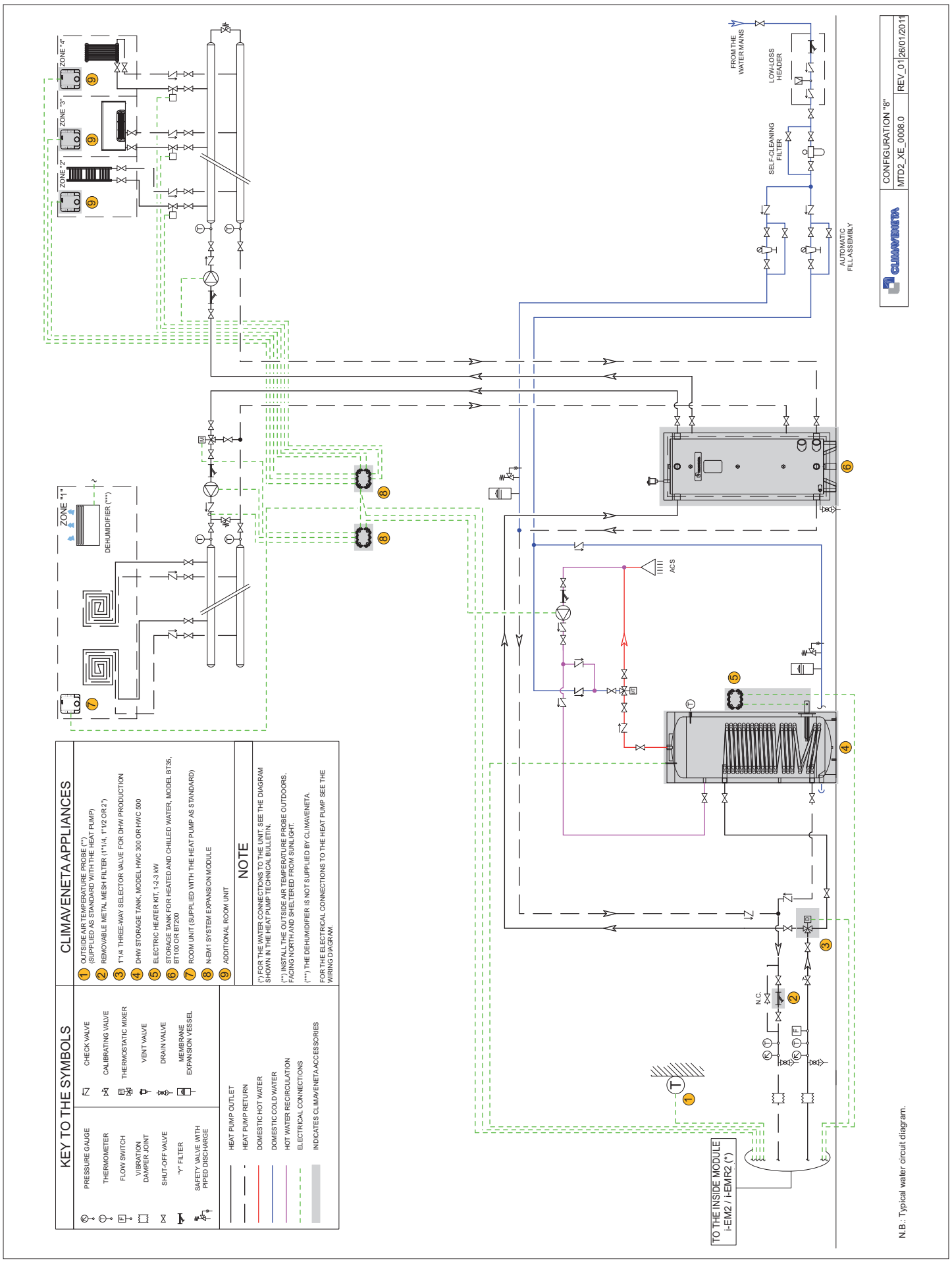
WATER CIRCUIT DIAGRAM

Configuration number 7 (parameter 0101= 7)



WATER CIRCUIT DIAGRAM

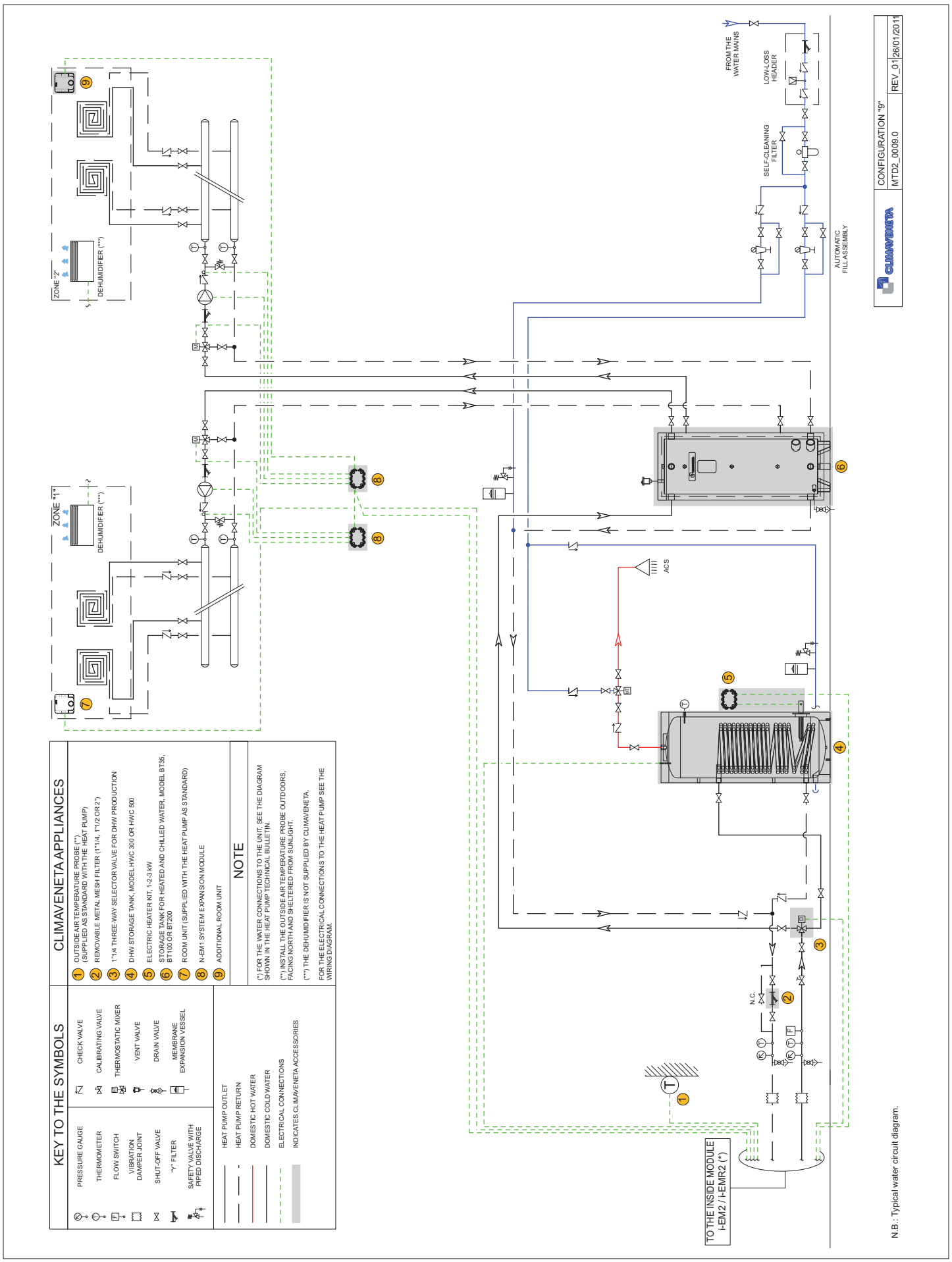
Configuration number 8 (parameter 0101= 8)



N.B.: Typical water circuit diagram.

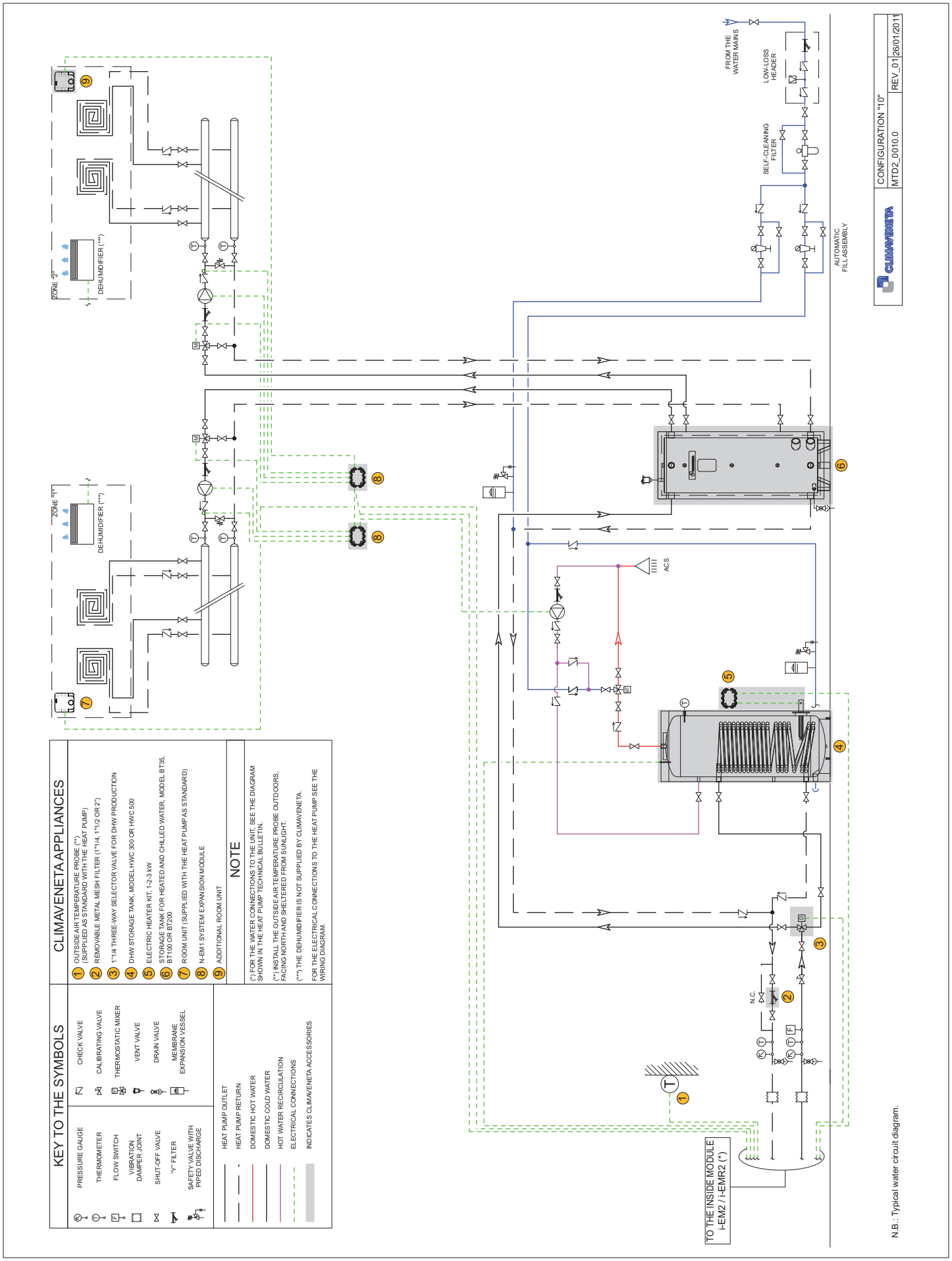
WATER CIRCUIT DIAGRAM

Configuration number 9 (parameter 0101= 9)



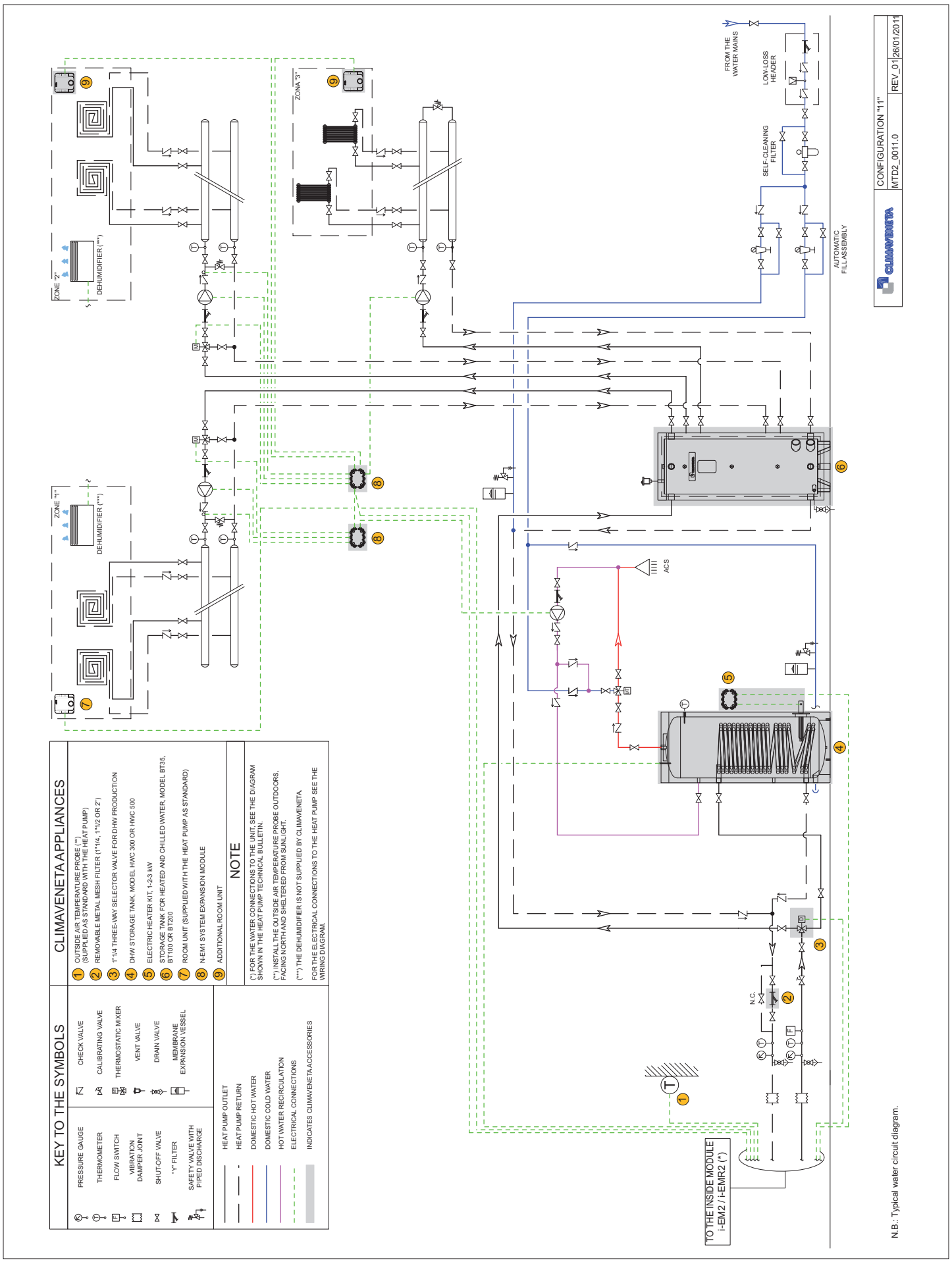
WATER CIRCUIT DIAGRAM

Configuration number 10 (parameter 0101= 10)



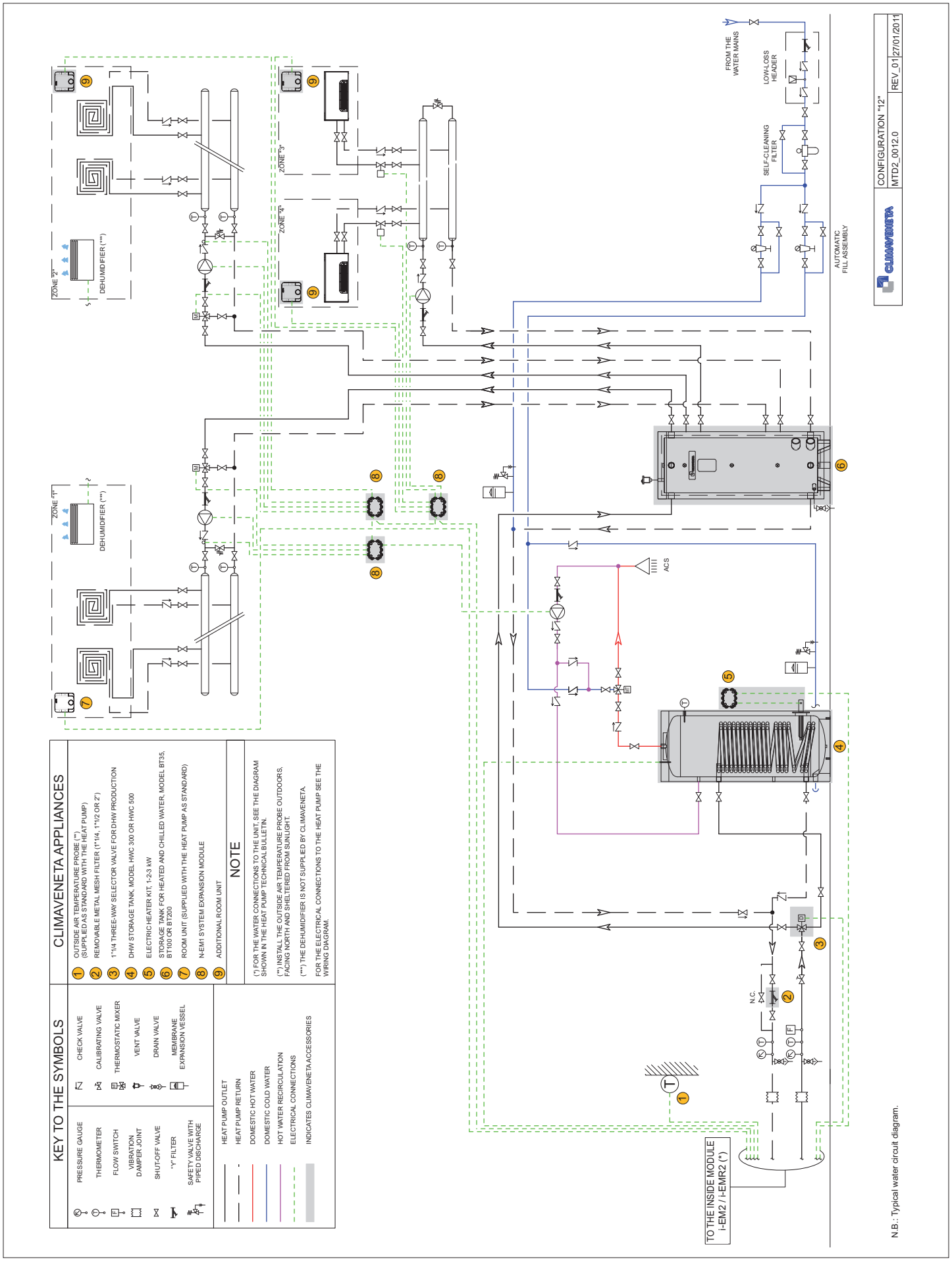
WATER CIRCUIT DIAGRAM

Configuration number 11 (parameter 0101= 11)



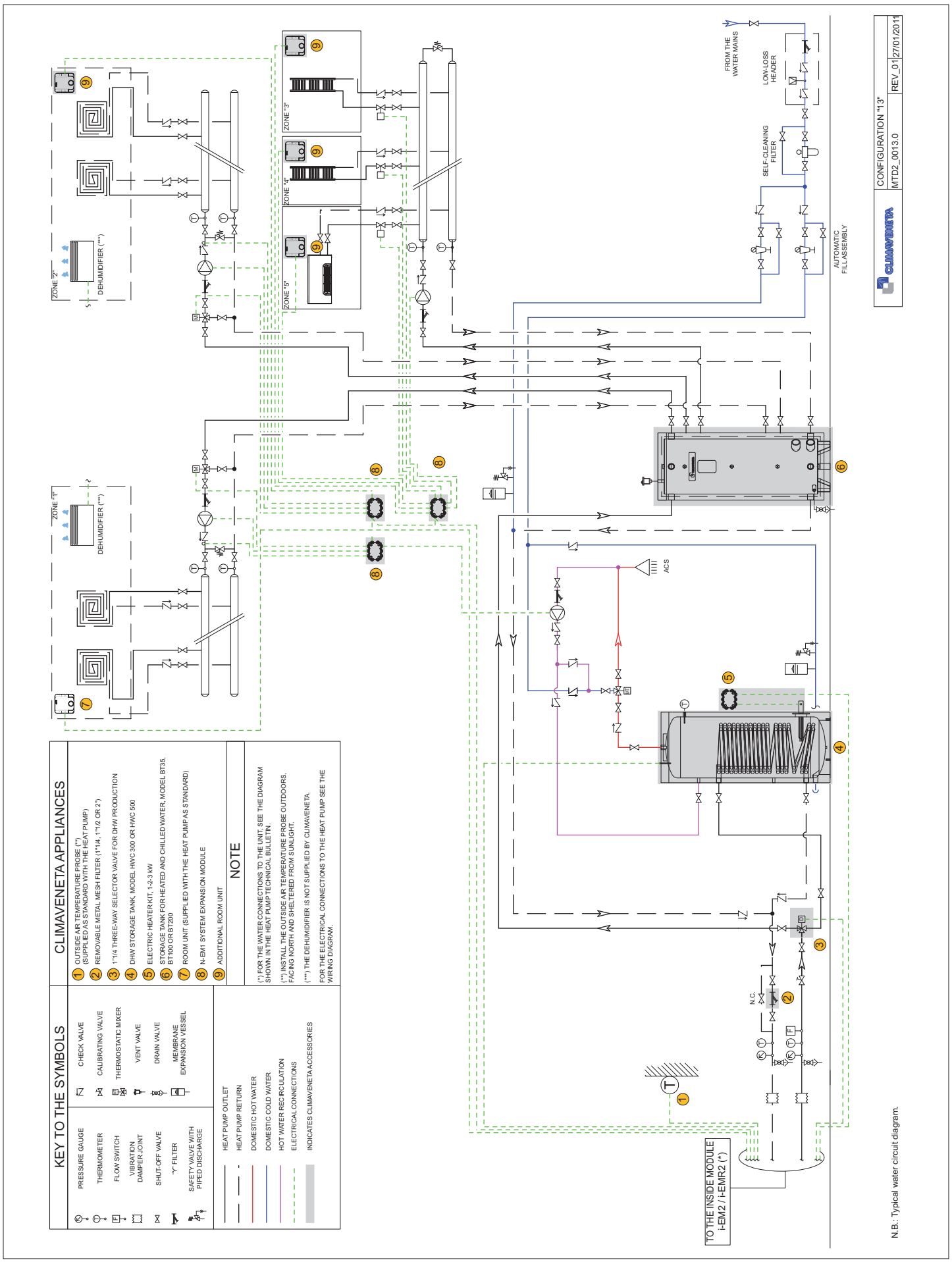
WATER CIRCUIT DIAGRAM

Configuration number 12 (parameter 0101= 12)



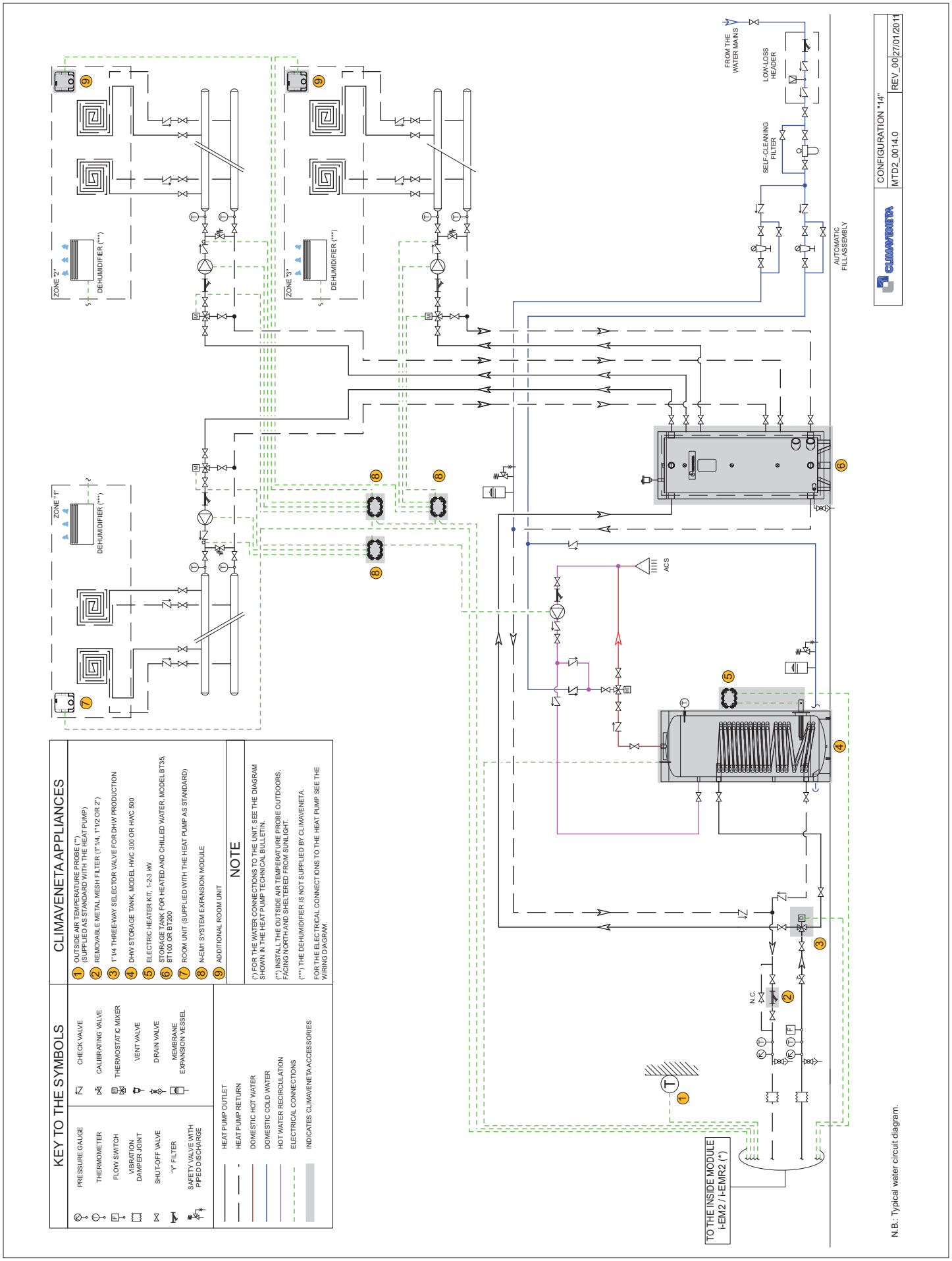
WATER CIRCUIT DIAGRAM

Configuration number 13 (parameter 0101= 13)



WATER CIRCUIT DIAGRAM

Configuration number 14 (parameter 0101= 14)



Climaveneta S.p.A.
Via Sarson 57/c
36061 Bassano del Grappa (VI)
Italy
Tel +39 0424 509 500
Fax +39 0424 509 509
info@climaveneta.com
www.climaveneta.com

Climaveneta France
3, Village d'Entreprises
ZA de la Couronne des Prés
Avenue de la Mauldre
78680 Epône
France
Tel +33 (0)1 30 95 19 19
Fax +33 (0)1 30 95 18 18
info@climaveneta.fr
www.climaveneta.fr

Climaveneta Deutschland GmbH
Lyrenstraße 13
44866 Bochum
Germany
Tel +49 2327-95428-0
Fax +49 2327-95428-99
info@climaveneta.de
www.climaveneta.de

Climaveneta España - Top Clima
Londres 67, 1 4
08036 Barcelona
Spain
Tel +34 934 195 600
Fax +34 934 195 602
topclima@topclima.com
www.climaveneta.com

Climaveneta Chat Union Refrig. Equipment Co Ltd
88 Bai Yun Rd, Pudong Xinghuo
New dev. zone 201419 Shanghai
China
Tel 008 621 575 055 66
Fax 008 621 575 057 97

Climaveneta Polska Sp. z o.o.
Ul. Sienkiewicza 13A,
05-120 Legionowo,
Poland
Tel +48 22 766 34 55-57
Fax +48 22 784 39 09
info@climaveneta.pl
www.climaveneta.pl

Climaveneta Climate Technologies (P) Ltd
#3487, 14th Main, HAL 2nd stage,
Indiranagar, Bangalore 560008
India
Tel:+91-80-42466900 - 949,
Fax: +91-80-25203540
sales@climaveneta.in

Climaveneta UK LTD.
Highlands Road,
Shirley Solihull
West Midlands B90 4NL
Tel: +44 (0)871 663 0664
Fax: +44 (0)871 663 1664
Freephone: 0800 801 819
response@climaveneta.co.uk
www.climaveneta.co.uk