ROBUR
caring for the environment

Installation and use manual

Cascade controller

for the centralized control of Caldaria systems and their distribution circuits

DISPOSAL
The appliance and all its accessories must be disposed of separately in accordance with the regulations in force.

Use of the WEEE symbol (Waste Electrical and Electronic Equipment) indicates that this product cannot be disposed of as household waste. Proper disposal of this product helps to prevent potential negative consequences for the environment and human health.

Revision: C
Code: D-LBR874EN

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I INTRODUCTION

Installation and use manual

This Installation and use manual contains all the information needed to install and configure the Cascade controller ODSP039, which can only be used in conjunction with one or more Caldaria systems, each of which must be equipped with its own OT/Modbus interface (optional ODSP040), with the exception of Caldaria 100.2 units that are already equipped with it.
The controller is a programmable digital controller, suitable for DIN rail mounting and capable of performing sophisticated temperature control functions. The large display allows easy entry of system parameters.

I.1 RECIPIENTS

This Manual is intended for:
- ► Electrical installers for proper installation of the control equipment.
- ► Installers and authorised Robur Technical Assistance Centres (TAC) for configuration.

I.2 AVAILABLE LANGUAGES

For versions of this Installation and use manual in other languages, see Robur website.

II SYMBOLS AND DEFINITIONS

II.1 KEY TO SYMBOLS

DANGER

WARNING

NOTE

PROCEDURE

REFERENCE (to other document)

II.2 TERMS AND DEFINITIONS

Boiler = condensing boiler series Caldaria.
controller = control unit for cascade and any secondary circuits management for condensing boilers series Caldaria, available as optional ODSP039.
OT/Modbus interface = OT/Modbus interface board for connection between boiler board and controller, available as optional ODSP040.
TAC = Technical Assistance Centre authorised by Robur.

III WARNINGS

III.1 GENERAL AND SAFETY WARNINGS

Installer's qualifications

Installation must exclusively be performed by a qualified firm and by skilled personnel, with specific knowledge of electrical systems, in compliance with the laws in force in the Country of installation.

Declaration of conformity

Upon completing installation, the installing firm shall issue to the owner/client the appliance's workmanlike conformity declaration, according to national/local regulations in force and the manufacturer's instructions/provisions.

Misuse

The appliance must only be used for the purposes for which it has been designed. Any other use is deemed hazardous. Incorrect use may affect operation, duration and safety of the appliance. Adhere to the manufacturer's instructions.

Electrocution hazard

- ■ Disconnect the electrical power supply before any operation on appliance components.
- ■ For electrical connections exclusively use compliant components and according to the specifications provided by the manufacturer.
- ■ Ensure the appliance cannot be accidentally switched back on.

Earthing

Electrical safety depends on effective earthing system, correctly connected to the appliance and installed according to the regulations in force.

In the event of failure

Operations on internal components and repairs may exclusively be carried out by a TAC, using only

original parts.
- In the event of fault of the appliance, do not attempt to repair and/or restore and immediately contact the TAC.

Keep the Manual

This Installation and use manual must always accompany the appliance and must be handed to the new owner or installer in the event of sale or removal.

The equipment must be installed indoors and out of the weather. For its positioning, refer to the protection rating given in Paragraph 2 *p. 6*.

III.2 CONFORMITY

The appliance is CE certified and conforms with all essential requirements of the following Directives:
- 2014/30/EC "Electromagnetic Compatibility Directive" as amended and added.

Furthermore, they comply with the requirements of the following standards:
- EN 55022 "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement"
- EN 55024 "Information technology equipment - Immunity characteristics - Limits and methods of measurement"
- EN 61000-6-1 "Immunity for residential, commercial and light-industrial environments".
- EN 61000-6-2 "Immunity for industrial environments".
- EN 61000-6-3 "Emission standard for residential, commercial and light-industrial environments".
- EN 61000-6-4 "Emission standard for industrial environments".

III.3 EXCLUSIONS OF LIABILITY AND WARRANTY

Any contractual or extra-contractual liability of the manufacturer for any damage caused by incorrect installation and/or improper use and/or failure to comply with regulations and with the manufacturer's directions/instructions shall be disclaimed.

In particular, the warranty on the appliance may be rendered void by the following conditions:

- Incorrect installation/cabling.
- Misuse.
- Failure to comply with the manufacturer's indications on installation, use and maintenance.
- Alteration or modification of the product or any part thereof.
- Extreme operational conditions or however outside of the operational ranges set forth by the manufacturer.
- Abnormal actions transmitted to the appliance by the plant or installation (mechanical stresses, pressure, vibrations, thermal expansion, electrical surges...).
- Accidental damages or due to force majeure.

1 GENERAL INFORMATION

The controller is a programmable digital controller with a display that allows the centralised management of Caldaria boilers, up to a maximum of 8 boilers connected to the same controller. The controller also allows the control of up to two mixed circuits and DHW production, including the corresponding temperature probes.
Each of the boilers connected to the controller must be equipped with its own OT/Modbus interface, available as ODSP040 optional, with the exception of the Caldaria 100.2 appliances, which are already equipped with it.
The controller also allows any errors on the boilers to be reported and reset.
The main functions are:

- ► Programmed on/off switching of the generation system for space heating and DHW production.
- ► Cascade management up to a maximum of 8 boilers connected to the same controller, with different priority logics.
- ► Outdoor temperature measurement by NTC probe.
- ► Manifold temperature measurement by NTC probe.
- ► Management of up to two mixed circuits.
- ► Management of a modulating pump downstream of any heat exchanger or hydraulic separator.
- ► Buffer tank DHW production management with diverter valve or through delivery from the heating manifold, also split between two DHW buffer tanks, with relevant temperature probes and recirculation management.
- ► Diagnostics with reporting of boiler errors and resetting directly from the controller.

2 TECHNICAL DATA

Table 2.1 *Technical data*

Power supply	Supply voltage	24 V AC (±10%)
	Frequency	50 / 60 Hz
	Absorption	max 450 mA
	Power supply protection	4 A delayed fuse
Function	Software class	A
Inputs	6 configurable universal inputs	NTC 10 kΩ 0-10 V DC PT1000 KTY 81 Digital input
	Digital inputs • Open contact voltage • Closed contact current	Safety Extra Low Voltage (SELV) for voltage-free contacts 3,3 V < 1 mA
Outputs	8 relay outputs	8 relays 5 A 220 V AC, potential-free contacts with common pole
	Relay outputs • Relay rated current • Voltage range	Mechanical relay without switching ON current 5 A 0 ÷ 277 V AC
	2 analog outputs	2 analog outputs for modulating commands 0-10 V DC
	Analog outputs • Voltage • Current • Ripple • Zero level accuracy • Error over rest of range	 max 10 V DC max 20 mA 80 mV @ 1 MHz 250 mV ≤ 3%
Outdoor probes measuring range	NTC 10 kΩ PT1000 and NI1000 KTY 81	-20 ÷ 90 °C (depending on the value of β) -60 ÷ 250 °C -50 ÷ 150 °C
Communication bus	Modbus RTU	2 RS485 Modbus connections (master/slave)
	Total cable length	max 1200 m
	Cable type to use	EIA RS485 (type Belden 9841)
Connections	Screw terminals	6 removable screw terminals
Cabling	Maximum lower terminals cable cross-section	16 AWG - 1,5 mm^2
	Maximum upper terminals cable cross-section	12 AWG - 3 mm^2
	Maximum input/ouput cables length	30 m
Climatic conditions	Storage Operation	-20 ÷ 50 °C 0 ÷ 50 °C, humidity 10 ÷ 95 % (non condensing)
Protection rating	Enclosure protection rating	IP 20
	Degree of contamination per EN60730	2
Mounting	DIN rail	4 DIN modules

Dimensions	With packing	130 x 75 x 130 mm
Weight	With packing	300 g

3 MOUNTING AND INSTALLATION

The controller is designed for DIN rail mounting and occupies the space equivalent to 4 DIN modules.

Before installing the unit, check that the equipment is not connected to its power supply.

The controller and any other equipment and accessories must be powered up only when the installation is complete. Failure to observe this instruction incurs a risk of electrocution and short-circuit.

The controller must not be exposed to water.

The unit's ambient operating temperature range is 0 °C - 50 °C.

3.1 MOUNTING AND CONNECTING THE OT/MODBUS INTERFACE

Mounting and connecting the OT/Modbus interface

1. Secure the OT/Modbus interface inside the control panel of the boiler, using the screw provided (Figure 3.1 *p. 7*).
2. Connect the OT/Modbus interface to the boiler board using the connection cable provided (Figure 3.2 *p. 7*).
3. Check that jumper B is open and jumper A is closed (Figure 3.3 *p. 8*).
4. Only for Caldaria 35 and Caldaria 55.1: check, through the interface of the boiler control panel, that the boiler parameter P28 is set to 0 (see the boiler Manual for setting the board parameters).
5. Only for the slave module of Caldaria 100.2: open jumper A (Figure 3.4 *p. 8*).

Figure 3.1 *OT/Modbus interface mounting*

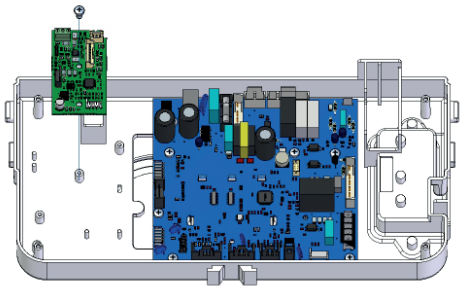
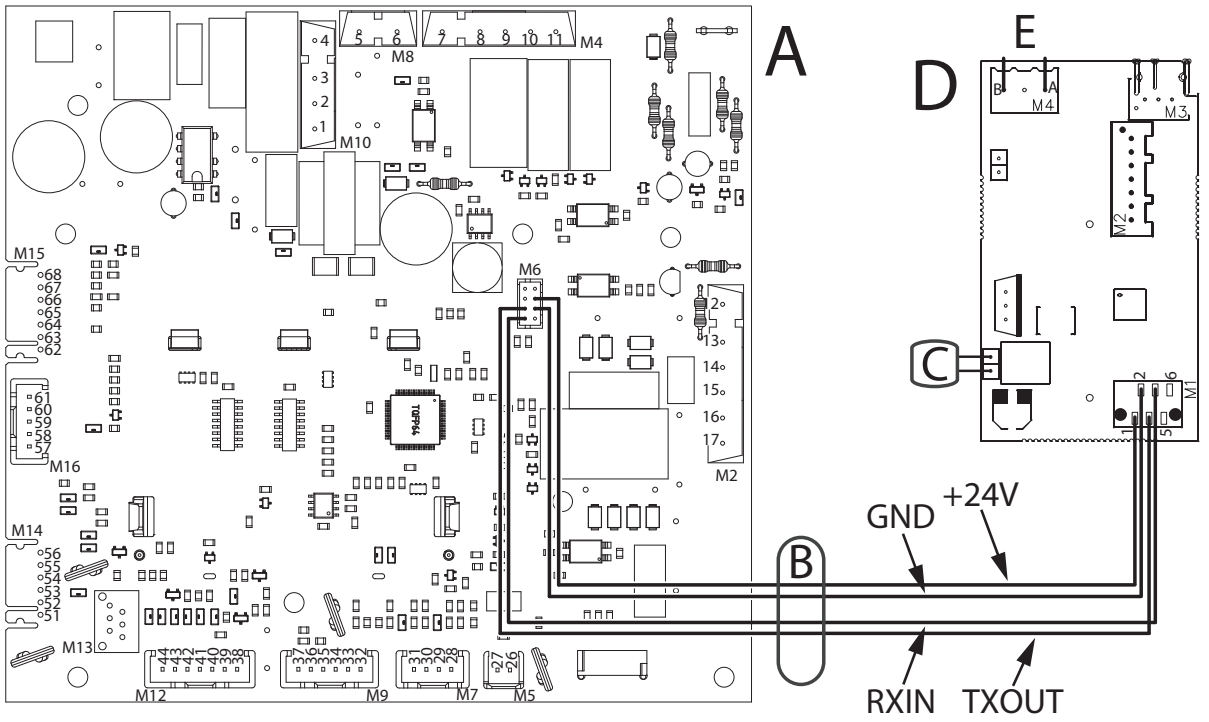
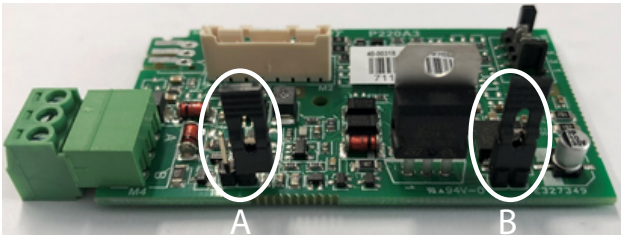


Figure 3.2 *Connection of OT/Modbus interface to boiler board*



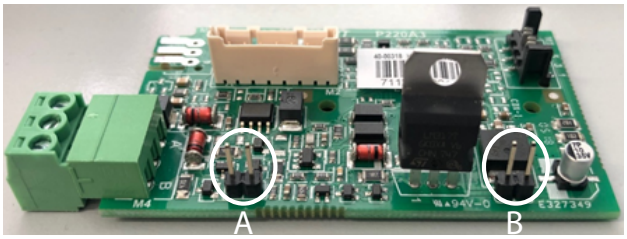
A Boiler board
B Connection cable (supplied)
C Jumper
D OT/Modbus interface ODSP040
E Modbus connection

Figure 3.3 *ODSP040 board jumper position for Caldaria 35 and 55.1*



A Jumper open B Jumper closed

Figure 3.4 *ODSP040 board jumper position for Caldaria 100.2 slave module*

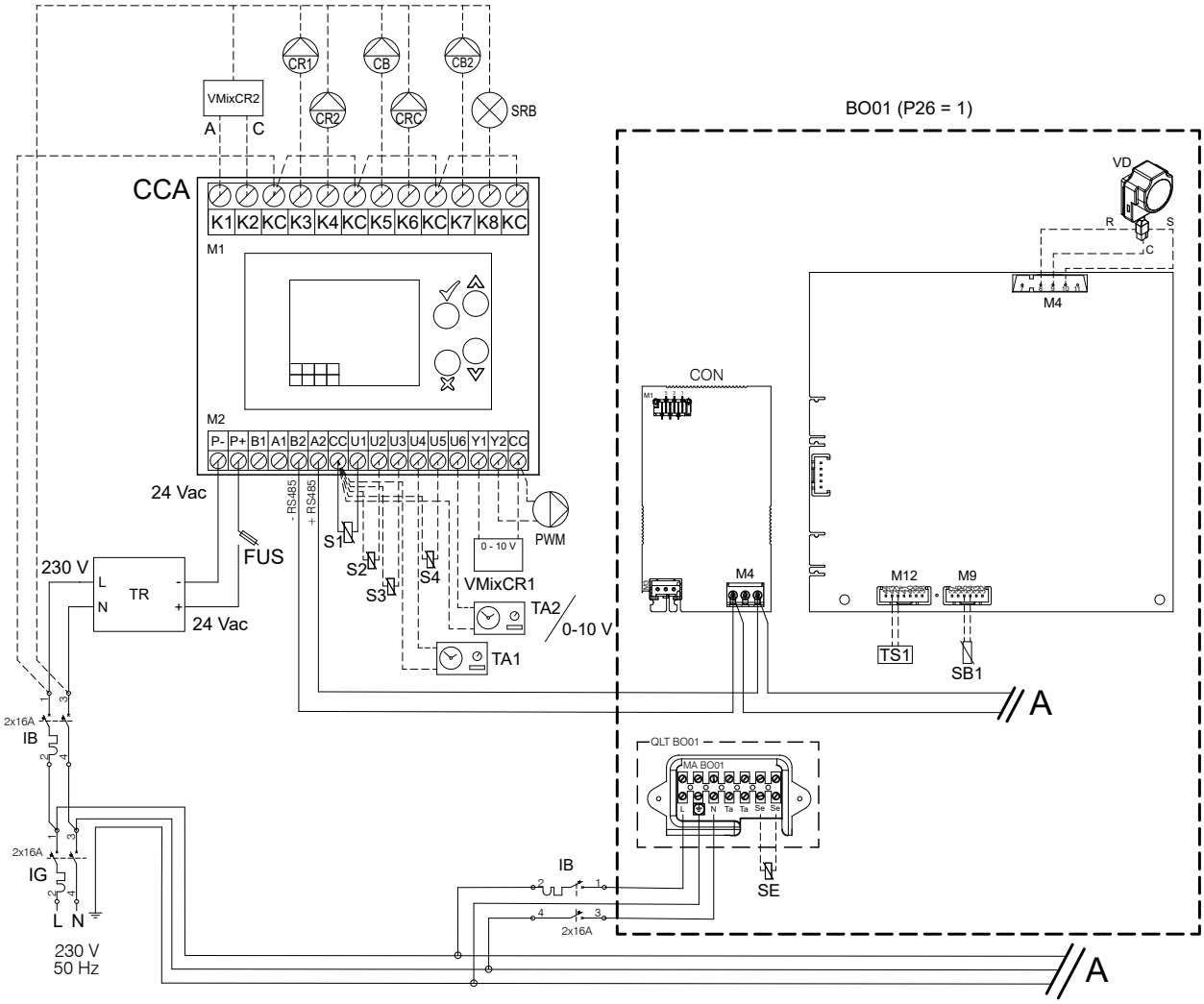


A Jumper open B Jumper open

For further details refer to the OT/Modbus interface instruction sheet.

3.2 ELECTRICAL HOOKUP

Figure 3.5 *Electrical connections to the first boiler*



A Connection to the following boiler of the cascade

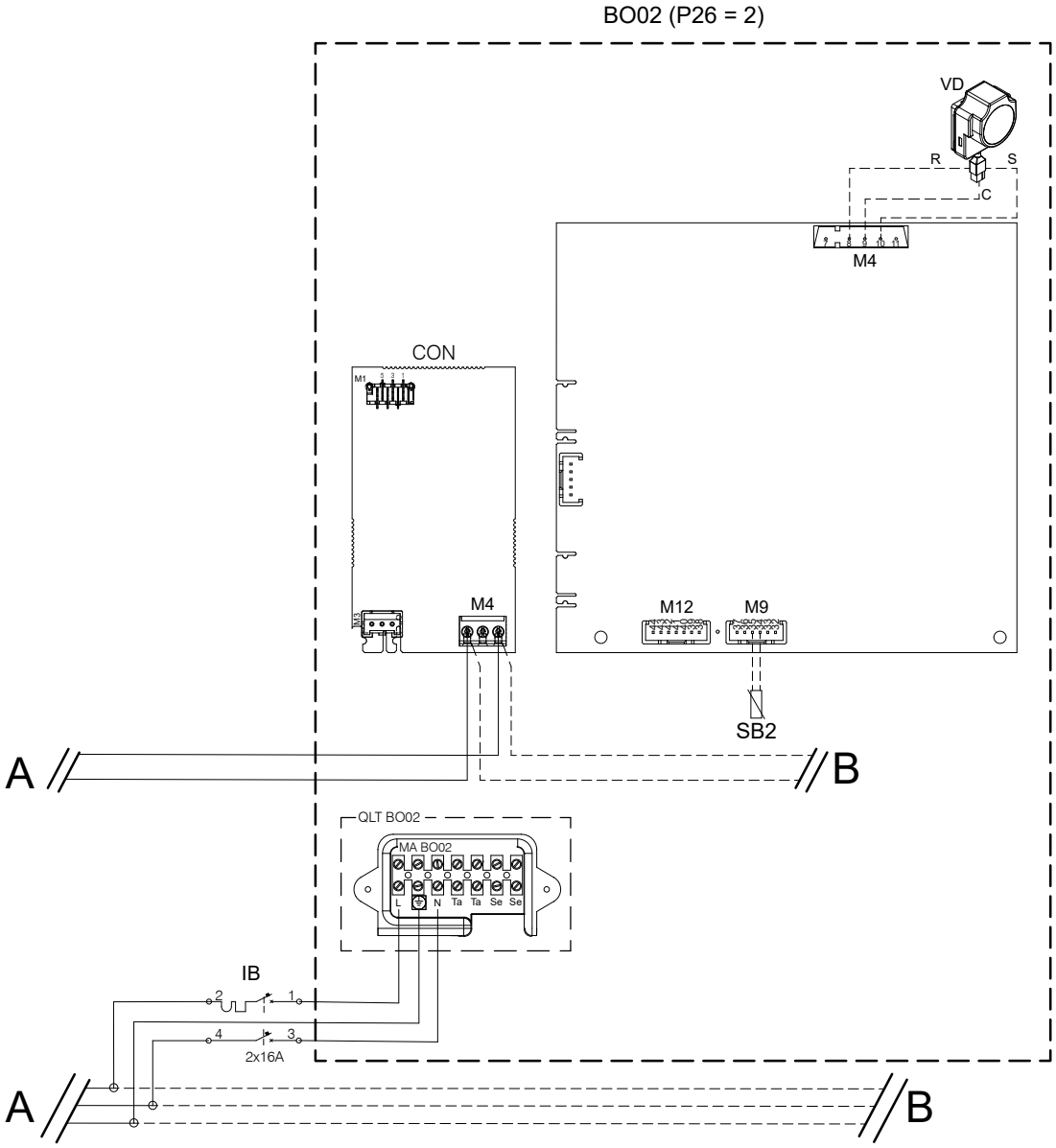
Required components

BO01 First boiler of the cascade (P26 = 1)
CCA controller (optional ODSP039)
CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)
FUS Delayed 4 A fuse
IB Two-pole magnetothermal breaker
IG General two-pole magnetothermal breaker
MA BO01 Terminal block of the first boiler of the cascade
QLT BO01 Electrical panel of the first boiler of the cascade
S1 Manifold/separator/inertial buffer probe (optional OSND010)

Optionals

0-10 V External temperature or power request signal
CB Charging circuit pump from the manifold for DHW buffer tank 1
CB2 Charging circuit pump from the manifold for DHW buffer tank 2
CR1 Heating circuit 1 pump
CR2 Heating circuit 2 pump
CRC DHW recirculation pump
PWM Modulating pump post heat exchanger/hydraulic separator
S2 HC2 flow probe (optional OSND010)
S3 HC1 flow probe (optional OSND010)
S4 Post heat exchanger/hydraulic separator probe (optional OSND010)
SB1 DHW buffer tank 1 probe (optional OSND011)
SE Outdoor probe (optional OSND009)
SRB Remote lockout lamp
TA1 External heating request for heating circuit 1
TA2 External heating request for heating circuit 2
TS1 DHW buffer tak 1 thermostat (alternative to SB1 probe)
VD Buffer tank 1 diverter valve for DHW charging
VMixCR1 0-10 V mixing valve for heating circuit 1
VMixCR2 Mixing valve for heating circuit 2

Figure 3.6 *Electrical connections to following boilers*



A Connection to the previous boiler of the cascade

B Connection to the following boiler of the cascade

Required components

CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)

IB Two-pole magnetothermal breaker

Optionals

BO02 Second boiler of the cascade (P26 = 2)

MA BO02 Terminal block of the second boiler of the cascade

QLT BO02 Electrical panel of the second boiler of the cascade

SB2 DHW buffer tank 2 probe (optional OSND011)

TS2 DHW buffer tak 2 thermostat (alternative to SB2 probe)

VD Buffer tank diverter valve for DHW charging

Remove the bridge on the TA-TA contacts of all boilers.

Remove any digital control connected to each of the boilers.

In the presence of several boilers provided for DHW service with 3-way diverter valve, it is mandatory to have one valve for each boiler and the individual valves must each be connected to its own boiler.

3.2.1 Electrical power supply

The controller requires a 24 V AC SELV power supply, with maximum absorption of 450 mA.
A suitable power supply unit must be provided for this purpose.
The controller is equipped with a buffer battery that guarantees the watch an autonomy of 1,5 hours in the absence of power.

3.2.2 Modbus connection

The Modbus signal connections must be made between terminals B2-A2 of the controller and A-B of the OT/Modbus interface (Figure 3.5 *p. 9*).
The connection must be made with RS485 shielded cable (Belden 9841 22 AWG cable recommended).
The maximum permissible total length of the connecting cable is 1200 m.

Mains power cables and Modbus signal cables must use separate ducts, separated by at least 50 mm.

3.2.3 Temperature probes connection

Mains power cables and temperature probes cables must use separate ducts, separated by at least 50 mm.

The connection of the S1 manifold probe is always mandatory, while the other probes are optional (depending on the presence or absence of the circuits/services for which they are used).

The SE outdoor temperature probe, if present, must be connected to the boiler with Modbus address 1 (and not to the controller).

The SB1 DHW buffer tank probe, if present, must be connected to the boiler with Modbus address 1 (and not to the controller).

The SB2 DHW buffer tank probe, if present, must be connected to the boiler with Modbus address 1 (and not to the controller).

3.2.4 Remote lockout lamp connection

Relay K8 is activated in the presence of an alarm at any of the boilers connected to the controller.
This allows, by connecting to relay K8 (230 Vac, maximum current 5 A) a lockout light or an audible alarm, to have visibility of the alarm status of the connected boilers.

The relay does not signal any fault in the temperature probes, which must be checked in the ViewTemp menu (Paragraph 6.3.5 *p. 17*).

The alarm status of each individual boiler is shown in the Boiler menu, under WarningBoil1 (WarningBoil2 for the Caldaria 100.2 slave module), while reset is possible from the ResetWarning item in the same menu. For further details see Paragraph 6.3.7 *p. 19*.

3.2.5 PWM modulating pump

The PWM modulating pump should be power supplied externally to the controller, keeping the power supply cables separate from the signal cables.
The 0-10 V signal from the controller only provides the PWM drive and not the pump power supply.

4 PRELIMINARY OPERATIONS FOR PROGRAMMING

After making all electrical connections correctly (Paragraph 3.2 *p. 9*), before setting the controller it is necessary to set the correct Modbus address for each boiler on the system, using parameter P26.
Modbus addresses can be set from 01 to 08. Under no circumstances should 00 be used.

If one or more boilers are also used for DHW production by means of a diverter valve, these boilers must be assigned the first Modbus addresses (1 to follow).

For each Caldaria 35 and Caldaria 55.1 the parameter P28 must also be set to the value 00. This indicates the presence of the OT/Modbus interface.

By setting the parameter OperatMode (Paragraph 6.2.2 *p. 14*) to the value 1 (DHW only) or 2 (Heating + DHW), it is necessary to set the parameter P01 of each boiler connected to the controller to the value 0 (fast), as indicated in Table 4.1 *p. 11*.

Table 4.1 *P01 settings*

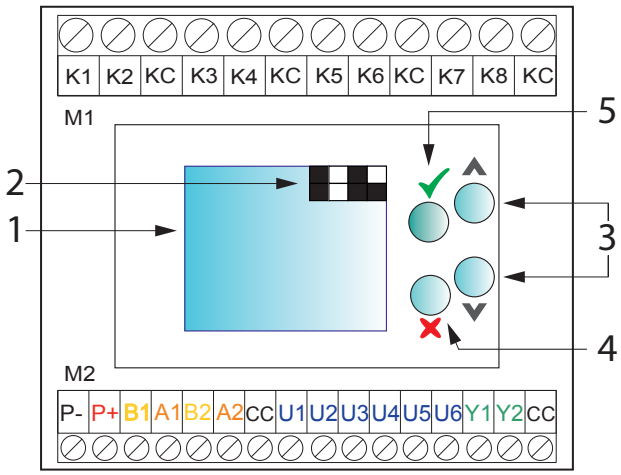
OperatMode	Description	Parameter P01
0	OFF	do not change
1	DHW only	0
2	Heating + DHW	0
3	Heating only	do not change

Once you have performed this configuration on the boilers, you can power the controller.
Within a few minutes the controller will detect the OT/Modbus interface of each of the connected boilers.
In the presence of error E52 (Communication error between the boiler and the OT/Modbus interface), wait for the end of the detection process, or check that the electrical connections have been made correctly and that the Modbus addresses (set in parameter P26 of each boiler) have been assigned correctly. See also Paragraph

8 *p. 42.*

5 CONTROL PANEL

Figure 5.1 *Controller control panel*



M1/M2 Electrical connection terminal blocks

M1 terminal block:

K1 VMixCR2 valve opening
K2 VMixCR2 valve closing
KC Common
K3 HC1 pump
K4 HC2 pump
K5 CB pump
K6 CRC pump
K7 CB2 pump
K8 SRB remote lockout lamp

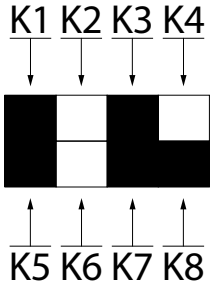
M2 terminal block:

P- 24 V AC power supply negative pole input
P+ 24 V AC power supply positive pole input
B2 Modbus connection to OT/Modbus interface
A2 Modbus connection to OT/Modbus interface
CC Common
U1 S1 manifold probe input
U2 S2 flow probe HC2 input
U3 S3 flow probe HC1 input
U4 TA1 external request input
U5 Exchanger/separator probe S4 input
U6 TA2 external request input or external 0-10 V control signal input
Y1 0-10 V output for opening/closing mixing valve VMixCR1
Y2 0-10 V output for PWM modulating pump
YC Common

Interface:

1 Display
2 Current date and time alternating relay outputs status
3 ▲▼ arrows to scroll through menus and submenus and set the value of parameters
4 ✗ key to exit menus, submenus and parameters, and cancel any changes to parameter values
5 ✓ key to enter menus, submenus and parameters, and confirm any changes to parameter values

Figure 5.2 *Relay status bar*



K1 VMixCR2 valve opening
K2 VMixCR2 valve closing
K3 HC1 pump
K4 HC2 pump
K5 CB pump
K6 CRC pump
K7 CB2 pump
K8 SRB remote lockout lamp

Open relay

Closed relay

6 MENUS AND PARAMETERS

For a complete list of menu items, parameters and their defaults see Paragraph 9 *p. 43*.

6.1 ACCESS TO MENUS AND PARAMETERS

To set or control the values of the controller parameters:

1. Use the ▲▼ arrows to select which menu to access.
2. Press the ✓ key to access the selected menu.
3. If needed, enter the password, corresponding to the following key sequence: ✓ ✓ ▼ ▼ ▲ ▲.
4. If needed, select which submenu to access using the ▲▼ arrows.
5. If needed, press the ✓ key to access the selected submenu.
6. Use the ▲▼ arrows to select the parameter to change.
7. Press the ✓ key to access the parameter to modify.
8. Use the ▲▼ arrows to change the value of the selected parameter.
9. Press the ✓ key to confirm the value change, or the ✗ key to exit without saving the modified value.
10. Press the ✗ key to exit the submenu or menu.

Access to menus "Setup, "OperatMode", "ViewTemp", "HC1ThermSts" and "HC2ThermSts" is free.
For all other menus a password is required, which corresponds to the key sequence: ✓ ✓ ▼ ▼ ▲ ▲.

Once you have entered your password, it will not be requested for the next 30 minutes.

For the list of menus and submenus, refer to Table 9.1 *p. 43*.

6.2 BASIC PARAMETER PROGRAMMING

This paragraph is dedicated to the user.

For accessing the menus and setting the value of the parameters see Paragraph 6.1 *p. 13*.

6.2.1 Setup menu

In this menu you set the time programs and general settings of the controller.

6.2.1.1 ProgHC1

In this menu you set the time programming of the heating circuit 1.
The default settings are shown in Table 6.1 *p. 13* below:

Table 6.1 *ProgHC1 default*

Time slot	Time slot start	Temperature level	Default
F1	06:00	Lev 1	
F2	08:30	Lev 1	Lev 0 OFF
F3	12:00	Lev 1	Lev 1 20 °C
F4	14:00	Lev 1	Lev 2 20,5 °C
F5	17:00	Lev 1	Lev 3 21 °C
F6	22:00	Lev 0	

Lev 0 corresponds to system shutdown. All other levels to its activation.
The temperature levels refer to the ambient temperature. However, as there is no thermostat in the heated room, setting these values only has an effect on the flow temperature of the system, and only if this is determined by a climatic curve.
The programming is weekly, on a maximum of six daily slots, each of which is associated with a temperature level.

Change the time programs and associated temperature levels

1. Use the ▲▼ arrows to select the item "Edit" and press the ✓ key.
2. Use the ▲▼ arrows to select the time slot you wish to change. Always use the arrows to move to the next or previous days.
3. Once you have found the time slot you wish to change, press the ✓ key to change it.
4. Use the ▲▼ arrows to set the new start time value, first the hours and then the minutes, confirming each change with ✓.
5. Use the ▲▼ arrows to change the room temperature level associated with the time slot and press the ✓ key to save the change, thus returning to the change of the start time of the time slot.
6. Press ✗ to exit the current time slot change.
7. Use the ▲▼ arrows to select the next time slot you wish to edit, or press ✗ to return to the ProgHC1 menu.

Time slots with coincident start and end times are deactivated.

Copy the daily time program to another day

1. The display must show the day you want to copy.
2. Use the ▲▼ arrows to select the item "Copy" and press the ✓ key.
3. Each subsequent press of the ✓ button copies the time program of the source day to the day shown on the display. It is not possible to copy selectively on only a few days.
4. When you have finished copying, press ✗ to exit.

Change temperature levels

1. Use the ▲▼ arrows to select the item "Leve" and

press the ✓ key.
2. Use the ∧∨ arrows to select the value for Level 1 winter, in steps of 0,5 °C. Press the ✓ key to save the change and go to the next level.
3. If necessary, repeat the operation to set the value of Level 2 and Level 3 winter levels. Do not change the Level1, Level2, Level3 summer values as they are not used.
4. When you have finished setting the levels, press ✗ to exit.

The Lev 0 is not editable and corresponds to the off state. In this case the system uses as setpoint the TLimNight (Paragraph 6.3.6 *p. 17*) or the AFTemp (Paragraph 6.3.8 *p. 20*).

6.2.1.2 ProgHC2

In this menu you set the time programming of the heating circuit 2.
The default settings are shown in Table 6.2 *p. 14* below:

Table 6.2 *ProgHC2 default*

Time slot	Time slot start	Temperature level	Default
F1	06:00	Lev 1	
F2	08:30	Lev 1	Lev 0 OFF
F3	12:00	Lev 1	Lev 1 20 °C
F4	14:00	Lev 1	Lev 2 20,5 °C
F5	17:00	Lev 1	Lev 3 21 °C
F6	22:00	Lev 0	

For programming modification operations, refer to the procedures reported in Paragraph 6.2.1.1 *p. 13*.

6.2.1.3 ProgDHW1

This menu sets the time schedule for DHW service for DHW buffer tank 1.
The default settings are shown in Table 6.3 *p. 14* below:

Table 6.3 *ProgDHW1 default*

Time slot	Time slot start	Temperature level	Default
F1	06:00	Lev 1	
F2	08:30	Lev 1	Lev 0 OFF
F3	12:00	Lev 1	Lev 1 60 °C
F4	14:00	Lev 1	Lev 2 60 °C
F5	17:00	Lev 1	Lev 3 65 °C
F6	22:00	Lev 1	

The temperature levels set in this case, thanks to the presence of a dedicated temperature probe in the DHW buffer tank 1 (SB1), correspond to the required setpoints (NomDHWTemp1) in the DHW buffer tank 1.

Anti-legionella thermal disinfection is activated by default on Saturdays at 23:00 until 06:00 on Sundays, with setpoint Lev 3 (65 °C by default).

For programming modification operations, refer to the procedures reported in Paragraph 6.2.1.1 *p. 13*.

6.2.1.4 ProgDHW2

This menu sets the time schedule for DHW service for DHW buffer tank 2.
The default settings are shown in Table 6.4 *p. 14* below:

Table 6.4 *ProgDHW2 default*

Time slot	Time slot start	Temperature level	Default
F1	06:00	Lev 0	
F2	08:30	Lev 0	Lev 0 OFF
F3	12:00	Lev 0	Lev 1 60 °C
F4	14:00	Lev 0	Lev 2 60 °C
F5	17:00	Lev 0	Lev 3 65 °C
F6	22:00	Lev 0	

The temperature levels set in this case, thanks to the presence of a dedicated temperature probe in the DHW buffer tank 2 (SB2), correspond to the required setpoints (NomDHWTemp2) in the DHW buffer tank 2.
For programming modification operations, refer to the procedures reported in Paragraph 6.2.1.1 *p. 13*.

6.2.1.5 Date

In this menu you set the current date.

Set the current date

1. Press the ✓ key to access the day's change.
2. Use the ∧∨ arrows to set the desired value and press the ✓ key to save the change and go to the month setting.
3. Use the ∧∨ arrows to set the desired value and press the ✓ key to save the change and go to the year setting.
4. Use the ∧∨ arrows to set the desired value and press the ✓ key to save the change.
5. Press ✗ to exit the edit mode.
6. Press ✗ to return to the Setup menu.

6.2.1.6 Time

In this menu you set the current time in 24-hour format.

Set the current time

1. Press the ✓ key to access the time's change.
2. Use the ∧∨ arrows to set the desired value and press the ✓ key to save the change and go to the minutes setting.
3. Use the ∧∨ arrows to set the desired value and press the ✓ key to save the change.
4. Press ✗ to exit the edit mode.
5. Press ✗ to return to the Setup menu.

6.2.2 OperatMode menu

In this menu you can select the operating mode of the system.

Table 6.5 *OperatMode menu*

Menu	Description	Setting	Default
OperatMode	System operating mode	0. OFF 1. DHW only 2. Heating + DHW 3. Heating only 4. Not used 5. Not used	0

In "OFF" mode, the antifreeze function of the system remains active (setpoint AFTemp, Paragraph 6.3.8 *p. 20*).

In "DHW only" mode, the antifreeze function of the system is not active, but the antifreeze protection set on the individual boilers remains active.
In the "Heating + DHW" mode, DHW production has priority over heating.
In the "Heating only" mode, DHW requests are disabled, including antifreeze protection in the DHW buffer tanks.

By setting the parameter OperatMode (Paragraph 6.2.2 *p. 14*) to the value 1 (DHW only) or 2 (Heating + DHW), it is necessary to set the parameter P01 of each boiler connected to the controller to the value 0 (fast), as indicated in Table 4.1 *p. 11*.

To apply the change of operating mode, power cycle the controller.

6.2.3 Manifold menu

In this menu you set the manifold temperatures.

Table 6.6 *Manifold menu*

Submenu	Description	Setting	Default
MaxManiTemp	Maximum manifold temperature (S1 probe)	30 ÷ 90 °C	75
MinManiTemp	Minimum manifold temperature (S1 probe)	10 ÷ 70 °C	40

6.2.3.1 MaxManiTemp

The parameter sets the maximum allowed manifold temperature, measured by probe S1.
If this temperature value is exceeded for more than 2 °C for more than 60 seconds the system is stopped, the pumps switched off and the mixing valves closed.

6.2.3.2 MinManiTemp

The parameter sets the minimum allowed manifold temperature, measured by probe S1.

6.2.4 HC2 menu

In this menu you set the parameters for heating circuit 2 (S2 probe).

6.2.4.1 ClimCurve2

Table 6.7 *ClimCurve2 menu*

Submenu	Description	Setting	Default
SpMaxHC2	Heating circuit 2 maximum temperature	30 ÷ 90 °C	45
SpMinHC2	Heating circuit 2 minimum temperature	20 ÷ 60 °C	25

The SpMaxHC2 parameter sets the maximum allowed temperature for heating circuit 2, measured by the S2 probe.
The SpMinHC2 parameter sets the minimum allowed temperature for heating circuit 2, measured by the S2 probe.

6.3 COMPLETE PARAMETER PROGRAMMING

This paragraph is dedicated to the installer.

To set the parameters' value follow the procedure in Paragraph 6.1 *p. 13*.

6.3.1 Setup menu

In this menu you set the time programs and general settings of the controller.

Table 6.8 *Setup menu*

Submenu	Description	Setting	Default
ProgHC1	Heating circuit 1 programming	6.2.1.1 *p. 13*	6.2.1.1 *p. 13*
ProgHC2	Heating circuit 2 programming	6.2.1.2 *p. 14*	6.2.1.2 *p. 14*
ProgDHW1	DHW programming for DHW buffer tank 1	6.2.1.3 *p. 14*	6.2.1.3 *p. 14*
ProgDHW2	DHW programming for DHW buffer tank 2	6.2.1.4 *p. 14*	6.2.1.4 *p. 14*
ProgRecirc	DHW recirculation programming	6.3.1.5 *p. 15*	6.3.1.5 *p. 15*
Date	Date setting	dd.mm.yy	-
Time	Time setting	mm:hh	-
UseLightSaving	Selection of automatic or manual summer time switch	0. manual 1. automatic	0
Language	Language selection	Italian English Polskie	Italian
Board Test	controller input/output test	6.3.1.10 *p. 16*	-
Info	FW version	-	-

6.3.1.1 ProgHC1

See Paragraph 6.2.1.1 *p. 13*.

6.3.1.2 ProgHC2

See Paragraph 6.2.1.2 *p. 14*.

6.3.1.3 ProgDHW1

See Paragraph 6.2.1.3 *p. 14*.

6.3.1.4 ProgDHW2

See Paragraph 6.2.1.4 *p. 14*.

6.3.1.5 ProgRecirc

In this menu you set the time programming of the DHW recirculation circuit.
The default settings are shown in Table 6.1 *p. 13* below:

Table 6.9 *ProgRecirc default*

Time slot	Time slot start	Temperature level	Default
F1	07:00	Lev 0	
F2	08:30	Lev 0	Lev 0 OFF
F3	12:00	Lev 0	Lev 40 °C
F4	13:00	Lev 0	Lev 2 20 °C
F5	16:00	Lev 0	Lev 3 30 °C
F6	22:00	Lev 0	

Lev 0 corresponds to system shutdown. Lev 1 corresponds to its activation. The other levels should not be used.
Levels are defined as temperatures, but any setting has the same effect, i.e. activating the recirculation circuit, once Lev 1 is set.
For programming modification operations, refer to the procedures reported in Paragraph 6.2.1.1 *p. 13*.

6.3.1.6 Date

See Paragraph 6.2.1.5 *p. 14*.

6.3.1.7 Time

See Paragraph 6.2.1.6 *p. 14*.

6.3.1.8 UseLightSaving

In this menu, you set whether the time switch (summer/winter time) should take place automatically or manually (default).

6.3.1.9 Language

The parameter sets the interface language of the controller.

6.3.1.10 Board Test

This menu is dedicated to testing the inputs and outputs of the controller.

Table 6.10 *Board Test menu*

Inputs	
Name	**Description**
U1	Manifold probe S1
U2	HC2 circuit probe
U3	HC1 circuit probe
U4	TA1 external request
U5	Manifold probe post heat exhanger/separator
U6	TA2 external request or 0-10 V external temperature or power control signal
Relay digital outputs	
Relay	**Description**
K1	VMixCR2 valve opening
K2	VMixCR2 valve closing
K3	HC1 pump
K4	HC2 pump
K5	CB pump
K6	CRC pump
K7	CB2 pump
K8	SRB remote lockout lamp
0-10 V analog outputs	
Name	**Description**
Y1	0-10 V VMixCR1
Y2	0-10 V PWM modulating pump

In the menu you can read the values of the analogue inputs (corresponding to the temperature probe readings S1, S2, S3, S4, the status of the external request TA1/TA2 and any external control signal 0-10 V).
The special values for probes S1, S2, S3, S4 are:
► -99.0 if the probe is connected but excluded or faulty
► -100.0 if the probe is not connected

In the event of a probe malfunction, there is no error reporting, but a special value for the temperature reading is displayed, depending on the type of malfunction (probe faulty or excluded or not connected).

For the external request TA1/TA2 the value is:
► -99.0 if the request is not active
► 99.0 if the request is active
It is not possible to manually force the values read by the probes or the status of the external request TA1/TA2 or the value of the external 0-10 V control signal.
When you enter the menu you are positioned on the relay test line, where you can activate or deactivate every single relay output, displaying the status next to it (Figure 5.2 *p. 12*).

Forcing relay status or analog output value

1. Select the relay of interest (Table 6.10 *p. 16*) by pressing the ✓ key.
2. Use the ▲▼ arrows to change the relay status (each time either arrow is pressed the status changes). The ■ icon corresponds to the open relay status, while the □ icon corresponds to the closed relay status.
3. Press ✗ to quit the relay status forcing or ✓ to move to forcing the analog outputs.
4. Use the ▲▼ arrows to set the analog output voltage value in 1,0 V steps.
5. Press ✗ to exit the forcing mode.

Exiting the Board Test menu with the ✗ key will deactivate all forcing that have been set.

6.3.1.11 Info

This menu displays the FW version of the controller: DSP-6.8.6.
The serial number of the device is not managed and always indicates -1.

6.3.2 Network menu

This menu is not used.

6.3.3 OperatMode menu

See Paragraph 6.2.2 *p. 14*.

6.3.4 SummerSeason menu

In this menu you can set a time period in the year when the heating system is switched off (but DHW requests remain active).

Table 6.11 *SummerSeason menu*

Submenu	Description	Setting	Default
Status	Activation/deactivation the shutdown period of the heating system	off on	off
StartingDay	Start day of the heating system shutdown period	1 ÷ 31	15
StartingMonth	Start month of the heating system shutdown period	1 ÷ 12	4
EndingDay	End day of the heating system shutdown period	1 ÷ 31	15
EndingMonth	End month of the heating system shutdown period	1 ÷ 12	10

The Status parameter sets the activation or deactivation of the shutdown period of the heating system.
The other parameters define respectively the day and month of the beginning of the shutdown period and the day and month of the end of the shutdown period of the heating system.

6.3.5 ViewTemp menu

This menu displays the temperatures read by the temperature probes and the setpoint values for circuits and services.

Table 6.12 *ViewTemp menu*

Submenu	Description	Default
ExtTemp	External temperature	-
ManifTemp	Manifold/separator temperature (S1)	-
NomManiTemp	Manifold/separator setpoint (S2)	-
TComp/HEXech	Manifold temperature post heat exchanger/separator (S4)	-
HC	Temperature submenu for heating circuits (Paragraph 6.3.5.1 *p. 17*)	
DHW	Temperature submenu for DHW services (Paragraph 6.3.5.2 *p. 17*)	
RoomTemp1	Not used	-100
RoomTemp2	Not used	-100
SolManTemp	Not used	-100
SolBufInfT	Not used	-100
SolBufInfT2	Not used	-100
SolManTemp2	Not used	-100
SolBufSupT	Not used	-100

The special values for temperature probes are:
- ► -99.0 if the probe is connected but excluded or faulty
- ► -100.0 if the probe is not connected

In the event of a probe malfunction, there is no error reporting, but a special value for the temperature reading is displayed, depending on the type of malfunction (probe faulty or excluded or not connected).

The nominal temperature values represent the setpoints for the relevant circuits and services.

If no outdoor probe (SE) is connected:
- ► NomManiTemp = MaxManiTemp, also considering which of the heating circuits is active
- ► NomTempHC2 = SpMaxHC2
- ► NomTempHC1 = MaxManiTemp
- ► Disable the outdoor probe in parameter OutProbe1 (Paragraph 6.3.9 *p. 23*) and/or OutProbe2 (Paragraph 6.3.10 *p. 23*)

With outdoor probe (SE) connected, the manifold setpoint NomManiTemp is determined by the climatic curve and the set target room temperature.
The NomDHWTemp1/NomDHWTemp2 value is the current setpoint value for the buffer tank probe (SB1/SB2) as per ProgDHW1/ProgDHW2 time programming.
In DWH mode, TCollNom = TMaxGc.

6.3.5.1 HC

In this menu the temperatures of the heating circuits and their setpoints are displayed.

Table 6.13 *HC menu*

Submenu	Description	Default
TempHC2	Mixed circuit 2 temperature (S2)	-
NomTempHC2	Mixed circuit 2 setpoint (S2)	-
TempHC1	Direct/mixed circuit 1 temperature (S3)	-
NomTempHC1	Direct/mixed circuit 1 (S3) setpoint	-

6.3.5.2 DHW

This menu displays the temperatures of the DHW buffer tanks and their setpoints.

Table 6.14 *DHW menu*

Submenu	Description	Default
DHWTemp1	Temperature of DHW buffer tank 1 (SB1)	-
DHWTemp2	Temperature of DHW buffer tank 2 (SB2)	-
NomDHW-Temp1	Nominal temperature of DHW buffer tank 1 (SB1)	-
NomDHW-Temp2	Nominal temperature of DHW buffer tank 2 (SB2)	-

6.3.6 Cascade menu

In this menu you set the cascade control parameters.

Table 6.15 *Cascade menu*

Submenu	Description	Setting	Default
Readings	Read-only parameters submenu	Paragraph 6.3.6.4 *p. 18*	
MaxBoilTemp	Maximum flow temperature of the individual boiler	30 ÷ 90 °C	77
TLimDay	Outdoor temperature limit for heating off	5 ÷ 35 °C	22
TLimNight	Outdoor temperature limit for heating on	-10 ÷ 20 °C	-5
ModBoilMAX	Maximum modulation degree of the single boiler	10 ÷ 100 %	80
ModBoilON	Modulation degree above which the next boiler is switched on	10 ÷ 100 %	80
ModBoilOff	Minimum modulation degree below which the previous boiler in the sequence is switched off	0 ÷ 100 %	30

Submenu	Description	Setting	Default
ModBoilMIN	Minimum modulation degree above which the next boiler is switched on or below which the previous boiler in the sequence is switched off	0 ÷ 100 %	0
NBoilDHW	Number of boilers with DHW diverter valve	0 ÷ 8	0
NBoilHC	Number of boilers activated in case of peak load	0 ÷ 8	0
BoilerSeq	Boiler ignition sequence	1 ÷ 5	5
SeqChgTime	Boiler ignition sequence change time	10 ÷ 800 h	100
SeqLockON	Minimum waiting time before switching on the boiler	0 ÷ 200 s	20
SeqLockOFF	Minimum waiting time before switching off the boiler	0 ÷ 200 s	20
PostCirculBoil	Boiler's post-circulation with manifold at setpoint	0. off 1. on	0

In particular, you can define:
- ► the activation/deactivation mode of the boilers
- ► the limit temperatures
- ► the maximum and minimum degree of modulation
- ► the number of boilers that may be used for DHW
- ► the boiler activation sequence

The activation/deactivation mode of the boilers can be based:
1. on the maximum percentage of modulation (default) (Paragraph 6.3.6.1 *p. 18*)
2. on the minimum percentage of modulation (Paragraph 6.3.6.2 *p. 18*)

Activation mode 2 (minimum modulation percentage) is activated by setting the ModBoilMIN parameter (Paragraph 6.3.6.11 *p. 19*) to a value other than 0 (default).

It is recommended not to change the activation/deactivation mode of the boilers

In order to speed up the achievement of the setpoint it is possible to act on the NBoilHC parameter (Paragraph 6.3.6.13 *p. 19*) to activate more boilers at the same time.

6.3.6.1 Activation mode based on maximum modulation percentage

In this mode the next boiler is activated only when the maximum modulation value for the previous boiler has been reached.
The next boiler is activated, after the lock time set in the SeqLockON parameter (Paragraph 6.3.6.16 *p. 19*), after the boiler previously switched on has exceeded the modulation percentage set in the ModBoilON parameter (Paragraph 6.3.6.9 *p. 19*).
When the next boiler in the sequence is switched on, the previous one reduces the power so that they all work with the same degree of modulation.
Once all the boilers have been activated, all boilers modulate up to the maximum value set in the ModBoilMAX parameter (Paragraph 6.3.6.8 *p. 19*), until the NomManiTemp setpoint is achieved (Paragraph 6.3.5 *p. 17*).
If a power reduction is required, the last activated boiler decreases its power down to the value set in the parameter ModBoilOff (Paragraph 6.3.6.10 *p. 19*), below which the boiler is switched off.
After the lock time set in the SeqLockOFF parameter (Paragraph 6.3.6.17 *p. 19*) has elapsed, it will be possible to proceed in the same way to shut down subsequent boilers.

6.3.6.2 Activation mode based on minimum modulation percentage

In this mode the next boiler is activated only when the minimum modulation value for the previous boiler has been reached.
The next boiler is activated, after the lock time set in the SeqLockON parameter (Paragraph 6.3.6.16 *p. 19*), after the boiler previously switched on has exceeded the modulation percentage set in the ModBoilMIN parameter (Paragraph 6.3.6.11 *p. 19*).
Once all the boilers have been activated, all boilers modulate up to the maximum value set in the ModBoilMAX parameter (Paragraph 6.3.6.8 *p. 19*), until the NomManiTemp setpoint is achieved (Paragraph 6.3.5 *p. 17*).
If a power reduction is required, all boilers decrease the modulation down to the value set in the parameter ModBoilMIN (Paragraph 6.3.6.11 *p. 19*), after which the last activated boiler decreases its power down to the value set in the parameter ModBoilOff (Paragraph 6.3.6.10 *p. 19*), below which the boiler is switched off.
After the lock time set in the SeqLockOFF parameter (Paragraph 6.3.6.17 *p. 19*) has elapsed, it will be possible to proceed in the same way to shut down subsequent boilers.

6.3.6.3 Activation mode for DHW production

In case of DHW production request, all the boilers configured for this service, through the parameter NBoilDHW (Paragraph 6.3.6.12 *p. 19*) are activated at the same time at the minimum power, then they all modulate together up to the maximum power.
When reducing the power, the power is reduced for all boilers at the same time until shutdown.

6.3.6.4 Readings

This menu displays read-only parameters related to the cascaded system.

Table 6.16 *Readings menu*

Submenu	Description	Setting	Default
NBoilFound	Number of found boilers	1 ÷ 8	-
NBoilReq	Number of active boilers	1 ÷ 8	-
Modulation%	Modulation degree of the cascade system	0 ÷ 100 %	-

6.3.6.4.1 *NBoilFound*

The parameter displays the number of boilers found by the controller.

6.3.6.4.2 *NBoilReq*

The parameter displays the number of boilers currently activated by the controller.

6.3.6.4.3 *Modulation%*

The parameter displays the current modulation percentage with respect to the total power available for the system managed by the controller.

6.3.6.5 MaxBoilTemp

The parameter sets the maximum flow temperature of the individual boiler, valid for both heating service and DHW production.
In case of change, the value of the parameter must be equal or lower than that of parameter P20 of each single boiler (whose default is 85 °C).

6.3.6.6 TLimDay

This parameter is only applicable if an outdoor temperature probe is present.

If the ExtTemp (Paragraph 6.3.5 *p. 17*) exceeds the value of this parameter, the heating service is interrupted, the pumps switched off and the mixing valves closed.

6.3.6.7 TLimNight

This parameter is only applicable if an outdoor temperature probe is present.

If the ExtTemp (Paragraph 6.3.5 *p. 17*) falls below the value of this parameter, the heating service is activated with the aim of raising the manifold temperature ManifTemp (Paragraph 6.3.5 *p. 17*) to the value RedTemp (Paragraph 6.3.8.4 *p. 21*).

6.3.6.8 ModBoilMAX

The parameter sets the maximum degree of modulation of the individual boiler.

6.3.6.9 ModBoilON

The parameter sets the degree of modulation above which the next boiler is switched on.

6.3.6.10 ModBoilOff

The parameter sets the degree of modulation below which the last boiler switched on is switched off.

6.3.6.11 ModBoilMIN

The parameter sets the minimum modulation level above which the next boiler is switched on or below which the last boiler is switched off.
Setting a value other than 0 activates the activation mode based on minimum modulation (Paragraph 6.3.6.2 *p. 18*).

It is recommended not to change the value of this parameter.

6.3.6.12 NBoilDHW

The parameter sets the number of boilers available for DHW service, which must be equipped with the corresponding diverter valve.

6.3.6.13 NBoilHC

The parameter sets the number of boilers that can be activated at the same time in case of a sudden load increase, i.e. when (ManifTemp - NomManiTemp) > 10 °C, so that the setpoint is reached more quickly.

6.3.6.14 BoilerSeq

The parameter sets the sequence activation logic of the individual boilers.

For the DHW production service no activation sequence is used, but the activation mode described in Paragraph 6.3.6.3 *p. 18*.

In order to define an activation logic, it is necessary to have at least two boilers.

The possible values are:

1. Sequence 1-2-3-4-5-6-7-8.
2. Sequence 8-7-6-5-4-3-2-1.
3. Sequence with priority activation of boilers with lower rated output.
4. Rotating sequence with the first boiler of the current sequence that is moved to the last position of the next sequence after the time set in the SeqChgTime parameter (Paragraph 6.3.6.15 *p. 19*).
5. Automatic sequence based on working hours, calculated when the working hours of the first boiler in the current sequence have reached the value set in the SeqChgTime parameter (Paragraph 6.3.6.15 *p. 19*).

6.3.6.15 SeqChgTime

The parameter sets the time after which the activation sequence is recalculated (for modes 4 and 5, Paragraph 6.3.6.14 *p. 19*).

6.3.6.16 SeqLockON

The parameter sets the minimum waiting time before the next boiler in the sequence is switched on.

6.3.6.17 SeqLockOFF

The parameter sets the minimum waiting time before the last boiler on in the sequence is switched off.

6.3.6.18 PostCirculBoil

The parameter defines the behaviour of the pumps of the individual boilers once the manifold setpoint has been achieved.
By setting the value 0, the pumps are switched off after the normal post-circulation time (defined by parameter P08 of the individual boiler).
By setting value 1 the post-circulation continues as long as a service request from the thermostats, temperature probes or time slots is active. The pump that remains switched on is the one on the last boiler switched on.

6.3.7 Boiler menu

This menu displays the data for the individual boilers.

Table 6.17 *Boiler menu*

Submenu	Description	Setting	Default
BoilSel	Boiler selection	1 ÷ 8	1
BoilTemp	Boiler flow temperature	[°C]	-
OpModeBoil	Boiler operating mode	-3. recognizing the boiler -2. boiler in error -1. boiler missing/unreadable 0. boiler in standby 1. boiler in space heating mode 2. boiler in DHW mode	-
FanHz1	RPM of the boiler blower (or of the boiler master module)	[Hz]	-
FanHz2	RPM of the boiler slave module	[Hz]	
BoilONTime	Boiler working hours	[h]	-
BoilNomPwr	Single boiler power	7 ÷ 15	-
WarningBoil1	Alarm code present on the boiler (or on the boiler master module)	-	-
WarningBoil2	Alarm code present on the boiler slave module	-	-
ResetWarning	Boiler alarm reset	0. no reset 1. WarningBoil1 reset 2. WarningBoil2 reset	0

6.3.7.1 BoilSel

The parameter allows you to select the boiler of interest.

6.3.7.2 BoilTemp

The parameter displays the boiler flow temperature selected in the BoilSel parameter (Paragraph 6.3.7.1 *p. 20*).

6.3.7.3 OpModeBoil

The parameter displays the operating mode of the boiler selected in the BoilSel parameter (Paragraph 6.3.7.1 *p. 20*).

6.3.7.4 FanHz1

This parameter displays the blower RPM (in Hz) of the boiler (or master module of the Caldaria 100.2) selected in the parameter SelezGc (Paragraph 6.3.7.1 *p. 20*).

6.3.7.5 FanHz2

The parameter displays the blower RPM (in Hz) of the slave module of the boiler Caldaria 100.2 selected in the parameter SelezGc (Paragraph 6.3.7.1 *p. 20*).

6.3.7.6 BoilONTime

The parameter displays the operating hours of the boiler selected in the parameter BoilSel (Paragraph 6.3.7.1 *p. 20*).

6.3.7.7 BoilNomPwr

The parameter displays the value of parameter P00 of the boiler selected in the parameter BoilSel (Paragraph 6.3.7.1 *p. 20*), which expresses its nominal power.
The possible values are:
9. Caldaria 35
10. Caldaria 55.1
14. Caldaria 100.2

For Caldaria 100.2 the value of parameter P00 on each master/slave module of the boiler is 3, but the controller assigns to the Caldaria 100.2 the value 14 for the parameter BoilNomPwr.

6.3.7.8 WarningBoil1

The parameter displays any error code currently present on the boiler (or on the boiler master module in the case of Caldaria 100.2).
It is possible to remote the error status of the boiler using relay K8 (Paragraph 3.2.4 *p. 11*).

For information on error codes, please refer to the Caldaria installation, use and maintenance manual.

6.3.7.9 WarningBoil2

The parameter displays any error code currently present on the slave module of the Caldaria 100.2.
It is possible to remote the error status of the boiler using relay K8 (Paragraph 3.2.4 *p. 11*).

For information on error codes, please refer to the Caldaria installation, use and maintenance manual.

6.3.7.10 ResetWarning

The parameter allows you to reset any errors on the boilers, including any master/slave modules.
The default value of the parameter is 0, which corresponds to no reset required.
Error reset is possible by setting the parameter to the value:
1. to reset the error on the boiler (or on the master module of the Caldaria 100.2)
2. to reset the error on the slave module of the Caldaria 100.2
Approximately 40 seconds after a successful reset request, the parameter value automatically returns to 0.

6.3.8 Manifold menu

In this menu you set the manifold temperature parameters, measured by the S1 probe (mandatory).

Table 6.18 *Manifold menu*

Submenu	Description	Setting	Default
MaxManiTemp	Maximum manifold temperature (S1 probe)	30 ÷ 90 °C	75

Submenu	Description	Setting	Default
MinManiTemp	Minimum manifold temperature (S1 probe)	10 ÷ 70 °C	40
UseRedTemp	Activating the use of RedTemp	0. off 1. on	1
RedTemp	Circuits temperature in reduced mode	15 ÷ 45 °C	30
AFTemp	Circuits temperature in antifreeze mode	-15 ÷ 15 °C	5
PostCircul1	Post-circulation mode	0. according to parameter PostCirc1Time 1. according to ProgHC1 2. permanent	0
PostCirc1Time	Pump post-circulation time	1 ÷ 99 minutes	5
Com/HexProbeFlow	Activation of post exchanger/separator probe S4	0. no S4 probe 1. S4 probe present 2. not used	0
Comp/HExchDeltaT	Temperature differential between S4 and S1	1 ÷ 20 °C	5
FlowSwContact	Not used	-	-
DtFlowMani	ΔT between manifold and setpoint set by climatic curve	0 ÷ 20 °C	5
ClimCurve1	Manifold climatic curve management	Paragraph 6.3.8.12 *p. 22*	
HexPump	Management of the modulating pump post heat exchanger/separator	Paragraph 6.3.8.13 *p. 22*	
ControlType	System control type	0. controller 1. External 0-10 V (power) 2. External 0-10 V (temperature)	0
MinOnPwr	Minimum system power for external 0-10 V power request	0 ÷ 100 %	10
TempCtrProbe	Control probe for 0-10 V external temperature control	0. S1 1. S2 2. S3 3. S1, S2, S3	0

6.3.8.1 MaxManiTemp

See Paragraph 6.2.3.1 *p. 15*.

6.3.8.2 MinManiTemp

See Paragraph 6.2.3.2 *p. 15*.

6.3.8.3 UseRedTemp

The parameter defines whether or not to use the value of RedTemp (Paragraph 6.3.8.4 *p. 21*) when the heating circuits are in attenuation (Lev 0) and any TA1/TA2 contacts are open.
The possible values are:

0. NomManiTemp = 0. The antifreeze functions remain active
1. NomManiTemp = RedTemp

6.3.8.4 RedTemp

The parameter sets the NomManiTemp value when the heating circuits are in reduced mode (Lev 0) and any TA/TA2 contacts are open.

6.3.8.5 AFTemp

The parameter sets the activation temperature of the antifreeze function on the circuits.
When the temperature detected by S1 falls below the value set in this parameter, the boilers are activated in order to bring the circuits to the temperature set in the parameter RedTemp (Paragraph 6.3.8.4 *p. 21*).
When the temperature detected by S2 or S3 falls below the value set in this parameter, the circuit pumps are activated in order to bring the circuits to the temperature set in the parameter RedTemp (Paragraph 6.3.8.4 *p. 21*).
As soon as all connected temperature probes have exceeded the RedTemp value (Paragraph 6.3.8.4 *p. 21*) by at least 1 °C, the boilers are switched off, the pumps switched off and the mixing valves closed.

6.3.8.6 PostCircul1

The parameter sets the activation mode of the HC1 pump when the boilers are not active.
The purpose of keeping the pump active even when the boilers are not active is to keep the S1 and/or S3 probe fluxed, so as to have a reliable temperature reading in all conditions.
The possible values are:

0. post-circulation equal to the value of parameter PostCirc1Time (Paragraph 6.3.8.7 *p. 21*)
1. post-circulation according to ProgHC1 (Paragraph 6.2.1.1 *p. 13*)
2. permanent post-circulation

6.3.8.7 PostCirc1Time

The parameter defines the duration in minutes of the post-circulation of the pump CR1 when the boilers are not active and the parameter PostCircul1 (Paragraph 6.3.8.6 *p. 21*) is set to 0.

6.3.8.8 Com/HexProbeFlow

The parameter defines whether or not probe S4 is present downstream of the heat exchanger/hydraulic separator.

6.3.8.9 Comp/HExchDeltaT

The parameter defines, in the presence of probe S4 (Paragraph 6.3.8.8 *p. 21*), the temperature difference below which the boilers are started up, even though S1 is satisfied.
The purpose of this parameter is to prevent the temperature downstream of the heat exchanger/hydraulic

separator (measured by probe S4) from falling below S1 beyond the value set in this parameter due to temperature losses associated with the heat exchanger/hydraulic separator.
With active heating request (from time program or thermostats TA1/TA2), the boilers are activated if S4 < (MaxManiTemp-Comp/HExchDeltaT) and deactivated if S4 > (MaxManiTemp-Comp/HExchDeltaT).
If S4 temperature is very far from S1, the system automatically increases MaxManiTemp by up to 10 °C and decreases it progressively as S4 approaches (S1-Comp/HExchDeltaT). This allows the target temperature at probe S4 to be achieved more quickly.

6.3.8.10 FlowSwContact

Not used.

6.3.8.11 DtFlowMani

The parameter sets the temperature increase of the manifold with respect to the value required by the ClimCurve1 climatic curve (Paragraph 6.3.8.12 *p. 22*).
In this way, any temperature losses due to mixing or dissipation are compensated in advance.

6.3.8.12 ClimCurve1

In this menu you set the climatic curve parameters for the manifold (S1 probe) and heating circuit 1 (S3 probe).
Whether or not to use the outdoor probe (and consequently the climatic curve) is defined in the OutProbe1 parameter (Paragraph 6.3.9.4 *p. 23*).

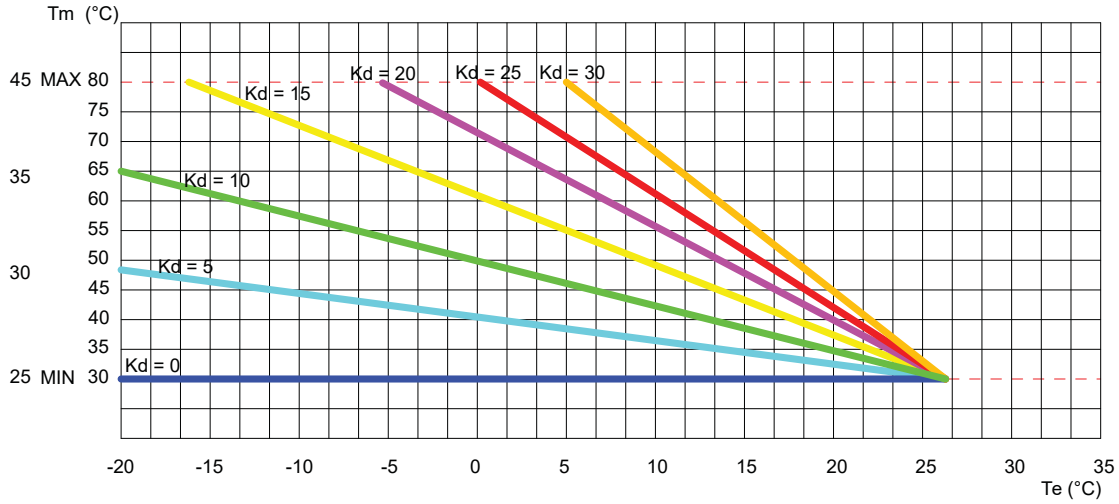
Table 6.19 *ClimCurve1 menu*

Submenu	Description	Setting	Default
SelCurvMani	Climatic curve selection	-15 ÷ 30	20
MinTproj1	Minimum design temperature	-20 ÷ 20 °C	0

6.3.8.12.1 *SelCurvMani*

The parameter sets the slope of the climatic curve to be used, selected from those in Figure 6.1 *p. 22*.

Figure 6.1 *Climatic curves*



Tm Delivery temperature Te Outdoor temperature Kd Heating control value

Setting the value 0 actually gives a fixed temperature control, iwth setpoint MinManiTemp (Paragraph 6.2.3.2 *p. 15*).
By setting the value -5 you can customize the curve, which will have as a minimum MinManiTemp (Paragraph 6.2.3.2 *p. 15*) and as a maximum MaxManiTemp (Paragraph 6.2.3.1 *p. 15*) and will be a straight line through the points (26, MinManiTemp) and (MinTProj1, MaxManiTemp).

6.3.8.12.2 *MinTproj1*

The parameter sets the minimum design temperature, to which is associated, only when the custom climatic curve is set (SelCurvMani = -5, Paragraph 6.3.8.12.1 *p. 22*), the MaxManiTemp flow temperature, in order to determine the slope of the curve itself.

6.3.8.13 HexPump

This menu sets the parameters for driving the modulating PWM pump downstream of the heat exchanger/separator, which has the aim of keeping the temperature difference on the secondary circuit aligned with that on the primary. The readings of probes S1 (manifold probe) and S4 (probe downstream of the heat exchanger/separator) are used for this purpose.

Table 6.20 *HexPump menu*

Submenu	Description	Setting	Default
Status	PWM pump driving	0 ÷ 10 V	-
MinModul	PWM pump minimum speed	30 ÷ 80 %	50
MaxModul	PWM pump maximum speed	50 ÷ 100 %	100

6.3.8.13.1 *Status*

The parameter displays the instantaneous drive voltage, between 0 and 10 V, of the PWM modulating pump.
The value 0 V corresponds to the modulation percentage set in the MinModul parameter (Paragraph 6.3.8.13.2 *p. 23*).
The value 10 V corresponds to the modulation percentage set in the MaxModul parameter (Paragraph 6.3.8.13.3 *p. 23*).

6.3.8.13.2 *MinModul*

The parameter defines the speed of the modulating pump (as a % of maximum speed) at 0 V control voltage.

6.3.8.13.3 *MaxModul*

The parameter defines the speed of the modulating pump (as a % of maximum speed) at 10 V control voltage.

6.3.8.14 ControlType

This parameter defines whether the controller acts as an autonomous controller of the system or whether it is driven by an external 0-10 V signal connected to the U6-CC contacts (Paragraph 3.2 *p. 9*).
The possible values are:

0. Control by the controller.
1. Control via external 0-10 V power request signal. The maximum power corresponds to the value of the ModBoilMAX parameter (Paragraph 6.3.6.8 *p. 19*). The minimum power corresponds to the value of the parameter MinOnPwr (Section 6.3.8.15 *p. 23*).
2. Control via an external 0-10 V temperature signal. The TempCtrProbe parameter (Paragraph 6.3.8.16 *p. 23*) allows the user to define on which temperature probe the control is carried out. The maximum and minimum temperatures will be those defined by the parameters of the specific circuit on which the regulation is carried out. Any DHW production will not be managed by the external 0-10 V signal.

For drive voltages below 3 V the system is switched off. For higher voltages the system performs a linear interpolation on power or temperature.

6.3.8.15 MinOnPwr

The parameter sets the minimum power of the system as a % of the total power, if the parameter ControlType (Paragraph 6.3.8.14 *p. 23*) is set to the value 1.
The system is activated at this power level when it receives a voltage of 3 V (minimum value for switching on the system) via the external 0-10 V power request signal.

6.3.8.16 TempCtrProbe

The parameter defines which temperature probe is used for control if the ControlType parameter (Paragraph 6.3.8.14 *p. 23*) is set to value 2.
The possible values are:

0. control on S1
1. control on S2
2. control on S3
3. control on S1, S2, S3

It is not possible to control probe S4, as the setpoint on probe S4 is defined indirectly via the parameter Comp/HExchDeltaT (Paragraph 6.3.8.9 *p. 21*) as differential to the reading on probe S1.

6.3.9 HC1 menu

In this menu you set the parameters for heating circuit 1 (S3 probe).

Table 6.21 *HC1 menu*

Submenu	Description	Setting	Default
HC1Pump	Heating circuit 1 pump status	0. off 1. on	-
PosVlvMix1	VMixCR1 mixing valve status	0 ÷ 10 V	-
ThermHC1	Room thermostat used on heating circuit 1	0. without thermostat 1. with input TA1 2. not used 3. not used	0
OutProbe1	Outdoor probe presence	0. absent 1. present	1
SpMaxHC1	Heating circuit 1 maximum temperature	30 ÷ 90 °C	45
SpMinHC1	Heating circuit 1 minimum temperature	20 ÷ 60 °C	25

6.3.9.1 HC1Pump

The parameter displays the status of the HC1 pump.

6.3.9.2 PosVlvMix1

The parameter displays the control voltage of the VlvMix1 mixing valve.
10 V corresponds to open valve, 0 V to closed valve.

6.3.9.3 ThermHC1

The parameter sets whether there is a room thermostat on heating circuit 1.
If there is no thermostat, the time program set for the circuit is used (ProgHC1, Paragraph 6.2.1.1 *p. 13*).
If a single room thermostat TA1 is also used to control the activation of heating circuit 2, the parameters ThermHC2 (Paragraph 6.3.10.7 *p. 24*) and HC2ActMode (Paragraph 6.3.10.3 *p. 24*) must also be set accordingly.

6.3.9.4 OutProbe1

The parameter sets whether the climatic curve (menu ClimCurve1, Paragraph 6.3.8.12 *p. 22*) should be used to determine the HC1 circuit setpoint.
In order to use the climatic curve, the outdoor probe SE must be present and connected.

If there is no outdoor probe, this parameter must necessarily be set to 0. The circuit temperature will be set by MaxManiTemp (Paragraph 6.2.3.1 *p. 15*).

6.3.9.5 SpMaxHC1

The parameter sets the maximum allowed temperature for heating circuit 1, measured by probe S3.

6.3.9.6 SpMinHC1

The parameter sets the minimum allowed temperature for heating circuit 1, measured by probe S3.

6.3.10 HC2 menu

In this menu you set the parameters for heating circuit 2 (S2 probe).

Table 6.22 *HC2 menu*

Submenu	Description	Setting	Default
HC2Pump	Heating circuit 2 pump status	0. off 1. on	-
PosVlvMix2	VMixCR2 mixing valve status	0 ÷ 100 %	-
HC2ActMode	Heating circuit 2 activation mode	0. together with heating circuit 1 1. independent	1
OutProbe2	Outdoor probe presence	0. absent 1. present	1
PostCirc2	Post-circulation mode	0. according to parameter PostCirc2Time 1. according to ProgHC2 2. permanent	0
PostCirc2Time	Pump post-circulation time	1 ÷ 99 minutes	5
ThermHC2	Room thermostat used on heating circuit 2	0. without thermostat 1. with input TA1 2. not used 3. with input TA2 4. not used	0
ClimCurve2	Heating circuit 2 climatic curve management	see Table 6.23 *p. 25*	
AlwaysON	Heating circuit 2 operating mode	0. HC2ActMode and DHWPmpSim 1. always active unless DHW request active and DHWPmpSim = 0	0

6.3.10.1 HC2Pump

The parameter displays the status of the HC2 pump.

6.3.10.2 PosVlvMix2

The parameter displays the status of the VmixCR2 mixing valve.
The value 0 corresponds to a fully closed valve, the value 100 to a fully open valve.

6.3.10.3 HC2ActMode

The parameter sets whether or not the activation of heating circuit 2 follows the activation of heating circuit 1.
The possible values are:

0. heating circuit 2 is controlled together with heating circuit 1 via ProgHC1 or via thermostat TA1
1. heating circuit 2 is controlled independently, either via ProgHC2 or via thermostat TA2

6.3.10.4 OutProbe2

The parameter sets whether the climate curve (menu ClimCurve2, Paragraph 6.3.10.8 *p. 24*) should be used to determine the HC2 circuit setpoint.
In order to use the climatic curve, the outdoor probe SE must be present and connected.

If there is no outdoor probe, this parameter must necessarily be set to 0. The circuit temperature will be set by SpMaxHC2 (Paragraph 6.3.10.8.2 *p. 25*).

6.3.10.5 PostCirc2

The parameter sets the activation mode of the HC2 pump when the boilers are not active.
The purpose of keeping the pump active even when the boilers are not active is to keep the S2 probe fluxed, so as to have a reliable temperature reading in all conditions.
The possible values are:

0. post-circulation equal to the value of parameter PostCirc2Time (Paragraph 6.3.10.6 *p. 24*)
1. post-circulation according to ProgHC2 (Paragraph 6.2.1.2 *p. 14*)
2. permanent post-circulation

6.3.10.6 PostCirc2Time

The parameter defines the duration in minutes of the post-circulation of the pump CR2 when the boilers are not active and the parameter PostCirc2 (Paragraph 6.3.10.5 *p. 24*) is set to 0.

6.3.10.7 ThermHC2

The parameter sets which room thermostat is used for heating circuit 2.
The possible values are:

0. without thermostat (the activation mode set in parameter HC2ActMode, Paragraph 6.3.10.3 *p. 24*, is used)
1. with input TA1 (accordingly set the parameter HC2ActMode, Paragraph 6.3.10.3 *p. 24*, to value 0 and the parameter ThermHC1, Paragraph 6.3.9.3 *p. 23*, to value 1)
2. not used
3. with input TA2 (accordingly set the parameter HC2ActMode, Paragraph 6.3.10.3 *p. 24*, to value 1)
4. not used

If there is no thermostat, the time program set for the circuit is used (ProgHC1 or ProgHC2, Paragraph 6.3.10.3 *p. 24*).
If thermostat TA1 is to control both heating circuits, set

► HC2ActMode = 0
► ThermHC1 = 1
► ThermHC2 = 1

6.3.10.8 ClimCurve2

In this menu you set the climatic curve parameters for heating circuit 2 (S2 probe).
Whether or not to use the outdoor probe (and consequently the climatic curve) is defined in the OutProbe2 parameter (Paragraph 6.3.10.4 *p. 24*).

Table 6.23 *ClimCurve2 menu*

Submenu	Description	Setting	Default
SelCurve-HC2	Climatic curve selection	-15 ÷ 30	20
SpMaxHC2	Heating circuit 2 maximum temperature	30 ÷ 90 °C	45
SpMinHC2	Heating circuit 2 minimum temperature	20 ÷ 60 °C	25
MinTProj2	Minimum design temperature	-20 ÷ 20 °C	0

6.3.10.8.1 *SelCurveHC2*

The parameter sets the slope of the climatic curve to be used, selected from those in Figure 6.1 *p. 22*.
Setting the value 0 actually gives a fixed temperature control, iwth setpoint SpMinHC2 (Paragraph 6.3.10.8.3 *p. 25*).
By setting the value -5 you can customize the curve, which will have as a minimum SpMinHC2 (Paragraph 6.3.10.8.3 *p. 25*) and as a maximum SpMaxHC2 (Paragraph 6.3.10.8.2 *p. 25*) and will be a straight line through the points (26, SpMinHC2) and (MinTProj2, SpMaxHC2).

6.3.10.8.2 *SpMaxHC2*

The parameter sets the maximum allowed temperature for heating circuit 2, measured by probe S2.

6.3.10.8.3 *SpMinHC2*

The parameter sets the minimum allowed temperature for heating circuit 2, measured by probe S2.

6.3.10.8.4 *MinTProj2*

The parameter sets the minimum design temperature, to which is associated, only when the custom climatic curve is set (SelCurveHC2 = -5, Paragraph 6.3.10.8.1 *p. 25*), the SpMaxHC2 flow temperature, in order to determine the slope of the curve itself.

6.3.10.9 AlwaysON

The parameter sets the selection of the operating mode of heating circuit 2 when DHW is required.
Among the settings of the parameter DHWPmpSim (Paragraph 6.3.12.8 *p. 27*) there is in fact the possibility to keep the mixed circuit active.
If set to 0, heating circuit 2 will follow the time program set in HC2ActMode (Paragraph 6.3.10.3 *p. 24*) and the setting of the parameter ParalPmpACS (Paragraph 6.3.12.8 *p. 27*) when there is a DHW request.
When set to value 1, heating circuit 2 will always be active (even when the circuit setpoint is satisfied) and will only be switched off if there is a DHW request, and only if the parameter DHWPmpSim (Paragraph 6.3.12.8 *p. 27*) is set to value 0.

6.3.11 RoomClimateCurve menu

This menu is not used.

6.3.12 DHW menu

In this menu you set the parameters related to the DHW production management (SB1/SB2 probes).

Table 6.24 *DHW menu*

Submenu	Description	Setting	Default
DHW1Pump	DHW buffer tank 1 charging pump from the manifold status	0. off 1. on	-
DHW2Pump	DHW buffer tank 2 charging pump from the manifold status	0. off 1. on	-
RecircPump	DHW recirculation pump status	0. off 1. on	-
DtDHWOn	Differential for DHW recharging activation	1 ÷ 20 °C	5
DHWMinTLck	Minimum temperature lock for DHW charging circuit	0. off 1. on	1
DHWPmpSim	Management of simultaneous requests for heating circuits	0. DHW priority 1. parallel operation DHW + mixed circuit 2. parallel operation DHW + mixed + direct circuit	0
DHW1Mode	DHW buffer tank 1 charging activation mode	0. DHW buffer tank probe SB1 1. thermostat TS1	0
DHW2Mode	DHW buffer tank 2 charging activation mode	0. DHW buffer tank probe SB2 1. thermostat TS2	0
DHW1TherSts	DHW buffer tank 1 thermostat status	0. open contact (no DHW request) 1. closed contact (DHW request active)	-
DHW2TherSts	DHW buffer tank 2 thermostat status	0. open contact (no DHW request) 1. closed contact (DHW request active)	-
RecircMode	Recirculation pump operation	0. ProgDHW1 1. ProgRecirc 2. ProgDHW2	1
MaxPwr%DHW	Modulation degree of boilers in DHW mode	1 ÷ 10	10
InstDHWTemp	Not used		60

By setting the parameter OperatMode (Paragraph 6.2.2 *p. 14*) to the value 1 (DHW only) or 2 (Heating + DHW), it is necessary to set the parameter P01 of each boiler connected to the controller to the value 0 (fast), as indicated in Table 4.1 *p. 11*.

The post-circulation for the DHW production service is fixed at 3 minutes.
The antifreeze protection for the DHW buffer tank is activated when the temperature read by the SB1/SB2 probe falls below 4 °C and is deactivated when the SB1/SB2 probe reaches 8 °C. This setting cannot be changed. The antifreeze protection functions of each DHW buffer tank are independent.

6.3.12.1 DHW management mode

The following ACS management modes are alternatives:

1. DHW through delivery from the heating manifold:
A. using the SB1/SB2 DHW buffer tank probe (Paragraph 6.3.12.1.1.1 *p. 26*)
B. using an external request (thermostat TS1/TS2) (Paragraph 6.3.12.1.1.2 *p. 26*)
2. DHW through diverter valves:
A. using the SB1 DHW buffer tank probe (Paragraph 6.3.12.1.2.1 *p. 26*)
B. using an external request (thermostat TS1) (Paragraph 6.3.12.1.2.2 *p. 27*)

6.3.12.1.1 ***DHW through delivery from the heating manifold***

In this operating mode, the coil of the DHW buffer tank(s) is fed by means of one or two deliveries from the secondary circuit.
If there are two DHW buffer tanks, the parameters DHW1Mode and DHW2Mode can be configured independently (e.g. if the first DHW buffer tank is equipped with SB1 probe and the second with TS2 thermostat).

6.3.12.1.1.1 *Delivery and DHW buffer tank probe SB1/SB2*

This operating mode involves supplying the DHW buffer tank 1 coil through a delivery from the secondary circuit and having the SB1 buffer tank probe connected to the boiler with address 1 (Paragraph 4 *p. 11*), disconnecting the electrical resistance normally present on this contact of the boiler electronic board.
If a second DHW buffer thank is present, whose coil is fed by a second delivery from the secondary circuit (CB2), it is possible to use the second SB2 buffer tank probe connected to the boiler with address 2 (Paragraph 4 *p. 11*), by disconnecting the electrical resistance normally present on this contact of the boiler electronic board.
To use this mode:

1. Set parameter DHW1Mode to 0 (Paragraph 6.3.12.9 *p. 28*).
2. Set parameter DHW2Mode to 0 (Paragraph 6.3.12.10 *p. 28*).
3. Remove the electrical resistance on terminals 34-35 of the boiler electronic board with address 1 and connect the buffer tank probe SB1 to the same terminals.
4. If there is also the second DHW buffer tank with the corresponding SB2 probe, remove the electrical resistance on terminals 34-35 of the boiler electronic board with address 2 and connect the buffer tank probe SB2 to the same terminals.
5. Set the desired time schedule and the corresponding setpoints in parameter ProgDHW1 (Paragraph 6.2.1.3 *p. 14*) and if necessary ProgDHW2 (Paragraph 6.2.1.4 *p. 14*), if the second DHW buffer tank is also present.

6.3.12.1.1.2 *Delivery and external request (DHW thermostat)*

This operating mode involves supplying the DHW buffer tank coil through a delivery from the secondary circuit (CB) and having a DHW service request generated by an external request, for example a thermostat (TS1), connected to the boiler with address 1 (Paragraph 4 *p. 11*).
If a second DHW buffer thank is present, whose coil is fed by a second delivery from the secondary circuit (CB2), it is possible to use a second external request, for example a second thermostat (TS2), connected to the boiler with address 2 (Paragraph 4 *p. 11*).
To use this mode:

1. Set parameter DHW1Mode to 1 (Paragraph 6.3.12.9 *p. 28*).
2. Set parameter DHW2Mode to 1 (Paragraph 6.3.12.10 *p. 28*).
3. Connect the external DHW request on terminals 42-43 (flow switch contact) of the boiler board with address 1.
4. If there is also the second DHW buffer tank with its external DHW request, connect it on terminals 42-43 (flow switch contact) of the boiler board with address 2.
5. Set the desired time schedule and the corresponding setpoints (with a temperature level above 32 °C) in parameter ProgDHW1 (Paragraph 6.2.1.3 *p. 14*) and if necessary ProgDHW2 (Paragraph 6.2.1.4 *p. 14*), if the second DHW buffer tank is also present.

6.3.12.1.2 ***DHW through diverter valves***

If there are two DHW buffer tanks, it is not possible for their diverter valves to be operated separately, although each must be connected to a single boiler in the cascade.
When the DHW service is requested by the SB1 DHW buffer tank probe or alternatively by the external request (TS1 thermostat), all boilers that can be activated for the DHW service will switch their diverter valves and activate for the DHW service.

6.3.12.1.2.1 *Diverter valve and DHW buffer tank probe SB1*

This operating mode involves feeding the DHW buffer tank 1 coil through a 3-way diverter valve on the primary circuit and having the SB1 buffer tank probe connected to the boiler with address 1 (Paragraph 4 *p. 11*), disconnecting the electrical resistance normally present on this contact of the boiler electronic board. The diverter valve for the buffer tank supply will also be connected to the same boiler. Any other diverter valves will be connected to the respective boilers.
To use this mode:

1. Set parameter DHW1Mode to 0 (Paragraph 6.3.12.9 *p. 28*).
2. Set the NBoilDHW parameter (Paragraph 6.3.6.12 *p. 19*) to the value corresponding to the number of boilers equipped with DHW diverter valve.
3. Check that each boiler is connected to its own DHW diverter valve.

4. Remove the electrical resistance on terminals 34-35 of the boiler electronic board with address 1 and connect the buffer tank probe SB1 to the same terminals.
5. Set the desired time schedule and the corresponding setpoints in parameter ProgDHW1 (Paragraph 6.2.1.3 *p. 14*).

6.3.12.1.2.2 *Diverter valve and external request (DHW thermostat)*

This operating mode involves supplying the DHW buffer tank coil through a 3-way diverter valve on the primary circuit and having a DHW service request generated by an external request, for example a thermostat (TS1), connected to the boiler with address 1 (Paragraph 4 *p. 11*). The diverter valve for the buffer tank supply will also be connected to the same boiler. Any other diverter valve will be connected to the respective boilers.
To use this mode:

1. Set parameter DHW1Mode to 1 (Paragraph 6.3.12.9 *p. 28*).
2. Set the NBoilDHW parameter (Paragraph 6.3.6.12 *p. 19*) to the value corresponding to the number of boilers equipped with DHW diverter valve.
3. Connect each DHW diverter valve to its own boiler (Figure 3.5 *p. 9*).
4. Connect the external DHW request on terminals 42-43 (flow switch contact) of the boiler board with address 1.
5. Set the desired time schedule and the corresponding setpoints (with a temperature level above 32 °C) in parameter ProgDHW1 (Paragraph 6.2.1.3 *p. 14*).

6.3.12.2 Anti-legionella

There is no specific mode for the anti-legionella disinfection function.
This is done by setting a specific schedule, duration and temperature level in the ProgDHW1 menu (Paragraph 6.2.1.3 *p. 14*) and eventually ProgDHW2 (Paragraph 6.2.1.4 *p. 14*), if the second DHW buffer tank is also present.

Anti-legionella thermal disinfection is activated by default from 23:00 on Saturday until 06:00 on Sunday, with setpoint Lev 3 (65 °C by default), only for DHW buffer tank 1, while it is deactivated for DHW buffer tank 2.

6.3.12.3 DHW1Pump

The parameter displays the status of the CB charging pump of the DHW buffer tank 1.

6.3.12.4 DHW2Pump

The parameter displays the status of the CB2 charging pump of the DHW buffer tank 2.

6.3.12.5 RecircPump

The parameter displays the status of the CRC recirculation pump.

6.3.12.6 DtDHWOn

The parameter sets the differential for ACS charge activation.
The DHW charge is activated if the temperature value of the DHW buffer tank (SB1 probe and possibly SB2 probe, if the second DHW buffer tank is also present) falls below (NomDHWTemp1 - DtDHWOn), or (NomDHWTemp1 - DtDHWOn) for the second DHW buffer tank, and is deactivated when the SB1 probe reaches NomDHWTemp1 (or SB2 reaches NomDHWTemp2, for the second DHW buffer tank).
The value of the NomDHWTemp1 parameter (Paragraph 6.3.5 *p. 17*) corresponds to the temperature level set in the ProgDHW1 time program (Paragraph 6.2.1.3 *p. 14*) for the corresponding time slot.
The value of the NomDHWTemp2 parameter (Paragraph 6.3.5 *p. 17*) corresponds to the temperature level set in the ProgDHW2 time program (Paragraph 6.2.1.4 *p. 14*) for the corresponding time slot.

6.3.12.7 DHWMinTLck

The parameter defines the rules for activating the DHW charging pump through delivery from the heating manifold (CB for the first DHW buffer tank, CB2 if the second DHW buffer tank is also present).
The possible values are:

0. Immediate activation of the charging pump in the presence of a DHW request (either via SB1/SB2 probe or via TS1/TS2 thermostat).
1. Activation of the charging pump only if the temperature difference between ManifTemp (S1) and DHWTemp1 (SB1), or between ManifTemp (S1) and DHWTemp2 (SB2) for the second DHW buffer tank, is greater than 5 °C, in order to ensure adequate heat exchange on the DHW buffer tank coil and to prevent insufficiently hot water flow from the manifold. The charging pump is switched off when ManifTemp (S1) falls below the DHWTemp1 (SB1) value, or when ManifTemp (S1) falls below the DHWTemp2 (SB2) value, for the second DHW buffer tank.

The parameter must be set to 0 (default) for boilers with diverter valves for DHW production.

6.3.12.8 DHWPmpSim

The parameter sets the parallel management mode for heating and DHW requests.
The possible values are:

0. Recommended setting if you want to minimise the charging time, as with this setting all heating circuits are switched off during DHW charging.
1. Value to be set when only the direct heating circuit is to be switched off during DHW charging. The mixed circuit remains active.
2. Value to be set when you want both services, DHW production and heating, to be active on both circuits at the same time. With this setting, the DHW charging time may be longer.

In the case of boilers with diverter valve for DHW production, they are all immediately separated from the heating circuit as soon as a DHW service request is received. The corresponding reduction in the power available for heating service must therefore be taken into account.

6.3.12.9 DHW1Mode

The parameter sets the DHW service request mode for DHW buffer tank 1 charging.
The possible values are:

0. SB1 probe present and connected to the boiler board with address 1 (terminals 34-35)
1. external request (DHW thermostat TS1), connected to the flow switch contacts on the boiler board with address 1 (terminals 42-43)

In presence of a DHW request from external request, the boilers configured for DHW production in the NBoilDHW parameter (Paragraph 6.3.6.12 *p. 19*) are activated, bringing the NomManiTemp setpoint (Paragraph 6.3.5 *p. 17*) to the MaxBoilTemp value (Paragraph 6.3.6.5 *p. 19*).

6.3.12.10 DHW2Mode

The parameter sets the DHW service request mode for DHW buffer tank 2 charging.
The possible values are:

0. SB2 probe present and connected to the boiler board with address 2 (terminals 34-35)
1. external request (DHW thermostat TS2), connected to the flow switch contacts on the boiler board with address 2 (terminals 42-43)

In presence of a DHW request from external request, the boilers configured for DHW production in the NBoilDHW parameter (Paragraph 6.3.6.12 *p. 19*) are activated, bringing the NomManiTemp setpoint (Paragraph 6.3.5 *p. 17*) to the MaxBoilTemp value (Paragraph 6.3.6.5 *p. 19*).

6.3.12.11 DHW1TherSts

The parameter displays the status of the external DHW service request (thermostat TS1), if any, for DHW buffer tank 1.
The possible values are:

0. open contact (no DHW request)
1. closed contact (DHW request active)

6.3.12.12 DHW2TherSts

The parameter displays the status of the external DHW service request (thermostat TS2), if any, for DHW buffer tank 2.
The possible values are:

0. open contact (no DHW request)
1. closed contact (DHW request active)

6.3.12.13 RecircMode

The parameter sets which time program the recirculation pump uses.
The possible values are:

0. according to ProgDHW1 (Paragraph 6.2.1.3 *p. 14*)
1. according to ProgRecirc (Paragraph 6.3.1.5 *p. 15*)
2. according to ProgDHW2 (Paragraph 6.2.1.4 *p. 14*)

6.3.12.14 MaxPwr%DHW

The parameter sets the maximum degree of modulation of the boilers in DHW mode.
Value 1 corresponds to 10% modulation, value 10 to 100% modulation.
The aim is to avoid delivering too much power on exchange coils that have a much lower capacity than the boiler.

6.3.12.15 InstDHWTemp

Not used.

6.3.13 Solar menu

This menu is not used.

6.3.14 FloorCoatHt menu

This menu is not used.

6.3.15 HC1ThermSts menu

This menu displays the opening (value 0) or closing (value 1) status of the external room thermostat request TA1, if any.

6.3.16 HC2ThermSts menu

This menu displays the opening (value 0) or closing (value 1) status of the external room thermostat request TA2, if any.

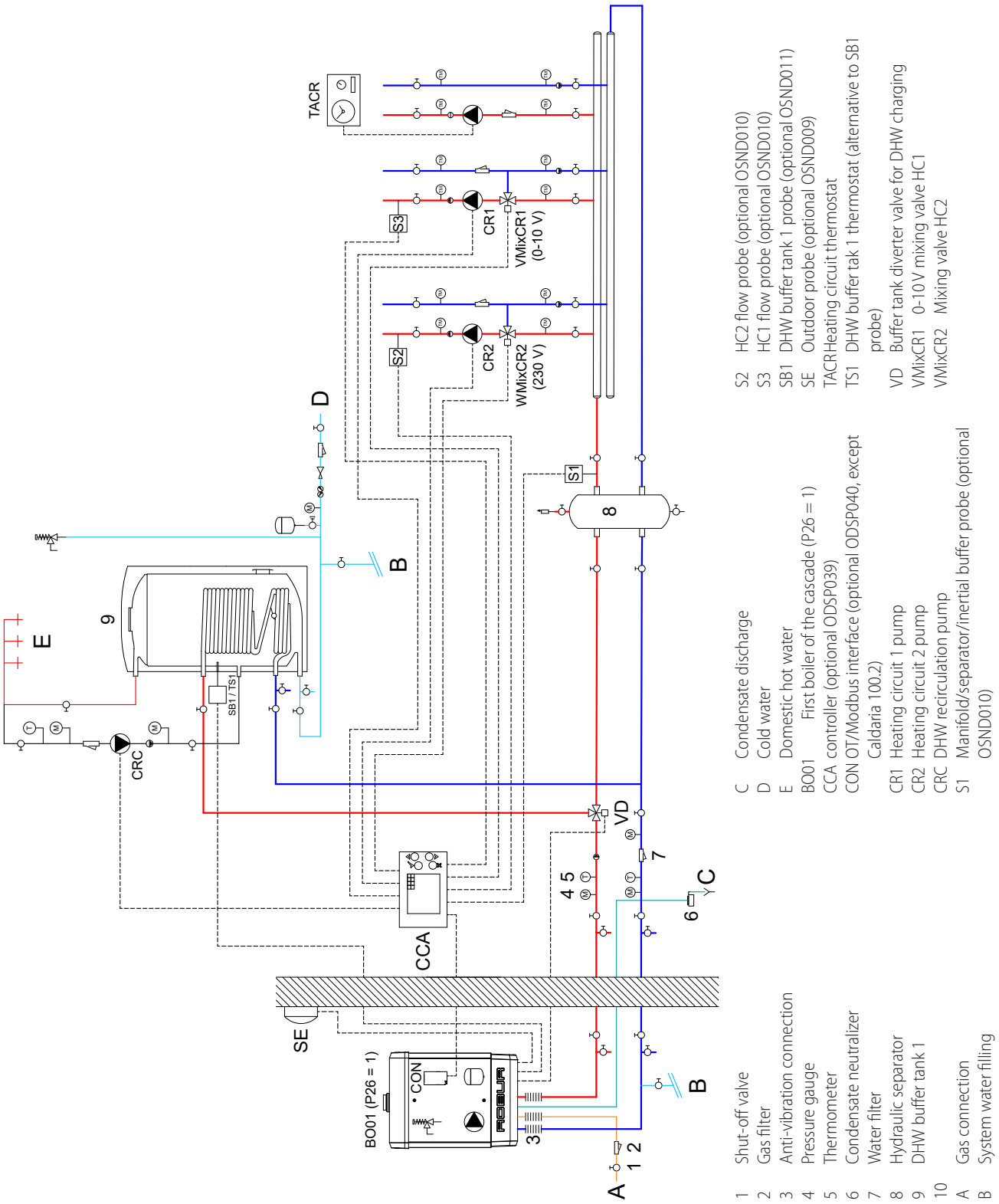
6.3.17 WebVisor menu

This menu is not used.

7 SYSTEM EXAMPLES

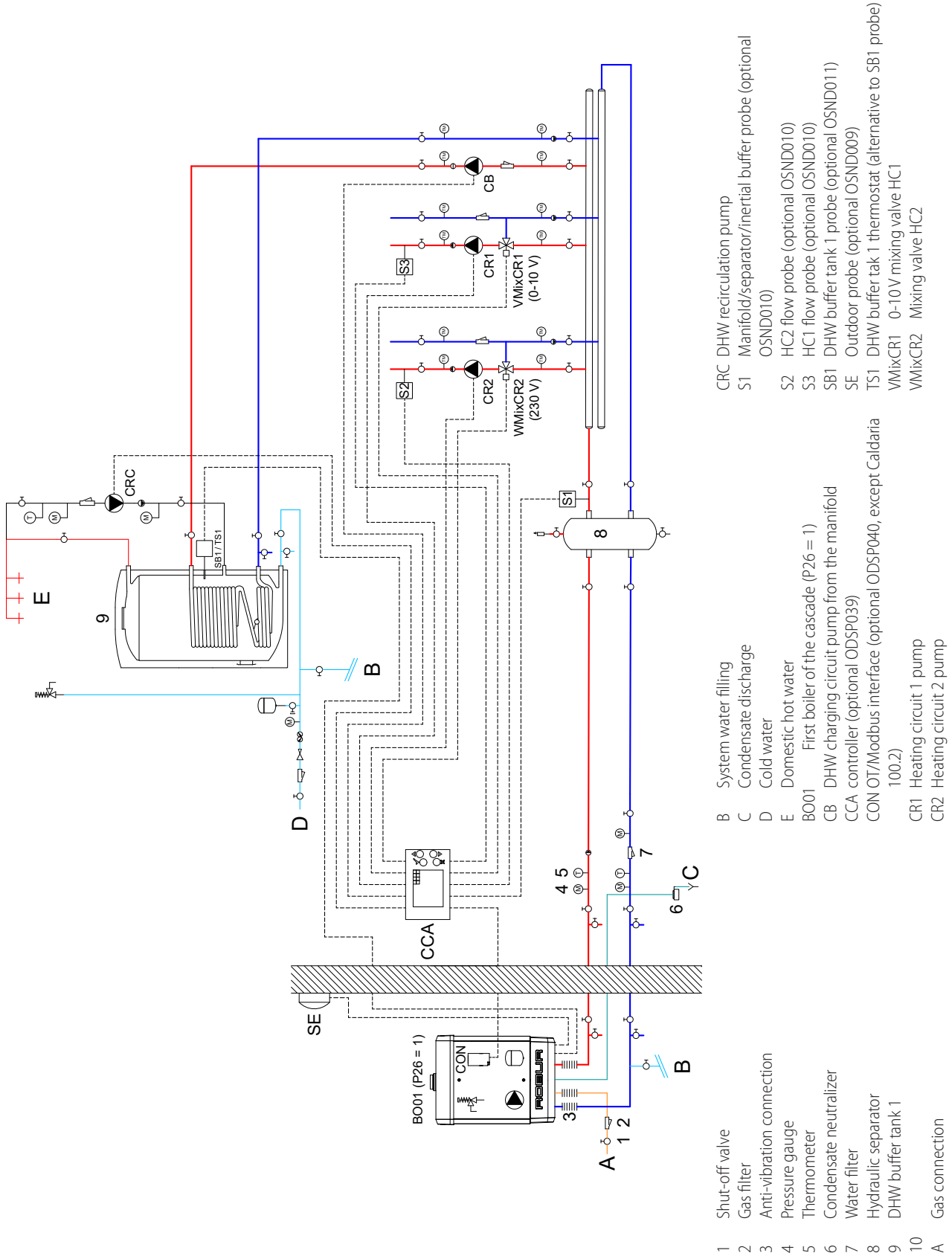
7.1 1 BOILER, DHW WITH DIVERTER VALVE, 3 CIRCUITS OF WHICH 2 MIXED

Figure 7.1 *1 boiler, DHW with diverter valve, 3 circuits of which 2 mixed*



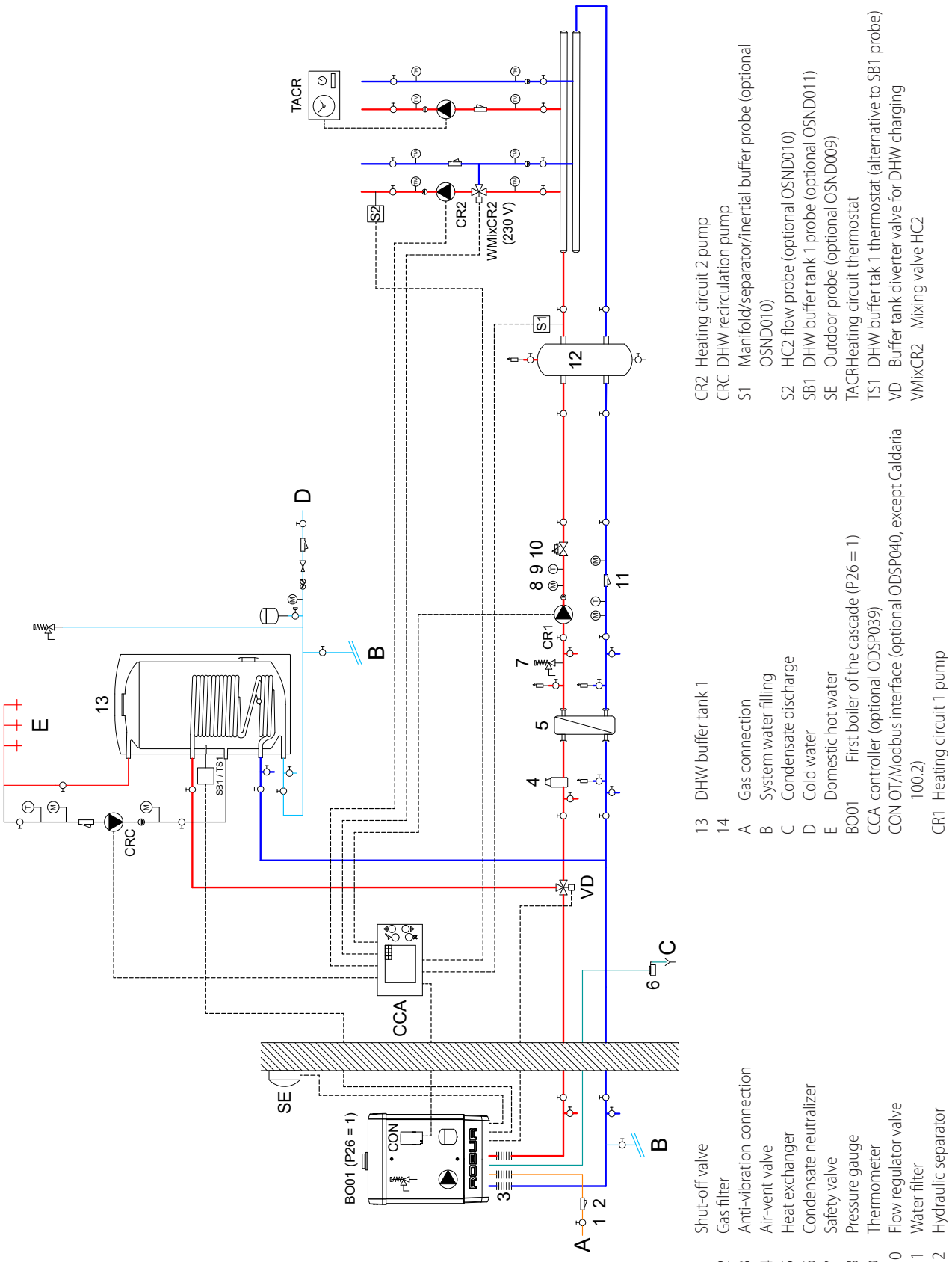
7.2 1 BOILER, DHW WITH DELIVERY, 3 CIRCUITS OF WHICH 2 MIXED

Figure 7.2 *1 boiler, DHW with delivery, 3 circuits of which 2 mixed*



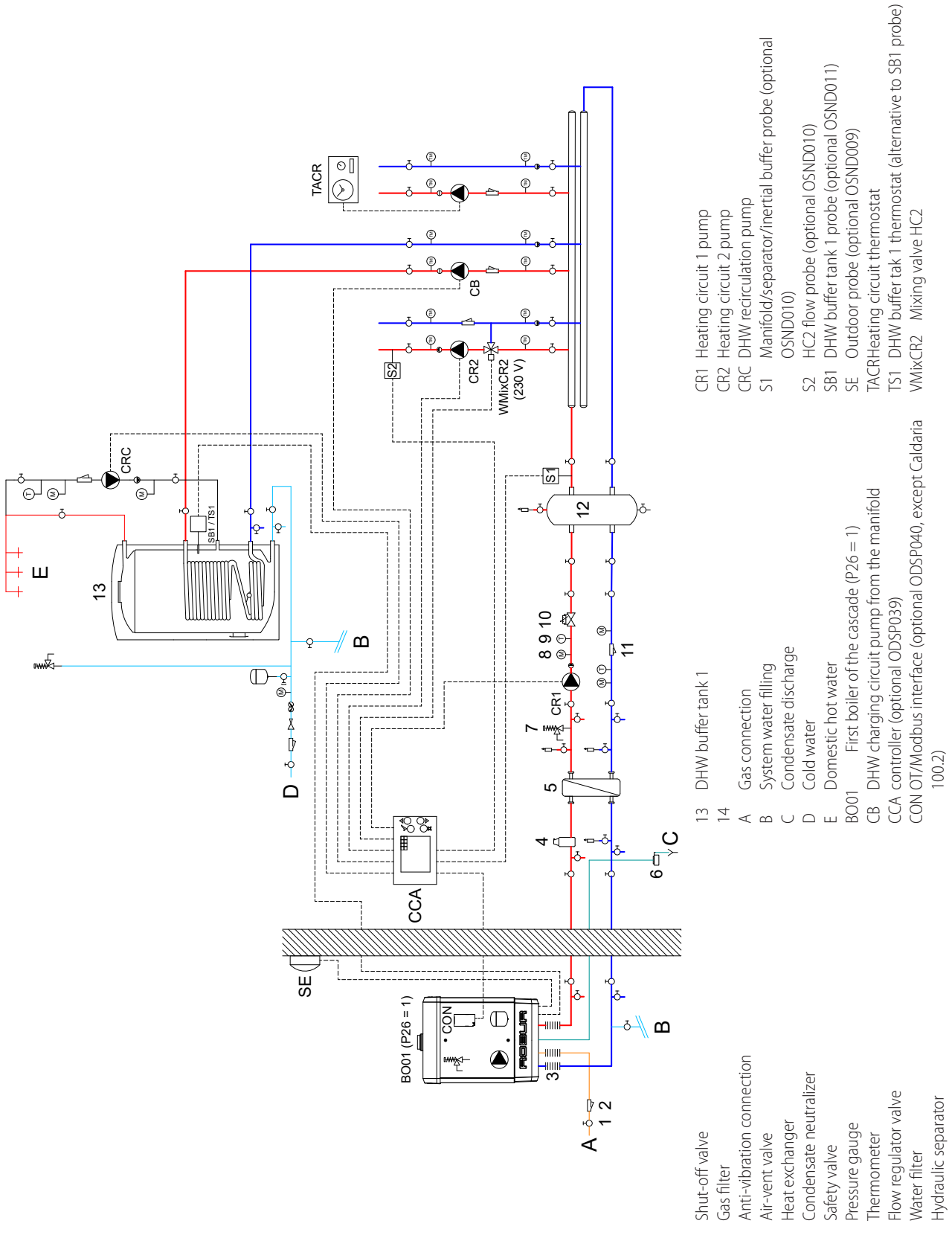
7.3 1 BOILER, DHW WITH DIVERTER VALVE, HEAT EXCHANGER, 2 CIRCUITS OF WHICH 1 MIXED

Figure 7.3 *1 boiler, DHW with diverter valve, heat exchanger, 2 circuits of which 1 mixed*



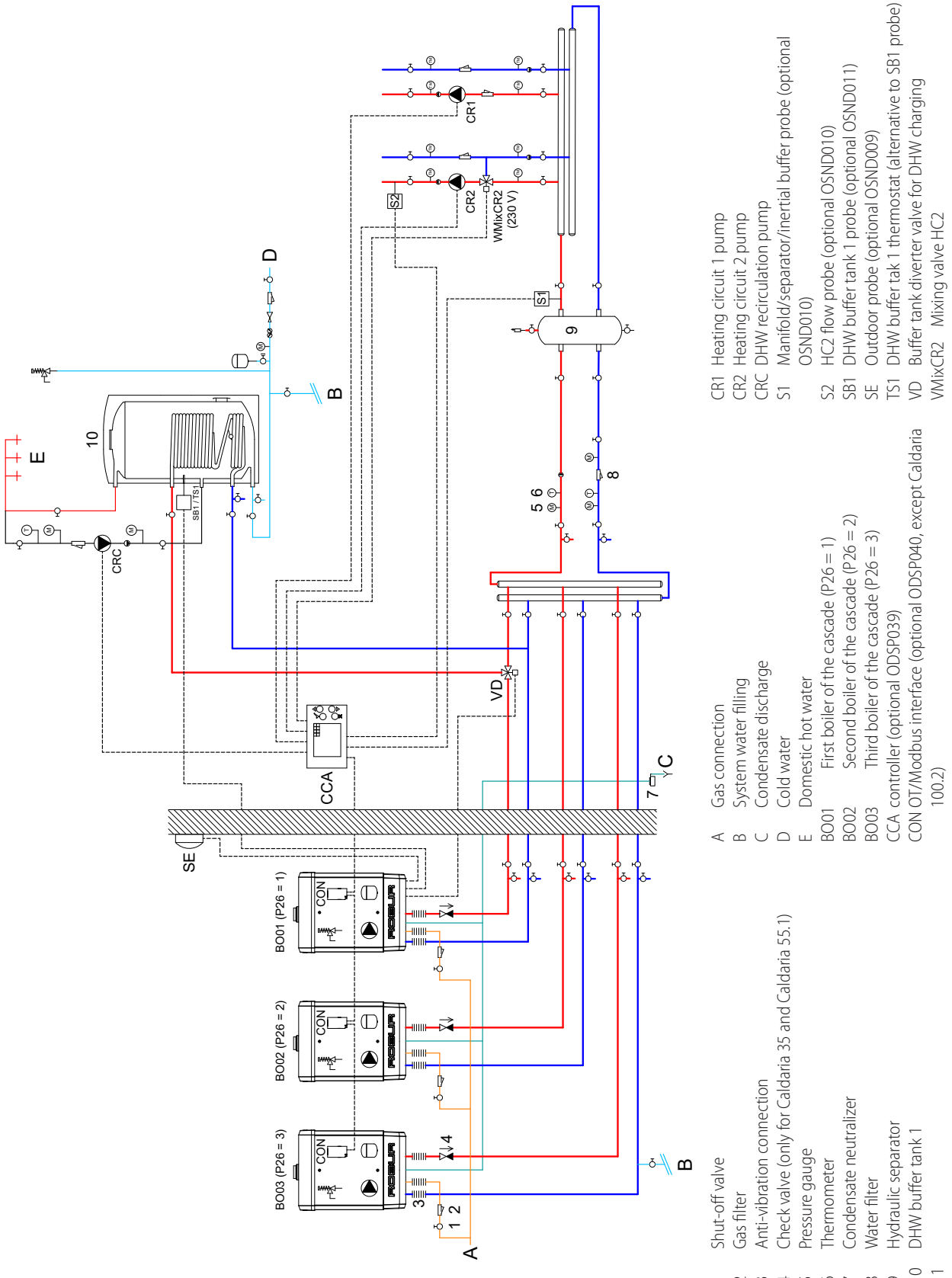
7.4 1 BOILER, DHW WITH DELIVERY, HEAT EXCHANGER, 3 CIRCUITS OF WHICH 1 MIXED

Figure 7.4 *1 boiler, DHW with delivery, heat exchanger, 3 circuits of which 1 mixed*



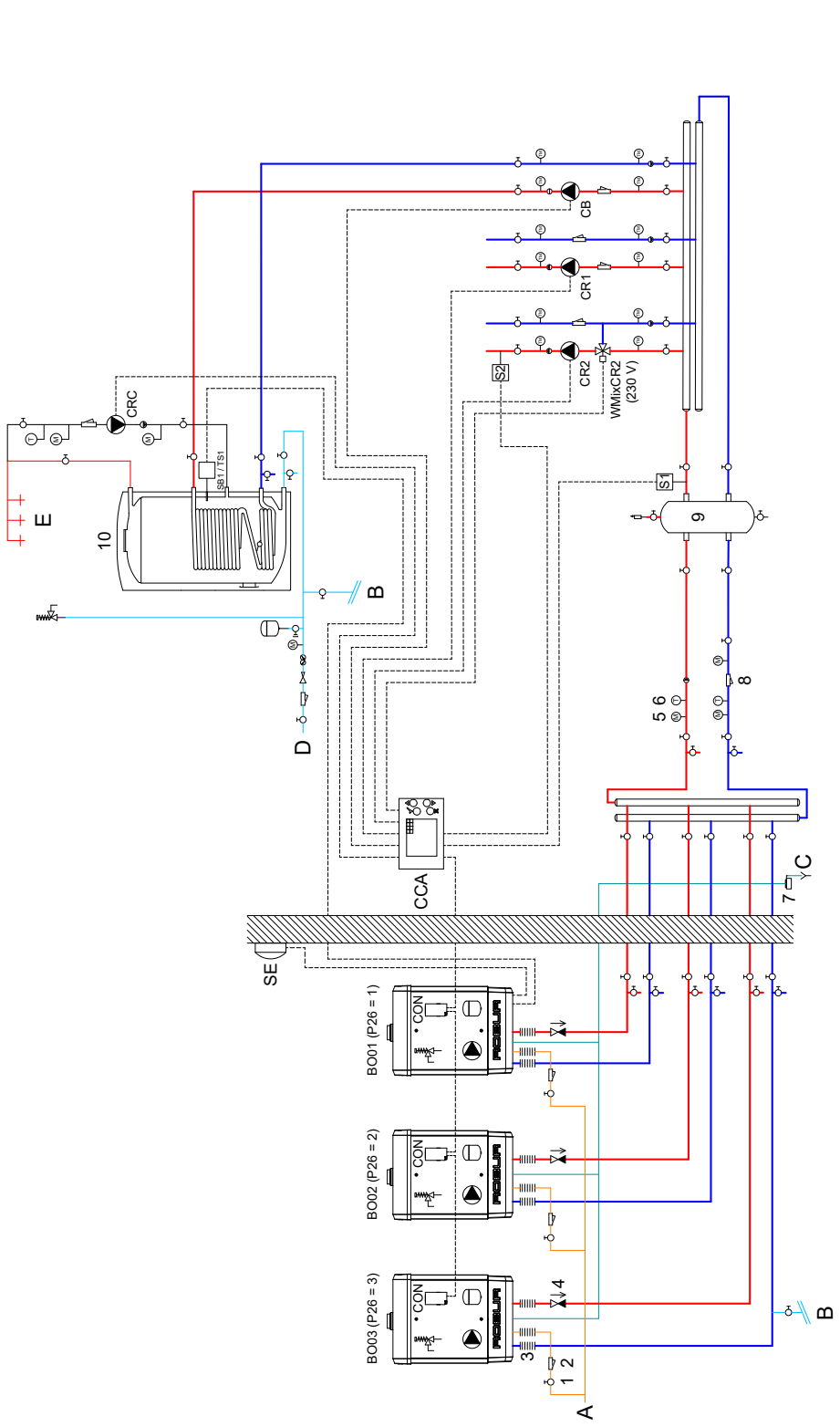
7.5 3 BOILERS, DHW WITH DIVERTER VALVE, 2 CIRCUITS OF WHICH 1 MIXED

Figure 7.5 *3 boilers, DHW with diverter valve, 2 circuits of which 1 mixed*



7.6 3 BOILERS, DHW WITH DELIVERY, 3 CIRCUITS OF WHICH 1 MIXED

Figure 7.6 *3 boilers, DHW with delivery, 3 circuits of which 1 mixed*

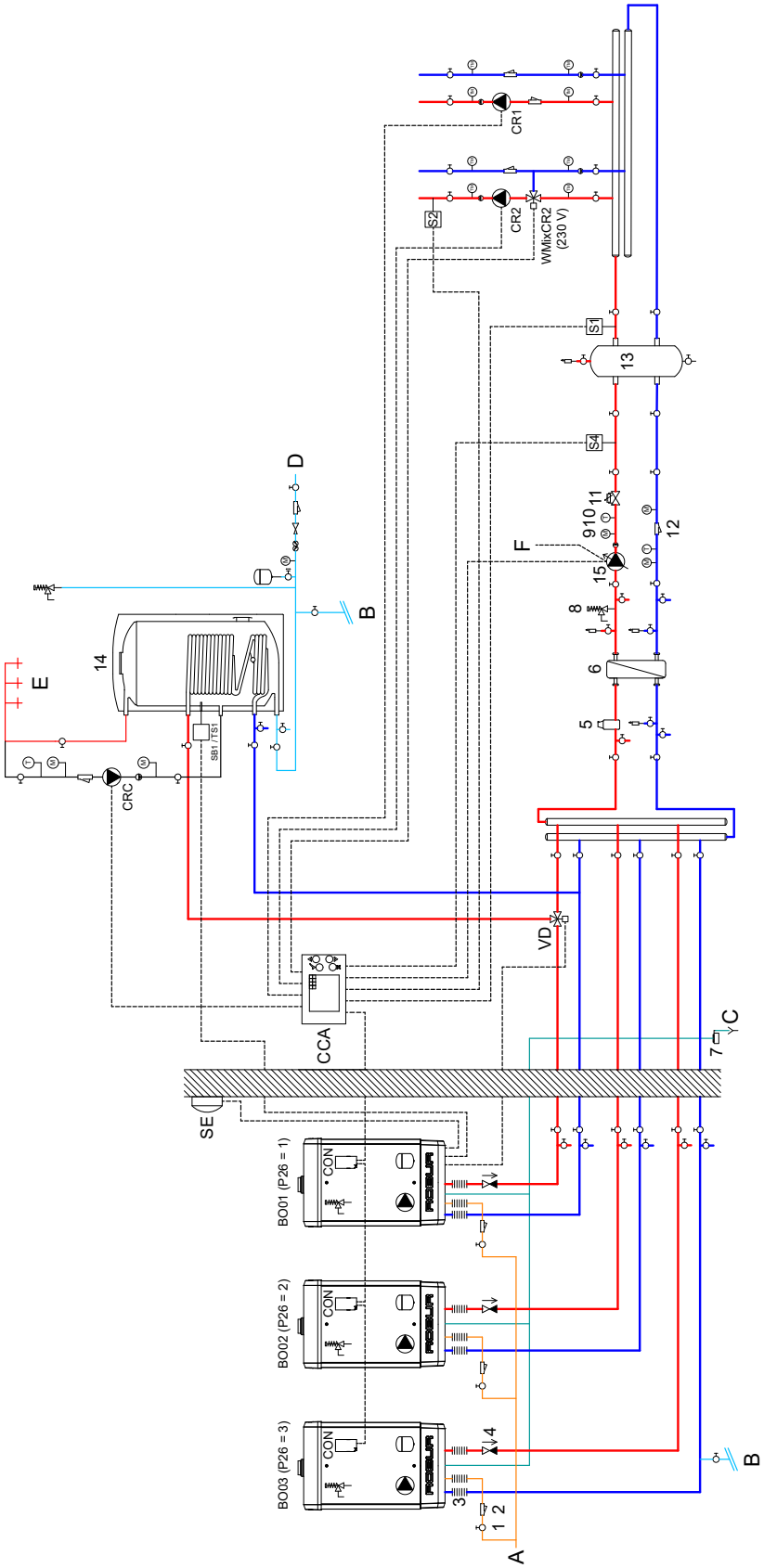


1 Shut-off valve
2 Gas filter
3 Anti-vibration connection
4 Check valve (only for Caldaria 35 and Caldaria 55.1)
5 Pressure gauge
6 Thermometer
7 Condensate neutralizer
8 Water filter
9 Hydraulic separator
10 DHW buffer tank 1
11

A Gas connection
B System water filling
C Condensate discharge
D Cold water
E Domestic hot water
BO01 First boiler of the cascade (P26 = 1)
BO02 Second boiler of the cascade (P26 = 2)
BO03 Third boiler of the cascade (P26 = 3)
CB DHW charging circuit pump from the manifold
CCA controller (optional ODSP039)
CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)
CR1 Heating circuit 1 pump
CR2 Heating circuit 2 pump
CRC DHW recirculation pump
S1 Manifold/separator/inertial buffer probe (optional OSND010)
S2 HC2 flow probe (optional OSND010)
SB1 DHW buffer tank 1 probe (optional OSND011)
SE Outdoor probe (optional OSND009)
TS1 DHW buffer tak 1 thermostat (alternative to SB1 probe)
VMixCR2 Mixing valve HC2

7.7 3 BOILERS, DHW WITH DIVERTER VALVE, HEAT EXCHANGER, 2 CIRCUITS OF WHICH 1 MIXED

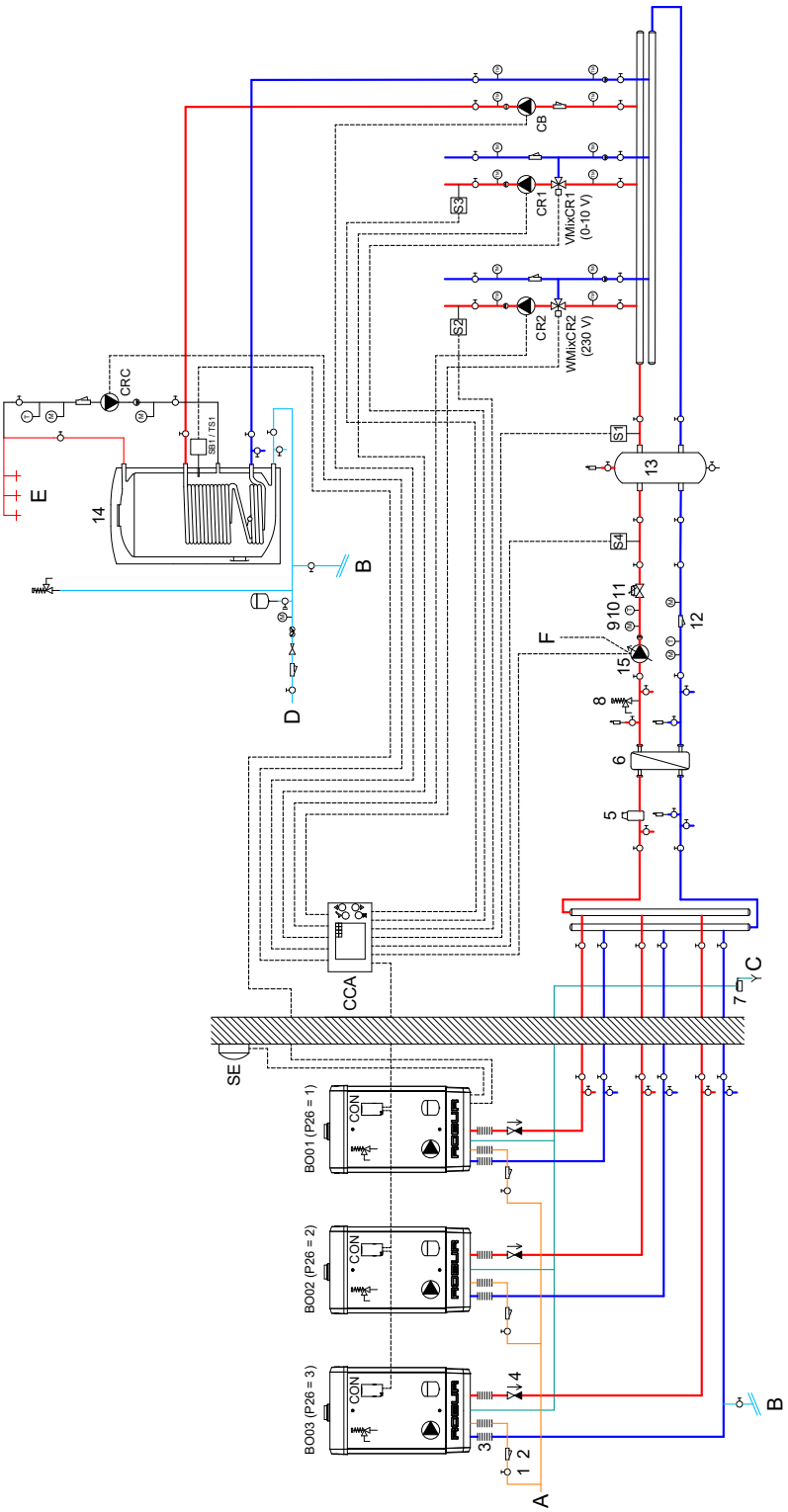
Figure 7.7 *3 boilers, DHW with diverter valve, heat exchanger, 2 circuits of which 1 mixed*



1 Shut-off valve
2 Gas filter
3 Anti-vibration connection
4 Check valve (only for Caldaria 35 and Caldaria 55.1)
5 Air-vent valve
6 Heat exchanger
7 Condensate neutralizer
8 Safety valve
9 Pressure gauge
10 Thermometer
11 Flow regulator valve
12 Water filter
13 Hydraulic separator
14 DHW buffer tank 1
15 Variable flow PWM pump
16
A Gas connection
B System water filling
C Condensate discharge
D Cold water
E Domestic hot water
F Variable flow PWM pump power supply
BO01 First boiler of the cascade (P26 = 1)
BO02 Second boiler of the cascade (P26 = 2)
BO03 Third boiler of the cascade (P26 = 3)
CCA controller (optional ODSP039)
CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)
CR1 Heating circuit 1 pump
CR2 Heating circuit 2 pump
CRC DHW recirculation pump
S1 Manifold/separator/inertial buffer probe (optional OSND010)
S2 HC2 flow probe (optional OSND010)
S4 Post heat exchanger/hydraulic separator probe (optional OSND010)
SB1 DHW buffer tank 1 probe (optional OSND011)
SE Outdoor probe (optional OSND009)
TS1 DHW buffer tak 1 thermostat (alternative to SB1 probe)
VD Buffer tank diverter valve for DHW charging
VMixCR2 Mixing valve HC2

7.8 3 BOILERS, DHW WITH DELIVERY, HEAT EXCHANGER, 3 CIRCUITS OF WHICH 2 MIXED

Figure 7.8 *3 boilers, DHW with delivery, heat exchanger, 3 circuits of which 2 mixed*

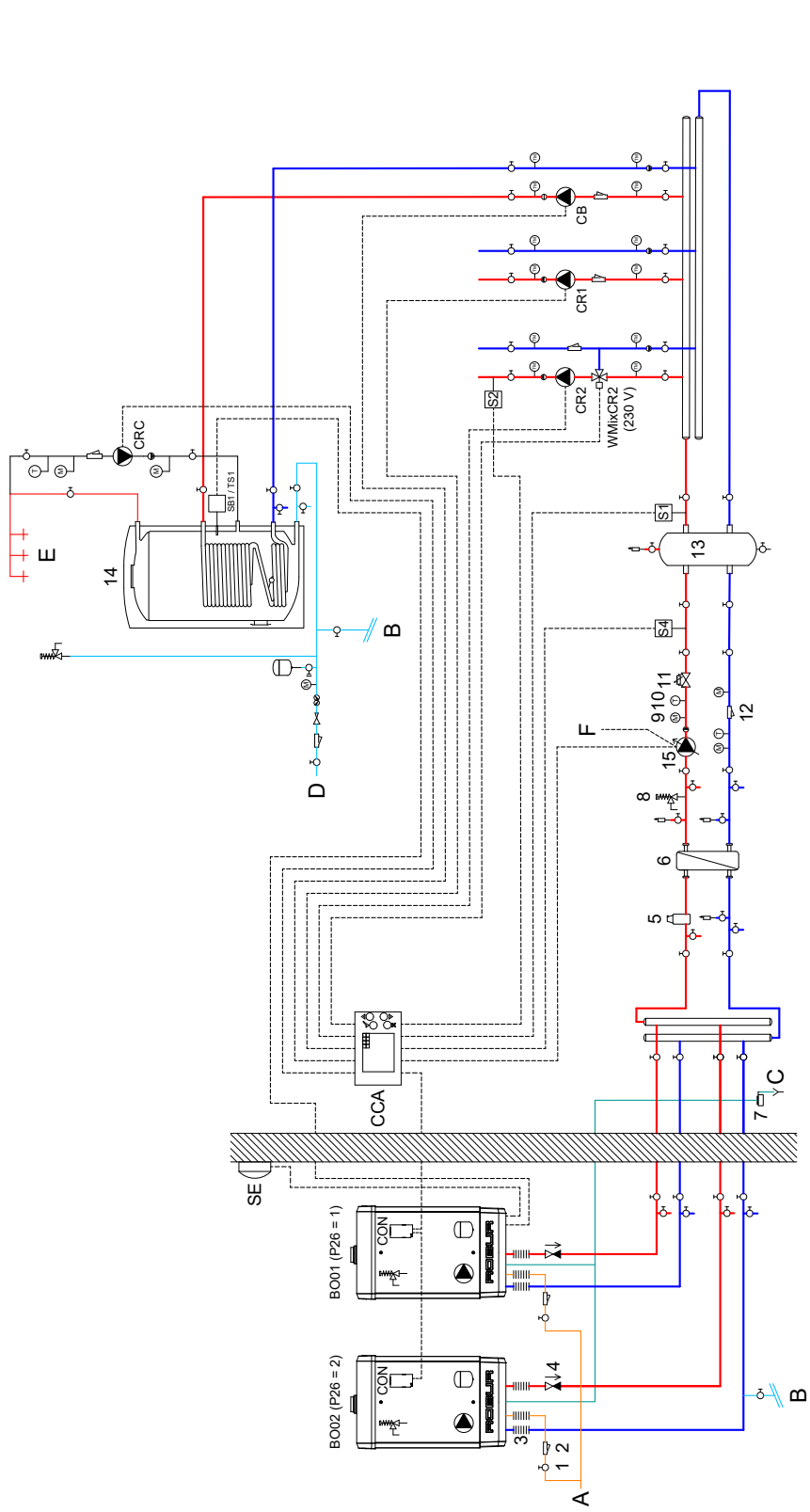


1 Shut-off valve
2 Gas filter
3 Anti-vibration connection
4 Check valve (only for Caldaria 35 and Caldaria 55.1)
5 Air-vent valve
6 Heat exchanger
7 Condensate neutralizer
8 Safety valve
9 Pressure gauge
10 Thermometer
11 Flow regulator valve
12 Water filter
13 Hydraulic separator
14 DHW buffer tank 1
15 Variable flow PWM pump
16

A Gas connection
B System water filling
C Condensate discharge
D Cold water
E Domestic hot water
F Variable flow PWM pump power supply
BO01 First boiler of the cascade (P26 = 1)
BO02 Second boiler of the cascade (P26 = 2)
BO03 Third boiler of the cascade (P26 = 3)
CB DHW charging circuit pump from the manifold
CCA controller (optional ODSP039)
CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)
CR1 Heating circuit 1 pump
CR2 Heating circuit 2 pump
CRC DHW recirculation pump
S1 Manifold/separator/inertial buffer probe (optional OSND010)
S2 HC2 flow probe (optional OSND010)
S3 HC1 flow probe (optional OSND010)
S4 Post heat exchanger/hydraulic separator probe (optional OSND010)
SB1 DHW buffer tank 1 probe (optional OSND011)
SE Outdoor probe (optional OSND009)
TS1 DHW buffer tak 1 thermostat (alternative to SB1 probe)
VMixCR1 0-10 V mixing valve HC1
VMixCR2 Mixing valve HC2

7.9 2 BOILERS, DHW WITH DELIVERY, HEAT EXCHANGER, 3 CIRCUITS OF WHICH 1 MIXED

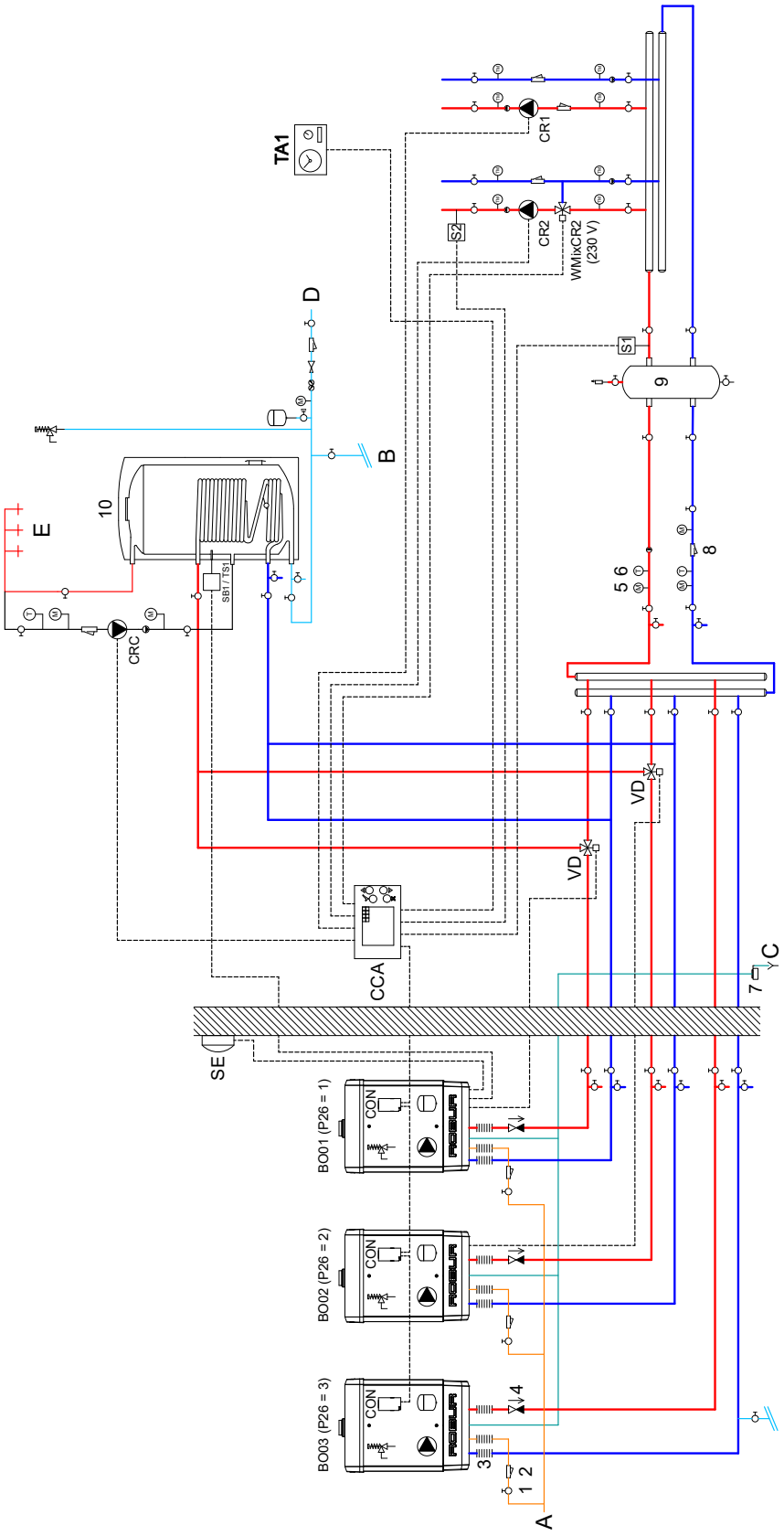
Figure 7.9 *2 boilers, DHW with delivery, heat exchanger, 3 circuits of which 1 mixed*



1 Shut-off valve
2 Gas filter
3 Anti-vibration connection
4 Check valve (only for Caldaria 35 and Caldaria 55.1)
5 Air-vent valve
6 Heat exchanger
7 Condensate neutralizer
8 Safety valve
9 Pressure gauge
10 Thermometer
11 Flow regulator valve
12 Water filter
13 Hydraulic separator
14 DHW buffer tank 1
15 Variable flow PWM pump
16
A Gas connection
B System water filling
C Condensate discharge
D Cold water
E Domestic hot water
F Variable flow PWM pump power supply
BO01 First boiler of the cascade (P26 = 1)
BO02 Second boiler of the cascade (P26 = 2)
CB DHW charging circuit pump from the manifold
CCA controller (optional ODSP039)
CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)
CR1 Heating circuit 1 pump
CR2 Heating circuit 2 pump
CRC DHW recirculation pump
S1 Manifold/separator/inertial buffer probe (optional OSND010)
S2 HC2 flow probe (optional OSND010)
S4 Post heat exchanger/hydraulic separator probe (optional OSND010)
SB1 DHW buffer tank 1 probe (optional OSND011)
SE Outdoor probe (optional OSND009)
TS1 DHW buffer tak 1 thermostat (alternative to SB1 probe)
VMixCR2 Mixing valve HC2

7.10 3 BOILERS, DHW WITH 2 DIVERTER VALVES, 2 CIRCUITS OF WHICH 1 MIXED

Figure 7.10 *3 boilers, DHW with 2 diverter valves, 2 circuits of which 1 mixed*



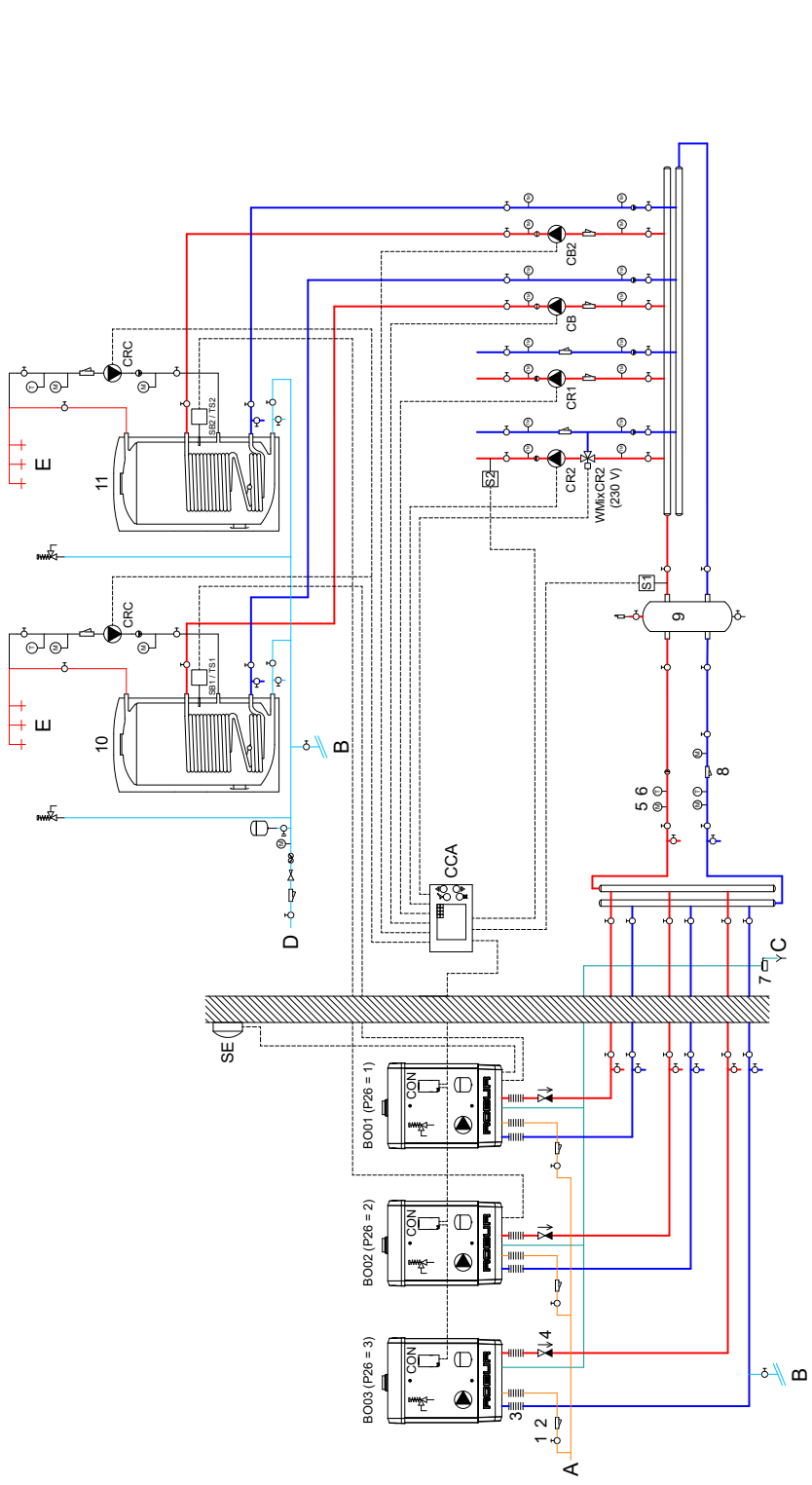
1 Shut-off valve
2 Gas filter
3 Anti-vibration connection
4 Check valve (only for Caldaria 35 and Caldaria 55.1)
5 Pressure gauge
6 Thermometer
7 Condensate neutralizer
8 Water filter
9 Hydraulic separator
10 DHW buffer tank 1
11
A Gas connection

B System water filling
C Condensate discharge
D Cold water
E Domestic hot water
BO01 First boiler of the cascade (P26 = 1)
BO02 Second boiler of the cascade (P26 = 2)
BO03 Third boiler of the cascade (P26 = 3)
CCA controller (optional ODSP039)
CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)
CR1 Heating circuit 1 pump
CR2 Heating circuit 2 pump

CRC DHW recirculation pump
S1 Manifold/separator/inertial buffer probe (optional OSND010)
S2 HC2 flow probe (optional OSND010)
SB1 DHW buffer tank 1 probe (optional OSND011)
SE Outdoor probe (optional OSND009)
TA1 External heating request
TS1 DHW buffer tak 1 thermostat (alternative to SB1 probe)
VD Buffer tank diverter valve for DHW charging
VMixCR2 Mixing valve HC2

7.11 3 BOILERS, DHW WITH 2 DELIVERIES, 4 CIRCUITS OF WHICH 1 MIXED

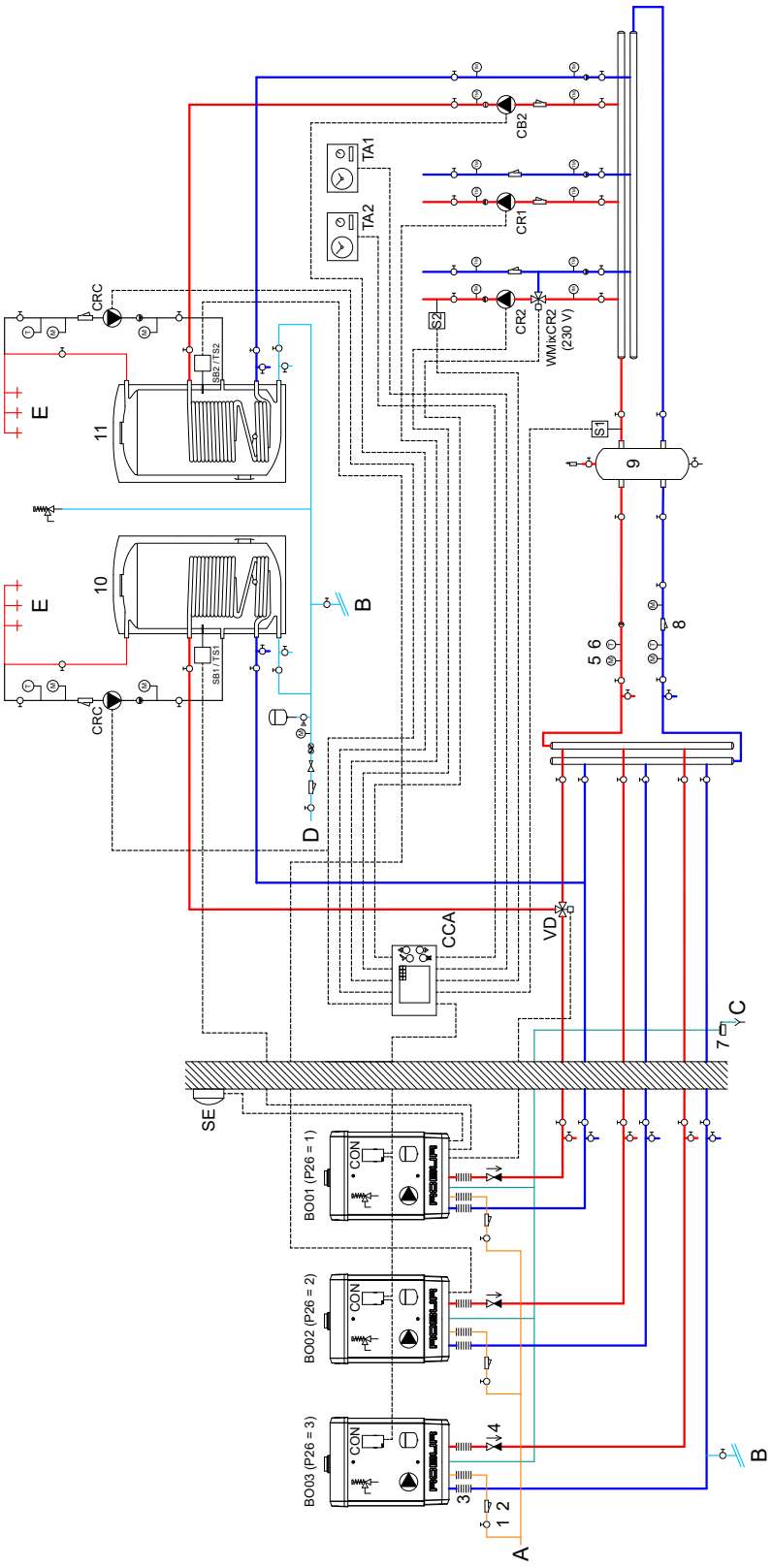
Figure 7.11 *3 boilers, DHW with 2 deliveries, 4 circuits of which 1 mixed*



1 Shut-off valve
2 Gas filter
3 Anti-vibration connection
4 Check valve (only for Caldaria 35 and Caldaria 55.1)
5 Pressure gauge
6 Thermometer
7 Condensate neutralizer
8 Water filter
9 Hydraulic separator
10 DHW buffer tank 1
11 DHW buffer tank 2
12
A Gas connection
B System water filling
C Condensate discharge
D Cold water
E Domestic hot water
BO01 First boiler of the cascade (P26 = 1)
BO02 Second boiler of the cascade (P26 = 2)
BO03 Third boiler of the cascade (P26 = 3)
CB Charging circuit pump from the manifold for DHW buffer tank 1
CB2 Charging circuit pump from the manifold for DHW buffer tank 2
CCA controller (optional ODSP039)
CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)
CR1 Heating circuit 1 pump
CR2 Heating circuit 2 pump
CRC DHW recirculation pump
S1 Manifold/separator/inertial buffer probe (optional OSND010)
S2 HC2 flow probe (optional OSND010)
SB1 DHW buffer tank 1 probe (optional OSND011)
SB2 DHW buffer tank 2 probe (optional OSND011)
SE Outdoor probe (optional OSND009)
TS1 DHW buffer tak 1 thermostat (alternative to SB1 probe)
TS2 DHW buffer tak 2 thermostat (alternative to SB2 probe)
VMixCR2 Mixing valve HC2

7.12 3 BOILERS, DHW WITH DIVERTER VALVE AND DELIVERY, 3 CIRCUITS OF WHICH 1 MIXED

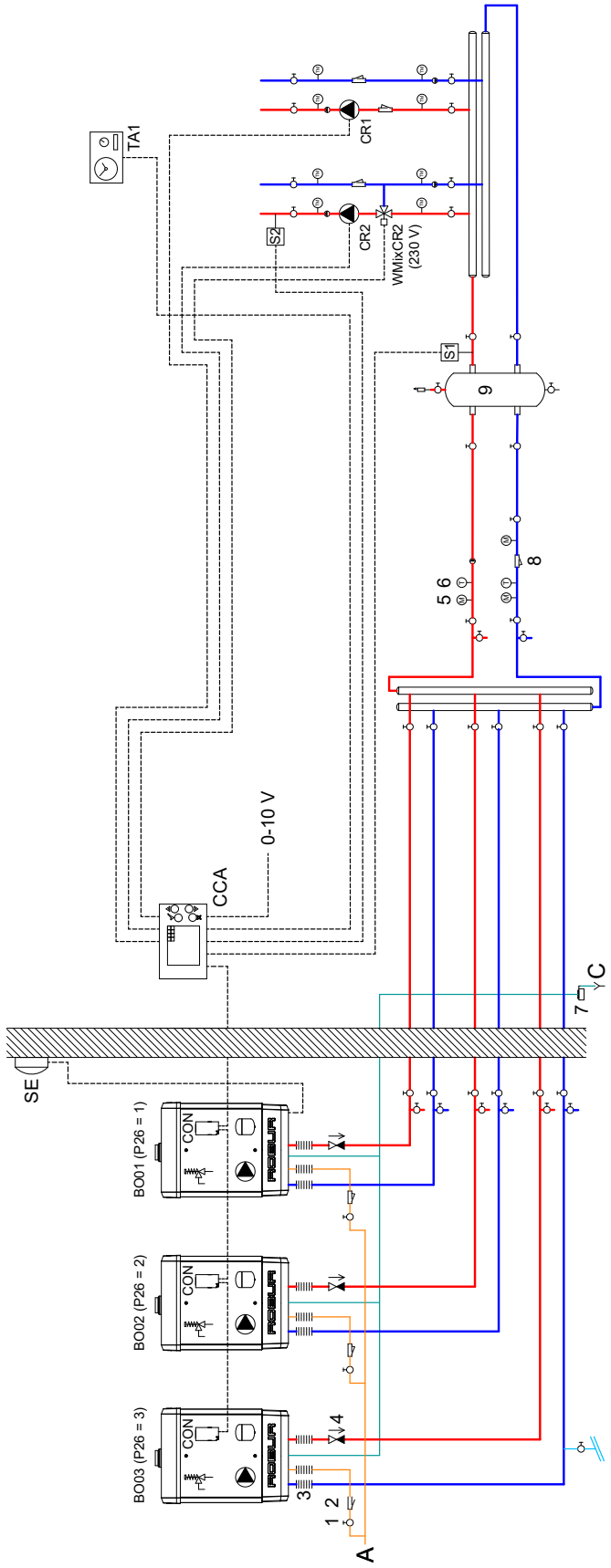
Figure 7.12 *3 boilers, DHW with diverter valve and delivery, 3 circuits of which 1 mixed*



1 Shut-off valve
2 Gas filter
3 Anti-vibration connection
4 Check valve (only for Caldaria 35 and Caldaria 55.1)
5 Pressure gauge
6 Thermometer
7 Condensate neutralizer
8 Water filter
9 Hydraulic separator
10 DHW buffer tank 1
11 DHW buffer tank 2
12
A Gas connection
B System water filling
C Condensate discharge
D Cold water
E Domestic hot water
BO01 First boiler of the cascade (P26 = 1)
BO02 Second boiler of the cascade (P26 = 2)
BO03 Third boiler of the cascade (P26 = 3)
CB2 Charging circuit pump from the manifold for DHW buffer tank 2
CCA controller (optional ODSP039)
CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)
CR1 Heating circuit 1 pump
CR2 Heating circuit 2 pump
CRC DHW recirculation pump
S1 Manifold/separator/inertial buffer probe (optional OSND010)
S2 HC2 flow probe (optional OSND010)
SB1 DHW buffer tank 1 probe (optional OSND011)
SB2 DHW buffer tank 2 probe (optional OSND011)
SE Outdoor probe (optional OSND009)
TA1 External heating request for heating circuit 1
TA2 External heating request for heating circuit 2
TS1 DHW buffer tak 1 thermostat (alternative to SB1 probe)
TS2 DHW buffer tak 2 thermostat (alternative to SB2 probe)
VD Buffer tank diverter valve for DHW charging
VMixCR2 Mixing valve HC2

7.13 3 BOILERS, HEATING ONLY, 0-10 V EXTERNAL INPUT, 2 CIRCUITS OF WHICH 1 MIXED

Figure 7.13 *3 boilers, heating only, 0-10 V external input, 2 circuits of which 1 mixed*



1 Shut-off valve
2 Gas filter
3 Anti-vibration connection
4 Check valve (only for Caldaria 35 and Caldaria 55.1)
5 Pressure gauge
6 Thermometer
7 Condensate neutralizer
8 Water filter
9 Hydraulic separator
10

A Gas connection
B System water filling
C Condensate discharge
0-10 V External temperature or power request signal
BO01 First boiler of the cascade (P26 = 1)
BO02 Second boiler of the cascade (P26 = 2)
BO03 Third boiler of the cascade (P26 = 3)
CCA controller (optional ODSP039)
CON OT/Modbus interface (optional ODSP040, except Caldaria 100.2)

CR1 Heating circuit 1 pump
CR2 Heating circuit 2 pump
S1 Manifold/separator/inertial buffer probe (optional OSND010)
S2 HC2 flow probe (optional OSND010)
SE Outdoor probe (optional OSND009)
TA1 External heating request
VMixCR2 Mixing valve HC2

8 FAULT CODES

All fault codes are indicated directly on the display of the boiler board where it occurs and can be reset using the ® key of the boiler.
The alarm status of each individual boiler is also shown in the Boiler menu, under WarningBoil1 (WarningBoil2 for the Caldaria 100.2 slave module), while reset is possible from the ResetWarning item in the same menu. For further details see Paragraph 6.3.7 *p. 19*.

Refer to the installation, use and maintenance manual of the individual boiler for the list of codes and their meaning.

In the presence of the controller additional faults may occur, detailed in Table 8.1 *p. 42* below:

Table 8.1 *Additional fault codes*

Code	Fault	Possible cause	Remedial action	Reset
E32	Communication error between the boiler board and the OT/Modbusinterface.	Wrong electrical connection	Check the electrical connection between boiler board and OT/Modbus interface.	Automatic
		OT/Modbus interface fault	Replace	
		Boiler board not working	Replace	
E52	Communication error between the OT/Modbusinterface and the controller	Power supply failure to controller	Wait up to two minutes after switching on the controller to read the Modbus addresses of the boilers.	Automatic
		Wrong electrical connection	Check the electrical connection between OT/Modbus interface and controller.	
		OT/Modbus interface fault	Replace	
		controller fault	Replace	

If one of these errors occurs and it is necessary to replace the controller or the OT/Modbus interface, in order to ensure that the boilers can still work, although without cascade management, proceed as follows, depending on the type of boiler and the type of error.

For Caldaria 35 and Caldaria 55.1, in case of E32 and E52 errors:

1. Access parameter P28 of each individual boiler.
2. Set the value 02 (Modbus control disabled).
3. Close the TA-TA request contact on the individual boiler.

For Caldaria 100.2 in case of error E52:

1. Power off the boiler and restore it after 5 seconds.
2. Close the TA-TA request contact on the individual boiler.

In case of error E32 on the Caldaria 100.2 it will not be possible in any way to activate the boiler until the faulty boards have been replaced.

9 MENUS AND PARAMETERS TABLE

Table 9.1 *ODSP039 menus structure and parameters*

Menu	Description	Password	Submenu	Description	Submenu	Description	Setting	Default
Setup	System settings	NO	ProgHC1	Heating circuit 1 programming			6.2.1.1 *p. 13*	6.2.1.1*p.13*
			ProgHC2	Heating circuit 2 programming			6.2.1.2 *p. 14*	6.2.1.2*p.14*
			ProgDHW1	DHW programming for DHW buffer tank 1			6.2.1.3 *p. 14*	6.2.1.3*p.14*
			ProgDHW2	DHW programming for DHW buffer tank 2			6.2.1.4 *p. 14*	6.2.1.4*p.14*
			ProgRecirc	DHW recirculation programming			6.3.1.5 *p. 15*	6.3.1.5*p.15*
			Date	Date setting			dd.mm.yy	-
			Time	Time setting			mm:hh	-
			UseLightSaving	Selection of automatic or manual summer time switch			0. manual 1. automatic	0
			Language	Language selection			Italian English Polskie	Italian
			Board Test	controller input/output test			6.3.1.10 *p. 16*	-
			Info	FW version			-	-
Network	Not used							
OperatMode	System operating mode	NO	-				0. OFF 1. DHW only 2. Heating + DHW 3. Heating only 4. Not used 5. Not used	0
SummerSeason	Annual shutdown period of the heating system.	YES	Status	Activation/deactivation the shutdown period of the heating system			off on	off
			StartingDay	Start day of the heating system shutdown period			1 ÷ 31	15
			StartingMonth	Start month of the heating system shutdown period			1 ÷ 12	4
			EndingDay	End day of the heating system shutdown period			1 ÷ 31	15
			EndingMonth	End month of the heating system shutdown period			1 ÷ 12	10

Menu	Description	Password	Submenu	Description	Submenu	Description	Setting	Default
ViewTemp	Temperatures display	NO	ExtTemp	External temperature			[°C]	-
			ManifTemp	Manifold/separator temperature (S1)			[°C]	-
			NomManiTemp	Manifold/separator setpoint (S2)			[°C]	-
			TComp/HEXech	Manifold temperature post heat exchanger/separator (S4)			[°C]	-
			HC	Temperatures of heating circuits	TempHC2	Mixed circuit 2 temperature (S2)	[°C]	-
					NomTem-pHC2	Mixed circuit 2 setpoint (S2)	[°C]	-
					TempHC1	Direct/mixed circuit 1 temper-ature (S3)	[°C]	-
					NomTem-pHC1	Direct/mixed circuit 1 (S3) setpoint	[°C]	-
			DHW	Temperatures of DHW services	DHWTemp1	Temperature of DHW buffer tank 1 (SB1)	[°C]	-
					DHWTemp2	Temperature of DHW buffer tank 2 (SB2)	[°C]	-
					NomDHW-Temp1	Nominal temperature of DHW buffer tank 1 (SB1)	[°C]	-
					NomDHW-Temp2	Nominal temperature of DHW buffer tank 2 (SB2)	[°C]	-
			RoomTemp1	Not used			[°C]	-100
			RoomTemp2	Not used			[°C]	-100
			SolManTemp	Not used			[°C]	-100
			SolBufInfT	Not used			[°C]	-100
			SolBufInfT2	Not used			[°C]	-100
			SolManTemp2	Not used			[°C]	-100
			SolBufSupT	Not used			[°C]	-100

Menu	Description	Password	Submenu	Description	Submenu	Description	Setting	Default
Cascade	Cascade management	YES	Readings	Rad-only boiler parameters	NBoilFound	Number of found boilers	1 ÷ 8	-
					NBoilReq	Number of active boilers	1 ÷ 8	-
					Modulation%	Modulation degree of the cascade system	0 ÷ 100 %	-
			MaxBoilTemp	Maximum flow temperature of the individual boiler			30 ÷ 90 °C	77
			TLimDay	Outdoor temperature limit for heating off			5 ÷ 35 °C	22
			TLimNight	Outdoor temperature limit for heating on			-10 ÷ 20 °C	-5
			ModBoilMAX	Maximum modulation degree of the single boiler			10 ÷ 100 %	80
			ModBoilON	Modulation degree above which the next boiler is switched on			10 ÷ 100 %	80
			ModBoilOff	Minimum modulation degree below which the previous boiler in the sequence is switched off			0 ÷ 100 %	30
			ModBoilMIN	Minimum modulation degree above which the next boiler is switched on or below which the previous boiler in the sequence is switched off			0 ÷ 100 %	0
			NBoilDHW	Number of boilers with DHW diverter valve			0 ÷ 8	0
			NBoilHC	Number of boilers activated in case of peak load			0 ÷ 8	0
			BoilerSeq	Boiler ignition sequence			1 ÷ 5	5
			SeqChgTime	Boiler ignition sequence change time			10 ÷ 800 h	100
			SeqLockON	Minimum waiting time before switching on the boiler			0 ÷ 200 s	20
			SeqLockOFF	Minimum waiting time before switching off the boiler			0 ÷ 200 s	20
			PostCirculBoil	Boiler's post-circulation with manifold at setpoint			0. off 1. on	0
Boiler	Individual boiler data	YES	BoilSel	Boiler selection			1 ÷ 8	1
			BoilTemp	Boiler flow temperature			[°C]	-
			OpModeBoil	Boiler operating mode			-3. recognizing the boiler -2. boiler in error -1. boiler missing/unreadable 0. boiler in standby 1. boiler in heating service 2. boiler in DHW service	-
			FanHz1	RPM of the boiler blower (or of the boiler master module)			[Hz]	-
			FanHz2	RPM of the boiler slave module			[Hz]	-
			BoilONTime	Boiler working hours			[h]	-
			BoilNomPwr	Single boiler power			7 ÷ 15	-
			WarningBoil1	Alarm code present on the boiler (or on the boiler master module)			-	-
			WarningBoil2	Alarm code present on the boiler slave module			-	-
			ResetWarning	Boiler alarm reset			0. no reset 1. WarningBoil1 reset 2. WarningBoil2 reset	0

Menu	Description	Password	Submenu	Description	Submenu	Description	Setting	Default
Manifold	Manifold (S1) management	YES	MaxManiTemp	Maximum manifold temperature (S1 probe)			30 ÷ 90 °C	75
			MinManiTemp	Minimum manifold temperature (S1 probe)			10 ÷ 70 °C	40
			UseRedTemp	Activating the use of RedTemp			0. off 1. on	1
			RedTemp	Circuits temperature in reduced mode			15 ÷ 45 °C	30
			AFTemp	Circuits temperature in antifreeze mode			-15 ÷ 15 °C	5
			PostCircul1	Post-circulation mode			0. according to parameter PostCirc1Time 1. according to ProgHC1 2. permanent	0
			PostCirc1Time	Pump post-circulation time			1 ÷ 99 minutes	5
			Com/Hex-ProbeFlow	Activation of post exchanger/separator probe S4			0. no S4 probe 1. S4 probe present 2. not used	0
			Comp/HExch-DeltaT	Temperature differential between S4 and S1			1 ÷ 20 °C	5
			FlowSwContact	Not used				-
			DtFlowMani	ΔT between manifold and setpoint set by climatic curve			0 ÷ 20 °C	5
			ClimCurve1	Manifold climatic curve management	SelCurvMani	Climatic curve selection	-15 ÷ 30	20
					MinTproj1	Minimum design temperature	-20 ÷ 20 °C	0
			HexPump	Management of the modulating pump post heat exchanger/separator	Status	PWM pump driving	0 ÷ 10 V	-
					MinModul	PWM pump minimum speed	30 ÷ 80 %	50
					MaxModul	PWM pump maximum speed	50 ÷ 100 %	100
			ControlType	System control type	0. controller 1. External 0-10 V (power) 2. External 0-10 V (temperature)			0
			MinOnPwr	Minimum system power for external 0-10 V power request	0 ÷ 100 %			10
			TempCtrProbe	Control probe for 0-10 V external temperature control	0. S1 1. S2 2. S3 3. S1, S2, S3			0
HC1	Heating circuit 1 (S3) management	YES	HC1Pump	Heating circuit 1 pump status			0. off 1. on	-
			PosVlvMix1	VMixCR1 mixing valve status			0 ÷ 10 V	-
			ThermHC1	Room thermostat used on heating circuit 1			0. without thermostat 1. with input TA1 2. not used 3. not used	0
			OutProbe1	Outdoor probe presence			0. absent 1. present	1
			SpMaxHC1	Heating circuit 1 maximum temperature			30 ÷ 90 °C	45
			SpMinHC1	Heating circuit 1 minimum temperature			20 ÷ 60 °C	25

Menu	Description	Password	Submenu	Description	Submenu	Description	Setting	Default
HC2	Heating circuit 2 (S2) management	YES	HC2Pump	Heating circuit 2 pump status			0. off 1. on	-
			PosVlvMix2	VMixCR2 mixing valve status			0 ÷ 100 %	-
			HC2ActMode	Heating circuit 2 activation mode			0. together with heating circuit 1 1. independent	1
			OutProbe2	Outdoor probe presence			0. absent 1. present	1
			PostCirc2	Post-circulation mode			0. according to parameter PostCirc2Time 1. according to ProgHC2 2. permanent	0
			PostCirc2Time	Pump post-circulation time			1 ÷ 99 minutes	5
			ThermHC2	Room thermostat used on heating circuit 2			0. without thermostat 1. with input TA1 2. not used 3. with input TA2 4. not used	0
			ClimCurve2	Heating circuit 2 climatic curve management	SelCurveHC2	Climatic curve selection	-15 ÷ 30	20
					SpMaxHC2	Heating circuit 2 maximum temperature	30 ÷ 90 °C	45
					SpMinHC2	Heating circuit 2 minimum temperature	20 ÷ 60 °C	25
					MinTProj2	Minimum design temperature	-20 ÷ 20 °C	0
			AlwaysON	Heating circuit 2 operating mode			0. HC2ActMode and DHWPmpSim 1. always active unless DHW request active and DHWPmpSim = 0	0
RoomClimateCurve	Not used							

Menu	Description	Password	Submenu	Description	Submenu	Description	Setting	Default
DHW	DHW management	YES	DHW1Pump	DHW buffer tank 1 charging pump from the manifold status			0. off 1. on	-
			DHW2Pump	DHW buffer tank 2 charging pump from the manifold status			0. off 1. on	-
			RecircPump	DHW recirculation pump status			0. off 1. on	-
			DtDHWOn	Differential for DHW recharging activation			1 ÷ 20 °C	5
			DHWMinTLck	Minimum temperature lock for DHW charging circuit			0. off 1. on	1
			DHWPmpSim	Management of simultaneous requests for heating circuits			0. DHW priority 1. parallel operation DHW + mixed circuit 2. parallel operation DHW + mixed + direct circuit	0
			DHW1Mode	DHW buffer tank 1 charging activation mode			0. DHW buffer tank probe SB1 1. thermostat TS1	0
			DHW2Mode	DHW buffer tank 2 charging activation mode			0. DHW buffer tank probe SB2 1. thermostat TS2	0
			DHW1TherSts	DHW buffer tank 1 thermostat status			0. open contact (no DHW request) 1. closed contact (DHW request active)	-
			DHW2TherSts	DHW buffer tank 2 thermostat status			0. open contact (no DHW request) 1. closed contact (DHW request active)	-
			RecircMode	Recirculation pump operation			0. ProgDHW1 1. ProgRecirc 2. ProgDHW2	1
			MaxPwr%DHW	Modulation degree of boilers in DHW mode			1 ÷ 10	10
			InstDHWTemp	Not used				60
Solar	Not used							
FloorCoatHt	Not used							
HC1ThermSts	TA1 contact status	NO	-				0. open contact 1. closed contact	-
HC2ThermSts	TA2 contact status	NO	-				0. open contact 1. closed contact	-
WebVisor	Not used							

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