



k.Water

Controller for hydronic air conditioning systems



USER MANUAL



k.Water

+030220991 - ENG

Up to date version available on

www.carel.com

GENERAL WARNINGS



CAREL bases the development of its products on decades of experience in HVAC/R, on continuous investments in technological innovations to products, procedures and strict quality processes with in-circuit and functional testing on 100% of its products, and on the most innovative production technology available on the market. CAREL and its subsidiaries/affiliates nonetheless cannot guarantee that all the aspects of the product and the software included with the product respond to the requirements of the final application, despite the product being developed according to start-of-the-art techniques. The customer (manufacturer, developer or installer of the final equipment) accepts all liability and risk relating to the configuration of the product in order to reach the expected results in relation to the specific final installation and/or equipment. CAREL may, based on specific agreements, act as a consultant for the successful commissioning of the final unit/application, however in no case does it accept liability for the correct operation of the final equipment/system. The CAREL product is a state-of-the-art product, whose operation is specified in the technical documentation supplied with the product or can be downloaded, even prior to purchase, from the website www.carel.com. Each CAREL product, in relation to its advanced level of technology, requires setup/configuration/programming/commissioning to be able to operate in the best possible way for the specific application. Failure to complete such operations, which are required/indicated in the user manual, may cause the final product to malfunction; CAREL accepts no liability in such cases. Only qualified personnel may install or carry out technical service on the product. The customer must only use the product in the manner described in the documentation relating to the product. In addition to observing any further warnings described in this manual, the following warnings must be heeded for all CAREL products:

- prevent the electronic circuits from getting wet. Rain, humidity and all types of liquids or condensate contain corrosive minerals that may damage the electronic circuits. In any case, the product should be used or stored in environments that comply with the temperature and humidity limits specified in the manual;
- do not install the device in particularly hot environments. Too high temperatures may reduce the life of electronic devices, damage them and deform or melt the plastic parts. In any case, the product should be used or stored in environments that comply with the temperature and humidity limits specified in the manual;
- do not attempt to open the device in any way other than described in the manual.
- do not drop, hit or shake the device, as the internal circuits and mechanisms may be irreparably damaged.
- do not use corrosive chemicals, solvents or aggressive detergents to clean the device.
- do not use the product for applications other than those specified in the technical manual.

All of the above suggestions likewise apply to the controllers, serial cards, programming keys or any other accessory in the CAREL product portfolio.

CAREL adopts a policy of continual development. Consequently, CAREL reserves the right to make changes and improvements to any product described in this document without prior warning. The technical specifications shown in the manual may be changed without prior warning. The liability of CAREL in relation to its products is specified in the CAREL general contract conditions, available on the website www.carel.com and/or by specific agreements with customers; specifically, to the extent where allowed by applicable legislation, in no case will CAREL, its employees or subsidiaries/affiliates be liable for any lost earnings or sales, losses of data and information, costs of replacement goods or services, damage to things or people, downtime or any direct, indirect, incidental, actual, punitive, exemplary, special or consequential damage of any kind whatsoever, whether contractual, extra-contractual or due to negligence, or any other liabilities deriving from the installation, use or impossibility to use the product, even if CAREL or its subsidiaries/affiliates are warned of the possibility of such damage.

DISPOSAL



INFORMATION FOR USERS ON THE CORRECT HANDLING OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

The product is made up of metal parts and plastic parts. In reference to European Union directive 2002/96/EC issued on 27 January 2003 and related national legislation, please note that:

- WEEE cannot be disposed of as municipal waste and such waste must be collected and disposed of separately;
- the public or private waste collection systems defined by local legislation must be used. In addition, the equipment can be returned to the distributor at the end of its working life when buying new equipment;
- the equipment may contain hazardous substances: the improper use or incorrect disposal of such may have negative effects on human health and on the environment;
- the symbol (crossed-out wheeled bin) shown on the product or on the packaging and on the instruction sheet indicates that the equipment has been introduced onto the market after 13 August 2005 and that it must be disposed of separately;
- in the event of illegal disposal of electrical and electronic waste, the penalties are specified by local waste disposal legislation.

Warranty on materials: 2 years (from production date, excluding consumables).




Approval: the quality and safety of CAREL S.p.A. products are guaranteed by the ISO 9001 certified design and production system.

IMPORTANT



Separate as much as possible the probe and digital input cables from cables to inductive loads and power cables, so as to avoid possible electromagnetic disturbance. Never run power cables (including the electrical panel cables) and signal cables in the same conduits.

Key to the symbols:

-  **Important:** to bring critical issues to the attention of those using the product.
-  **Note:** to focus attention on important topics; in particular the practical application of the various product functions.
-  **Important:** this product is to be integrated and/or incorporated into the final apparatus or equipment. Verification of conformity to the laws and technical standards in force in the country where the final apparatus or equipment will be operated is the manufacturer's responsibility. Before delivering the product, Carel has already completed the checks and tests required by the relevant European directives and harmonised standards, using a typical test setup, which however cannot be considered as representing all possible conditions of the final installation.

Software class and structure: class A in accordance with IEC 60730-1

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1. Introduction

k.Water is a Carel controller programmed for the management of a hydronic air conditioning system. It works by sending the request for heating and cooling to the equipment, such as boilers, solar thermal panels and chillers/heat pumps, and by controlling different types of distribution circuits. The system comprises a main controller, available in the mini or large version, and up to four c.pCOe expansion cards, added depending on system complexity (number of inputs/outputs).

k.Water can manage the following maximum configuration:

- heating/cooling system: 2 boilers and 2 chillers/heat pumps, with ON/OFF or modulating operation;
- hot and cold water distribution system: 10 distribution circuits, with 12 different types available for each.

The system can be configured either manually, on the user terminal, with simple screens that guide the user step-by-step through the commissioning procedure, or using a software tool, which generates a configuration file that is then loaded onto the controller via the USB port or via FTP server.

The controller comes with:

- a built-in webserver, with standard graphic pages for complete interaction with the controller;
- Ethernet and serial ports, for allow communication with field devices or local and remote supervisors;
- BACnet® BTL certification listing (B-BC), certifying perfect interoperability with other devices that use the standard BACnet® protocol, both via TCP/IP and via serial.

Main functions:

- system and heating/cooling equipment frost protection;
- Legionella prevention;
- set point compensation based on outside temperature;
- fixed set point, sliding set point with climate curve (climate zones as defined by law in Italy), with influence of room temperature;
- request sent to the heating-cooling equipment based on temperature or capacity;
- solar thermal control with overheating protection for solar collectors and storage tanks;
- integration with k.Air controllers to serve hot/cold water coils on air handling units or heat recovery units;
- possibility to connect a touch screen user terminal, with simplified interface for system managers;
- energy consumption measurement by integrating e-meter energy meters.

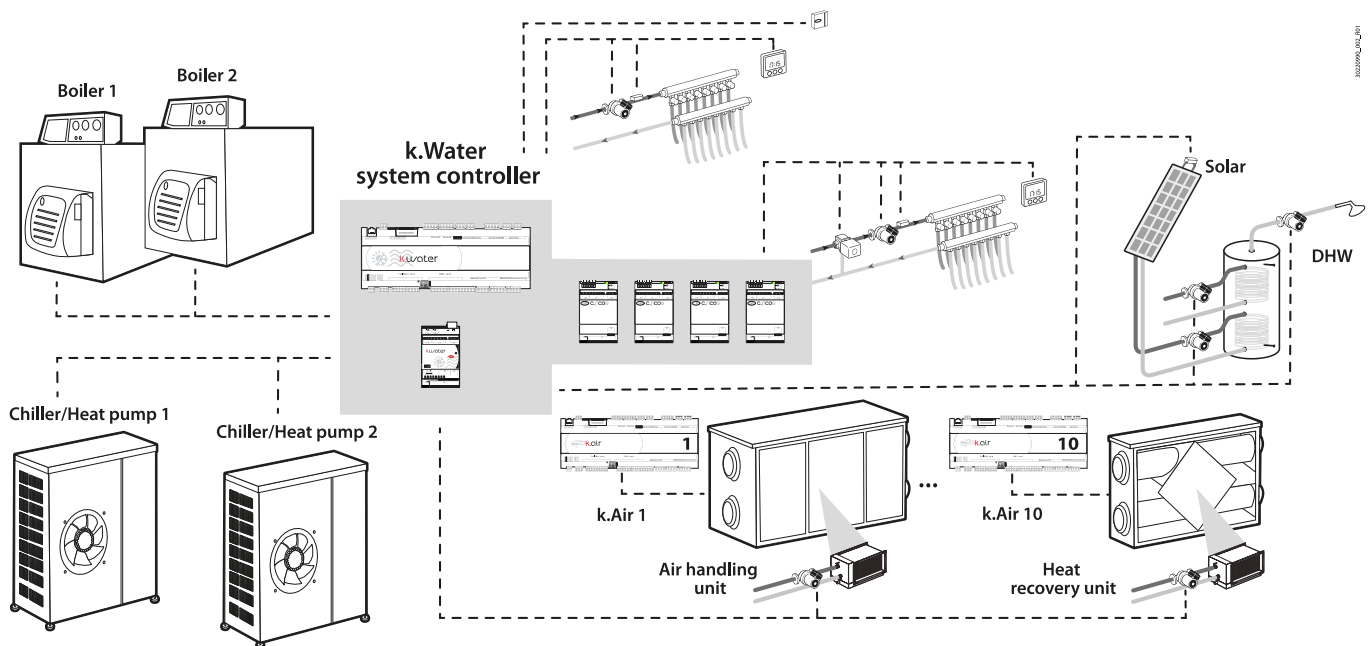


Fig.1.a

1.1 Architecture

kWater communicates via Ethernet with the pGDx terminal, the supervisor and the k.Air air handling unit controllers. 1 to 11 serial probes and 1 to 3 energy meters can be connected via RS485.

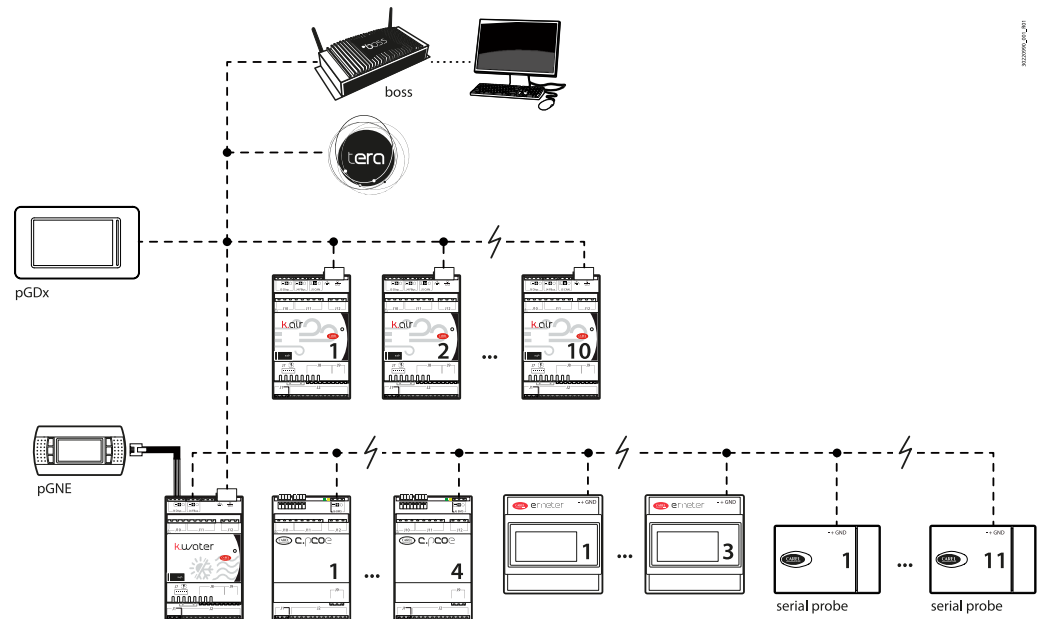


Fig.1.b

1.2 Accessories

1.2.1 c.pCOe expansion card

A maximum of four c.pCOe cards can be installed. Each card adds 10 universal inputs/outputs and 6 digital outputs to those on the kWater controller. See the technical leaflet + 05000591E for details on setting the network addresses.

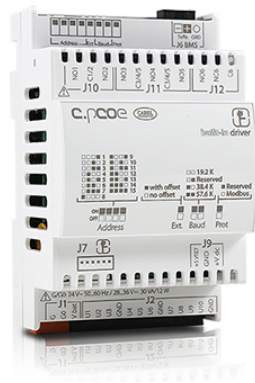


Fig.1.c

1.2.2 pGNE graphic terminal

The pGNE terminal features a 132x64 pixel display with white backlighting and a 6-button keypad, and is required for commissioning the system. It provides complete graphic management through icons (defined during application software development) and the management of international fonts in two sizes: 5x7 and 11x15 pixels. The application software resides on the controller only, and the terminal does not require any additional software during use.

Installation accessories:

- telephone connection cable for k.Water large P/N S90CONN00*;
- connection cable for k.Water mini P/N S90CONN050;
- junction card TCONN6J000 (technical leaflet +050002895).

See the technical leaflet +050001425.



Fig.1.d

1.2.3 pGDx touch terminal (4.3")

The 4.3" pGDx graphic terminal is part of the touch screen family, designed to make the user interface with k.Water controllers simple and intuitive. The electronic technology used and the 65K colour display enable management of high quality images and advanced features to ensure a high aesthetic standard. The touch screen display guarantees simple human-machine interaction, making it easier to browse between the various screens. The pGDx terminal can be used to fully browse the k.Water webserver, thus acting as a system terminal. In the version with built-in T/H probe, it can also act as a room terminal for a distribution circuit.



Fig.1.e

See the technical leaflet +050001895.

1.2.4 Electrical energy meter

Three-phase energy meter with removable front display unit. The device can be mounted either on a DIN rail or on a panel; it measures both active and reactive energy for cost allocation, and forwards the main electrical parameters.



Fig.1.f

See the technical leaflet +0500047ML, +0500048ML and the manual +0300044IE.

1.2.5 PT1000 temperature probe

Solar collector probe, suitable for high temperatures.

P/N	Type	Range
PT1060HT01	PT1000 HT IP67, L=6 m (10 pcs.)	-50 to 250°C

Tab.1.a



1.2.6 NTC temperature probe

➡ **Note:** for more information, see the passive probe user manual +030220655.

Contact NTC probes for measuring the temperature of water circuits.



Fig.1.g

P/N	Type	Range
NTC*HF*	10 kΩ 1% @ 25 °C, IP67	-50 to 105/50 °C (air/fluid in contact)

Tab.1.b

1.2.7 Immersion NTC probes for fluids



Fig.1.h

Electrical connector	P/N	Accessory
TSOPZCW030 (cable L = 3m)	TSN1300000	Socket TSOPZPT000 (screw-on)
TSOPZCM000 (cable supplied by installer)		Fitting TSOPZRT000 (weld)



Fig.1.i

P/N	Accessory
TSC1500030	Fitting TSOPZRV000
	(from M14 to 3/8" Gas, screw-on)
	Fitting TSOPZRS000 (M14, weld)



Fig.1.j

P/N	Socket
NTC*WH*	• 1413306AXX (nickel-plated brass)
	• 1413309AXX (AISI 316)



Fig.1.k

P/N	Compression fitting
NTC*WH*	1309589AXX

1.2.8 Active temperature and humidity probes for air

➡ **Note:** for more information, see the DP probe user manual +030220660.

Probes for measuring room and outside temperature and humidity.



Fig.1.l



Fig.1.m

P/N	Type	Range
DPWC112000	Wall-mounted temperature (0-10 V) / humidity (0-10 V) probe, room or outdoor	-10 to 60 °C/10 to 90% RH
DPUC110000	Outside temperature (NTC or 4-20 mA)/humidity (4-20 mA) probe	-35 to 70 °C/10 to 90% RH

Tab.1.c

1.2.9 Pressure probes

➡ **Note:** for more information see the technical leaflet: +050000598, +050000488, +050000486.



Fig.1.n



Fig.1.o



Fig.1.p

P/N	Type	Range
SPKT0053P0	0 to 5 V	-1 to 4.2 bars
SPKT0051S0	0 to 5 V	-1 to 4.2 bars (*)
SPKT0021C0	4 to 20 mA	-0.5 to 7 bars (*)

Tab.1.d

(*) for all types of liquid.

1.2.10 Flow sensor

Installer's responsibility.

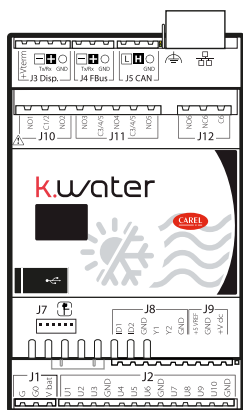
2. Communication ports

Note: see the CAREL manual +0300057EN for the hardware specifications of the serial ports. The k.Water controller manages the protocols on the serial ports shown in the table.

Serial	Type/connectors	Model	Specifications	Protocol
Ethernet	RJ45	k.Water mini	1 Ethernet port, 10/100 Mbps	TCP/IP
		k.Water Large	2 Ethernet ports, 10/100 Mbps (100-BASE TX), both equivalent	
ZERO	J3 Disp.	k.Water mini	Integrated on main board	pLAN
ZERO	pLAN/J10, J11	k.Water Large	HW driver: asynchronous half duplex RS485 pLAN Not optically-isolated Connectors: telephone jack + four-pin pull-out (four-pin pull-out only for k.Water mini)	
THREE	J6 BMS	k.Water mini	Integrated on main board	Modbus Slave
	BMS 2 / J25	k.Water Large	HW driver: asynchronous half duplex RS485 Slave Optically-isolated serial port Three-pin plug-in connector	
FOUR	J4 FBus	k.Water mini	Integrated on main board HW driver: asynchronous half duplex RS485 Master.	Modbus Master
	FieldBus 2 / J26 and J23	k.Water Large	Integrated on main board	
			HW driver: asynchronous half duplex RS485 Master or Slave	
			J23: not optically-isolated	
			J26: optically-isolated	
			Three-pin plug-in connector	
		J23 and J26 are both managed by the same protocol as serial 4, with the advantage of being electrically independent		

Fig.2.a

k.Water mini



2.1 Architecture and network addresses

Example of a system comprising 1 kWater mini controller, 2 c.pCO_e expansion cards and 10 kAir controllers. See the "Commissioning" section for details on setting the network addresses.

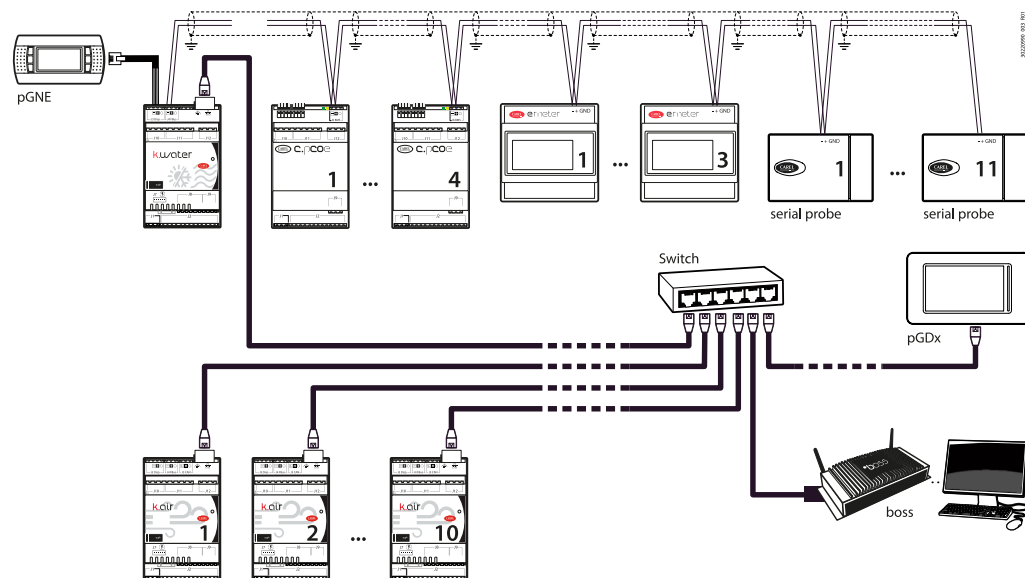


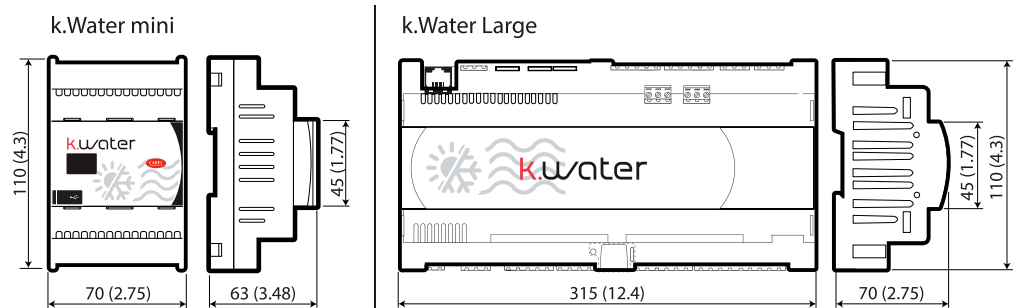
Fig.2.c

➡ **Note:** see menu Fe for the serial port communication parameters (protocol, baud rate, stop bits, parity).

3. Installation

3.1 Assembly and dimensions - mm (inches)

The controllers are mounted on a DIN rail.



pGNE

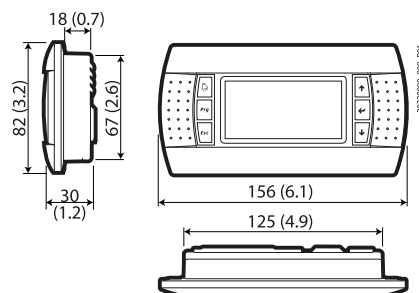


Fig.3.a

pGDx

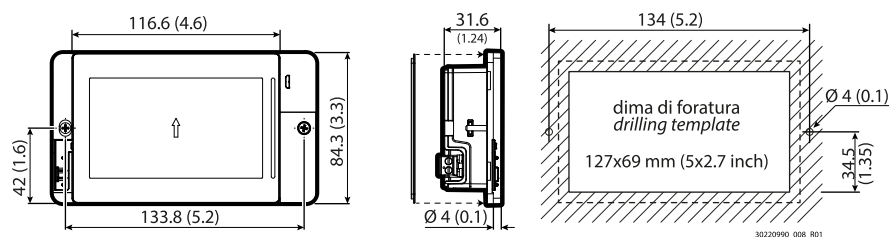


Fig.3.b

➤ **Note:** the pGNE and pGDx terminals have the same drilling template.

3.2 Installation

Environmental conditions

Avoid installing the controller and terminal in environments with the following conditions:

- exposure to direct sunlight and the elements in general;
- temperature and humidity outside of the values allowed for the operation of the product (see the component technical leaflets for the "Technical specifications");
- wide and rapid fluctuations in ambient temperature;
- strong magnetic and/or radio frequency interference (thus avoid installation near transmitting antennae);
- strong vibrations or knocks;
- in the presence of explosives or flammable gas mixtures;
- exposure to aggressive and polluting atmospheres (e.g.: sulphur and ammonia gases, saline mist, smoke) which may cause corrosion and/or oxidation;
- exposure to dust (formation of corrosive patina with possible oxidation and reduction of insulation);
- exposure to water.


Positioning the controller inside the panel

The controller must be installed inside an electrical panel and must not be accessible, to avoid impact. The position in the electrical panel must be chosen so as to guarantee correct physical separation from the power components (solenoids, contactors, actuators, inverters, ...) and the connected cables. The ideal solution is to house these two circuits in two separate cabinets. Proximity to such devices/cables may create random malfunctions that are not immediately evident. The structure of the panel must allow the correct flow of cooling air.

Important:

- for safety reasons, the equipment must be housed inside an electrical panel so that the only accessible parts are the display and the keypad on the built-in terminal;
- the controller must be installed in such a way as to simplify operations on the disconnection devices;
- when wiring, separate as much as possible the probe, digital input and serial line cables from the power device cables (contactors, circuit breakers and the like) to avoid possible electromagnetic disturbance;
- never run power cables (including the electrical cables) and probe signal cables in the same conduits;
- for the control signals, it is recommended to use shielded cables with twisted wires. If the controller cables have to cross over the power cables, the intersections must be as near as possible to 90 degrees, always avoiding running the controller cables parallel to the power cables;
- reduce the path of probe cables as much as possible, and avoid spiral paths that enclose power devices;
- in the event of any malfunctions, do not attempt to repair the device, rather contact a CAREL service centre.

Electrical installation

 **Important:** before carrying out any maintenance, disconnect the controller from the power supply by moving the main system switch to "off".

Provide a power disconnect device in compliance with current regulations. Use cable ends suitable for the corresponding terminals. Loosen each screw and insert the cable ends, then tighten the screws. There is no limit to the number of wires that can be inserted into a single terminal. The maximum torque for tightening the terminal screws is 0.6 Nm. For the maximum length of the connections of the analogue/digital inputs and the analogue outputs, see the table of technical specifications in the c.pCO manual. For environments with strong disturbance, it is recommended to use shielded cables with the shield connected to the earth in the electrical panel. When the operation is completed, slightly tug the cables to check they are sufficiently tight.

Note:

- fix the cables connected to the controller using cable ties, placed around 3 cm from the connectors;
- if the power supply transformer secondary is earthed, make sure that the earth wire is connected to the wire that runs to the controller and is connected to terminal G0. Follow this instruction for all devices connected to controller via the serial network.

Important:

- a power supply voltage other than that specified may seriously damage the system;
- the fuse must be located near the controller;
- installation and maintenance/inspection of the controller are operations reserved exclusively for qualified technical personnel, in compliance with current national and local regulations;
- all of the extra low voltage connections (24 Vac or 28-36 Vdc analogue and digital inputs, analogue outputs, serial bus connections, power supplies) must have reinforced or double insulation from the mains network;
- avoid touching or nearly touching the electronic components fitted on the boards to avoid electrostatic discharges (extremely damaging) from the operator to the components;
- do not exert excessive force with the screwdriver on the connectors to avoid damaging the controller;
- if the device is used in a way not specified by the manufacturer, the protection provided may be compromised;
- only install optional cards and connectors supplied by Carel.

3.2.1 c.pCOe expansion card installation

See the technical leaflet +0500059IE.

3.3 Electrical connections

Ethernet network

Connections:

- use CAT-5 STP shielded cables;
- always make the earth connection using the male spade connector near the Ethernet connectors;
- the maximum length of an Ethernet connection is 100 m between devices;

RS485 network

To improve the controller's immunity to electromagnetic disturbance, the serial connection cable must be a shielded twisted pair, two-core or three-core depending on the insulation of the serial port. The following rule applies:

- if the serial port is (functionally) isolated from the power supply, a third connection wire is required in the serial cable, as a common reference for the controllers. If the serial port is not optically-isolated and the common reference is already available, the third wire is not used.

For the RS485 network, use a twisted pair cable with the specifications shown in the table.

Master device	HW	Lmax (m)	Capacity wire/wire (pF/m)	Resistance on first and last device	Max no. slave devices on bus	Data rate (bit/s)
k.Water mini						
FBUS	RS485	2/500 (unshielded/shielded AG24)	< 90	120 Ω	64	19200
PC			< 90	120 Ω	207	38400
k.Water Large						
FBUS	RS485	1000	< 90	120 Ω	64	19200
PC		1000	< 90	120 Ω	207	38400

⚡ **Note:** for Master-Slave networks the maximum allowed length is 1000 m; 120 Ω 1/4W terminating resistors on the first and last devices in the network must be used when the length exceeds 100 m.

For further information, see the c.pCO manual +0300057EN.

3.3.1 Terminal connection

k.Water mini

Use the accessory cable P/N S90CONN050, as shown in the figure. The maximum distance allowed between controller and terminal is 10 m.

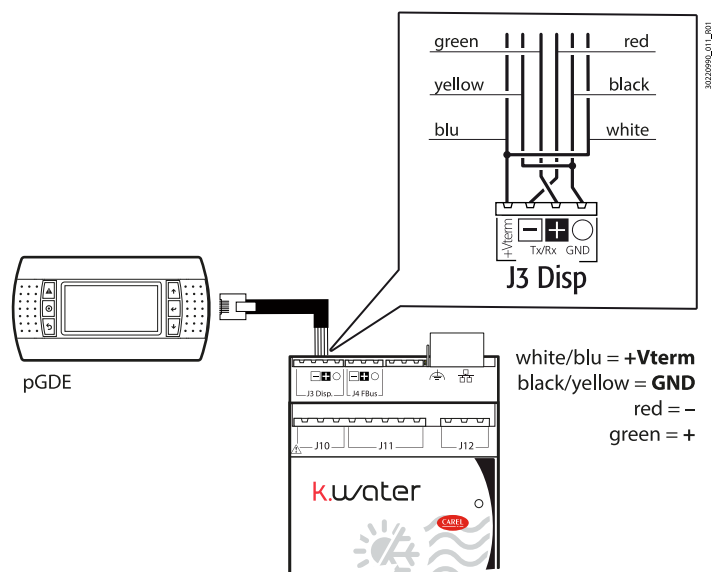


Fig.3.c

k.Water Large

See manual +0300057EN.

3.3.2 Input/output labelling

The k.Water controllers differ in size and are equipped with inputs and outputs and provide power to active probes in accordance with the various applications.

The following specifications depend on the model:

- maximum number and type of inputs/outputs;
- optically-isolated Fieldbus ports;
- type of interfaces.
- Bacnet license, B-BC enabled

Label	Signal type
	Universal inputs/outputs, configurable via software as:
	Analogue inputs:
	- NTC , PTC, PT1000 probes
	- 0-1 Vdc or 0-10 Vdc signals
	- 0/4-20 mA signals
U...	- 0-5 V signals for ratiometric probes
	Digital inputs (not opto-isolated):
	- voltage-free contacts (not opto-isolated)
	- fast digital inputs
	Analogue outputs (not opto-isolated):
	- 0-10 Vdc signals
Y...	0-10 Vdc analogue outputs, PWM outputs
ID...	24 Vac/24 Vdc digital input
ID...H	230 Vac digital input
NO...	Relay output, normally-open contact
NC...	Relay output, normally-closed contact
C...	Relay output, common
Tx/Rx, GND	Serial port

Label	Signal type
	Ethernet port
	Functional earth

Tab.3.a

3.3.3 I/O table

		k.Water controllers						c.pCOe I/O expansion card					
		mini		Large		Label	In/Out	Type	Basic - c.pCOe		Label	In/Out	Type
Universal inputs/ outputs	NTC input	10		10		U	In	Universal I/O	10		U	In	Universal I/O
	PTC input	10		10		U	In	Universal I/O	10		U	In	Universal I/O
	PT1000 input	10		10		U	In	Universal I/O	10		U	In	Universal I/O
	0-1 Vdc/0-10 Vdc input (power to controller)	0		max tot 10	max 6	U	In	Universal I/O	0		U	In	Universal I/O
	0-1 Vdc/0-10 Vdc input (power to external devices)	10 (Note 1)			10	U	In	Universal I/O	10 (Note 1)		U	In	Universal I/O
	0-20 mA/4-20 input (power to controller)	max tot 4	max 2 (Note 2)	max tot 9	max 6	U	In	Universal I/O	max tot 4	max 2 (Note 2)	U	In	Universal I/O
	0- 20 mA/4- 20 input (power to external devices)		max 4		max 9	U	In	Universal I/O		max 4	U	In	Universal I/O
	0-5 V input for ratiometric probe (+ 5Vref)	max 2		max 6		U	In	Universal I/O	2		U	In	Universal I/O
	Digital inputs with voltage-free contacts	10		10		U	In	Universal I/O	10		U	-	Universal I/O
	Fast digital inputs	max 2		max 6		U	In	Universal I/O	max 2		U	-	Universal I/O
	0-10 Vdc output, not opto-isolated	max 5		10		U	Out	Universal I/O	max 5		U	-	Universal I/O
	PWM output, not opto-isolated	10		10		U	Out	Universal I/O	10		U	-	Universal I/O
	max tot 10		max tot 10					max tot 10					
Digital inputs	24 Vac/Vdc input, opto-isolated	0		14		ID	In	Digital input	0		ID	In	Digital input
	24 Vac/Vdc or 230 Vac (50/60 Hz) input	0		4		ID	In	Digital input	0		ID	In	Digital input
	Voltage-free contacts	2		-		ID	In	Digital input	0		ID	In	Digital input
		max tot 2		max tot 18					max tot 0				
Analogue outputs	0-10 Vdc output, opto-isolated	0		6		Y	Out	Analogue output	0		Y	Out	Analogue output
	0-10 Vdc output, not opto-isolated	2		0		Y1, Y2	Out	Analogue output	0		Y1, Y2	Out	Analogue output
	PWM output, opto-isolated	0		2		Y3, Y4	Out	Analogue output	-		-	-	
	PWM output, not opto-isolated	2		0		Y1, Y2	Out	Analogue output	0		Y1, Y2	Out	Analogue output
	Unipolar stepper motor output	1		0		J7	Out	Analogue output	0		J7	Out	Analogue output

		k.Water controllers					c.pCOe I/O expansion card			
		mini	Large	Label	In/Out	Type	Basic - c.pCOe	Label	In/Out	Type
	Bipolar stepper motor output	0	0	1-3-2-4	Out	Analogue output	0	-	-	-
		max tot 2	max tot 6				max tot 0			
Digital outputs	NO/NC relay output	1	5	NO/NC	Out	Digital output	1	NO/NC	Out	Digital output
	NO relay output	5	13	NO	Out	Digital output	5	NO	Out	Digital output
		max tot 6	max tot 18				max tot 6			
		20	52				16	Total I/Os		

Tab.3.b

➔ **Note 1:** CAREL probes P/N DP**Q and DP****2 can only be used with an external power supply and not powered by cPCOMini.

➔ **Note 2:** except for CAREL probes P/N DP**Q and DP****2.

		k.Water controllers					c.pCOe I/O expansion card			
		mini	Large	Label	In/Out	Type	Basic - c.pCOe	Label	In/Out	Type
Terminal power supply		0	1	J10			0	--		Telephone jack (pLAN) J10
		1	0	J3 Disp			0			J3 Disp, display port
		1	1	+Vterm			0			Additional terminal power supply
Probe power supply		1	1	+VDC			1			Power supply to active probes
		1	1	+5 Vref			1			Ratiometric probe power supply
Analogue output power supply		0	1	VG, VG0			0			
Integrated Fieldbus port		1	2	J23/J26, J4 (mini)			0			
Accessory Fieldbus ports		0	1	BMS card			0			
Integrated BMS ports		0	1	J25, J6 (Mini)						
Accessory BMS ports		0	1	BMS card						
USB host ports		1	1				0			
USB slave ports		1	1				0			
Ethernet		1	2				0			

Tab.3.c

3.4.1 k.Water Large, k.Water mini, cpCOe



Ref.	Description
9	ID...: digital inputs with voltage A (*) IDH...: digital inputs with voltage B (**)
10	Telephone jack for terminal
11	Plug-in terminal network connector
12	Reserved
12a	Reserved
13	Ethernet connector 1
14	Ethernet connector 2
15	Relay digital outputs
16	BMS2 connector
17	FieldBus2 connector
18	FieldBus/BMS selection dipswitches
19	FieldBus2 connector
25	USB host ports (master)

Ref.	Description	Ref.	Description
8	ID: digital inputs with voltage A (*)	26	USB device port (slave)
8a	Type: digital inputs with voltage-free contacts	27	Spade connector for Ethernet port earth
		29	μSD Slot

➤ **Nota:** (*) Voltage A: 24 Vac or 28-36 Vdc; (**) Voltage B: 230 Vac - 50/60 Hz.

3.5 System configuration

k.Water is a flexible controller, as it can manage different types of systems, from simple heating/cooling to more complex systems. The first prerequisite for commissioning the system is a project defined based on the map of the system being controlled: the inputs and outputs can be assigned freely. Indeed, there are no fixed positions for probes, actuators, pumps, alarms, etc. and these can be assigned manually to any of the available inputs/outputs, depending on the type of signal used. For example, an NTC probe can be assigned to the first available universal input, while a 0-10 Vdc modulating control signal for a valve can be assigned either to a universal input/output or to an analogue output, as desired, based on availability on the card used. The controller size and number of expansion modules required are defined by the user based on the list of inputs/outputs or other system requirements (e.g. remote actuator position with reference to the main controller). Alternatively, the selection and configuration software tool can be used to determine, based on the system, the number of controllers required, optimising the inputs and outputs. The system is defined as the sum of individual base units. Activation of the individual units enables the configuration of a series of inputs/outputs and makes specific control functions available.

3.5.1 Production

The heating/cooling equipment may be:

- combustion appliances (boilers, max 2).
- reverse-cycle electrical appliances (heat pumps/chillers, max 2 in total);

Each heating/cooling appliance can operate in stand-alone mode or based on the maximum demand from the distribution circuits, with different control logics.

➤ **Note:**

- k.Water does not replace the control boards on the heating/cooling appliances, rather it simply control the pumps and sends the request signals;
- DO = digital output, AI = analogue input, DI = digital input, AO = analogue output.

BOILER

Signal type	Function	Note
DO	Activation signal	On/Off, from k.Water to boiler
DI	Remote enabling signal	from external selector to k.Water digital input
AI	Inlet temperature probe	for monitoring
AI	Outlet temperature probe	for monitoring or control
AO	Modulating control signal	0-10V modulating signal relating to capacity (0-100%) or temperature (minimum set point-maximum set point)
DI	Unit feedback/alarm	
DO	Pump 1 control signal	Pump group management (2 in rotation + 1 backup) with corresponding status or alarm signal
DO	Pump 2 control signal	
DO	Pump 3 control signal	
DI	Pump 1 feedback/alarm	
DI	Pump 2 feedback/alarm	

Signal type	Function	Note
DI	Pump 3 feedback/alarm	

CHILLER/HEAT PUMP

Signal type	Function	Note
DO	Activation signal	On/Off, from k.Water to chiller/heat pump
DI	Remote enabling signal	from external selector
AI	Inlet temperature probe	for monitoring
AI	Outlet temperature probe	for monitoring or control
DI	Unit feedback/alarm	
DO	Cooling/heating changeover	
DO	Comfort/economy set point changeover	
AO	Modulating control signal	0-10V modulating signal relating to capacity (0-100%) or temperature (minimum set point-maximum set point)
DI	Unit feedback/alarm	
DO	Pump 1 control signal	Pump group management (2 in rotation + 1 backup) with corresponding status or alarm signal
DO	Pump 2 control signal	
DO	Pump 3 control signal	
DI	Pump 1 feedback/alarm	
DI	Pump 2 feedback/alarm	
DI	Pump 3 feedback/alarm	

Fig.3.f

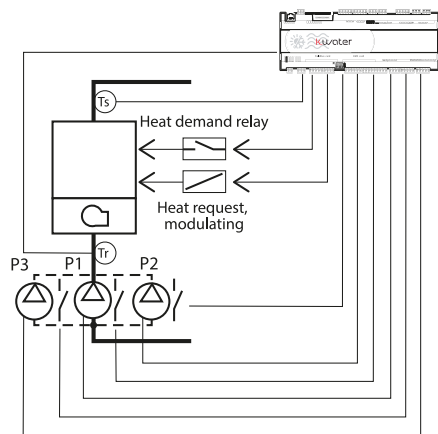


Fig.3.g

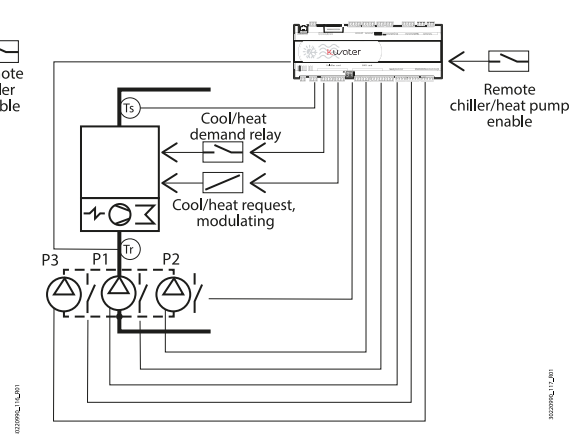


Fig.3.h

Ref.	Description
P1, P2, P3	Boiler/chiller/heat pump pumps
Ts	Outlet probe
Tr	Inlet probe

Tab.3.d

3.5.2 Distribution

A maximum of 10 distribution circuits can be configured, selected from 12 different types. The control of each circuit involves the following inputs/outputs (maximum configuration):

Signal type	Function	Note
DI	Remote enabling signal	
AI	Main probe	for control
AI	Secondary probe	for control or monitoring
AI	Auxiliary probe	for monitoring
AI	Outside temperature probe	for climate compensation
AO	0-10 V/2-10 V reference modulating signal	Modulating signal to control a mixing valve or variable-speed pump or (alternatively) 2 digital outputs for opening/closing the 3-position valve
DO	3-position valve: open	
DO	3-position valve: close	
DO	Pump 1 control signal	
DO	Pump 2 control signal	
DO	Pump 3 control signal	
DO	Dehumidifier (only for direct plus and mixed plus circuits)	
DI	Pump 1 feedback/alarm	
DI	Pump 2 feedback/alarm	
DI	Pump 3 feedback/alarm	

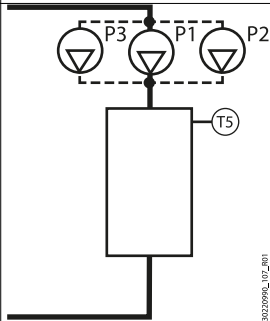
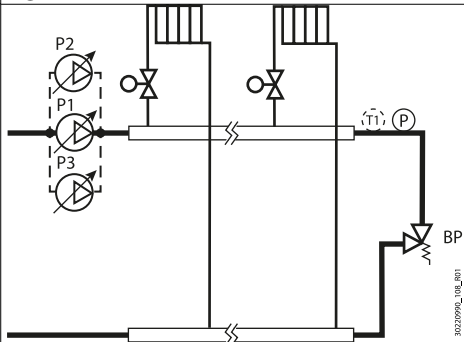
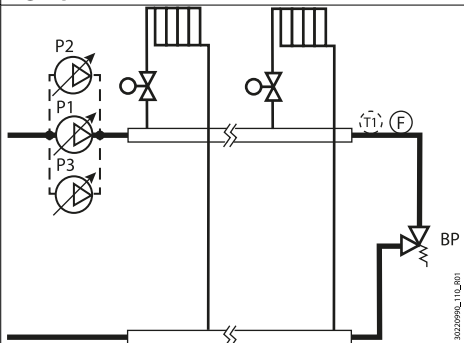
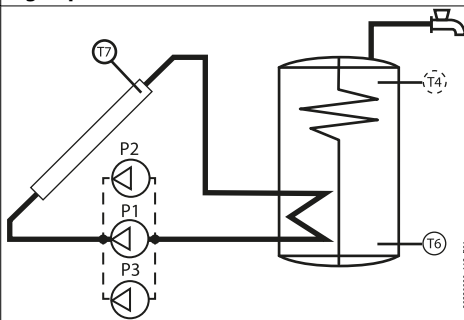
The type of circuit can be chosen from 12 predefined layouts, which represent some of the most common system functions. Each circuit enables specific control functions.

1. Direct
2. Direct Plus
3. Mixed
4. Mixed Plus
5. DHW distribution
6. DHW tank fill
7. Generic tank fill
8. Pressure control
9. Flowrate control
10. Solar thermal
11. kAir service
12. Constant delta temperature

➔ **Note:** in the following layouts, the optional probes are shown with dashed lines.

No.	Figure	Name	Activation	Control probe (mandatory)	Main control functions
1	<p>Fig.3.i</p>	Direct	<ul style="list-style-type: none"> Scheduler Remote input 	---	See par. "On/Off programming"
2		Direct plus	<ul style="list-style-type: none"> Scheduler Remote input Heating/cooling operating mode 	Room temperature probe	<ul style="list-style-type: none"> ON/OFF from room temperature Dehumidifier control (with H3) <p>See pars. "Heating" and "Cooling".</p>

No.	Figure	Name	Activation	Control probe (mandatory)	Main control functions
3	Fig.3.j Fig.3.k	Mixed	<ul style="list-style-type: none"> Scheduler Remote input Heating/cooling operating mode 	Outlet temperature probe	<ul style="list-style-type: none"> Fixed point Climate control Climate control with compensation based on room temperature set point Dewpoint control (with T3, H3) See par. "Heating" and "Cooling".
4	 Fig.3.l	Mixed plus	<ul style="list-style-type: none"> Scheduler Remote input Heating/cooling operating mode 	Outlet + room temperature probe	<ul style="list-style-type: none"> Fixed point Climate control Climate control with compensation based on room temperature set point Dewpoint control Dehumidifier control (with H3) Floating control See pars. "Heating" and "Cooling".
5	 Fig.3.m	Domestic hot water distribution (recirculation)	<ul style="list-style-type: none"> Scheduler Remote input 	DHW recirculation probe	Fixed point See par. "DHW distribution".
6	 Fig.3.n	Domestic hot water (DHW) tank fill	<ul style="list-style-type: none"> Scheduler Remote input 	Tank temperature probe	Fixed point See par. "DHW tank fill".

No.	Figure	Name	Activation	Control probe (mandatory)	Main control functions
7	 <p>Fig.3.o</p>	Generic tank fill	<ul style="list-style-type: none"> Scheduler Remote input 	Tank temperature probe	Fixed point See par. "Other types of control".
8	 <p>Fig.3.p</p>	Pressure control	<ul style="list-style-type: none"> Scheduler Remote input 	Pressure probe	Fixed point See par. "Other types of control".
9	 <p>Fig.3.q</p>	Flowrate control	<ul style="list-style-type: none"> Scheduler Remote input 	Flow sensor	Fixed point See par. "Other types of control".
10	 <p>Fig.3.r</p>	Solar thermal	<ul style="list-style-type: none"> Scheduler Remote input Heating/cooling operating mode 	Solar collector probe + tank bottom probe	Differential control (collector temperature-tank temperature) See par. "DHW (domestic hot water) production".

No.	Figure	Name	Activation	Control probe (mandatory)	Main control functions
11	<p>Fig.3.s</p>	k.Air service(*)	<ul style="list-style-type: none"> Scheduler Remote input from k.Air 	---	k.Air call See par. "Start-up requests" and "k.Air service".
12	<p>Fig.3.t</p>	Constant delta temperature	<ul style="list-style-type: none"> Scheduler Remote input Heating/cooling operating mode 	Outlet + inlet temperature probe	Differential control (outlet temperature-inlet temperature) See par. "Other types of control".

Ref.	Description	Ref.	Description	Ref.	Description
P1, P2	Circuit pumps	H3	Room humidity	T8	DHW distribution (recirculation) probe
P3	Backup pump	T4	DHW tank top temperature	HC/CC	Heating/cooling zone circuit
T1	Outlet temperature	T5	Tank temperature	BP	Bypass valve
T2	Inlet temperature	T6	DHW tank bottom temperature		
T3	Room temperature	T7	Solar collector temperature		

➡ **Note (*):**

k.Water controls the heating/cooling of the coils managed by k.Air controllers.

3.6 Functional diagrams

3.6.1 Example 1

3 mixed heating/cooling circuits

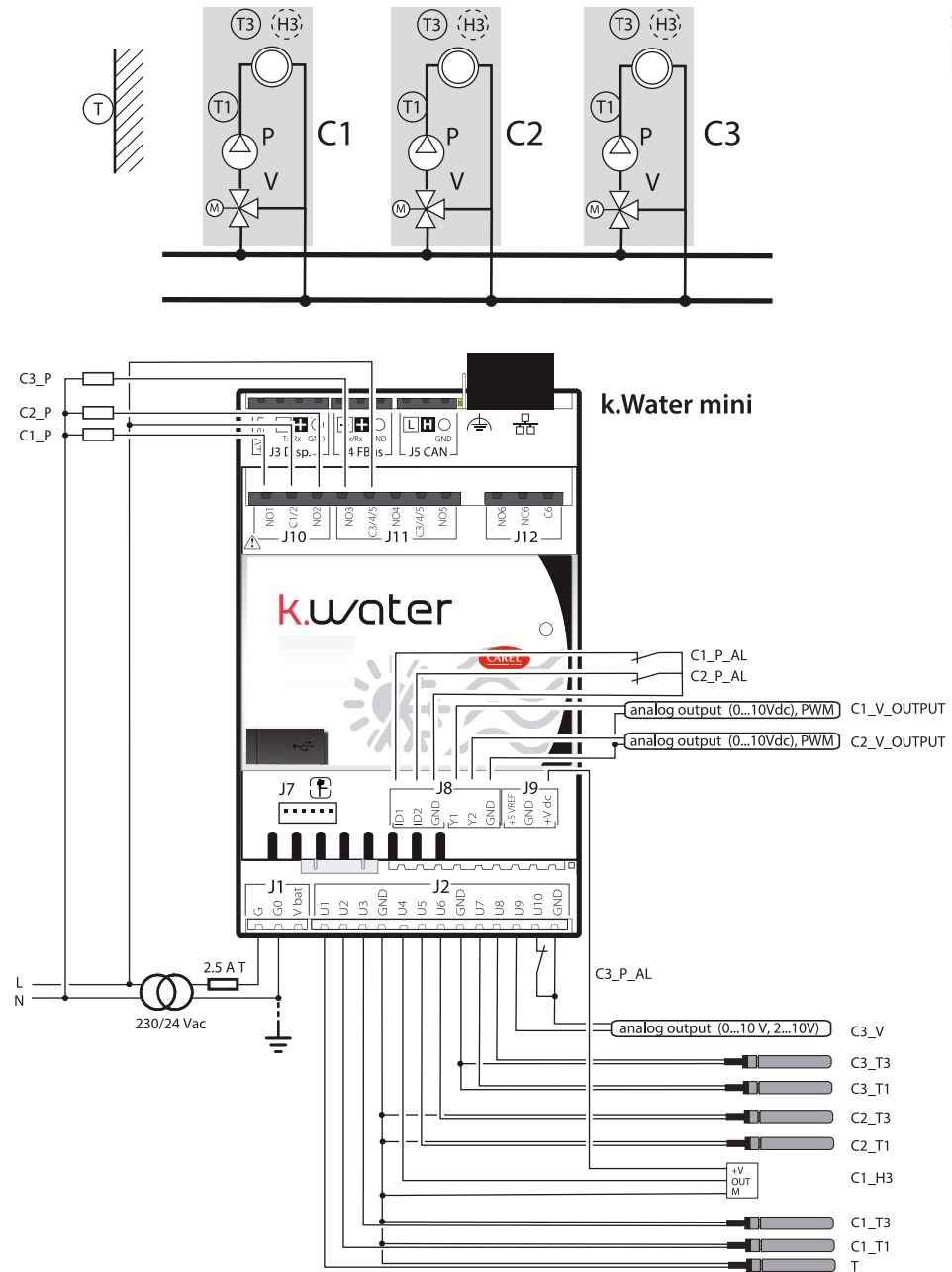


Fig.3.u

Ref.	Description	Ref.	Description	Ref.	Description
T	Outside temperature	C1/C2/C3	Mixed plus circuit 1/2/3	H3	Room humidity (optional)
T1	Outlet temperature	AL	Alarm	V	Mixing valve

3.6.2 Example 2

1 boiler, 2 mixed plus circuits, DHW production and distribution, solar thermal

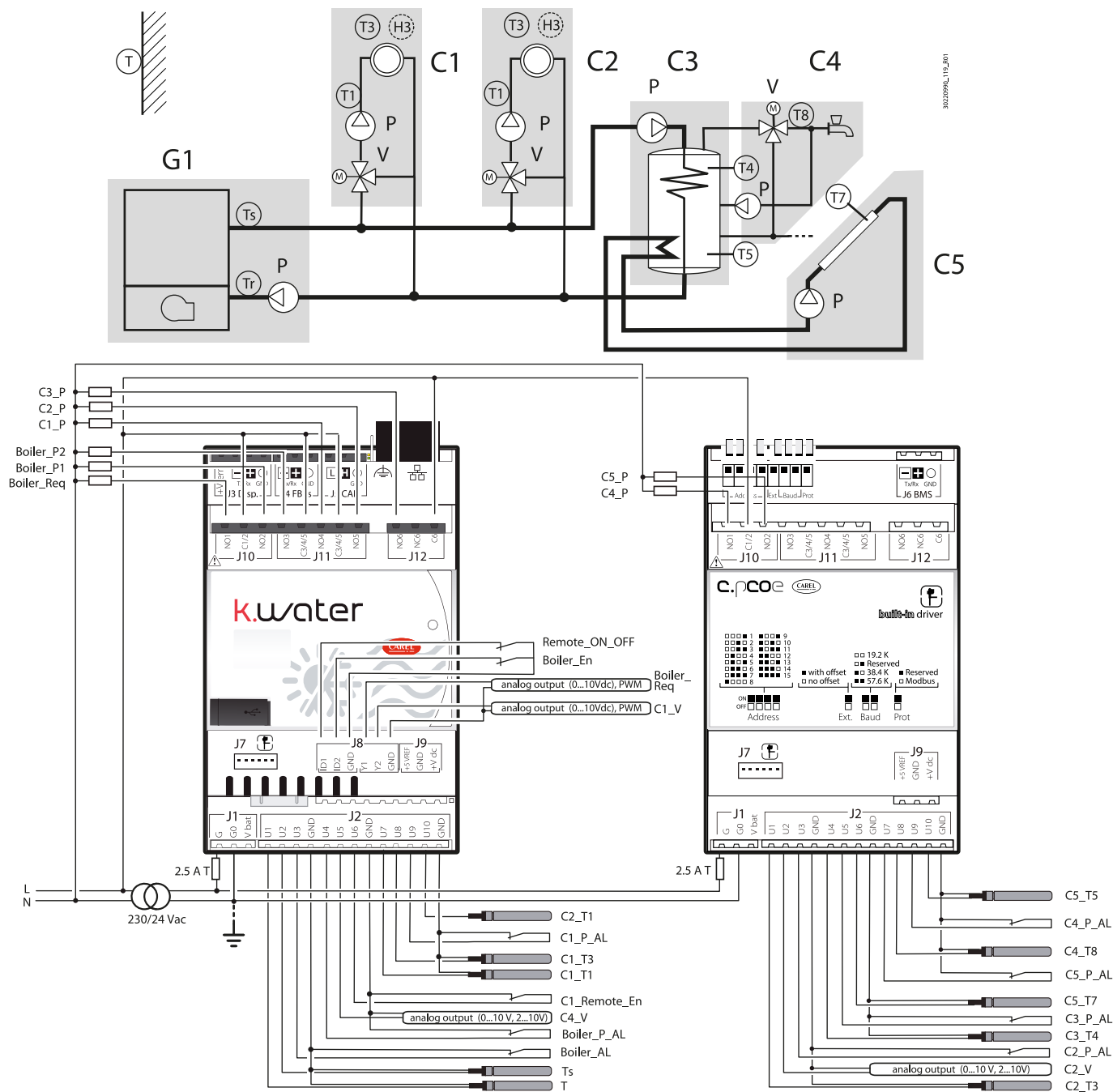


Fig.3.v

Ref.	Description	Ref.	Description	Ref.	Description
T	Outside temperature	Ts	Boiler outlet temperature	T3	Room temperature
T1	Circuit outlet temp.	Tr	Boiler inlet temperature	H3	Room humidity
C1/C2	Mixed plus circuit 1/2	T4/T5	Tank top/bottom temperature	T7	Solar collector temperature
G1	Boiler	C3	DHW tank fill	T8	DHW distribution (recirculation) probe
C4	DHW recirculation	C5	Solar thermal	AL	Alarm

3.6.3 Example 3

1 boiler, 1 reverse-cycle electrical heating/cooling appliance, 2 mixed circuits, DHW production and distribution, solar thermal

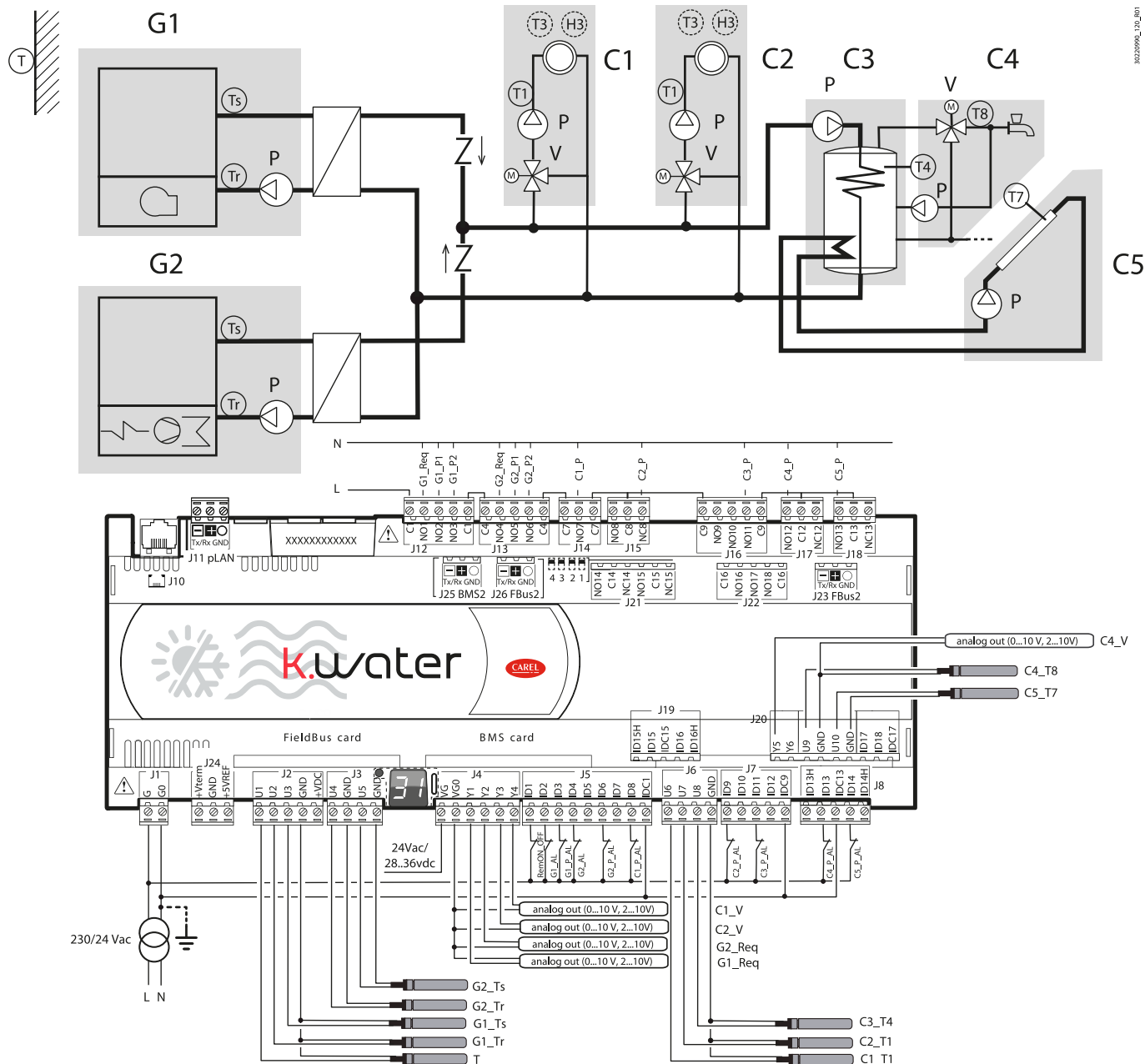


Fig.3.w

Ref.	Description
T	Outside temperature
T1	Circuit outlet temp.
C1/C2	Mixed plus circuit 1/2
G1	Boiler
G2	Reverse-cycle heat pump
AL	Alarm

Ref.	Description
C3	DHW tank fill
C4	DHW recirculation
C5	Solar thermal
Ts	Heating/cooling appliance outlet temperature
Tr	Heating/cooling appliance inlet temperature

Ref.	Description
T4	Tank top temperature
T3	Room temperature
H3	Room humidity
T7	Solar collector temperature
T8	DHW distribution (recirculation) probe

4. User interface

4.1 Graphic terminal

The pGNE graphic terminal comprises a display and 6-button keypad for configuring and programming the system. The pGDx terminal, available as an accessory, is intended for system managers, once commissioning has been completed using the pGNE terminal.

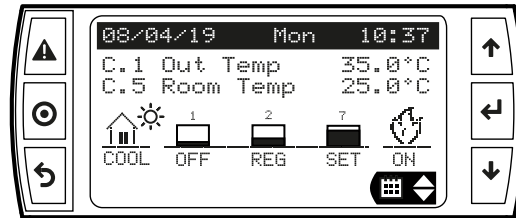


Fig.4.a: pGNE

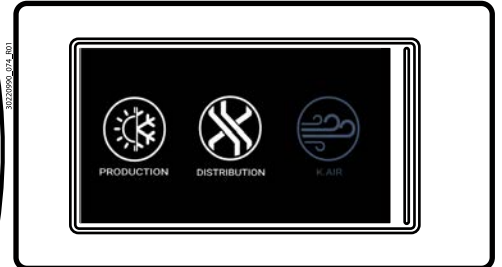







Fig.4.b: pGDx

Note: nonetheless, the pGDx can be used, in the service profile, to view the pGNE terminal screens and to commission the system.

4.1.1 Keypad

Fig.4.c

BUTTON	DESCRIPTION
 Alarm	<ul style="list-style-type: none"> Display active alarms/mute buzzer Reset alarms with manual reset (press and hold)
 Prg	Access the main menu
 Esc	Return to the previous screen
 Up / Down	<ul style="list-style-type: none"> Scroll quick-access menu rows Browse between display screens Increase / decrease value
 Enter	<ul style="list-style-type: none"> Select quick-access menu row Switch from parameter display to setting mode Confirm value and move to the next parameter

Tab.4.a

4.1.2 Display

During normal operation, the display shows, in addition to the current date and time, two system variables, the operating mode, the number of zone circuits that are off (OFF), being controlled (REG) and that have reached the set point (SET).

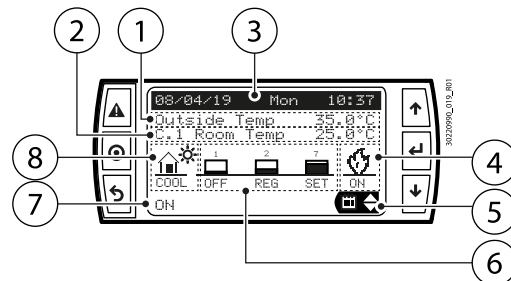


Fig.4.d

Key

1	Variable 1 on display
2	Variable 2 on display (C.1 = circuit 1)
3	Current date/time
4	Type of appliance:
	: chiller
	: heat pump/boiler
5	Quick-access menu button icon
	: heat pump/chiller/boiler
6	Number of circuits off (OFF), being controlled (REG) and that have reached the set point (SET).
7	Current system status
8	Operating mode
	/ = Cooling/Heating

➡ **Note:** the variables on the display can be selected on screen Ba11.

4.1.3 Current system status

State	Description	Status	Description
ON	Operating	OFF BY DI	Off from digital input
OFF BY BMS	Off by BMS	OFF BY KEYBOARD	Off from the keypad
OFF BY SCHED	Off by scheduler (time bands)	MANUAL MODE	Manual mode (heating/cooling appliances bypassed)
OFF BY K.AIR	Off by control signal from k.Air	ANTILEGIONELLA ON	Legionella prevention function active
		ANTIFREEZE ON	Frost protection function active

4.2
Programming
mode

The parameters can be modified using the keypad at the front. Access to the parameters depends on the level: User (password = 0000), Service (password = 1234) and Manufacturer (password = 5678). Press Prg to access the main menu.



Fig.4.e

Main menu icons and access by user type:

Ref.	Icon	Name	Access	Ref.	Icon	Name	Access
A.		On/Off	U, S, M	E.		Alarm log	U, S, M
B.		System configurations	M	F.		Other	S, M
C.		I/O configuration	M	G.		Logout	U, S, M
D.		Import/Export	S, M				

Note:

Each screen has a unique code, shown at the top right, comprising 4 characters:

1st character	2nd character	3rd character	4th character
Main branch	Secondary branch	progressive no.	

4.2.1 Setting the parameters

Note:

- the user, installer and manufacturer passwords can be changed on screen Fd01;
- for read (R) or read/write (R/W) access to each screen according to the type of user, see the parameters table.

Navigation

- Press Esc one or more times to go to the standard display;
- Press Prg and enter the password;



Fig.4.f

- To change from one programming level to another, exit using the Logout command in menu G and enter again using a different password;

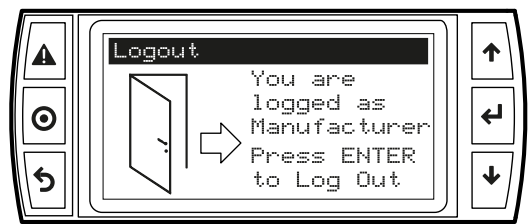


Fig.4.g

4. Select the parameter category (A-F) by pressing Up/Down;
5. Press Enter to enter the first submenu or the first screen;
6. Press Enter to set the first parameter on the screen: the cursor flashes in front of the first value to be set; press UP/DOWN to change the value and confirm by pressing Enter. Then move to the next parameter.

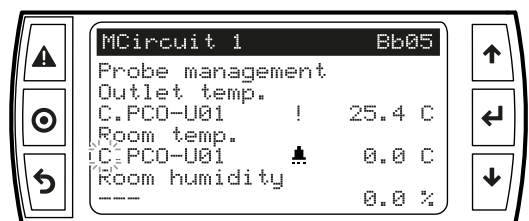


Fig.4.h

7. press Enter to return to the screen level, Esc to go back to the higher level if necessary and continue setting the parameters on the other screens, following steps 4-8.
8. press UP/DOWN to move to the following screens and repeat steps 4-8 for other changes;
9. press Esc one or more times to go back to the standard display.

➔ **Note:**

- the parameters that can be set are shown on the display in UPPER CASE;
- when assigning an input/output to an analogue probe/output, the exclamation mark (!) indicates that the input has already been assigned; the bell indicates that the input has not been enabled in menu C (Input/Output).

EXAMPLE 1: setting the date/time

1. Press Esc one or more times to go to the standard display;
2. Press Prg: after entering the password, the main menu is shown;
3. Press UP/DOWN and select category F: Other; press Enter to confirm;
4. Press UP/DOWN and select sub-category a: Date/time; press Enter to confirm;
5. Set the date: day, month, year;
6. Press Enter to confirm and set the hours, minutes and seconds;
7. When the settings are complete, press Esc three times to return to the standard display.

➔ **Note:** when setting the time, the clock on the display stops, even if the clock inside the controller continues counting.

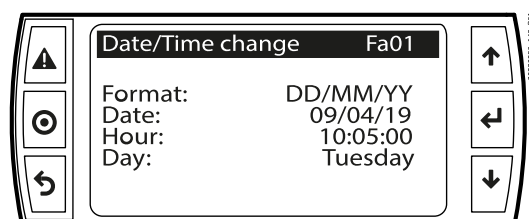
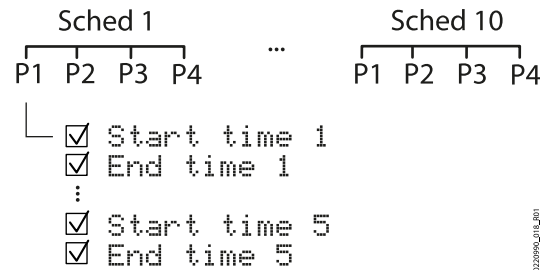


Fig.4.i

4.3 On/Off programming

4.3.1 Daily schedules

The system allows 10 daily schedules to be set, each with 4 programs (P1-P4) and each of these with 5 on/off time bands. Each time band can be assigned Off, Economy or Comfort mode.



Note: on/off programs can be assigned to appliances and zone circuits.

Access screen Qc04 to select the scheduler and the program, and then the next two screens to set the time bands and the operating mode.

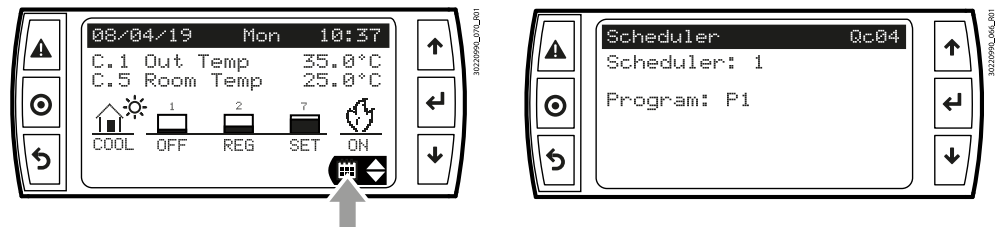


Fig.4.j

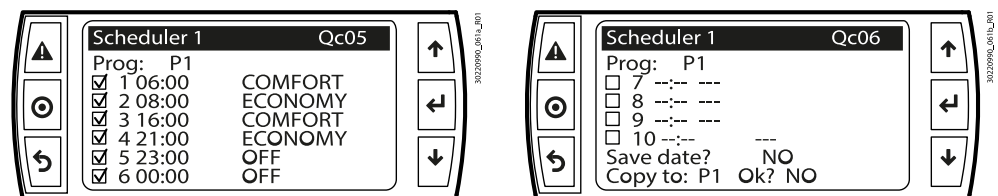


Fig.4.k

4.3.2 Weekly schedules

For each schedule (Scheduler 1-10), a program can be assigned for each day of the week, selecting between: Off, Economy, Comfort, Program 1-4.

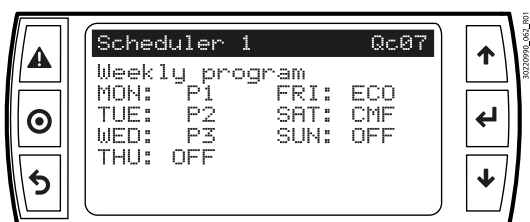


Fig.4.l

4.3.3 Heating/cooling appliance schedules

Access screen Qc03 to assign a schedule to the heating/cooling appliances (1-10/H24)

- chiller;
- heat pump;
- boiler.

The current status of each heating/cooling appliance is shown on the right.

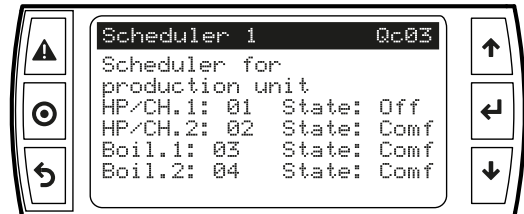


Fig.4.m

4.3.4 Distribution circuit schedules

The current mode of a zone circuit depends on the schedule and the holiday and special day settings.

Circuit schedules:

access screen Qc01 to assign a schedule to zone circuits 1-10. The current status of the circuit is shown in the status column.

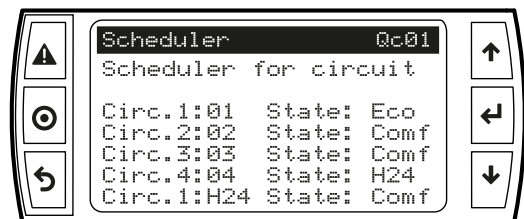


Fig.4.n

Holidays:

Note:

- Holiday scheduling has priority over weekly schedules;
- a holiday period must be at least two days long.

To set holiday periods for a schedule:

1. access screen Qc04 and select the schedule (1-10);
2. press DOWN until reaching screen Qc08: up to three holiday periods and the corresponding operating modes can be assigned.

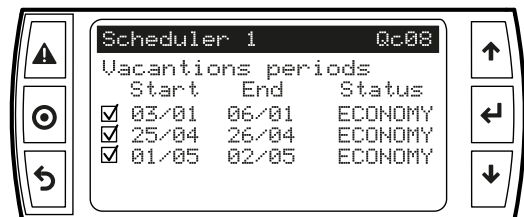


Fig.4.o

Special days:

Note: special day scheduling has priority over weekly and holiday schedules.

To set special days for a schedule:

1. access screen Qc04 and select the schedule (1-10);
2. press DOWN until reaching screens Qc09-Qc10: up to 15 special days and the corresponding operating modes can be assigned.

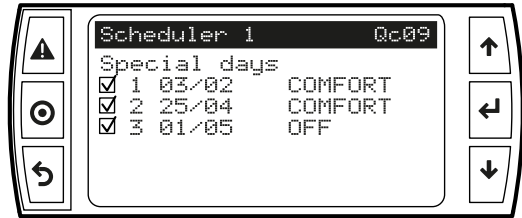


Fig.4.p

Summary chart

Scheduler 1...10

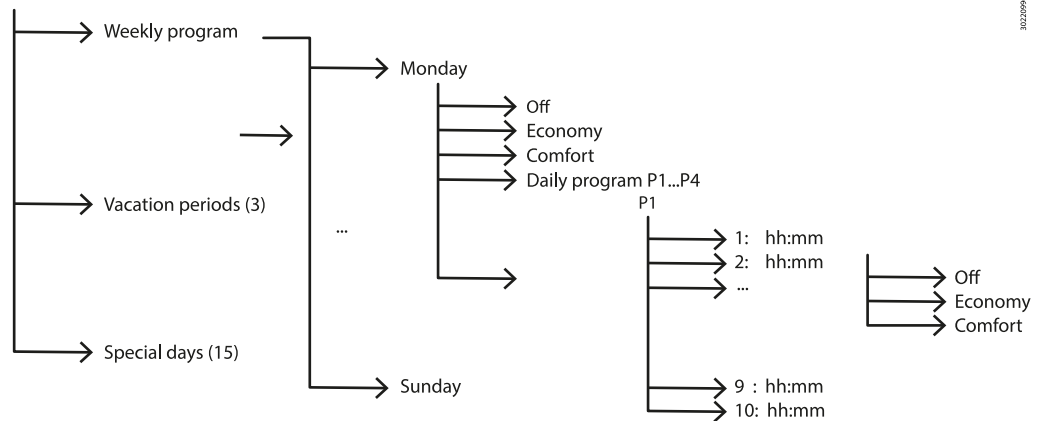


Fig.4.q

EXAMPLE

Circuit1: Scheduler 1--> P1

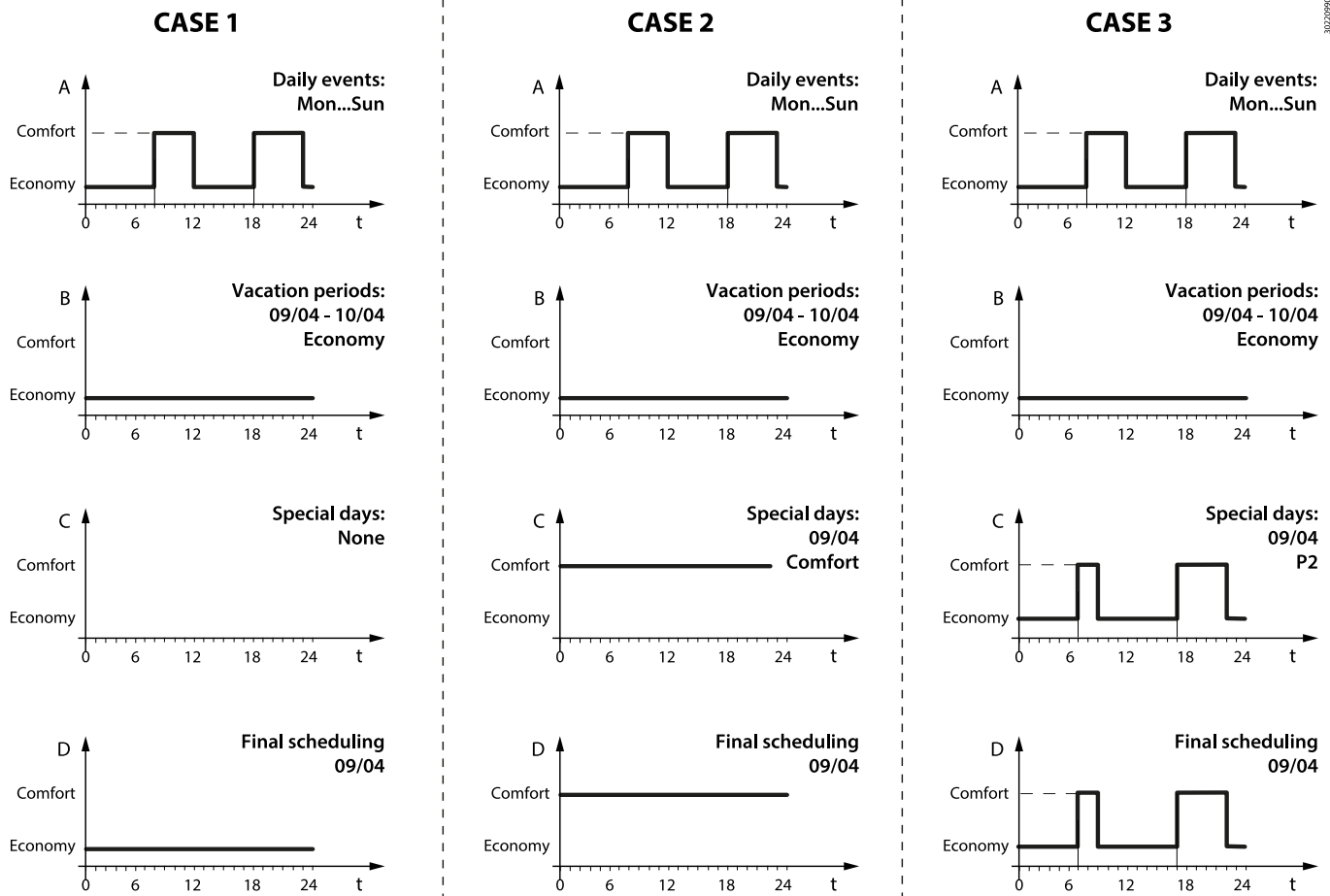


Fig.4.r

4.4 Quick access menu

Note: the quick access menu does not require a password (level = user).

The quick access menus provide instant access to unit information and settings.

Procedure:

1. Press ESC one or more times to go to the standard display;
2. Press UP/DOWN to display the icon relating to the desired quick access menu;

Icon			
	Info	Set point	Scheduler

3. Press Enter to enter the menu, UP/DOWN to navigate, ESC to exit.

4.4.1 Info

After the first screen, which displays information on:

1. Outside temperature;
2. Outside humidity;
3. Frost protection active (Yes/No);

the next screens show information on the appliances and zone circuits.

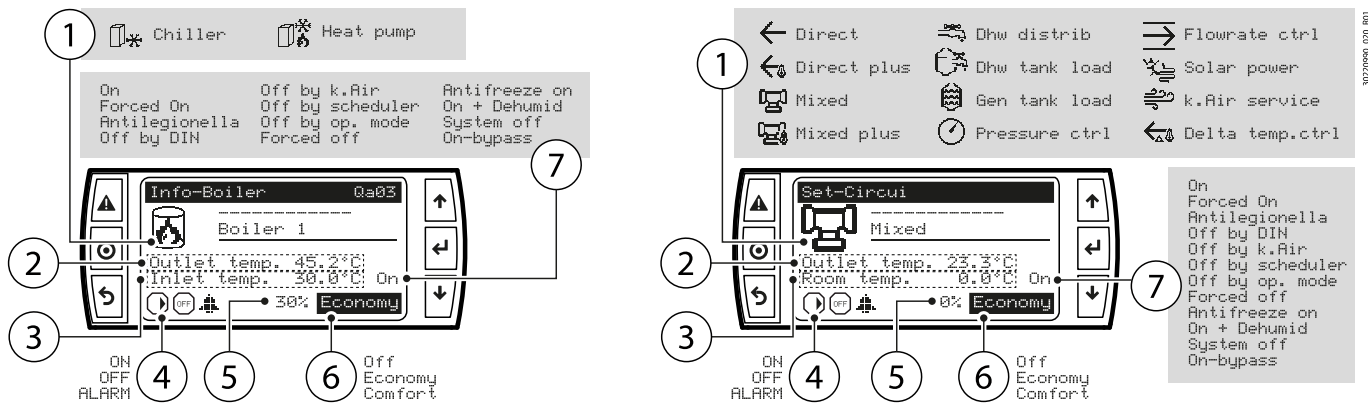


Fig.4.s

Ref.	Description	Ref.	Description
1	Heating/cooling appliance	1	Zone circuits
2	Main probe	2	Main probe
3	Secondary probe	3	Secondary probe
4	Pump 1/2/3 status (operating/off/alarm)	4	Pump 1/2/3 status
5	Request	5	Request
6	Appliance scheduler	6	Circuit scheduler
7	Appliance status	7	Circuit status

The next screens show information on the software version, operating hours and possible blackouts. After confirming screen Qa99, the I/O reading screens are shown.

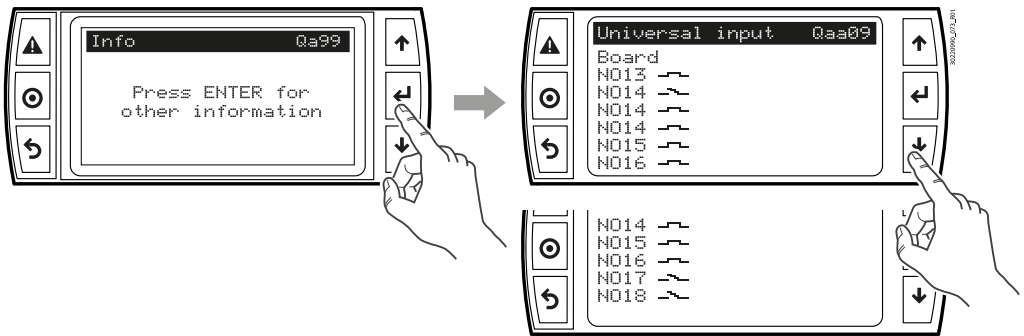


Fig.4.t

4.4.2 Scheduler

After the first screens, used to switch the zone circuits and appliances on and off, screen Qc04 is used to set programs P1-P4 for each scheduler, the holiday periods and special days. See "On/off programming".

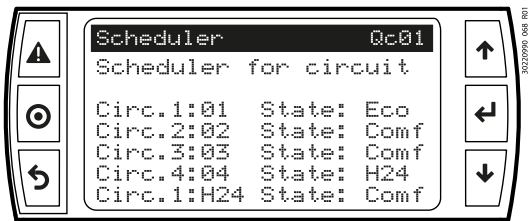


Fig.4.u

4.4.3 Set point

The set points for each distribution circuit - entered on screens B*20, B*44 and B*45 - can be displayed and set directly from the menu.

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M
B*20	Heating control						R	R	R/W
	Room/outlet set point						R	R	R/W
	Comfort	25.0	°C	0.0	99.9		R	R	R/W
	Economy	23.0	°C	0.0	99.9		R	R	R/W
	Differential	0.5	°C	0.0	9.9		R	R	R/W
	Outlet set point Fixed Climate Custom	Fixed	-	Fixed	Custom		R	R	R/W
B*44	Pressure control					Ba01/2: Pressure control			
	Set point	2.0	bar	0	9999.9		R	R	R/W
	High threshold	5.0	bar	0	9999.9		R	R	R/W
	Differential	1.0	bar	0	999.9		R	R	R/W
B*45	Flowrate control					Ba01/2: Flowrate control			
	Set point	10	m ³ /h	0	9999.9		R	R	R/W

Tab.4.b

(*) = b,..., m

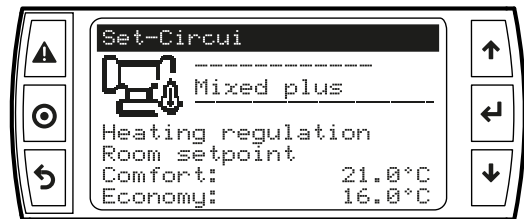















Fig.4.v

4.4.4 Menu tree

A.	ON/OFF		
B.	System configuration		
	a. General		
	b. Circuit 1		
	c. Circuit 2		
	d. Circuit 3		
	e. Circuit 4		
	f. Circuit 5		
	g. Circuit 6		
	h. Circuit 7		

	i.  /  Circuit 8	
	l.  /  Circuit 9	
	m.  /  Circuit 10	
	no.  /  Heat pump 1	
	o.  /  Heat pump 2	
	p.  /  Boiler 1	
	q.  /  Boiler 2	
C. 	I/O configuration	
D. 	Import / Export	
E. 	Alarm log	
F. 	Other	
	a.  Date/Time	
	b.  Unit of measure	
	c.  Language	
	d.  Change password	
	e.  Network	
	f.  Initialisation	
	g.  Work hours	
	h.  Manuals	
G. 	Logout	

 **Note:** if not enabled, the circuits, heat pumps/chillers/boilers show the  icon.

5. Commissioning

5.1 Software configuration

Once the heating/cooling appliances and the zone circuits that comprise the system and the active control functions have been defined, the controller can be configured in two possible ways:

- via configuration software running on a PC, which generates a .txt configuration file (figure, ref. A), to be uploaded onto the controller via USB flash drive (ref. B);
- manually, on the pGDN terminal.

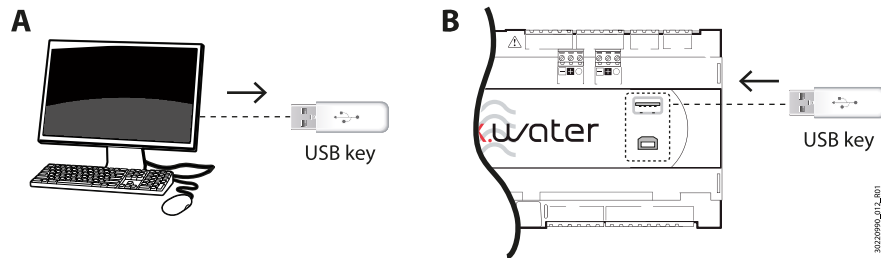


Fig.5.a: Configuration with software tool

Note: contact Carel for the configuration software.

5.1.1 Loading the configuration file

The software configuration tool provides a .txt file, called: "kWater_conf_XX" (XX = 00-99). To import the configuration from the USB flash drive onto the controller:

- go to screen D01 and select: Import -> USB -> File name;
- confirm.



Fig.5.b

Ref.	Display description	Def.	UOM	Min	Max	U	S	M
D01	Import/Export IMPORT EXPORT	-	-	IMPORT	EXPORT	R	R/W	R/W
	Memory type Internal flash memory USB	-	-	Internal flash memory	USB	R	R/W	R/W
	File name kWater_Conf_00..99	00	-	00	99	R	R/W	R/W
	Confirm: NO YES	NO	-	NO	YES	R	R/W	R/W

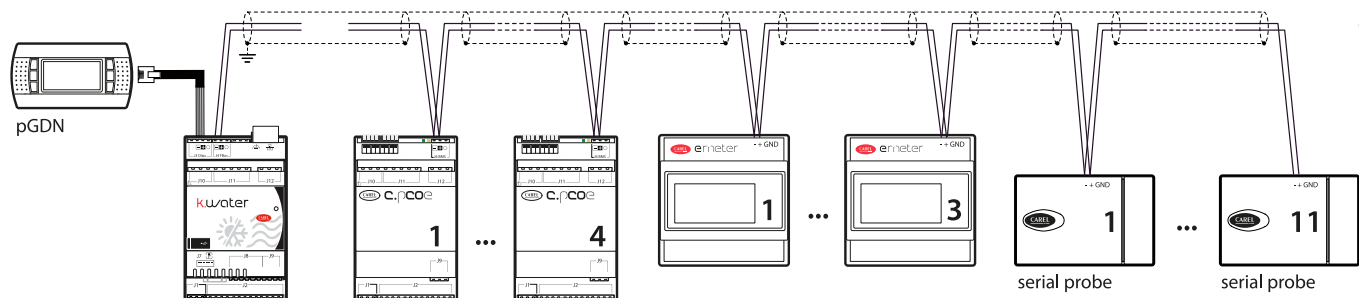
5.2 Manual configuration

5.2.1 Configuring devices connected via RS485 serial

The following devices can communicate with kWater via RS485:

- c.pCO_e expansion card;
- serial temperature/humidity probes;
- energy meters

⚠ Important: set a unique address for each device to avoid communication problems. See screens Fe corresponding to the communication parameters.



c.pCOe

The expansion cards cpCOe1 to c.pCOe4 have a fixed address (cannot be changed), respectively 1 to 4. Access the following screen to enable the expansion cards.

Ref.	Display description	Def.	UOM	Min	Max
Fe09	c.pCOe (Expansion board)				
	Enable c.pCOe				
	c.pCOe1 No Yes	No	-	No	Yes
	c.pCOe2 No Yes	No	-	No	Yes
	c.pCOe3 No Yes	No	-	No	Yes
	c.pCOe4 No Yes	No	-	No	Yes

⚙ Note: these addresses must be set manually using the dipswitches on the c.pCOe cards.

Serial probes

Set the number of devices used. The address of device 1 to 11 is 129 to 139 respectively and cannot be changed.

Ref.	Display description	Def.	UOM	Min	Max
Fe10	Enable serial probe				
	Number	0	-	0	11
	Modbus address start from	129	-	-	-

⚙ Note: the addresses must be set manually using the dipswitches on the serial probes.

Energy meters

Access the following screen to enable the devices. The software automatically assigns different addresses to each device, which can be changed subsequently.

Ref.	Display description	Def.	UOM	Min	Max
Fe11	Enable energy meters				
	Number	0	-	0	3
	Modbus address				
	Energy meter 1	21	-	0	255
	Energy meter 2	22	-	0	255
	Energy meter 3	23	-	0	255

⚙ Note: the addresses must be set manually on the front panel of the energy meters.

5.3 Enabling and configuring the inputs/outputs (I/O)

The first step in defining the hydronic system is to enable the inputs/outputs. The position of inputs/outputs can be assigned freely, and involves:

1. drawing a map of the overall system;
2. choosing: analogue inputs, digital inputs, analogue outputs to be enabled for each circuit.

For each universal input/output, specify:

1. whether it is on the main board or on the expansion cards;
2. the type of probe: passive (NTC, NTC high temperature), voltage input 0-1 V/0-10 V, ratiometric input with external power supply or from c.pCO, current input 4-20mA or 0-20 mA, digital input or analogue output;
3. minimum and maximum value read, offset;
4. filtering coefficient.

➡ **Note:** when assigning an input/output (for example in menu B) to a specific function, there are two possible cases:

- the selected input/output has already been assigned: the exclamation mark (!) is shown;
- the selected input/output has not been enabled (in menu C): the bell is shown (🔔).

Ref.	Display description	Def.	UOM	Min	Max
C01	Universal input/output configuration				
	MB (Mother board) E1 E2 E3 E4	-	-	MB	E4
	--- U1 U2 U3 U4 U5 U6 U72 U8 U9 U10	---	-	U1	U10
	Type --- NTC NTC-HT NTC-80 / PT1000 PTC-R 0...1V 0...10 V 0...5V c.pCO 0...5V Ext 0.5...4.5V 4...20 mA 0...20 mA DIN Aout	---	-	NTC	Aout
	Min	0.0	-	-9999.9	9999.9
	Max	100.0	-	-9999.9	9999.9
	Offset	0.0	-	-9999.9	9999.9
	Value used	-	-%	-	-
	Status: Open _/_ Closed ____	-			
	Filter:	5		0	9
	Error: -! 🔔	-			
C03	Aout configuration analogue output				
	MB (Mother board) E1 E2 E3 E4	-	-	MB	E4
	--- Y1 Y2 Y3 Y4 Y5 Y6	---	-	Y1	Y6
	Type --- 0...10 V	---	-	NTC	Aout
	Min	0.0	V	0.0	10.0
	Max	10.0	V	0.0	10.0
	Value	0.0	%	0.0	10.0
	Error: -! 🔔	-			

➡ **Note:** for analogue inputs, the measured value is displayed, while for the digital inputs the status is shown, open or closed. See menu Qaa.

5.4 Enable/configure heating/cooling appliances

5.4.1 Type of appliances

The following can be enabled (maximum configuration):

- 2 heat pumps/chillers (or 1 heat pump and 1 chiller);
- 2 boilers.

Ref.	Display description	Def.	UOM	Min	Max
	Electrical generator configuration				
Ba03	1: Disabled Chiller Heat pump	---	-	---	Heat pump
	2: Disabled Chiller Heat pump	---	-	---	Heat pump

Ref.	Display description	Def.	UOM	Min	Max
Ba04	Boiler enable				
	1: No Yes	No	-	No	Yes
	2: No Yes	No	-	No	Yes

5.4.2 I/O assignment for heating/cooling appliance

For each heating/cooling appliance, k.Water can manage:

- 1/2/3 pumps with corresponding outputs and alarm digital inputs;
- outlet and inlet probes;
- ON/OFF request signal;
- modulating request signal.

➔ **Note:** the modulating request signal to the heating/cooling appliance can be set as the highest request for each distribution circuit. See “Functions”.

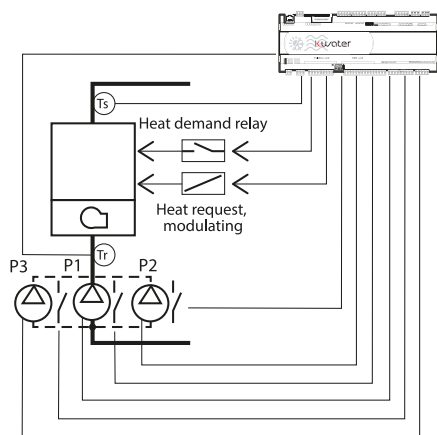


Fig.5.c

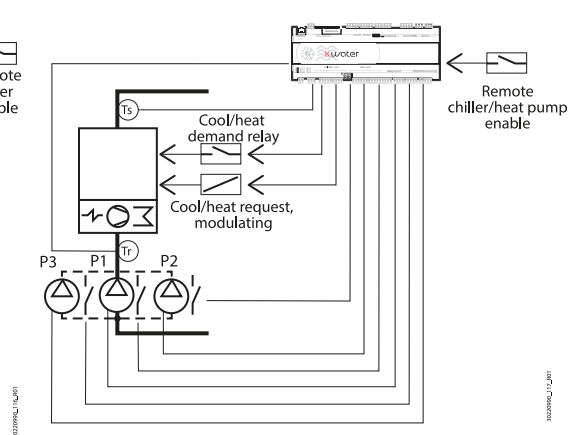


Fig.5.d

Ref.	Description
P1, P2, P3	Boiler/chiller/heat pump pumps
Ts	Outlet probe
Tr	Inlet probe







5.4.3 Outlet/inlet temperature probes

Configure the probes (already enabled in menu C) for each appliance outlet and inlet.

Ref.	Display description	Def.	UOM	Min	Max
Bn05/Bo05/ Bp05/Bq05	Chiller/heat pump/boiler 1/2				
	Probe management				
	Outlet temperature				
	c.pCO: U01...U10; SP_TEM_01...11	-	°C	-99.9	99.9
	c.pCOE1...E4: U01...U10				
	Inlet temperature See outlet temperature	-	°C	-99.9	99.9

5.4.4 Appliance pumps

Pump alarm input

Ref.	Display description	Def.	UOM	Min	Max
Electrical generator configuration					
Bn01	Chiller/heat pump 1				
	Number of pumps	0	-	0	3
Bn02	Pump alarm input				
	1: --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-		
	2: --- See 1:	-	-		
	3: --- See 1:	-	-		
	Signal Overload Feedback	Overload	-	Overload	Feedback
	Logic N.C. N.O.	N.C.	-	N.C.	N.O.

➡ **Note:** repeat the same procedure for Bo02, Bp02, Bq02.

An alarm signal can be set for each pump, so that with groups of 2 or 3 pumps, the controller stops the pump with the alarm and replaces it respectively with the second or third backup pump.

There are two types of alarm input:

- overload: when the alarm is active, the pump is stopped immediately and cannot be restarted. The alarm features automatic reset and no delay;
- feedback (signal received downstream of the pump): the alarm is activated 5 seconds after the pump activation signal. The pump can start even if the alarm signal is present, before stopping if the signal persists. The alarm is manually reset.

Output configuration:

Ref.	Display description	Def.	UOM	Min	Max
Bn03	Chiller/heat pump				
	Pump command output	0	-	0	3
	1: c.pCO: NO01...NO18; pCOE1...E4: NO01...NO06	OFF	-	OFF	ON
	2: See 1	OFF	-	OFF	ON
	3: See 1	OFF	-	OFF	ON
	Post circulation	0	min	0	999

➡ **Note:** repeat the same procedure for Bo03, Bp03, Bq03.

Pump post circulation is useful to protect the heating appliances from overheating when stopping heat production.

5.5 Outside temperature probe

Temperature probe

➔ **Note:** the value read by the outside temperature probe is necessary to enable functions such as climate compensation and set point compensation.

Ref.	Display description	Def.	UOM	Min	Max
Ba08	Outside temperature				
	Source	Input channel	-	Input channel	BMS
	Input channel k.Air Unit 1 ...10 BMS				

	c.pCO: U01...U10; SP_TEM_01...11	---	-	U01	U10
	c.pCOE1...E4: U01...U10				
	Value	--	°C	-99.9	99.9
	Average value	--	°C	-99.9	99.9
	Sampling time	60	s	1	300
	Average reset	--	-	--	RR
	-- RR				

➔ **Note:** the controller uses a filtered temperature value, based on the most recent samples acquired.

Humidity probe

The outside humidity probe is for monitoring only.

Ref.	Display description	Def.	UOM	Min	Max
Ba09	Outside humidity				
	Source				
	Input channel k.Air 1 ...10 BMS				
	Channel				

	c.pCO: U01...U10; SP_HUM_01...11 c.pCOE1...E4: U01...U10	---	-	U01	U10
	Value	-	%RH	0	100

5.6 Distribution circuits

5.6.1 Selection

➔ **Note:**

- for the type of distribution circuits that can be selected and the corresponding control probe, see "Installation".
- for details on control, see "Functions".

Access the following screens to select the distribution circuits.

Ref.	Display description	Def.	UOM	Min	Max
Ba01	Circuit configuration				
	1-5 --- Direct Direct plus Mixed Mixed plus DHW distribution DHW tank fill Gen. tank fill Pressure ctrl Flowrate ctrl Solar power k.Air service Constant delta temperature	-	-	Direct	Constant delta temp.
Ba02	Circuit configuration				
	6-10 --- Direct Direct plus Mixed Mixed plus DHW distribution DHW tank fill Gen. tank fill Pressure ctrl Flowrate ctrl Solar power k.Air service Constant delta temperature	-	-	Direct	Constant delta temp.

➡ **Note:** the control probe needs to be enabled and configured for each circuit. The optional probe is for monitoring only. See chap. "Installation".

5.6.2 Enable circuit components

➡ **Note:** the following explanations refer to circuit 1 on menus Bb01 to Bb50. The same also apply to circuits 2 to 10 on menus Bc01-Bc50, ..., Bm01-Bm50.

Pumps

For the enabled circuits, configure:

- 1/2/3 pumps with corresponding digital outputs and alarm digital inputs;
- analogue output (*) for modulating pumps, or
- modulating output for the mixing valve.

➡ **Note:** (*) the analogue output is shared between the pumps.

Ref.	Display description	Def.	UOM	Min	Max
Bb01	Circuit icon - Circuit description				
	Number of pumps	0	-	0	3
	Description	-----		0...0	Z...Z
Bb02	Circuit 1				
	Pump alarm input				
	1:				
	c.pCO: U01...U10; Din01...Din18	-	-		
	c.pCOE1...E4: U01...U10	-	-		
	2: see 1:	-	-		
	3: see 1:	-	-		
	Signal				
	Overload Feedback	Overload	-	Overload	Feedback
	Logic				
Bb03	N.C. N.O.	N.C.	-	N.C.	N.O.
	Pump command output	----	-	NO01	NO18
	1/2/3: c.pCO: NO01...NO18; c.pCOE1...E4: NO01...NO06				

➡ **Note:** the description of the circuit as entered is shown on the Info screens (Qa11, Qa13, ..., Qa29).

Pump protection functions

For each heating/cooling appliance and circuit, activate the anti-seize and pump rotation functions. See chap. "Functions".

Ref.	Display description	Def.	UOM	Min	Max
Bb04,..., Bm04	Circuit 1...10				
	Pump management				
	Anti-seize	No	-	No	Yes
	Rotation time	24	h	0	999
	Force rotation	No	-	No	Yes

Probes

Assign the probe inputs required for operation of the circuits.

Ref.	Display description	Def.	UOM	Min	Max
Bb05...Bm05	Circuit 1				
	Probe management				
	Outlet/room/tank temperature: c.pCO: U01...U10; SP_TEM_01...11; c.pCOE1...E4: U01...U10	-	°C	-99.9	99.9
	Room humidity: c.pCO: U01...U10; SP_HUM_01...11; c.pCOE1...E4: U01...U10	-	%RH	0	100
	Pressure/flowrate	-	bars; m3/h	-	-

➡ **Note:** if a probe is not used, leave the input as "----" (not assigned). Also see screens Bn05-Bq05 for the heating/cooling appliances.

Modulating output

The following can be controlled:

- modulating pumps with a (shared) signal: 0-10 V; 2-10 V;
- modulating valve with signal: 0-10 V; 2-10 V.

The 3-position valve is controlled by 2 digital outputs:

- 1 opening signal;
- 1 closing signal.

➡ **Note:** enter the stroke time for the 3-position valve, i.e. the time to move from the fully-closed position to the fully-open position.

Ref.	Display description	Def.	UOM	Min	Max
Bb06	Circuit 1				
	Modulating control				
	Output status	0.0	%	0.0	100
	Type 0...10 V; 2...10V; 3 Points	0...10 V	-	0...10 V	3 Points
	Channel: c.pCO: U01...U10; Y1...Y6; c.pCOE1...E4: U01...U10	U01	-	U01	Y6
	Valve stroke time:	180	s	0	600
	Open: c.pCO: NO01..NO18; c.pCOE1...4: NO01..NO06	---	-	NO01	NO18
	Closed: c.pCO: NO01..NO18; c.pCOE1...4: NO01..NO06	---	-	NO01	NO18

5.6.3 Remote enabling input



This can be assigned both to heating/cooling appliances and distribution circuits.

It can be set as:

- enabling, or
- to bypass signals from the scheduler or k.Air controllers.

➡ **Note:** for "k.Air Service" circuits, on screen Bb48 the k.Air controllers that can request the activation of the circuit are displayed with a check mark (after auto-discovery).

Ref.	Display description	Def.	UOM	Min	Max
Bb10, ..., Bm10	Circuit 1...10				
	Remote control				
	c.pCO: U01...U10; Din01...Din18; c.pCOE1...E4: U01...U10	---	-	U01	Din18
	N.C. ; N.O.	N.C.	-	N.C.	N.O.
	Bypass ; Enable	Bypass	-	Bypass	Enabling
	...				
Bb48	k.Air control				
	<div> <div>1 2 3 4 5 6 7 8 9 10</div> <div> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> </div>	-	-	No k.Air	Every k.Air
Bn07/Bo7/Bp07/Bq07	Chiller/Heat pump/Boiler 1/2				
	Remote control				

	c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-		
	Logic N.C. ; N.O.	N.C.	-	N.C.	N.O.
	Bypass ; Enable	Bypass	-	Bypass	Enabling
	...				

5.6.4 Manual activation signals

To allow normal maintenance and/or commissioning operations on the circuits or appliances, the entire circuit or part of it can be manually switched off or on.

The following distinction can be made:

- activation of the entire circuit;
- activation of individual devices.

Manual circuit activation

Activation of the individual devices in the circuit takes is managed based on the type of control (e.g. in a mixed plus circuit, the request to activate the pump depends on the room temperature). Forced manual activation bypasses the on/off requests from remote controller, heating/cooling control mode and circuit scheduler. It does not bypass the protection functions, such as frost and Legionella protection, and alarms. Compared to the enable/bypass function associated with the circuit remote digital input, forced manual activation has priority.

Set Man.On and Man.Off to force the circuit on and off, respectively. Leave auto to disable manual mode. Manual mode is shown on the info menu, with the messages "Force on/Forced off".

Ref.	Display description	Def.	UOM	Min	Max
Bb10...Bm10	Circuit 1...10				
	...				
	Manual Auto Man.On Man.Off	Auto	-	Auto	Man.off
Bn07/Bo07/Bp07/Bq07	Heat pump, Chiller 1/2 - Boiler 1/2				
	...				
	Manual Auto Man.on Man.off	Auto	-	Auto	Man.off

Forced manual activation of individual devices

Forced manual activation can also be applied to each individual device. For on/off devices, the possibilities are Auto - Man.on - Man.off. For modulating devices, the working point can be selected, AUTO or 0% to 100%. Forced activation of individual devices is a complete bypass of activation, control and system protections (frost and Legionella). The alarms remain active (from digital input, if configured), as well as pumps anti-seize, which act on the individual devices.

Ref.	Display description	Def.	UOM	Min	Max
Fh01...Fh23	Manual commands				
	P1/P2/P3 Auto Man.On Man.Off	Auto	-	Man.On	Man.Off
	...				
	Output Auto 0...100%	Auto	-	Auto	100

Note:

- forced manual activation remains active even after a restart due to blackout. In this case, deactivate forced manual activation to restore the system;
- the function can be useful for checking operation/wiring on the individual devices.

5.6.5 Operating hours and scheduled maintenance counter

Access menus Fg01-Fg20 to set the alarm thresholds for the heating/cooling appliances and circuit pumps.

Ref.	Display description	Def.	UOM	Min	Max
Fg01...Fg20	Boiler 1				
	Work hours				
	P1	-	-	0	32767000
	P2	-	-	0	32767000
	P3	-	-	0	32767000
	Reset				
	P1 No Yes	No	-	No	Yes
	P2 No Yes	No	-	No	Yes
	P3	No	-	No	Yes

Ref.	Display description	Def.	UOM	Min	Max
	No Yes				
	Alarm threshold (*)	0	h	0	32767000
	(*): if threshold=0h, the alarm is disabled				
...					
Fg11...20	Circuit 1...10				
	See Fg01				

5.6.6 k.Air controller auto-discovery

Note:

- make sure that k.Air controllers 1-10 have previously been assigned a unique address (from 1 to 10). See manual + 030220980;
- connect the system controllers to the Ethernet network. See "Communication ports".

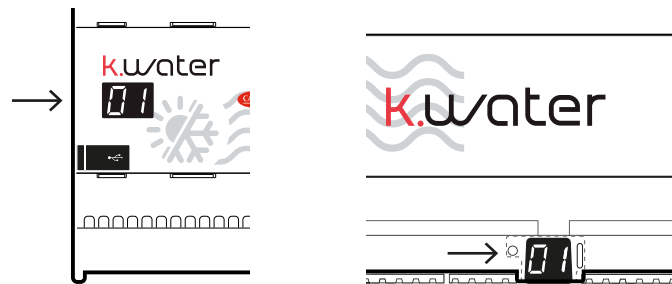


Fig.5.e

The auto-discovery procedure for the k.Air controllers in the network must be carried out before connecting the "k.Air service" circuit to the corresponding k.Air controller. See chap. Functions.

Press UP/DOWN to start auto-discovery;

Ref.	Display description					Def.	UOM	Min	Max
Fe12	k.Air configuration								
	Auto discovery					No	-	No	Yes
	No <input type="checkbox"/> / Yes <input checked="" type="checkbox"/>								
	1	2	3	4	5				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
	6	7	8	9	10				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Example:

there are 2 k.Air controllers on the Ethernet network: no. 1 and no. 3. "k.Air Service" circuit 1 is only activated by k.Air controller no. 3.

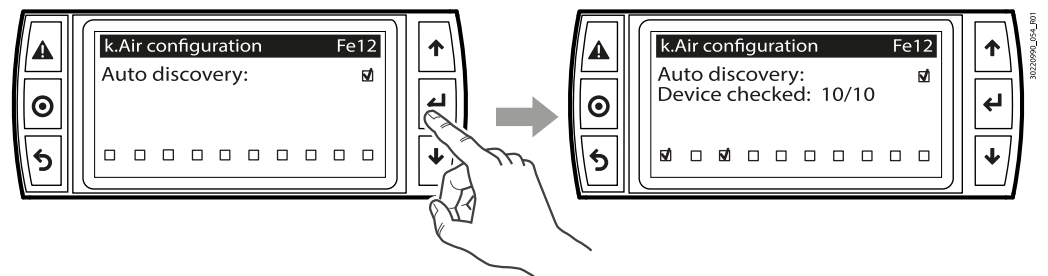


Fig.5.f

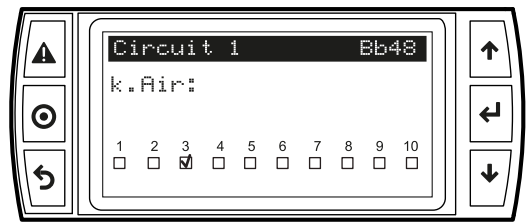


Fig.5.g

5.6.7 pGDx terminal

The pGDx terminal, available as an accessory, is intended for system managers and commissioning technicians, once commissioning has been completed using the pGNE terminal. It can display the graphic webserver pages stored on the controller.

Note:

- nonetheless, the pGDx can be used, in the service profile, to view the pGNE terminal screens and to commission the system;
- the pGDx terminal product label shows the MAC Address.

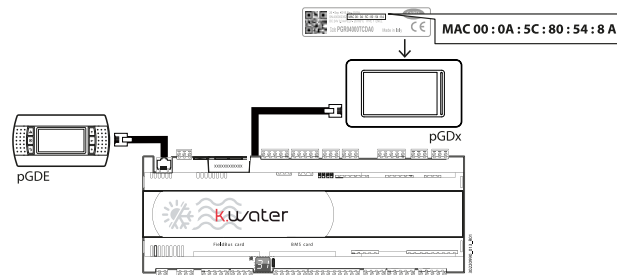


Fig.5.h

Network connection

To connect the kWater controller to the pGDx terminal:

Procedure:

1. connect the pGDx terminal to the power supply and the Ethernet cable. See technical leaflet +050001895;
2. once both devices have been powered on, enter: "kwater01.local" (figure) in the text box shown on the display.
3. confirm by selecting Check and then, if the network is stable, GO.

Once communication has been established, the initial screen (figure) is shown on the pGDx.



Fig.5.i

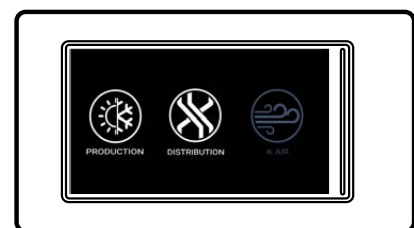


Fig.5.j

If needing to use the temperature and humidity probes included in the pGDx terminal:

- go to the following screen and enter the last 4 digits of the MAC Address. In this way, kWater will acquire the values read by the temperature and humidity probe, which can be assigned as a room temperature and humidity probe for the circuit where the terminal is located.

Ref.	Display description	Def.	UOM	Min	Max
	pGDx				
Fe08	Host name - last four digit MAC Address				
		0	-	0	z
		0	-	0	z
	MACxx:xx:xx:xx:00:00	0	-	0	z
		0	-	0	z
	Temperature	---.---	°C		
	Humidity	---.---	%rH		

5.6.8 Checks before commissioning

Once the system has been configured, set up the control functions, including:

- activate the system;
- climate zone
- season changeover
- system and heating/cooling appliance frost protection;
- Legionella prevention;
- scheduler.

See chap. "Functions".

6. Functions

6.1 System ON/OFF

The system On/Off function switches the heating/cooling appliances and distribution circuits on/off. The protections remain active (frost, Legionella, pump anti-seize). Once the system is switched on, the circuits are activated based on their respective settings. See the following paragraphs.

6.1.1 Activation

The system switches on when there is a simultaneous request from:

1. user terminal;
2. digital input;
3. scheduler;
4. k.Air.

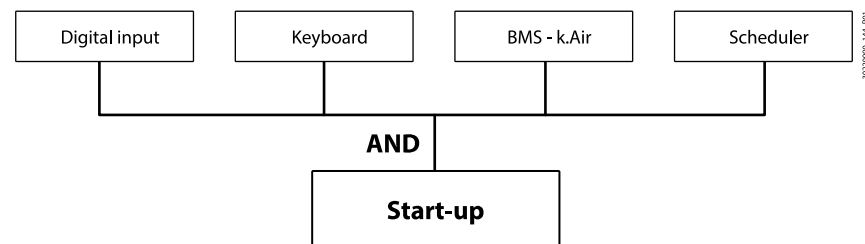
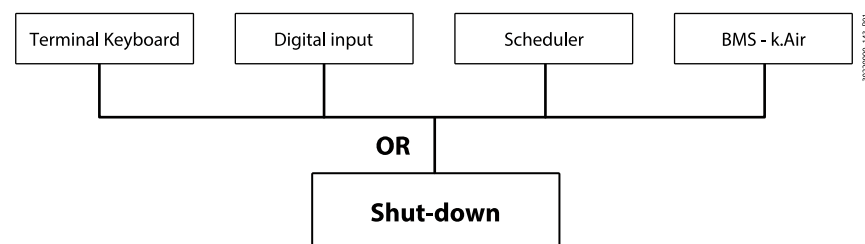


Fig.6.a

6.1.2 Shutdown

The system switches off when there is at least one shutdown request from:

1. user terminal;
2. digital input;
3. scheduler;
4. k.Air.



Note: the system operating mode (heating/cooling) also determines whether the circuits switch on, based on the operating mode of appliances and distribution circuits. See the corresponding paragraph.

6.1.3 System activation

The various on and off functions are described below.

User terminal

Access screen A01 and press UP/DOWN to switch from ON to OFF and vice-versa.

Ref.	Display description	Def.	UOM	Min	Max
A01	Unit On/Off Off On	Off	-	Off	On

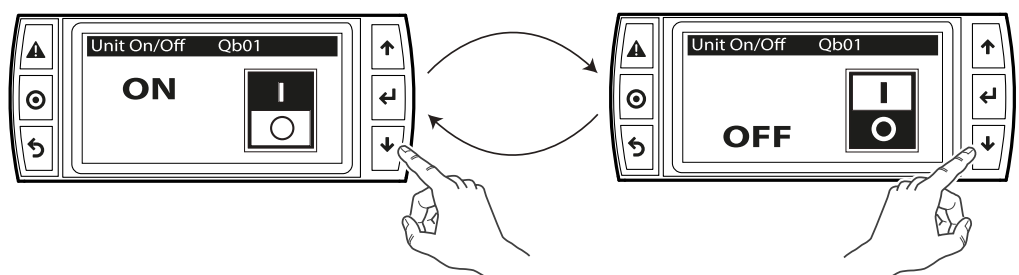


Fig.6.b

Digital input

Access screen Ba06 and select the digital input (remote control).

Ref.	Display description	Def.	UOM	Min	Max
Ba06	General configuration				
	System On/Off				
	By remote control:				

	c.pCO: U01...U10; Din01...Din18	---	-	U01	Din18
	c.pCOE1...E4: U01...U10				
	Type N. C. N. O.	N.C.	-	N.C.	N.O.
	Enabling Bypass	Enabling	-	Enabling	Bypass
	By scheduler 01...10, H24, --	H24	-	01	10
	By k.Air 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>	-	-	no k.Air	every k.Air

➔ **Note 1:** when selecting:

- Enabling: the digital input signal enables system on/off;
- Bypass: the digital input bypasses the activation request from the scheduler and from k.Air, and not the on function from the user terminal.

➔ **Note 2:** N.C./N.O. = normally closed/normally open.

On by scheduler;

Go to "by scheduler" to select the scheduler that activates the system, or "H24" if it is always on.

On by k.Air (integrated controller for managing air handling units)

Go to "by k.Air" to select one or more k.Air controllers (from 1 to 10) that can activate the system (check mark is shown in the box). The resulting activation takes into account all possible requests.

6.2 Distribution circuits ON/OFF

The distribution circuits are activated when there is a request from:

1. operating mode (heating/cooling);
2. digital input;
3. scheduler;
4. k.Air;
5. forced manual activation.

6.2.1 Activation priority

A distribution circuit is classified as primary or secondary according to the function performed and its interaction with the heating/cooling appliance.

- primary (ref. A): following the request, first the distribution circuit pumps are switched on, and after a settable delay the heating/cooling appliance pumps are activated. The heating/cooling appliance production request is delayed by 30 s.
- secondary (ref. B): following the request the heating/cooling appliance pumps are switched on and the production request to the heating/cooling appliance is delayed by 30 s. Activation of the distribution circuit pump is delayed by a settable time.

➔ **Note:** post circulation of the heating/cooling appliance pump is still enabled.

Ref.	Display description	Def.	UOM	Min	Max
Bb12	Circuit 1				
Bc12	Priority	Primary	-	Primary	Secondary
...	Primary Secondary				
Bm12	Delay	0	min	1	999

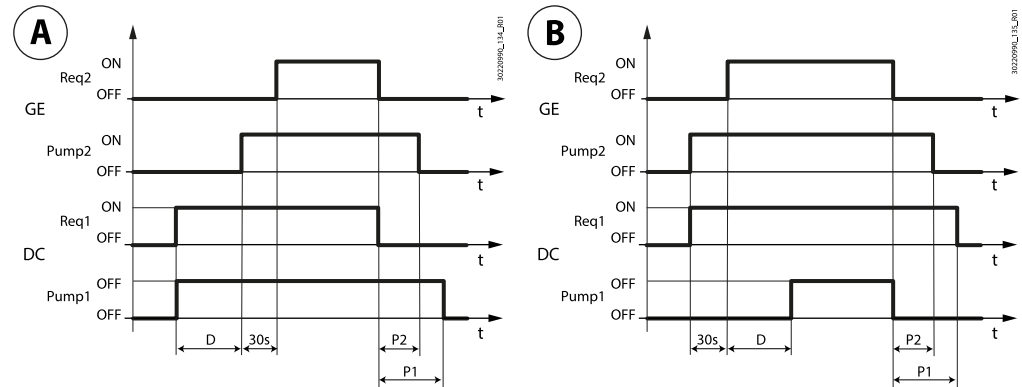


Fig.6.c

Ref.	Description
DC	Distribution circuit
Req1	Distribution circuit request
Pump1	Distribution circuit pump
GE	Heating/cooling appliance
Req2	Appliance request

Ref.	Description
Pump2	Appliance pump
D	Delay
P1	Distribution circuit pump post circulation
P2	Heating/cooling appliance pump post circulation
t	Time

6.2.2 On/off control signals

Control mode

The circuit's control mode determines when it is activated. See "Operating mode".

Ref.	Display description	Def.	UOM	Min	Max
	Circuit 1				
	Control mode				
Bb11...Bm11	Only heating Only cooling Heating / Cooling Always heating Always cooling	Only heating	-	Only heating	Always cooling
	Antifreeze	No	-	No	Yes
	No Yes				

Digital input

Access screen Bb10...Bm10 and select the digital input (remote control).

Ref.	Display description	Def.	UOM	Min	Max
	Circuit 1...10				
	Remote control:				
Bb10 Bc10 ...	---	---	-	U01	Din18
Bm10	c.pCO: U01...U10; Din01...Din18; c.pCOE1...E4: U01...U10				
	Logic	N.C.	-	N.C.	N.O.
	N. C. N. O.				
	Bypass Enable	-	-	Bypass	Enabling

➔ **Note 1:** when selecting:

- Enabling: the digital input signal enables system on/off;
- Bypass: the digital input bypasses the activation request from the scheduler and from k.Air, and not the on function from the user terminal.

➔ **Note 2:** N.C./N.O. = normally closed/normally open.

On by scheduler

Procedure:

1. go to the "Scheduler" direct access menu;
2. assign each circuit a scheduler 1-10, or continuous operation (H24 = 24 hours).

The operating mode of each circuit will be shown.

Ref.	Display description	Def.	UOM	Min	Max
	Scheduler				
	Scheduler for circuit				
Qc01	Circuit 1...5: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24
	Status	Off	-	Off	Comfort
	Off Economy Comfort				
	Scheduler				
	Scheduler for circuit				
Qc02	Circuit 6...10: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24
	Status	Off	-	Off	Comfort
	Off Economy Comfort				

On by k.Air

➔ **Note:**

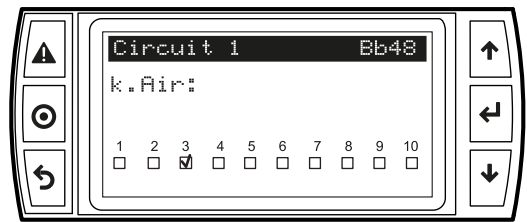
- switching on by k.Air only applies to circuits configured as k.Air service;
- before making this setting, carry out the auto discovery procedure. Also see "Commissioning".

Access screen Bb48-Bm48 to connect circuit 1-10 to the request from k.Air controller 1-10.

Ref.	Display description					Def.	UOM	Min	Max
Bb48...Bm48	Circuito1...10					-	-	No k.Air	k.Air 1...10
	k.Air								
	1	2	3	4	5				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
	6	7	8	9	10				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Example:

circuit 1, configured as k.Air service, is activated by k.Air controller number 3.



Forced manual activation

See chap. "Commissioning".

6.3 Appliance ON/OFF

The software activates the heating/cooling appliances with the request from:

1. distribution circuits;
2. climate zone;
3. digital input;
4. scheduler;
5. kAir;
6. forced manual activation.

6.3.1 Activation request

Command output

Select the heating/cooling appliance command outputs. If the scheduler for the heating/cooling appliance has been set, the on/off command output and the Eco set point selection output determine the Comfort/Economy/Off request sent to the appliance.

Ref.	Display description	Def.	UOM	Min	Max
Bn10/ Bo10/ Bp10/ Bq10	Chiller-Heat pump 1/Chiller-Heat pump 2/Boiler 1/Boiler 2				
	On/Off command output ---	---	-	NO01	NO18
	c.pCO: NO01...NO18; c.pCOE1...E4: NO01...NO06;				
	ECO set point selection ---	---	-	NO01	NO18
	c.pCO: NO01...NO18; c.pCOE1...E4: NO01...NO06;				
	Cooling/heating selection ---	---	-	NO01	NO18
	c.pCO: NO01...NO18; c.pCOE1...E4: NO01...NO06;				

Digital input

Access screens Bn07...Bq07 and select the digital input for activating the appliance (remote control).

Ref.	Display description	Def.	UOM	Min	Max
Bn07/ Bo07/ Bp07/ Bq07	Chiller-Heat pump 1/Chiller-Heat pump 2/Boiler 1/Boiler 2				
	Remote control: ---	---	-	U01	Din18
	c.pCO: U01...U10; Din01...Din18; c.pCOE1...E4: U01...U10				
	Logic N.C. N.O.	N.C.	-	N.C.	N.O.
	Bypass Enable	Bypass	-	Bypass	Enabling
	Mode Auto Man.On Man.Off	Auto	-	Auto	Man.Off

➡ **Note 1:** when selecting:

- Enabling: the digital input signal enables system on/off;
- Bypass: the digital input bypasses the activation request from the scheduler.

➡ **Note 2:** N.C./N.O. = normally closed/normally open.

Time bands

Procedure:

1. go to the "Scheduler" direct access menu;
2. assign each appliance a scheduler 1-10, or continuous operation (H24 = 24 hours).

Ref.	Display description	Def.	UOM	Min	Max
Qc03	Scheduler				
	Scheduler for production unit				
	HP/CH.1 - HP/CH.2 - Boiler 1 - Boiler 2	--	-	01	H24
	-- ; 01; 02; 03; 04; 05; 06; 07; 08; 09; 10; H24				
	Status	Off	-	Off	Comfort
	Off ; Economy ; Comfort				

See chap. "User interface", for programming the scheduler.

Distribution circuit

Activation of a heating/cooling appliance can be linked to the request in one or more distribution circuits

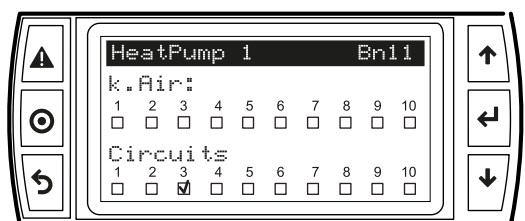
Procedure:

1. access screen Bn11/Bo11/Bp11/Bq11 to connect heat pump/chiller/boiler 1/2 to the request from circuits 1-10.

Ref.	Display description	Def.	UOM	Min	Max
Bn11/ Bo11/ Bp11/ Bq11	Chiller/Heat pump/Boiler 1/2				
	k.Air: No/Yes				
	1 2 3 4 5				
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	-	-	1	10
	6 7 8 9 10				
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
	Circuits: No/Yes				
	1 2 3 4 5				
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	-	-	1	10
	6 7 8 9 10				
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				

Example 1:

The request to heat pump 1 only comes from circuit 3.



K.Air

Activation of a heating/cooling appliance can be linked to a direct request from a k.Air controller, even without being configured as a "k.Air Service" circuit.

Procedure:

1. access screen Fe12 to check many kAir controllers are available;
2. access screens Bn11/Bo11/Bp11/Bq11 to connect heat pump/chiller/boiler 1/2 to the request from kAir controller 1-10.

Example 2:

The request to heat pump 1 comes from:

- two kAir controllers: no. 6 and no. 7.
- circuit 3 and circuit 5, configured as kAir service.

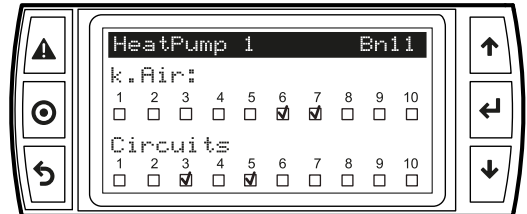


Fig.6.d

Note: the kAir controllers can send the request directly to the heating/cooling appliance, without going via the circuits. In this case, the air handling unit will take in the fluid at the heating/cooling appliance outlet temperature, which is different from the kAir service circuit set point.

Climate zone (for Italy)

See the following paragraph.

6.3.2 Climate zone

Note:

- this paragraph refers to a control function applicable in Italy;
- a "custom" climate zone can be set, so as to comply with different national and local regulations.

Introduction

Presidential Decree 412/93 (Italian market) defines:

- the "degree-days" of a certain location to be the sum, across the entire typical heating period of the year, of the positive daily differences between room temperature, conventionally set at 20°C, and the average daily outside temperature; the unit of measurement used is known as the degree-day (DD);
- based on the degree-days, different geographical areas and the corresponding period in combustion heating systems can be operated. Outside of such period, electrically-powered heat appliances can be used (heat pumps, electric heaters, etc.).

Six zones are defined in accordance with decree 412/93, plus a "Custom" zone for which the user can define the start day/month and end day/month of the heating period.

Climate zone	Degree-days	Heating period	
A	<600	1 December to 15 March	6 hours a day
B	601<DD<900	1 December to 31 March	8 hours a day
C	901<DD<1400	15 November to 15 March	10 hours a day
D	1401<DD<2100	1 November - 15 April	12 hours a day
E	2101<DD<3000	15 October - 15 April	14 hours a day
F	DD>3001	No limitation	

Tab.6.a

Access screen Ba05 and select the climate zone based on the place of installation. If necessary, select the "Custom" zone and manually set the start and end date of the heating period.

Ref.	Display description	Def.	UOM	Min	Max
Ba05	General configuration				
	Climate zone				
	Current date	dd/mm/yy	--/--/--	01/01/00	31/12/1999
	Zone	-	-	A	Custom
	A B C D E F Custom				
	Manual	Auto	-	Auto	Manual Off
	Auto Manual On Manual Off				
	Start		day	1	31
			month	1	12
	End		day	1	31
			month	1	12
	Status	Active	-	Active	Not active
	Active Not active				

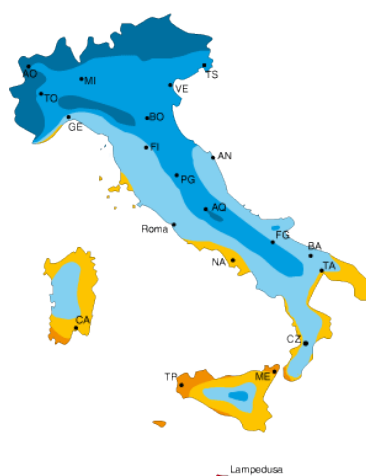


Fig.6.e

Colour	Zone	DD
Red	A	<600
Orange	B	601<DD<900
Yellow	C	901<DD<1400
Light blue	D	1401<DD<2100
Dark blue	E	2101<DD<3000
Blue	F	DD>3001

Tab.6.b: Climate zones in Italy

6.4 Operating mode

6.4.1 System

k.Water provides two system operating modes, taking into account the season (winter/summer):

- heating;
- cooling.

The operating mode can be selected via:

- user terminal;
- digital input;
- k.Air controller, connected to the network;
- supervisor (BMS).

Ref.	Display description	Def.	UOM	Min	Max
Ba07	General configuration				
	Operating mode				
	Source	PGD	-	PGD	BMS
	PGD Input channel k.Air Unit 1 ...10 BMS				
	---	---	-	U01	Din18
	c.pCO: U01...U10; Din01...Din18; c.pCOE1...E4: U01...U10				
	Mode	-	-	Heating	Cooling
	Heating Cooling				

➡ **Note:** if the operating mode is determined by digital input, k.Air Unit or BMS, it cannot be changed from the user terminal (pGNE).

For each circuit, heating/cooling appliance and distribution, the following control modes are available, which must be set in order to integrate with each other and with the system specifications.

Control mode	Display description	Example
Cooling/heating	The circuit operates in heating/cooling mode based on the system heating/cooling operating mode	Radiant circuit for heating/cooling
Always heating	The circuit always operates in heating mode, regardless of the system heating/cooling operating mode	Circuit DHW tank fill
Always cooling	The circuit always operates in cooling mode, regardless of the system heating/cooling operating mode	Chiller producing chilled water all year round
Only heating	The circuit is only active if the system is in heating operating mode	Radiant circuit for heating in winter
Only cooling	The circuit is only active if the system is in cooling operating mode	Circuit with fan coil for cooling in summer

6.4.2 Heating/cooling appliance

Set the operating mode for each heating/cooling appliance.

Ref.	Display description	Def.	UOM	Min	Max
	Heat pump/Chiller/Boiler 1/2				
Bn08/ Bo08/ Bp08/ Bq08	Control mode: Only heating ; Only cooling ; Heating / Cooling ; Always heating ; Always cooling	Heat pump: Cooling/heating Chiller: only cooling Boiler: always heating	-	Only heating	Always cooling
	DHW production	No	-	No	Yes
	Antilegionella	No	-	No	Yes
	Antifreeze protection	No	-	No	Yes

The table below shows the control modes that can be set for each heating/cooling appliance.

Heating/cooling appliance	Control mode				
	Cooling/heating	Always heating	Always cooling	Only heating	Only cooling
Heat pump	YES	YES	YES	YES	YES
Chiller	NO	NO	YES	NO	YES
Boiler	NO	YES	NO	YES	NO

6.4.3 Distribution circuits

The control mode can be set for each distribution circuit.

Ref.	Display description	Def.	UOM	Min	Max
	Circuit 1				
Bb11...Bm11	Control mode Only heating ; Only cooling ; Heating / Cooling ; Always heating ; Always cooling	Only heating	-	Only heating	Always cooling
	Antifreeze protection No ; Yes	No	-	No	Yes

The table below shows the control modes that can be set for each circuit.

Distribution circuit	Control mode				
	Cooling/heating	Always heating	Always cooling	Only heating	Only cooling
Direct	YES	YES	YES	YES	YES
Direct plus	YES	YES	YES	YES	YES
Mixed	YES	YES	YES	YES	YES
Mixed plus	YES	YES	YES	YES	YES
DHW distribution	NO	YES	NO	YES	NO
DHW tank fill	NO	YES	NO	YES	NO
Generic tank fill	YES	YES	YES	YES	YES
Pressure control	YES	NO	NO	YES	YES

Distribution circuit	Control mode				
	Cooling/ heating	Always heating	Always cooling	Only heating	Only cooling
Flowrate control	YES	NO	NO	YES	YES
Solar thermal (*)	-	-	-	-	-
k.Air service	YES	YES	YES	YES	YES
Constant delta temperature	YES	YES	YES	YES	YES

➡ **Note:** (*) the solar thermal circuit is always enabled.

6.5 Type of control

The type of control depends on the type of distribution circuit.

➡ **Note:** see "Installation" for the complete list of distribution circuits, the control probe and the activation requests.

6.5.1 Heating

As an example, the following settings can be activated in the mixed plus circuit, equipped with a room temperature and humidity probe (optional).

In the mixed plus circuit there are two set points:

- outlet set point (water);
- room set point (air).

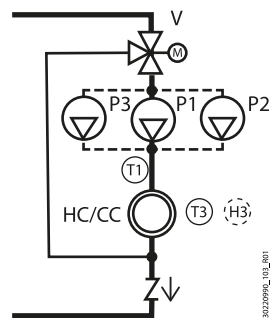


Fig.6.f

Key	
P1/P2/P3	Pump 1/2/3
V	Mixing valve
T1	Outlet temperature probe
T3	Room temperature probe
H3	Room humidity probe (optional)
HC/CC	Heating/cooling circuit

The outlet set point determines the request sent to the modulating device (mixing valve) with PID control.

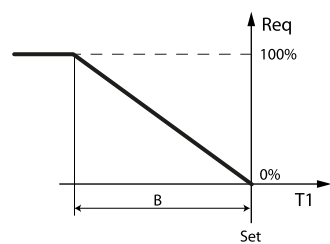


Fig.6.g

Ref.	Description
Req	Request
Set	Outlet set point

Ref.	Description
B	Band
T1	Outlet temperature

Tab.6.c

➡ **Note:** band = 100/P (P=proportional gain)

The room set point and the differential determine activation of the pump, via the digital output.

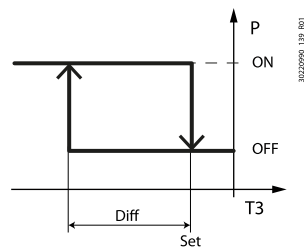


Fig.6.h

Ref.	Description	Ref.	Description
P	Pump	Diff	Differential
Set	Room set point	T3	Room temperature

Tab.6.d

Constant temperature control (fixed point)

This function keeps the fluid outlet (or inlet) temperature constant.

➔ **Note:** this control function can be used in circuits with mixing valves. See par. on enabling the circuit components.

Select the type of outlet set point as fixed, and then set:

- the outlet temperature set point;
- the PID control parameters.

For a mixed circuit, set the outlet set point.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb20,...,Bm20	Heating control				
	Outlet set point				
	Comfort	25.0	°C	0.0	99.9
	Economy	23.0	°C	0.0	99.9
	Differential	0.5	°C	0.0	99.9
	Outlet set point Fixed Climate Custom	Fixed	-	Fixed	Custom
Bb50...Bm50	Circuit 1...10				
	Outlet temperature control				
	P	2.0	-	0	99.9
	I	120	-	0	999
	D	0	-	0	999
	Limit min	0	%	0	100
	Limit max	100	%	0	100
	Output	-	%	0	100

For a circuit with a room probe (e.g. mixed plus), set the room set point.

➔ **Note:** for control with a room probe, if the differential is = 0 the pumps is always on.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb20,...,Bm20	Heating control				
	Room set point				
	Comfort	25.0	°C	0.0	99.9
	Economy	23.0	°C	0.0	99.9
	Outlet set point Fixed Climate Custom	Fixed	-	Fixed	Custom
Bb21,...,Bm21	Heating outlet				
	Fixed set point				
	Set point	35.0	°C	-50.0	99.9

Climate control

The outlet temperature set point is floating and is calculated based on the outside temperature, according to the climate curve. As the slope of the latter increases, the outlet set point increases. Select "Outlet set point = climate" and in the following screen the number corresponding to the chosen climate curve (see graph). Alternatively, by choosing "Custom", enter the 4 points that define the custom climate curve.

Note: each family of climate curves relates to an expected room heating set point, in comfort and economy modes.

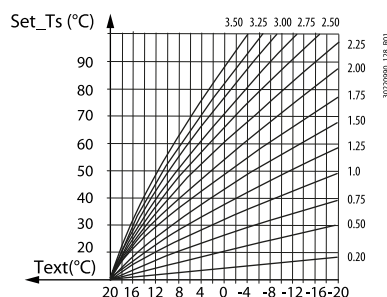


Fig.6.i

The climate curve may vary:

- based on the offset, so as to increase/decrease the outlet set point;
- when changing the room set point from comfort to economy, even without a room temperature probe.

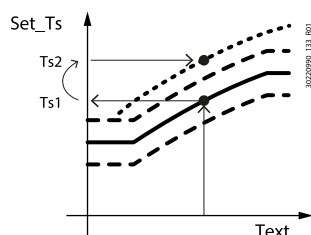


Fig.6.j

Example

For a mixed circuit, set the outlet set point.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb20,...,Bm20	Heating control				
	Outlet set point				
	Comfort	25	°C	0.0	99.9
	Economy	23	°C	0.0	99.9
	Outlet set point Fixed Climate Custom	Fixed	-	Fixed	Custom
	Heating climatic curve				
	Curve no.	1.0	-	0.1	4.0
	Offset	0.0	°C	-99.9	99.9
Bb22,...,Bm22	Limit min	-	°C	0.0	99.9
	Limit max	-	°C	0.0	99.9
	Set point calcul.	-	°C	0.0	99.9

Fig.6.k

For a mixed plus circuit (with room probe) set:

- under the set point, the reference room set point in Comfort and Economy modes for climate curve shifting;
- the pump activation differential;
- the coefficient that sets the weight of the room probe (room authority).

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb20,...,Bm20	Heating control				
	Room set point				
	Comfort	23	°C	0.0	99.9
	Economy	20	°C	0.0	99.9
	Differential	0.5	°C	0.0	9.9
	Outlet set point Fixed Climate Custom	Fixed	-	Fixed	Custom
	Heating climatic curve				
	Curve no.	0.0	-	0.1	4.0
	Offset	0.0	°C	-99.9	99.9
Bb22,...,Bm22	Room authority	0.0	°C	0.0	100.0
	Limit min	-	°C	0.0	99.9
	Limit max	-	°C	0.0	99.9
	Set point calcul.	-	°C	-	-

Climate control with room authority

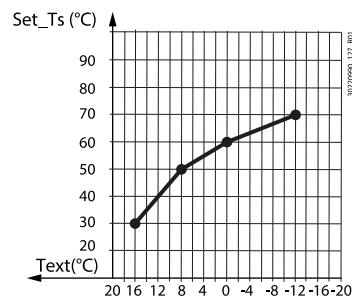
The room authority coefficient (0-100) determines the weight of the room temperature measured over the outlet set point, with a change in slope and shifting. Furthermore, minimum and maximum thresholds can be set to define the range in which the set point can vary.

Note:

- enable the room probe to activate control with room authority;
- set a low room authority value to avoid unstable control.

Custom climate curve

Alternatively, a custom climate curve can be set.



Key

Set_Ts	Outlet temperature set point
Text	Outside temperature

Fig.6.I

Ref.	Display description	Def.	UOM	Min	Max
Bb23,...,Bm23	Custom climatic curve				
	1.				
	Outside temperature	-12.0	°C	-99.9	99.9
	Set point	70.0	°C	-99.9	99.9
	2.				
	Outside temperature	0.0	°C	-99.9	99.9
	Set point	60.0	°C	-99.9	99.9
	3.				
	Outside temperature	8.0	°C	-99.9	99.9
	Set point	50.0	°C	-99.9	99.9
	4.				
	Outside temperature	16.0	°C	-99.9	99.9
	Set point	30.0	°C	-99.9	99.9
	Offset:	0.0	°C	-99.9	99.9

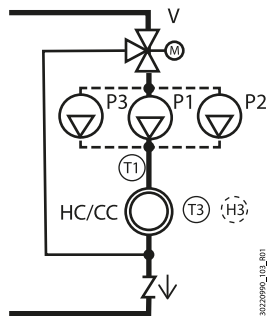
Ref.	Display description	Def.	UOM	Min	Max
	Calc.:	-	°C	0.0	99.9

6.5.2 Cooling

As an example, the following settings can be activated in the mixed plus circuit, equipped with a room temperature and humidity probe (optional).

In the mixed plus circuit there are two set points:

- outlet set point (water);
- room set point (air).



Key	
P1/P2/P3	Pump 1/2/3
V	Mixing valve
T1	Outlet temperature
T3	Room temperature
H3	Room humidity (optional)
HC/CC	Heating/cooling circuit

Fig.6.m

The outlet set point determines the request sent to the modulating device (mixing valve) with PID control.

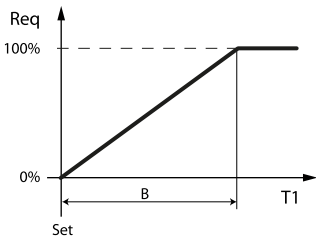


Fig.6.n

Ref.	Description	Ref.	Description
Req	Request	B	Band
Set	Set point	T1	Outlet temperature

Tab.6.e

Note: band = 100/P (P=proportional gain)

The room set point and differential determine activation of the pump, via the digital output.

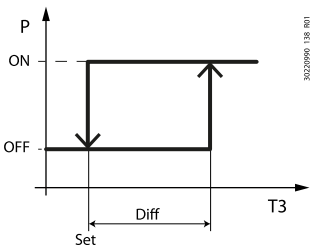


Fig.6.o

Ref.	Description	Ref.	Description
P	Pump	Diff	Differential
Set	Set point	T3	Room temperature

Tab.6.f

The set point is determined based on the type of control selected.

Constant temperature control (fixed point)

This function keeps the fluid outlet (or inlet) temperature constant.

➔ **Note:** this control function can be used in circuits with mixing valves. See par. on enabling the circuit components.

Select the type of outlet set point as fixed, and then set:

- the outlet temperature set point;
- the PID control parameters.

For a mixed circuit, set the outlet set point.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb30,...,Bm30	Cooling control				
	Outlet set point				
	Comfort	23.0	°C	0.0	99.9
	Economy	21.0	°C	0.0	99.9
Bb50...Bm50	Circuit 1...10				
	Outlet temperature control				
	P	2.0	-	0	99.9
	I	120	-	0	999
	D	0	-	0	999
	Limit min	0	%	0	100
	Limit max	100	%	0	100
	Output	-	%	0	100

For a mixed circuit with room sensor, also set the room set point.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb30,...,Bm30	Cooling control				
	Room set point				
	Comfort	23.0	°C	0.0	99.9
	Economy	21.0	°C	0.0	99.9
	Differential	0.5	°C	0.0	99.9
	Compensation No Yes	No	-	No	Yes
	Outlet set point Fixed Floating	Fixed	-	Fixed	Floating
Bb32	Cooling outlet				
	Fixed set point				
	Set point	15.0	°C	-99.9	99.9

➔ **Note:** for control with room probe:

- if differential = 0 the pumps are always on;
- the set point compensation and floating set point control functions can be activated.

Set point compensation

The software adjusts the set point based on the outside temperature.

Compensation is defined by:

1. start compensation threshold;
2. end compensation threshold;
3. maximum compensation value.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb30	Cooling control				
	...				
	Compensation No Yes	-	-	No	Yes
	...				
Bb31	Room set compensation				
	Outside temperature	-	°C	-999.9	999.9
	Min	30.0	°C	-99.9	99.9
	Max	35.0	°C	-99.9	99.9
	Compensation				
	Min	0.0	°C	-99.9	99.9
	Max	2.0	°C	-99.9	99.9
	Compensation	0.0	°C	-99.9	99.9

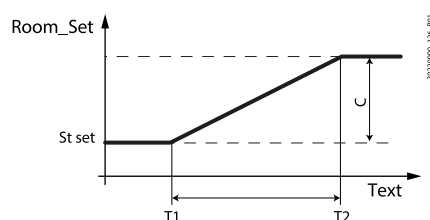


Fig.6.p

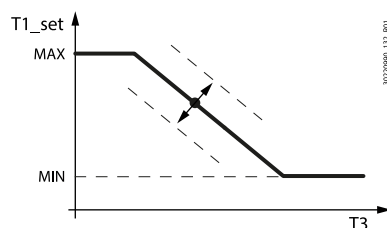
Ref.	Description	Ref.	Description
Room_Set	Room set point	T2	Outside temperature to end compensation
Text	Outside temperature	C	Maximum compensation value.
T1	Outside temperature to start compensation		

Tab.6.g

Note: the outside temperature probe must be installed.

Floating set point control

The outlet temperature set point is floating and is calculated using PID control, based on the room temperature.



Key

T3	Room temperature
T1_set	Outlet temperature set point

Select the outlet set point as floating, set the PID parameters, the minimum and maximum limits for the set point and then verify the resulting set point.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb30,...,Bm30	Cooling control				
	Room set point				

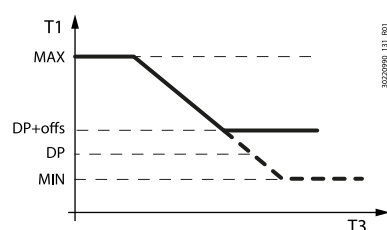
Ref.	Display description	Def.	UOM	Min	Max
	Comfort	23.0	°C	0.0	99.9
	Economy	21.0	°C	0.0	99.9
	Differential	0.5	°C	0.0	99.9
	Compensation No Yes	No	-	No	Yes
	Outlet set point Fixed Floating	Fixed	-	Fixed	Floating
Bb33...Bm33	Cooling outlet				
	Floating set point				
	P	2.0	-	0	99.9
	I	120	-	0	999
	D	0	-	0	999
	Limit min	14.0	°C	-999.9	999.9
	Limit max	16.0	°C	-999.9	999.9
	Set point	-	°C	-999.9	999.9

Dewpoint control

This function prevents condensate from forming and is always active when the room humidity and temperature probes are installed. The controller calculates the dew point based on room temperature and room humidity. If the outlet set point calculated to reach the room set point is lower than the dew point, the outlet set point is set as being equal to the dew point + offset.

Set the minimum set point limit and the offset. The screen shows:

- the reading of the room temperature/humidity probes;
- the resulting dew point;
- the minimum limit (fixed point only);
- the resulting outlet set point.



Ref.	Description
T3	Room temperature
T1	Supply temperature

Ref.	Description
DP	Dew point
offs	Offset

Tab.6.h

The parameters involved are shown below.

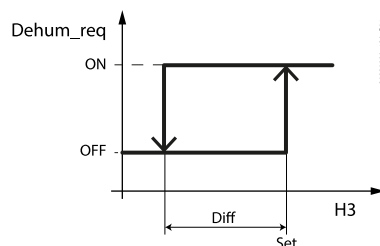
Ref.	Display description	Def.	UOM	Min	Max
Bb34...Bm34	Cooling outlet				
	Room dewpoint control				
	Room	0.0	°C	0.0	100.0
		0.0	%RH	0.0	100
	Dew point	-	-	-	-
	Offset	-30.0	°C	-999.9	999.9
	Limit min: (only fixed point)	14.0	°C	-999.9	999.9
	Set point	-	°C	-999.9	999.9

Dehumidifier activation

The direct plus and mixed plus circuits equipped with humidity probe (optional) have a command to activate the dehumidifier.

There are two possible selections:

1. comfort: the dehumidifier is activated at a fixed humidity set point;
2. comfort + dew point. In this case, the dehumidifier is activated:
 - a. to control the humidity;
 - b. to avoid surface condensation on radiant panels, considering the circuit operating temperature.

**Key**

Set	Set point
H3	Room humidity
Diff	Differential
Dehum_req	Dehumidifier request

Fig.6.q

Ref.	Display description	Def.	UOM	Min	Max
Dehumidification output					
Bb07...Bm07	1: -- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	---	-	NO01	NO18
	Dehumid. set point Comfort ; Comfort + Dewpoint	Comfort	-	Comfort	Comfort + dewpoint
	Set point	55	%RH	0	100
	Differential	2	%RH	0	99

6.6 DHW (domestic hot water) production

Domestic hot water production is always available, regardless of the system operating mode, heating or cooling.

Ref.	Display description	Def.	UOM	Min	Max
Ba07	Operating mode				
	...				
	Mode Heating ; Cooling	-	-	Heating	Cooling

Enable circuit

Configure at least one distribution circuit as:

- DHW tank fill;
- DHW distribution.

Ref.	Display description	Def.	UOM	Min	Max
Ba01	General configuration				
	Circuit configuration				
	1-5 ... DHW distribution ; DHW tank fill ...	-	-	Direct	Constant delta temperature
Ba02	General configuration				
	Circuit configuration				
	6-10 ... DHW distribution ; DHW tank fill ...	-	-	Direct	Constant delta temperature

It is recommended to set the control mode as:

- always heating: if domestic hot water must always be produced regardless of the system operating mode;
- only heating: if domestic hot water production is to be produced only with the system in heating mode.

Ref.	Display description	Def.	UOM	Min	Max
Bb11...Bm11	Circuit 1...10				

Ref.	Display description	Def.	UOM	Min	Max
	Control mode Only heating Only cooling Heating / Cooling Always heating Always cooling	Only heating	-	Only heating	Always cooling
	Antifreeze protection No Yes	No	-	No	Yes

Enable production unit

Normally, a DHW production unit must always be available, and must be set to "Always heating" mode. However, for example with heat pumps, it is also possible to set "Only heating" or "Cooling/heating" modes, so that these contribute to DHW production only when the system is in heating mode.

Enable DHW production.

Ref.	Display description	Def.	UOM	Min	Max
Bn08...Bo08					
	Chiller/heat pump 1				
	Control mode: Only heating Only cooling Heating / Cooling Always heating Always cooling	Heat pump: Heating/Cooling Only cooling	-	Only heating	Always heating
	DHW production	No	-	No	Yes
	Antilegionella	No	-	No	Yes
	Antifreeze protection	No	-	No	Yes
Bp08...Bq08	Boiler 1...2				
	Control mode: Only heating Always heating	Only heating	-	Only heating	Always heating
	DHW production	No	-	No	Yes
	Antilegionella	No	-	No	Yes
	Antifreeze protection No Yes	No	-	No	Yes

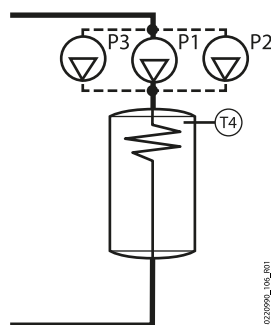
Assign the circuit to heating/cooling appliance

Access the following screen and press UP/DOWN to show the check mark for the circuit to be connected to the heating/cooling appliance.

Ref.	Display description	Def.	UOM	Min	Max
Bn11 ... Bq11					
	Chiller/Heat pump/Boiler 1-2				
	...	-	-	1	10
	Circuits: No/Yes				
	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> </div> <div> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> <div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> </div> <div> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div>	-	-	1	10

6.6.1 Domestic hot water (DHW) tank fill

In the circuit, the fill pump is activated to reach the domestic hot water (DHW) set point.

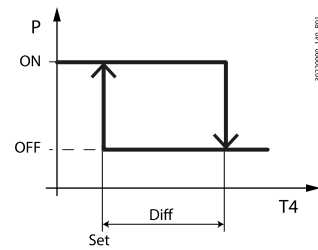


Key

T4	DHW tank temperature
P1/2/3	Tank pump 1/2/3

Fig.6.r

When the tank temperature reaches the set point, the pump stops.

**Fig.6.s****Key**

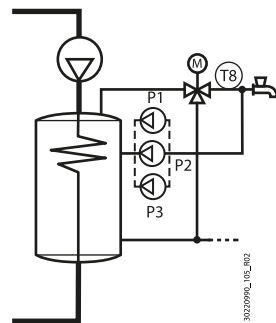
P	Pump
Set	Set point
Diff	Differential
T4	DHW tank temperature

The following screen is used to set the set point and differential.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb41...Bm41	DHW fill				
	Set point	45	°C	-99.9	99.9
	Differential	2	°C	-9.9	9.9
	Antilegionella	No	-	No	Yes
	No ; Yes				

6.6.2 Domestic hot water (DHW) distribution

In the "DHW Distribution" circuit, the mixing valve controls the domestic hot water delivery temperature. The recirculation pump is activated cyclically, according to the On/Off times.

**Key**

T8	DHW recirculation probe
P1/2/3	Recirculation pump 1/2/3

Fig.6.t

Setting screen.

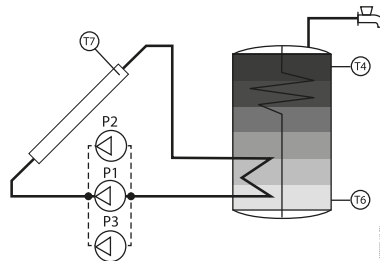
Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb40...Bm40	DHW circuit control				
	Set point	45	°C	-99.9	99.9
	Pump cycles				
	On	60	s	0	9999
	Off	0	s	0	9999
	Antilegionella	No	-	No	Yes
	No ; Yes				

6.6.3 Solar thermal

The control manages the transfer of heat from the solar collectors to a solar storage tank.

Note:

- for the solar collector use the PT1000 probe provided. See the paragraph "Accessories".
- position the tank probe at the bottom of the tank, so as to fully exploit the solar energy.



Key

P1/2/3	Solar pump
T7	Solar collector temperature
T6	Tank bottom temperature

Fig.6.u

The solar pump is activated when two conditions are met:

- the tank temperature is lower than the set point;
- the difference between the solar collector temperature and the solar tank temperature is greater than a differential (activation).

The solar pump is deactivated when one of two conditions occurs:

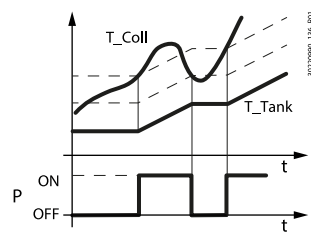
- the tank temperature is higher than the set point; it is reactivated when it falls below a set point - differential;
- the difference between the solar collector temperature and the solar tank temperature is less than 2 °C.

Settings

Set:

- the solar tank set point in the set point menu;
- the temperature difference between the solar collector and the solar tank for pump activation.

Ref.	Display description	Def.	UOM	Min	Max
Qb018...Qb109	Solar thermal				
	Set point	60	°C	0.0	90.0
Bb46...Bm46	Solar thermal				
	Tank temperature differential	2.0	°C	0.0	20.0
	Activation delta	6.0	°C	0.0	50.0
	...				



Key

P	Solar pump
T_coll	Solar collector temperature
T_Tank	Solar tank temperature
t	Time

Protection functions

To avoid overheating in the solar collectors and stagnation of water, the collector cooling function can be activated. If the collector temperature exceeds the (cooling) threshold, the solar pump is activated, with

alternating on/off cycles until the temperature falls to the threshold minus a differential. The solar storage tank temperature also has a maximum protection threshold, above which the pump is stopped, even when the collectors need to be cooled.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb47...Bm47	Solar thermal				
	Collector cooling				
	Threshold	110.0	°C	0.0	145.0
	Differential	10.0	°C	0.0	20.0
	Pump cycles				
	ON	60	s	0	9999
	OFF	0	s	0	9999
Bb46...Bm46	Solar thermal				
	...				
	Max tank temperature	80.0	°C	0.0	90.0
	Differential	10.0	°C	0.0	40.0

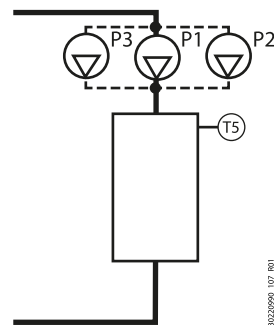
➔ **Note:**

- with both protection functions active, the pump will be off;
- if the OFF time is set to zero, the pump is always on.

6.7 Other types of control

6.7.1 Generic tank fill

In the "Generic tank control" circuit, the fill pump is activated so as to reach the set point.

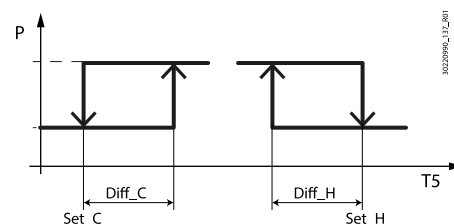


Key

T5	Tank temperature
P1/2/3	Fill pump 1/2/3

Fig.6.v

When the tank temperature reaches the set point, the pump stops. The behaviour is similar in cooling mode.



Key

Set_H	Heating set point
Set_C	Cooling set point
Diff_H	Heating differential
Diff_C	Cooling differential
T5	Tank temperature
P	Tank pump

Screen for setting the set point and differential.

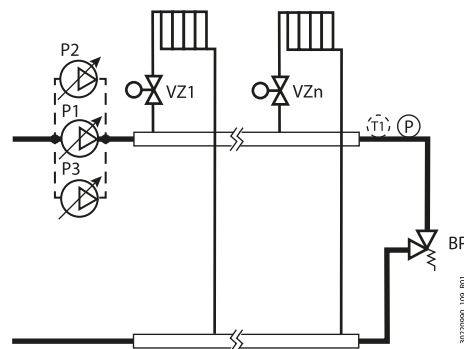
Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					

Ref.	Display description	Def.	UOM	Min	Max
Bb42...Bm42	Generic tank fill				
	Heating				
	Set point	25	°C	0	99.9
	Differential	0.5	°C	0	9.9
Bb43...Bm43	Generic tank fill				
	Cooling				
	Set point	23	°C	-50.0	99.9
	Differential	0.5	°C	0	9.9

6.7.2 Pressure control

The pressure in the water circuit is kept constant in response to opening/closing of the distribution circuit valves.

If the circuit is not equipped with a bypass valve, set the maximum pressure threshold above which the pump switches off. The pump is reactivated at threshold - differential.



Key

VZ1...VZn	Zone 1...n valve (not managed)
P1/2/3	System pump 1/2/3
P	Pressure probe
BP	Bypass valve

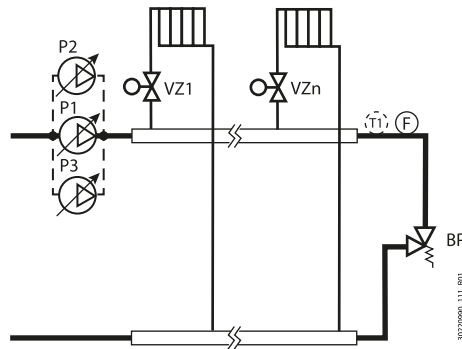
Fig.6.w

The controller varies the pump speed so as to keep the pressure constant.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb44...Bm44	Pressure control				
	Set point	2.0	bar	0	9999.9
	High threshold	5.0	bar	0	9999.9
	Differential	1.0	bar	0	9.9
Bb50...Bm50	Pressure control				
	P	2.0	-	0	99.9
	I	120	-	0	999
	D	0	-	0	999
	Limit min	0	%	0	100
	Limit max	100	%	0	100
	Output	-	%	0	100

6.7.3 Flowrate control

The flow rate in the water circuit is kept constant in response to requests for distribution circuit operation.



Key	
VZ1...VZn	Zone 1...n valve (not managed)
P1/2/3	System pump 1/2/3
F	Flow sensor
BP	Bypass valve

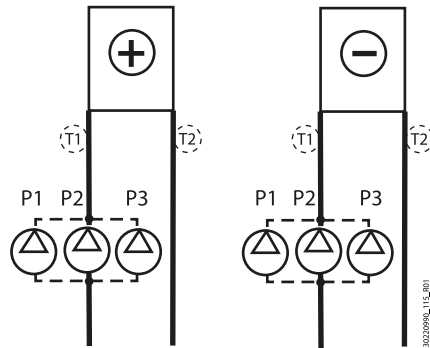
Fig.6.x

The controller varies the pump speed so as to keep the flow rate constant.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb45...Bm45	Flowrate control				
	Set point	10	m3/h	0.0	9999.9
Bb50...Bm50	Flowrate control				
	P	2.0	-	0	99.9
	I	120	-	0	999
	D	0	-	0	999
	Limit min	0	%	0	100
	Limit max	100	%	0	100
	Output	-	%	0	100

6.7.4 k.Air service

The circuit receives requests from the k.Air controllers and serves the heating/cooling coil. It is activated either via scheduler or remote input.



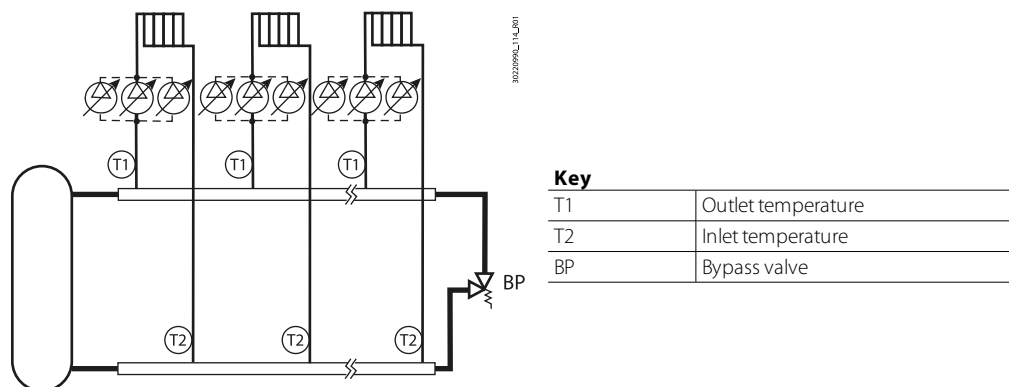
Key	
T1	Outlet temperature
T2	Inlet temperature

Fig.6.y

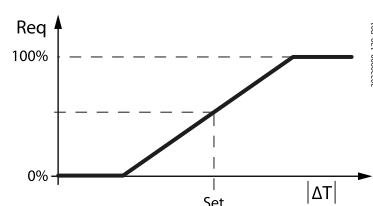
6.7.5 Constant delta temperature

Note: the outlet and inlet probes must be installed.

In the "Temperature differential control" circuit, the pump speed varies in order to keep the differential between outlet and inlet greater than a set point, so as to ensure heat exchange in the room.

**Fig.6.z**

If the temperature difference between outlet and inlet is lower than the set point, the pump speed is decreased so as to decrease heat exchange.

**Key**

ΔT	Outlet temperature - inlet temperature
Set	Set point
Req	Request

The following screen is used to set the set point, which is in fact a temperature differential.

Ref.	Display description	Def.	UOM	Min	Max
Circuit 1...10					
Bb49...Bm49	Constant delta temperature				
	Set point	5.0	°C	0.0	99.9

6.8 Heating/cooling appliance

6.8.1 Switching between heat pump/boiler operation

Each heating/cooling appliance can work in a temperature range, as measured by the outside probe. In heating mode there are two deactivation thresholds: a maximum and a minimum (screen Bn12..Bq12). The first threshold can be used to stop the appliance when the outside temperature exceeds a certain value. Furthermore, combined with the second threshold, it can give priority to one of the appliances over another (e.g.: enable boiler at the coldest time of the year).

Note:

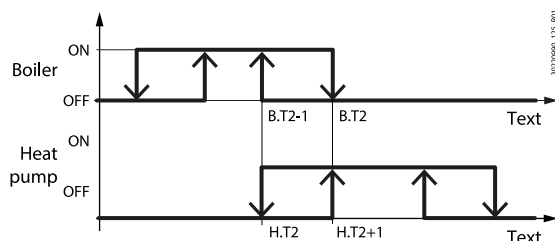
- in cooling mode, only the minimum deactivation threshold is available.
- the deactivation thresholds disable the domestic hot water request but not the frost protection function.

Ref.	Display description	Def.	UOM	Min	Max
Bn12/Bo12/Bp12/Bq12	Chiller/Heat pump/Boiler 1/2				
	Outside temperature cut-off				
	Heating OFF over				
	Threshold	25.0	°C	0	99.9
	Differential	1.0	°C	0	9.9
	Heating OFF below				
	Threshold	7.0	°C	-50	99.9
	Differential	1.0	°C	0	9.9
Bn16/Bo16	Chiller/Heat pump 1/2				
	Outside temperature cut-off				

Ref.	Display description	Def.	UOM	Min	Max
	Cooling OFF below				
	Threshold	15.0	°C	-0.0	99.9
	Differential	1.0	°C	0.0	9.9

Example

Priority between heating appliances with thresholds T1 and T2 (a 1 °C hysteresis is needed to avoid continuous on/off cycles).



Ref.	Description	Ref.	Description
Boiler	Boiler	B.T2	Maximum boiler deactivation threshold
Heat pump	Heat pump	H.T2	Minimum heat pump deactivation threshold
Text	Outside temperature		

Tab.6.i

6.8.2 Capacity depending on the circuits

The heating/cooling appliance set point is defined by the highest request from the connected circuits. Connect the circuits to the heating/cooling appliance by enabling the checkbox.

Ref.	Display description	Def.	UOM	Min	Max
Bn1 ... Bq11					
	Chiller/Heat pump 1/2				
	...				
	Circuits: No/Yes				
	1 2 3 4 5	-	-	1	10
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
	6 7 8 9 10				
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				

To activate control in heating mode:

- access screens Bn13-Bq13 and select "from circuits".

Ref.	Display description	Def.	UOM	Min	Max
Bn13/ Bo13/ Bp13/ Bq13	Heat Pump/Boiler 1/2				
	Heating mode				
	Set point				
	Fixed Climatic Custom From circuits	Fixed	-	Fixed	From circuits
	Circuit set point				
	Maximum	0.0	°C	0.0°C	99.9°C
	Offset	2.0	°C	0.0°C	99.9°C
	Set point calculated	-	°C	0.0°C	99.9°C

To activate control in cooling mode:

- access screens Bn17-Bo17 and select "from circuits".

Ref.	Display description	Def.	UOM	Min	Max
Bn17/ Bo17	Chiller 1/2				
	Cooling mode				
	Set point				
	Fixed From circuits	Fixed	-	Fixed	From circuits

Ref.	Display description	Def.	UOM	Min	Max
	Circuit set point				
	Minimum	90.0	°C	0.0	99.9
	Offset	2.0	°C	0.0	99.9
	Set point calcul.	-	°C	0.0	99.9

Subsequently, in screens Bn18-Bo18 enable control by temperature or capacity (power).

Ref.	Display description	Def.	UOM	Min	Max
Bn18/ Bo18	Chiller/heat pump 1/2				
	Modulating control				
	Control by Power ; Temperature	Power	-	Power	Temperature

Screens Bp16...Bq16 for boilers 1...2

Ref.	Display description	Def.	UOM	Min	Max
Bp16/ Bq16	Boiler 1/2				
	Modulating control				
	Control by Power ; Temperature	Power	-	Power	Temperature

Appliance controlled by temperature/power

In temperature mode, the set point from the circuits is transformed into a temperature set point for the heating/cooling appliance. A screen is available for setting the parameters for converting the set point to a percentage value that controls the analogue output.

Ref.	Display description	Def.	UOM	Min	Max
Bn19/Bo19	Chiller/heat pump 1/2				
	Temperature control				
	Current set point	-	°C	0.0	99.9
	Set point				
	Minimum	0.0	°C	0.0	100.0
	Maximum	100.0	°C	0.0	100.0
	Signal	0	%	0.0	100.0
	Minimum	0.0	%	0.0	100.0
	Maximum	100.0	%	0.0	100.0
	Output	-	%	0.0	100.0

Screens for boilers:

Ref.	Display description	Def.	UOM	Min	Max
Bp17/Bq17	Boiler 1/2				
	Temperature control				
	Current set point	2.0	°C	0.0	99.9
	Set point				
	Minimum	0.0	°C	0.0	100.0
	Maximum	100.0	°C	0.0	100.0
	Signal	0	%	0.0	100.0
	Minimum	0.0	%	0.0	100.0
	Maximum	100.0	%	0.0	100.0
	Output	-	%	0.0	100.0

For power modulation, a screen is available for configuring the PID that controls the modulating output value.

The temperature set point is converted by a PID into a power set point (0-100%) to control the heating/cooling appliance.

Ref.	Display description	Def.	UOM	Min	Max
Bn20/Bo20	Chiller/Heat pump 1-2				
	Power control				
	Temperature	-	°C	-	-
	P	2.0	-	0.0	99.9
	I	120	-	0	999
	D	0	-	0	999

Ref.	Display description	Def.	UOM	Min	Max
	Limit min	0.0	%	0.0	100.0
	Limit max	100.0	%	0.0	100.0
	Output	-	%	0.0	100.0

Screens for boilers:

Ref.	Display description	Def.	UOM	Min	Max
Bp18/Bq18	Boiler 1/2				
	Power control				
	Temperature	-	°C	-99.9	99.9
	P	2.0	-	0.0	99.9
	I	120	-	0	999
	D	0	-	0	999
	Limit min	0.0	%	0.0	100.0
	Limit max	100.0	%	0.0	100.0
	Output	-	%	0.0	100.0

Modulating output to the heating/cooling appliance:

Ref.	Display description	Def.	UOM	Min	Max
Bn06/Bo06	Chiller/Heat pump 1/2				
	Modulating control				
	Output status	-	%	0	100
	Signal 0...10 V 2...10 V	0...10 V	-	0...10 V	2...10 V
	--- c.pCO: U01...U10; Y01...Y06 c.pCOE1...E4: U01...U10				

Screens for boilers:

Ref.	Display description	Def.	UOM	Min	Max
Bp06/Bq06	Boiler 1/2				
	Modulating control				
	Output status				
	Signal 0...10 V 2...10 V	0...10 V	-	0...10 V	2...10 V
	--- c.pCO: U01...U10; Y01...Y06 c.pCOE1...E4: U01...U10	-	°C	999.9	999.9

6.8.3 Capacity delivered independently

In this case, control of heating/cooling appliance capacity is independent of the request from the distribution circuits. To enable this function, the heating/cooling appliance must not be connected to any of the circuits in the system.

Access the following screens and disable all of the checkboxes.

Ref.	Display description	Def.	UOM	Min	Max
Bn1 ... Bq11	Chiller/Heat pump 1/2				
	k.Air: No/Yes				
	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> </div> <div> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> <div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> </div> <div> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div>	-	-	1	10
	Circuits: No/Yes	-	-	1	10

Ref.	Display description					Def.	UOM	Min	Max
	1	2	3	4	5				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
	6	7	8	9	10				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

In the following screens, go to the set point field and select fixed or climate:

- fixed: the heating/cooling appliance works according to a fixed set point;
- climate, custom: the set point is calculated based on the outside temperature, depending on the chosen climate curve.

Ref.	Display description	Def.	UOM	Min	Max
Bn13/Bo13/Bp13/Bq13	Chiller/Heat pump/Boiler 1/2				
	Heating mode				
	Set point Fixed Climatic Custom From circuits	Fixed	-	Fixed	From circuits
	Room/outlet set point				
	Comfort	-	°C	0.0	99.9
	Economy	-	°C	0.0	99.9
	Set point calculated	-	°C	0.0	99.9

Note:

- for this type of control, the heating/cooling appliance outlet temperature probe is required;
- the explanations already provided for setting the climate curve in the distribution circuits also apply here.

6.9 Generic functions

6.9.1 Pump anti-seize

The function can be activated for both the heating/cooling appliances and the distribution circuits equipped with one or more pumps. It prevents the pumps from remaining off for too long, with the risk of seizing.

The function, once enabled:

- activates the pump once every 7 days for 10 seconds;
- resets the timer every time it is used.

Enabling

Distribution circuits:

Ref.	Display description	Def.	UOM	Min	Max
Bb04...Bm04					
	Circuit 1...10				
	Pump management				
	Anti-seize	No	-	No	Yes
	Rotation time	24	h	0	999
	Force rotation	No	-	No	Yes

Appliances

Ref.	Display description	Def.	UOM	Min	Max
Bn04, Bo04, Bp04, Bq04					
	Chiller/Heat pump/Boiler 1/2				
	Pump management				
	Anti-seize	No	-	No	Yes
	Rotation time	24	h	0	999
	Force rotation	No	-	No	Yes

6.9.2 Pump rotation

The controller activates the group of pumps following a request to activate the circuit or the heating/cooling appliance. Activation mode depends on the number of pumps present.

Number of pumps	Pumps active on request	Pumps in standby
1	1	0
2	1	1
3	2	1

When there is just one pump, there is no type of backup and rotation. When there are two pumps, the second pump is always available in case of malfunction on the first, signalled via the digital input with alarm function. To balance the operating hours of the group of pumps, timed rotation is applied, configured on screens Bb04-Bq04. To check operation of the rotation function during installation, it can be activated manually. Timed rotation can be disabled by setting the rotation hours to zero.

6.10.1 Introduction

Legionella prevention is an important function that prevents the spread of Legionella bacteria by thermal disinfection.

The method involves heating the water to a temperature above 60 °C (at 60 °C the bacterium dies in 32 minutes, at 66 °C in 2 minutes, and at 70 °C it dies instantaneously) for a sufficient time to ensure disinfection.

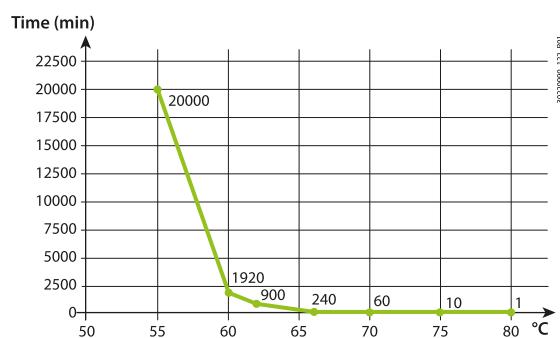


Fig.6.aa

⚠ Important:

- the method does not require any special equipment, yet has the disadvantage of being effective only when the hot water reaches every part of the system, including the distribution terminals;
- to reduce the danger of the bacteria, precautions should already be taken in the design phase, eliminating the possibility of water stagnation (-> systems with recirculation);
- ensure adequate maintenance, which includes correct cleaning of the system and the storage tanks, as well as all other components where water may stagnate and sediments may form;
- chemical treatment of the water, aimed at avoiding the production and proliferation of algae and other bacteria, also helps defend against Legionella, which often feeds on these species to grow;
- it is the installer's and/or user's responsibility to verify compliance of the procedure with legal and regulatory requirements in force in the place where the product is installed;
- application of this procedure does not in itself imply the certainty of complete removal of the risk of bacterial contamination in all parts of the system. It is the full and complete responsibility of the installer and/or user to carry out periodical checks on the system through specific bacteriological analysis.

Legionella prevention is a cyclical function that activates the heating appliances (boiler or heat pump) and the circuits involved in the production/distribution of domestic hot water (DHW tank fill and DHW distribution) for a time calculated according to the temperature measured by the reference probe.

➡ Note:

- the set point is automatically calculated by the controller and cannot be set;
- the function contrasts with the requirement for energy savings and measures to prevent the formation of scale and prevent burns (temperature above 60 °C).

Set the screens relating to:

6.10 Legionella prevention

- Legionella prevention function;
- appliances involved;
- distribution circuits involved;

6.10.2 Enable function

Enable the Legionella prevention cycle and set the control probe.

⚠ Important: the probe must measure the coldest point in the domestic hot water distribution network. In this way, it can be assumed that all other parts have a higher temperature, so as to ensure better disinfection.

Ref.	Display description	Def.	UOM	Min	Max
Ba12					
	General configuration				
	Antilegionella				
	Cycle Disable Enable	Disable	-	Disable	Enable
	Control probe — c.pCO: U01...U10; c.pCOE1...E4: U01...U10	---			
	Program Fixed days Fixed period	Fixed days	-	Fixed days	Fixed period

Programming

The Legionella prevention cycle can be activated:

- on certain days (fixed days);
- periodically (fixed period).

Fixed days: screen to set the day of the week and time band for activation:

Ref.	Display description	Def.	UOM	Min	Max
Ba13					
	General configuration				
	Antilegionella				
	Fixed days				
	MO TU WE TH <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FR SA SU <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	No day	-	No day	All days
	Start	0	hours	0	23
		0	min	0	59
	End	0	hours	0	23
		0	min	0	59

Fixed period: the count starts when the controller is switched on; set the period between consecutive cycles.

🕒 Note: the days are counted after midnight.

Ref.	Display description	Def.	UOM	Min	Max
Ba14					
	General configuration				
	Antilegionella				
	Fixed period				
	Days between cycles	0	day	0	9
	Start	0	hours	0	23
		0	min	0	59
	End	0	hours	0	23
		0	min	0	59

➔ **Note:** during normal operation, the controller continuously monitors the Legionella prevention control probe. This means a scheduled Legionella prevention cycle can be skipped if, in the hours leading up to the start of the cycle, the temperature measured was sufficient to correctly complete a disinfection cycle.

Minimum duration with high temperature ($T > 75^{\circ}\text{C}$)

If the temperature measured by the control probe $> 75^{\circ}\text{C}$, set the minimum duration of the Legionella prevention cycle, which otherwise would end after about 10 s. It is also possible to enter a number of failed cycles before activating the alarm.

Ref.	Display description	Def.	UOM	Min	Max
Ba15					
	General configuration				
	Antilegionella				
	Minimum duration	1	min	1	99
	Maximum no. failed cycles	1	-	0	99
	Force start	---	-	---	Start
	--- Start				

Manual activation

A Legionella prevention cycle can also be started manually. See the previous screen.

6.10.3 Enable heating/cooling appliances

The Legionella prevention cycle needs domestic hot water (DHW) at a temperature constantly above 60°C . Set which of the heating/cooling appliances already enabled for DHW production will be activated during the Legionella prevention cycle. Set the control mode to "Always heating" to always activate the Legionella prevention function.

➔ **Note:** the "Only heating" setting means that the Legionella prevention function will only be activated when the system is in heating mode.

Ref.	Display description	Def.	UOM	Min	Max
Bn08, Bo08, Bp08, Bq08					
	Heat Pump/Boiler 1/2				
	Control mode: Only heating Only cooling Heating / Cooling Always heating Always cooling	Heat pump: Cooling/heating Chiller: Only cooling	-	Only heating	Always cooling
	DHW production	No	-	No	Yes
	Antilegionella	No	-	No	Yes
	Antifreeze protection	No	-	No	Yes

Then set the heating/cooling appliance set point during the Legionella prevention cycle.

Ref.	Display description	Def.	UOM	Min	Max
Bn13, Bo13, Bp13, Bq13					
	Chiller/heat pump 1				
	Heating mode				
	...				
	Antilegionella	75.0/60.0	$^{\circ}\text{C}$	60.0 $^{\circ}\text{C}$	95.0 $^{\circ}\text{C}$
	Set point calculated	-	$^{\circ}\text{C}$	0.0 $^{\circ}\text{C}$	99.9 $^{\circ}\text{C}$

6.10.4 Enable circuits

All "DHW fill" and "DHW distribution" circuits must have the Legionella prevention cycle enabled. However, on kwater the circuits requiring the function can be enabled selectively.

During the Legionella prevention cycle, the circuit pumps and mixing valves will be activated, independently of the standard control request, so as to allow correct water flow.

Screen for "DHW Distribution" circuit.

Ref.	Display description	Def.	UOM	Min	Max
Bb40...Bm40					
	DHW circuit control				
	Set point	45	°C	-99.9	99.9
	Pump cycles				
	On	60	s	0	9999
	Off	0	s	0	9999
	Antilegionella No Yes	No	-	No	Yes

Screen for "DHW tank fill" circuit.

Ref.	Display description	Def.	UOM	Min	Max
Bb41...Bm41					
	DHW fill				
	Set point	45	°C	-99.9	99.9
	Differential	2.0	°C	-9.9	9.9
	Antilegionella No Yes	No	-	No	Yes

6.11 Frost protection

The frost protection function operates:

1. when the outside probe is configured;
2. only when circuits or appliances are OFF.

In the distribution or production circuits where modulation is required, the economy set point will be used, while for production with set points from the circuits, the lowest set point from the circuits connected to the heating/cooling appliance will be used.

There are two types of frost protection functions, both based on the outside temperature measurement:

1. system;
2. production.

Screen for setting the frost protection (antifreeze) threshold for circuits and appliances.

Ref.	Display description	Def.	UOM	Min	Max
Ba10					
	General configuration				
	Antifreeze				
	Circuits				
	Threshold	0.0	°C	-40.0	10.0
	Status Off On	Off	-	Off	On
	Production				
	Threshold	-10.0	°C	-40.0	10.0
	Status Off On	Off	-	Off	On

6.11.1 System frost protection

Enable the frost protection function for each circuit.

Ref.	Display description	Def.	UOM	Min	Max
Bb11...Bm11					
	Circuit 1				
	Control mode Only heating Only cooling Heating / Cooling Always heating Always cooling	Only heating	-	Only heating	Always cooling
	Antifreeze protection No Yes	No	-	No	Yes

If the outside temperature measurement falls below the threshold for the circuit, the valves will open and the circuit pump will be activated. The deactivation differential is fixed at 2°C.

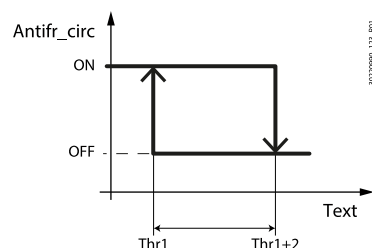


Fig.6.ab

Ref.	Description	Ref.	Description
Antifr_circ	Circuit frost protection	Thr1	Circuit frost protection activation threshold
Text	Outside temperature		

➡ **Note:** if the circuits are already active, they will continue normal operation according to their own settings.

6.11.2 Appliance frost protection

Enable the frost protection function for each appliance.

Ref.	Display description	Def.	UOM	Min	Max
Bn08, Bo08, Bp08, Bq08					
	Chiller/Heat pump/Boiler 1				
	Control mode: Only heating ; Only cooling ; Heating / Cooling ; Always heating ; Always cooling	Heat pump: Cooling/heating Chiller: Only cooling	-	Only heating	Always cooling
	DHW production	No	-	No	Yes
	Antilegionella	No	-	No	Yes
	Antifreeze protection	No	-	No	Yes

If the outside temperature measurement falls below the threshold for the appliance, this will be activated.

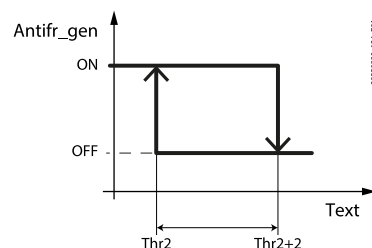


Fig.6.ac

Ref.	Description	Ref.	Description
Antifr_gen	Appliance frost protection	Thr2	Appliance frost protection activation threshold
Text	Outside temperature		

6.11.3 Energy consumption measurement

The function is used to measure power consumption in several parts of the system.

For configuration, access screen Fe10 and set the number and serial addresses of the energy meters.

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M
Fe10	Enable energy meters								
	Number	0	-	0	3		R	R/W	R/W
	Modbus address								
	Energy meter 1	21	-	0	255		R	R/W	R/W
	Energy meter 2	22	-	0	255		R	R/W	R/W
	Energy meter 3	23	-	0	255		R	R/W	R/W

Data measured: power, energy, reactive energy.

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M
Qa47 Qa48 Qa49	Energy meter 1/2/3								
	Mains freq:	-	Hz	-999.9	999.9	Fe10: no. energy meters = 1	R	R	R
	Power factor:	-	-	-9.999	9.999		R	R	R
	Power:	-	W	-99999.9	99999.9		R	R	R
	Energy:	-	kWh	-99999.9	99999.9		R	R	R
	Reactive energy:	-	kvarh	-9999.99	9999.99		R	R	R

More detailed information is available on screen Qaa99.

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M
Qaa71/ Qaa75/ Qaa79	Energy meter 1/2/3								
	Power								
	L1	0	Watt	-99999.9	99999.9		R	R	R
	L2	0	Watt	-99999.9	99999.9		R	R	R
	L3	0	Watt	-99999.9	99999.9		R	R	R
	Tot	0	Watt	-99999.9	99999.9		R	R	R
	PF								
	L1	0	-	-99999.9	99999.9		R	R	R
	L2	0	-	-99999.9	99999.9		R	R	R
	L3	0	-	-99999.9	99999.9		R	R	R
	Tot	0	-	-99999.9	99999.9		R	R	R
Qaa72/ Qaa76/ Qaa80	Energy meter 1/2/3								
	Next phase								
	L1	0.0	V	-99999.9	99999.9		R	R	R
	L2	0.0	V	-99999.9	99999.9		R	R	R
	L3	0.0	V	-99999.9	99999.9		R	R	R
	Tot	0.0	V	-99999.9	99999.9		R	R	R
	Current								
	L1	0.0	A	-99999.9	99999.9		R	R	R
	L2	0.0	A	-99999.9	99999.9		R	R	R
	L3	0.0	A	-99999.9	99999.9		R	R	R
	Tot	0.0	A	-99999.9	99999.9		R	R	R
Qaa73/ Qaa77/ Qaa81	Energy meter 1/2/3								
	Voltage next phase								
	L1	0.0	V	-99999.9	99999.9		R	R	R
	L2	0.0	V	-99999.9	99999.9		R	R	R
	L3	0.0	V	-99999.9	99999.9		R	R	R
	Tot	0.0	V	-99999.9	99999.9		R	R	R
	Phase neutral								
	L1	0.0	A	-99999.9	99999.9		R	R	R
	L2	0.0	A	-99999.9	99999.9		R	R	R
	L3	0.0	A	-99999.9	99999.9		R	R	R
	Tot	0.0	A	-99999.9	99999.9		R	R	R

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M
	Energy meter 1/2/3								
	Apparent power								
	L1	0	VA	-99999.9	99999.9		R	R	R
	L2	0	VA	-99999.9	99999.9		R	R	R
Qaa74/	L3	0	VA	-99999.9	99999.9		R	R	R
Qaa78	Tot	0	VA	-99999.9	99999.9		R	R	R
Qaa82	Reactive power								
	L1	0	var	-99999.9	99999.9		R	R	R
	L2	0	var	-99999.9	99999.9		R	R	R
	L3	0	var	-99999.9	99999.9		R	R	R
	Tot	0	var	-99999.9	99999.9		R	R	R

7. Parameter table

🔍 **Note:** IR = input register, HR = holding register, DI = digital input, C = Coil

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Press UP/DOWN to show the main screen and the Info, Set and ON/OFF icons, then press Enter to open the quick-access menu										
Info										
Qa01	Outside temperature		°C				R	R	R	
	Outside humidity		%rH				R	R	R	
	Antifreeze Off ; On		Off	Off	On		R	R	R	
Qa02	Not used									
Qa03	Info boiler 1					Ba04: Boiler configuration 1: enable				
	Boiler 1					Bp01: Number of pumps; Bp05: Probe management				
	Outlet temperature	-	°C	-999.9	999.9		R	R	R	
	Inlet temperature	-	°C	-999.9	999.9		R	R	R	
	Pump 1 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Modulation control	0	%	0	100	Bp06: Channel Bp18 PID/limits	R	R	R	
	Circuit status On ; Forced On ; Antilegionella ; Off by DI ; Off by k.Air ; Off by scheduler ; Off by operating mode ; Forced off ; Antifreeze ON ; System off	On	-	On	System off	Bp07: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Request from scheduler Off ; Economy ; Comfort ; On	Off	-	Off	On		R	R	R	
Qa04	Not used									
Qa05	Info boiler 2					Ba04: Boiler configuration 2: enable				
	Boiler 2									
	Outlet temperature	-	°C	-999.9	999.9	Bq05: Probe management	R	R	R	
	Inlet temperature	-	°C	-999.9	999.9	Bq05: Probe management	R	R	R	
	Pump 1 status Off ; On ; Alarm	Off	-	Off	Alarm	Bq01: Number of pumps	R	R	R	
	Pump 2 status Off ; On ; Alarm	Off	-	Off	Alarm	Bq01: Number of pumps	R	R	R	
	Pump 3 status Off ; On ; Alarm	Off	-	Off	Alarm	Bq01: Number of pumps	R	R	R	
	Modulation control	0	%	0	100	Bq06: Channel Bq18 PID/limits	R	R	R	
	Circuit status On ; Forced On ; Antilegionella ; Off by DI ; Off by k.Air ; Off by scheduler ; Off by operating mode ; Forced off ; Antifreeze ON ; System off	On	-	On	System off	Bq07: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Request from scheduler Off ; Economy ; Comfort ; On	Off	-	Off	On	Qc03: Scheduler	R	R	R	
Qa06	Not used									
Qa07	Info-Heat pump 1 ; Info-Chiller 1					Ba03: Electrical generator				

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
						configuration: Heat pump/chiller				
	Heat pump Chiller									
	Outlet temperature	-	°C	-999.9	999.9	Bn05: Probe management	R	R	R	
	Inlet temperature	-	°C	-999.9	999.9	Bn05: Probe management	R	R	R	
	Pump 1 status Off On Alarm	Off	-	Off	Alarm	Bn01: number of pumps	R	R	R	
	Pump 2 status Off On Alarm	Off	-	Off	Alarm	Bn01: number of pumps	R	R	R	
	Pump 3 status Off On Alarm	Off	-	Off	Alarm	Bn01: number of pumps	R	R	R	
	Modulation control	0	%	0	100	Bn06: channel; Bn18 PID/limits	R	R	R	
	Circuit status On Forced On Antilegionella Off by DI Off by k.Air Off by scheduler Off by operating mode Forced off Antifreeze ON System off	On	-	On	System off	Bn07: mode (manual on -> forced on; manual off -> forced off)	R	R	R	
	Request from scheduler Off Economy Comfort On	Off	-	Off	On	Qc03: Scheduler	R	R	R	
Qa08	Not used									
Qa09	Info Heat pump 2 Info-Chiller 2					Ba03: Electrical generator configuration: Heat pump/chiller				
	Heat pump Chiller									
	Outlet temperature	-	°C	-999.9	999.9	Bo05: Probe management	R	R	R	
	Inlet temperature	-	°C	-999.9	999.9	Bo05: Probe management	R	R	R	
	Pump 1 status Off On Alarm	Off	-	Off	Alarm	Bo01: number of pumps	R	R	R	
	Pump 2 status Off On Alarm	Off	-	Off	Alarm	Bo01: number of pumps	R	R	R	
	Pump 3 status Off On Alarm	Off	-	Off	Alarm	Bo01: number of pumps	R	R	R	
	Modulation control	0	%	0	100	Bo06: Channel Bo18 PID/limits	R	R	R	
	Circuit status On Forced On Antilegionella Off by DI Off by k.Air Off by scheduler Off by operating mode Forced off Antifreeze ON System off	On	-	On	System off	Bo07: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Request from scheduler Off Economy Comfort On	Off	-	Off	On	Qc03: Scheduler	R	R	R	
Qa10	Not used									
Qa11	Info circuit 1									
	Circuit description					Description entered in Bb01				
	Direct Direct plus Mixed Mixed plus DHW distribution DHW tank fill Gen. tank fill Pressure ctrl Flowrate ctrl Solar power k.Air service Constant delta temperature						R	R	R	
	Direct: Outlet temp. Direct plus: Room temp. Mixed: Outlet temp.	-	°C	-999.9	999.9	Bb05: Probe management	R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Mixed plus: Room temp. DHW distribution: DHW outlet temp. DHW tank fill: DHW tank temp. Generic tank fill: Tank temp. Pressure ctrl: Pressure Flowrate ctrl: Flowrate Solar thermal: Solar collector temp. k.Air service: Return temp. Constant delta temp.: Inlet temp.									
	Direct: Room temp. Direct plus: Outlet temp. Mixed: Room temp. Mixed plus: Outlet temp. DHW distribution: DHW tank temp. DHW tank fill: Second DHW tank temp. Generic tank fill: Second tank temp. Pressure ctrl: Outlet temp. Flowrate ctrl: Outlet temp. Solar thermal: Tank temp. k.Air service: Return temperature Constant delta temp.: Inlet temp.	-	°C	-999.9	999.9	Bb05: Probe management	R	R	R	
	Pump 1 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Circuit status On Forced On Antilegionella Off by DI Off by k.Air Off by scheduler Off by operating mode Forced off Antifreeze ON System off	On	-	On	System off	Bb10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Modulation control	0	%	0	100	Bb06: Channel Bb50: PID/limits	R	R	R/W	
	Request from scheduler Off Economy Comfort On	Off	-	Off	On	Qc01: scheduler	R	R	R	
Qa12	Not used									
Qa13	Info circuit 2									
	Circuit description					Description entered in Bc01				
	Probe 1: see Qa11						R	R	R	
	Probe 2: see Qa11						R	R	R	
	Pump 1 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Circuit status On Forced On Antilegionella Off by DI Off by k.Air Off by scheduler Off by operating mode Forced off Antifreeze	On	-	On	System off	Bc10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	ON; System off									
	Modulation control	0	%	0	100	Bc06: Channel Bc50: PID/limits	R	R	R	
	Request from scheduler Off; Economy; Comfort; On	Off	-	Off	On	Qc01: scheduler	R	R	R	
Qa14	Not used									
Qa15	Info circuit 3									
	Circuit description					Description entered in Bd01				
	Probe 1: see Qa11						R	R	R	
	Probe 2: see Qa11						R	R	R	
	Pump 1 status Off; On; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off; On; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off; On; Alarm	Off	-	Off	Alarm		R	R	R	
	Circuit status On; Forced On; Antilegionella; Off by DI; Off by k.Air; Off by scheduler; Off by operating mode; Forced off; Antifreeze ON; System off	On	-	On	System off	Bd10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R/W	
	Modulation control	0	%	0	100	Bd06: Channel Bd50: PID/limits	R	R	R	
	Request from scheduler Off; Economy; Comfort; On	Off	-	Off	On	Qc01: scheduler	R	R	R	
Qa16	Not used									
Qa17	Info circuit 4									
	Circuit description					Description entered in Be01				
	Probe 1: see Qa11						R	R	R	
	Probe 2: see Qa11						R	R	R	
	Pump 1 status Off; On; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off; On; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off; On; Alarm	Off	-	Off	Alarm		R	R	R	
	Circuit status On; Forced On; Antilegionella; Off by DI; Off by k.Air; Off by scheduler; Off by operating mode; Forced off; Antifreeze ON; System off	On	-	On	System off	Be10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Modulation control	0	%	0	100	Be06: Channel Be50: PID/limits	R	R	R	
	Request from scheduler Off; Economy; Comfort; On	Off	-	Off	On	Qc01: scheduler	R	R	R	
Qa18	Not used									
Qa19	Info circuit 5									
	Circuit description					Description entered in Bf01				
	Probe 1: see Qa11						R	R	R	
	Probe 2: see Qa11						R	R	R	
	Pump 1 status Off; On; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off; On; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off; On; Alarm	Off	-	Off	Alarm		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Circuit status On Forced On Antilegionella Off by DI Off by k.Air Off by scheduler Off by operating mode Forced off Antifreeze ON System off	On	-	On	System off	Bf10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Modulation control	0	%	0	100	Bf06: Channel Bf50: PID/limits	R	R	R	
	Request from scheduler Off Economy Comfort On	Off	-	Off	On	Qc01: scheduler	R	R	R	
Qa20	Not used									
Qa21	Info circuit 6									
	Circuit description					Description entered in Bg01				
	Probe 1: see Qa11						R	R	R	
	Probe 2: see Qa11						R	R	R	
	Pump 1 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Circuit status On Forced On Antilegionella Off by DI Off by k.Air Off by scheduler Off by operating mode Forced off Antifreeze ON System off	On	-	On	System off	Bg10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Modulation control	0	%	0	100	Bg06: Channel Bg50: PID/limits	R	R	R	
	Request from scheduler Off Economy Comfort On	Off	-	Off	On	Qc02: scheduler	R	R	R	
Qa22	Not used									
Qa23	Info circuit 7									
	Circuit description					Description entered in Bh01				
	Probe 1: see Qa11						R	R	R	
	Probe 2: see Qa11						R	R	R	
	Pump 1 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off On Alarm	Off	-	Off	Alarm		R	R	R	
	Circuit status On Forced On Antilegionella Off by DI Off by k.Air Off by scheduler Off by operating mode Forced off Antifreeze ON System off	On	-	On	System off	Bh10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Modulation control	0	%	0	100	Bh06: Channel Bh50: PID/limits	R	R	R	
	Request from scheduler Off Economy Comfort On	Off	-	Off	On	Qc02: scheduler	R	R	R	
Qa24	Not used									
Qa25	Info circuit 8									
	Circuit description					Description entered in Bi01				
	Probe 1: see Qa11									
	Probe 2: see Qa11									
	Pump 1 status	Off	-	Off	Alarm		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Off ; On ; Alarm									
	Pump 2 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Circuit status On ; Forced On ; Antilegionella ; Off by DI ; Off by k.Air ; Off by scheduler ; Off by operating mode ; Forced off ; Antifreeze ON ; System off	On	-	On	System off	Bi10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Modulation control	0	%	0	100	Bi06: Channel Bi50: PID/limits	R	R	R	
	Request from scheduler Off ; Economy ; Comfort ; On	Off	-	Off	On	Qc02: scheduler	R	R	R	
Qa26	Not used									
Qa27	Info circuit 9									
	Circuit description					Description entered in BI01				
	Probe 1: see Qa11						R	R	R	
	Probe 2: see Qa11						R	R	R	
	Pump 1 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Circuit status On ; Forced On ; Antilegionella ; Off by DI ; Off by k.Air ; Off by scheduler ; Off by operating mode ; Forced off ; Antifreeze ON ; System off	On	-	On	System off	BI10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Modulation control	0	%	0	100	BI06: Channel BI50: PID/limits	R	R	R	
	Request from scheduler Off ; Economy ; Comfort ; On	Off	-	Off	On	Qc02: scheduler	R	R	R	
Qa28	Not used									
Qa29	Info circuit 10									
	Circuit description					Description entered in Bm01				
	Probe 1: see Qa11						R	R	R	
	Probe 2: see Qa11						R	R	R	
	Pump 1 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 2 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Pump 3 status Off ; On ; Alarm	Off	-	Off	Alarm		R	R	R	
	Circuit status On ; Forced On ; Antilegionella ; Off by DI ; Off by k.Air ; Off by scheduler ; Off by operating mode ; Forced off ; Antifreeze ON ; System off	On	-	On	System off	Bm10: mode (manual on -> Forced on; manual off -> Forced off)	R	R	R	
	Modulation control	0	%	0	100	Bm06: Channel Bm50: PID/limits	R	R	R	
	Request from scheduler Off ; Economy ; Comfort ; On	Off	-	Off	On	Qc02: scheduler	R	R	R	
Qa30	Not used									

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Qa31	Info									
	Antilegionella									
	Cycle active No Yes	No	-	No	Yes	Ba12: Cycle = enable; Ba13: Fixed days; Ba14: Fixed period; B(b...m)40: Antilegionella=Yes	R	R	R	
	Cycle timeout No Yes	No	-	No	YES		R	R	R	
	Countdown									
	Temperature check	0	s	0	32767		R	R	R	
	Cycle timeout	0	s	0	9999		R	R	R	
Qa32...Qa46	Not used									
Qa47	Energy meter 1									
	Mains freq:	-	Hz	-999.9	999.9	Fe10: no. energy meters = 1	R	R	R	
	Power factor:	-	-	-9.999	9.999		R	R	R	
	Power:	-	W	-99999.9	99999.9		R	R	R	
	Energy:	-	kWh	-99999.9	99999.9		R	R	R	
	Reactive energy:	-	kvarh	-9999.99	9999.99		R	R	R	
Qa48	Energy meter 2									
	Mains freq:	-	Hz	-999.9	999.9	Fe10: No. energy meters = 2	R	R	R	
	Power factor:	-	-	-9.999	9.999		R	R	R	
	Power:	-	W	-99999.9	99999.9		R	R	R	
	Energy:	-	kWh	-99999.9	99999.9		R	R	R	
	Reactive energy:	-	kvarh	-9999.99	9999.99		R	R	R	
Qa49	Energy meter 3									
	Mains freq:	-	Hz	-999.9	999.9	Fe10: No. energy meters = 3	R	R	R	
	Power factor:	-	-	-9.999	9.999		R	R	R	
	Power:	-	W	-99999.9	99999.9		R	R	R	
	Energy:	-	kWh	-99999.9	99999.9		R	R	R	
	Reactive energy:	-	kvarh	-9999.99	9999.99		R	R	R	
Qa50	Carel S.p.A.									
	Code: OSSTDmKWTE									
	SW version.:	-					R	R	R	
	OS version:	-					R	R	R	
	BOOT version:	-					R	R	R	
Qa51...Qa52	Not used									
Qa53	Work hours									
	Unit	-	h				R	R	R	
Qa54	Blackout info									
	Current date - time: 30/01/19 12:25:05						R	R	R	
	Power off date - time: 24/01/2019 12:25:05						R	R	R	
	Length last time off dd - hh - mm						R	R	R	
Qa55...Qa60	Not used									
Qa61	KAir01									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	









































Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	H:		%	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off ; On						R	R	R	
	Outside T.:		°C				R	R	R	
	Unit Unit: Off by alarm ; Off by BMS ; Off by sched ; Off by DI ; Off by KeyB ; Off by fan ; Off by airflow ; Off by k.Water Antifreeze off ; Switch on ; Warm up ; Cooling ; Manual switch on ; Manual warm up ; Manual heating ; Manual cooling ; Defrost recuperator ; Defrost evaporator ; Antifreeze ; Cont. probe error. ; Shut down ; I/O test ; Dehumid ; Generic cont. ; Manual generic cont. Low supply temp. ; High supply temp. ; High saturation humidity ; Inactive start ; Exception ; Offline						R	R	R	
Qa62	KAir02									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off ; On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off ; On						R	R	R	
	Outside T:		°C				R	R	R	
	Unit: See Qa61						R	R	R	
Qa63	KAir03									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off ; On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off ; On						R	R	R	
	Outside T:		°C				R	R	R	
	Unit: See Qa61						R	R	R	
Qa64	KAir04									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Off On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Outside T.:		°C				R	R	R	
	Unit: See Qa61						R	R	R	
Qa65	KAir05									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Outside T.:		°C				R	R	R	
	Unit: See Qa61						R	R	R	
Qa66	KAir06									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Outside T.:		°C				R	R	R	
	Unit: See Qa61						R	R	R	
Qa67	KAir07									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Outside T.:		°C				R	R	R	
	Unit: See Qa61						R	R	R	
Qa68	KAir08									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Off On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Outside T.:		°C				R	R	R	
	Unit: See Qa61						R	R	R	
Qa69	KAir09									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Outside T.:		°C				R	R	R	
	Unit: See Qa61						R	R	R	
Qa70	KAir10									
	Return									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Supply									
	T:		°C	-99.9	99.9		R	R	R	
	H:		%rH	0.0	100.0		R	R	R	
			%	0.0	100.0		R	R	R	
	Off On						R	R	R	
	Outside T.:		°C				R	R	R	
	Unit: See Qa61						R	R	R	
Qa71....Qa98	Not used									
Qa99	Press enter for other information									
	Universal input									
	Board									
Qaa01	U1	-	-	-999.9	999.9		R	R	R	
	U2	-	-	-999.9	999.9		R	R	R	
	U3	-	-	-999.9	999.9		R	R	R	
	U4	-	-	-999.9	999.9		R	R	R	
	U5	-	-	-999.9	999.9		R	R	R	
	Universal input									
	Board									
Qaa02	U6	-	-	-999.9	999.9		R	R	R	
	U7	-	-	-999.9	999.9		R	R	R	
	U8	-	-	-999.9	999.9		R	R	R	
	U9	-	-	-999.9	999.9		R	R	R	
	U10	-	-	-999.9	999.9		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Qaa03	Digital inputs									
	Board									
	ID1	-	-	Open	Close		R	R	R	
	ID2	-	-	Open	Close		R	R	R	
	ID3	-	-	Open	Close		R	R	R	
	ID4	-	-	Open	Close		R	R	R	
	ID5	-	-	Open	Close		R	R	R	
Qaa04	Digital inputs									
	Board									
	ID7	-	-	Open	Close		R	R	R	
	ID8	-	-	Open	Close		R	R	R	
	ID9	-	-	Open	Close		R	R	R	
	ID10	-	-	Open	Close		R	R	R	
	ID11	-	-	Open	Close		R	R	R	
Qaa05	Digital inputs									
	Board									
	ID13	-	-	Open	Close		R	R	R	
	ID14	-	-	Open	Close		R	R	R	
	ID15	-	-	Open	Close		R	R	R	
	ID16	-	-	Open	Close		R	R	R	
	ID17	-	-	Open	Close		R	R	R	
Qaa06	Digital inputs									
	Board									
	ID18	-	-	Open	Close		R	R	R	
	Analogue outputs									
	Board									
	Y1	-	-	-999.9	999.9		R	R	R	
	Y2	-	-	-999.9	999.9		R	R	R	
Qaa07	Analogue outputs									
	Board									
	Y3	-	-	-999.9	999.9		R	R	R	
	Y4	-	-	-999.9	999.9		R	R	R	
	Y5	-	-	-999.9	999.9		R	R	R	
	Y6	-	-	-999.9	999.9		R	R	R	
	Digital outputs									
Qaa08	Board									
	NO1	-	-	Open	Close		R	R	R	
	NO2	-	-	Open	Close		R	R	R	
	NO3	-	-	Open	Close		R	R	R	
	NO4	-	-	Open	Close		R	R	R	
	NO5	-	-	Open	Close		R	R	R	
	NO6	-	-	Open	Close		R	R	R	
Qaa09	Digital outputs									
	Board									
	NO7	-	-	Open	Close		R	R	R	
	NO8	-	-	Open	Close		R	R	R	
	NO9	-	-	Open	Close		R	R	R	
	NO10	-	-	Open	Close		R	R	R	
	NO11	-	-	Open	Close		R	R	R	
Qaa09	Digital outputs									
	Board									
	NO12	-	-	Open	Close		R	R	R	
	NO13	-	-	Open	Close		R	R	R	
	NO14	-	-	Open	Close		R	R	R	
	NO15	-	-	Open	Close		R	R	R	
	NO16	-	-	Open	Close		R	R	R	
Qaa09	NO17	-	-	Open	Close		R	R	R	
	NO18	-	-	Open	Close		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Qaa10	Universal input					Fe08: c.pCOe1=yes				
	c.pCOe 1									
	U1	-	-	-999,9	999,9		R	R	R	
	U2	-	-	-999,9	999,9		R	R	R	
	U3	-	-	-999,9	999,9		R	R	R	
	U4	-	-	-999,9	999,9		R	R	R	
	U5	-	-	-999,9	999,9		R	R	R	
Qaa11	Universal input					Fe08: c.pCOe1=yes				
	c.pCOe 1									
	U6	-	-	-999,9	999,9		R	R	R	
	U7	-	-	-999,9	999,9		R	R	R	
	U8	-	-	-999,9	999,9		R	R	R	
	U9	-	-	-999,9	999,9		R	R	R	
	U10	-	-	-999,9	999,9		R	R	R	
Qaa12	Universal input					Fe08: c.pCOe2=yes				
	c.pCOe 2									
	U1	-	-	-999,9	999,9		R	R	R	
	U2	-	-	-999,9	999,9		R	R	R	
	U3	-	-	-999,9	999,9		R	R	R	
	U4	-	-	-999,9	999,9		R	R	R	
	U5	-	-	-999,9	999,9		R	R	R	
Qaa13	Universal input					Fe08: c.pCOe2=yes				
	c.pCOe 2									
	U6	-	-	-999,9	999,9		R	R	R	
	U7	-	-	-999,9	999,9		R	R	R	
	U8	-	-	-999,9	999,9		R	R	R	
	U9	-	-	-999,9	999,9		R	R	R	
	U10	-	-	-999,9	999,9		R	R	R	
Qaa14	Universal input					Fe08: c.pCOe3=yes				
	c.pCOe 3									
	U1	-	-	-999,9	999,9		R	R	R	
	U2	-	-	-999,9	999,9		R	R	R	
	U3	-	-	-999,9	999,9		R	R	R	
	U4	-	-	-999,9	999,9		R	R	R	
	U5	-	-	-999,9	999,9		R	R	R	
Qaa15	Universal input					Fe08: c.pCOe3=yes				
	c.pCOe 3									
	U6	-	-	-999,9	999,9		R	R	R	
	U7	-	-	-999,9	999,9		R	R	R	
	U8	-	-	-999,9	999,9		R	R	R	
	U9	-	-	-999,9	999,9		R	R	R	
	U10	-	-	-999,9	999,9		R	R	R	
Qaa16	Universal input					Fe08: c.pCOe4=yes				
	c.pCOe 4									
	U1	-	-	-999,9	999,9		R	R	R	
	U2	-	-	-999,9	999,9		R	R	R	
	U3	-	-	-999,9	999,9		R	R	R	
	U4	-	-	-999,9	999,9		R	R	R	
	U5	-	-	-999,9	999,9		R	R	R	
Qaa17	Universal input					Fe08: c.pCOe4=yes				
	c.pCOe 4									
	U6	-	-	-999,9	999,9		R	R	R	
	U7	-	-	-999,9	999,9		R	R	R	
	U8	-	-	-999,9	999,9		R	R	R	
	U9	-	-	-999,9	999,9		R	R	R	
	U10	-	-	-999,9	999,9		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Qaa18	Digital output					Fe08: c.pCOe1=yes				
	c.pCOe 1									
	NO1	-	-				R	R	R	
	NO2	-	-				R	R	R	
	NO3	-	-				R	R	R	
	NO4	-	-				R	R	R	
	NO5	-	-				R	R	R	
Qaa19	Digital output					Fe08: c.pCOe2=yes				
	c.pCOe 2									
	NO1	-	-				R	R	R	
	NO2	-	-				R	R	R	
	NO3	-	-				R	R	R	
	NO4	-	-				R	R	R	
	NO5	-	-				R	R	R	
Qaa20	Digital output					Fe08: c.pCOe3=yes				
	c.pCOe 3									
	NO1	-	-				R	R	R	
	NO2	-	-				R	R	R	
	NO3	-	-				R	R	R	
	NO4	-	-				R	R	R	
	NO5	-	-				R	R	R	
Qaa21	Digital output					Fe08: c.pCOe4=yes				
	c.pCOe 4									
	NO1	-	-				R	R	R	
	NO2	-	-				R	R	R	
	NO3	-	-				R	R	R	
	NO4	-	-				R	R	R	
	NO5	-	-				R	R	R	
Qaa22..Qaa50	Not used									
Qaa51	Serial probe 1					Fe09: Enable serial probe. Number = 1				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	129	-	129	129		R	R	R	
Qaa52	Serial probe 2					Fe09: Enable serial probe. Number = 2				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	130	-	130	130		R	R	R	
Qaa53	Serial probe 3					Fe09: Enable serial probe. Number = 3				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	131	-	131	131		R	R	R	
Qaa54	Serial probe 4					Fe09: Enable serial probe. Number = 4				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	132	-	132	132		R	R	R	
Qaa55	Serial probe 5					Fe09: Enable serial probe. Number = 5				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	133	-	133	133		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Qaa56	Serial probe 6					Fe09: Enable serial probe. Number = 6				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	134	-	134	134		R	R	R	
Qaa57	Serial probe 7					Fe09: Enable serial probe. Number = 7				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	135	-	135	135		R	R	R	
Qaa58	Serial probe 8					Fe09: Enable serial probe. Number = 8				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	136	-	136	136		R	R	R	
Qaa59	Serial probe 9					Fe09: Enable serial probe. Number = 9				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	137	-	137	137		R	R	R	
Qaa60	Serial probe 10					Fe09: Enable serial probe. Number = 10				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	138	-	138	138		R	R	R	
Qaa61	Serial probe 11					Fe09: Enable serial probe. Number = 11				
	Temperature	-	°C	-999.9	999.9		R	R	R	
	Humidity	-	%rH	0.0	100.0		R	R	R	
	Modbus address	139	-	139	139		R	R	R	
Qaa62...Qaa70	Not used									
Qaa71/Qaa75/ Qaa79	Energy meter 1/2/3									
	Power									
	L1	0	Watt	-99999.9	99999.9		R	R	R	
	L2	0	Watt	-99999.9	99999.9		R	R	R	
	L3	0	Watt	-99999.9	99999.9		R	R	R	
	Tot	0	Watt	-99999.9	99999.9		R	R	R	
	PF									
	L1	0	-	-99999.9	99999.9		R	R	R	
	L2	0	-	-99999.9	99999.9		R	R	R	
	L3	0	-	-99999.9	99999.9		R	R	R	
	Tot	0	-	-99999.9	99999.9		R	R	R	
Qaa72/Qaa76/ Qaa80	Energy meter 1/2/3									
	Next phase									
	L1	0.0	V	-99999.9	99999.9		R	R	R	
	L2	0.0	V	-99999.9	99999.9		R	R	R	
	L3	0.0	V	-99999.9	99999.9		R	R	R	
	Tot	0.0	V	-99999.9	99999.9		R	R	R	
	Current									
	L1	0.0	A	-99999.9	99999.9		R	R	R	
	L2	0.0	A	-99999.9	99999.9		R	R	R	
	L3	0.0	A	-99999.9	99999.9		R	R	R	
	Tot	0.0	A	-99999.9	99999.9		R	R	R	
Qaa73/Qaa77/ Qaa81	Energy meter 1/2/3									
	Voltage next phase									

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	L1	0.0	V	-99999.9	99999.9		R	R	R	
	L2	0.0	V	-99999.9	99999.9		R	R	R	
	L3	0.0	V	-99999.9	99999.9		R	R	R	
	Tot	0.0	V	-99999.9	99999.9		R	R	R	
	Phase neutral									
	L1	0.0	A	-99999.9	99999.9		R	R	R	
	L2	0.0	A	-99999.9	99999.9		R	R	R	
	L3	0.0	A	-99999.9	99999.9		R	R	R	
	Tot	0.0	A	-99999.9	99999.9		R	R	R	
Qaa74/ Qaa78 Qaa82	Energy meter 1/2/3									
	Apparent power									
	L1	0	VA	-99999.9	99999.9		R	R	R	
	L2	0	VA	-99999.9	99999.9		R	R	R	
	L3	0	VA	-99999.9	99999.9		R	R	R	
	Tot	0	VA	-99999.9	99999.9		R	R	R	
	Reactive power									
	L1	0	var	-99999.9	99999.9		R	R	R	
	L2	0	var	-99999.9	99999.9		R	R	R	
	L3	0	var	-99999.9	99999.9		R	R	R	
	Tot	0	var	-99999.9	99999.9		R	R	R	
Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Set point										
Qb010, Qb020, Qb030, Qb040, Qb050, Qb060, Qb070, Qb080, Qb090, Qb0100	Set circuit 1, 2...10					B*11: Control mode: heating				
	Circuits: direct plus, mixed, mixed plus									
	Heating control									
	Direct ---	Direct plus Room set point: Comfort, Economy								
	Mixed Outlet set point: comfort, economy	Mixed plus Room set point: Comfort, Economy								
	DHW distribution Set point	DHW tank fill Set point								
	Generic tank fill Set point	Pressure ctrl Set point								
	Flowrate ctrl Set point	Solar thermal Set point								
	k.Air service ---	Constant delta temp. Inlet set point: comfort, economy								
	Comfort	25.0	°C	0.0	99.9		R/W	R/W	R/W	
	Economy	23.0	°C	0.0	99.9		R/W	R/W	R/W	
Qb011, Qb021, Qb031, Qb041, Qb051, Qb061, Qb071, Qb081, Qb091, Qb0101	Set circuit 1, 2 ...10					B*11: Control mode: cooling				
	Circuits: direct plus, mixed, mixed plus									
	Cooling control					See Ba01				
	See Qb010									
	Comfort	23.0	°C	0.0	99.9		R/W	R/W	R/W	
	Economy	21.0	°C	0.0	99.9		R/W	R/W	R/W	
Qb012, Qb022, Qb032, Qb042, Qb052, Qb062, Qb072, Qb082, Qb092, Qb0102	Set circuit 1, 2 ...10					Ba01 1: DHW distribution				
	Circuits: DHW distribution									
	See Qb010									
	Set point	45.0	°C	-99.9	99.9		R/W	R/W	R/W	
Qb013, Qb023, Qb033, Qb043, Qb053, Qb063,	Set circuit 1, 2 ...10					Ba01 1: DHW tank fill				

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Qb073, Qb083, Qb093, Qb103	Circuits: DHW tank fill Set point	45.0	°C	-99.9	99.9		R/W	R/W	R/W	
Qb014, Qb024, Qb034, Qb044, Qb054, Qb064, Qb074, Qb084, Qb094, Qb104	Set circuit 1, 2 ...10 Circuits: gen. tank fill Heating Set point	25.0	°C	-99.9	99.9	Ba01 1: gen. tank fill	R/W	R/W	R/W	
Qb015, Qb025, Qb035, Qb045, Qb055, Qb065, Qb075, Qb085, Qb095, Qb105	Set circuit 1, 2 ...10 Cooling Set point:	23.0	°C	-99.9	99.9	Ba01 1: gen. tank fill	R/W	R/W	R/W	
Qb016, Qb026, Qb036, Qb046, Qb056, Qb066, Qb076, Qb086, Qb096, Qb106	Set circuit 1, 2 ...10 Circuits: pressure control Set point:	2.0	bar	0	9999.9	Ba01 1: Pressure ctrl	R/W	R/W	R/W	
Qb017, Qb027, Qb037, Qb047, Qb057, Qb067, Qb077, Qb087, Qb097, Qb107	Set circuit 1, 2 ...10 Circuits: flowrate control Set point:	-	m3/h	0.0	9999.9	Ba01 1: Flowrate ctrl	R/W	R/W	R/W	
Qb019, Qb029, Qb039, Qb049, Qb059, Qb069, Qb079, Qb089, Qb099, Qb109	Set circuit 1, 2 ...10 Circuits: solar thermal Set point	60.0	°C	0.0	90.0		R/W	R/W	R/W	
Qb110	Boiler 1 Set point: Fixed Climate Custom From circuits	-	-	Fixed	From circuits		R	R	R	
	Outlet set point Room set point Circuit set point									
	Maximum:	0.0	°C	0.0	99.9	Bp13: from circuits	R	R	R	
	Comfort:	60.0	°C	0.0	99.9	Bp13: Fixed / Climate / Custom	R/W	R/W	R/W	
	Offset:	2.0	°C	0.0	9.9	Bp13: from circuits	R/W	R/W	R/W	
	Economy:	50.0	°C	0.0	99.9	Bp13: Fixed / Climate / Custom	R/W	R/W	R/W	
	Antilegionella:	60.0	-	0.0	99.9	Bp08 Antilegionella: Yes	R/W	R/W	R/W	
	Set point calc.:	-	°C	-99.9	99.9		R	R	R	
Qb111	Boiler 2 Set point: Fixed Climate Custom From circuits	-	-	Fixed	From circuits					
	Outlet set point Room set point Circuit set point									
	Highest:	0.0	°C	0.0	99.9	Bq13: from circuits	R	R	R	
	Comfort:	60.0	°C	0.0	99.9	Bq13: Fixed / Climate / Custom	R	R/W	R/W	
	Offset:	2.0	°C	0.0	9.9	Bq13: from circuits	R/W	R/W	R/W	
	Economy:	50.0	°C	0.0	99.9	Bq13: Fixed / Climate / Custom	R/W	R/W	R/W	
	Antilegionella:	60.0	-	0.0	99.9	Bq08 Antilegionella: Yes	R/W	R/W	R/W	
	Set point calc.:	-	°C	-99.9	99.9		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Qb120	Heat pump/chiller 1									
	Cooling									
	Set point: Fixed From circuits	-	-	Fixed	From circuits		R	R	R	
	Outlet set point									
	Lowest	90.0	°C	0.0	99.9	from circuits	R	R	R	
	Comfort	7.0	°C	0.0	99.9		R	R	R/W	
	Offset:	2.0	°C	0.0	9.9	from circuits	R/W	R/W	R/W	
	Economy	9.0	°C	0.0	99.9		R	R	R/W	
	Set point calc.	-	°C	-99.9	99.9		R	R	R	
Qb121	Heat pump/chiller 1									
	Heating									
	Set point: Fixed Climate Custom From circuits	-	-	Fixed	From circuits		R	R	R	
	Outlet set point Room set point									
	Highest	0.0	°C	0.0	99.9	from circuits	R	R	R	
	Comfort	60.0	°C	0.0	99.9		R	R	R/W	
	Offset:	2.0	°C	0.0	9.9	from circuits	R	R	R/W	
	Economy	50.0	°C	0.0	99.9		R	R	R/W	
	Set point calc.	-	°C	-99.9	99.9		R	R	R	
Qb130	Heat pump/chiller 2									
	Cooling									
	Set point: Fixed From circuits	-	-	Fixed	From circuits		R	R	R	
	Outlet set point									
	Lowest	90.0	°C	0.0	99.9	from circuits	R	R	R	
	Comfort	7.0	°C	0.0	99.9		R	R	R/W	
	Offset:	2.0	°C	0.0	9.9	from circuits	R/W	R/W	R/W	
	Economy	9.0	°C	0.0	99.9		R	R	R/W	
	Set point calc.	-	°C	-99.9	99.9		R	R	R	
Qb131	Heat pump/chiller 2									
	Heating									
	Set point: Fixed Climate Custom From circuits	-	-	Fixed	From circuits		R	R	R	
	Outlet set point Room set point									
	Highest	0.0	°C	0.0	99.9	from circuits	R	R	R	
	Comfort	60.0	°C	0.0	99.9		R	R	R/W	
	Offset:	2.0	°C	0.0	9.9	from circuits	R	R	R/W	
	Economy	50.0	°C	0.0	99.9		R	R	R/W	
	Set point calc.	-	°C	-99.9	99.9		R	R	R	
Qb140	Operating mode									
	Mode: Heating Cooling	Heating	-	Heating	Cooling		R/W	R/W	R/W	
Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Qc01	Scheduler									
	Scheduler for circuit									
	Circuit 1: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	Circuit 2: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	Circuit 3: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	Circuit 4: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	Circuit 5: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
Qc02	Scheduler									
	Scheduler for circuit									
	Circuit 6: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	Circuit 7: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	Circuit 8: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	Circuit 9: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	Circuit 10: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
Qc03	Scheduler									
	Scheduler for production unit									
	HP/CH.1: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	HP/CH.2: -- 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Boiler 1: — 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
	Boiler 2: — 01 02 03 04 05 06 07 08 09 10 H24	--	-	01	H24		R/W	R/W	R/W	
	Status Off Economy Comfort	Off	-	Off	Comfort		R	R	R	
Qc04	Scheduler									
	Scheduler:	1		1	10		R/W	R/W	R/W	
	Program: P1 P2 P3 P4	P1		P1	P4		R/W	R/W	R/W	
Qc05	Scheduler	-	-	1	10	See Qc04	R	R	R	
	Prog: P1 P2 P3 P4	-	-	P1	P4	See Qc04	R	R	R	
	1 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>	R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
	2 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
	3 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
	4 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
	5 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
	6 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
Qc06	Scheduler	-	-	1	10	See Qc04	R	R	R	
	Prog: P1 P2 P3 P4	-	-	P1	P4	See Qc04	R	R	R	
	7 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>	R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
	8 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
	9 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
	10 hh:mm	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	h	0	23		R/W	R/W	R/W	
		0	min	0	59		R/W	R/W	R/W	
	Off Economy Comfort	Off	-	Off	Comfort		R/W	R/W	R/W	
	Save data ? No Yes	No	-	No	YES		R/W	R/W	R/W	
	Copy to: P1 P2 P3 P4	P1	-	P1	P4		R/W	R/W	R/W	
	Ok? No Yes	No	-	No	YES		R/W	R/W	R/W	
Qc07	Scheduler	-	-	1	10	See Qc04	R	R	R	
	MON: OFF ECO CMF P1 P2 P3 P4	-	-	OFF	P4		R/W	R/W	R/W	
	TUE: OFF ECO CMF P1 P2 P3 P4	-	-	OFF	P4		R/W	R/W	R/W	
	WED: OFF ECO CMF P1 P2 P3 P4	-	-	OFF	P4		R/W	R/W	R/W	
	THU: OFF ECO CMF P1 P2 P3 P4	-	-	OFF	P4		R/W	R/W	R/W	
	FRI: OFF ECO CMF P1 P2 P3 P4	-	-	OFF	P4		R/W	R/W	R/W	
	SAT: OFF ECO CMF P1 P2 P3 P4	-	-	OFF	P4		R/W	R/W	R/W	
	SUN: OFF ECO CMF P1 P2 P3 P4	-	-	OFF	P4		R/W	R/W	R/W	
Qc08	Scheduler	-	-	1	10	See Qc04	R	R	R	
	Vacation periods									
		<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>	R/W	R/W	R/W	
	Start	1	Day	1	31		R/W	R/W	R/W	
		1	Month	1	12		R/W	R/W	R/W	
	End	1	Day	1	31		R/W	R/W	R/W	
		1	Month	1	12		R/W	R/W	R/W	
	Status OFF ECO CMF P1..P4	OFF	-	OFF	P4		R/W	R/W	R/W	
		<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
	Start	1	Day	1	31		R/W	R/W	R/W	
		1	Month	1	12		R/W	R/W	R/W	
	End	1	Day	1	31		R/W	R/W	R/W	
		1	Month	1	12		R/W	R/W	R/W	
	Status OFF ECO CMF P1..P4	OFF	-	OFF	P4		R/W	R/W	R/W	
		<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
	Start	1	Day	1	31		R/W	R/W	R/W	
		1	Month	1	12		R/W	R/W	R/W	
	End	1	Day	1	31		R/W	R/W	R/W	
		1	Month	1	12		R/W	R/W	R/W	
	Status OFF ECO CMF P1..P4	OFF	-	OFF	P4		R/W	R/W	R/W	
Qc09	Scheduler	-	-	1	10	See Qc04	R	R	R	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Special days									
	1:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No <input type="checkbox"/> / Yes <input checked="" type="checkbox"/>	R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	2:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	3	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	4	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	5	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	6	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
Qc10	Scheduler	-	-	1	10	See Qc04	R	R	R	
	Special days									
	7:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No <input type="checkbox"/> / Yes <input checked="" type="checkbox"/>	R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	8:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	9:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	10:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	11:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	12:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
Qc11	Scheduler	-	-	1	10	See Qc04	R	R	R	
	Special days									
	13:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	14:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	
	15:	<input type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>		R/W	R/W	R/W	
		0	day	1	31		R/W	R/W	R/W	
		0	Month	1	12		R/W	R/W	R/W	
	OFF ECO CMF P1..P4	Off	-	Off	P4		R/W	R/W	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
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A. ON/OFF

A01	Unit On/Off Off On	Off	-	Off	On		R/W	R/W	R/W	DIO
-----	-------------------------	-----	---	-----	----	--	-----	-----	-----	-----



B: System configuration

Circuit select 1/15

a. General

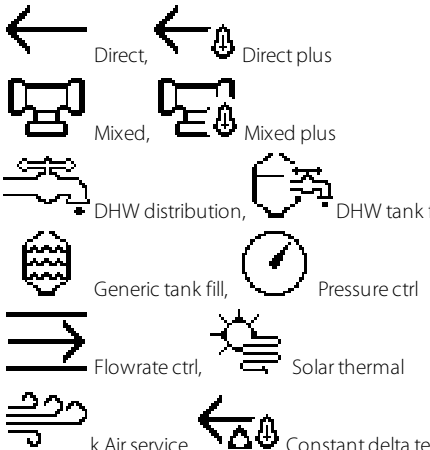
Ba01	General configuration									
	Circuit configuration									
	1-5 --- Direct Direct plus Mixed Mixed plus DHW distribution DHW tank fill Gen. tank fill Pressure ctrl Flowrate ctrl Solar power k.Air service Constant delta temperature	-	-	Direct	Constant delta temp.		R	R	R/W	IR12,IR29 IR46,IR63 IR80
Ba02	General configuration									
	Circuit configuration									
	6-10 --- Direct Direct plus Mixed Mixed plus DHW distribution DHW tank fill Gen. tank fill Pressure ctrl Flowrate ctrl Solar power k.Air service Constant delta temperature	-	-	Direct	Constant delta temp.		R	R	R/W	IR97,IR114, IR131,IR148, IR165
Ba03	General configuration									
	Electrical generator configuration									
	1:	-	-	Disabled	Heat pump		R	R	R/W	HR668







Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Disabled Chiller Heat pump									
	2: Disabled Chiller Heat pump	-	-	Disabled	Heat pump		R	R	R/W	HR704
Ba04	General configuration									
	Boiler enable									
	1: No Yes	No	-	No	Yes		R	R	R/W	HR596
	2: No Yes	No	-	No	Yes		R	R	R/W	HR632
Ba05	General configuration									
	Climatic zone									
	Current date	dd/mm/yy	--/--	01/01/2000	31/12/1999	-	-	R/W	R/W	
	Zone A B C D E F Custom	-	-	A	Custom		R	R/W	R/W	HR2
	Mode Auto Manual On Manual Off	Auto	-	Auto	Manual Off		R	R/W	R/W	HR3
	Start		day	1	31	Zone = Custom	R	R/W	R/W	IR317,HR 4
			Month	1	12	Zone = Custom	R	R/W	R/W	IR318,HR 5
	End		day	1	31	Zone = Custom	R	R/W	R/W	IR319,HR 6
			Month	1	12	Zone = Custom	R	R/W	R/W	IR320,HR 7
	Status Active Not active	Active	-	Active	Not active		R	R	R	DI118
Ba06	General configuration									
	System On/Off									
	By remote control: --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10						R	R	R/W	DI119
	Type N. C. N. O.	N.C.	-	N.C.	N.O.	Remote control not ---	R	R	R/W	C0
	Enabling Bypass	Enabling	-	Enabling	Bypass	Remote control not ---	R	R	R/W	C200
	By scheduler 01 02 03 04 05 06 07 08 09 10 H24 --	H24	-	01	10		R	R	R/W	HR2859
	From kAir 1 2 3 4 5	-	-	no k.Air	every k.Air		R	R	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	□□□□□ 6 7 8 9 10 □□□□□									
Ba07	General configuration									
	Operating mode									
	Source PGD ; Input channel ; k.Air Unit 1 ...10 ; BMS	PGD					R	R	R/W	HR8
	Water --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-	U01	U18	Source =input channel	R	R	R/W	
	Mode Heating ; Cooling	-	-	Heating	Cooling	R/W if the source =PGD	R	R	R/W	DI1
Ba08	General configuration									
	Outside temperature									
	Source Input channel ; k.Air 1 ...10 ; BMS	Input channel		Input channel	BMS		R	R	R/W	HR9
	--- c.pCO: U01...U10; SP_TEM_01...11 c.pCOE1...E4: U01...U10	-	-	-	-	Source =input channel	R	R	R/W	
	Value	-	°C	-99.9	99.9		R	R	R	IR321
	Average value	-	°C	-99.9	99.9		R	R	R	IR10
	Sampling time	60	s	1	300		R	R	R/W	HR10
	Average reset -- ; RR	--	-	--	RR		R	R	R/W	C1
Ba09	General configuration									
	Outside humidity									
	Source Input channel ; k.Air 1 ...10 ; BMS	Input channel	-	Input channel	BMS		R	R	R/W	HR11
	Channel --- c.pCO: U01...U10; SP_HUM_01...11 c.pCOE1...E4: U01...U10	-	-	U01	U10-	Source =input channel	R	R	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Value	0.0	%R.H.	0	100		R	R	R	IR11
Ba10	General configuration									
	Antifreeze									
	Circuits									
	Threshold	0.0	°C	-40.0	10.0		R	R	R/W	HR12
	Status Off On	Off	-	Off	On		R	R	R	DI120
	Production						R	R		
	Threshold	-10.0	°C	-40.0	10.0		R	R	R/W	HR13
	Status Off On	Off	-	Off	On		R	R	R	DI2
Ba11	General configuration									
	Display variables									
	Var 1: Outside Temp, Outside Hum, Outside Enth Circuit 1...10: Direct: outlet temp. (*) Directo plus: outlet temp. (*) Mixed: outlet temp. Mixed plus: outlet temp. DHW distribution: DHW distribution temp. DHW tank fill: DHW tank temp. Generic tank fill: gen. tank temp. Pressure ctrl: pressure Flowrate ctrl: flowrate Solar thermal: solar collector temp. k.air service: outlet temp.; Constant delta temperature: outlet temp. (*) Optional probe	---					R	R/W	R/W	HR14
	Var 2 See var.1 Circuit 1...10: Direct: room temp. (*)	---					R	R/W	R/W	HR15

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Direct plus: outlet temp. Mixed: room temp. (*) Mixed plus: room temp. DHW distribution: tank temp. DHW tank fill: second DHW tank temp. (*) Generic tank fill: second gen. tank temp. (*) Pressure control: outlet temp. (*) Flowrate control: outlet temp. (*) Solar thermal: tank temp. k.air service: inlet temp. Constant delta temperature: inlet temp. (*) Optional probe									
Ba12	General configuration									
	Antilegionella									
	Cycle Disable Enable	Enable	-	Disable	Enable		R	R/W	R/W	C2
	Control probe -- c.pCO: U01...U10; c.pCOE1...E4: U01...U10	---	-	U01	U10		R	R/W	R/W	IR12
	Value	-	°C	-99.9	99.9		R	R	R	IR322
	Program Fixed days Fixed period	Fixed days	-	Fixed days	Fixed period		R	R/W	R/W	C3
Ba13	General configuration									
	Antilegionella									
	Fixed days M T W T O U E H □ □ □ □ FR SA SU □ □ □	No day	-	No day	All days		R	R/W	R/W	C4 C5 C6 C7 C8 C9 C10

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Note: press UP/DOWN and ENTER to select days									
	Start	0	hours	0	23		R	R/W	R/W	HR16
		0	min	0	59		R	R/W	R/W	HR17
	End	0	hours	0	23		R	R/W	R/W	HR18
		0	min	0	59		R	R/W	R/W	HR19
Ba14	General configuration									
	Antilegionella									
	Fixed period									
	Days between cycles	0	day	0	9		R	R/W	R/W	HR773
	Start	0	hours	0	23		R	R/W	R/W	HR16
		0	min	0	59		R	R/W	R/W	HR17
	End	0	hours	0	23		R	R/W	R/W	HR18
		0	min	0	59		R	R/W	R/W	HR19
Ba15	General configuration									
	Antilegionella									
	Minimum duration	1	min	1	99		R	R/W	R/W	HR20
	Maximum no. failed cycles	1	min	0	99		R	R/W	R/W	HR21
	Force start --- Start	---	-	---	Start		R	R/W	R/W	C12
Ba16	General configuration									
	General alarm command output	---	-	01	18		R	R/W	R/W	HR3065
	-- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06			<input type="checkbox"/>	<input checked="" type="checkbox"/>	Output not active / active	R	R	R	DI656
b. Circuit 1...10: depends on circuit assignment										
Note: Modbus column shows the addresses of variables for circuits 1...10.										
Bb01										IR12,IR29 IR46,IR 63 IR80,IR 97 IR114,IR 131 IR148,IR 165
	Number of pumps	0	-	0	3		R	R	R/W	HR846,HR859 HR872,HR885 HR898,HR 911 HR 924,HR 937 HR 950,HR 963
	Description	-----		0000000000000000	ZZZZZZZZZZZZZZZZ		R	R	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Bb02	Circuit 1						R	R	R/W	
	Pump alarm input						R	R	R/W	
	1: --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-				k.Water mini: 2 DI	R	R	R/W	C 402, C 403, C 404, C 405, C 406, C 407, C 408, C 409, C 410, C 411
	2: --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-				k.Water mini: 2 DI	R	R	R/W	C 388, C 389, C 390, C 391, C 392, C 393, C 394, C 395, C 396, C 397
	3: --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-				k.Water mini: 2 DI	R	R	R/W	C 374, C 375, C 376, C 377, C 378, C 379, C 380, C 381, C 382, C 383
	Signal Overload Feedback	Overload	-	Overload	Feedback		R	R	R/W	
	Logic N.C., N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	
Bb03	Circuit 1									
	Pump command output 1: --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	----	-	NO01	NO18	box empty = not working; full = working	R	R	R/W	DI 121, DI 125, DI 129, DI 133, DI 137, DI 141, DI 145, DI 149, DI 153, DI 157
	2: --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	----	-	NO01	NO18	box empty = not working; full = working	R	R	R/W	DI 122, DI 126, DI 130, DI 134, DI 138, DI 142, DI 146, DI 150, DI 154, DI 158
	3: --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	----	-	NO01	NO18	box empty = not working; full = working	R	R	R/W	DI 123, DI 127, DI 131, DI 135, DI 139, DI 143, DI 147, DI 151, DI 155, DI 159
Bb04	Circuit 1									
	Pump management									
	Anti-seize	No	-	No	Yes		R	R	R/W	C 12, C 21, C 30, C 39, C 48, C 57, C 66, C 75, C 84, C 93

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Rotation time	24	h	0	999		R	R	R/W	HR 30, HR 87, HR 144, HR 201, HR 258, HR 315, HR 372, HR 429, HR 486, HR 543
	Force rotation	No	-	No	Yes		R	R	R/W	C 13, C 22, C 31, C 40, C 49, C 58, C 67, C 76, C 85, C 94
Bb05	Circuit 1									
	Probe management									
Circuit configuration (example): 1. Direct, 2. Direct plus, 3. Mixed, 4. Mixed plus, 5. DHW distribution, 6. DHW tank fill, 7. Generic tank fill, 8. Pressure ctrl, 9. Flowrate ctrl, 10. Solar thermal, 11. k.Air service, 12. Constant delta temp.										
	1/2/3/4: Outlet temperature 5.DHW outlet temp.; DHW tank fill Tank temp.; 8.Circuit pressure 9. Circuit flowrate 10. Solar collector temperature 11/12: Outlet temp. --- c.pCO: U01...U10; SP_TEM_01...11 c.pCOE1...E4: U01...U10	-	°C	-99.9	99.9		R	R	R/W	IR 21, IR 38, IR 55, IR 72, IR 89, IR 106, IR 123, IR 140, IR 157, IR 174
	1/2/3/4: Room temperature 5. DHW tank temp. 6. DHW second temp.; 7.Tank second temp. 8.Outlet temperature 9. Outlet temperature 10. DHW tank temp. 11/12: Inlet temperature --- c.pCO: U01...U10; SP_TEM_01...11 c.pCOE1...E4: U01...U10	-	°C	-99.9	99.9		R	R	R/W	IR 22, IR 39, IR 56, IR 73, IR 90, IR 107, IR 124, IR 141, IR 158, IR 175
	1/2/3/4: Room humidity --- c.pCO: U01...U10; SP_HUM_01...11 c.pCOE1...E4:	-	%	0	100		R	R	R/W	IR23, IR 40, IR57, IR 74, IR 91, IR 108, IR 125, IR 142, IR 159, IR 176

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	U01...U10									
Bb06	Circuit 1									
	Modulating control									
	Output status	0.0	%	0.0	100		R	R	R	IR 19, IR 36, IR 53, IR 70, IR 87, IR 104, IR 121, IR 138, IR 155, IR 172
	Type 0...10 V 2...10V 3 Points	0...10 V	-	0...10 V	3 Points		R	R	R/W	HR 31, HR 88, HR 145, HR 202, HR 259, HR 316, HR 373, HR 430, HR 487, HR 544
	Channel --- c.pCO: U01...U10; Y01...Y06 c.pCOE1...E4: U01...U10	U01	-	U01	Y6	k.Water mini: 2 Y	R	R	R/W	
	Valve stroke time:	180	s	0	600	Signal type: 3 Points	R	R	R/W	HR 32, HR 89, HR 146, HR 203, HR 260, HR 317, HR 374, HR 431, HR 488, HR 545
	Open: --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	---	-	NO01	NO18		R	R	R/W	
	Closed: --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	90	s	NO01	NO18		R	R	R/W	
Bb07	Dehumid. command output									
	1: --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	---	-	NO01	NO18		R	R	R/W	HR3130, HR3131, HR3132, HR3133, HR3134, HR3135, HR3136, HR3137, HR3138, HR3139
	Dehumid. set point Comfort Comfort + Dewpoint	Comfort	-	Comfort	Comfort + Dewpoint		R	R	R/W	C 493,C494, C 495,C496, C497,C498 C 499,C500, C501,C502
	Setp:	55	%RH	0	100		R	R	R/W	HR3022, HR3026, HR3030,

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
										HR3034, HR3038, HR3042, HR3046, HR3050, HR3054, HR3058
	Differ.:	2	%RH	0	99		R	R	R/W	HR3024, HR3028, HR3032, HR3036, HR3040, HR3044, HR3048, HR3052, HR3056, HR3060
Bb08	Not used									
Bb09	Not used									
Bb10	Circuit 1									
	Remote control --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	---	-	U01	Din18	k.Water mini: 2 DI	R	R	R/W	DI 124, DI 128 DI 132, DI 136 DI 140, DI 144 DI 148, DI 152 DI 156, DI 160
	Logic N.C. N.O.	-	-	N.C.	N.O.		R	R	R/W	C 14, C 23 C 32, C 41 C 50, C 59 C 68, C 77 C 86, C 95
	Bypass Enable	-		Bypass	Enable		R	R	R/W	C 15, C 24 C 33, C 42 C 51, C 60 C 69, C 78 C 87, C 96
	Mode Auto Man.on Man.off	-	-	Auto	Man.off		R	R	R/W	HR33, HR90 HR147, HR 204 HR261, HR 318 HR375, HR432 HR489, HR546
Bb11	Circuit 1									
	Control mode Only heating Only cooling Heating / Cooling Always heating Always cooling	Only heating	-	Only heating	Always cooling		R	R	R/W	HR34, HR91 HR148, HR205 HR262, HR319 HR376, HR433 HR490, HR547
	Antifreeze protection No Yes	No	-	No	Yes		R	R	R/W	C 16, C 25 C 34, C 43 C 52, C 61 C 70, C 79 C 88, C 97
Bb12	Circuit 1									

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Priority Primary Secondary	Primary	-	Primary	Secondary		R	R	R/W	C 17, C 26 C 35, C 44 C 53, C 62 C 71, C 80 C 89, C 98
	Delay	0	min	1	999		R	R	R/W	HR35,HR92, HR149,HR 206 HR263,HR320 HR377,HR434 HR491,HR 548
	Post circulation	0	min	1	999		R	R	R/W	HR36,HR93, HR150,HR 207 HR 264,HR321 HR 378,HR435 HR492,HR549
Bb13	Not used									
Bb14	Not used									
Bb15	Not used									
Bb16	Not used									
Bb17	Not used									
Bb18	Not used									
Bb19	Not used									
Bb20	Heating control									
	Room set point					Circuit: Direct plus, Mixed plus				
	Comfort	25.0	°C	0.0	99.9	Comfort	R	R	R/W	HR22, HR79 HR136,HR193 HR250,HR307 HR364,HR421 HR478,HR 535
	Economy	23.0	°C	0.0	99.9	Economy	R	R	R/W	HR23,HR80 HR137,HR194 HR251,HR308 HR365,HR422 HR479,HR536
	Differential	0.5	°C	0.0	9.9	Differential	R	R	R/W	HR 37,HR94 HR151,HR208 HR265,HR322 HR379,HR436 HR493,HR550
	Heating control					Circuit: Mixed				
	Outlet set point						R	R	R/W	
	Comfort	25.0	°C	0.0	99.9		R	R	R/W	
	Economy	23.0	°C	0.0	99.9		R	R	R/W	
	Outlet set point Fixed Climate Custom	Fixed	-	Fixed	Custom					HR 38, HR 95 HR 152, HR 209, HR 266, HR 323, HR 380, HR 437, HR 494, HR 551
Bb21	Heating outlet					Bb20: outlet set= fixed				
	Fixed set point									
	Set point	35	°C	-50.0	99.9		R	R	R/W	HR 39, HR 96,

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
										HR 153, HR 210, HR 267, HR 324, HR 381, HR 438, HR 495, HR 552
Bb22	Heating climatic curve					Bb20: outlet set= Climate				
	Curve no.	1.0	-	0.1	4.0		R	R	R/W	HR 40, HR 97, HR 154, HR 211, HR 268, HR 325, HR 382, HR 439, HR 496, HR 553
	Offset	0.0	°C	-99.9	99.9		R	R	R/W	HR 41, HR 98 HR 155, HR 212, HR 269, HR 326, HR 383, HR 440, HR 497, HR 554
	Room authority	0.0	-	0.0	100.0	Room probe enabled	R	R	R/W	HR 42, HR 99, HR 156, HR 213, HR 270, HR 327, HR 384, HR 441, HR 498, HR 555
	Limit min	-	°C	25.0	99.9		R	R	R/W	HR 43, HR 100 HR 157, HR 214 HR 271, HR 328 HR 385, HR 442 HR 499, HR 556
	Limit max	-	°C	80.0	99.9		R	R	R/W	HR 44, HR 101 HR 158, HR 215 HR 272, HR 329 HR 386, HR 443 HR 500, HR 557
	Set point calcul.	-	°C	-	-		R	R	R	IR 25, IR 42 IR 59, IR 76 IR 93, IR 110 IR 127, IR 144 IR 161, IR 178
Bb23	Climatic heating custom curve					Bb20: outlet set= Custom				
	1.									
	Outside temperature	-12.0	°C	-99.9	99.9		R	R	R/W	HR 45, HR 102, HR 159, HR 216, HR 273, HR 330, HR 387, HR 444, HR 501, HR 558
	Set point	70.0	°C	-99.9	99.9		R	R	R/W	HR 46, HR 103 HR 160, HR 217 HR 274, HR 331 HR 388, HR 445 HR 502, HR 559
	2.									
	Outside temperature	0.0	°C	-99.9	99.9		R	R	R/W	HR 47, HR 104, HR 161, HR 218, HR 275, HR 332, HR 389, HR 446, HR 503, HR 560

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Set point	60.0	°C	-99.9	99.9		R	R	R/W	HR 48, HR 105, HR 162, HR 219, HR 276, HR 333, HR 390, HR 447, HR 504, HR 561
3.										
	Outside temperature	8.0	°C	-99.9	99.9		R	R	R/W	HR 49, HR 106, HR 163, HR 220, HR 277, HR 334, HR 391, HR 448, HR 505, HR 562
	Set point	50.0	°C	-99.9	99.9		R	R	R/W	HR 50, HR 107, HR 164, HR 221, HR 278, HR 335, HR 392, HR 449, HR 506, HR 563
4.										
	Outside temperature	16.0	°C	-99.9	99.9		R	R	R/W	HR 51, HR 108 HR 165, HR 222 HR 279, HR 336 HR 393, HR 450 HR 507, HR 564
	Set point	30.0	°C	-99.9	99.9		R	R	R/W	HR 52, HR 109, HR 166, HR 223, HR 280, HR 337, HR 394, HR 451, HR 508, HR 565
	Offset:						R	R	R/W	HR 41, HR 98 HR 155, HR 212 HR 269, HR 326 HR 383, HR 440 HR 497, HR 554
	Calc.:						R	R	R	IR 24, IR 31 IR 58, IR 75 IR 92, IR 109 IR 126, IR 143 IR 160, IR 177
Bb24	Not used									
Bb25	Not used									
Bb26	Not used									
Bb27	Not used									
Bb28	Not used									
Bb29	Not used									
Bb30	Cooling control					Bb11: Only cooling, Heating/ cooling, Always cooling				
	Room set point					Circuits: Direct plus, Mixed plus				
	Comfort	23.0	°C	0	99.9		R	R	R/W	HR 24, HR 81, HR 138, HR 195, HR 252, HR 309 HR 366, HR 423, HR 480, HR 537

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Economy	21.0	°C	0	99.9		R	R	R/W	HR 25, HR 82, HR 139, HR 196, HR 253, HR 310, HR 367, HR 424, HR 481, HR 538,
	Differential	0.5	°C	0	9.9		R	R	R/W	HR 53, HR 110, HR 167, HR 224, HR 281, HR 338, HR 395, HR 452, HR 509, HR 566
	Compensation No Yes	No	-	No	Yes		R	R	R/W	C 18, C 27 C 36, C 45 C 54, C 63 C 72, C 81 C 90, C 99
	Outlet set point Fixed Floating	Fixed	-	Fixed	Floating		R	R	R/W	C 19, C 28 C 37, C 46 C 55, C 64 C 73, C 82 C 91, C 100
	Cooling control									
	Outlet set point					Circuit: Mixed				
	Comfort	23.0	°C	0	99.9		R	R	R/W	
	Economy	21.0	°C	0	99.9		R	R	R/W	
Bb31	Cooling control					Bb30: Compensation = yes				
	Room set compensation									
	Outside temperature	-	°C	-999.9	999.9		R	R	R	IR 10
	Min	30.0	°C	-99.9	99.9		R	R	R/W	HR 54, HR 111 HR 168, HR 225 HR 282, HR 339 HR 396, HR 453 HR 510, HR 567
	Max	35.0	°C	-99.9	99.9		R	R	R/W	HR 56, HR 113 HR 170, HR 227 HR 284, HR 341 HR 398, HR 455 HR 512, HR 569
	Compensation									
	Min	0.0	°C	-99.9	99.9		R	R	R/W	HR 55, HR 112 HR 169, HR 226 HR 283, HR 340 HR 397, HR 454 HR 511, HR 568
	Max	2.0	°C	-99.9	99.9		R	R	R/W	HR 57, HR 114 HR 171, HR 228 HR 285, HR 342 HR 399, HR 456 HR 513, HR 570
	Compensation	0.0	°C	-99.9	99.9		R	R	R	IR 31, IR 54 IR 77, IR 100 IR 123, IR 146







Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
										IR 169, IR 192 IR 215, IR 238
Bb32	Cooling outlet					Bb30: outlet set = Fixed				
	Fixed set point									
	Set point	15.0	°C	-99.9	99.9		R	R	R/W	HR 58, HR 115 HR 172, HR 229 HR 286, HR 343 HR 400, HR 457 HR 514, HR 571
Bb33	Cooling outlet					Bb30: outlet set = Float				
	Floating set point									
	P	2.0		0	99.9		R	R	R/W	HR 59, HR 116 HR 173, HR 230 HR 287, HR 344 HR 401, HR 458 HR 515, HR 572
	I	120		0	999		R	R	R/W	HR 60, HR 117 HR 174, HR 231 HR 288, HR 345 HR 402, HR 459 HR 516, HR 573
	D	0		0	999		R	R	R/W	HR 61, HR 118 HR 175, HR 232 HR 289, HR 346 HR 403, HR 460 HR 517, HR 574
	Limit min	14.0	°C	-999.9	999.9		R	R	R/W	HR 62, HR 119 HR 176, HR 233 HR 290, HR 347 HR 404, HR 461 HR 518, HR 575
	Limit max	16.0	°C	-999.9	999.9		R	R	R/W	HR 63, HR 120 HR 177, HR 234 HR 291, HR 348 HR 405, HR 462 HR 519, HR 576
	Set point	-	°C	-999.9	999.9		R	R	R	IR 26, IR 43 IR 60, IR 77 IR 94, IR 111 IR 128, IR 145 IR 162, IR 179
Bb34	Cooling outlet					Room probe				
	Room dewpoint control									
	Room	0.0	°C	0.0	100	Temperature	R	R	R	IR 22, IR 39 IR 56, IR 73 IR 90, IR 107 IR 124, IR 141 IR 158, IR 175
		0.0	%RH	0.0	100	Humidity	R	R	R	IR 23, IR 40 IR 57, IR 74 IR 91, IR 108





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										IR 125, IR 142 IR 159, IR 176
	Dewpoint	-	°C	-	-		R	R	R	IR 27, IR 44 IR 61, IR 78 IR 95, IR 112 IR 129, IR 146 IR 163, IR 180
	Offset	-30.0	°C	-30.0	30.0		R	R	R/W	HR 64, HR 121 HR 178, HR 235 HR 292, HR 349 HR 406, HR 463 HR 520, HR 577
	Limite min	14.0	°C	-999.9	999.9	Set point =fixed	R	R	R/W	HR 62, HR 119 HR 176, HR 233 HR 290, HR 347 HR 404, HR 461 HR 518, HR 575
	Set point	-	°C	-999.9	999.9		R	R	R	IR 28, IR 45 IR 62, IR 79 IR 96, IR 113 IR 130, IR 147 IR 164, IR 181
Bb35	Not used									
Bb36	Not used									
Bb37	Not used									
Bb38	Not used									
Bb39	Not used									
Bb40	DHW circuit control					Ba01/2: DHW distribution				
	Set point	45.0	°C	-99.9	99.9		R	R	R/W	HR 26, HR 83 HR 140, HR 197 HR 254, HR 311 HR 368, HR 425 HR 482, HR 539
	Pump cycling:									
	On	60	s	0	9.999		R	R	R/W	HR 65, HR 122 HR 179, HR 236 HR 293, HR 350 HR 407, HR 464 HR 521, HR 578
	Off	0	s	0	65535		R	R	R/W	HR 66, HR 123 HR 180, HR 237 HR 294, HR 351 HR 408, HR 465 HR 522, HR 579
	Antilegionella No Yes	No	-	No	Yes		R	R	R/W	C 20, C 29 C 38, C 47 C 56, C 65 C 74, C 83 C 92, C 101
Bb41	Fill DHW tank					Ba01/2: DHW tank fill				
	Set point	45	°C	-99.9	99.9		R	R	R/W	HR 26, HR 83 HR 140, HR 197 HR 254, HR 311

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
										HR 368, HR 425 HR 482, HR 539
	Differ.	2	°C	-9.9	9.9		R	R	R/W	HR 67, HR 124 HR 181, HR 238 HR 295, HR 352 HR 409, HR 466 HR 523, HR 580
	Antilegionella No Yes	No	-	No	Yes		R	R	R/W	C 20, C 29 C 38, C 47 C 56, C 65 C 74, C 83 C 92, C 101
Bb42	Fill generic tank					Ba01/2: Generic tank fill				
	Heating									
	Set point	25.0	°C	0	99.9		R	R	R/W	HR 22, HR 79 HR 136, HR 193 HR 250, HR 307 HR 364, HR 421 HR 478, HR 535
	Differ.	0.5	°C	0	9.9		R	R	R/W	HR 37, HR 94 HR 151, HR 208 HR 265, HR 322 HR 379, HR 436 HR 493, HR 550
Bb43	Fill generic tank					Ba01/2: Generic tank fill				
	Cooling									
	Set point:	23.0	°C	-50.0	99.9		R	R	R/W	HR 24, HR 81 HR 138, HR 195 HR 252, HR 309 HR 366, HR 423 HR 480, HR 537
	Differ.:	0.5	°C	0	9.9		R	R	R/W	HR 53, HR 110 HR 167, HR 224 HR 281, HR 338 HR 395, HR 452 HR 509, HR 566
Bb44	Pressure control					Ba01/2: Pressure control				
	Set point	2.0	bar	0	9999.9		R	R	R/W	HR 27, HR 84 HR 141, HR 198 HR 255, HR 312 HR 369, HR 426 HR 483, HR 540
	High threshold:	5.0	bar	0	9999.9		R	R	R/W	HR 68, HR 125 HR 182, HR 239 HR 296, HR 353 HR 410, HR 467 HR 524, HR 581
	Differential:	1.0	bar	0	9.9		R	R	R/W	HR 69, HR 126 HR 183, HR 240 HR 297, HR 354 HR 411, HR 468 HR 525, HR 582

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Bb45	Flowrate control					Ba01/2: Flowrate control				
	Set point	10	m ³ /h	0.0	9999.9		R	R	R/W	HR 28, HR 85 HR 142, HR 199 HR 256, HR 313 HR 370, HR 427 HR 484, HR 541
Bb46	Solar thermal					Ba01/2: solar thermal				
	DHW tank differential	2.0	°C	0.0	20.0		R	R	R/W	HR3270, HR3274, HR3278, HR3282, HR3286, HR3290, HR3294, HR3298, HR3302, HR3306
	Activation delta	6.0	°C	2.0	50.0		R	R	R/W	HR 70, HR 127 HR 184, HR 241 HR 298, HR 355 HR 412, HR 469 HR 526, HR 583
	Max. DHW tank temperature	80.0	°C	0.0	90.0		R	R	R/W	HR 71, HR 128 HR 185, HR 242 HR 299, HR 356 HR 413, HR 470 HR 527, HR 584
	Differential	10.0	°C	0.0	40.0		R	R	R/W	HR 72, HR 127 HR 186, HR 243 HR 300, HR 357 HR 414, HR 471 HR 528, HR 585
Bb47	Solar thermal					Ba01/2: solar thermal				
	Cooling collector									
	Threshold	110.0	°C	0.0	145.0		R	R	R/W	HR3267, HR3271, HR3275, HR3279, HR3283, HR3287, HR3291, HR3295, HR3299, HR3303
	Differential	10.0	°C	0.0	20.0		R	R	R/W	HR3268, HR3272, HR3276, HR3280, HR3284, HR3288, HR3292, HR3296, HR3300, HR3304







Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Pump cycles									
	On	60	s	0	9.999		R	R	R/W	HR 65, HR 122 HR 179, HR 236 HR 293, HR 350 HR 407, HR 464 HR 521, HR 578
	Off	0	s	0	9.999		R	R	R/W	HR 66, HR 123 HR 180, HR 237 HR 294, HR 351 HR 408, HR 465 HR 522, HR 579
Bb48	k.Air 1 2 3 4 5 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 6 7 8 9 10 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	-	-	No k.Air	k.Air1...10	Ba01/2: k.Air service				
Note: press UP/ DOWN to see the checkbox and select the k.Air controllers										
Bb49	Constant delta temp.					Ba01/2: differential temperature control				
	Set point	5.0	°C	0.0	99.9		R	R	R/W	HR 73, HR 130 HR 187, HR 244 HR 301, HR 358 HR 415, HR 472 HR 529, HR 586
Bb50	Circuit 1									
	Constant delta temp.					Ba01/2: Constant delta temperature				
	Pressure control					Ba01/2: pressure control				
	Flowrate control					Ba01/2: flowrate control				
	P	2.0	-	0	99.9		R	R	R/W	HR 74, HR 131 HR 188, HR 245 HR 302, HR 359 HR 416, HR 473 HR 530, HR 587
	I	120	-	0	999		R	R	R/W	HR 75, HR 132 HR 189, HR 246 HR 303, HR 360 HR 417, HR 474 HR 531, HR 588
	D	0	-	0	999		R	R	R/W	HR 76, HR 133 HR 190, HR 247 HR 304, HR 361 HR 418, HR 475 HR 532, HR 589
	Limit min	0	%	0	100		R	R	R/W	HR 77, HR 134 HR 191, HR 248 HR 305, HR 362 HR 419, HR 476 HR 533, HR 590





Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Limit max	100	%	0	100		R	R	R/W	HR 78, HR 135 HR 192, HR 249 HR 306, HR 363 HR 420, HR 477 HR 534, HR 591
	Output	-	%	0	100		R	R	R	IR 19, IR 36 IR 53, IR 70 IR 87, IR 104 IR 121, IR 138 IR 155, IR 172
Bc01...Bc50: see Bb01... Bb50										
Bd01...Bd50: see Bb01... Bb50										
Be01...Be50: see Bb01... Bb50										
Bf01...Bf50: see Bb01... Bb50										
Bg01...Bg50: see Bb01... Bb50										
Bh01...Bh50: see Bb01... Bb50										
Bi01...Bi50: see Bb01... Bb50										
Bl01...Bl50: see Bb01... Bb50										
Bm01...Bm50: see Bb01... Bb50										
Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
no. Heat pump 1 (electrical generator 1)										
Bn01	Chiller / heat pump 1									
	Number of pumps	0	-	0	3		R	R	R/W	HR669
Bn02	Chiller / heat pump 1									
	Pump alarm input									
	1: --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-				R	R	R	C412
	2: --- See 1:	-	-				R	R	R	C398
	3: --- See 1:	-	-				R	R	R	C484
	Signal Overload Feedback	Overload	-	Overload	Feedback		R	R	R/W	
	Logic N.C. N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	
	Post circulation	0	min	0	999					
Bn03	Chiller / heat pump 1									
	Pump command output									
	1: OFF/ ON c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	OFF	-	OFF	ON		R	R	R/W	DI173
	2: OFF/ ON See 1	OFF	-	OFF	ON		R	R	R/W	DI174
	3: OFF/ ON See 1	OFF	-	OFF	ON		R	R	R/W	DI175
	Post circulation	0	min	0	999		R	R	R/W	HR670
Bn04	Chiller / heat pump 1									

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Pump management									
	Anti-seize	No	-	No	Yes		R	R	R/W	C138
	Rotation time	24	h	0	999		RR R/W	RR R/W	RR R/W	HR671
	Force rotation	No	-	No	Yes		R	R	R/W	C139
Bn05	Chiller / heat pump 1									
	Probe management									
	Outlet temperature c.pCO: U01...U10; SP_TEM_01...11 c.pCOE1...E4: U01...U10	-	°C	-99.9	99.9		R	R	R/W	IR364
	Inlet temperature See outlet temperature	-	°C	-99.9	99.9		R	R	R/W	IR365
Bn06	Chiller / heat pump 1									
	Modulating control									
	Output status	-	%	0	100		R	R	R	IR367
	Signal 0...10V; 2...10V	0...10V	-	0...10V	2...10V		R	R	R/W	HR672
	--- c.pCO: U01...U10; Y01...Y06 c.pCOE1...E4: U01...U10									
Bn07	Chiller / heat pump 1									
	Remote control									
	c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-				R	R	R	DI176
	Logic N.C. ; N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	C140
	Bypass ; Enable	Bypass	-	Bypass	Enable		R	R	R/W	C141
	Mode Auto ; Man.On ; Man.Off	Auto	-	Auto	Man.Off		R	R	R/W	HR674
Bn08	Chiller / heat pump 1									
	Control mode: Only heating ; Only cooling ; Heating / Cooling ; Always heating ; Always cooling	Heat pump: Cooling/ heating Chiller: Only cooling	-	Only heating	Always cooling		R	R	R/W	HR675
	DHW production	No	-	No	Yes	Heat pump: Cooling/ heating; Always heating; Only heating	R	R	R/W	C142
	Antilegionella	No	-	No	Yes		R	R	R/W	C143
	Antifreeze protection	No	-	No	Yes		R	R	R/W	C144
Bn09	Chiller / heat pump 1									
	Unit feedback --- c.pCO: U01...U10; Din01...Din18	-	-				R	R	R/W	DI177

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	c.pCOE1...E4: U01...U10									
	Signal Overload Feedback	Overload	-	Overload	Feedback		R	R	R/W	
	Logic N.C. N.O.	N.C.		N.C.	N.O.		R	R	R/W	
Bn10	Chiller / heat pump 1									
	ON/OFF command output --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	-	-	NO01	NO18		R	R	R/W	DI178
	Eco set point selection --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	-	-	NO01	NO18		R	R	R/W	DI713
	Cooling/heating selection --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06					Only for heat pump	R	R	R/W	DI712
Bn11	Chiller / heat pump 1									
	k.Air: No/Yes 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>	-	-	1	10		R	R	R/W	
	Circuits: No/Yes 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>	-	-	1	10		R	R	R/W	C145, C146 C147, C148 C149, C150 C151, C152 C153, C154
Bn12	Chiller / heat pump 1									
	Outside temperature cut-off									
	Heating OFF over									
	Threshold	25.0	°C	0	99.9		R	R	R/W	HR677
	Differential	1.0	°C	0	9.9		R	R	R/W	HR678
	Heating OFF below									
	Threshold	7.0	°C	-50	99.9		R	R	R/W	HR3311
	Differential	1.0	°C	0	9.9		R	R	R/W	HR3312
Bn13	Chiller / heat pump 1									
	Heating mode									
	Set point Fixed Climatic Custom From circuits	Fixed	-	Fixed	From circuits		R	R	R/W	IR361
	Outlet set point					Fixed				
	Comfort	60.0	°C	0.0	99.9		R	R	R/W	HR664
	Economy	50.0	°C	0.0	99.9		R	R	R/W	HR665
	Room set point					Climate, Custom				
	Comfort	-	°C	0.0	99.9		R	R	R/W	
	Economy	-	°C	0.0	99.9		R	R	R/W	
	Circuit set point					From circuits				IR362
	Highest	-	°C	0.0	99.9		R	R	R/W	
	Offset	2.0	°C	0.0	99.9		R	R	R/W	HR666







Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Antilegionella	75.0	°C	60.0	95.0	Bn08: Antilegionella = yes	R	R	R/W	HR667
	Set point calculated	-	°C	0.0°C	99.9		R	R	R	IR363
Bn14	Heat pump 1					Bn13: climate				
	Heating climatic curve									
	Curve no.	1.0	°C	0.1	4.0		R	R	R/W	HR679
	Offset	0.0	°C	-99.9	99.9		R	R	R/W	HR680
	Limite min	25.0	°C	0.0	99.9		R	R	R/W	HR681
	Limit max	80.0	°C	0.0	99.9		R	R	R/W	HR682
	Set point calcul.	-	°C	0.0°C	99.9		R	R	R	IR366
Bn15	Heat pump 1					Bn13: custom				
	Heating climatic curve									
	Outside temperature									
	1:	-12.0	°C	-99.9	99.9		R	R	R/W	HR683
	2:	0.0	°C	-99.9	99.9		R	R	R/W	HR685
	3:	8.0	°C	-99.9	99.9		R	R	R/W	HR687
	4:	16.0	°C	-99.9	99.9		R	R	R/W	HR689
	Offset	0.0	°C	-99.9	99.9		R	R	R/W	HR680
	Set point									
	1:	70.0	°C	0.0	99.9		R	R	R/W	HR684
	2:	60.0	°C	0.0	99.9		R	R	R/W	HR686
	3:	50.0	°C	0.0	99.9		R	R	R/W	HR688
	4:	30.0	°C	0.0	99.9		R	R	R/W	HR690
	Calculated	-	°C	0.0	99.9		R	R	R/W	HR366
Bn16	Chiller / heat pump 1									
	Outside temperature cut-off									
	Cooling OFF below									
	Threshold	15.0	°C	0	99.9		R	R	R/W	HR806
	Differential	1.0	°C	0	9.9		R	R	R/W	HR807
Bn17	Chiller / heat pump 1									
	Cooling mode									
	Set point Fixed From circuits	Fixed	-	Fixed	From circuits		R	R	R/W	HR2860
	Outlet set point									
	Comfort	7.0	°C	-50.0	99.9		R	R	R/W	HR2861
	Economy	9.0	°C	-50.0	99.9		R	R	R/W	HR2862
	Circuit set point									
	Lowest	90.0	°C	0.0	99.9		R	R	R	
	Offset	2.0	°C	0.0	99.9		R	R	R/W	HR2863
	Set point calcul.	-	°C	0.0	99.9		R	R	R	IR363
Bn18	Chiller / heat pump 1									
	Modulating unit									
	Control by Power Temperature	Power	-	Power	Temperature		R	R	R/W	C155
Bn19	Chiller / heat pump 1									
	Temperature control									
	Actual set point	-	°C	0.0	99.9		R	R	R	IR363
	Set point									
	Lowest	0.0	°C	0.0	100.0		R	R	R/W	HR691
	Highest	100.0	°C	0.0	100.0		R	R	R/W	HR693
	Signal									
	Lowest	0.0	%	0.0	100.0		R	R	R/W	HR692
	Highest	100.0	%	0.0	100.0		R	R	R/W	HR694
	Output	-	%	0.0	100.0		R	R	R/W	IR367
Bn20	Chiller / heat pump 1									
	Power control									






Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Temperature	-	°C	-99.9	99.9		R	R	R	IR364
	P	2.0	-	0.0	99.9		R	R	R/W	HR695
	I	120	-	0.0	999		R	R	R/W	HR696
	D	0	-	0	999		R	R	R/W	HR697
	Limit min	0.0	%	0.0	100.0		R	R	R/W	HR692
	Limit max	100.0	%	0.0	100.0		R	R	R/W	HR694
	Output	-	%	0.0	100.0		R	R	R/W	IR367
Bn21...Bn25	Not used									
Bn30	Chiller / heat pump 1					Bn05,Bn06				
	Low outlet temperature alarm									
	Offset	20.0	°C	0.0	99.9	Threshold=set (Bn17)- offset	R	R	R/W	HR698
	Delay	30	min	0	600		R	R	R/W	HR699
Bn31	Chiller / heat pump 1					Bn05,Bn06				
	High outlet temperature alarm									
	Offset	20.0	°C	0.0	99.9	Threshold=set (Bn17)+offset	R	R	R/W	HR2865
	Delay	30	min	0	600		R	R	R/W	HR699
o. Heat pump 2 (electrical generator 2)										
Bo01	Chiller / heat pump 2									
	Number of pumps	0	-	0	3		R	R	R/W	HR705
Bo02	Chiller / heat pump 2									
	Pump alarm input									
	1: --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-				R	R	R/W	C413
	2: --- See 1:	-	-				R	R	R/W	C399
	3: --- See 1:	-	-				R	R	R/W	C385
	Signal Overload Feedback	Overload	-	Overload	Feedback		R	R	R/W	
	Type N.C. N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	
Bo03	Chiller / heat pump 2									
	Pump command output									
	1: OFF/ ON c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	OFF	-	OFF	ON		R	R	R/W	DI179
	2: OFF/ ON See 1	OFF	-	OFF	ON		R	R	R/W	DI180
	3: OFF/ ON See 1	OFF	-	OFF	ON		R	R	R/W	DI181
	Post circulation	0	min	0	999		R	R	R/W	HR706
Bo04	Chiller / heat pump 2									
	Pump management									
	Anti-seize	No	-	No	Yes		R	R	R/W	C156
	Rotation time	24	h	0	999		R	R	R/W	HR707
	Force rotation	No	-	No	Yes		R	R	R/W	C157

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Bo05	Chiller / heat pump 2									
	Probe management									
	Outlet temperature c.pCO: U01...U10; SP_TEM_01...11 c.pCOE1...E4: U01...U10	-	°C	-99.9	99.9		R	R	R/W	IR383
	Inlet temperature See outlet temperature	-	°C	-99.9	99.9		R	R	R/W	IR384
Bo06	Chiller / heat pump 2									
	Modulating unit									
	Output status	-	%	0	100		R	R	R	IR386
	Signal range 0...10V ; 2...10V	0...10V	-	0...10V	2...10V		R	R	R/W	HR708
	Channel: --- c.pCO: U01...U10; Y01...Y06 c.pCOE1...E4: U01...U10									
Bo07	Chiller / heat pump 2									
	Remote control									
	c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-				R	R	R/W	DI182
	Logic N.C. ; N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	C158
	Bypass ; Enable	Bypass	-	Bypass	Enable		R	R	R/W	C159
	Mode Auto ; Man.On ; Man.Off	Auto	-	Auto	Man.Off		R	R	R/W	HR710
Bo08	Chiller / heat pump 2									
	Control mode: Only heating ; Only cooling ; Heating / Cooling ; Always heating ; Always cooling	Heat pump: Cooling/ heating Chiller: Only cooling	-	Only heating	Always cooling		R	R	R/W	HR711
	DHW production	No	-	No	Yes	Heat pump: Cooling/ heating; Always heating; Only heating	R	R	R/W	C160
	Antilegionella	No	-	No	Yes		R	R	R/W	C161
	Antifreeze protection	No	-	No	Yes		R	R	R/W	C162
Bo09	Chiller / heat pump 2									
	Unit feedback --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-				R	R	R/W	DI183
	Signal Overload ; Feedback	Overload	-	Overload	Feedback		R	R	R/W	







Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Logic N.C. N.O.	N.C.		N.C.	N.O.		R	R	R/W	
Bo10	Chiller / heat pump 2									
	ON/OFF command output --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	-	-	NO01	NO18		R	R	R/W	DI184
	Eco set point selection --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	-	-	NO01	NO18		R	R	R/W	DI717
	Cooling/heating selection --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06					Only for heat pump	R	R	R/W	DI716
Bo11	Chiller / heat pump 2									
	k.Air: No/Yes 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>	-	-	1	10		R	R	R/W	
	Circuits: No/Yes 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>	-	-	1	10		R	R	R/W	C163, C164 C165, C166 C167, C168 C169, C170 C171, C172
Bo12	Chiller / heat pump 2									
	Outside temperature cut-off									
	Heating OFF over									
	Threshold	25.0	°C	0	99.9		R	R	R/W	HR713
	Differential	1.0	°C	0	9.9		R	R	R/W	HR714
	Heating OFF below									
	Threshold	7.0	°C	-50	99.9		R	R	R/W	HR3313
	Differential	1.0	°C	0	9.9		R	R	R/W	HR3314
Bo13	Chiller / heat pump 2									
	Heating mode									
	Set point Fixed Climatic Custom From circuits	Fixed	-	Fixed	From circuits		R	R	R/W	IR380
	Outlet set point					Fixed				
	Comfort	60.0	°C	0.0	99.9		R	R	R/W	HR700
	Economy	50.0	°C	0.0	99.9		R	R	R/W	HR701
	Room set point					Climate, Custom				
	Comfort	-	°C	0.0	99.9		R	R	R/W	
	Economy	-	°C	0.0	99.9		R	R	R/W	
	Circuit set point					From circuits				IR381
	Highest	-	°C	0.0	99.9		R	R	R/W	
	Offset	2.0	°C	0.0	99.9		R	R	R/W	HR702
	Antilegionella	75.0	°C	60.0	95.0	Bo08: Antilegionella =yes	R	R	R/W	HR703
	Set point calculated	-	°C	0.0°C	99.9		R	R	R	IR382






Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Bo14	Heat pump 2					Bo13: climate				
	Heating climatic curve									
	Curve no.	1.0	°C	0.1	4.0		R	R	R/W	HR715
	Offset	0.0	°C	-99.9°C	99.9°C		R	R	R/W	HR716
	Limite min	25.0	°C	0.0	99.9°C		R	R	R/W	HR717
	Limit max	80.0	°C	0.0	99.9°C		R	R	R/W	HR718
	Set point calcul.	-	°C	0.0°C	99.9°C		R	R	R	IR385
Bo15	Heat pump 2					Bo13: custom				
	Heating climatic curve									
	Outside temperature									
	1:	-12.0	°C	-99.9	99.9		R	R	R/W	HR719
	2:	0.0	°C	-99.9	99.9		R	R	R/W	HR721
	3:	8.0	°C	-99.9	99.9		R	R	R/W	HR723
	4:	16.0	°C	-99.9	99.9		R	R	R/W	HR725
	Offset	0.0	°C	-99.9	99.9		R	R	R/W	HR716
	Set point									
	1:	70.0	°C	0.0	99.9		R	R	R/W	HR720
	2:	60.0	°C	0.0	99.9		R	R	R/W	HR722
	3:	50.0	°C	0.0	99.9		R	R	R/W	HR724
	4:	30.0	°C	0.0	99.9		R	R	R/W	HR726
	Calculated	-	°C	0.0	99.9		R	R	R/W	HR385
Bo16	Chiller / heat pump 2									
	Outside temperature cut-off									
	Cooling OFF below									
	Threshold	15.0	°C	0	99.9		R	R	R/W	HR822
	Differential	1.0	°C	0	9.9		R	R	R/W	HR823
Bo17	Chiller / heat pump 2									
	Cooling mode									
	Set point Fixed From circuits	Fixed	-	Fixed	From circuits		R	R	R/W	HR2866
	Outlet set point									
	Comfort	7.0	°C	-50.0	99.9		R	R	R/W	HR2867
	Economy	9.0	°C	-50.0	99.9		R	R	R/W	HR2868
	Circuit set point									
	Lowest	-	°C	-50.0	99.9					
	Offset	2.0	°C	0.0	99.9		R	R	R/W	HR2869
	Set point calcul.	-	°C	0.0	99.9		R	R	R	IR382
Bo18	Chiller / heat pump 2									
	Modulating unit									
	Control by Power Temperature	Power	-	Power	Temperature		R	R	R/W	C173
Bo19	Chiller / heat pump 2									
	Temperature control									
	Actual set point	-	°C	-99.9	99.9		R	R	R	IR382
	Set point									
	Lowest	0.0	°C	0.0	100.0		R	R	R/W	HR727
	Highest	100.0	°C	0.0	100.0		R	R	R/W	HR729
	Signal									
	Lowest	0.0	%	0.0	100.0		R	R	R/W	HR728
	Highest	100.0	%	0.0	100.0		R	R	R/W	HR730
	Output	-	%	0.0	100.0		R	R	R/W	IR386
Bo20	Chiller / heat pump 2									
	Power control									
	Temperature	-	°C	-	-		R	R	R	IR383
	P	2.0	-	0.0	99.9		R	R	R/W	HR731
	I	120	-	0.0	999		R	R	R/W	HR732
	D	0	-	0	999		R	R	R/W	HR733

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Limit min	0.0	%	0.0	100.0		R	R	R/W	HR728
	Limit max	100.0	%	0.0	100.0		R	R	R/W	HR730
	Output	-	%	0.0	100.0		R	R	R/W	IR386
Bo21...Bo25	Not used									
Bo30	Chiller / heat pump 2					Bo05,Bo06				
	Low outlet temperature alarm									
	Offset	20.0	°C	0.0	99.9	Threshold=set (Bo17)- offset	R	R	R/W	HR374
	Delay	30	min	0	600		R	R	R/W	HR735
Bo31	Chiller / heat pump 2					Bo05,Bo06				
	High outlet temperature alarm									
	Offset	20.0	°C	0.0	99.9	Threshold=set (Bo17)+offset	R	R	R/W	HR2871
	Delay	30	min	0	600		R	R	R/W	HR735
p. Boiler 1										
Bp01	Boiler 1									
	Number of pumps	0	-	0	3		R	R	R/W	HR597
Bp02	Boiler 1									
	Pump alarm input									
	1: --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-				R	R	R/W	C400
	2: --- See 1	-	-				R	R	R/W	C386
	3: --- See 1	-	-				R	R	R/W	C372
	Signal Overload Feedback	Overload	-	Overload	Feedback		R	R	R/W	
	Logic N.C. N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	
Bp03	Boiler 1									
	Pump command output									
	1: c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	OFF	-	OFF	ON		R	R	R/W	DI161
	2: See 1	OFF	-	OFF	ON		R	R	R/W	DI162
	3: See 1	OFF	-	OFF	ON		R	R	R/W	DI163
	Post circulation	0	min	0	999		R	R	R/W	HR598
Bp04	Boiler 1									
	Pump management									
	Anti-seize	No	-	No	Yes		R	R	R/W	C102
	Rotation time	24	h	0	999		R	R	R/W	HR599
	Force rotation	No	-	No	Yes		R	R	R/W	C103
Bp05	Boiler 1									
	Probe management									
	Outlet temperature c.pCO:	-	°C	-99.9	99.9		R	R	R/W	IR326

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	U01...U10; SP_TEM_01...11 c.pCOE1...E4: U01...U10									
	Inlet temperature See outlet temperature	-	°C	-99.9	99.9		R	R	R/W	IR327
Bp06	Boiler 1									
	Modulating unit									
	Output status	-	%	0.0	100.0		R	R	R	IR329
	Signal 0...10V 2...10V	0...10V	-	0...10V	2...10V		R	R	R/W	HR600
	--- c.pCO: U01...U10; Y01...Y06 c.pCOE1...E4: U01...U10	-	°C	-999.9	999.9		R	R	R/W	
Bp07	Boiler 1									
	Remote control --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-				R	R	R/W	DI164
	Logic N.C. N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	C104
	Bypass Enable	Bypass	-	Bypass	Enable		R	R	R/W	C105
	Mode Auto Man.On Man.Off	Auto	-	Auto	Man.Off		R	R	R/W	HR602
Bp08	Boiler 1									
	Control mode: Only heating Always heating	Always heating	-	Only heating	Always heating		R	R	R/W	HR603
	DHW production	No	-	No	YES		R	R	R/W	C106
	Antilegionella	No	-	No	YES		R	R	R/W	C107
	Antifreeze protection	No	-	No	YES		R	R	R/W	C108
Bp09	Boiler 1									
	Unit feedback c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	U01	-	U01	Din18		R	R	R/W	DI165
	Signal Overload Feedback	Overload	-	Overload	Feedback		R	R	R/W	
	Logic N.C. N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	
Bp10	Boiler 1									
	On/Off command output --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	-	-				R	R	R/W	DI166
Bp11	Boiler 1									
	k.Air: No/Yes 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>	-	-	1	10		R	R	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Circuits: No/Yes 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>	-	-	1	10		R	R	R/W	C109, C110 C111, C112 C113, C114 C115, C116 C117, C118
Bp12	Boiler 1									
	Outside temperature cut-off									
	Heating OFF over									
	Threshold	25.0	°C	0	99.9		R	R	R/W	HR605
	Differential	1.0	°C	0	9.9		R	R	R/W	HR606
	Heating OFF below									
	Threshold	7.0	°C	-50.0	99.9		R	R	R/W	HR3307
	Differential	1.0	°C	0	9.9		R	R	R/W	HR3308
Bp13	Boiler 1									
	Set point Fixed Climatic Custom From circuits	Fixed	-	Fixed	From circuits		R	R	R/W	IR323
	Outlet set point				Fixed					
	Comfort	60.0	°C	0.0	99.9		R	R	R/W	HR592
	Economy	50.0	°C	0.0	99.9		R	R	R/W	HR593
	Room set point					Climate, Custom				
	Comfort	-	°C	0.0	99.9		R	R	R/W	
	Economy	-	°C	0.0	99.9		R	R	R/W	
	Circuit set point					From circuits				
	Highest	-	°C	0.0	99.9		R	R	R/W	IR324
	Offset	2.0	°C	0.0	9.9		R	R	R/W	HR594
	Antilegionella	60.0	°C	60.0	95.0		R	R	R/W	HR595
	Set point calcul.	-	°C	-99.9	99.9		R	R	R	IR325
Bp14	Boiler 1					Bp13: climate				
	Heating climatic curve									
	Curve no.	1.0	-	0.1	4.0		R	R	R/W	HR607
	Offset	0.0	°C	-99.9	99.9		R	R	R/W	HR608
	Limite min	25.0	°C	0.0	99.9		R	R	R/W	HR609
	Limit max	80.0	°C	0.0	99.9		R	R	R/W	HR610
	Set point calcul.	-	°C	0.0	99.9		R	R	R	IR328
Bp15	Boiler 1					Bp13: custom				
	Custom climatic curve									
	Outside temperature									
	1:	-12.0	°C	-99.9	99.9		R	R	R/W	HR611
	2:	0.0	°C	-99.9	99.9		R	R	R/W	HR613
	3:	8.0	°C	-99.9	99.9		R	R	R/W	HR615
	4:	16.0	°C	-99.9	99.9		R	R	R/W	HR617
	Offset	0.0	°C	-99.9	99.9		R	R	R/W	HR608
	Set point									
	1:	70.0	°C	0.0	99.9		R	R	R/W	HR612
	2:	60.0	°C	0.0	99.9		R	R	R/W	HR614
	3:	50.0	°C	0.0	99.9		R	R	R/W	HR616
	4:	30.0	°C	0.0	99.9		R	R	R/W	HR618
	Calculated	-	°C	-99.9	99.9		R	R	R/W	IR328
Bp16	Boiler 1									
	Modulating unit control by Power Temperature	Power	-	Power	Temperature		R	R	R/W	C119
Bp17	Boiler 1					Temperature				
	Temperature check									
	Actual set point	-	°C	0.0	99.9		R	R	R	IR325
	Set point									
	Lowest	0.0	°C	0.0	100.0		R	R	R/W	HR619

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Highest	100.0	°C	0.0	100.0		R	R	R/W	HR621
	Signal									
	Lowest	0.0	%	0.0	100.0		R	R	R/W	HR620
	Highest	100.0	%	0.0	100.0		R	R	R/W	HR622
	Output	-	%	0.0	100.0		R	R	R/W	IR329
Bp18	Boiler 1									
	Power control									
	Temperature	-	°C	-99.9	99.9		R	R	R	IR326
	P	2.0	-	0.0	99.9		R	R	R/W	HR623
	I	120	-	0.0	999		R	R	R/W	HR624
	D	0	-	0	999		R	R	R/W	HR625
	Limit min	0.0	%	0.0	100.0		R	R	R/W	HR620
	Limit max	100.0	%	0.0	100.0		R	R	R/W	HR622
	Output	-	%	0.0	100.0		R	R	R/W	IR329
Bp19	Boiler 1					Bp06				
	Low outlet temperature alarm									
	Offset	20	°C	0	99.9		R	R	R/W	HR626
	Delay	30	min	0	600		R	R	R/W	HR627
q. Boiler 2										
Bq01	Boiler 2									
	Number of pumps	0	-	0	3		R	R	R/W	HR633
Bq02	Boiler 2									
	Pump alarm input									
	1: --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-				R	R	R/W	C401
	2: --- See 1	-	-				R	R	R/W	C387
	3: --- See 1	-	-				R	R	R/W	C373
	Signal Overload ; Feedback	Overload	-	Overload	Feedback		R	R	R/W	
	Logic N.C. ; N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	
Bq03	Boiler 2									
	Pump command output									
	1: OFF/ON c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	OFF	-	OFF	ON		R	R	R/W	DI167
	2: OFF/ON See 1	OFF	-	OFF	ON		R	R	R/W	DI168
	3: OFF/ON See 1	OFF	-	OFF	ON		R	R	R/W	DI169
	Post circulation	0	min	0	999		R	R	R/W	HR634
Bq04	Boiler 2									
	Pump management									
	Anti-seize	No	-	No	Yes		R	R	R/W	C120
	Rotation time	24	h	0	999		R	R	R/W	HR635
	Force rotation	No	-	No	Yes		R	R	R/W	C121
Bq05	Boiler 2									



Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	Probe management									
	Outlet temperature c.pCO: U01...U10; SP_TEM_01...11 c.pCOE1...E4: U01...U10	-	°C	-99.9	99.9		R	R	R/W	IR345
	Inlet temperature See outlet temperature	-	°C	-99.9	99.9		R	R	R/W	IR346
Bq06	Boiler 2									
	Modulating unit									
	Output status	-	%	0.0	100.0		R	R	R	IR348
	Type 0...10 V 2...10 V	0...10 V	-	0...10 V	2...10 V		R	R	R/W	HR636
	Channel --- c.pCO: U01...U10; Y01...Y06 c.pCOE1...E4: U01...U10	-	°C	-999.9	999.9		R	R	R/W	
Bq07	Boiler 2									
	Remote control --- c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	-	-				R	R	R/W	DI170
	Logic N.C. N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	C122
	Bypass Enable	Bypass	-	Bypass	Enable		R	R	R/W	C123
	Mode Auto Man.On Man.Off	Auto	-	Auto	Man.Off		R	R	R/W	HR638
Bq08	Boiler 2									
	Control mode: Only heating Always heating	Always heating	-	Only heating	Always heating		R	R	R/W	HR639
	DHW production	No	-	No	YES		R	R	R/W	C124
	Antilegionella	No	-	No	YES		R	R	R/W	C125
	Antifreeze protection	No	-	No	YES		R	R	R/W	C126
Bq09	Boiler 2									
	Unit feedback c.pCO: U01...U10; Din01...Din18 c.pCOE1...E4: U01...U10	U01	-	U01	Din18		R	R	R/W	DI171
	Signal Overload Feedback	Overload	-	Overload	Feedback		R	R	R/W	
	Logic N.C. N.O.	N.C.	-	N.C.	N.O.		R	R	R/W	
Bq10	Boiler 2									
	On/Off command output --- c.pCO: NO01...NO18 pCOE1...E4: NO01...NO06	-	-				R	R	R/W	DI172


Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Bq11	Boiler 2									
	k.Air: No/Yes									
	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>	-	-	1	10		R	R	R/W	
	Circuits: No/Yes									
	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>	-	-	1	10		R	R	R/W	C127, C128 C129, C130 C131, C132 C133, C134 C135, C136
Bq12	Boiler 2									
	Outside temperature cut-off									
	Heating OFF over									
	Threshold	25.0	°C	0	99.9		R	R	R/W	HR641
	Differential	1.0	°C	0	9.9		R	R	R/W	HR642
	Heating OFF below									
	Threshold	-50.0	°C	0	99.9		R	R	R/W	HR3309
	Differential	1.0	°C	0	9.9		R	R	R/W	HR3310
Bq13	Boiler 2									
	Set point									
	Fixed Climatic Custom From circuits	Fixed	-	Fixed	From circuits		R	R	R/W	IR342
	Outlet set point					Fixed				
	Comfort	60.0	°C	0.0	99.9		R	R	R/W	HR628
	Economy	50.0	°C	0.0	99.9		R	R	R/W	HR629
	Room set point					Climate, Custom				
	Comfort	-	°C	0.0	99.9		R	R	R/W	
	Economy	-	°C	0.0	99.9		R	R	R/W	
	Circuit set point					From circuits				
	Highest	-	°C	0.0	99.9		R	R	R/W	IR343
	Offset	2.0	°C	0.0	9.9		R	R	R/W	HR630
	Antilegionella	60.0	°C	60.0	95.0					
	Set point calcul.	-	°C	-99.9	99.9		R	R	R	IR344
Bq14	Boiler 2					Bq13: climate				
	Heating climatic curve									
	Curve no.	1.0	-	0.1	4.0		R	R	R/W	HR643
	Offset	0.0	°C	-99.9	99.9		R	R	R/W	HR644
	Limite min	25.0	°C	0.0	99.9		R	R	R/W	HR645
	Limit max	80.0	°C	0.0	99.9		R	R	R/W	HR646
	Set point calcul.	-	°C	-99.9	99.9		R	R	R	IR347
Bq15	Boiler 2					Bq13: custom				
	Custom climatic curve									
	Outside temperature									
	1:	-12.0	°C	-99.9	99.9		R	R	R/W	HR647
	2:	0.0	°C	-99.9	99.9		R	R	R/W	HR649
	3:	8.0	°C	-99.9	99.9		R	R	R/W	HR651
	4:	16.0	°C	-99.9	99.9		R	R	R/W	HR653
	Offset	0.0	°C	-99.9	99.9		R	R	R/W	HR644
	Set point									
	1:	70.0	°C	0.0	99.9		R	R	R/W	HR648
	2:	60.0	°C	0.0	99.9		R	R	R/W	HR650
	3:	50.0	°C	0.0	99.9		R	R	R/W	HR652
	4:	30.0	°C	0.0	99.9		R	R	R/W	HR654
	Calculated	-	°C	-99.0	99.9		R	R	R/W	IR347
Bq16	Boiler 2									
	Modulating unit control by Power Temperature	Power	-	Power	Temperature		R	R	R/W	C137

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Bq17	Boiler 2					Temperature				
	Temperature check									
	Actual set point	-	°C	0.0	99.9		R	R	R	IR344
	Set point									
	Lowest	0.0	°C	0.0	100.0		R	R	R/W	HR655
	Highest	100.0	°C	0.0	100.0		R	R	R/W	HR657
	Signal									
	Minimum	0.0	%	0.0	100.0		R	R	R/W	HR656
	Maximum	100.0	%	0.0	100.0		R	R	R/W	HR658
	Output	-	%	0.0	100.0		R	R	R/W	IR348
Bq18	Boiler 2									
	Power control									
	Temperature	-	°C	-	-		R	R	R	IR345
	P	1.0	-	0.0	99.9		R	R	R/W	HR659
	I	120	-	0.0	999		R	R	R/W	HR660
	D	0	-	0	999		R	R	R/W	HR661
	Limit min	0.0	%	0.0	100.0		R	R	R/W	HR656
	Limit max	100.0	%	0.0	100.0		R	R	R/W	HR658
	Output	-	%	0.0	100.0		R	R	R/W	IR348
Bq19	Boiler 2					Bq06				
	Low outlet temperature alarm									
	Offset	20	°C	0	99.9		R	R	R/W	HR662
	Delay	30	min	0	600		R	R	R/W	HR663

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
C. I/O configuration										
C01	Universal input configuration									
	MB (Mother board) E1 E2 E3 E4	-	-	MB	E4		R	R	R/W	
	--- U1 U2 U3 U4 U5 U6 U7 U8 U9 U10	---	-	U1	U10		R	R	R/W	IR406
	Type --- NTC NTC-HT NTC-80 / PT1000 PTC-R 0...1V 0...10 V 0...5V c.pCO 0...5V Ext 0.5...4.5V 4...20 mA 0...20 mA DIN Aout	---	-	NTC	Aout		R	R	R/W	
	Min	0.0	-	-9999.9	9999.9		R	R	R/W	
	Max	100.0	-	-9999.9	9999.9		R	R	R/W	
	Offset	0.0	-	-9999.9	9999.9		R	R	R/W	
	Value used	-	-%	-	-		R	R	R	IR407
	Status: Open _/_ Closed ___	-					R	R	R	
	Filter:	5		0	9		R	R	R/W	
	Error: -	-					R	R	R	IR408
C02	Not used									
C03	Aout configuration analogue output									
	MB (Mother board) E1 E2 E3 E4	-	-	MB	E4		R	R	R/W	
	--- Y1 Y2 Y3 Y4 Y5 Y6	---	-	Y1	Y6		R	R	R/W	
	Type --- 0...10V	---	-	NTC	Aout		R	R	R/W	
	Min	0.0	V	0.0	10.0		R	R	R/W	
	Max	10.0	V	0.0	10.0		R	R	R/W	
	Value	0.0	%	0.0	100.0		R	R	R	IR411
	Error: -	-					R	R	R	IR412

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
D.										
D01	Import/Export IMPORT ; EXPORT	-	-	IMPORT	EXPORT		R	R/W	R/W	
	Memory type: Internal flash memory ; USB	-	-	Internal flash memory	USB		R	R/W	R/W	
	File name: kWater_conf_00..99	00	-	00	99		R	R/W	R/W	HR0
	Confirm ? No ; Yes	NO	-	-	-		R	R/W	R/W	
D02	Unit configuration									
	Alarm export									
	Memory type Internal flash memory ; USB									
	File name	AL_ Export_ 00	-	AL_Export_00	AL_Export_ 99		R	R/W	R/W	HR1
	Confirm ? No ; Yes									
E. Alarm log	Data logger record no.									
	Alarm no. hour : min dd/mm/yy									
	Board no. Controller status									
	Event Start ;					????????				
F. Other										
a. Date/Time										
Fa01	Date/time change									
	Format DD/MM/YY	-	-	-	-		R	R/W	R/W	
	Date --/--/--		DD	01	31		R	R/W	R/W	
			MM	01	12		R	R/W	R/W	
			YY	00	99		R	R/W	R/W	
	Time hh/mm/ss		hh	00	23		R	R/W	R/W	
			mm	00	59		R	R/W	R/W	
			ss	01	59		R	R/W	R/W	
	Day Monday ; Tuesday ; Wednesday ; Thursday ; Friday ; Saturday ; Sunday	-	Day week	Mon	Sun		R	R	R	IR404
Fa02	Time zone									
	Current		London	-	London	...	R	R	R/W	IR405
	City	GMT								
	LONDON	+0								
	REYKJAVIK	+0								
								
	New time zone See previous row	London	-	London	Casablanca		R	R/W	R/W	
	Update time zone No ; Yes	-	No	No	Yes		R	R/W	R/W	
b. Unit of measure										
Fb01	User interface UoM SI (°C, kPa)									IR205
Fb02	Web interface SI (°C, kPa)									HR772
c. Language										


Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Fc01	Language									
	English Italiano Deutsch Francais Espanol	English	-	English	Espanol		R/W	R/W	R/W	
	Press Enter to change, Esc to confirm									
 d. Change password										
Fd01	Change password									
	User	0000	-	0000	9.999		R/W	R/W	R/W	HR769
	Service	1234	-	0000	9.999		-	R/W	R/W	HR770
	Manufacturer	5678	-	0000	9.999		-	-	R/W	HR771
 e. Network										
Fe02	Serial ports									
	Protocol selection									
	Ethernet port									
	None Bacnet Modbus 1 Modbus 2	None	-	None	Modbus 2		R	R/W	R/W	
	BMS2 port									
	None Bacnet Modbus 1 Modbus 2	None	-	None	Modbus 2		R	R/W	R/W	
	Save ?									
	No Yes	No	-	No	Yes		R	R/W	R/W	
Fe03	Serial ports									
	Fieldbus 1									
	Baud rate									
	1200 2400 4800 9600 19200 38400	19200	baud	1200	38400		R	R/W	R/W	HR743
	Stop bits									
	1 2	2	-	1	2		R	R/W	R/W	HR744
	Parity									
	None Odd Even	None	-	None	Even		R	R/W	R/W	HR745
Fe04	Serial ports									
	Fieldbus 2									
	Baud rate									
	1200 2400 4800 9600 19200 38400	19200	baud	1200	38400		R	R/W	R/W	HR746
	Stop bits									
	1 2	2	-	1	2		R	R/W	R/W	HR747
	Parity									
	None Odd Even	None	-	None	Even		R	R/W	R/W	HR748
Fe05	Serial ports									
	BMS 1									
	Baud rate									
	1200 2400 4800 9600 19200 38400	19200	baud	1200	38400		R	R/W	R/W	HR749
	Stop bits									
	1 2	2	-	1	2					HR750
	Parity									
	None Odd Even	None	-	None	Even		R	R/W	R/W	HR751
	Address									
		1	-	0	255		R	R/W	R/W	HR752
Fe06	Serial ports									
	BMS 2									
	Baud rate									
	19200 1200 2400 4800 9600 19200 38400	19200	baud	1200	38400		R	R/W	R/W	HR753
	Stop bits									
	1 2	2	-	1	2					HR754
	Parity									
	None Odd Even	None	-	None	Even		R	R/W	R/W	HR755
	Address									
		1	-	0	255		R	R/W	R/W	HR756

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Fe07	Network configuration									
	DHCP	On	-	Off	On		R/W	R/W	R/W	
	On Off									
	IP	0.0.0.0	-				R/W	R/W	R/W	
	Mask	0.0.0.0					R/W	R/W	R/W	
	GW	0.0.0.0					R/W	R/W	R/W	
	DNS	0.0.0.0					R/W	R/W	R/W	
	Update ? No Yes	No	-	No	YES		R/W	R/W	R/W	
Fe08	pGDx									
	Host name - last four digit MAC Address									
	MACxx:xx:xx:xx:00:00	0	-	0	z		R	R/W	R/W	HR757
		0	-	0	z		R	R/W	R/W	HR759
		0	-	0	z		R	R/W	R/W	HR761
		0	-	0	z		R	R/W	R/W	HR763
	Temperature	---,--	°C							IR435
	Humidity	---,--	%rH							HR3140
Fe09	c.pCOe (Expansion board)									
	Enable c.pCOe									
	c.pCOe1 No Yes	No	-	No	Yes		R	R	R/W	HR765
	c.pCOe2 No Yes	No	-	No	Yes		R	R	R/W	HR766
	c.pCOe3 No Yes	No	-	No	Yes		R	R	R/W	HR767
	c.pCOe4 No Yes	No	-	No	Yes		R	R	R/W	HR768
Fe10	Serial probes									
	Enable serial probe									
	Number	0	-	0	11		R	R/W	R/W	
	Modbus address start from	129					R	R	R	
Fe11	Enable energy meters									
	Number	0	-	0	3		R	R/W	R/W	
	Modbus address									
	Energy meter 1	21	-	0	255		R	R/W	R/W	
	Energy meter 2	22	-	0	255		R	R/W	R/W	
	Energy meter 3	23	-	0	255		R	R/W	R/W	
Fe12	k.Air configuration									
	Auto discovery	No	-	No	Yes		R	R	R/W	
	Search No <input type="checkbox"/> / Yes <input checked="" type="checkbox"/>									
	<div> <div>1</div><div>2</div><div>3</div><div>4</div><div>5</div> <div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div> <div>6</div><div>7</div><div>8</div><div>9</div><div>10</div> <div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input type="checkbox"/></div> </div>									C201, C202 C203, C204 C205, C206 C207, C208 C209, C210
Fe13	Hostname set									
	Hostname	kwater01	-	kwater01	kwater10		R	R/W	R/W	HR3143
Fe15	Remote On/Off No Yes	No	-	No	Yes		R	R/W	R/W	C174
 f. Initialisation										

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
Ff01	Initialisation									
	Alarms initialisation									
	Delete alarm logs? No Yes	No	-	No	Yes		R/W	R/W	R/W	
	Clear autoreset counters? No Yes	No	-	No	Yes		R/W	R/W	R/W	
	Enable buzzer? Yes No	Yes	-	No	Yes		R/W	R/W	R/W	
Ff02	Initialisation									
	Default installation									
	Wipe retain memory No Yes	No	-	No	Yes		R	R	R/W	
	Wipe NVRAM memory No Yes	No	-	No	Yes		R	R	R/W	
	Wipe both memories No Yes	No	-	No	Yes		R	R	R/W	
Ff03	Initialisation									
	Password set point No Yes	No	-	No	Yes		R	R	R/W	
	Password scheduler No Yes	No	-	No	Yes		R	R	R/W	
Ff04	Energy meter									
	Reset all counters									
	Energy meter 1	0	-	0	1		R	R	R/W	
	Energy meter 2	0	-	0	1		R	R	R/W	
	Energy meter 3	0	-	0	1		R	R	R/W	
Fg01	Boiler 1									
	Work hours									
	P1	-	h	0	32767000		R	R	R	IR332
	P2	-	h	0	32767000		R	R	R	IR335
	P3	-	h	0	32767000		R	R	R	IR338
	Reset									
	P1 No Yes	No	-	No	Yes		R	R/W	R/W	
	P2 No Yes	No	-	No	Yes		R	R/W	R/W	
	P3 No Yes	No	-	No	Yes		R	R/W	R/W	
	Alarm threshold (*):	0	h	0	32767000		R	R/W	R/W	HR779
	Note (*): if threshold=0h, the alarm is disabled									
Fg02	Boiler 2 See Fg01									IR351, IR354 IR357, HR795
Fg03	Chiller / heat pump 1 See Fg01									IR370, IR373 IR376, HR811
Fg04	Chiller / heat pump 2 See Fg01									IR389, IR392 IR395, HR827
Fg05...10	Not used									
Fg11	Circuit 1									
	Work hours									
	P1	-	h	0	32767000		R	R/W	R/W	
	P2	-	h	0	32767000		R	R/W	R/W	
	P3	-	h	0	32767000		R	R/W	R/W	
	Reset									
	P1 No Yes	No	-	No	Yes		R	R/W	R/W	
	P2 No Yes	No	-	No	Yes		R	R/W	R/W	

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	P3 No Yes	No	-	No	Yes		R	R/W	R/W	
	Alarm threshold:	0	h	0	32767000		R	R/W	R/W	HR839
Fg12	Circuit 2 See circuit 1									HR852
Fg13	Circuit 3 See circuit 1									HR865
Fg14	Circuit 4 See circuit 1									HR878
Fg15	Circuit 5 See circuit 1									HR891
Fg16	Circuit 6 See circuit 1									HR904
Fg17	Circuit 7 See circuit 1									HR917
Fg18	Circuit 8 See circuit 1									HR930
Fg19	Circuit 9 See circuit 1									HR943
Fg20	Circuit 10 See circuit 1									HR956
	Boiler 1									
	Manual commands									
Fh01	P1 Auto Manual On Manual Off	Auto	-	Auto	Manual Off		R	R/W	R/W	HR3070
	P2 Auto Manual On Manual Off	Auto	-	Auto	Manual Off		R	R/W	R/W	HR3084
	P3 Auto Manual On Manual Off	Auto	-	Auto	Manual Off		R	R/W	R/W	HR3098
	Boiler Auto Manual On Manual Off	Auto	-	Auto	Manual Off		R	R/W	R/W	HR3112
	Output Auto 0...100%	Auto	-	Auto	100		R	R/W	R/W	HR3116
Fh02	Boiler 2									
	See Fh01									HR3071 HR3085 HR3099 HR3113 HR3117
Fh03	Chiller / Heat pump 1									
	See Fh01									HR3082 HR3096 HR3110 HR3114 HR3128
Fh04	Chiller / Heat pump 2									
	See Fh01									HR3083 HR3097 HR3111 HR3115 HR3129
Fh05	Circuit 1									
	Manual commands									
	P1 Auto Manual On Manual Off	Auto	-	Auto	Manual Off		R	R/W	R/W	HR3072
	P2 Auto Manual On Manual Off	Auto	-	Auto	Manual Off		R	R/W	R/W	HR3086

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
	P3 Auto Manual On Manual Off	Auto	-	Auto	Manual Off		R	R/W	R/W	HR3100
	Valve Auto 0...100%	Auto	-	Auto	100		R	R/W	R/W	HR3118
	P1 status Off On Alarm	-	-	Off	Alarm		R	R	R	IR15
	P2 status Off On Alarm	-	-	Off	Alarm		R	R	R	IR16
	P3 status Off On Alarm	-	-	Off	Alarm		R	R	R	IR17
Fh06	Circuit 2 See Fh05									HR3073 HR3087 HR3101 HR3119 IR32 IR33 IR34
Fh07	Circuit 3 See Fh05									HR3074 HR3088 HR3102 HR3120 IR49 IR50 IR51
Fh08	Circuit 4 See Fh05									HR3075 HR3089 HR3103 HR3121 IR66 IR67 IR68
Fh09	Circuit 5 See Fh05									HR3076 HR3090 HR3104 HR3122 IR83 IR84 IR85
Fh10	Circuit 6 See Fh05									HR3077 HR3091 HR3105 HR3123 IR100 IR101 IR102
Fh11	Circuit 7 See Fh05									HR3078 HR3092 HR3106 HR3124 IR117 IR118 IR119
Fh12	Circuit 8 See Fh05									HR3079 HR3093 HR3107 HR3125

Ref.	Display description	Def.	UOM	Min	Max	Note	U	S	M	Modbus
										IR134 IR135 IR136
Fh13	Circuit 9 See Fh05									HR3080 HR3094 HR3108 HR3126 IR151 IR152 IR153
Fh14	Circuit 10 See Fh05									HR3081 HR3095 HR3109 HR3127 IR168 IR169 IR170
	See Fh05									
 G. Logout										
G01	Logout									
	You are logged in as user/ service/ manufacturer									
	Press enter to log out									

8. Alarms and signals

8.1 Types of alarms

The controller manages two types of alarms, depending on the reset mode:

A - automatic: the alarm is reset and the device restarts automatically when the alarm condition is no longer present;

M - manual: an operator needs to physically restart the controller.

8.1.1 Active alarms

Active alarms are signalled by buzzer and the Alarm button lighting up. Pressing Alarm mutes the buzzer and displays the alarm code (on the top row) and the description (on the bottom row). Alarm activation is recorded in the alarm log.

If the alarm is reset automatically, the Alarm button goes off, the alarm code is cleared from the list and the alarm reset event is recorded in the alarm log.

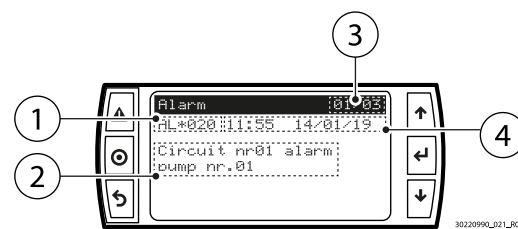


Fig.8.a

Ref.	Description	Ref.	Description
1	Alarm code	3	Alarm number/total alarms;
2	Alarm description	4	Alarm time and date

An alarm can be reset by pressing Alarm for more than 3 s. If the condition that generated the alarm is still present, the alarm will be reactivated.

8.1.2 Alarm log

From each alarm display screen, pressing Enter switches to the alarm log screens. These show the alarm activation (Start) and deactivation times (Stop). Alternatively, access menu E. A maximum of 64 events are stored, in a FIFO queue.

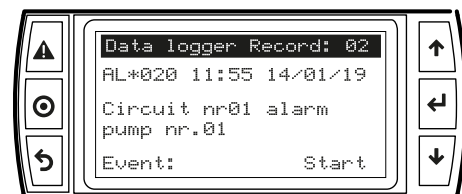


Fig.8.b

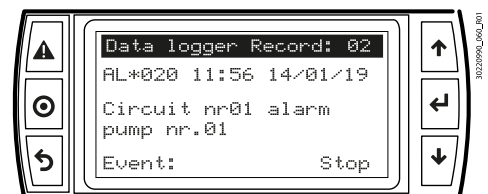


Fig.8.c

The alarm log can be deleted by accessing the following screen:

Ref.	Display description	Def.	UOM	Min	Max
Ff01	Initialisation				
	Alarms initialisation				
	Delete alarm logs? No Yes	No	-	No	Yes
	Clear autoreset counters? No Yes	No	-	No	Yes
	Enable buzzer? Yes No	Yes	-	No	Yes

8.2 Alarm table

The alarms listed refer to circuits 1-10 and relate to a circuit with the maximum number of configurable probes/outputs. Therefore, certain alarms may not occur because the actual configuration of the circuit does not include certain probes/outputs.

Code	Description	Reset	Effect in cooling	Effect in heating	Modbus
AL*000	Error in number of retain memory writes	Manual	Signal only	Signal only	DI 185
AL*001	Retain memory write error	Manual	Signal only	Signal only	DI 186
AL*002	c.pCOe no. 01 offline	Auto	Shutdown system	Shutdown system	DI 187
AL*003	c.pCOe no. 01 configuration error	Auto	Shutdown system	Shutdown system	DI 188
AL*004	c.pCOe no. 02 offline	Auto	Shutdown system	Shutdown system	DI 189
AL*005	c.pCOe no. 02 configuration error	Auto	Shutdown system	Shutdown system	DI 190
AL*006	c.pCOe no. 03 offline	Auto	Shutdown system	Shutdown system	DI 191
AL*007	c.pCOe no. 03 configuration error	Auto	Shutdown system	Shutdown system	DI 192
AL*008	c.pCOe no. 04 offline	Auto	Shutdown system	Shutdown system	DI 193
AL*009	c.pCOe no. 04 configuration error	Auto	Shutdown system	Shutdown system	DI 194
AL*010	AL_010	Auto	---	---	DI 195
AL*011	Circuit no. 01 outlet temperature probe error	Auto	Valve 0%	Valve 0%	DI 196
AL*012	Circuit no. 01 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 197
AL*013	Circuit no. 01 room humidity probe error	Auto	Dew point control disabled	No effect	DI 198
AL*014	Circuit no. 01 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 199
AL*015	Circuit no. 01 DHW tank probe error	Auto	---	Fill OFF	DI 200
AL*016	Circuit no. 01 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 201
AL*017	Circuit no. 01 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 202
AL*018	Circuit no. 01 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 203
AL*019	Circuit no. 01 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 204
AL*020	Circuit no. 01 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 205
AL*021	Circuit no. 01 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 206
AL*022	Circuit no. 01 alarm on pump no. 03	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 207
AL*023	AL_23	Auto	---	---	DI 208
AL*024	Circuit no. 01 maintenance request	Auto	Signal only	Signal only	DI 209
AL*025	Circuit no. 01 inlet temperature probe error	Auto	Signal only	Signal only	DI 210
AL*026	AL_026	Auto	---	---	DI 211
AL*027	AL_027	Auto	---	---	DI 212
AL*028	AL_028	Auto	---	---	DI 213
AL*029	AL_029	Auto	---	---	DI 214
AL*030	AL_030	Auto	---	---	DI 215
AL*031	Circuit no. 02 outlet temperature probe error	Auto	Valve 0%		DI 216
AL*032	Circuit no. 02 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 217

Code	Description	Reset	Effect in cooling	Effect in heating	Modbus
AL*033	Circuit no. 02 room humidity probe error	Auto	Dew point control disabled	No effect	DI 218
AL*034	Circuit no. 02 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 219
AL*035	Circuit no. 02 DHW tank probe error	Auto	---	Fill OFF	DI 220
AL*036	Circuit no. 02 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 221
AL*037	Circuit no. 02 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 222
AL*038	Circuit no. 02 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 223
AL*039	Circuit no. 02 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 224
AL*040	Circuit no. 02 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 225
AL*041	Circuit no. 02 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 226
AL*042	Circuit no. 02 alarm on pump no. 03	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 227
AL*043	Circuit no. 02 configuration error	Auto	---	---	DI 228
AL*044	Circuit no. 02 maintenance request	Auto	Signal only	Signal only	DI 229
AL*045	Circuit no. 02 inlet temperature probe error	Auto	Signal only	Signal only	DI 230
AL*046	AL_046	Auto	---	---	DI 231
AL*047	AL_047	Auto	---	---	DI 232
AL*048	AL_048	Auto	---	---	DI 233
AL*049	AL_049	Auto	---	---	DI 234
AL*050	AL_050	Auto	---	---	DI 235
AL*051	Circuit no. 03 outlet temperature probe error	Auto	Valve 0%	Valve 0%	DI 236
AL*052	Circuit no. 03 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 237
AL*053	Circuit no. 03 room humidity probe error	Auto	Dew point control disabled	No effect	DI 238
AL*054	Circuit no. 03 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 239
AL*055	Circuit no. 03 DHW tank probe error	Auto	---	Fill OFF	DI 240
AL*056	Circuit no. 03 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 241
AL*057	Circuit no. 03 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 242
AL*058	Circuit no. 03 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 243
AL*059	Circuit no. 03 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 244
AL*060	Circuit no. 03 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 245
AT*061	Circuit no. 03 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 246
AL*062	Circuit no. 03 alarm on pump no. 03	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 247
AL*063	AL_063	Auto	---	---	DI 248
AL*064	Circuit no. 03 maintenance request	Auto	Signal only	Signal only	DI 249
AL*065	Circuit no. 03 inlet temperature probe error	Auto	Signal only	Signal only	DI 250
AL*066	AL_066	Auto	---	---	DI 251
AL*067	AL_067	Auto	---	---	DI 252
AL*068	AL_068	Auto	---	---	DI 253
AL*069	AL_069	Auto	---	---	DI 254
AL*070	AL_070	Auto	---	---	DI 255
AL*071	Circuit no. 04 outlet temperature probe error	Auto	---	---	DI 256
AL*072	Circuit no. 04 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 257
AL*073	Circuit no. 04 room humidity probe error	Auto	Dew point control disabled	No effect	DI 258
AL*074	Circuit no. 04 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 259
AL*075	Circuit no. 04 DHW tank probe error	Auto	---	Fill OFF	DI 260
AL*076	Circuit no. 04 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 261
AL*077	Circuit no. 04 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 262
AL*078	Circuit no. 04 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 263

Code	Description	Reset	Effect in cooling	Effect in heating	Modbus
AL*079	Circuit no. 04 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 264
AL*080	Circuit no. 04 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 265
AL*081	Circuit no. 04 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 266
AL*082	Circuit no. 04 alarm on pump no. 03	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 267
AL*083	AL_083	Auto	---	---	DI 268
AL*084	Circuit no. 04 maintenance request	Auto	Signal only	Signal only	DI 269
AL*085	Circuit no. 04 inlet temperature probe error	Auto	Signal only	Signal only	DI 270
AL*086	AL_086	Auto	---	---	DI 271
AL*087	AL_087	Auto	---	---	DI 272
AL*088	AL_088	Auto	---	---	DI 273
AL*089	AL_089	Auto	---	---	DI 274
AL*090	AL_090	Auto	---	---	DI 275
AL*091	Circuit no. 05 outlet temperature probe error	Auto	Valve 0%	Valve 0%	DI 276
AL*092	Circuit no. 05 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 277
AL*093	Circuit no. 05 room humidity probe error	Auto	Dew point control disabled	No effect	DI 278
AL*094	Circuit no. 05 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 279
AL*095	Circuit no. 05 DHW tank probe error	Auto	---	Fill OFF	DI 280
AL*096	Circuit no. 05 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 281
AL*097	Circuit no. 05 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 282
AL*098	Circuit no. 05 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 283
AL*099	Circuit no. 05 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 284
AL*100	Circuit no. 05 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 285
AL*101	Circuit no. 05 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 286
AL*102	Circuit no. 05 alarm on pump no. 03	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 287
AL*103	AL_103	Auto	---	---	DI 288
AL*104	Circuit no. 05 maintenance request	Auto	Signal only	Signal only	DI 289
AL*105	Circuit no. 05 inlet temperature probe error	Auto	Signal only	Signal only	DI 290
AL*106	AL_106	Auto	---	---	DI 291
AL*107	AL_107	Auto	---	---	DI 292
AL*108	AL_108	Auto	---	---	DI 293
AL*109	AL_109	Auto	---	---	DI 294
AL*110	AL_110	Auto	---	---	DI 295
AL*111	Circuit no. 06 outlet temperature probe error	Auto	Valve 0%	Valve 0%	DI 296
AL*112	Circuit no. 06 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 297
AL*113	Circuit no. 06 room humidity probe error	Auto	Dew point control disabled	No effect	DI 298
AL*114	Circuit no. 06 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 299
AL*115	Circuit no. 06 DHW tank probe error	Auto	---	Fill OFF	DI 300
AL*116	Circuit no. 06 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 301
AL*117	Circuit no. 06 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 302
AL*118	Circuit no. 06 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 303
AL*119	Circuit no. 06 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 304
AL*120	Circuit no. 06 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 305
AL*121	Circuit no. 06 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 306
AL*122	Circuit no. 06 alarm on pump no. 03	Auto	Pump off/rotation	Pump off/rotation	DI 307

Code	Description	Reset	Effect in cooling	Effect in heating	Modbus
			if another is available	if another is available	
AL*123	AL_123	Auto	---	---	DI 308
AL*124	Circuit no. 06 maintenance request	Auto	Signal only	Signal only	DI 309
AL*125	Circuit no. 06 inlet temperature probe error	Auto	Signal only	Signal only	DI 310
AL*126	AL_126	Auto	---	---	DI 311
AL*127	AL_127	Auto	---	---	DI 312
AL*128	AL_128	Auto	---	---	DI 313
AL*129	AL_129	Auto	---	---	DI 314
AL*130	AL_130	Auto	---	---	DI 315
AL*131	Circuit no. 07 outlet temperature probe error	Auto	Valve 0%	Valve 0%	DI 316
AL*132	Circuit no. 07 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 317
AL*133	Circuit no. 07 room humidity probe error	Auto	Dew point control disabled	No effect	DI 318
AL*134	Circuit no. 07 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 319
AL*135	Circuit no. 07 DHW tank probe error	Auto	---	Fill OFF	DI 320
AL*136	Circuit no. 07 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 321
AL*137	Circuit no. 07 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 322
AL*138	Circuit no. 07 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 323
AL*139	Circuit no. 07 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 324
AL*140	Circuit no. 07 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 325
AL*141	Circuit no. 07 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 326
AL*142	Circuit no. 07 alarm on pump no. 03	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 327
AL*143	AL_143	Auto	---	---	DI 328
AL*144	Circuit no. 07 maintenance request	Auto	Signal only	Signal only	DI 329
AL*145	Circuit no. 07 inlet temperature probe error	Auto	Signal only	Signal only	DI 330
AL*146	AL_146	Auto	---	---	DI 331
AL*147	AL_147	Auto	---	---	DI 332
AL*148	AL_148	Auto	---	---	DI 333
AL*149	AL_149	Auto	---	---	DI 334
AL*150	AL_150	Auto	---	---	DI 335
AL*151	Circuit no. 08 outlet temperature probe error	Auto	Valve 0%	Valve 0%	DI 336
AL*152	Circuit no. 08 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 337
AL*153	Circuit no. 08 room humidity probe error	Auto	Dew point control disabled	No effect	DI 338
AL*154	Circuit no. 08 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 339
AL*155	Circuit no. 08 DHW tank probe error	Auto	---	Fill OFF	DI 340
AL*156	Circuit no. 08 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 341
AL*157	Circuit no. 08 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 342
AL*158	Circuit no. 08 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 343
AL*159	Circuit no. 08 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 344
AL*160	Circuit no. 08 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 345
AL*161	Circuit no. 08 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 346
AL*162	Circuit no. 08 alarm on pump no. 03	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 347
AL*163	AL_163	Auto	---	---	DI 348
AL*164	Circuit no. 08 maintenance request	Auto	Signal only	Signal only	DI 349
AL*165	Circuit no. 08 inlet temperature probe error	Auto	Signal only	Signal only	DI 350
AL*166	AL_166	Auto	---	---	DI 351
AL*167	AL_167	Auto	---	---	DI 352

Code	Description	Reset	Effect in cooling	Effect in heating	Modbus
AL*168	AL_168	Auto	---	---	DI 353
AL*169	AL_169	Auto	---	---	DI 354
AL*170	AL_170	Auto	---	---	DI 355
AL*171	Circuit no. 09 outlet temperature probe error	Auto	Valve 0%	Valve 0%	DI 356
AL*172	Circuit no. 09 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 357
AL*173	Circuit no. 09 room humidity probe error	Auto	Dew point control disabled	No effect	DI 358
AL*174	Circuit no. 09 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 359
AL*175	Circuit no. 09 DHW tank probe error	Auto	---	Fill OFF	DI 360
AL*176	Circuit no. 09 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 361
AL*177	Circuit no. 09 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 362
AL*178	Circuit no. 09 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 363
AL*179	Circuit no. 09 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 364
AL*180	Circuit no. 09 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 365
AL*181	Circuit no. 09 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 366
AL*182	Circuit no. 09 alarm on pump no. 03	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 367
AL*183	AL_183	Auto	---	---	DI 368
AL*184	Circuit no. 09 maintenance request	Auto	Signal only	Signal only	DI 369
AL*185	Circuit no. 09 inlet temperature probe error	Auto	Signal only	Signal only	DI 370
AL*186	AL_186	Auto	---	---	DI 371
AL*187	AL_187	Auto	---	---	DI 372
AL*188	AL_188	Auto	---	---	DI 373
AL*189	AL_189	Auto	---	---	DI 374
AL*190	AL_190	Auto	---	---	DI 375
AL*191	Circuit no. 10 outlet temperature probe error	Auto	Valve 0%	Valve 0%	DI 376
AL*192	Circuit no. 10 room temperature probe error	Auto	Circuit OFF	Direct circuit = OFF Mixed plus = circuit ON with minimum outlet set point	DI 377
AL*193	Circuit no. 10 room humidity probe error	Auto	Dew point control disabled	No effect	DI 378
AL*194	Circuit no. 10 DHW outlet temperature probe error	Auto	---	Valve 0%	DI 379
AL*195	Circuit no. 10 DHW tank probe error	Auto	---	Fill OFF	DI 380
AL*196	Circuit no. 10 tank temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 381
AL*197	Circuit no. 10 pressure probe error	Auto	Circuit OFF	Circuit OFF	DI 382
AL*198	Circuit no. 10 outlet probe error	Auto	Circuit OFF	Circuit OFF	DI 383
AL*199	Circuit no. 10 solar collector temperature probe error	Auto	Circuit OFF	Circuit OFF	DI 384
AL*200	Circuit no. 10 alarm on pump no. 01	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 385
AL*201	Circuit no. 10 alarm on pump no. 02	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 386
AL*202	Circuit no. 10 alarm on pump no. 03	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 387
AL*203	AL_203	Auto	---	---	DI 388
AL*204	Circuit no. 10 maintenance request	Auto	Signal only	Signal only	DI 389
AL*205	Circuit no. 10 inlet temperature probe error	Auto	Signal only	Signal only	DI 390
AL*206	AL_206	Auto	---	---	DI 391
AL*207	AL_207	Auto	---	---	DI 392
AL*208	AL_208	Auto	---	---	DI 393
AL*209	AL_209	Auto	---	---	DI 394
AL*210	AL_210	Auto	---	---	DI 395
AL*211	Heat pump/chiller 1 serious alarm	Auto	Unit OFF	Unit OFF	DI 396
AL*212	Heat pump/chiller 1 warning	Auto	Signal only	Signal only	DI 397
AL*213	Heat pump/chiller 1 outlet temperature probe error	Auto	Unit 100%	Unit 100%	DI 398

Code	Description	Reset	Effect in cooling	Effect in heating	Modbus
AL*214	Heat pump/chiller 1 inlet temperature probe error	Auto	Signal only	Signal only	DI 399
AL*215	Heat pump 1 low outlet temperature error - heating mode	Auto	Signal only	Signal only	DI 400
AL*216	Heat pump/chiller 1 high outlet temperature error - cooling mode	Auto	Signal only	Signal only	DI 401
AL*217	AL_217	Auto	---	---	DI 402
AL*218	AL_218	Auto	---	---	DI 403
AL*219	AL_219	Auto	---	---	DI 404
AL*220	Heat pump/chiller 1 pump no. 1 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 405
AL*221	Heat pump/chiller 1 pump no. 2 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 406
AL*222	Heat pump/chiller 1 pump no. 3 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 407
AL*223	Heat pump/chiller 1 configuration error	Auto	---	---	DI 408
AL*224	Heat pump/chiller 1 maintenance request	Auto	Signal only	Signal only	DI 409
AL*225	Heat pump/chiller 1 pump maintenance request	Auto	Signal only	Signal only	DI 410
AL*226	AL_226	Auto	---	---	DI 411
AL*227	AL_227	Auto	---	---	DI 412
AL*228	AL_228	Auto	---	---	DI 413
AL*229	AL_229	Auto	---	---	DI 414
AL*230	AL_230	Auto	---	---	DI 415
AL*231	Heat pump/chiller 2 serious alarm	Auto	Unit OFF	Unit OFF	DI 416
AL*232	Heat pump/chiller 2 warning	Auto	Signal only	Signal only	DI 417
AL*233	Heat pump/chiller 2 outlet temperature probe error	Auto	Unit 100%	Unit 100%	DI 418
AL*234	Heat pump/chiller 2 inlet temperature probe error	Auto	Signal only	Signal only	DI 419
AL*235	Heat pump 2 low outlet temperature error - heating mode	Auto	Signal only	Signal only	DI 420
AL*236	Heat pump/chiller 2 high outlet temperature error - cooling mode	Auto	Signal only	Signal only	DI 421
AL*237	AL_237	Auto	---	---	DI 422
AL*238	AL_238	Auto	---	---	DI 423
AL*239	AL_239	Auto	---	---	DI 424
AL*240	Heat pump/chiller 2 pump no. 1 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 425
AL*241	Heat pump/chiller 2 pump no. 2 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 426
AL*242	Heat pump/chiller 2 pump no. 3 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 427
AL*243	Heat pump/chiller 2 configuration error	Auto	---	---	DI 428
AL*244	Heat pump/chiller 2 maintenance request	Auto	Signal only	Signal only	DI 429
AL*245	Heat pump/chiller 2 pump maintenance request	Auto	Signal only	Signal only	DI 430
AL*246	AL_246	Auto	---	---	DI 431
AL*247	AL_247	Auto	---	---	DI 432
AL*248	AL_248	Auto	---	---	DI 433
AL*249	AL_249	Auto	---	---	DI 434
AL*250	AL_250	Auto	---	---	DI 435
AL*251	Boiler no. 1 serious alarm	Auto	Unit OFF	Unit OFF	DI 436
AL*252	Boiler no. 1 warning	Auto	Signal only	Signal only	DI 437
AL*253	Boiler no. 1 outlet temperature error	Auto	---	Unit 100%	DI 438
AL*254	Boiler no. 1 inlet temperature error	Auto	Signal only	Signal only	DI 439
AL*255	Boiler no. 1 low outlet temperature error	Auto	Signal only	Signal only	DI 440
AL*256	AL_256	Auto	---	---	DI 441
AL*257	AL_257	Auto	---	---	DI 442
AL*258	AL_258	Auto	---	---	DI 443
AL*259	AL_259	Auto	---	---	DI 444
AL*260	Boiler no. 1 pump no. 1 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 445
AL*261	Boiler no. 1 pump no. 2 alarm	Auto	Pump off/rotation	Pump off/rotation	DI 446

Code	Description	Reset	Effect in cooling	Effect in heating	Modbus
			if another is available	if another is available	
AL*262	Boiler no.1 pump no. 3 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 447
AL*263	AL_263	Auto	---	---	DI 448
AL*264	Boiler no. 1 maintenance request	Auto	Signal only	Signal only	DI 449
AL*265	Boiler no. 1 pump maintenance request	Auto	Signal only	Signal only	DI 450
AL*266	AL_266	Auto	---	---	DI 451
AL*267	AL_267	Auto	---	---	DI 452
AL*268	AL_268	Auto	---	---	DI 453
AL*269	AL_269	Auto	---	---	DI 454
AL*270	AL_270	Auto	---	---	DI 455
AL*271	Boiler no. 2 serious alarm	Auto	Unit OFF	Unit OFF	DI 456
AL*272	Boiler no. 2 warning	Auto	Signal only	Signal only	DI 457
AL*273	Boiler no. 2 outlet temperature error	Auto	---	Unit 100%	DI 458
AL*274	Boiler no. 2 inlet temperature error	Auto	Signal only	Signal only	DI 459
AL*275	Boiler no. 2 low outlet temperature error	Auto	Signal only	Signal only	DI 460
AL*276	AL_276	Auto	---	---	DI 461
AL*277	AL_277	Auto	---	---	DI 462
AL*278	AL_278	Auto	---	---	DI 463
AL*279	AL_279	Auto	---	---	DI 464
AL*280	Boiler no. 2 pump no. 1 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 465
AL*281	Boiler no. 2 pump no. 2 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 466
AL*282	Boiler no. 2 pump no. 3 alarm	Auto	Pump off/rotation if another is available	Pump off/rotation if another is available	DI 467
AL*283	Boiler no. 2 configuration error	Auto	---	---	DI 468
AL*284	Boiler no. 2 maintenance request	Auto	Signal only	Signal only	DI 469
AL*285	Boiler no. 2 pump maintenance request	Auto	Signal only	Signal only	DI 470
AL*286	AL_286	Auto	---	---	DI 471
AL*287	AL_287	Auto	---	---	DI 472
AL*288	AL_288	Auto	---	---	DI 473
AL*289	AL_289	Auto	---	---	DI 474
AL*290	AL_290	Auto	---	---	DI 475
AL*291	Outside temperature probe error	Auto	Frost protection function active	Frost protection function active	DI 476
AL*292	Outside humidity probe error	Auto	Signal only	Signal only	DI 477
AL*293	AL_293	Auto	---	---	DI 478
AL*294	AL_294	Auto	---	---	DI 479
AL*295	Antilegionella cycle failed	Auto	Signal only	Signal only	DI 480
AL*296	AL_296	Auto	---	---	DI 481
AL*297	AL_297	Auto	---	---	DI 482
AL*298	AL_298	Auto	---	---	DI 483
AL*299	AL_299	Auto	---	---	DI 484
AL*300	AL_300	Auto	---	---	DI 485
AL*301	Serial probe no. 1 offline	Auto	Signal only	Signal only	DI 486
AL*302	Serial probe no. 2 offline	Auto	Signal only	Signal only	DI 487
AL*303	Serial probe no. 3 offline	Auto	Signal only	Signal only	DI 488
AL*304	Serial probe no. 4 offline	Auto	Signal only	Signal only	DI 489
AL*305	Serial probe no. 5 offline	Auto	Signal only	Signal only	DI 490
AL*306	Serial probe no. 6 offline	Auto	Signal only	Signal only	DI 491
AL*307	Serial probe no. 7 offline	Auto	Signal only	Signal only	DI 492
AL*308	Serial probe no. 8 offline	Auto	Signal only	Signal only	DI 493
AL*309	Serial probe no. 9 offline	Auto	Signal only	Signal only	DI 494
AL*310	Serial probe no. 10 offline	Auto	Signal only	Signal only	DI 495
AL*311	Serial probe no. 11 offline	Auto	Signal only	Signal only	DI 496
AL*312	AL_312	Auto	---	---	DI 497

Code	Description	Reset	Effect in cooling	Effect in heating	Modbus
AL*313	AL_313	Auto	---	---	DI 498
AL*314	AL_314	Auto	---	---	DI 499
AL*315	PGDx offline	Auto	Signal only	Signal only	DI 500
AL*316	AL_316	Auto	---	---	DI 501
AL*317	AL_317	Auto	---	---	DI 502
AL*318	AL_318	Auto	---	---	DI 503
AL*319	AL_319	Auto	---	---	DI 504
AL*320	AL_320	Auto	---	---	DI 505
AL*321	Energy meter no. 1 offline	Auto	Signal only	Signal only	DI 506
AL*322	Energy meter no. 2 offline	Auto	Signal only	Signal only	DI 507
AL*323	Energy meter no. 3 offline	Auto	Signal only	Signal only	DI 508
AL*324	kair1 offline	Auto	Circuit OFF	Circuit OFF	DI 509
AL*325	kair2 offline	Auto	Circuit OFF	Circuit OFF	DI 510
AL*326	kair3 offline	Auto	Circuit OFF	Circuit OFF	DI 511
AL*327	kair4 offline	Auto	Circuit OFF	Circuit OFF	DI 512
AL*328	kair5 offline	Auto	Circuit OFF	Circuit OFF	DI 513
AL*329	kair6 offline	Auto	Circuit OFF	Circuit OFF	DI 514
AL*330	kair7 offline	Auto	Circuit OFF	Circuit OFF	DI 515
AL*331	kair8 offline	Auto	Circuit OFF	Circuit OFF	DI 516
AL*332	kair9 offline	Auto	Circuit OFF	Circuit OFF	DI 517
AL*333	kair10 offline	Auto	Circuit OFF	Circuit OFF	DI 518

Tab.8.a

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CAREL

CAREL INDUSTRIES S.p.A. - Headquarters

Via dell'Industria, 11

35020 Brugine - Padova (Italy)

Tel. (+39) 049.9716611

Fax (+39) 049.9716600

email: carel@carel.com - www.carel.com

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