CONTROL

Versatronik®200
System Control

Part Number
KWE 701 010
Vi 7416 059

KWE Technologies Group

Installation and Operating Manual

Cautionary Statement
Please observe the safety instructions and read through this manual carefully before commissioning the equipment.

Draft

C US LR 102874

IMPORTANT

Read and save these instructions for future reference

Table of Contents

Section 1

Section 2

Section 3

Section 4

Section 5

Section 6

Section 7

Section 8

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Caution, Warning and Trademark Information

About these instructions

Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION" and "IMPORTANT". See below.

WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in death, serious injury or substantial product/property damage.

→ *Warnings draw your attention to the presence of potential hazards or important product information.*

CAUTION

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/property damage.

→ *Cautions draw your attention to the presence of potential hazards or important product information.*

CAUTION

Static sensitive components may be damaged by improper handling or work within the control. Ensure all possible measures are taken to eliminate build-up of static electricity.

IMPORTANT

→ *Helpful hints for installation, operation or maintenance which pertains to the product.*

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Caution, Warning and Trademark Information

Important Regulatory and Installation Requirements

Codes
The installation of this unit must be in accordance with local codes.

All electrical wiring is to be done in accordance with the latest edition of CSA C22,1 Part 1 and/ or local codes. In the U.S. use the National Electrical Code ANSI/NFPA 70.

The installing contractor must comply with the Standard of Controls and Safety Devices for Automatically fired Boilers, ANSI/ ASME CSD-1 where required by the authority having jurisdiction.

Working on the equipment
The installation, adjustment, service and maintenance of this unit must be done by a licensed professional heating contractor or persons who are qualified and experienced in the installation, service, and maintenance of similar products. There are no user serviceable parts on this control.

Power supply
Install power supply in accordance with the regulation of the authorities having jurisdiction or in absence of such requirements, in accordance with National Codes.

→ *Please carefully read this manual prior to attempting installation. Any warranty is null and void if these instructions are not followed.*

→ *The completeness and functionality of field supplied electrical controls and components must be verified by those installing the device.*

WARNING

More than one live circuit. See wiring diagram in this manual. Turn off power supply to control and damper/blower before servicing. Contact with live electrical components can result in serious injury or death

This is not a safety device

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Caution, Warning and Trademark Information

Information

Warranty Conditions

If the system is not installed, commissioned, serviced and repaired properly, it will render the manufacturer's warranty null and void.

Important Text

! Important information is highlighted with an exclamation mark.

⚠ This attention symbol indicates dangerous situations.

Installation

Information regarding the installation and commissioning of this equipment is found in the following sections.

Declaration of Conformity

This device corresponds to the requirements of the relevant guidelines and standards, if the corresponding installation regulations and the manufacturer's instructions are complied with.

Trademark Information

®Versatronik is a registered trademark of K-W Electronic Service Inc.

† All other products listed are trademarks of their respective companies

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Please visit: **www.viessmann.ca**
www.viessmann.us

Power Connection Regulations

Please note the connection conditions specified by your local electrical power supply company and authorities having jurisdiction.
Your heating control system may be installed and serviced only by appropriately authorized specialists.

⚠ If the system is not installed properly, there is a risk of fatal or severe personal injury.

Control Installation Information

Section 2.0

Section 2.1

Section 2.2

Section 2.3

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Control Installation Checklist

Step	Description
1	Review box contents
2	Mounting of control onto solid surface using field supplied hardware
3	Wiring and interconnection of outdoor temperature sensor
4	Wiring and interconnection of LLH/common supply temperature sensor
5	Wiring and interconnection of DHW temperature sensor
6	Wiring and interconnection of boiler (Based on system requirements) Demand connections Communication connections (Coco OT device)
7	Wiring of pumps 120VAC (DHW, Mixing Valve Heating Circuit and Multifunction)
8	Wiring of mixing valve (Multifunction)
9	Wiring of Lago Remotes (accessory)
10	Wiring of input demand/signal (system dependant)
11	Coding and testing

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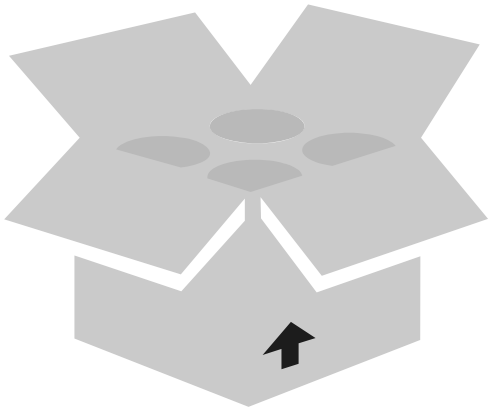
Installation

Unboxing and Mounting Control



Unboxing the Control
In the box, you will find the following:

Qty.	Description	Part Number
1	Versatronik 200 Control	
1	Installation and Operational Manual	XXX XXX
1	Outdoor Temperature Sensor	711 050
1	DHW Temperature Sensor	711 046
1	Common Supply/LLH Sensor	711 045
2	CoCo OT Boiler Communication Modules	709 025
19	2 Pole Plug-in Connection Terminals	230 120
2	3 Pole Plug-in Connection Terminals	230 121
2	4 Pole Plug-in Connection Terminals	230 122
2	Fuse 160mA	255 071
2	Fuse Time Delay T15A	255 068

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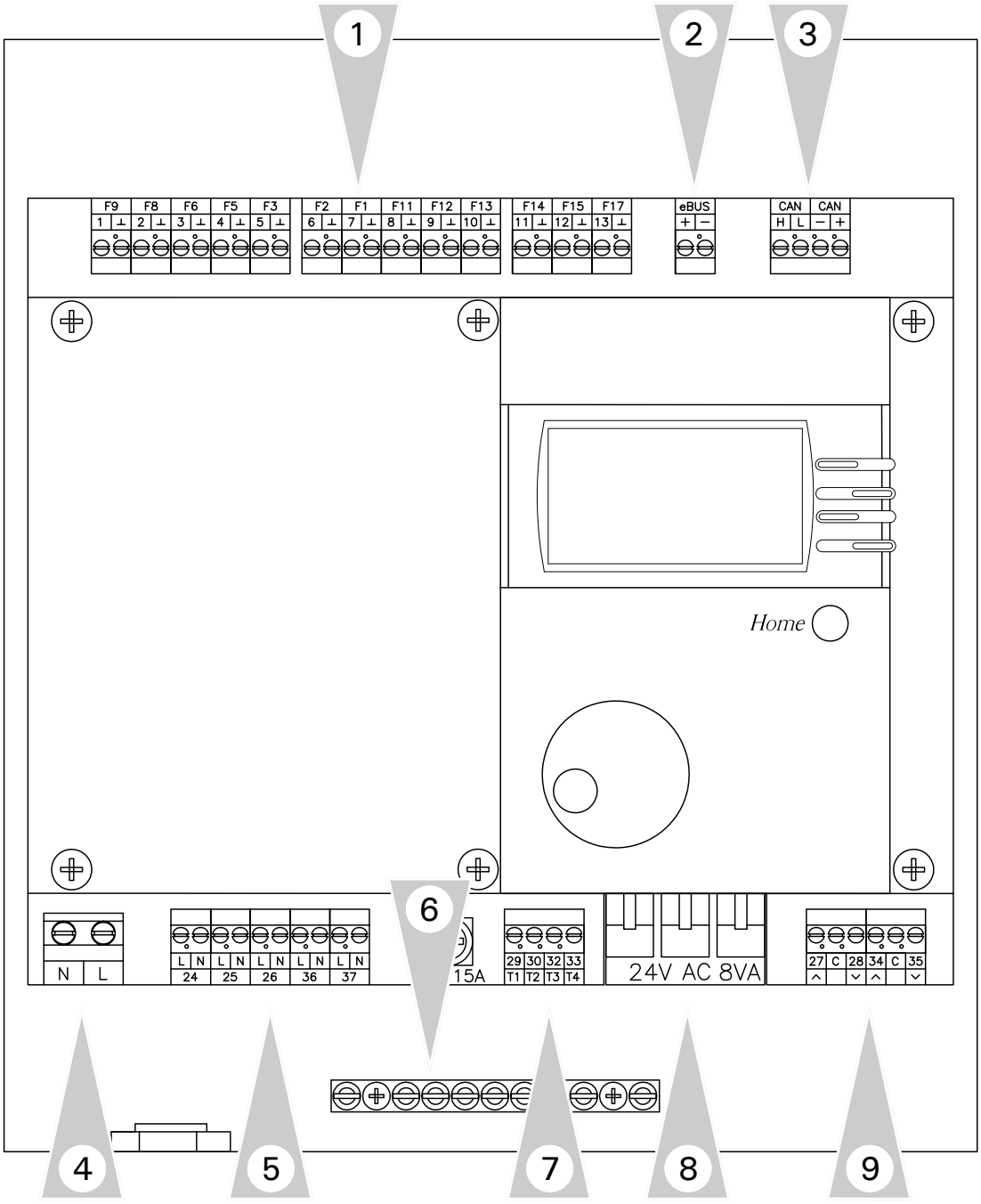
Installation

Connection Overview



1. Sensor Low Voltage Connections (terminal connections 1 through 13)
2. Input 0-10VDC control signal
3. CAN BUS communication connections (H, L and —, +)
4. Pre-wired power cord connection (N and L)
5. Pump outputs 120VAC (24, 25, 26, 36 and 37)
6. Ground terminal strip
7. Potential-Free (dry contact) burner demands (29, 30 and 32, 33)
8. Mixing valve coding card
9. Mixing Valve wiring connections (27, C, 28 and 34, C, 35)

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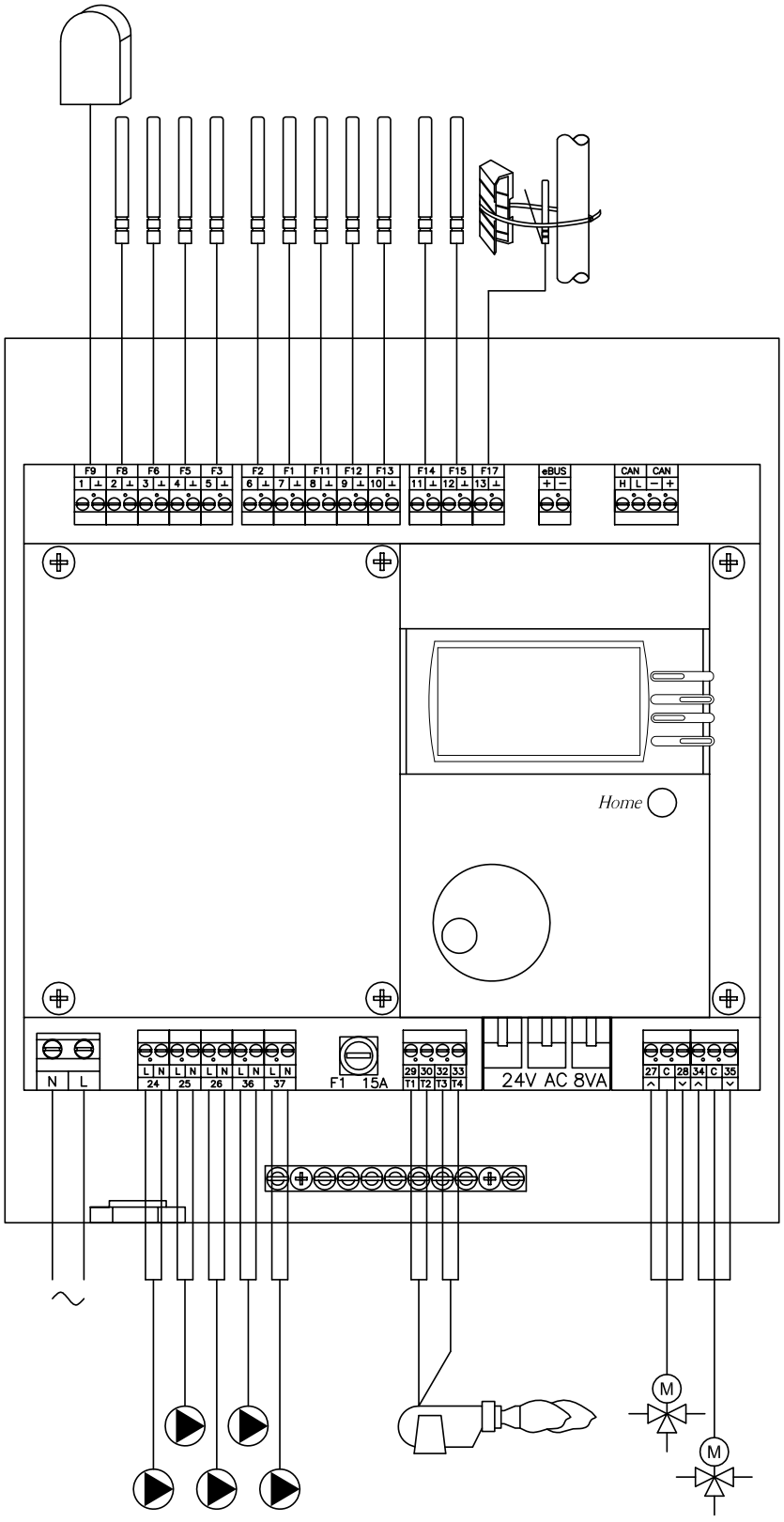
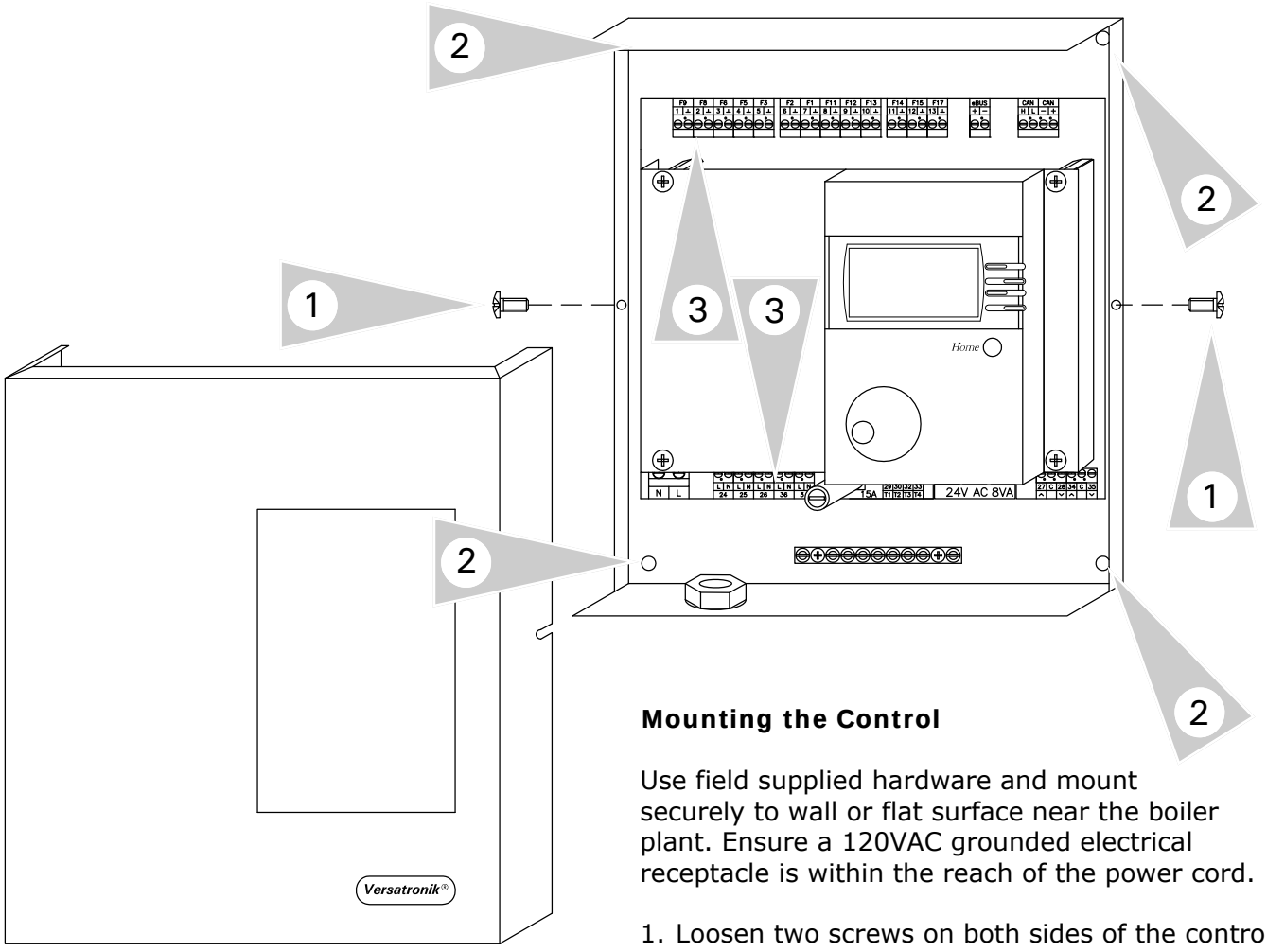
Installation

Connection Overview





Mounting the Control

Use field supplied hardware and mount securely to wall or flat surface near the boiler plant. Ensure a 120VAC grounded electrical receptacle is within the reach of the power cord.

1. Loosen two screws on both sides of the control and remove the control cover by lifting from base. Set aside
2. Locate the four mounting holes in each corner of rear of control. Use field supplied hardware to mount securely.
3. Wire control with necessary sensors and outputs as per various system requirements.

Relocate control front cover onto control and tighten screws on side to prevent accidental removal by others.

Important

When considering a location where to mount the control, consider the following avoidances: pressure relief valves, overhead pipes, or any devices which may cause water damage to the control.

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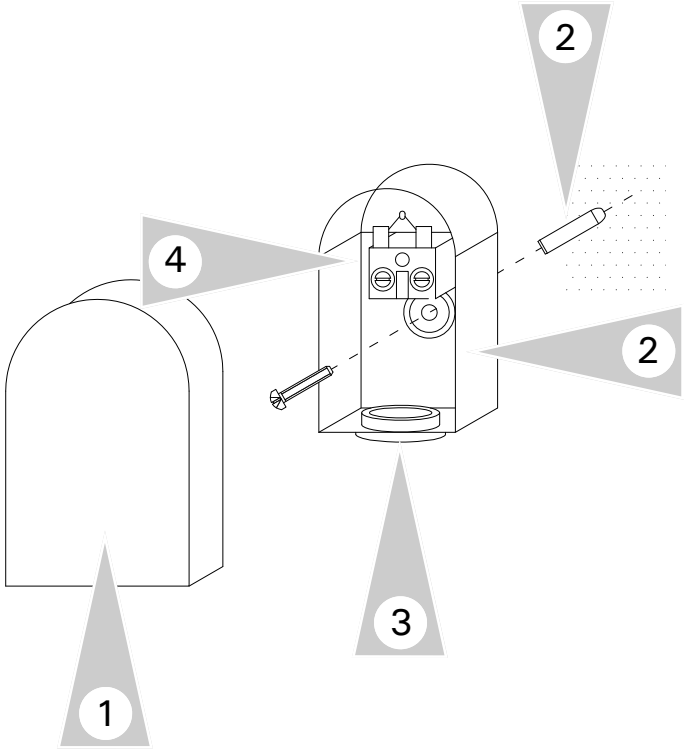
Installation

Sensors

Outdoor sensor AF

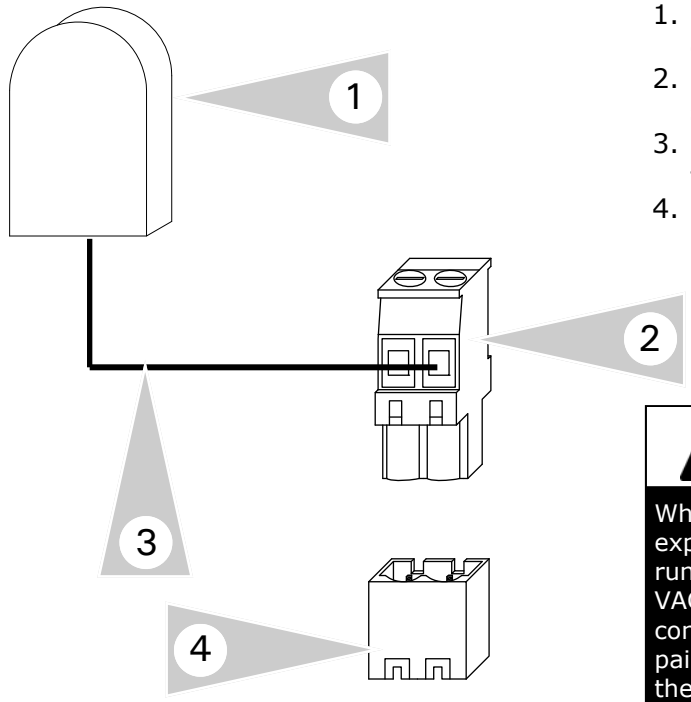


Installation Overview

The outdoor temperature sensor should be mounted 2 to 2.5m / 6.5 to 8 ft above ground level on the north or north-west facing wall of the building. In the case of multi-storey buildings, it should be mounted in the upper half of the second storey. Make sure that the sensor is not located over windows, doors and air vents, nor immediately beneath a balcony or guttering. Do not paint over the outdoor temperature sensor housing.

Installation Instruction

1. Remove cover from outdoor temperature sensor.
2. Mount rear section of sensor to outside wall following guidelines with field supplied hardware.
3. Insert wire into the bottom of sensor housing strain relief.
4. Connect wire to sensor terminals and tighten.
5. Reinstall cover onto sensor.



Control Connections

1. Interconnection of newly installed sensor to control.
2. Field supplied wiring between control and sensor.
3. Connect wire to supplied 2 pole plug. Tighten terminals.
4. Plug 2 pole plug into F9 socket.

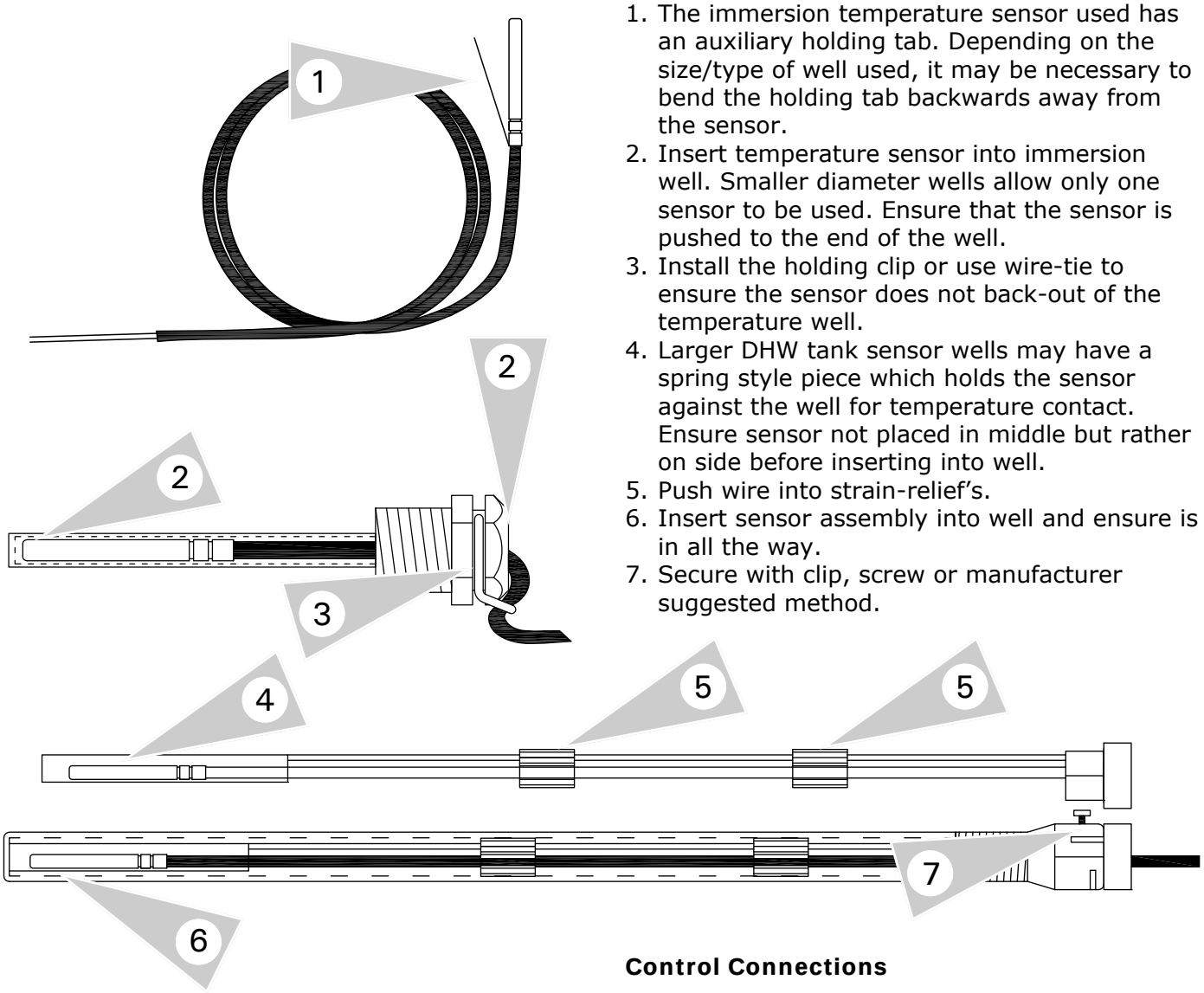
WARNING

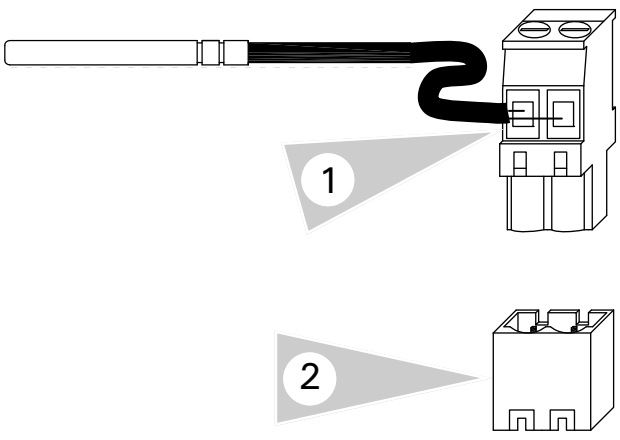
When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair of shield design wire. Ensure that only one end of the shielding is grounded.

Installation

Sensors

Immersion sensor KF / SPF





Installation Instruction

1. The immersion temperature sensor used has an auxiliary holding tab. Depending on the size/type of well used, it may be necessary to bend the holding tab backwards away from the sensor.
2. Insert temperature sensor into immersion well. Smaller diameter wells allow only one sensor to be used. Ensure that the sensor is pushed to the end of the well.
3. Install the holding clip or use wire-tie to ensure the sensor does not back-out of the temperature well.
4. Larger DHW tank sensor wells may have a spring style piece which holds the sensor against the well for temperature contact. Ensure sensor not placed in middle but rather on side before inserting into well.
5. Push wire into strain-relief's.
6. Insert sensor assembly into well and ensure is in all the way.
7. Secure with clip, screw or manufacturer suggested method.

Control Connections

1. Wire sensor to 2-pole plug. Not polarity sensitive.
2. Plug into control socket based on sensor functionality.

Technical Information

Sensor: 5K resistive element
Length: 3m/10feet

Note: When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors.

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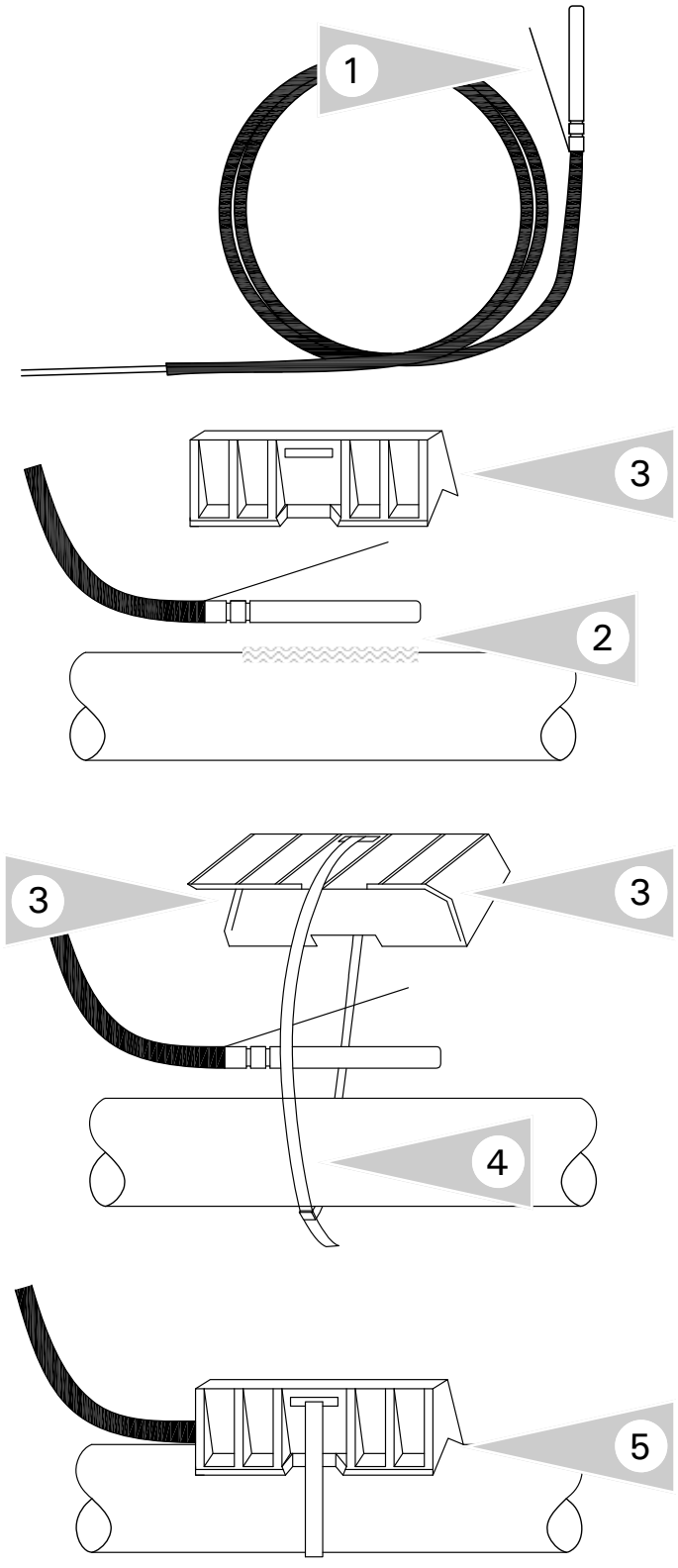
Installation

Sensors (Mixing Valve Extension Kit Accessory)

Flow sensor VF

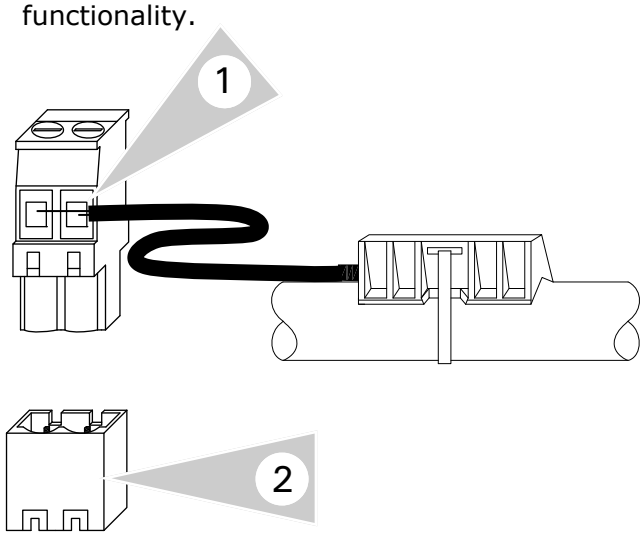


Installation Instruction

1. The same immersion sensor that is used with temperature wells, is also used for strap-on/ contact type applications.
2. Select proper location for sensor. When using with mixing valve sensing, ensure the sensor is sensing the mixed temperature out of the mixing valve.
   Apply supplied contact paste to sensor/pipe to maximize temperature sensing.
3. Position sensor retaining cap above the sensor. Wire runs through open end of the retaining cap . Fasten down the retaining cap and sensor with supplied wire tie. Larger diameter pipes may require additional wire ties or field supplied wire strapping.
4. Tighten strap.
5. Sensor and retaining cap securely affixed to pipe.

Control Connections

1. Wire sensor to 2-pole plug. Not polarity sensitive.
2. Plug into control socket based on sensor functionality.

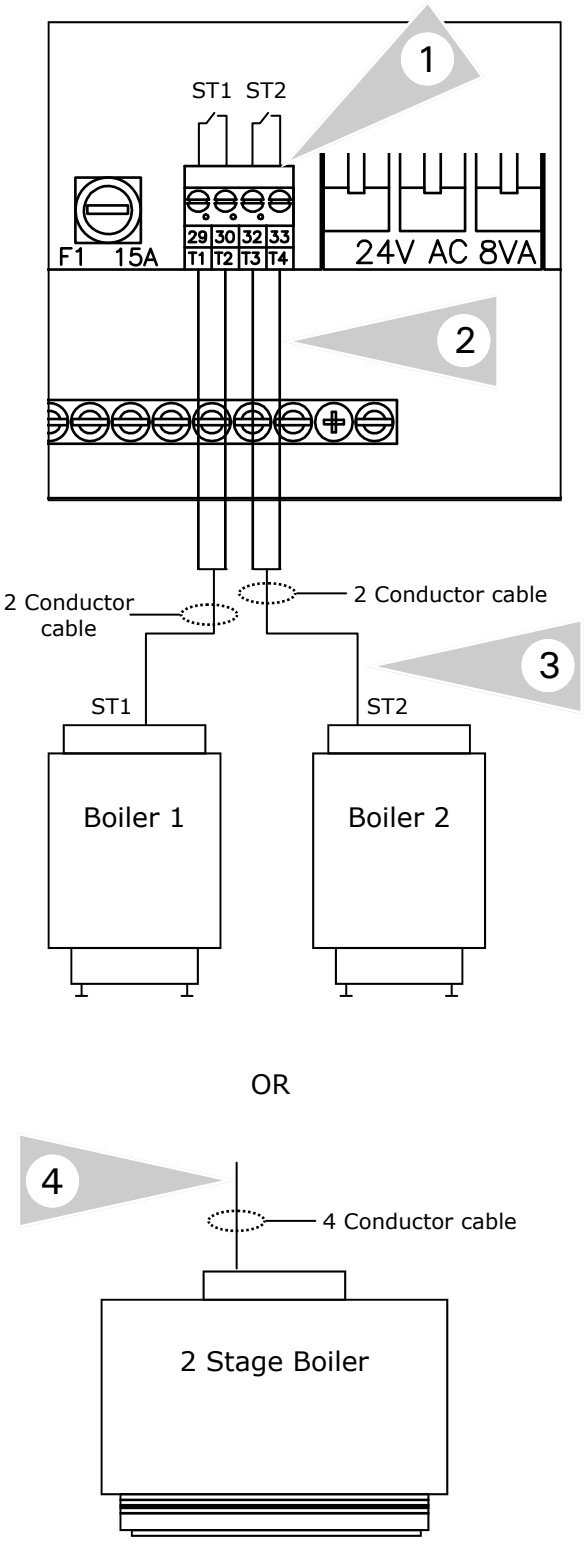


Technical Information

Sensor: 5K resistive element
Length: 3m/10feet

Note: When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors.

Burner Heat Demand(s)



Connection Operation Overview

Terminals 29 and 30 as well as 32 and 33 can be used to stage either 2 single-stage boilers or a single 2-stage boiler. This functionality is dependant on a number of control settings.

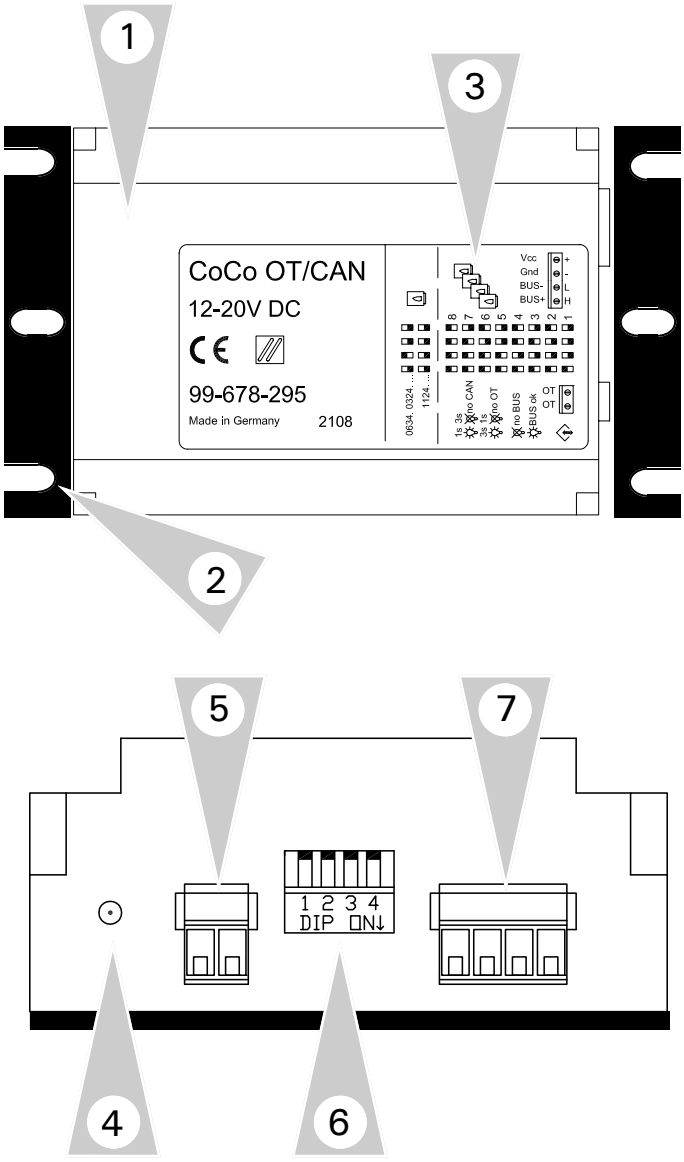
Terminals 29 and 30 are the first stage call for heat. These terminals would typically be connected to the TT contacts on the boiler. Refer to either the control manual or the boiler manual for correct terminal locations and specific manufacturer requirements.

Terminals 32 and 33 is the second stage of either a 2 stage boiler or a second boiler in a lead-lag configuration. These terminals would typically be connected to the TT contacts on the boiler. Refer to either the control manual or the boiler manual for correct locations and specific manufacturer requirements.

Connections

1. Terminal block inside of control.
2. Field supplied wiring between Versatronik 200 and boiler(s).
3. Two conductor cabling is typically used with single stage boilers.
4. Four conductor cabling is typically used with two stage boilers.

Boiler / Burner Communication



Operation Overview

Boiler communication between the Versatronik 200 System Control requires the use of a Coco OT/CAN module. This device provides the transfer of information such as boiler set point temperatures from the system controller to the boiler.

The Versatronik 200 uses a CAN communication protocol which is translated in the Coco module to OpenTherm (OT). The Coco OT module then communicates to the boiler.

Each boiler requires one of the Coco OT modules. The modules can be mounted near the system control or the boiler. The Versatronik 200 System Controller is shipped with 2 of the Coco OT modules. If more than 2 OT enabled boilers are used, extra modules will need to be ordered.

Wiring connections to the Coco OT consist of 4 wires between the Versatronik 200 and 2 wires between the Coco OT module and the boiler. The four wires between the Versatronik and the Coco provide power and communication. The two wires between the Coco and the boiler provide OT communication.

Wiring terminations are comprised of a 4 pole connector and a 2 pole connector. Both of these connectors can be unplugged from the Coco OT module to allow for ease of connections.

A LED indicator on the side of the Coco OT module provides a simple diagnostic indicator based on the flashes.

A 4 pole On/Off DIP switch provides the programming function of the Coco OT module.

Elements Overview

1. Coco OT Module
2. Mounting holes
3. Legend
4. LED indicator
5. OpenTherm terminal connection
6. DIP switches
7. Power supply and CAN BUS connections

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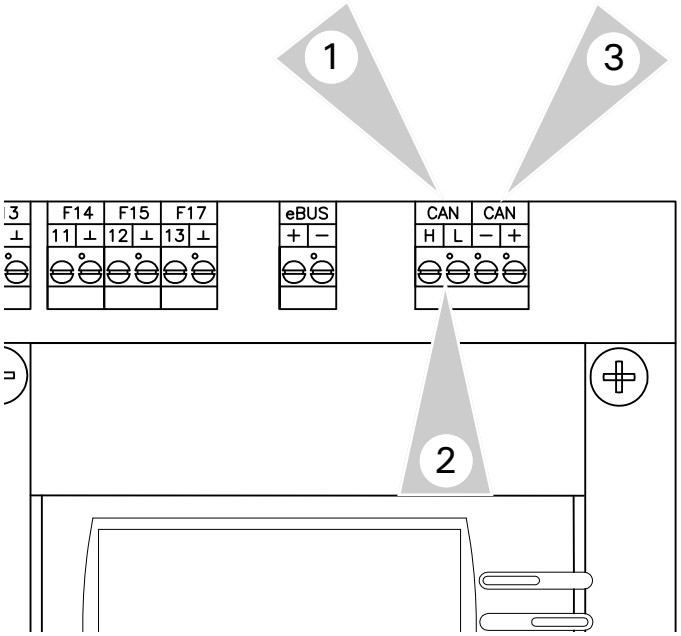
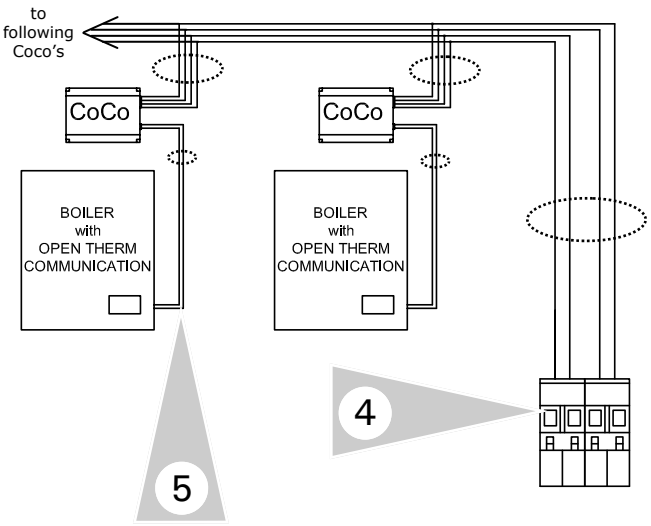
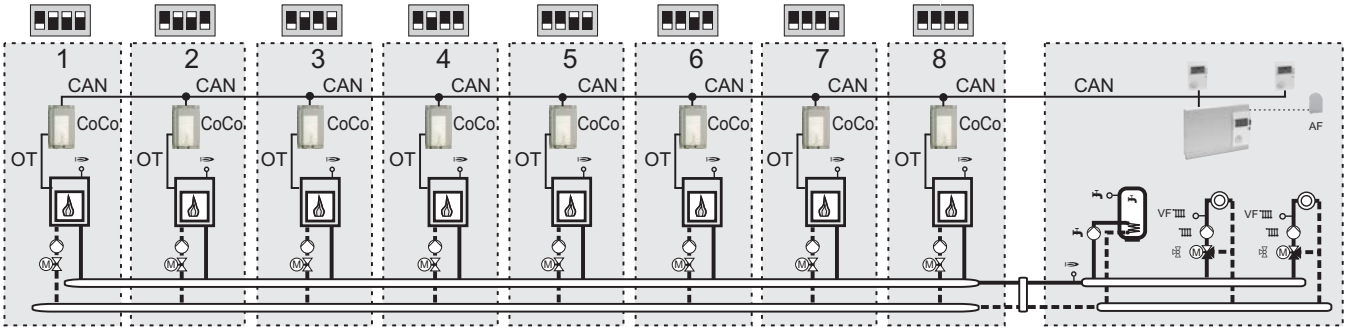
Coco OT Connections and Settings Overview (Multiple Modulating Boilers)





Connections Overview

1. The Coco OT modules are wired to the CAN connections in the Versatronik 200 control. A four pole connector is provided to make this connection.
2. The H and L terminals are used for the CAN BUS communication connections. Ensure that these connections are not reversed, otherwise communication issues may occur.
3. The — and + terminals are used for the power supply to each Coco OT module.
4. Plug in the 4 pole connector into the Versatronik 200 control once all of the interconnections have been completed. Each module is daisy-chained from the previous Coco OT module.
   Four conductor cable is typically used between the Versatronik 200 and the Coco OT modules.
   Two conductor cable is used between the Coco OT module and the OT enabled boiler.
5. Refer to boiler specific manual for OT connections within boiler.
6. Multiple boiler system DIP switch settings are shown in graphic. Set each Coco OT module for boilers 1 through 8.



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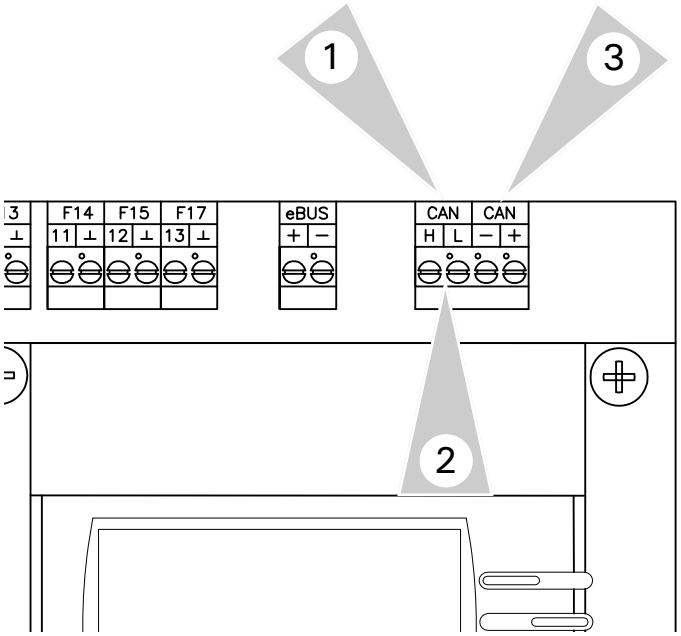
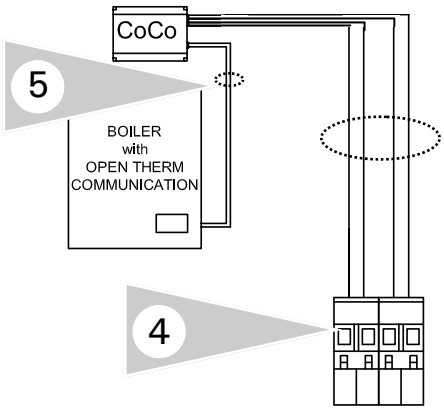
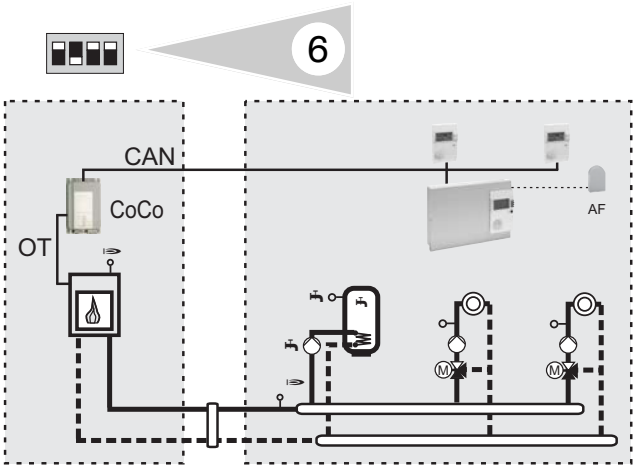
Coco OT Connections and Settings Overview (Single Modulating Boiler)







Connections Overview

1. The Coco OT module is wired to the CAN connections in the Versatronik 200 control. A four pole connector is provided to make this connection.
2. The H and L terminals are used for the CAN BUS communication connections. Ensure that these connections are not reversed, otherwise communication issues may occur.
3. The — and + terminals are used for the power supply to each Coco OT module.
4. Plug in the 4 pole connector into the Versatronik 200 control once the interconnections have been completed.
   Four conductor cable is typically used between the Versatronik 200 and the Coco OT modules.
   Two conductor cable is used between the Coco OT module and the OT enabled boiler.
5. Refer to boiler specific manual for OT connections within boiler.
6. Single boiler system DIP switch setting is shown in graphic.

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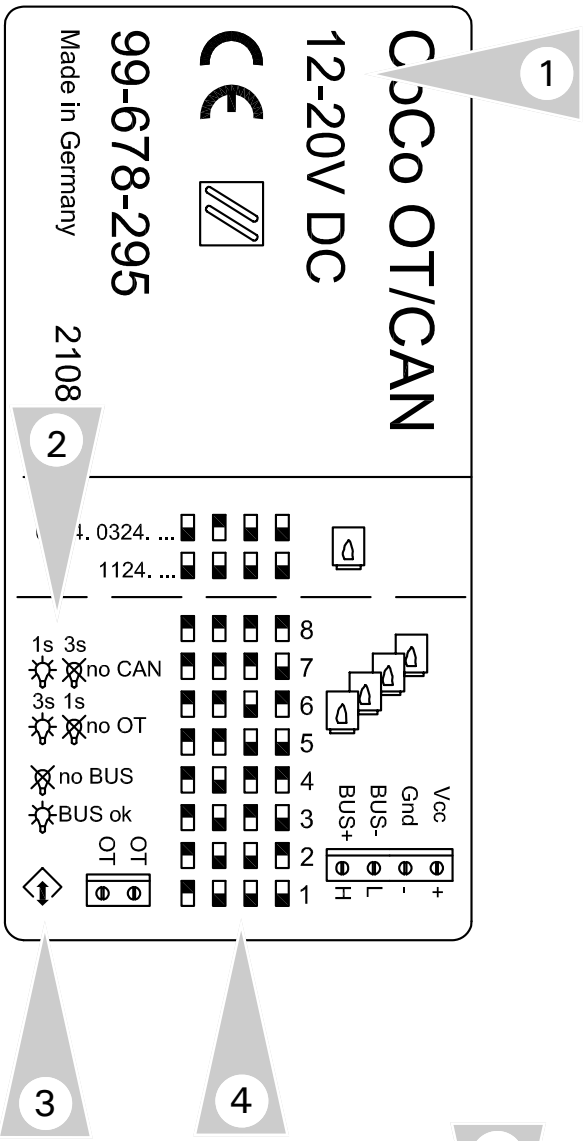
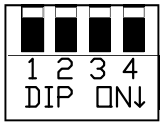
Coco OT Connections and Settings Overview



Settings Overview

1. The label that is part of every Coco OT module indicates the necessary setting and communication information.
2. LED indicator information:
   1 second ON, 3 seconds OFF, no CAN communication
   3 seconds ON, 1 second OFF, no OT communication
   Indicator OFF, no BUS communication
   Indicator ON, communication good.
3. LED indicator
4. DIP switch settings:



NOTE: Switch movement downwards is turning ON. Movement upwards is turning OFF.

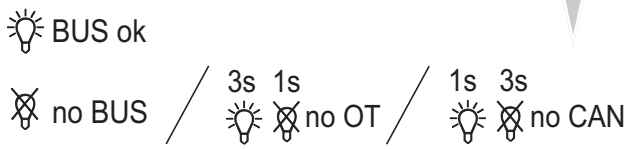
Multi-boiler Settings

Boiler	SW1	SW2	SW3	SW4
1	ON	OFF	OFF	OFF
2	ON	OFF	OFF	ON
3	ON	OFF	ON	OFF
4	ON	OFF	ON	ON
5	ON	ON	OFF	OFF
6	ON	ON	OFF	ON
7	ON	ON	ON	OFF
8	ON	ON	ON	ON

Single Boiler Setting

Boiler	SW1	SW2	SW3	SW4
1	OFF	ON	OFF	OFF

LED Indicator



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Installation

Connection Table

Control Inputs

Terminal Plug	Sensor Input		Function 1	Function 2
1/⊥	F9	AF	Outdoor Temperature Sensor	
2/⊥	F8	KF	Common Supply (Low Loss Header)/Boiler 1 Sensor	
3/⊥	F6	SPF	DHW Temperature Sensor	
4/⊥	F5	VF	Supply Temperature Sensor Heat Circuit 2	
5/⊥	F3	FBR Terminal 3	Room set value/Telephone switch HC1	Buffer top
6/⊥	F2	FBR Terminal 1	Room sensor HC1	Buffer middle
7/⊥	F1		Buffer bottom (solar zone)	Buffer bottom
8/⊥	F11	VF	Supply Temperature Sensor Heat Circuit 1	Sensor multifunction 1
9/⊥	F12	SPF	Storage tank sensor bottom	Sensor multifunction 2
10/⊥	F13	PT 1000	Heat generator 2/ Solar collector 2	Sensor multifunction 3
11/⊥	F14	PT 1000	Solar collector 1	Sensor multifunction 4
12/⊥	F15	FBR Terminal 1	Room sensor HC2	0-10V -input
13/⊥	F17	FBR Terminal 3	Room set value/Telephone switch HC2	Return flow sensor refrigeration machine

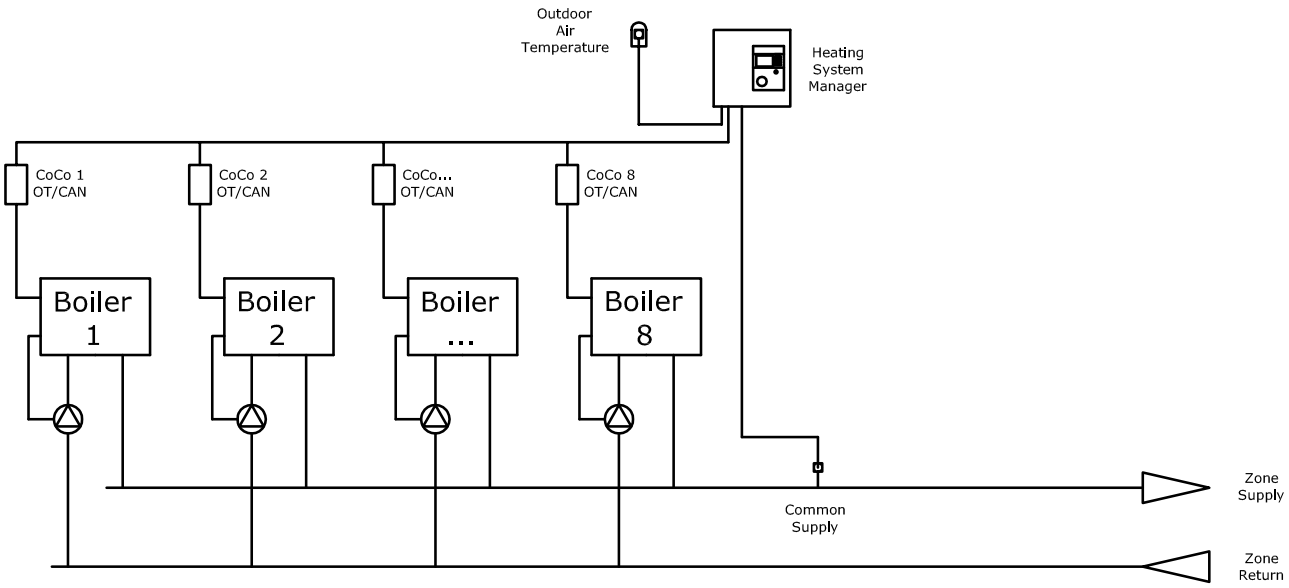
Control Communication/Control Connections

Terminal			Description 1	Description 2
	+		+	0-10V + input/output for boiler control
	—		—	0-10V — input/output for boiler control
CAN	H	CAN BUS	High data line	
CAN	L	CAN BUS	Low data line	
CAN	—	CAN BUS	Power supply (—)	
CAN	+	CAN BUS	Power supply (+)	

Control Output Connections

Terminal	Description
24	Pump, Heating circuit 1 (A1)
25	Pump, Heating circuit 2 (A2)
26	DHW Pump (A3)
27	MV open, Heating circuit 2 (A4)
28	MV close, Heating circuit 2 (A5)
29/30	Burner Call 1 On (A6)
32/33	Burner Call 2 On [2-stage:HS 1+2 (after 10s) ON] (A7) Coded boiler pump multifunction
34	MV open Heating circuit 1 / Multifunction 1 (A8)
35	MV close Heating circuit 1 / Multifunction 2 (A9)
36	Multifunction 3 (A10) (Coded output)
37	Multifunction 4 (A12) (Coded output)

System Example 01 (Cascade controller for modulating boilers)



System Description

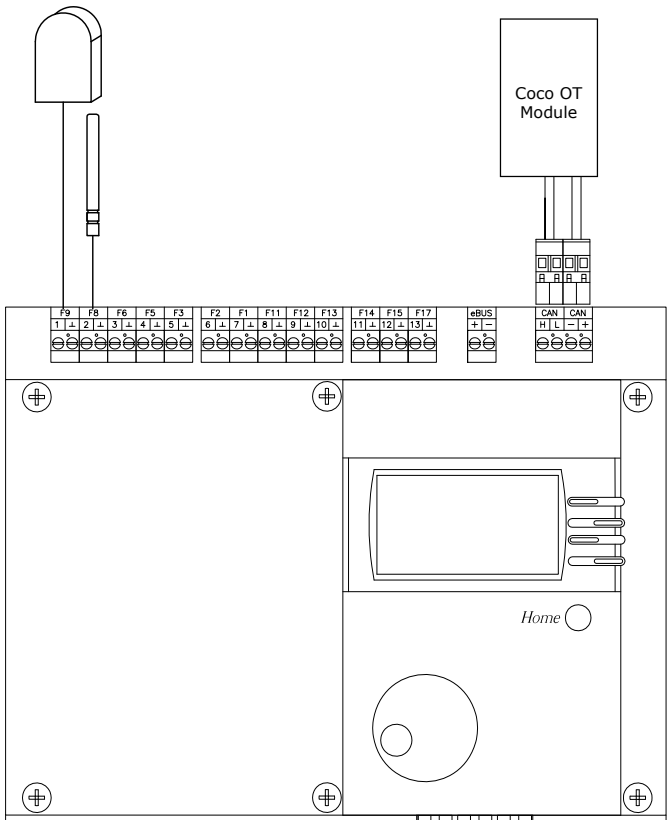
- Communication to OpenTherm enabled boilers 1 through 8. Boiler set point from Heating System Manager. Boiler responsible for achieving set point by modulating the burners
- Outdoor reset
- Outdoor sensor connection
- Common supply sensor connection
- No Low Loss Header or hydraulic separator
- Possible connection via closely spaced Tee's
- No DHW production
- No DHW recirc pump operation
- No space heating control
- Individual boiler pumps controlled from boiler pump output (refer to boiler manual)

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Installation—Control Wiring

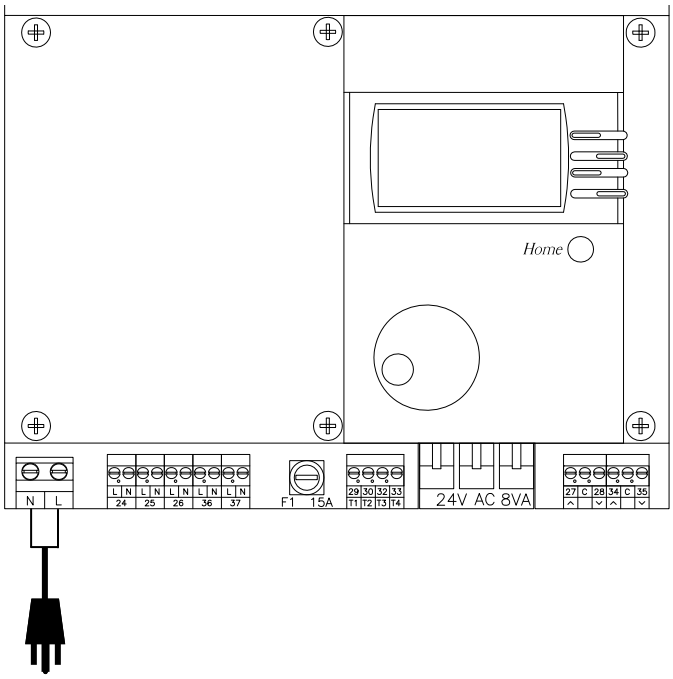
System Example 01 (Cascade controller for modulating boilers)

Inputs



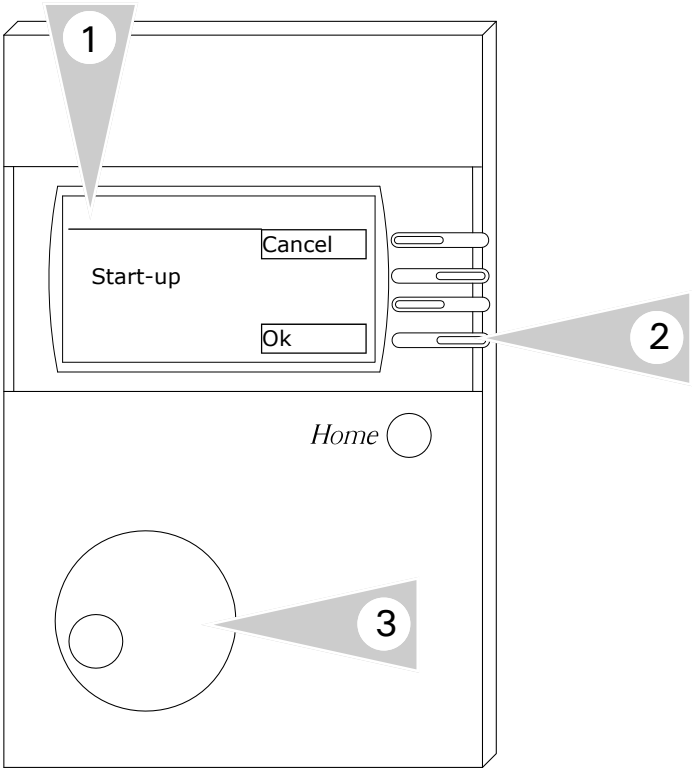
Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)
HL—+		CAN BUS Communication to Coco OT modules

Outputs



Terminal	Description
	No Output Connections

System Example 01 (Cascade controller for modulating boilers)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

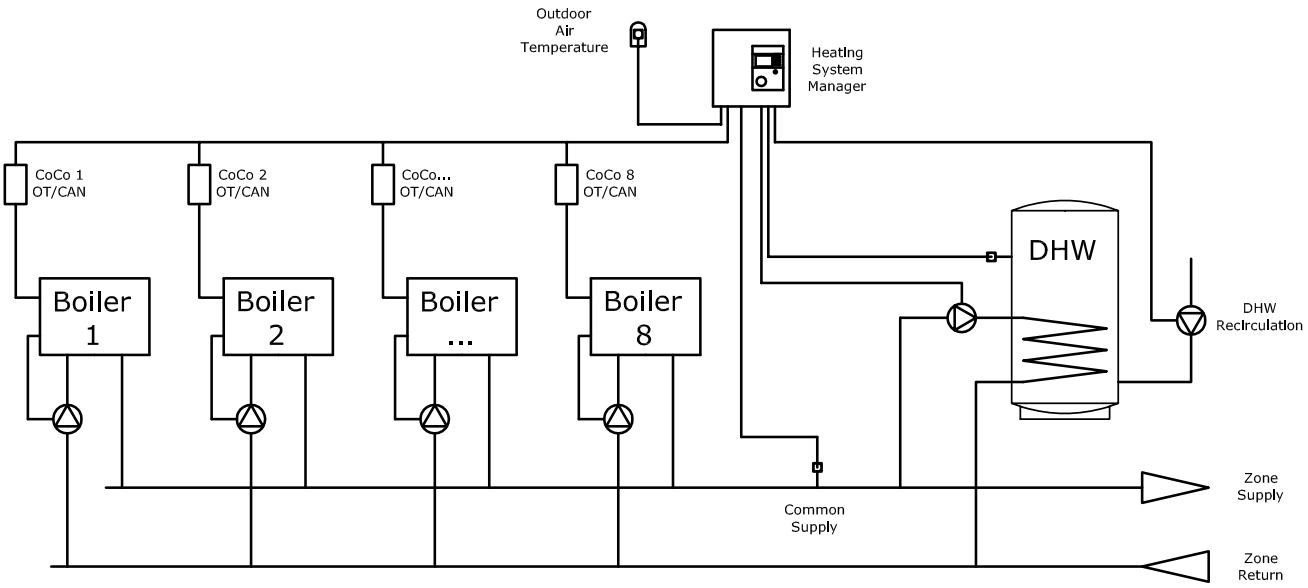
   Note: variables shown during the start up sequence are a function of the system selection.

Designation	Settings
System selection	01
Boiler 1 Type	06
BUS BOILER 1	02
Boiler 2 type	22
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

4

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 02 (Cascade controller for modulating boilers)



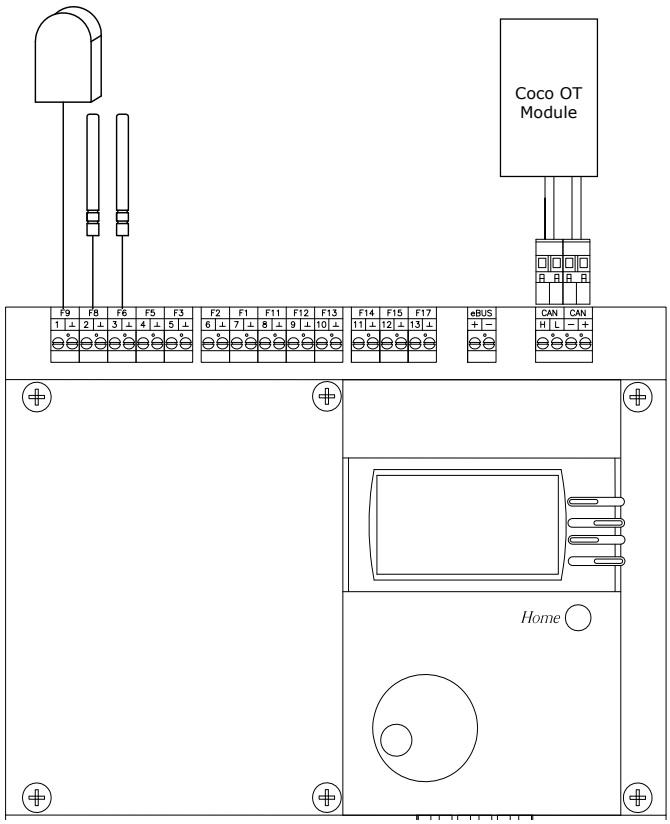
System Description

- Communication to OpenTherm enabled boilers 1 through 8. Boiler set point from Heating System Manager. Boiler responsible for achieving set point by modulating the burners
- Outdoor reset
- Outdoor sensor connection
- Common supply sensor connection
- No Low Loss Header or hydraulic separator
- Possible connection via closely spaced Tee's
- DHW production
- DHW recirc pump operation
- No space heating control
- Individual boiler pumps controlled from boiler pump output (refer to boiler manual)

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

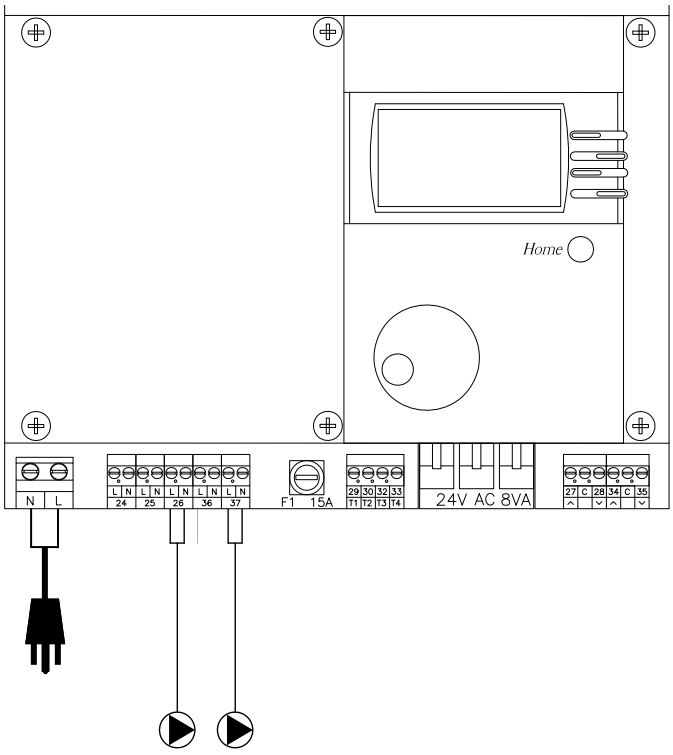
System Example 02 (Cascade controller for modulating boilers)

Inputs



Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)
3/⊥	F6	DHW Temperature Sensor
HL—+		CAN BUS Communication to Coco OT modules

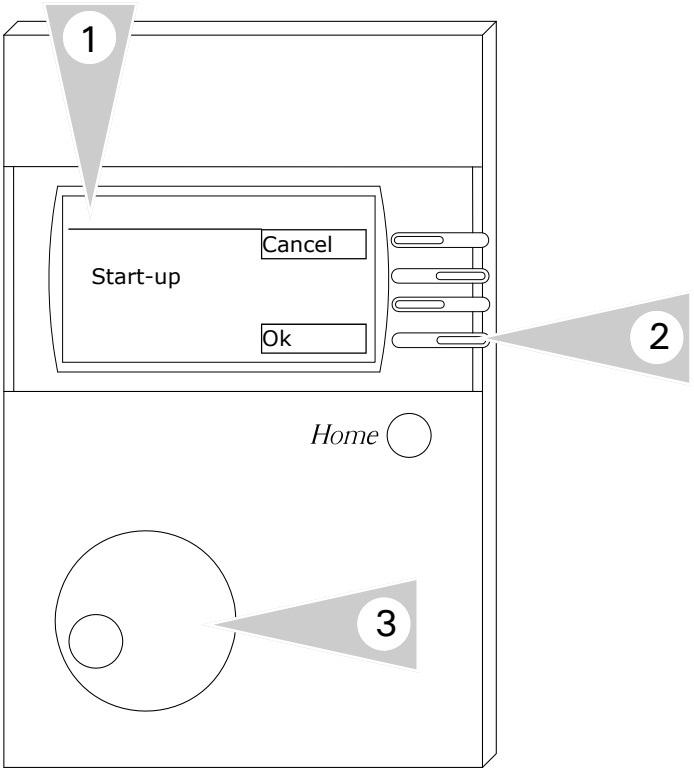
Outputs



Terminal	Description
26/N	DHW Pump (A3)
37/N	DHW Recirc Pump (A12) (Coded output) Multifunction 4

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 02 (Cascade controller for modulating boilers)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

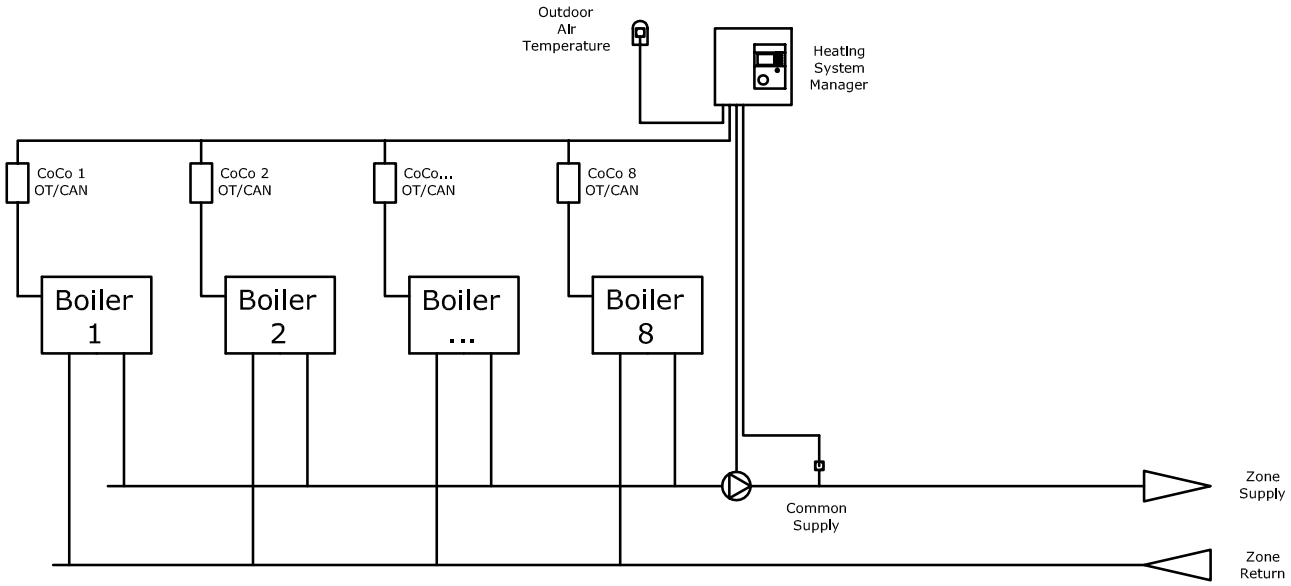
   Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	01
Boiler 1 Type	06
BUS BOILER 1	02
Boiler 2 type	22
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 03 (Cascade controller for modulating boilers)



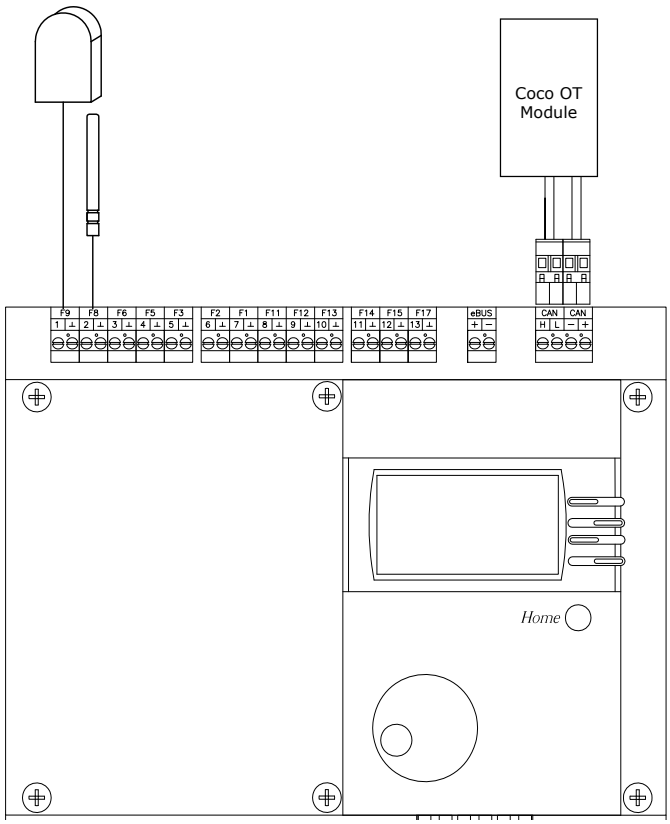
System Description

- Communication to OpenTherm enabled boilers 1 through 8. Boiler set point from Heating System Manager. Boiler responsible for achieving set point by modulating the burners
- Outdoor reset
- Outdoor sensor connection
- Common supply sensor connection
- No Low Loss Header or hydraulic separator
- Possible connection via closely spaced Tee's
- No DHW production
- No DHW recirc pump operation
- No space heating control
- Common supply pump controlled and connected to heating system manager

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

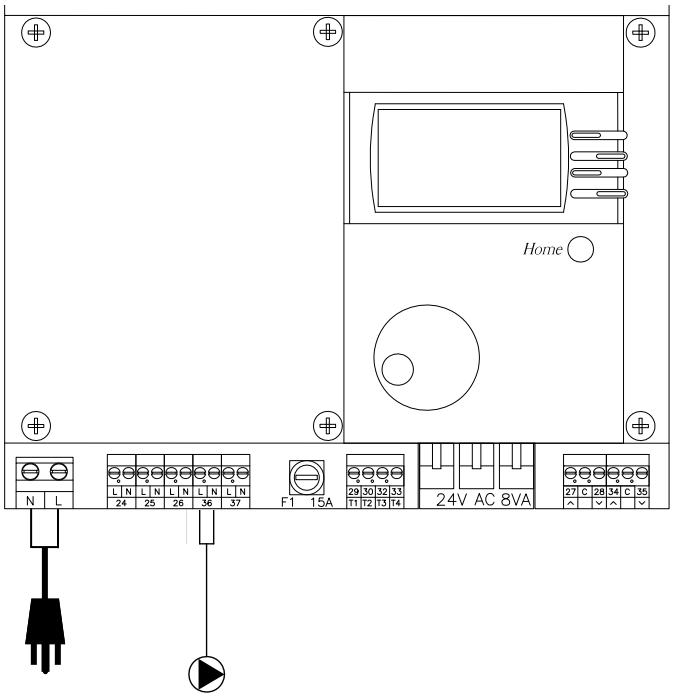
System Example 03 (Cascade controller for modulating boilers)

Inputs



Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)/Boiler 1 Sensor
HL—+		CAN BUS Communication to Coco OT modules

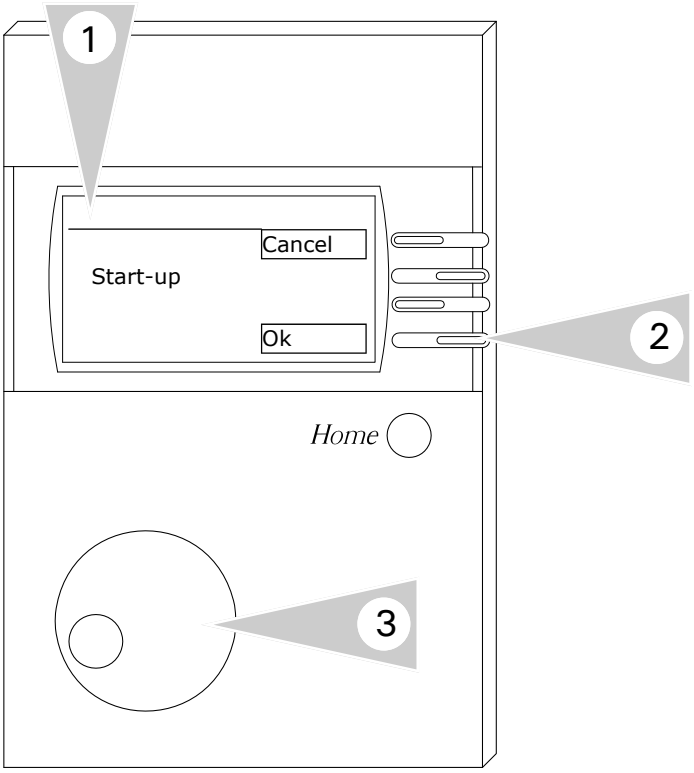
Outputs



Terminal	Description
36/N	Common Supply Pump (A10) (Coded output) Multifunction 3

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 03 (Cascade controller for modulating boilers)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

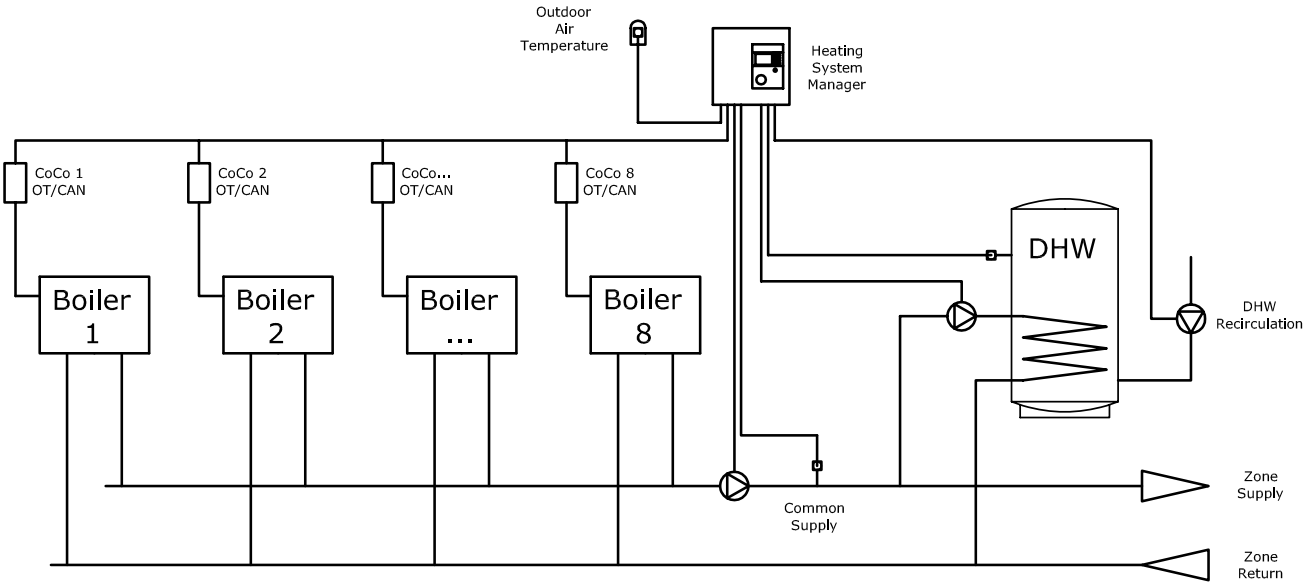
   Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	01
Boiler 1 Type	06
BUS BOILER 1	02
Boiler 2 type	22
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function ^{HC1}	Standard
HC Function ^{HC2}	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 04 (Cascade controller for modulating boilers)



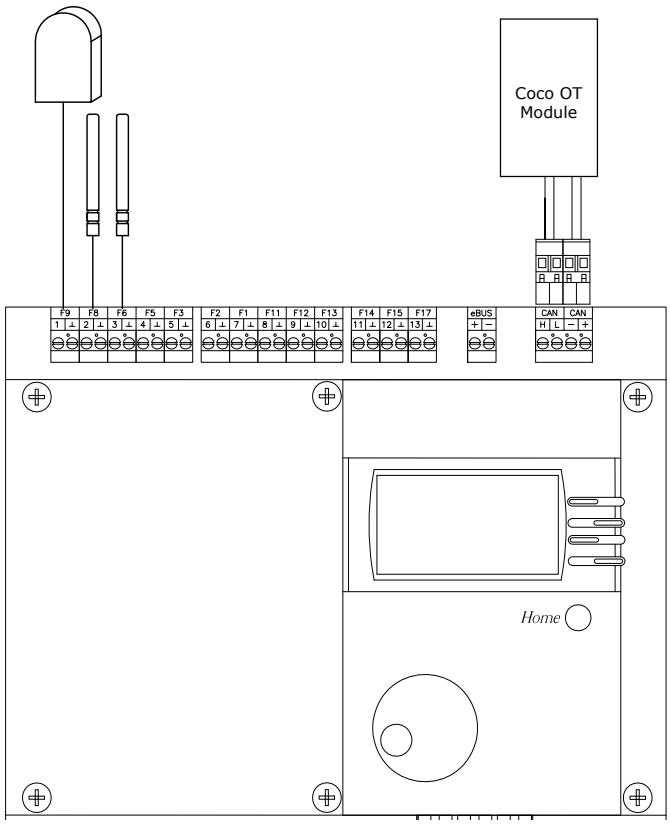
System Description

- Communication to OpenTherm enabled boilers 1 through 8. Boiler set point from Heating System Manager. Boiler responsible for achieving set point by modulating the burners
- Outdoor reset
- Outdoor sensor connection
- Common supply sensor connection
- No Low Loss Header or hydraulic separator
- Possible connection via closely spaced Tee's
- DHW production
- DHW recirc pump operation
- No space heating control
- Common supply pump controlled and connected to heating system manager

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

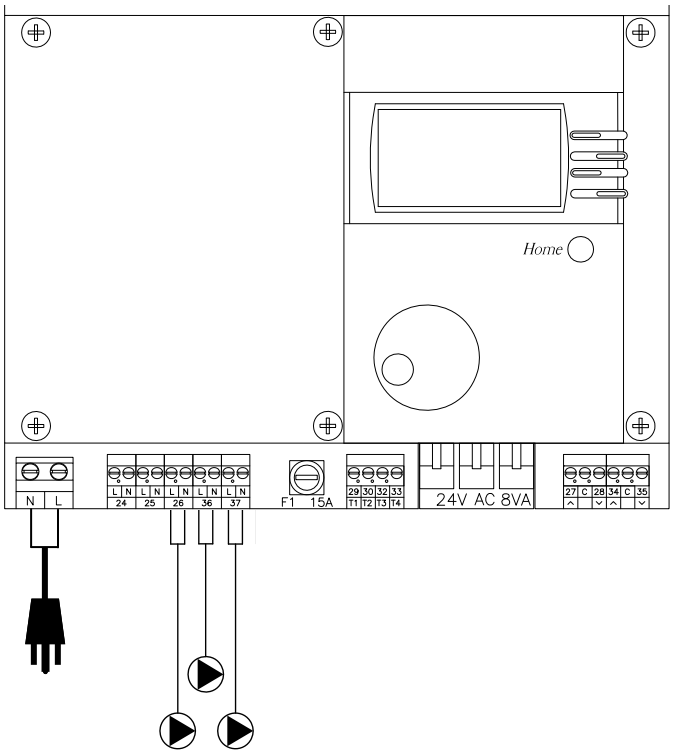
System Example 04 (Cascade controller for modulating boilers)

Inputs



Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)/Boiler 1 Sensor
3/⊥	F6	DHW Temperature Sensor
HL—+		CAN BUS Communication to Coco OT modules

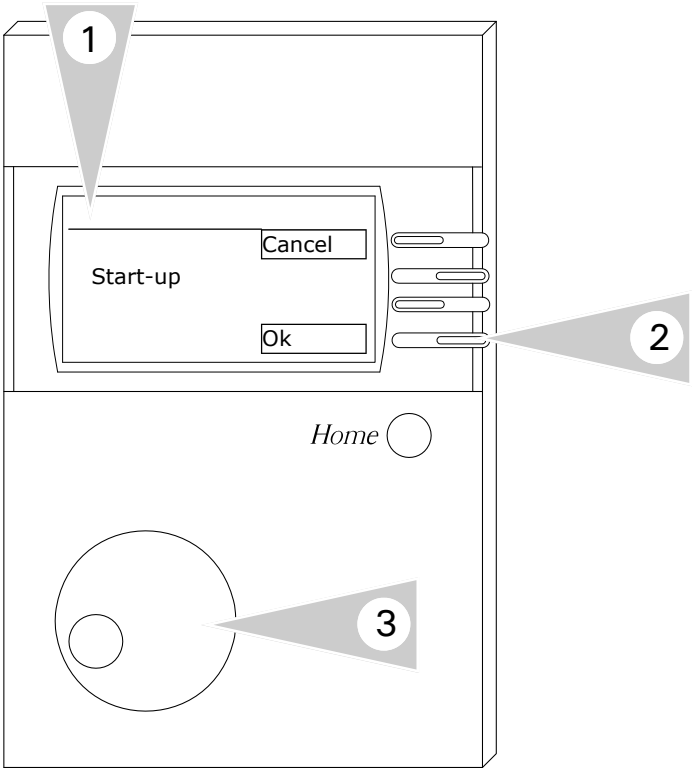
Outputs



Terminal	Description
26/N	DHW Pump (A3)
36/N	Common Supply Pump (A10) (Coded output) Multifunction 3
37/N	DHW Recirc Pump (A12) (Coded output) Multifunction 4

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 04(Cascade controller for modulating boilers)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

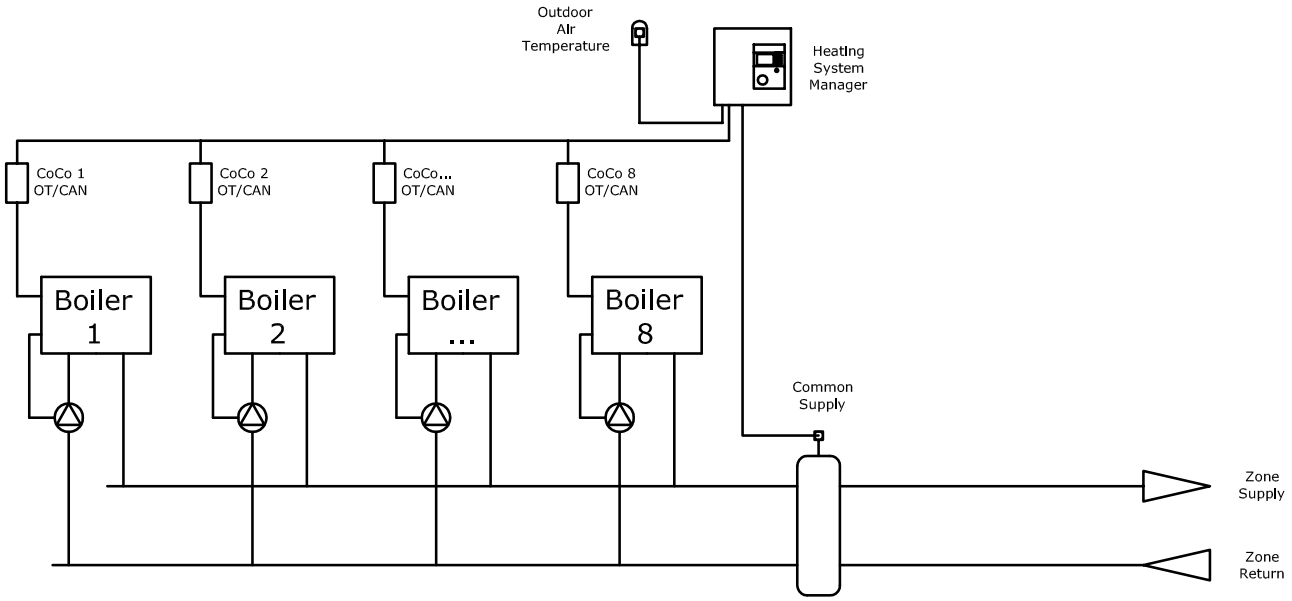
Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	01
Boiler 1 Type	06
BUS BOILER 1	02
Boiler 2 type	22
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 05 (Cascade controller for modulating boilers)



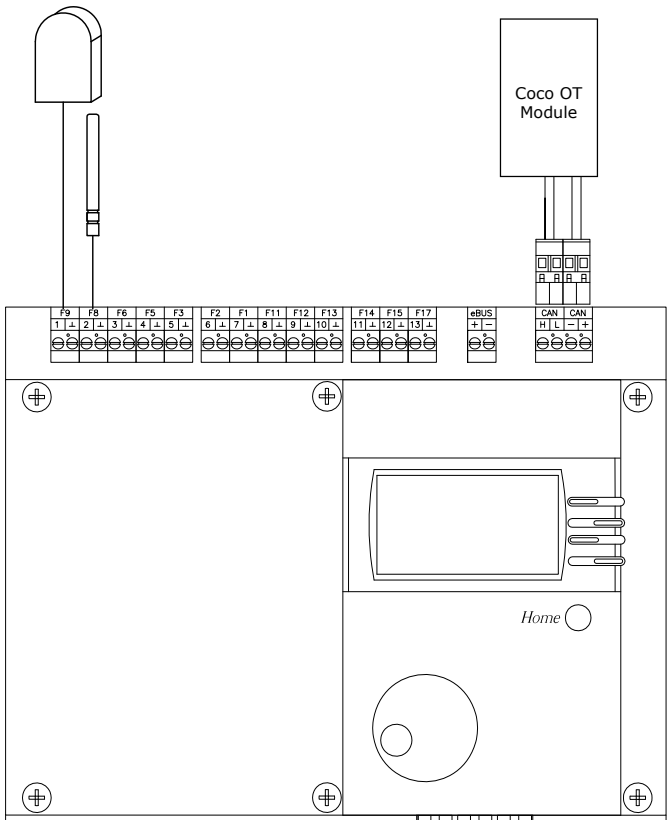
System Description

- Communication to OpenTherm enabled boilers 1 through 8. Boiler set point from Heating System Manager. Boiler responsible for achieving set point by modulating the burners
- Outdoor reset
- Outdoor sensor connection
- Common supply sensor connection
- Low Loss Header or hydraulic separator
- No DHW production
- No DHW recirc pump operation
- No space heating control
- Individual boiler pumps controlled from boiler pump output (refer to boiler manual)

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

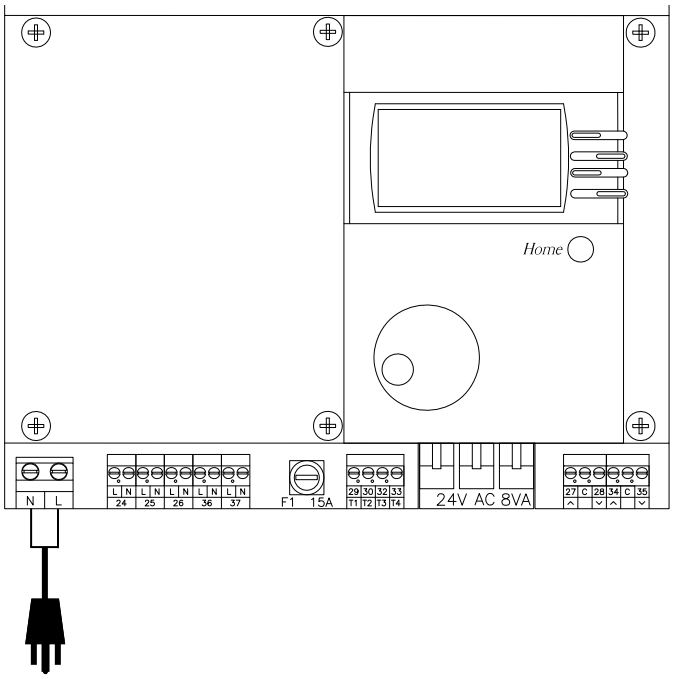
System Example 05 (Cascade controller for modulating boilers)

Inputs



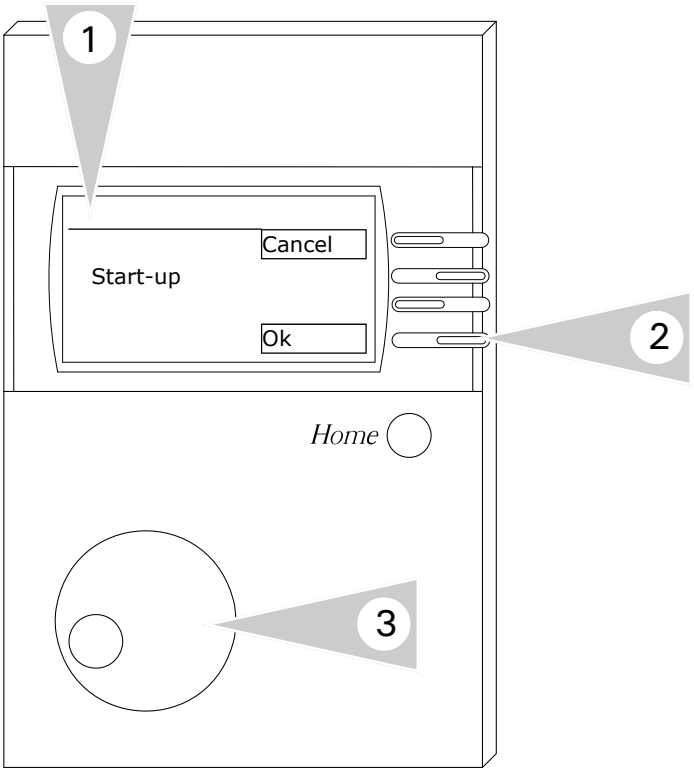
Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)/Boiler 1 Sensor
HL—+		CAN BUS Communication to Coco OT modules

Outputs



Terminal	Description
	No Output Connections

System Example 05 (Cascade controller for modulating boilers)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

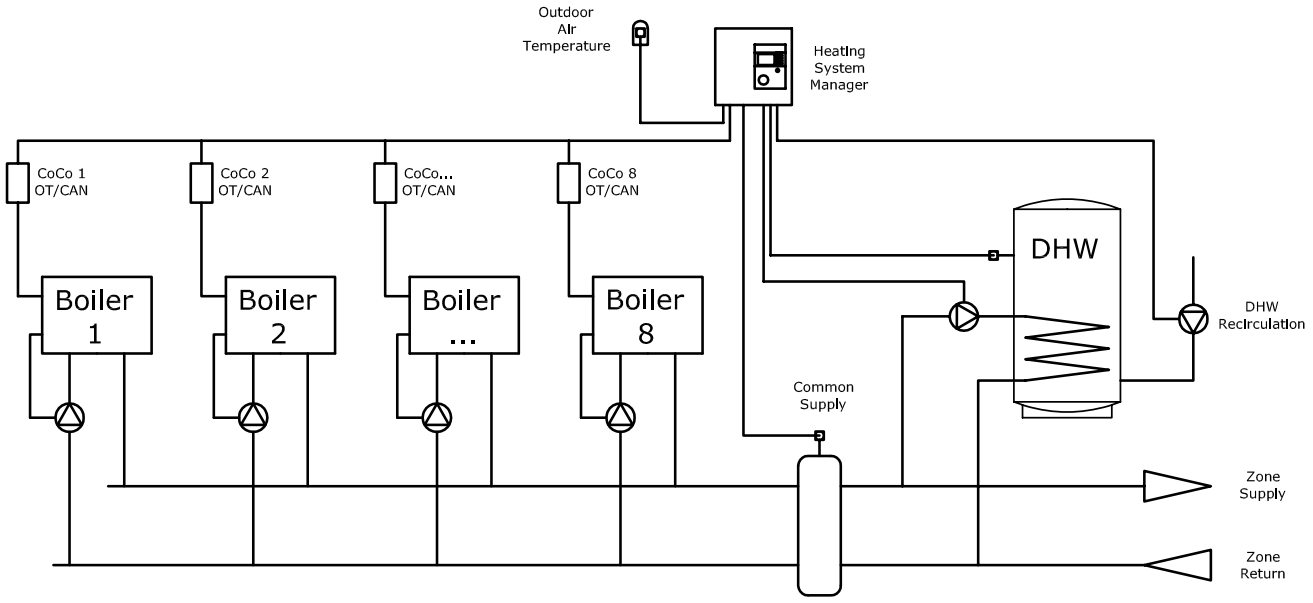
   Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	01
Boiler 1 Type	06
BUS BOILER 1	02
Boiler 2 type	22
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 06 (Cascade controller for modulating boilers)



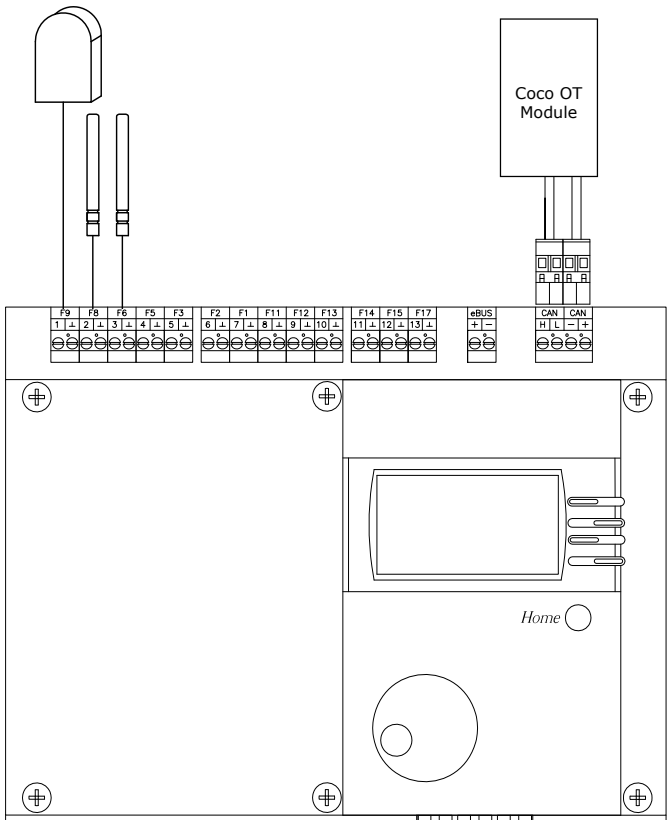
System Description

- Communication to OpenTherm enabled boilers 1 through 8. Boiler set point from Heating System Manager. Boiler responsible for achieving set point by modulating the burners
- Outdoor reset
- Outdoor sensor connection
- Common supply sensor connection
- Low Loss Header or hydraulic separator
- DHW production
- DHW recirc pump operation
- No space heating control
- Individual boiler pumps controlled from boiler pump output (refer to boiler manual)

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

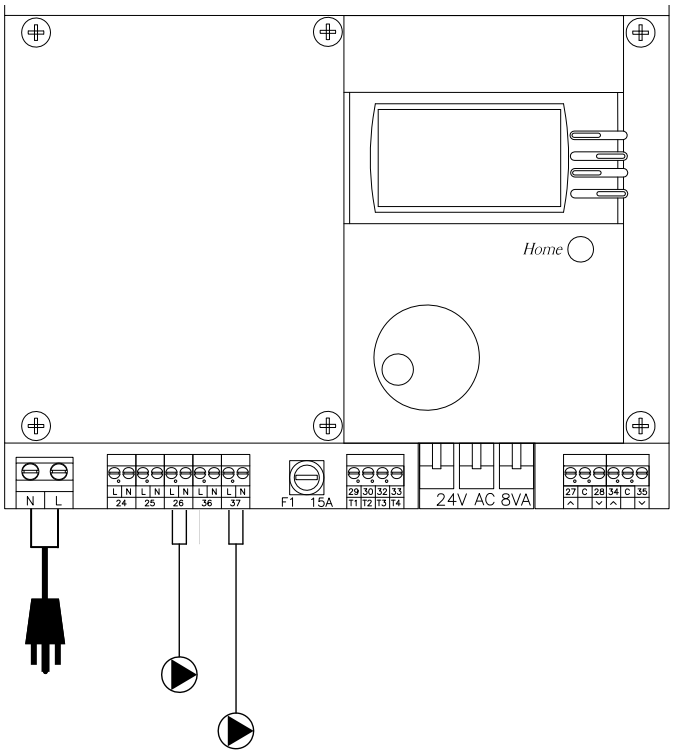
System Example 06 (Cascade controller for modulating boilers)

Inputs



Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)/Boiler 1 Sensor
3/⊥	F6	DHW Temperature Sensor
HL—+		CAN BUS Communication to Coco OT modules

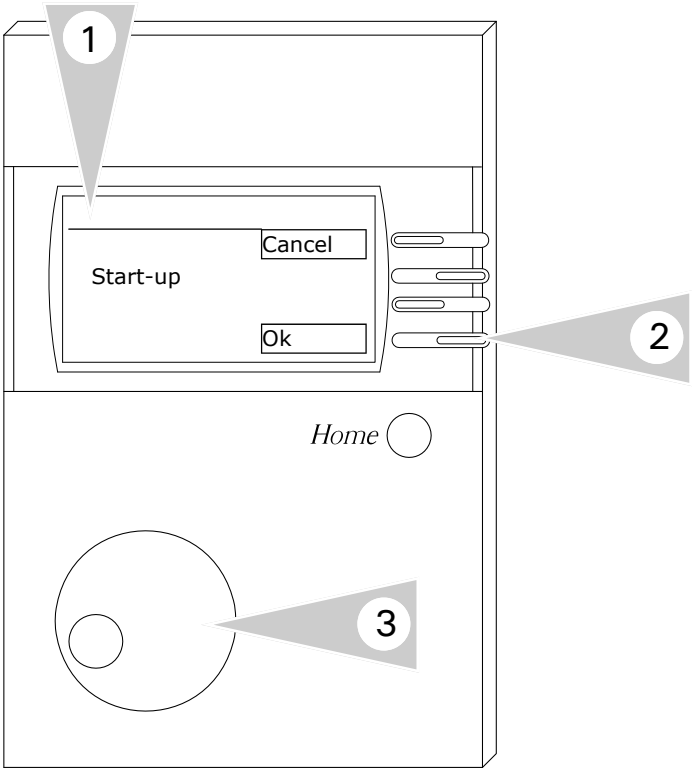
Outputs



Terminal	Description
26/N	DHW Pump (A3)
37/N	DHW Recirc Pump (A12) (Coded output) Multifunction 4

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 06 (Cascade controller for modulating boilers)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

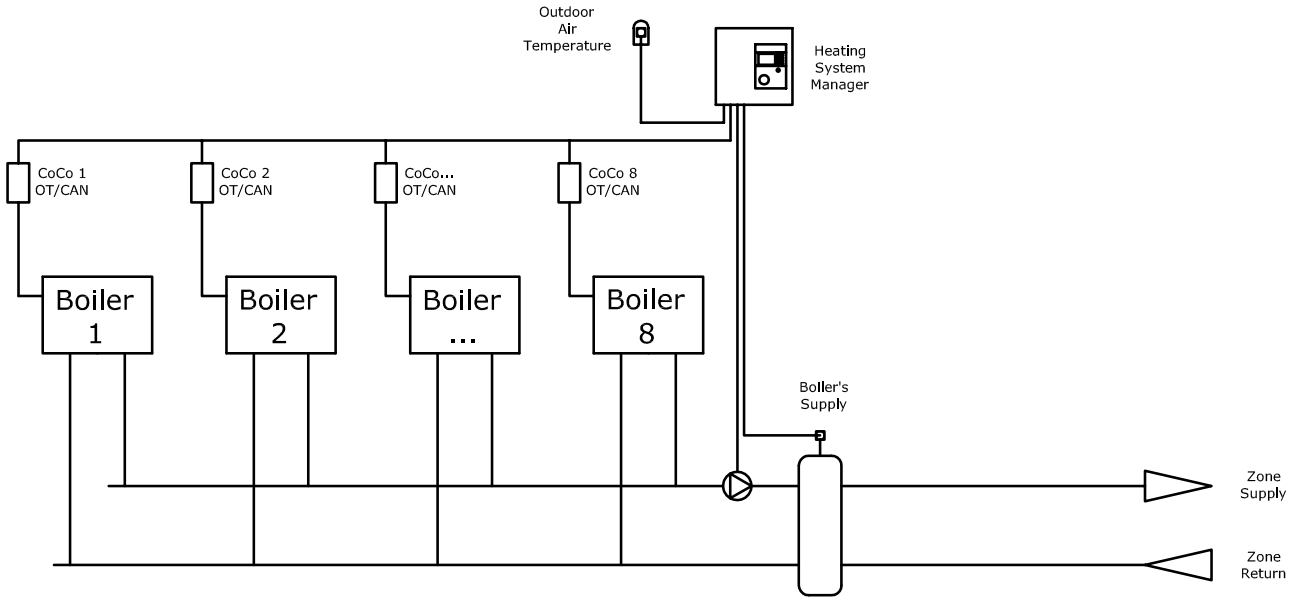
   Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	01
Boiler 1 Type	06
BUS BOILER 1	02
Boiler 2 type	22
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 07 (Cascade controller for modulating boilers)



System Description

- Communication to OpenTherm enabled boilers 1 through 8. Boiler set point from Heating System Manager. Boiler responsible for achieving set point by modulating the burners
- Outdoor reset
- Outdoor sensor connection
- Common supply sensor connection
- Low Loss Header or hydraulic separator
- No DHW production
- No DHW recirc pump operation
- No space heating control
- Common supply pump controlled and connected to heating system manager

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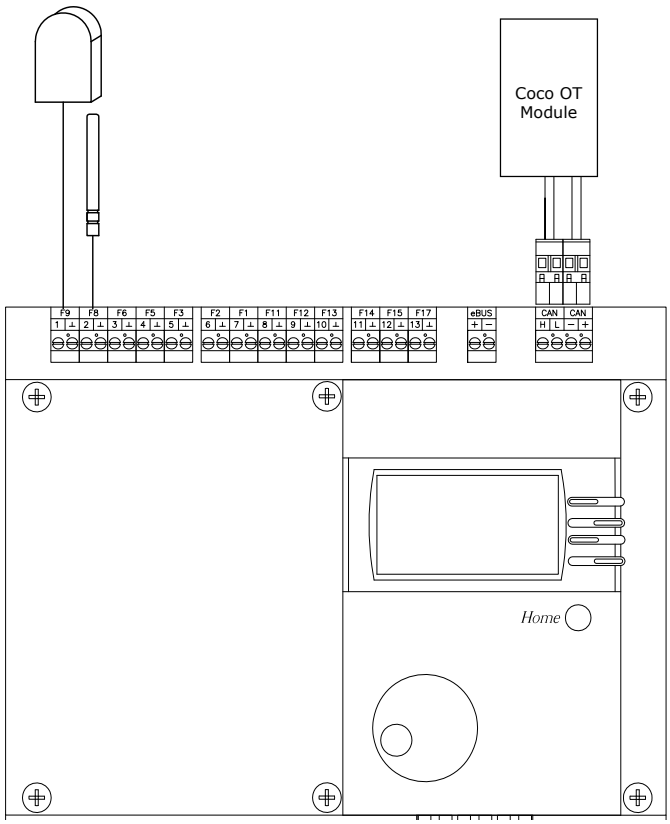
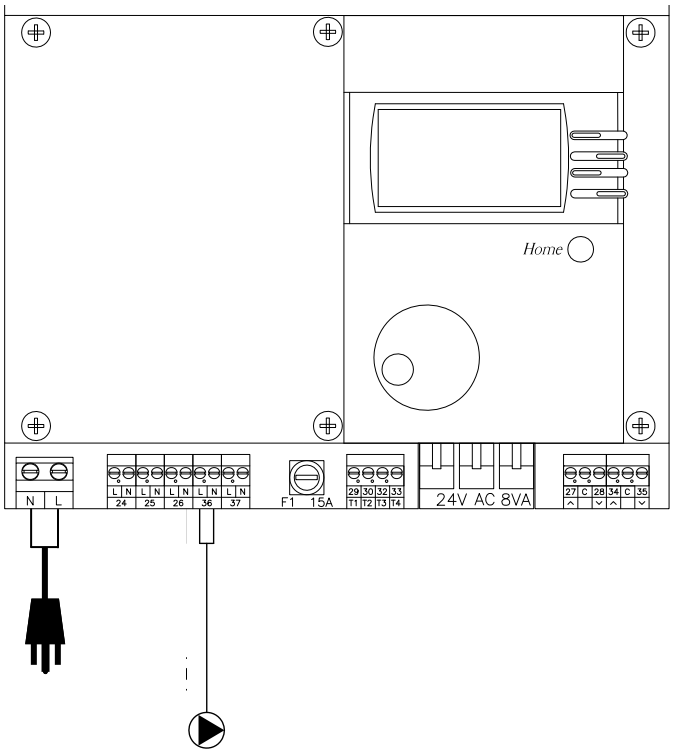
System Example 07 (Cascade controller for modulating boilers)

Inputs



Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)/Boiler 1 Sensor
HL—+		CAN BUS Communication to Coco OT modules

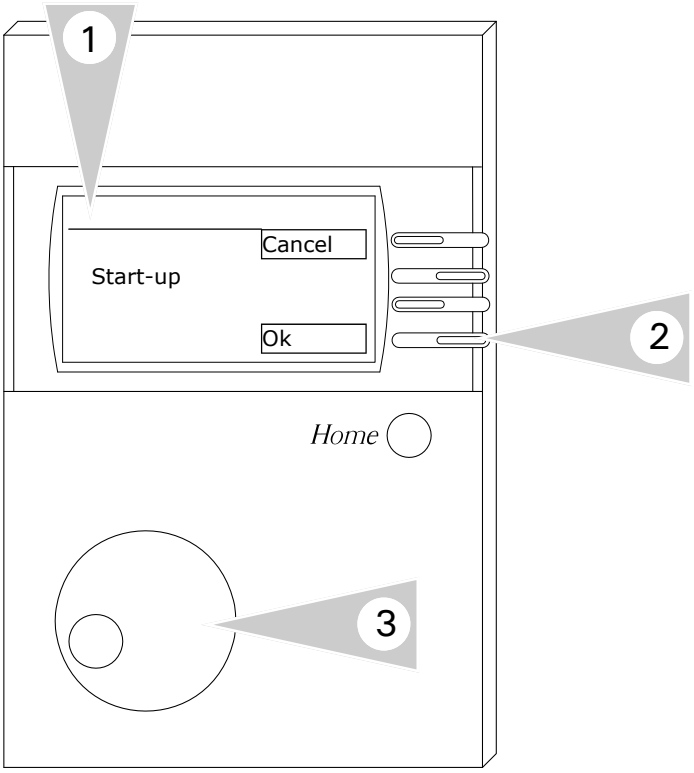
Outputs



Terminal	Description
36/N	Common Supply Pump (A10) (Coded output) Multifunction 3

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 07 (Cascade controller for modulating boilers)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

   Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	01
Boiler 1 Type	06
BUS BOILER 1	02
Boiler 2 type	22
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

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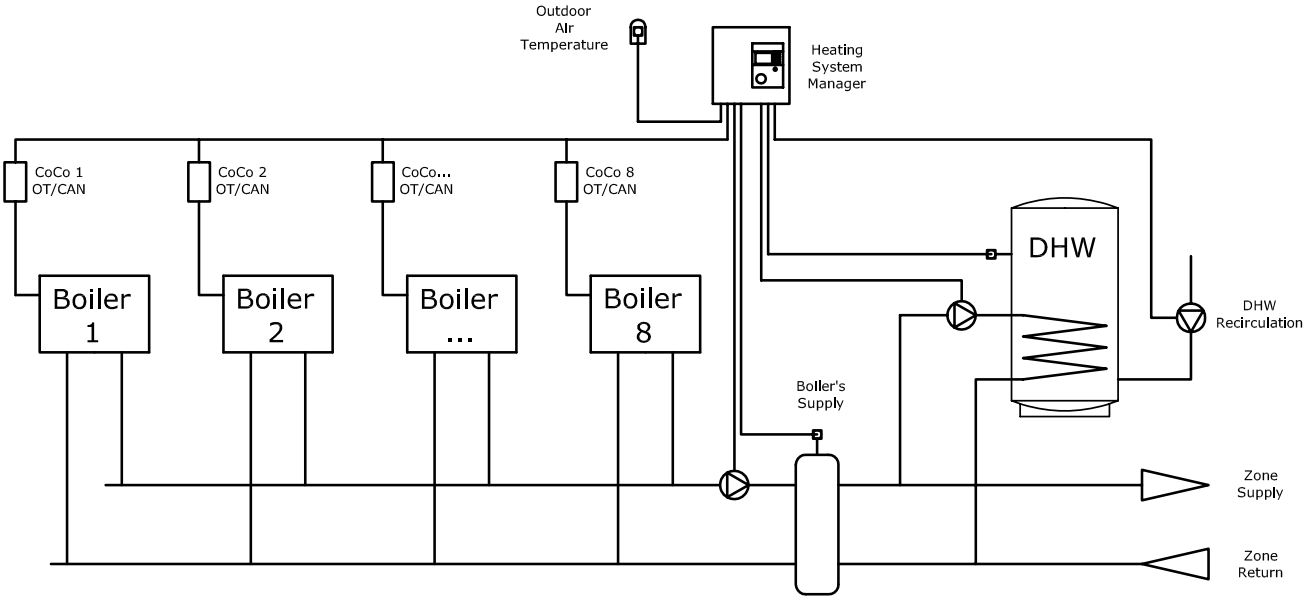
System Example 08 (Cascade controller for modulating boilers)



System Description

- Communication to OpenTherm enabled boilers 1 through 8. Boiler set point from Heating System Manager. Boiler responsible for achieving set point by modulating the burners
- Outdoor reset
- Outdoor sensor connection
- Common supply sensor connection
- Low Loss Header or hydraulic separator
- DHW production
- DHW recirc pump operation
- No space heating control
- Common supply pump controlled and connected to heating system manager

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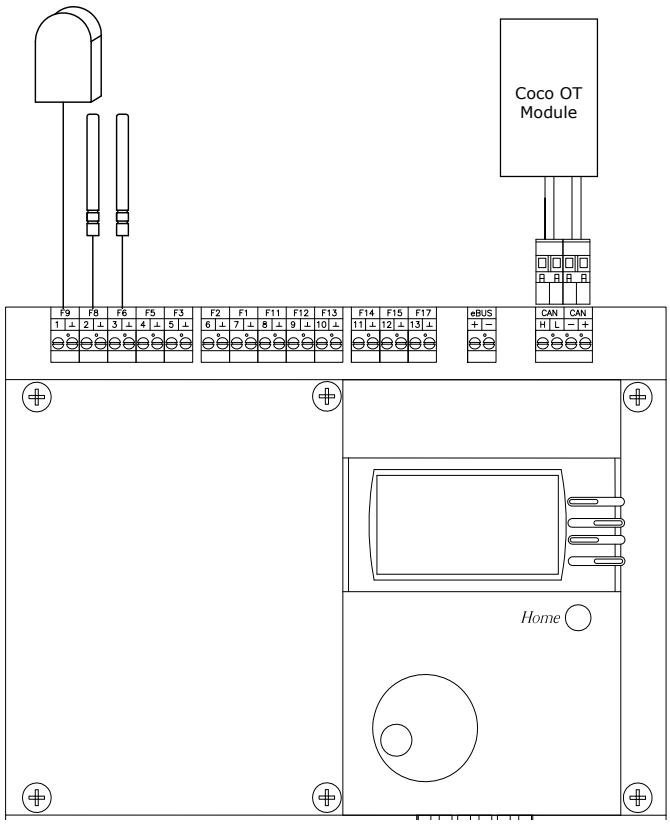
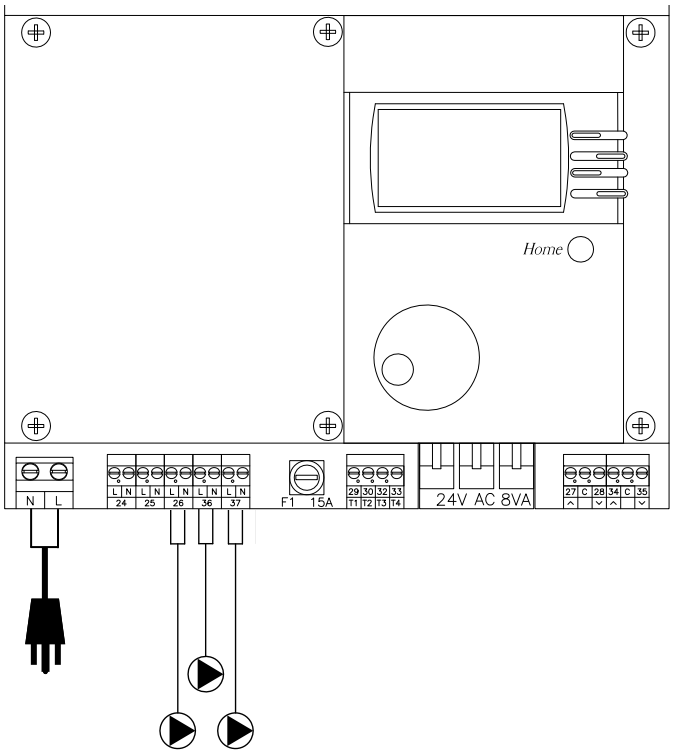
System Example 08 (Cascade controller for modulating boilers)

Inputs



Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)/Boiler 1 Sensor
3/⊥	F6	DHW Temperature Sensor
HL—+		CAN BUS Communication to Coco OT modules

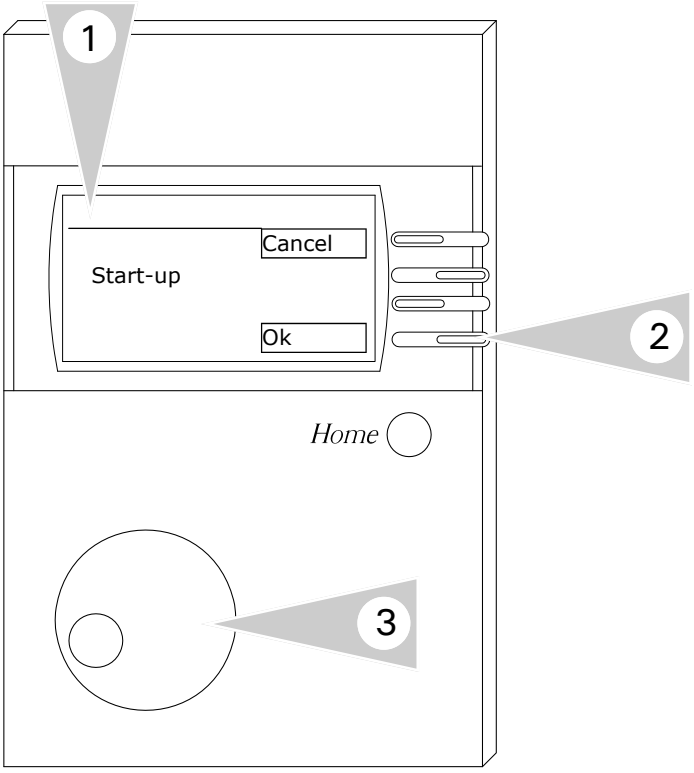
Outputs



Terminal	Description
26/N	DHW Pump (A3)
36/N	Common Supply Pump (A10) (Coded output) Multifunction 3
37/N	DHW Recirc Pump (A12) (Coded output) Multifunction 4

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 08 (Cascade controller for modulating boilers)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

   Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	01
Boiler 1 Type	06
BUS BOILER 1	02
Boiler 2 type	22
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

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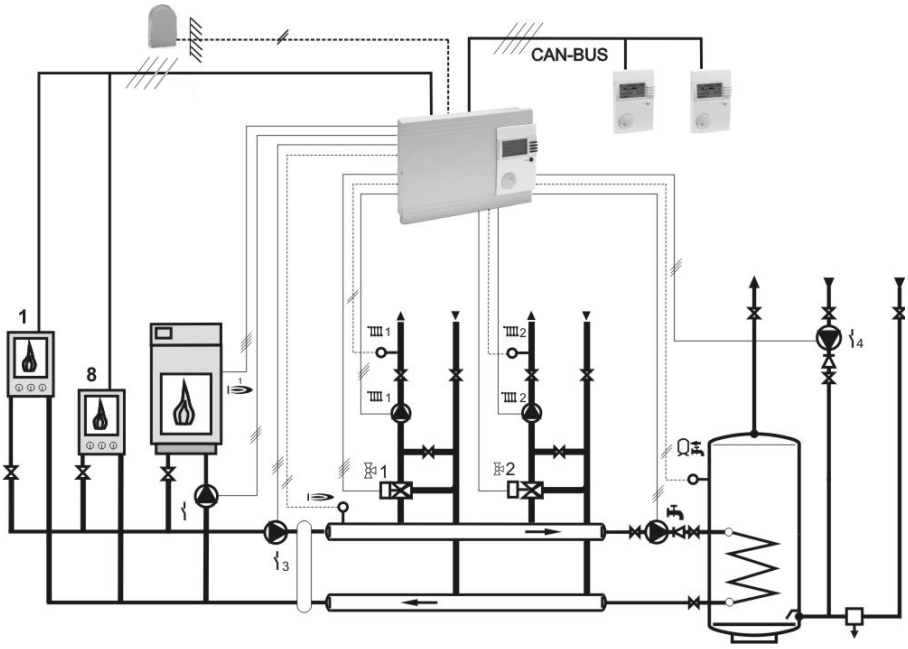
System Example 09 (Cascade controller for modulating boilers)



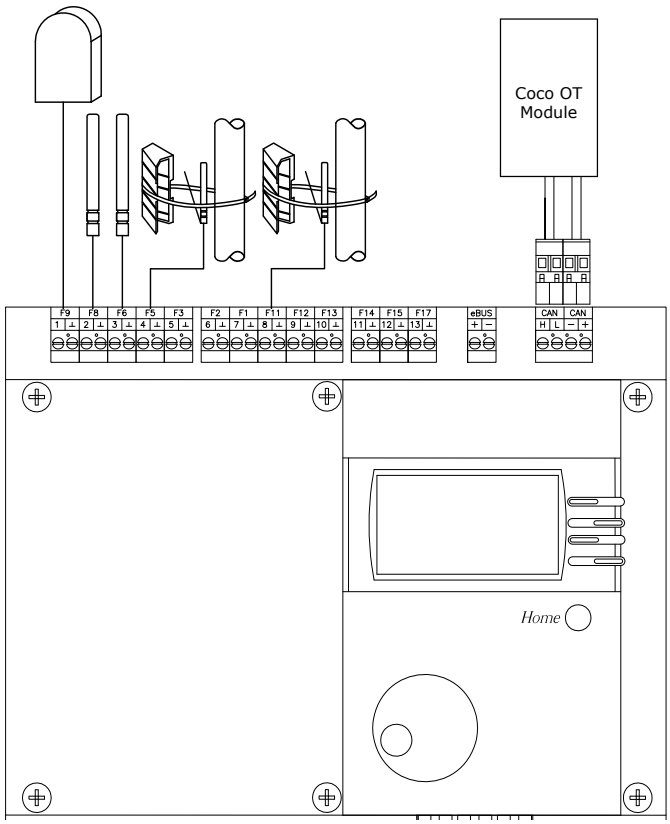
System Description

- Communication to OpenTherm enabled boilers 1 through 8. Boiler set point from Heating System Manager. Boiler responsible for achieving set point by modulating the burners
- Outdoor reset
- Dry contact demand for standby boiler and operation of boiler pump. Boiler pump controlled by dry contact output with field supplied 24VAC transformer and 24VAC coil relay.
- Primary side LLH/hydraulic separator pump controlled by relay multifunction 3
- DHW production connection from supply/ return header on secondary side of hydraulic separator
- DHW recirc pump operation function of multifunction 4 relay
- Heating Circuit 1 and 2 via mixing valve operation
- Lago Remote Controls for both mixing valves

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

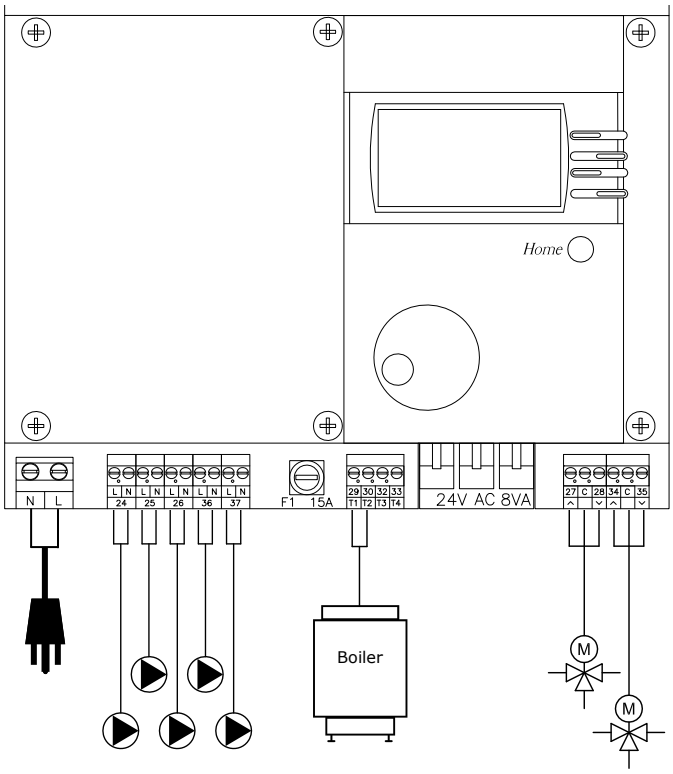
System Example 09 (Cascade controller for modulating boilers)

Inputs



Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)/Boiler 1 Sensor
3/⊥	F6	DHW Temperature Sensor
4/⊥	F5	Supply Temperature Sensor Heat Circuit 2 (Optional)
8/⊥	F11	Supply Temperature Sensor Heat Circuit 1 (Optional)
HL—+		CAN BUS Communication to Coco OT modules

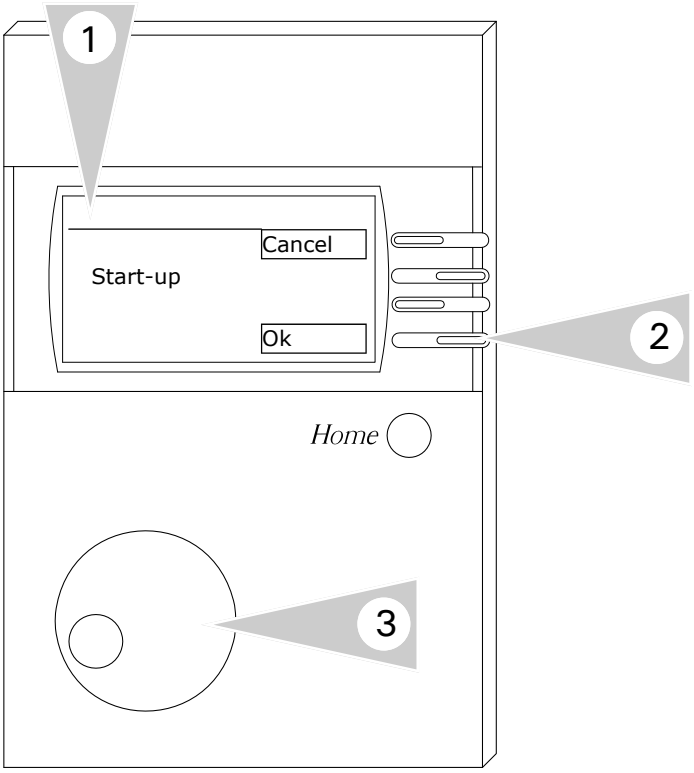
Outputs



Terminal	Description
24/N	Pump, Heating circuit 1 (A1)
25/N	Pump, Heating circuit 2 (A2)
26/N	DHW Pump (A3)
27/C	MV open, Heating circuit 2 (A4)
28/C	MV close, Heating circuit 2 (A5)
29/30	Standby Burner Call 1 On (A6)
32/33	Boiler pump call signal output. Extra transformer and 24V relay required
34/C	MV open Heating circuit 1 / Multifunction 1 (A8)
35/C	MV close Heating circuit 1 / Multifunction 2 (A9)
36/N	Common Supply Pump (A10) (Coded output) Multifunction 3
37/N	DHW Recirc Pump (A12) (Coded output) Multifunction 4

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System Example 09 (Cascade controller for modulating boilers)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

   Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	01
Boiler 1 Type	06
BUS BOILER 1	02
Boiler 2 type	22
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

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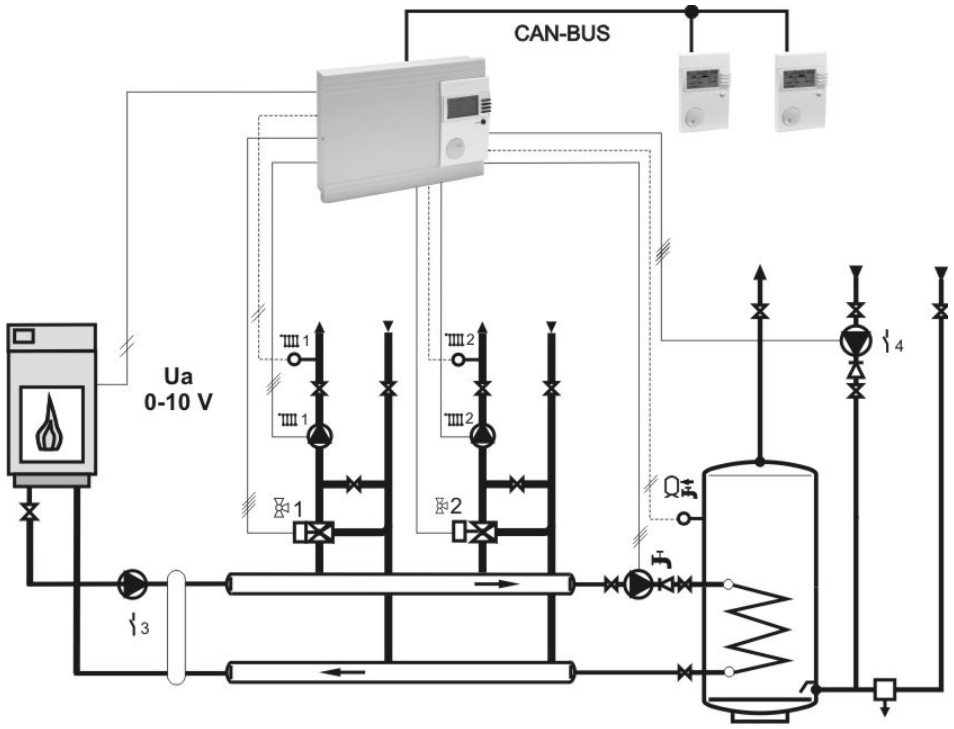
System Example 11 (0-10V controller)



System Description

- Boiler operation a function of 0-10VDC output signal from Heating System Manager. The 0-10VDC signal determines boiler temperature set point
- Outdoor reset
- Primary side LLH/hydraulic separator pump controlled by relay multifunction 3
- DHW production connection from supply/ return header on secondary side of hydraulic separator
- DHW recirc pump operation function of multifunction 4 relay
- Heating Circuit 1 and 2 via mixing valve operation
- Optional: Lago Remote Controls for both mixing valves

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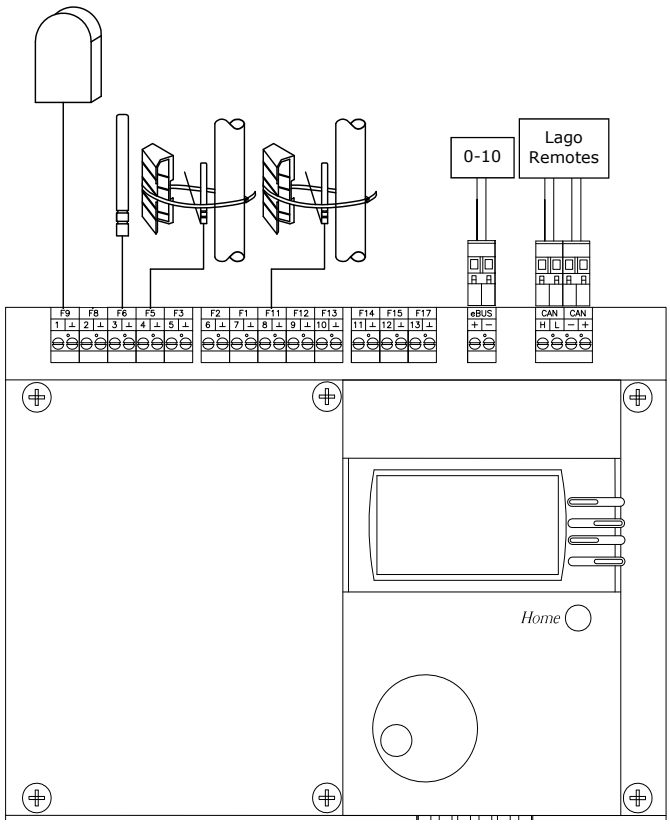
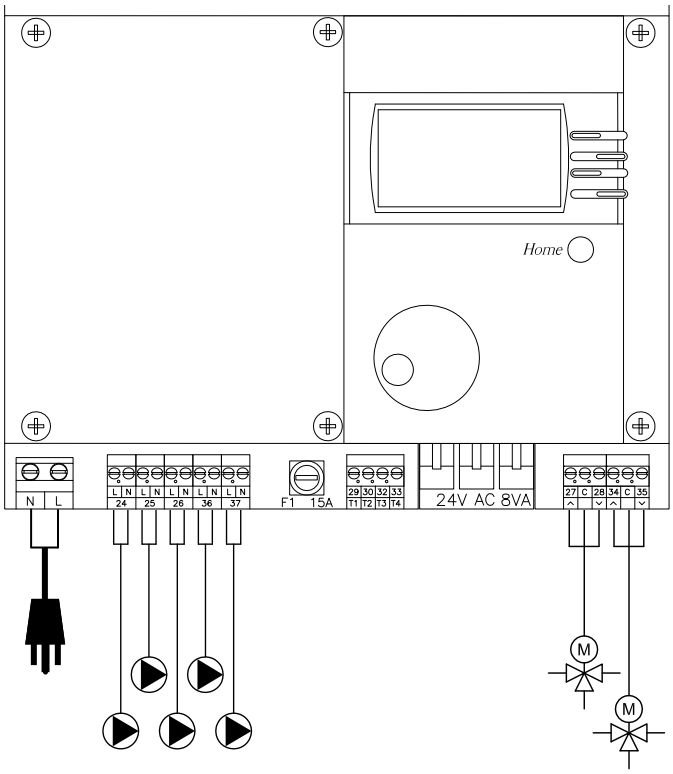
System Example 11 (0-10V controller)

Sensor Inputs



Outputs

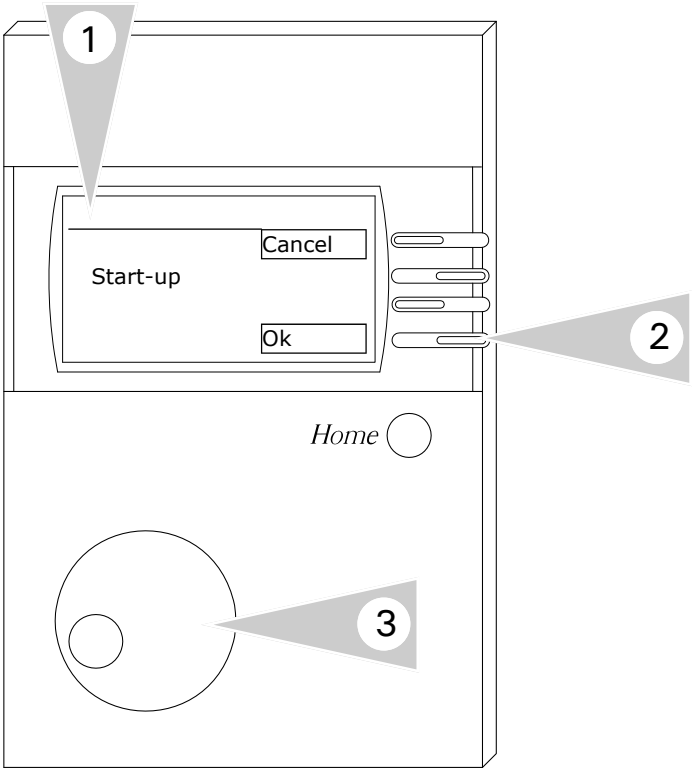


Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
3/⊥	F6	DHW Temperature Sensor
4/⊥	F5	Supply Temperature Sensor Heat Circuit 2 (Optional)
8/⊥	F11	Supply Temperature Sensor Heat Circuit 1 (Optional)
HL—+		CAN BUS Communication to Lago remotes

Terminal	Description 2
eBUS	0-10V + input/output for boiler control
eBUS	0-10V — input/output for boiler control

Terminal	Description
24/N	Pump, Heating circuit 1 (A1)
25/N	Pump, Heating circuit 2 (A2)
26/N	DHW Pump (A3)
27/C	MV open, Heating circuit 2 (A4)
28/C	MV close, Heating circuit 2 (A5)
34/C	MV open Heating circuit 1 / Multifunction 1 (A8)
35/C	MV close Heating circuit 1 / Multifunction 2 (A9)
36/N	LLH/Common Supply Pump (A10) (Coded output) Multifunction 3
37/N	DHW Recirc Pump (A12) (Coded output) Multifunction 4

System Example 11 (0-10V controller)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

   Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	03
Boiler 1 Type	02
BUS BOILER 1	05
Boiler 2 type	00
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	01
MF 4 Function	02
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

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System Example 11 (0-10V controller) Settings

0-10V I/O and Voltage curves for 0-10V system selection
Go to **:**

Main menu➔ Expert level ➔configuration➔ change system selection to **03 (0-10V)**
Main menu➔ Expert level ➔ 0-10V I/O

From No. 0-10 are fixed ranged values that can influence the Voltage and temp, No.11 can be defined by configuring any voltage range output and input for 0-10

U1=Voltage1 ➔ T1
U2= Voltage2 ➔ T2
UO=boiler off (UO must lie outside of the valid voltage values)
Voltage curve is defined from U1:T1 (point1) to U2:T2 (point 2)

The room temperature has the influence to increase the desired temp in the supply temp depending what the room desired is set to. As soon as the room temp drops below the desired set temp the
setpoint temp in the supply increases and the Voltage changes depending on the voltage curve setup unless the room influence **under Main menu➔ User ➔ Heating Circuit ➔Room Influence** is set to OFF then the room influence would not affect the desired temp to increase or decrease in this point the outside temperature would have the effect of increasing or decreasing the desired boiler temp setpoint depending on the heating Curve Value selected under
Main menu ➔ User ➔ Heating Circuit ➔ Heating curve.

Note: **as soon as the room temp increases above the desired temp the Time selection will go to reduced mode. (if the room influence is ON and temp is above the setpoint)**

When No.11 is selected for Voltage curve the boiler Tmax and boiler Tmin can be set under
Main menu➔ Expert ➔ Heat source
Important set values for 0-10V I/O

Configuration/**BUS BOILER 1 = 04 =>** Output of the temperature setting of the heat generator via the 0-10V output signal.

Configuration/**BUS BOILER 1 = 05 =>** Output of the set modulation depth via the 0-10V output signal.

Configuration / **F15 Function = 01 =>** Evaluation of the preset external header temperature setting via the 0-10V output signal.

Configuration/F15 function = 03 => Evaluation of the preset external modulation depth via the 0..10V input.

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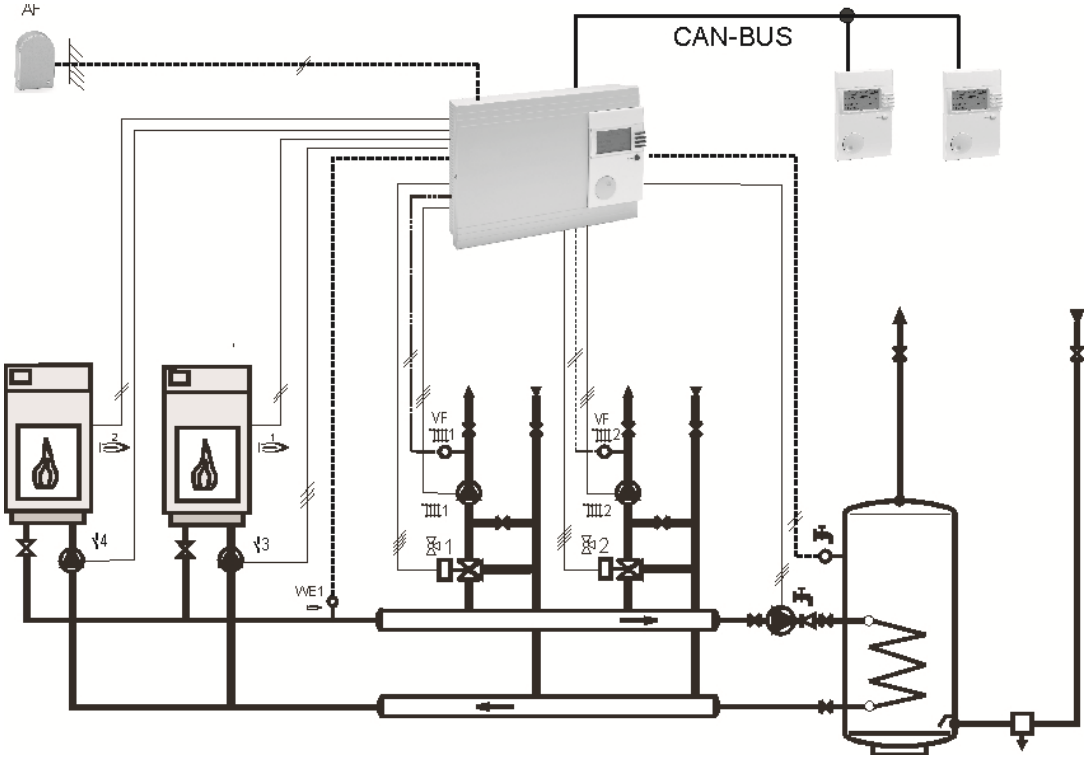
System Example 12 (Two Singe Stage boilers switching)



System Description

- Two single stage boilers each with boiler pump. Lead lag operation
- Outdoor reset
- DHW production connection from supply/ return header
- Heating Circuit 1 and 2 via mixing valve operation
- No DHW recirculation

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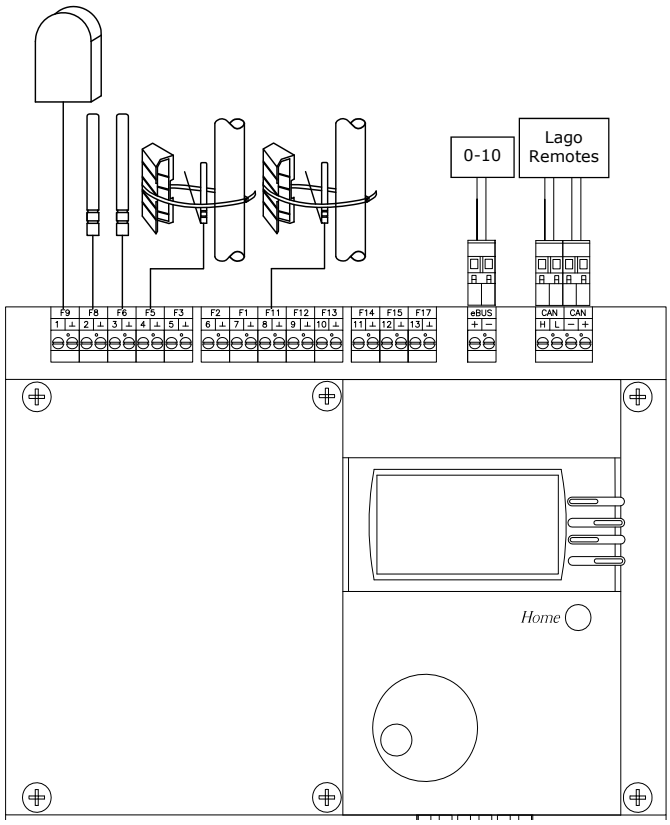
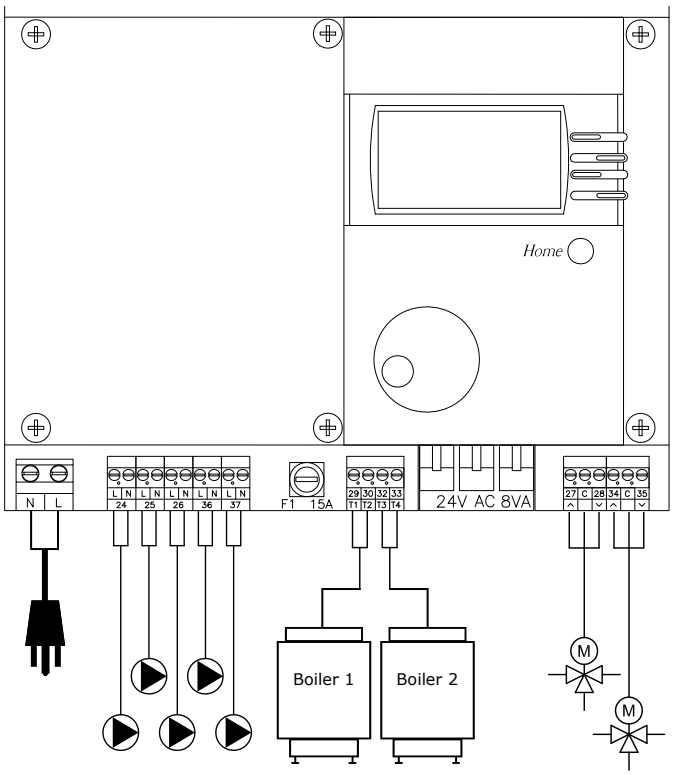
System Example 12 (Two Singe Stage boilers switching)

Sensor Inputs



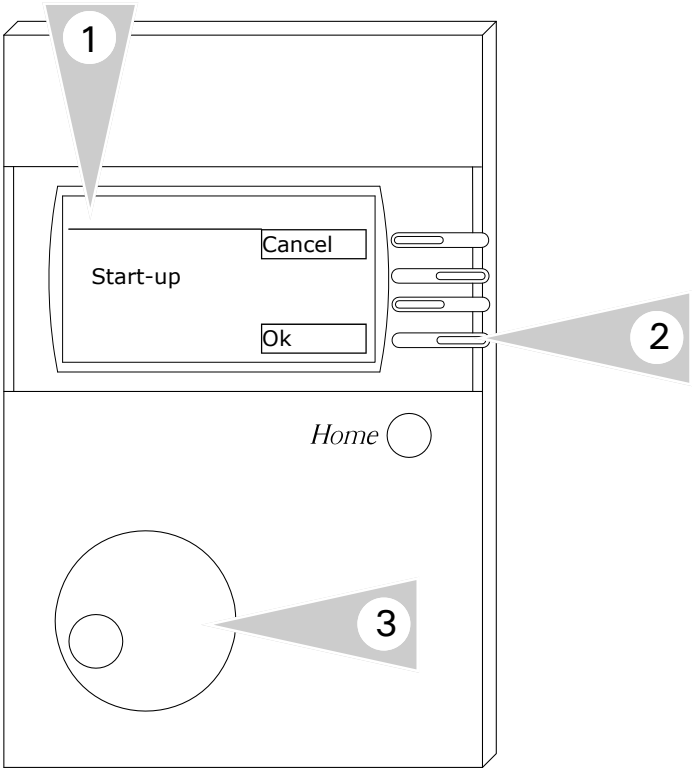
Terminal Plug	Sensor Input	Function
1/⊥	F9	Outdoor Temperature Sensor
2/⊥	F8	Common Supply (Low Loss Header)/Boiler 1 Sensor
3/⊥	F6	DHW Temperature Sensor
4/⊥	F5	Supply Temperature Sensor Heat Circuit 2 (Optional)
8/⊥	F11	Supply Temperature Sensor Heat Circuit 1 (Optional)
HL—+		CAN BUS Communication to Lago remotes

Outputs



Terminal	Description
24/N	Pump, Heating circuit 1 (A1)
25/N	Pump, Heating circuit 2 (A2)
26/N	DHW Pump (A3)
27/C	MV open, Heating circuit 2 (A4)
28/C	MV close, Heating circuit 2 (A5)
29/30	Burner Call 1 On (A6)
32/33	Burner Call 2 On (A7)
34/C	MV open Heating circuit 1 / Multifunction 1 (A8)
35/C	MV close Heating circuit 1 / Multifunction 2 (A9)
36/N	Boiler 1 pump (A10) (Coded output) Multifunction 3
37/N	Boiler 2 pump (A12) (Coded output) Multifunction 4

System Example 12 (Two Singe Stage boilers switching)



Programming

Refer Start-up section in this manual for the complete information.

Note: Ensure all of the necessary connections are performed before powering the control ON.

1. Once the initial wiring checks are complete, power the control ON. A Start-up screen will appear in the screen display.
2. To enter the Start-up sequence, press button adjacent to OK.
3. Enter the necessary information during the start up phase by utilizing the rotary dial and function keys (2).
4. Refer to the table for the necessary programming information during the start up sequence.

   Note: variables shown during the start up sequence are a function of the system selection.

4

Designation	Settings
System selection	05
Boiler 1 Type	04
BUS BOILER 1	00
Boiler 2 type	00
Boiler 2 storage	00
Tank type	00
Cooling operation	OFF
Gradient	Off
HC Function HC1	Standard
HC Function HC2	Standard
Output boiler stg	00 kW
MF 1 Function	00
MF 2 Function	00
MF 3 Function	05
MF 4 Function	06
F 15 Function	00
BUS ID 1	01
BUS ID 2	02
Sensor	5k
BUS Scan	Off

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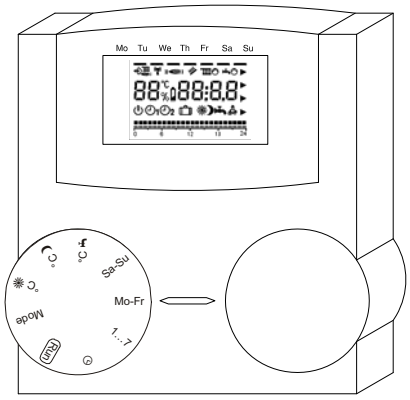
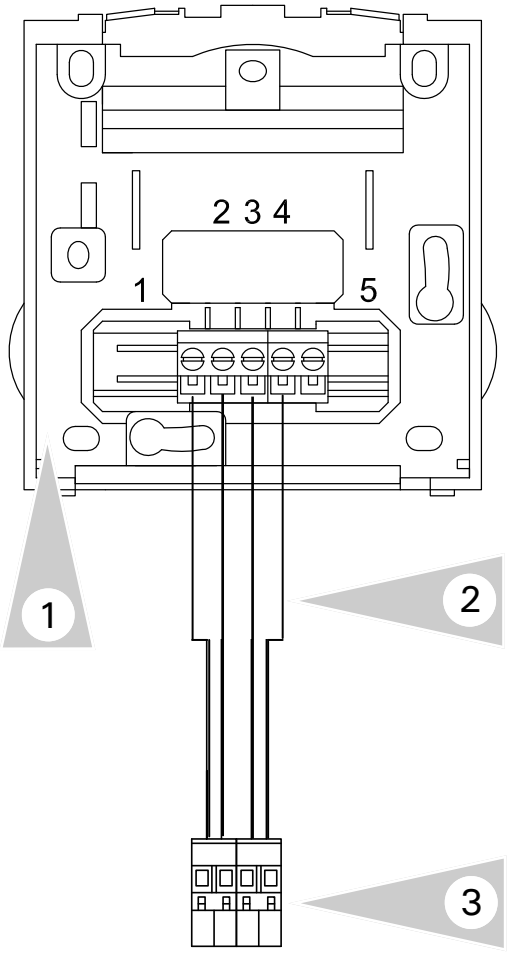
Accessories

Remote Heating Circuit Lago FB





Lago Overview

The Versatronik Lago FB remote control is designed to operate as a remote control for mixing valve circuits. It communicates with the Versatronik 200 via CAN BUS communications.

The remote is mounted to a wall mounted sub-base which houses a wiring terminal strip.

The Lago is programmed to control mixing valve 1 and/or 2. It uses a multi-element LCD display to provide the user with comprehensive information.

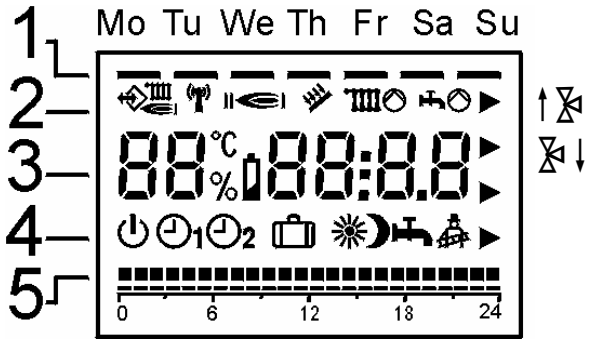
- ▶ Rotating potentiometer for modifying the room temperature setting
  Adjusting range: (±5 K)
- ▶ Room control via the integrated room sensor
- ▶ Rotating switch for selecting operating mode
  - ⏻ Standby/OFF (frost protection only)
  - $\mathbb{O}_1$ Automatic mode (acc. to timer program 1 in controller)
  - $\mathbb{O}_2$ Automatic mode (acc. to timer program 2 in controller)
  - ☽ 24-hour night operation (reduction temperature)
  - ☼ 24-hour daytime operation (comfort temperature)
  - Summer mode (heating OFF, hot water only)

Lago Installation

1. Sub-base for the Lago remote. Secure to wall with field supplied hardware.
2. Connect sub-base with field supplied 4 conductor cabling. If installing both remotes, they can be wired together by paralleling the terminal connections.
3. CAN BUS communication plug. The same connection plug is used with Coco OT communication adaptors. Parallel connections for second Lago if used
   H to terminal 1
   L to terminal 2
   — to terminal 3
   + to terminal 4

Accessories

Remote Heating Circuit Lago FB Operation



Operation Overview

There are three primary elements regarding the operation of the Lago remote control:

1. LCD display screen
2. Mode selector dial
3. Value selector dial

Utilizing all three of these elements will allow the user to perform temperature adjustments on the heating circuit as well as reviewing current information.

LCD Screen Information

1. Days of the week at the top of the screen
   Mo=Monday
   Tu=Tuesday
   We=Wednesday
   Th=Thursday
   Fr=Friday
   Sa=Saturday
   Su=Sunday
2. Status Indicators

	BUS Communication OK
/	Burner Operation Burner stages I and II
/	Heating Operation (=Pump operation)
/	DHW Operation (=Pump operation)
/	Mixing Valve Operation Open/Closed signals

3. Current Information with dial set to *RUN* use value selector dial to select information.

C/F	Room Temperature and time
HO	Holiday mode of operation with remaining time in days.
AF	Outside Temperature (only with outside sensor)
	Boiler temperature (System dependant)
	Supply temperature of heating circuit
	DHW Tank temperature
E001	Fault indication

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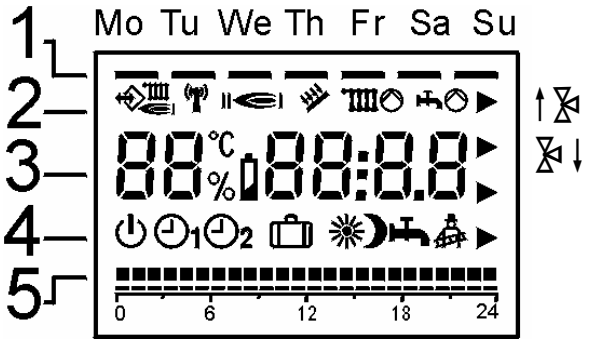
Installation

Accessories

Remote Heating Circuit Lago FB Operation



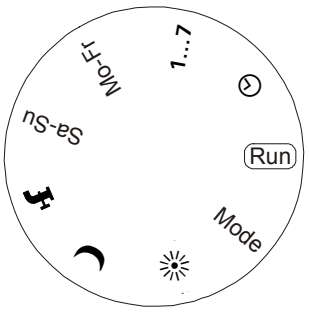
LCD Screen Information Continued

4. Operating Mode

⏻	Stand-by No heating operation and no DHW operation Only frost protection
🕘1	Heating with Operating Program 1
🕘2	Heating with Operating Program 2
☼	24hour normal heating operation 24hour DHW operation (coding 12)
☽	24hour reduced heating operation 24hour DHW operation (coding 12)
🛁	No heating operation (frost protection) DHW operation (coding 12)
🔧	Service Operation Boiler set point temperature coding 8, pump ON, deactivation after 15 mins
PL	Expert Level Programming codes 1 through 17
HO	Holiday Operation Use value selector dial to select number of days. Start time is immediate and ends on the last day at 24:00 hours. Set room temperature 15C/59F for 24h.

5. Heating program times in hours. Displays the time in one hour blocks

Changing the set values



Run	Default display, sensor value display, holidays
Mode	Set/Display the operating mode, expert level, holiday function
☼	Set/Display the set point room temperature (day time)
☽	Set/Display the set point room temperature (night time)
🛁	Set/Display the hot water set temperature
Sa-Su	Set/Display the heating program 1 (Saturday to Sunday)
Mo-Fr	Set/Display the heating program 1 (Monday to Friday)
1...7	Set/Display the week days (Monday to Sunday)
🕘	Set/Display the time

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Operation

Accessories

Remote Heating Circuit Lago FB Operation

Changing Heating Times ◴1, ◴2

Set the mode selection dial to Mo-Fr. The first hour block flashes, the display shows 0:00 hours and the current heating program is indicated.

For the first reduction phase up to the next start of heating.

1. Turn the value selector dial **LEFT** until the display shows the start time for the first heating period.

For the first heating period.

1. Turn the value selector dial **RIGHT** until the display shows the end time for the first heating period

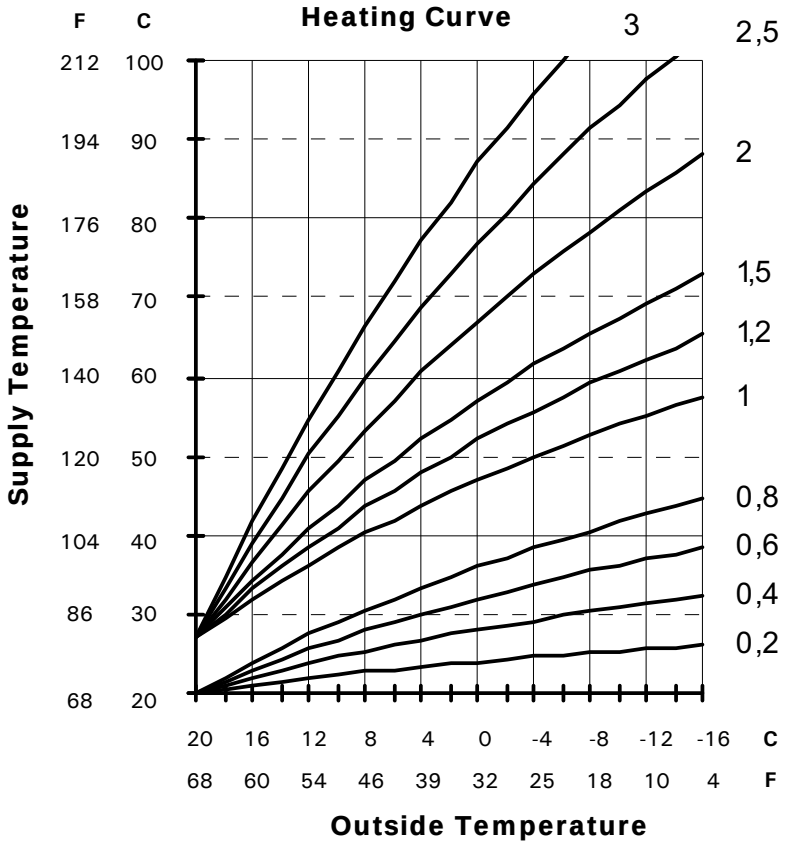
For the reduction phase up to the next start of heating.

1. Turn the value selector dial **LEFT** until the display shows the start time for the second heating period.

For the following heating period.

1. Turn the value selector dial RIGHT until the display shows the end time for the second heating period.

Programming is carried out rotatingly. After 23:45 hours, the hour block jumps back to 0:00 hours.

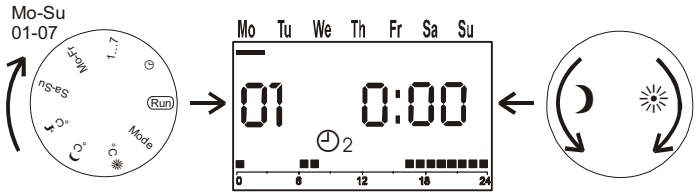


KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Operation

Accessories

Remote Heating Circuit Lago FB Operation Expert Level



Rotate Mode Selection Dial to **MODE**
Use Value Selection Dial to select ***Expert Level*** **PL**
Use Mode Selection Dial to select desired parameter. Use Value Selection Dial to set the desired value.

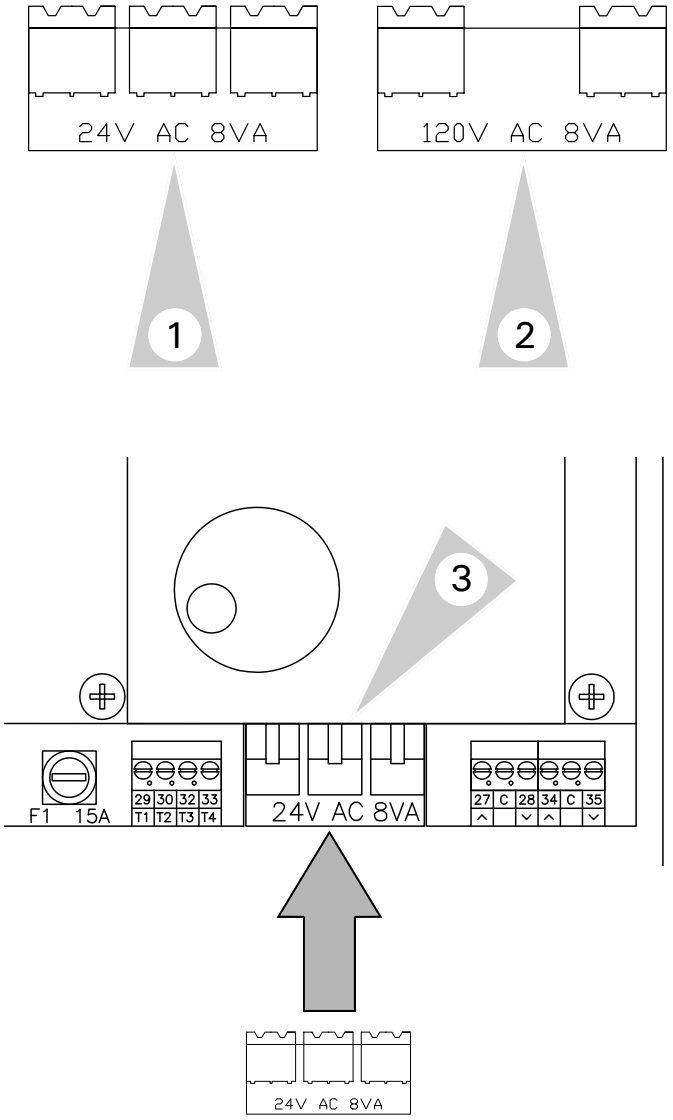
Exiting Expert Level

Use Mode Selection Dial to select Entry/Return parameter. Display PL
Use Value Selection Dial to exit from expert level

Code	Description	Default	Range	Notes
01	Heating Program for Monday	6:00—8:00 16:00—22:00	00:00—24:00	Set values 01-07 Entry of heating program specific to day. Refer to Changing Heating Times. Use Mode Selector Dial to select week day Use Value Selector Dial to set heating program
02	Heating Program for Tuesday			
03	Heating Program for Wednesday			
04	Heating Program for Thursday			
05	Heating Program for Friday			
06	Heating Program for Saturday	7:00—23:00		
07	Heating Program for Sunday			
08	Maximum Supply Temperature	80C/176F	10C/50F—110C/230F	Maximum limit
09	Minimum Supply Temperature	30C/86F	10C/50F—110C/230F	Minimum temperature limit
10	Heating Slope	1.20	0.20—3.00	Outdoor temperature sensor req'd
11	Room Sensor Effect (P Controller)	10	Off, 0-20	The boiler temperature is increased by the set value when the room temperature drops below the desired room temperature by 1 degree
12	DHW Operation Mode	4	0-4	DHW Operating Mode 00=Off 01=DHW according to htg prog 01 02=DHW according to htg prog 02 03=DHW according to active htg prog 04=24h production
13	Room Sensor Correction	0	+/—5K/9Ra	Correction of actual room temperature display
14	Outside Temperature Frost Protect.	0C/32F	Off, -15C to +15C 5F to 41F	Frost protection setting
15	I—Controlled Portion (00:30 h)	OFF	Off, 03:00h—00:15h	Correction of the room temperature deviation. If the room temperature deviates by 1K for the set period, the supply temperature is increased by the value programmed at "Room sensor effect"
16	BUS ID	01	0-15	Number of the remote heating circuit values
17	Temperature Unit	C	C/F	Selected unit value

Accessories

Mixing Valve Adapter Card



Operating Information

The Mixing Valve Adapter Card is used to select the voltage that is required for the mixing valve actuators to be controlled by the Versatronik 200. The card is plugged into the control.

Once plugged in, the Versatronik is then ready to allow the wiring of either 24VAC or 120VAC actuators to the mixing valve outputs. It is not possible to control a combination of voltages. Only 24VAC or 120VAC.

Installation Information

Select the card to be installed based on the voltage of the actuators to be installed.

1. 24VAC card
2. 120VAC card
3. Push card together with mating connectors on main PCB of Versatronik

Specifications

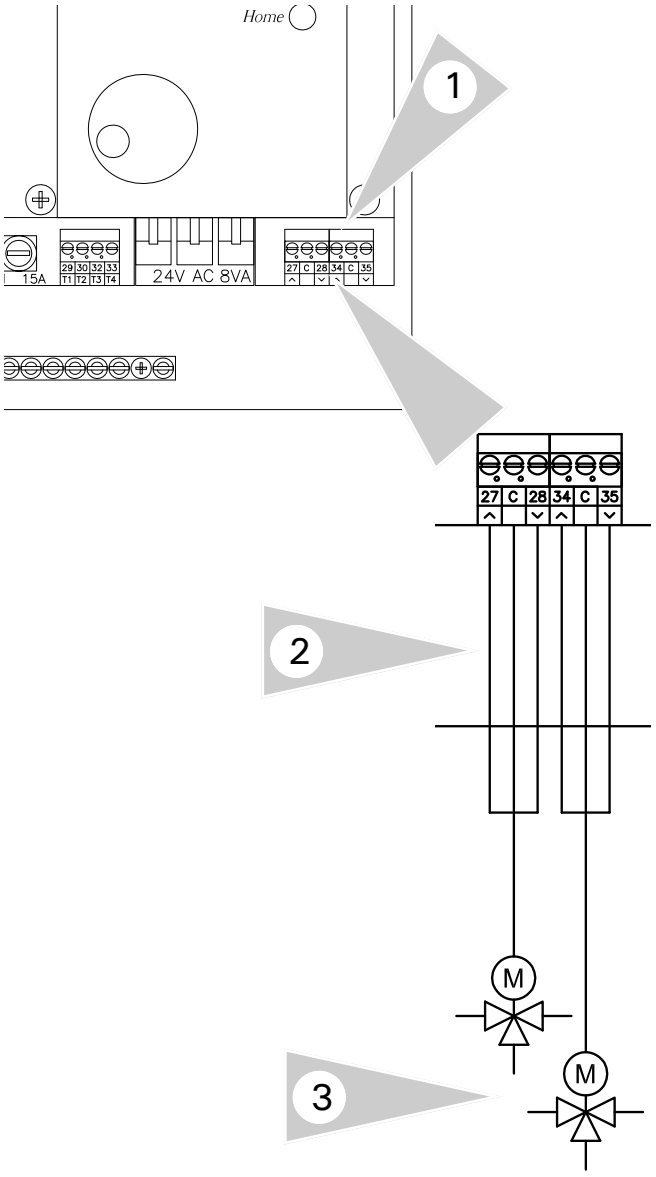
Voltage	Output VA
24VAC	8VA
120VAC	8VA

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Installation

Accessories

Mixing Valve Actuators



Operating Information

The Versatronik 200 control can control up to two mixing valves. The actuators to be controlled are to be of floating point type and not 0-10VDC or 4-20mA signals.

The mixing valve actuator is to modulate to maintain the supply temperature set point. The set point temperature is based on heating curve settings.

Testing the function of the actuator(s) can be accomplished by performing a relay test or adjusting the heating curve settings up and down to influence the set point. The actual supply temperature is sensed by a strap on sensor onto the outlet pipe of the mixing valve.

Installation Information

Select the card to be installed based on the voltage of the actuators to be installed.

1. Locate the terminals in the control.
   Mixing valve 1 is connected to terminals 34, 35 and C.
   Mixing valve 2 is connected to terminals 27, 28 and C
2. Using field supplied wiring between the Versatronik 200 and the mixing valve actuator.
3. Wire the actuators following manufacturer instructions.

Specifications

Voltage	Output VA
24VAC	8VA
120VAC	8VA

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Accessories

Change of Operating Mode—Telephone switch

The heating system can be switched to Heating mode h with a telephone switch. The connection terminals of the controller for the remote control FBR (see connection diagram) are used for installation. As soon as a short circuit is detected between terminal ([6+GND at Hc1] and [13+GND at HC2], the associated heating circuit switches to heating circuit. Additionally the hot water preparation is activated (only for controllers with hot water preparation). When the short circuit is eliminated, the controller once again heats on the basis of the set heating program.

⚠ If the heating circuit is controlled remotely by a remote control, the telephone switch must be connected at the operating module.

PC

All system-specific parameters can be set and interrogated using the C*omfort*S*oft* parameterisation software. The parameters can be saved, displayed graphically and evaluated on the PC at predefined intervals.

To connect to a PC, you need the CoCo PC active, which also supports the sending of error messages by SMS and the remote interrogation of controller data.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Control Operation

Section 3.0

Section 3.1

Section 3.2

Section 3.3

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Operation Overview

The Versatronik 200 System Control is a highly configurable boiler system heating controller. It is capable of DHW, mixing valve control and multi-function settings which provides selectable output functions.

Control of up to 8 boilers via CoCo communication modules, a stand-by demand on/ off boiler, DHW production as well as the operation of 2 mixing valves can be programmed.

The user interface control includes a large screen which provides 4 lines of information at a glance. The screen assists in programming as well as providing visual indicator for fault detection as well as performing a relay test.

Movement through the various menus is accomplished with rotary dial. Selection of desired menu selection is confirmed by a pressing a function button.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

System bus

This controller can be expanded in a modular fashion using additional modules that are connected via the integrated bus. In its maximum configuration, the system can be used to control the following heating system components

1-8 Boiler (modulating or switching)
1-15 Mixed weather-dependent heating circuits
0-15 Room controller (digital or analogue)
1 Solar system (2 collectors, 2 storage tanks)
1 Solid fuel boiler

The various components are simply coupled to the system bus. The modules log on to the system automatically and search for their communication partners via the defined bus IDs (heating circuit number or boiler number).

Bus ID MV Controller

For mixing valve motor controllers and control units

The bus ID (00-15; expert level parameter) is used to number the heating circuits in the system. Each operating module and each mixing valve motor module is given the number of the assigned heating circuit as its bus ID.

- Heating circuit numbers (00-15) may not be assigned twice.
- Heating circuit numbers 00 and 01 may not be used simultaneously.
- The heating circuits are sequentially numbered starting with "01".
- Please only use heating circuit number 00 for replacement controllers if "00" was used in the replaced controller.

Pre-settings

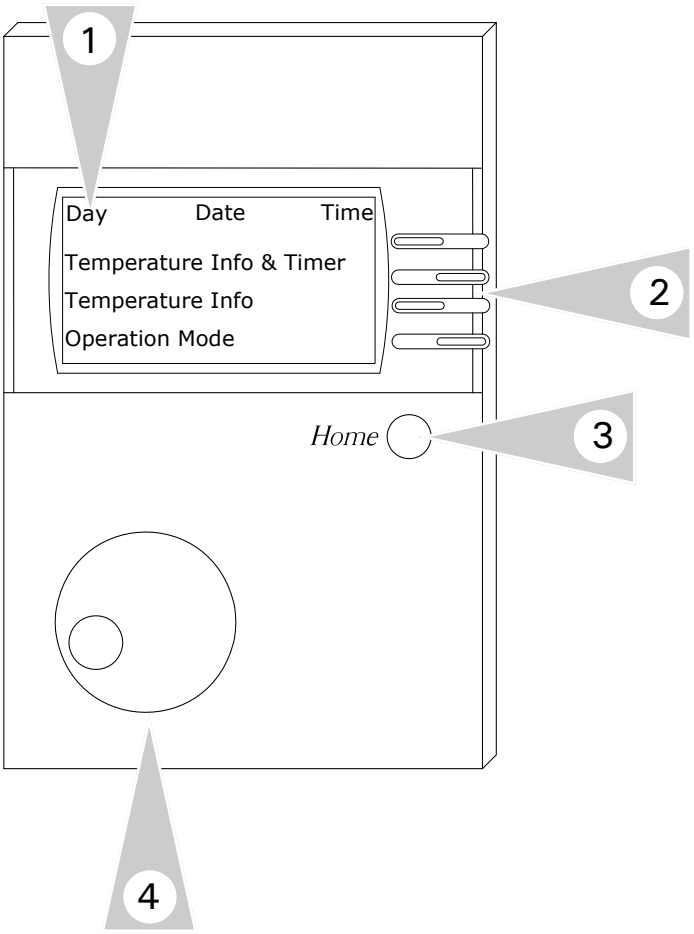
Heating circuit 1 → 01
Heating circuit 2 → 02

! After setting all the bus ID's the system must be reenergised (once only).

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Operation

User Interface Control Elements



Overview

1. **Screen Display** which provides four lines of information for user.
2. **Function keys** => See line functions below

   Line 1: Displays the Day, Date and Time
   F button: Adjust Date, Time and Holiday

   Line 2: Displays the selected Favourites (the selection of the currently displayed favourites takes place with the rotary knob)
   F button: Adjust Favourites or additional displays

   Line 3: Display the temperature of the heat generator 1 or the Low Loss Header for cascade boiler operation

   Pressing the function key will display the set point and actual temperatures.

   Line 4: Display of the central operating mode
   Pressing the function key will display the operating mode of the first heating circuit provided it is not remote controlled (Heating, Reducing, Party or Holiday)

   F button: Adjust or activate the mode, the Party, Reduced or the Holiday function (valid for all internal heating circuits)

   ! In order to adjust the values from the standard display, press the associated function key and adjust using the rotary knob or, if there are several values, first select the desired value with the function key. Save the value using the function key [OK].

3. **Home button**: Allows the user to toggle between the information screen and the Main Menu screen.
4. **Rotary knob**: Use the rotary knob to move through the various control menus. Is also used when changing values or selecting features/functions.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Operation

Display
System value display (e.g. sensor values and set points). No adjustments can be made. Operating errors are therefore excluded in this area

User
Summary of settings that can be made by the operator

Time program
Summary of time programs for heating circuits, the hot water circuit and extra functions where applicable

Time-Date
Time, date, holiday program and data for the summer/winter changeover

Service
Summary of the values for the service technician

Expert level
Summary of values for which expert knowledge is required to make settings (installation technician)
⚠ Values in the expert level are protected by a code no. (damage/malfunction possible)

Expert level IM (only for HS via BUS)
Summary/display of the values sent to the BUS by the HS

Levels [Assignment of the set values]

The settings in the different areas are sorted into operating levels

Installation
All display values and settings that relate to the heat generator or the entire system and cannot be assigned to a consumer circuit.

DHW
All display values and settings that affect central hot water preparation and circulation.

Heating circuit 1 / 2
All indicator and set values that relate to the corresponding consumer circuit (also, for example, as decentral hot-water circuit).

Solar / MF
All indicator and set values that relate to solar energy recovery and settings for the multifunction relay.
! An overview of all settings can be found on the following pages.

Setting the operating mode

In normal mode (standard display), press the F button [4].
The rotary knob can now be used to change the operating mode (see next page for the operating mode).
Save with "OK" => F button [4]
End without save with "End" => F button [1]
For the activation of the party or the reducing function, press the corresponding F button [2 or 3].

The rotary knob can now be used to set the heating time increase (Party) or the heating time interruption (Reducing).
If the heating or reducing needs to take place for the rest of the day, then you can turn the rotary knob to the left to heat or interrupt the heating for entire days. In this manner, a direct starting holiday program can be set very quickly (e.g. Reduced 5 Days)

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Operation

Selecting an operating mode

The selected operating mode is shown in the display. It takes effect when the setting is not changed for 5 s.
The following operating modes are available for selection:

Standby / OFF
(Heating OFF and hot water preparation OFF, only frost protection mode)

Automatic mode 1
(Heating according to timer program 1;
HW according to HW program)

Automatic mode 2
(Heating according to timer program 2;
HW according to HW program)

Summer mode
(Heating OFF, HW according to HW program)

Normal (**Day) mode**
(24 h heating with comfort temperature 1;
HW according to HW program)

Reduced (**Night) mode**
(24 h heating with reduced temperature;
HW according to HW program)

Service (automatic reset after 15 min)
The heat generator regulates to the maximum heat generator temperature. When the heat generator temperature has reached 65°C, the consumers are regulated to their maximum flow temperature to dissipate heat (emergency cooling).

! The emergency cooling function must be explicitly enabled in the consumer circuits by means of a set value (B-Heat sink set value).

- Actuation of the switch-over valve cooling

Cooling operation

- Heating operation disabled
(hot water preparation only)
- Start of the refrigerating machines if required by the heating circuit or the temperature Installation/T-Return Cooling is exceeded
- Heating circuits controlled to the temperature Heating circuitx/T-Flow Cooling

When MF function "cooling switch-over valve" is active => Hydraulic separation of the cooling circuit

Effect on the operating mode

The operating mode set here affects the boiler regulation and the integrated heating circuits of the controller.

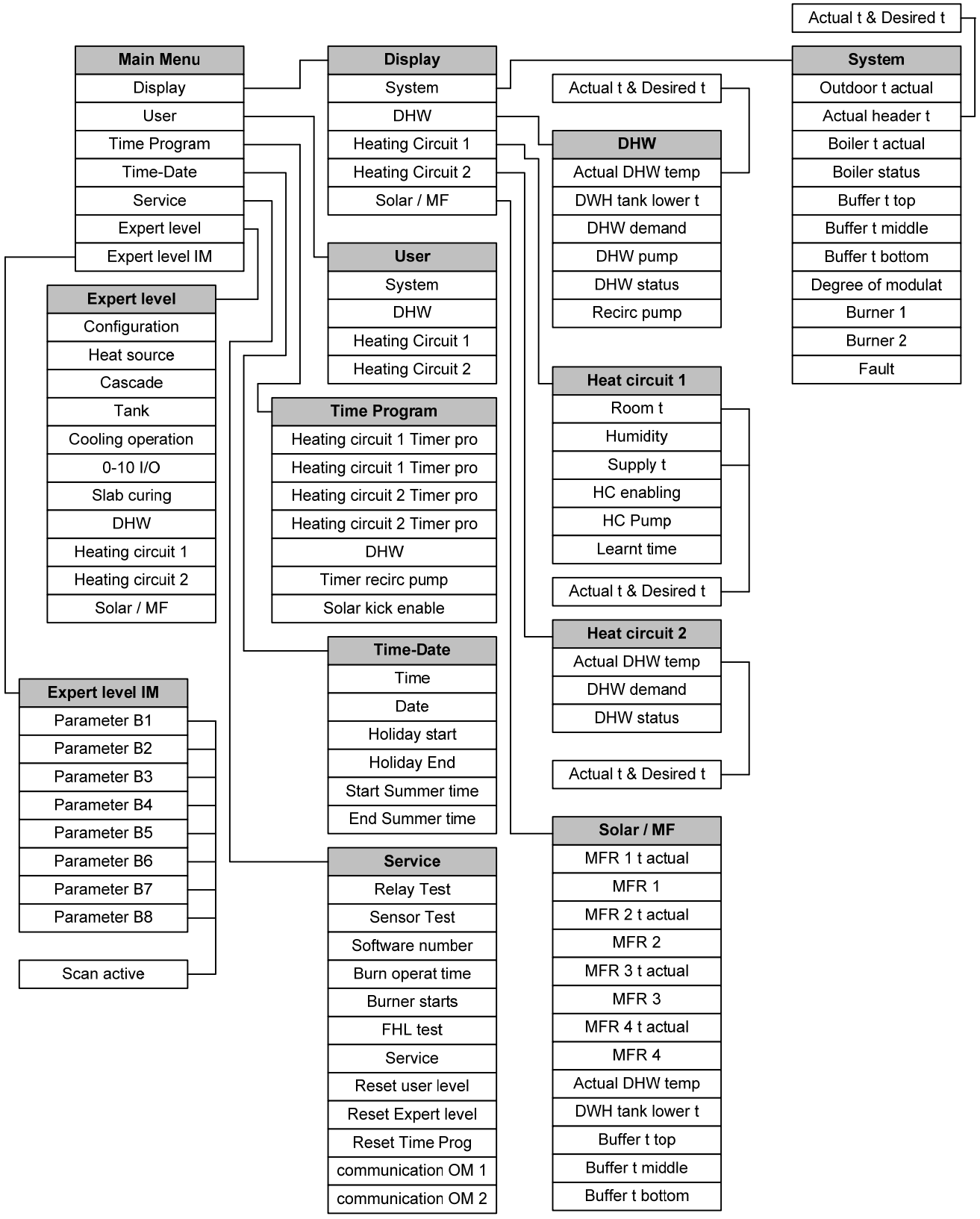
Each heating circuit can be assigned a separate operating mode from the one set by means of the "operating mode" parameter in the user level of the corresponding heating circuit.

When the "⏻= Standby/OFF", and "🛏 = Summer mode" operating modes are set, they have a reducing effect on all the heating circuits of consumer circuits in the entire system.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Menu Structure

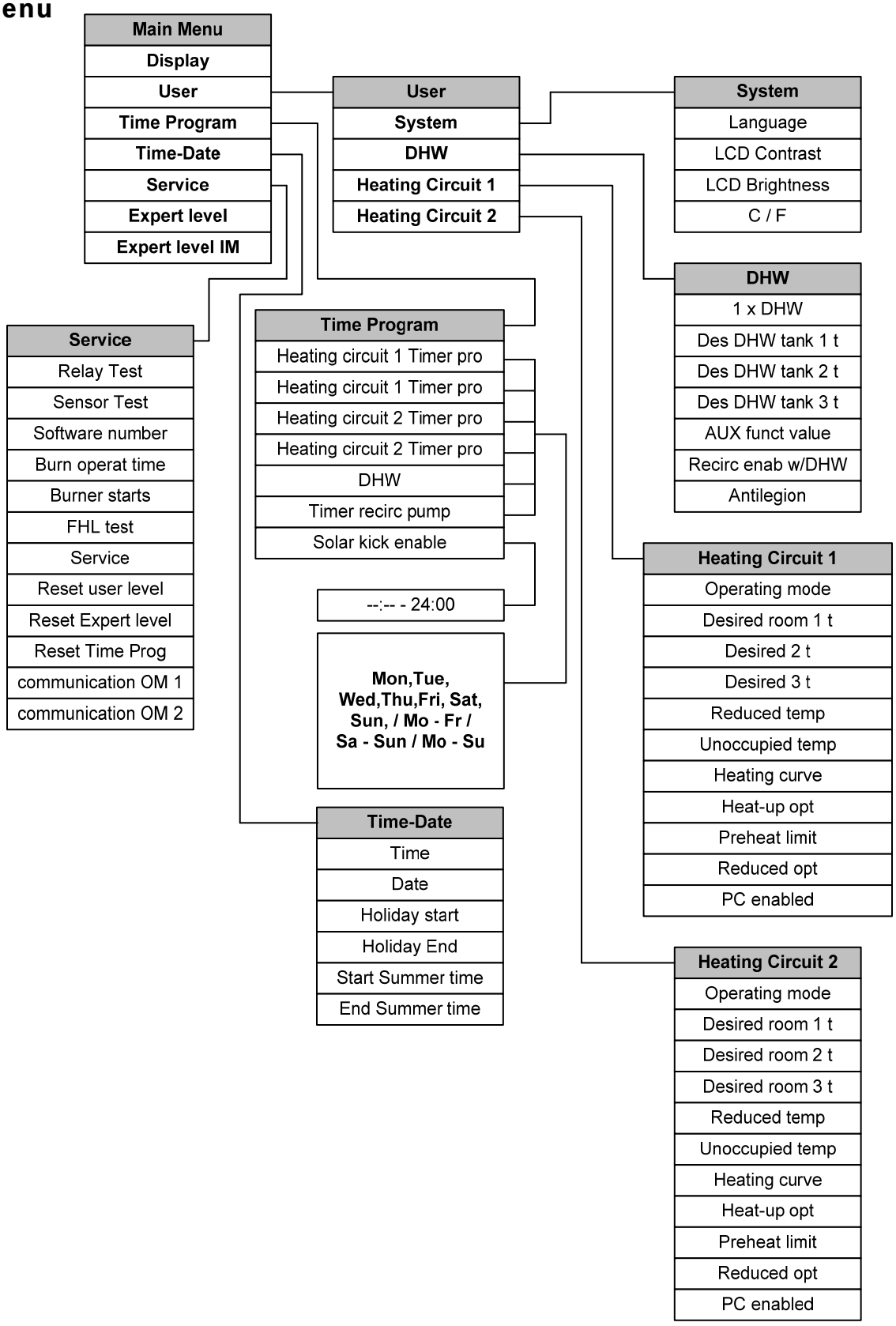
Main Menu



KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Menu Structure

Main Menu



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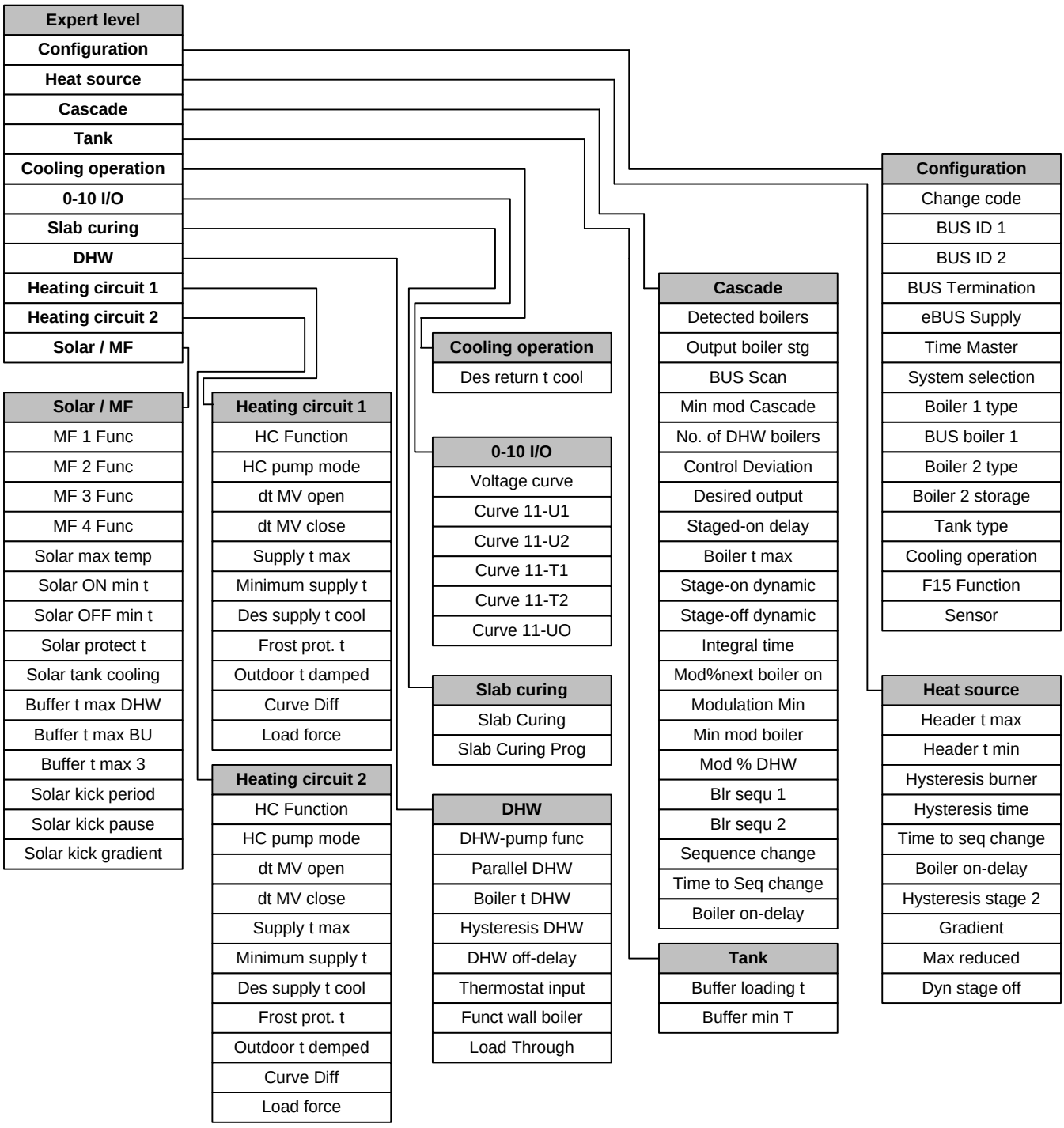
Expert Level Menu



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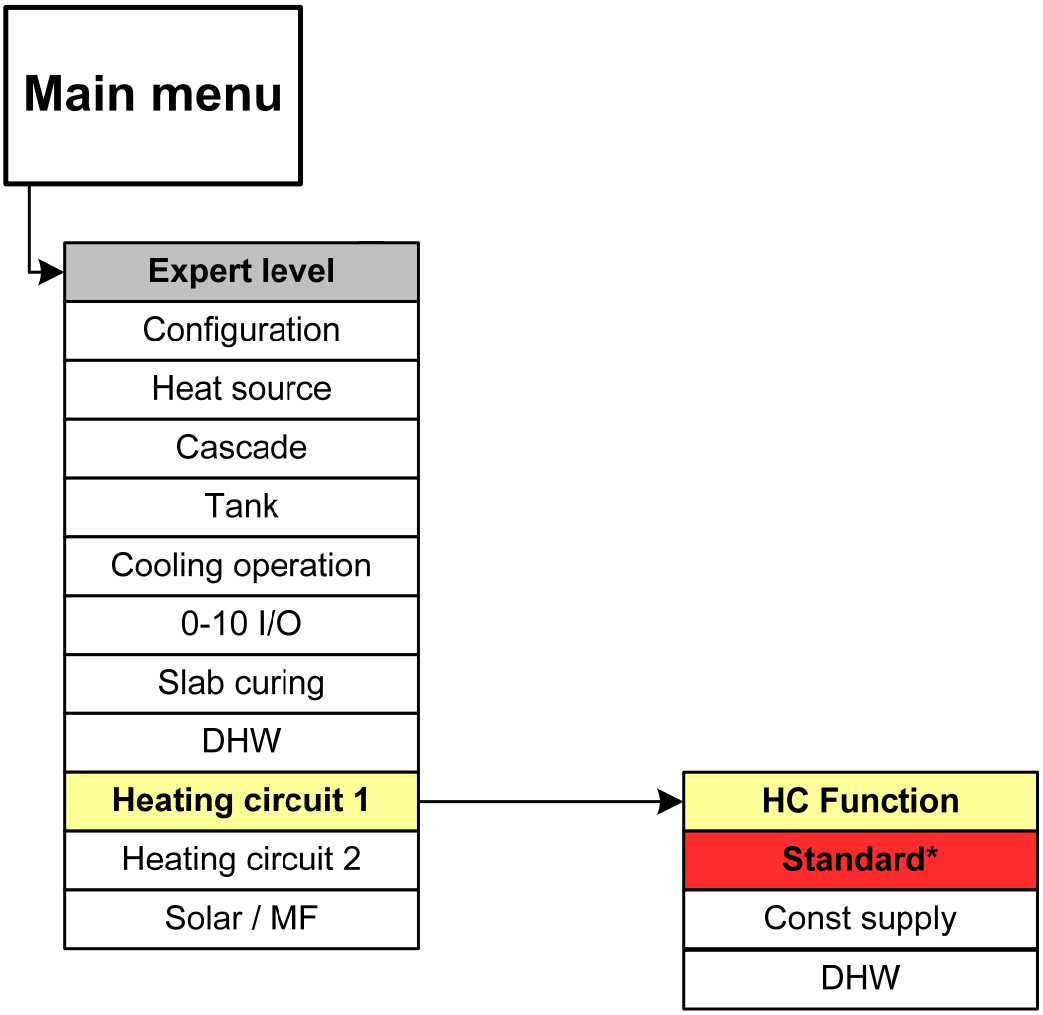
Expert Level Menu—Heating Circuit 1



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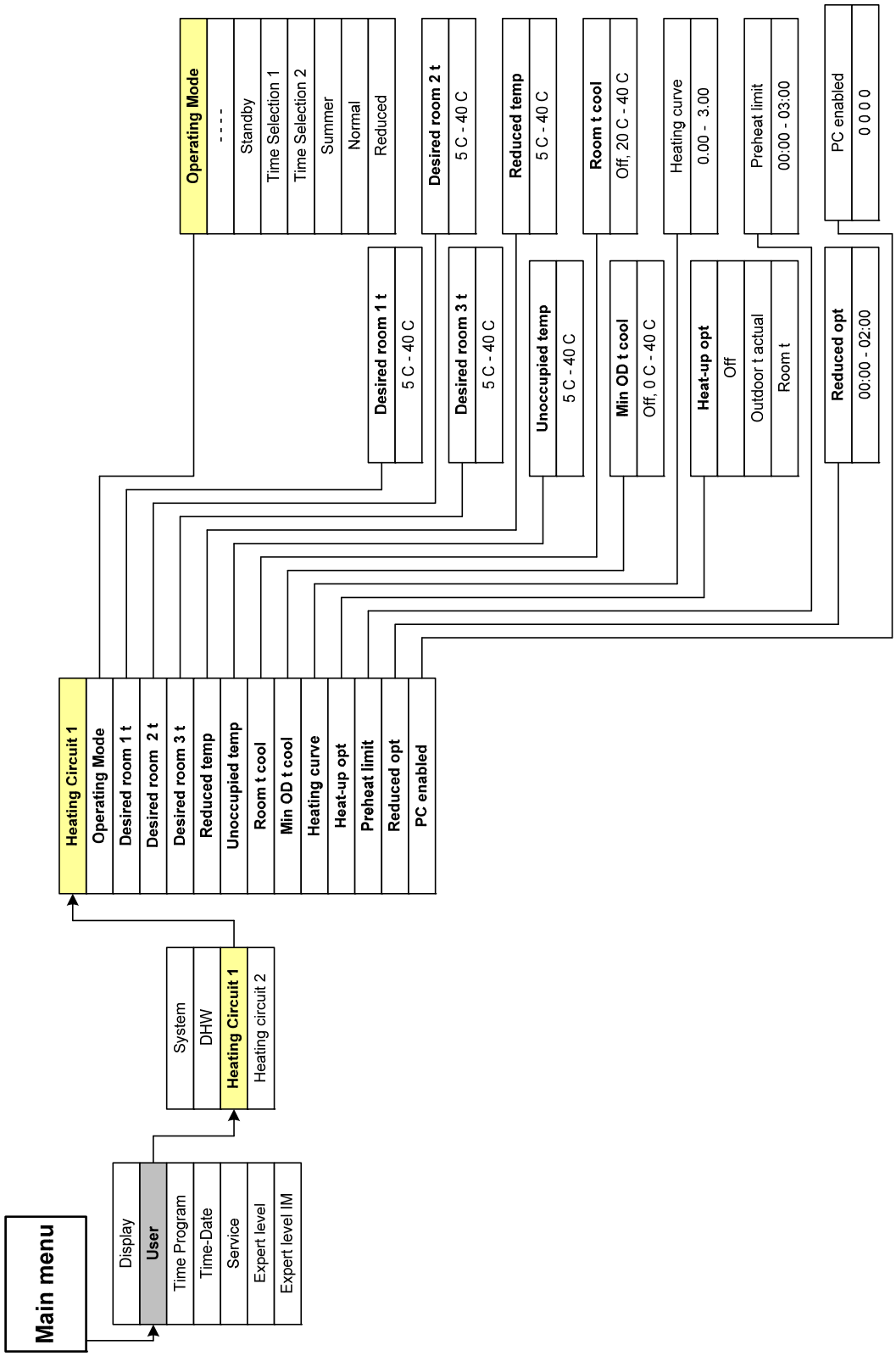
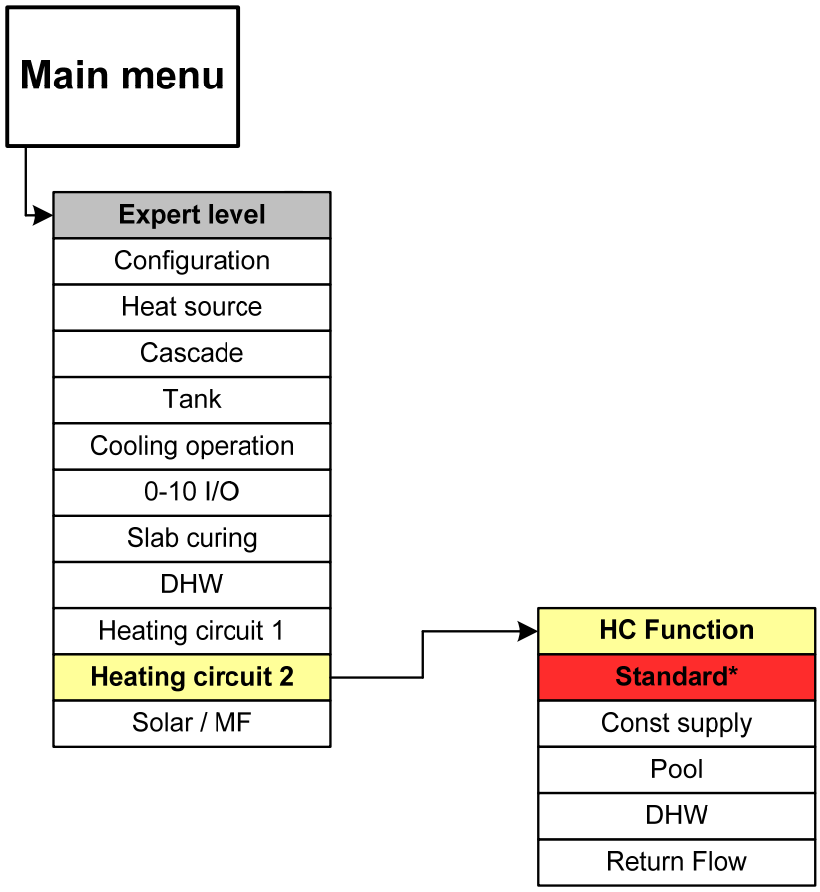
Main Menu—User Heating Circuit 1



Expert Level Menu—Heating Circuit 2



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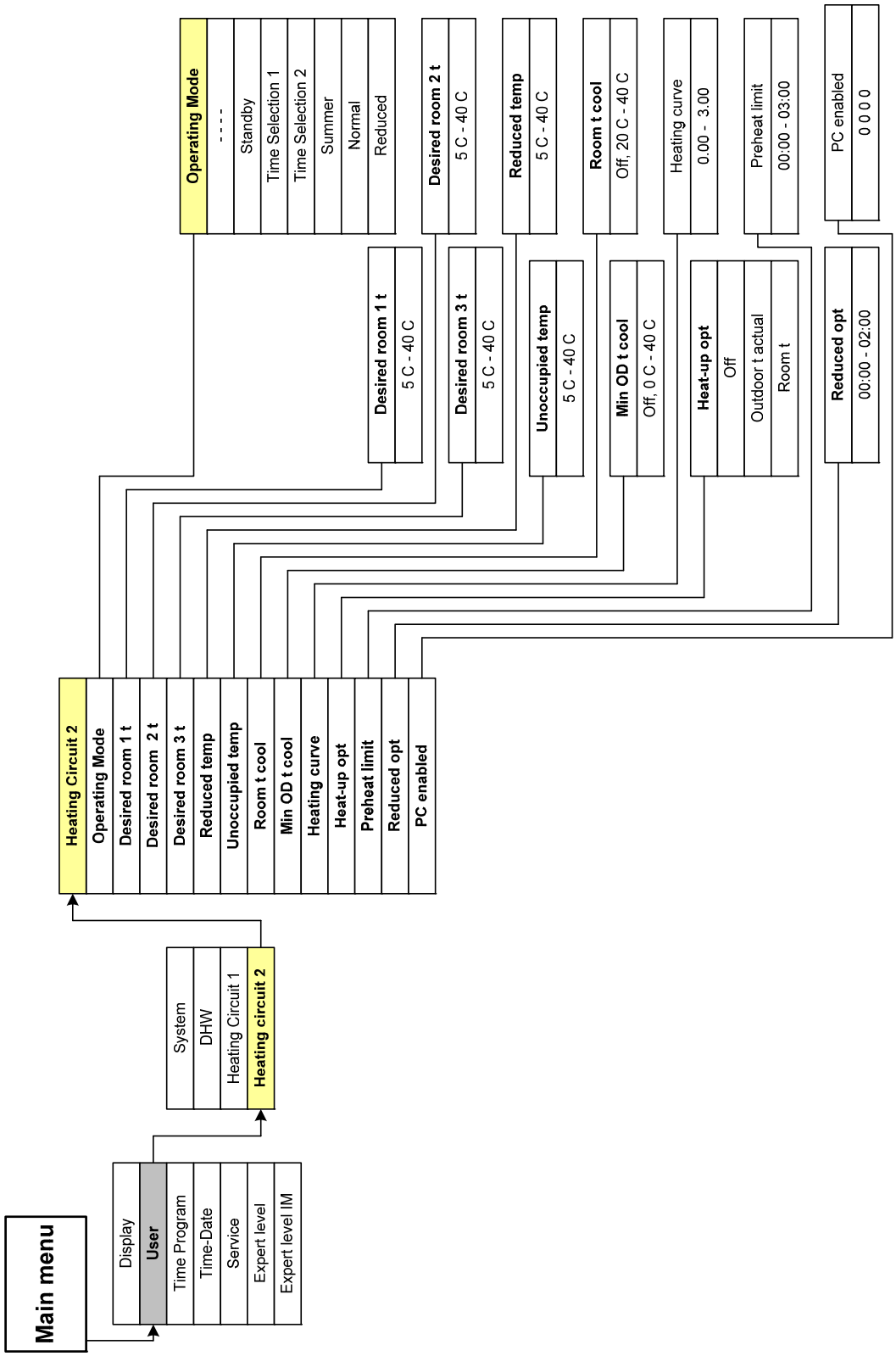
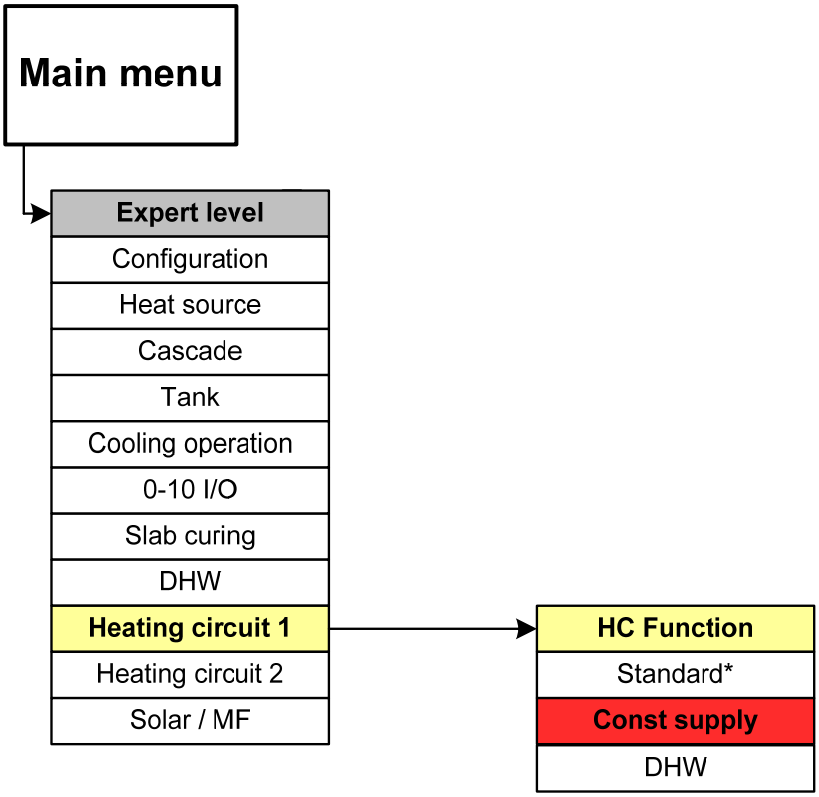
Main Menu—User Heating Circuit 2



Expert Level Menu—Heating Circuit 1



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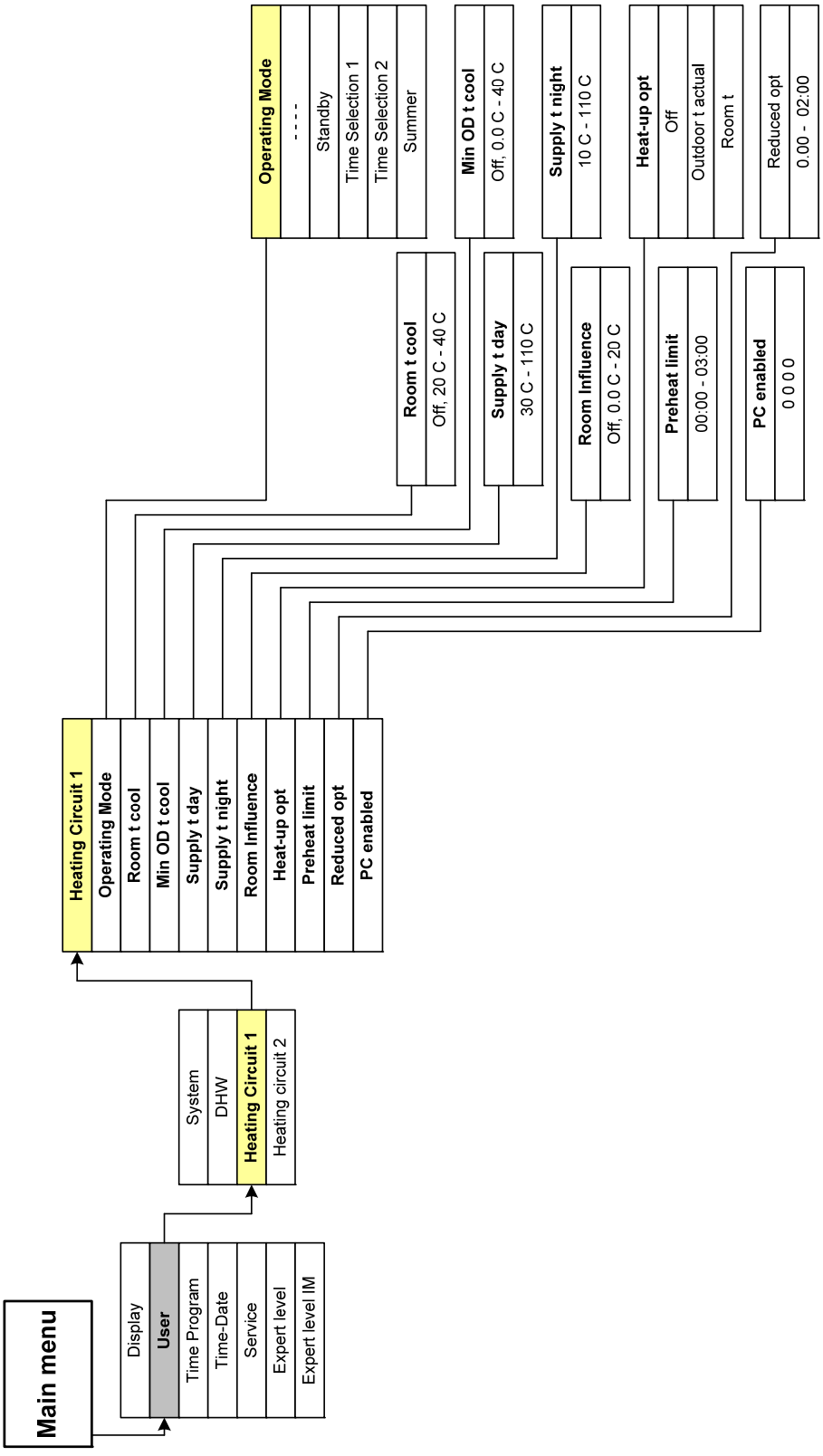
Main Menu—User Heating Circuit 1



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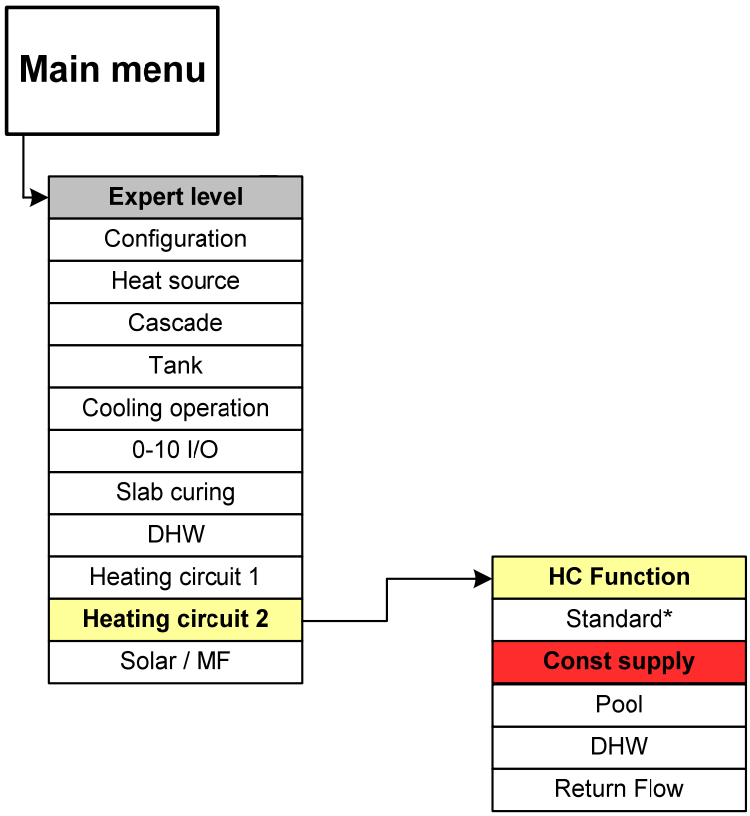
Expert Level Menu—Heating Circuit 2



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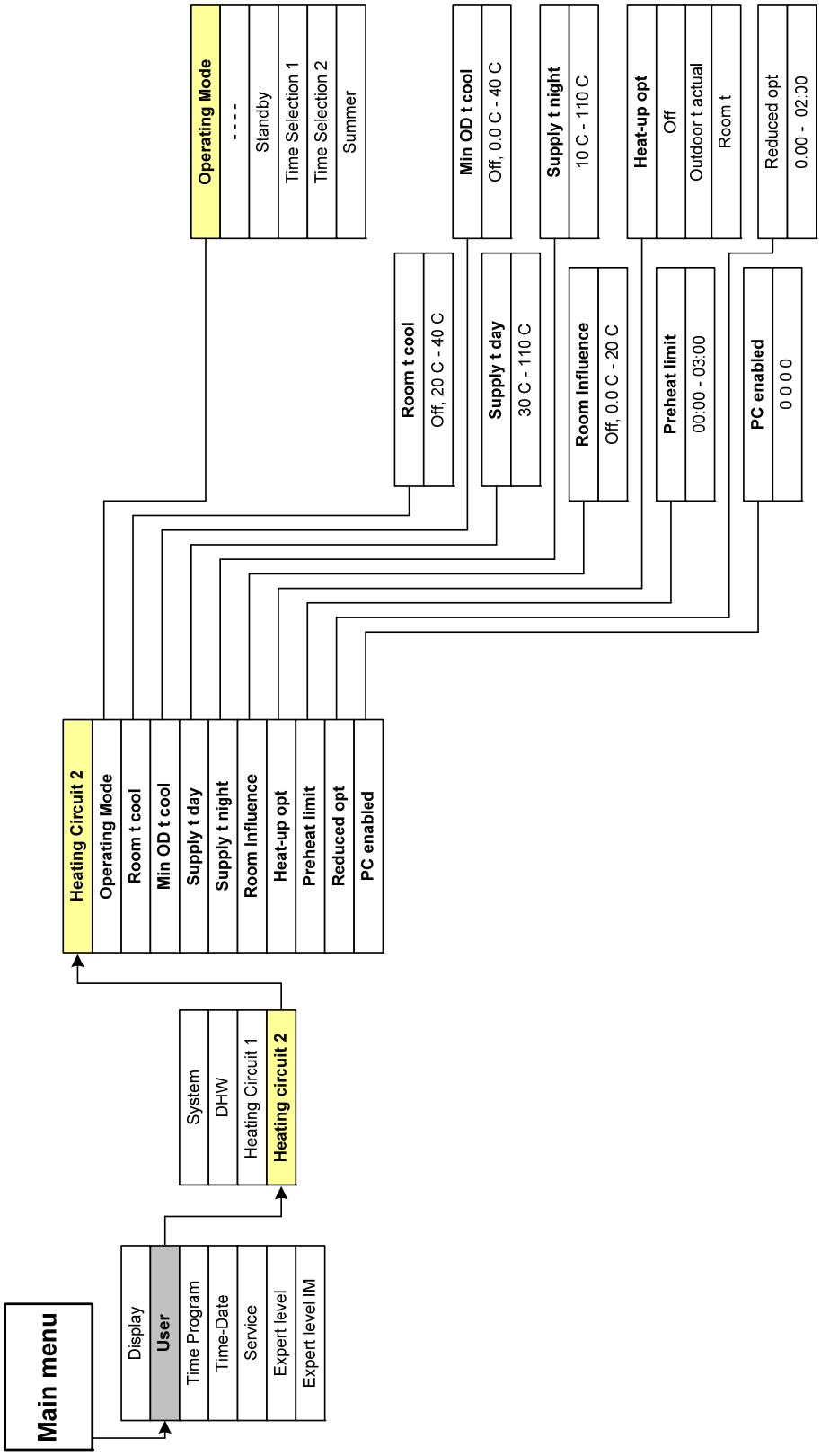
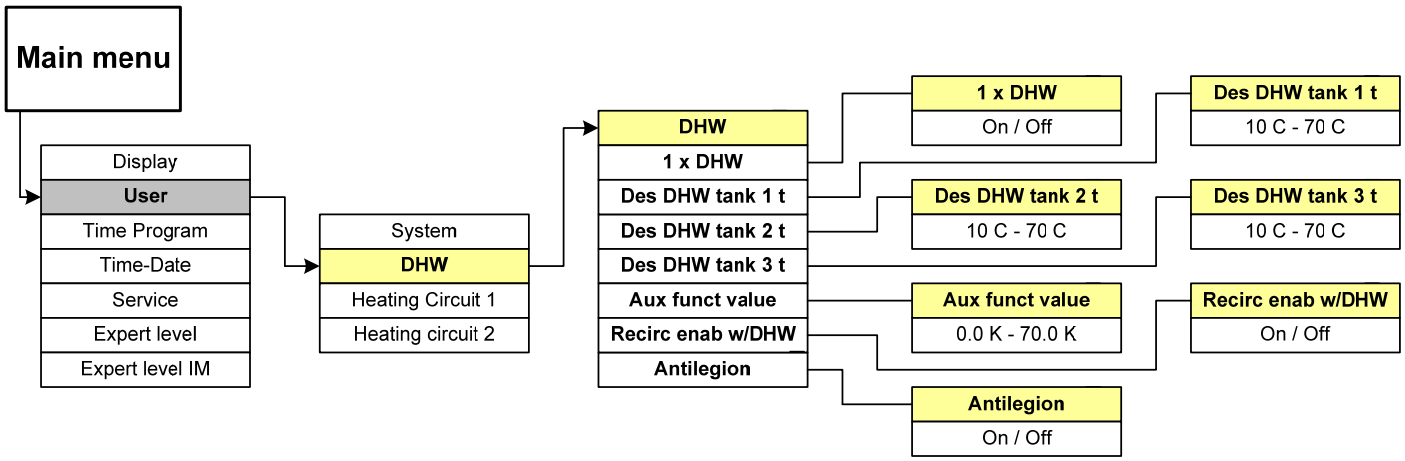
Main Menu—User Heating Circuit 2



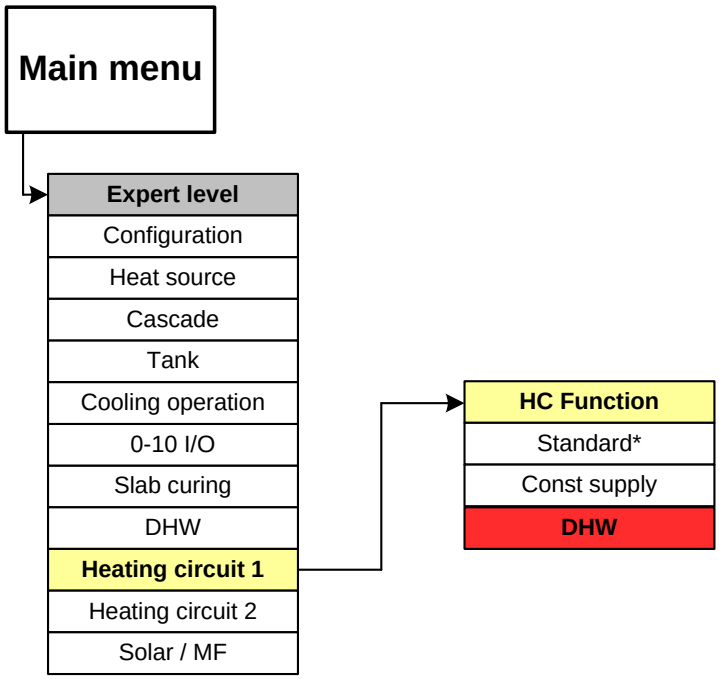
Operation

Menu Structure

Main Menu User—DHW



Main Menu Expert—Heating Circuit 1



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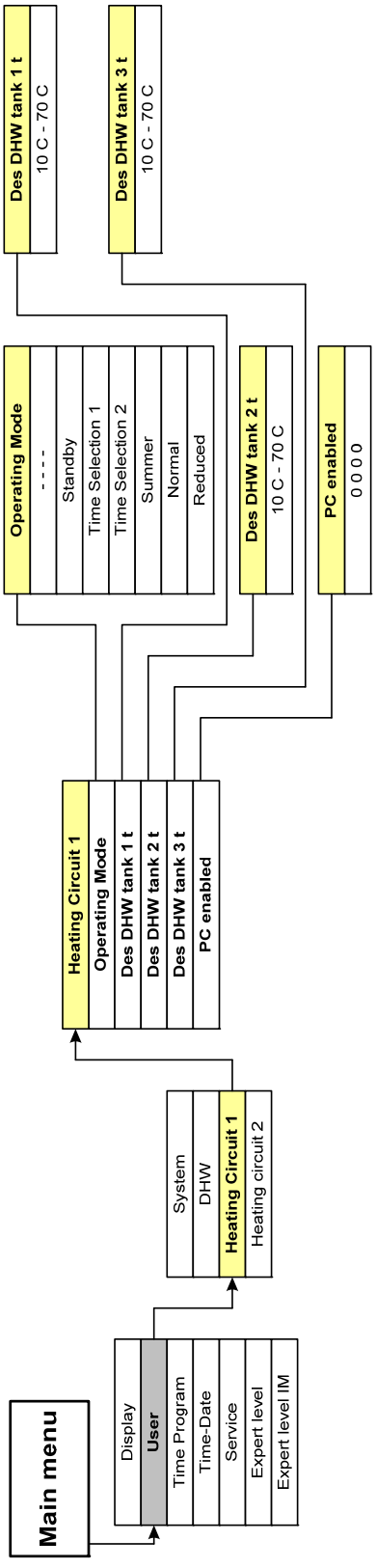
Main Menu User—Heating Circuit 1



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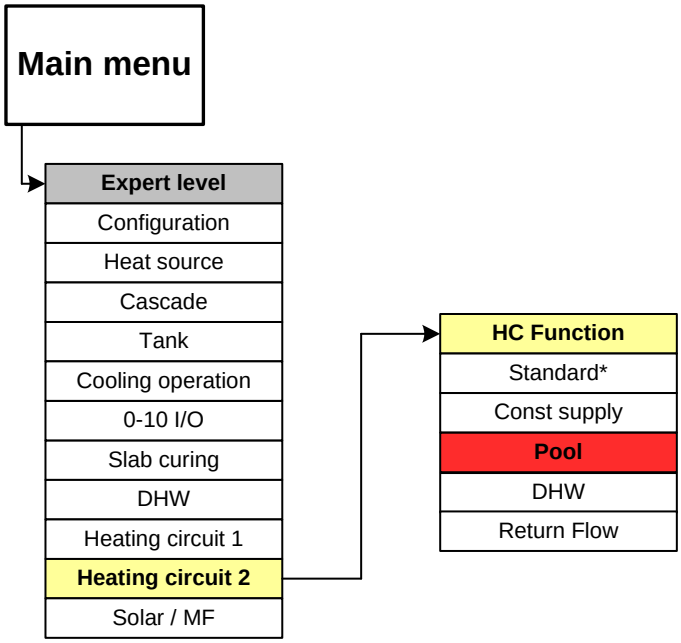
Main Menu Expert—Heating Circuit 2



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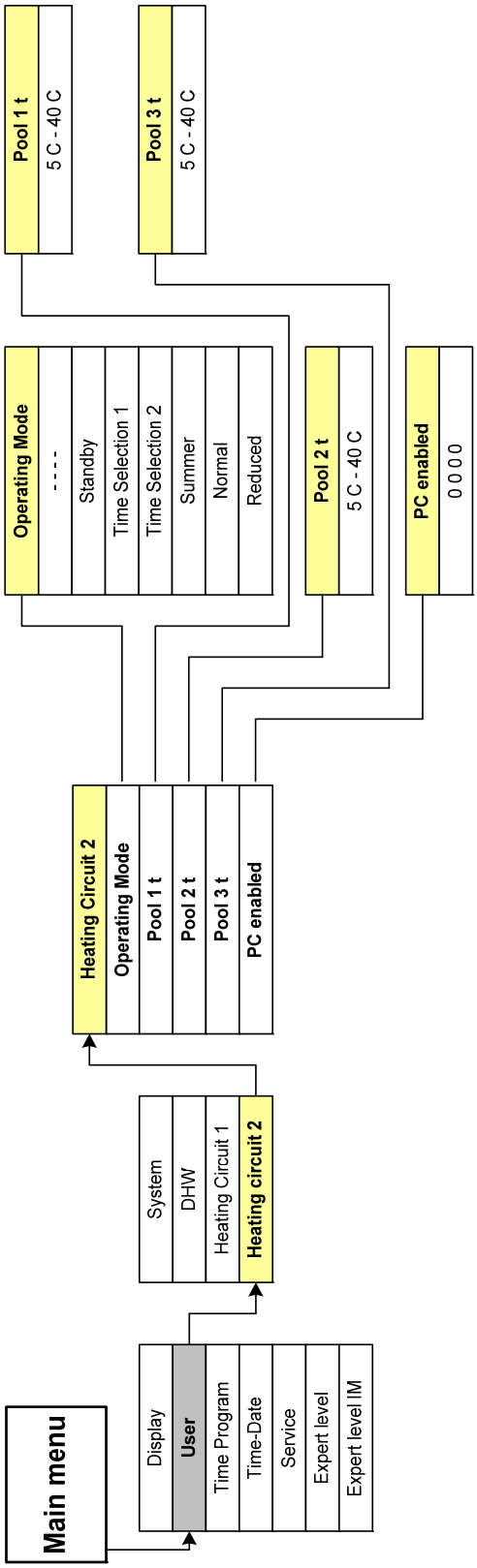
Main Menu User—Heating Circuit 2



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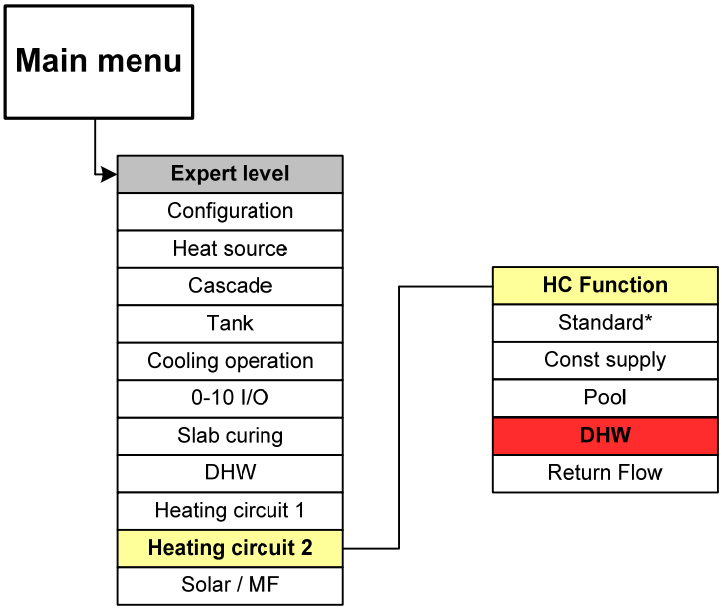
Main Menu Expert—Heating Circuit 2



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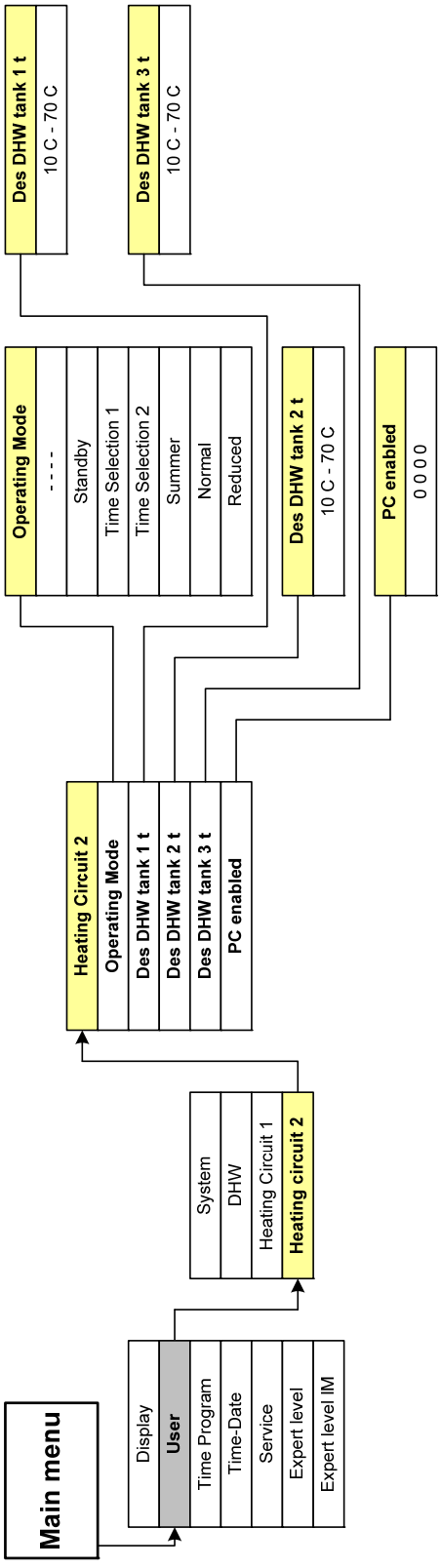
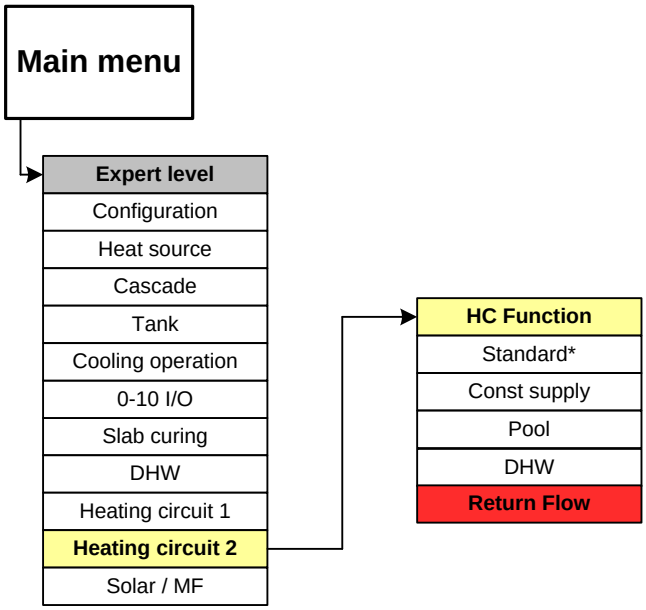
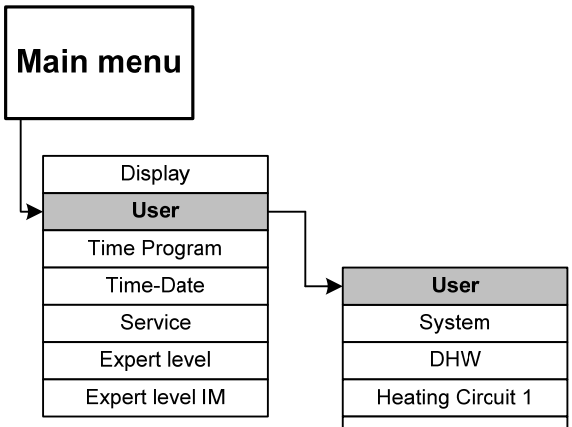
Main Menu User—Heating Circuit 2



Heatcircuit 2: HC Function = Return Flow (return temp elevation valve) Heating circuit 2 as return flow temperature increase via mixing valve

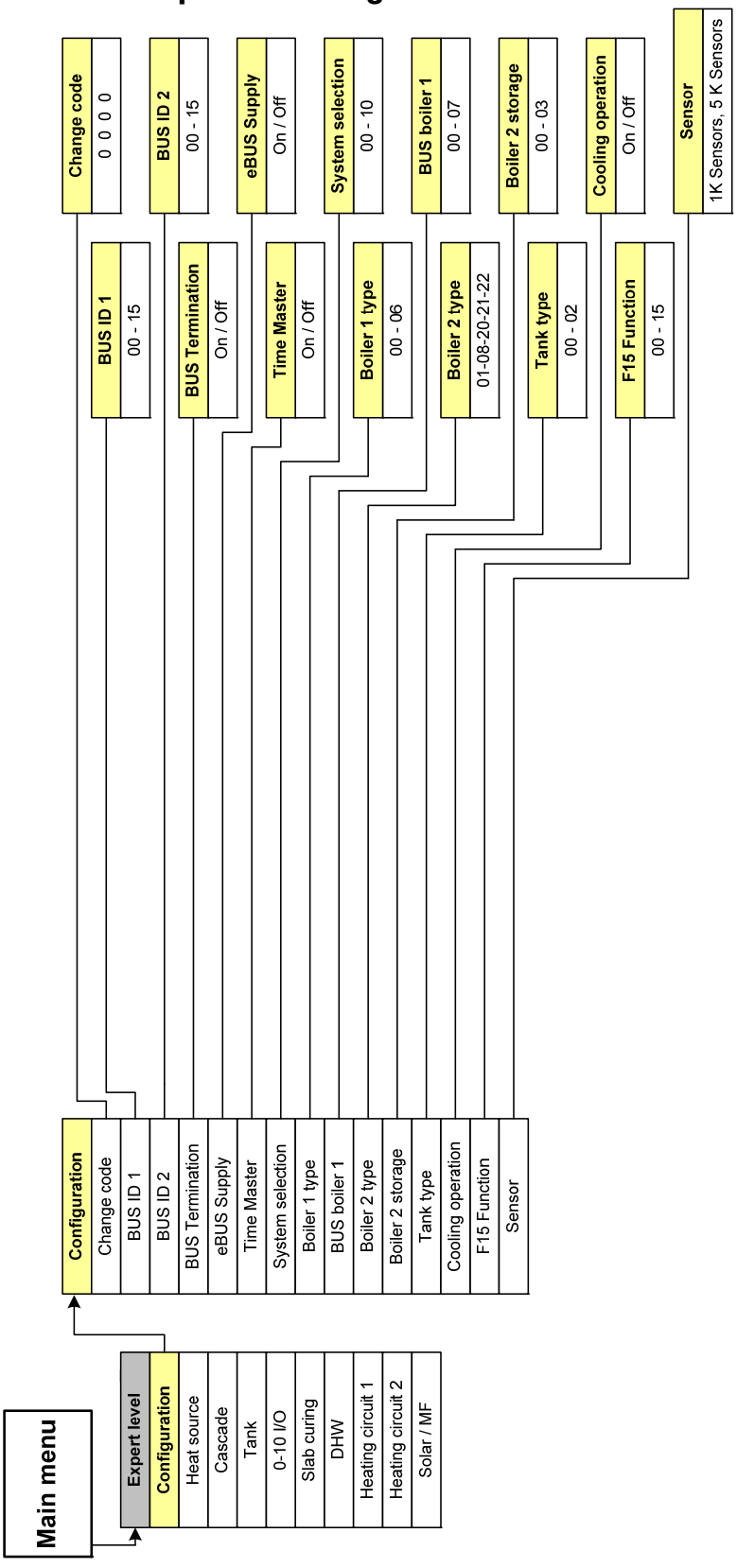




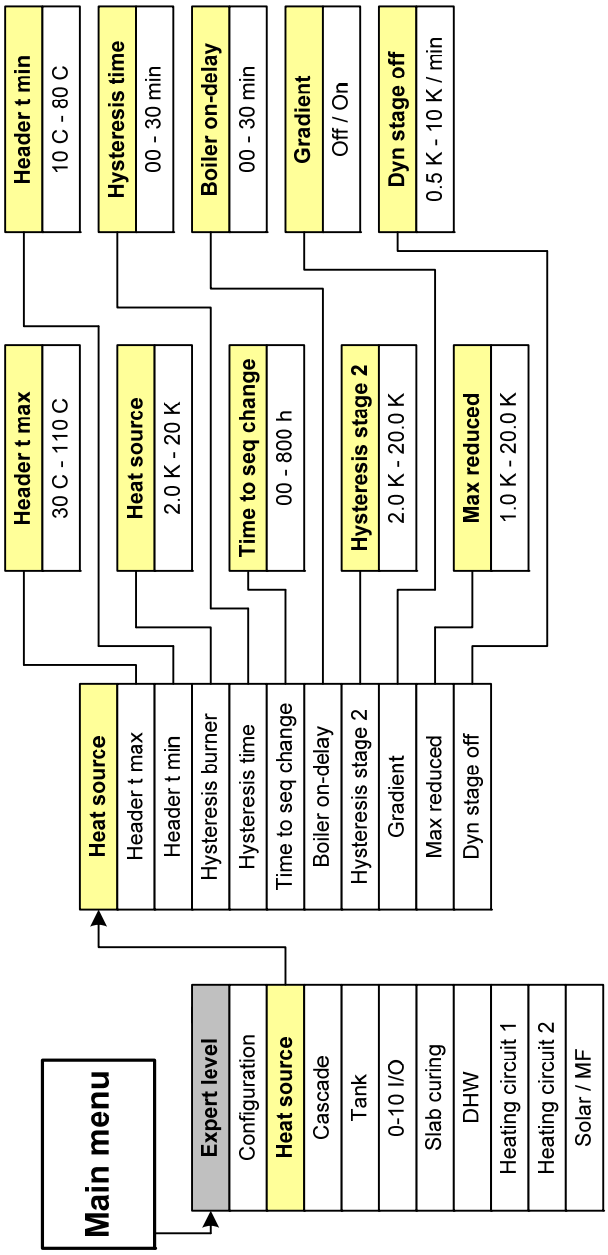
Heating circuit 2 not available here when Return Flow is selected under Expert → Heating circuit 2 → HC Function → Return Flow

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Main Menu Expert—Configuration



Main Menu Expert—Heat Source Settings



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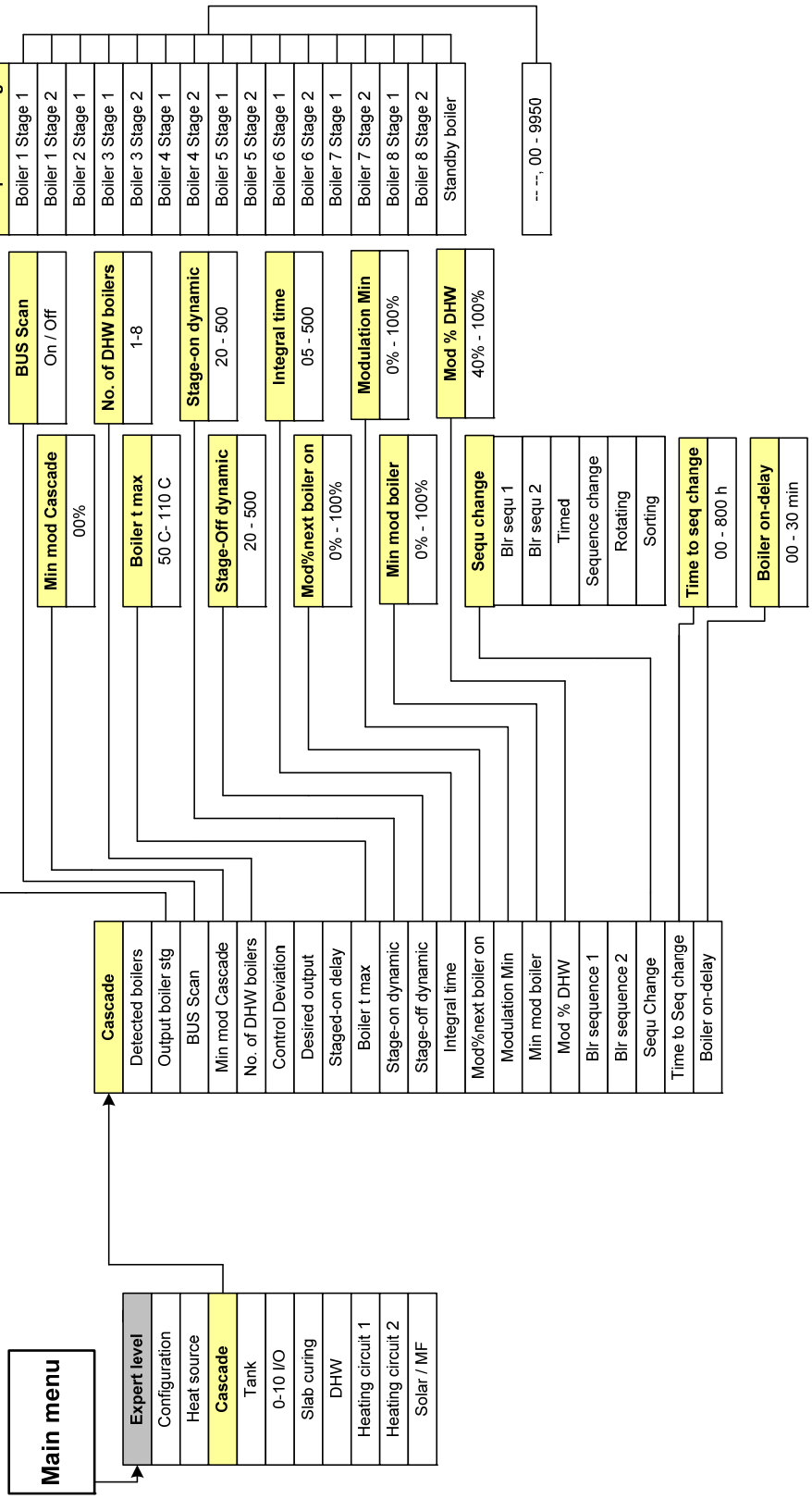
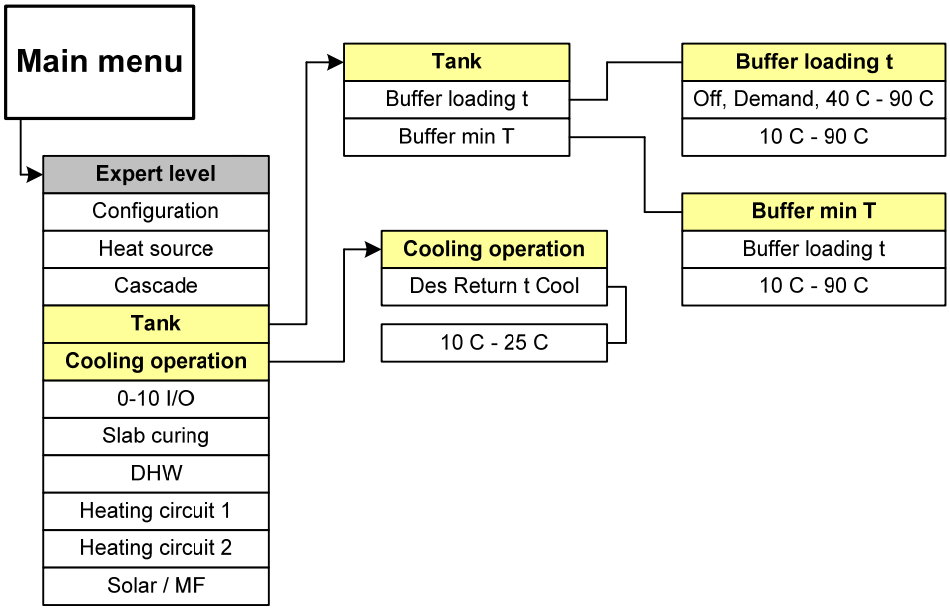
Main Menu Expert—Cascade Settings



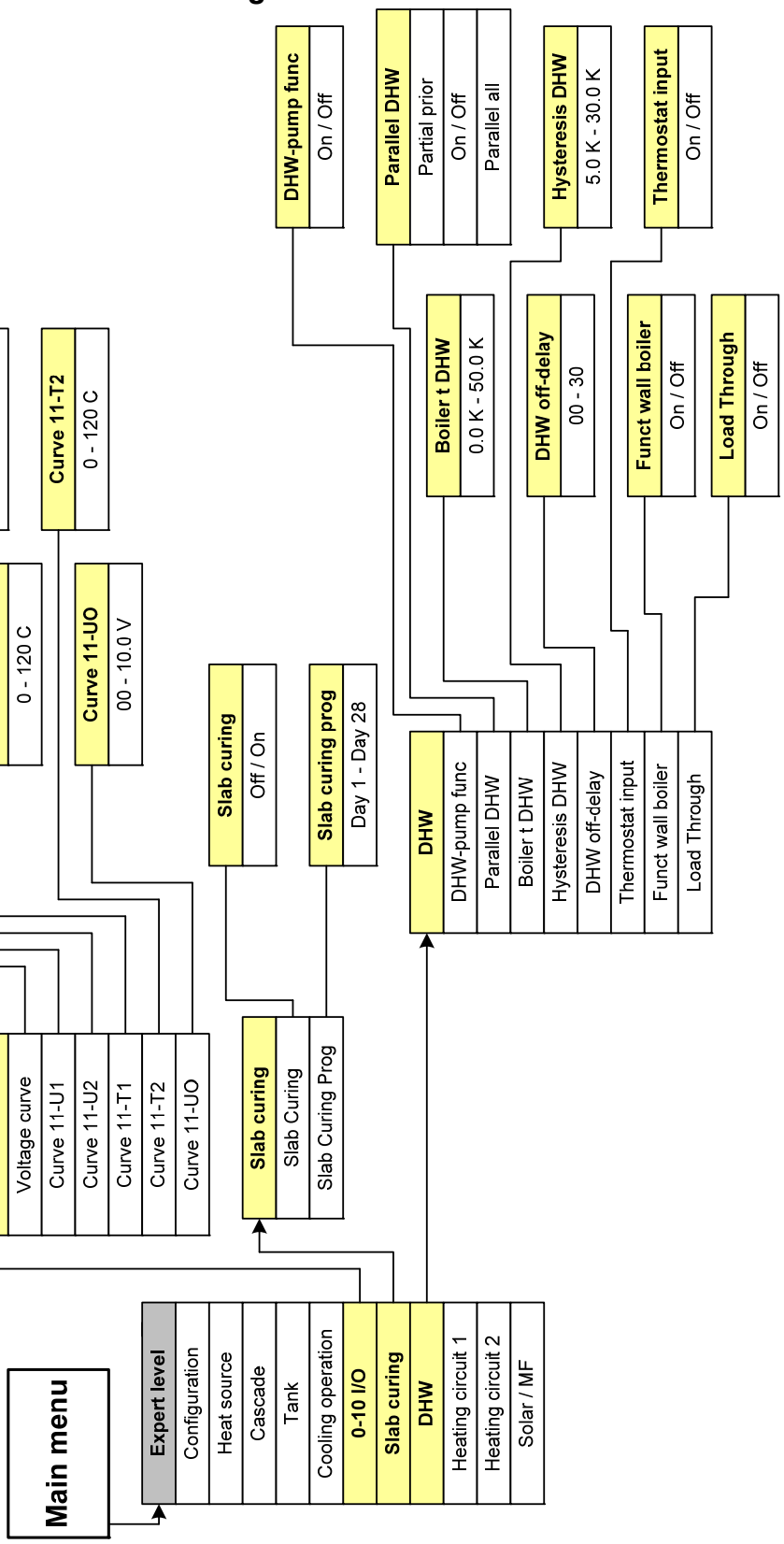
KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Main Menu Expert—Buffer Tank



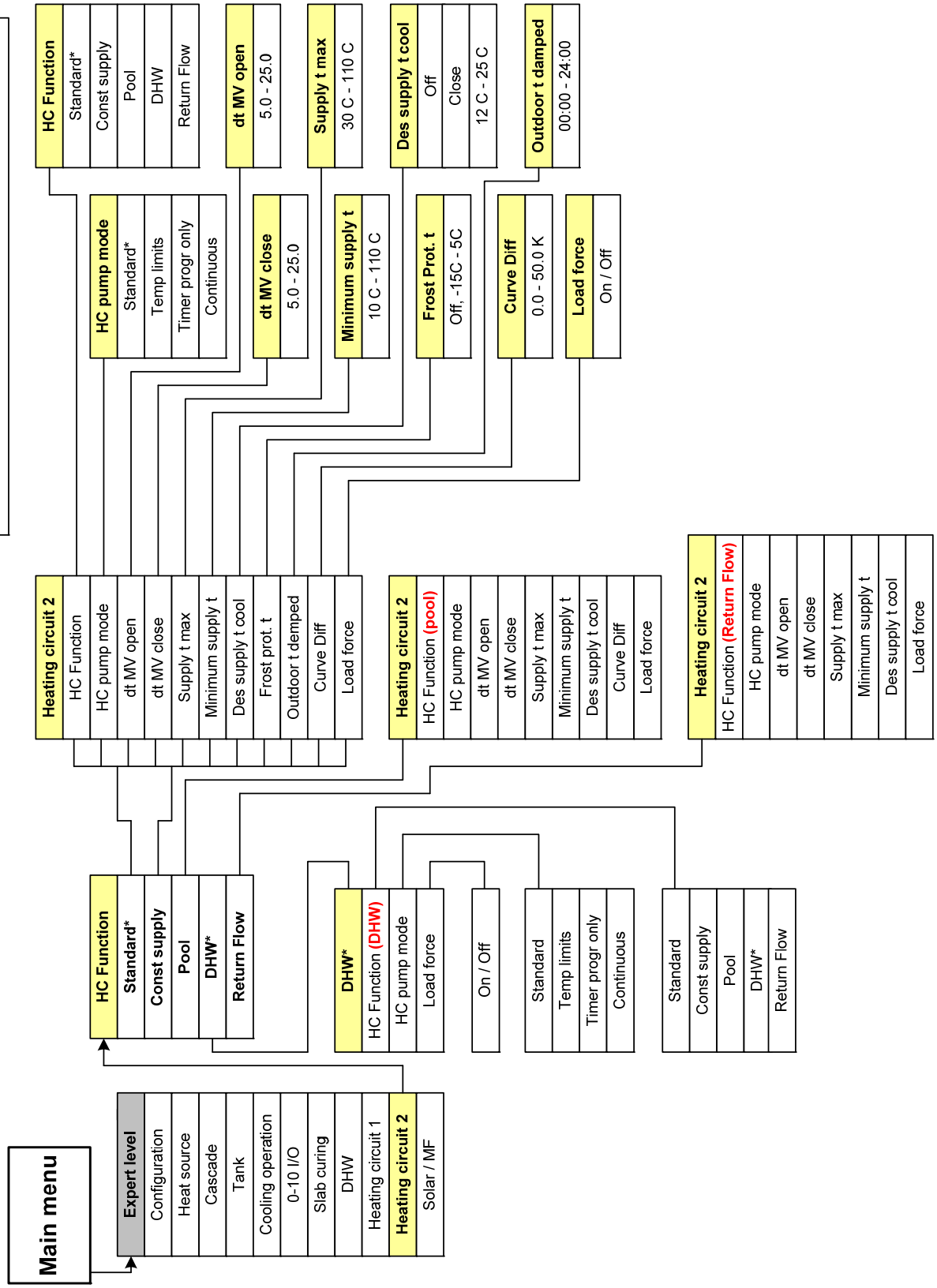
KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Main Menu Expert—0-10 / Slab Curing / DHW

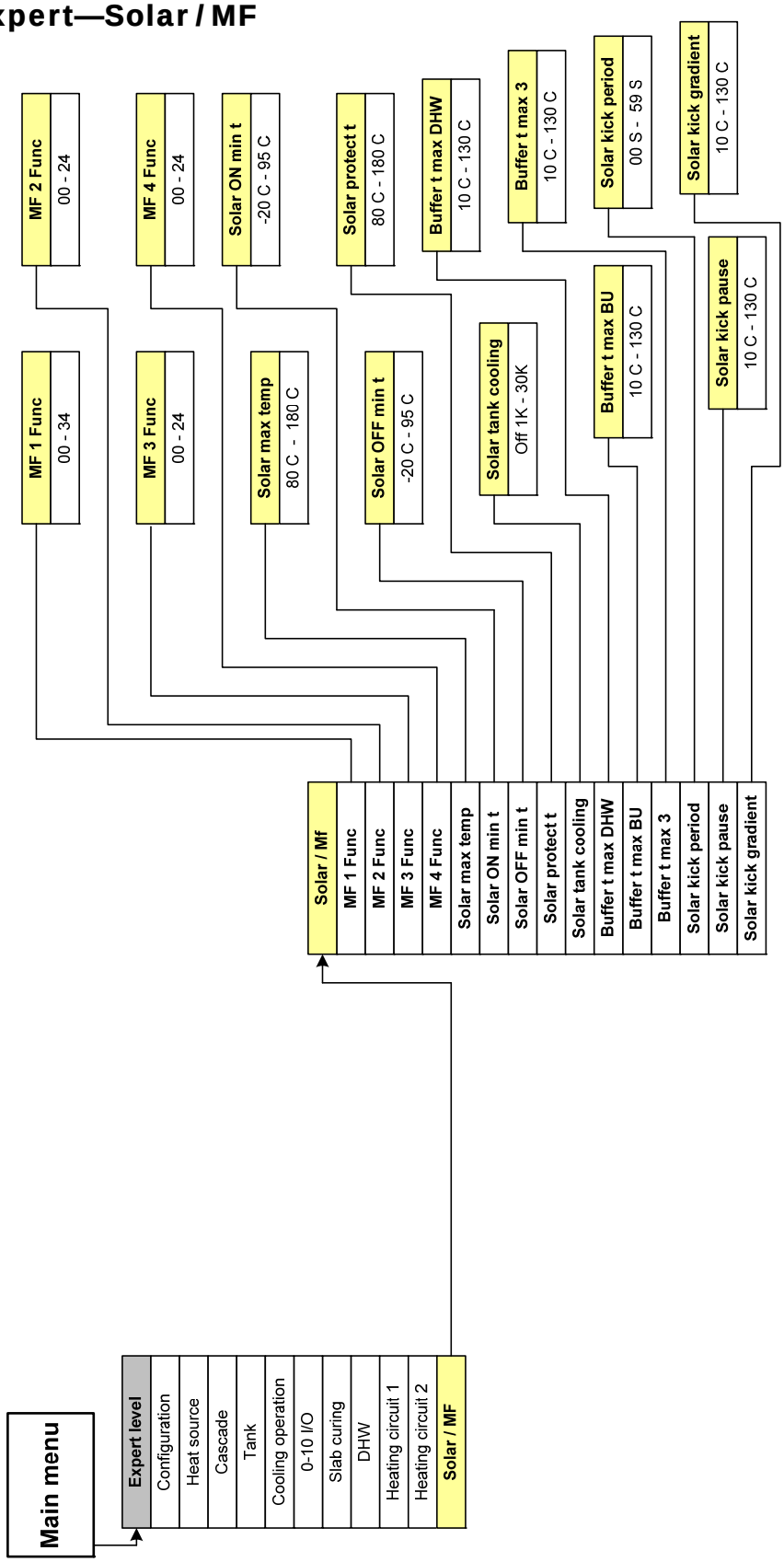


Main Menu Expert—Heating Circuit 1 Settings

Main Menu Expert—Heating Circuit 2 Settings

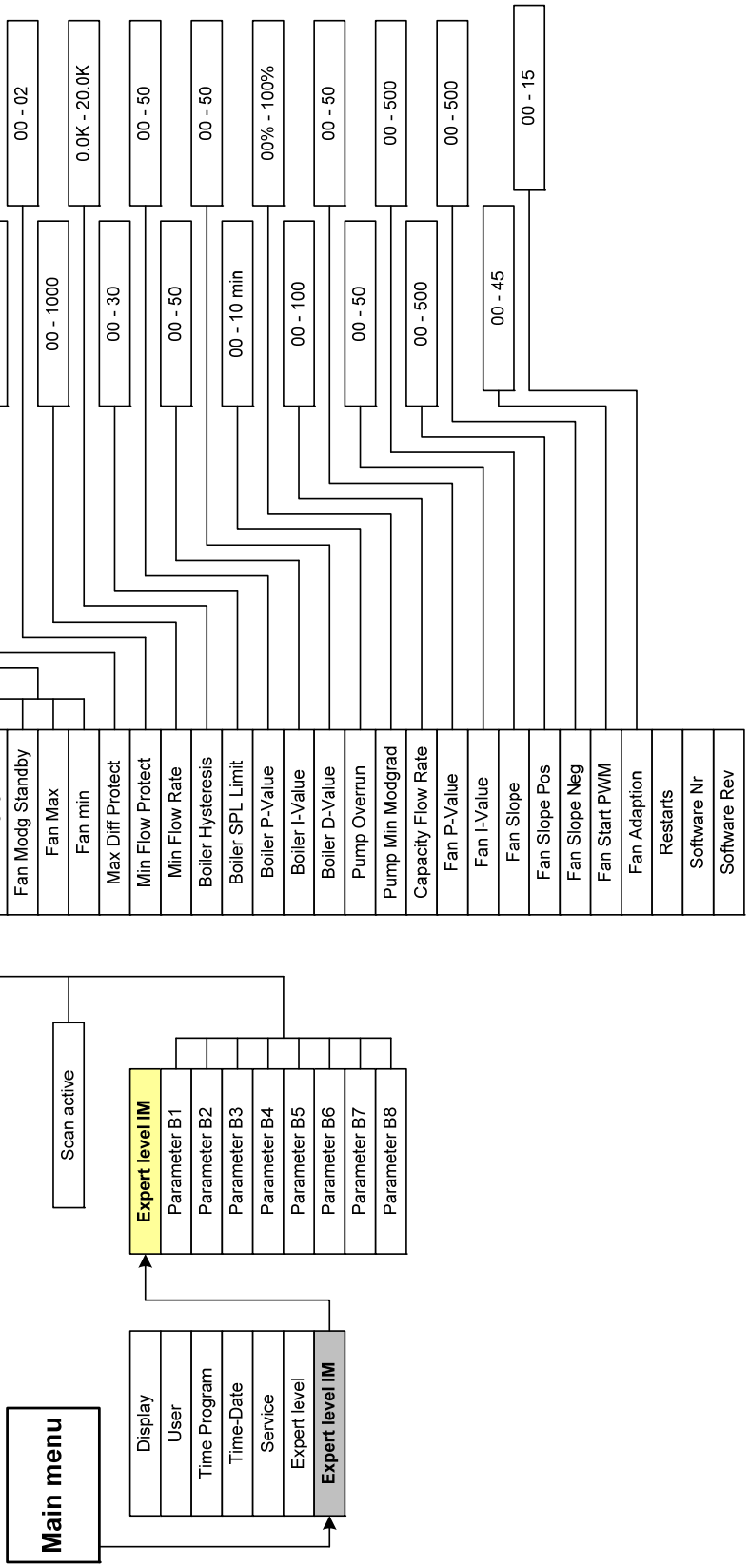


Main Menu Expert—Solar / MF

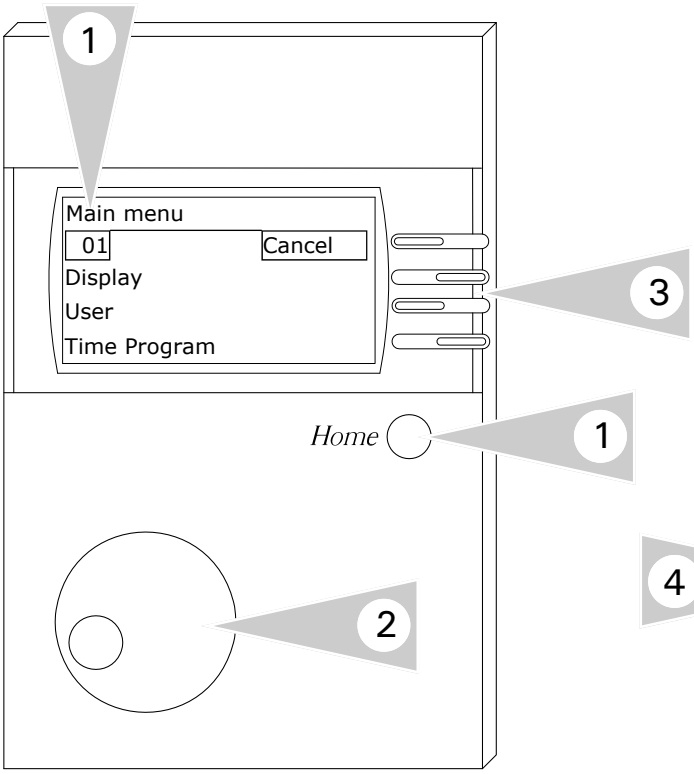


KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Main Menu Expert—Expert Level IM



Display Range—Actual Temperature / Status



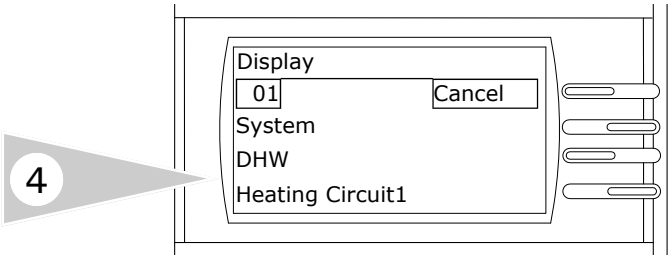
Viewing Actual Temperatures

Note: Temperatures and status information is based on system selection and installed accessories.

1. Press the Home button to display ***Main Menu***

2. Use rotary dial and ensure ***Display*** is viewed in the screen.

3. Press the adjacent key beside the word Display to select menu option.



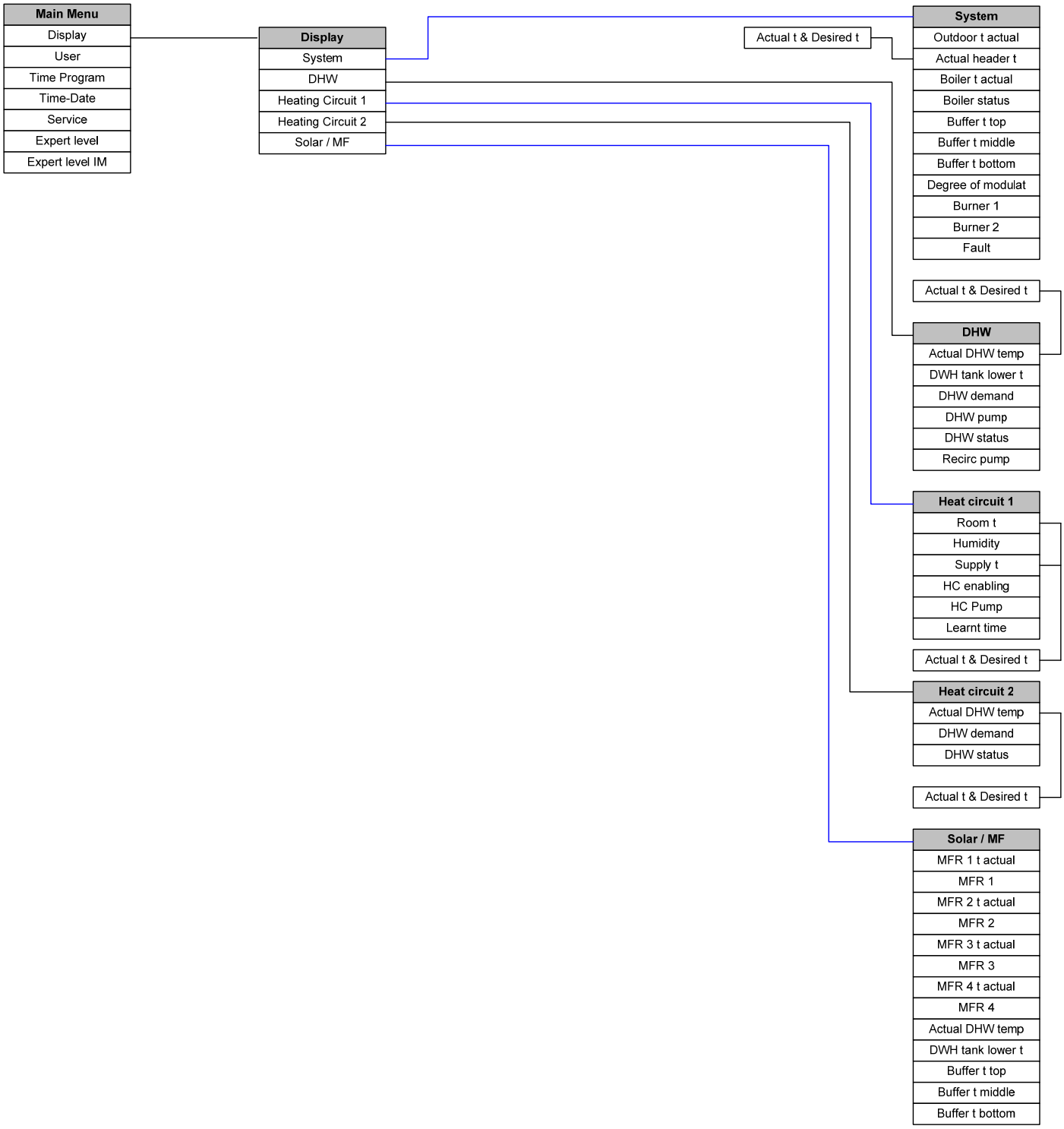
4. When in the display mode, select any of the various circuits to view temperatures/status information.

   Display only appears if the sensor is connected and the value is present in the system, otherwise "----" or no display.

   When current level is no longer required, pressing the ***Cancel*** button will exit from current screen.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Display Menu Structure Overview



KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Actual Values—Display

(HG => heat generator) use ⊙ to select parameters	
T-Outside	Outside temperature
Ext setpoint	External set value specification (0-10V)
T-Header	LLH/Common supply temperature and set value (with F button) (only for cascades)
T-HS	Temperature boiler 1 (through 8)
HS State	Status (On/Off) boiler 1 through 8
T-Solid Fuel	At boiler 2 = Boiler for solid fuel (A7)
T-Return 1	Return flow temperature of HS 1
T-Return 2	Return flow temperature of HS 2
T-Return total	Installation return flow temperature
T-Buffer T	Buffer storage tank temperature removal
T-Buffer M	Buffer storage tank temperature charging zone HS
T-Buffer B	Buffer storage tank solar zone
T-Storage 3	Temperature of storage tank 3 (e.g. solar pool-heating)
Mod depth	Modulation degree of HS
Burner 1	Status burner relay 1 (On/Off)
Burner 2	Status burner relay 2 (On/Off)
Error	Error number; 00 = error-free

T-Outside [F9]
The measured outside temperature is smoothed for control purposes. The smoothed value is displayed here.

Ext setpoint [F15]
The 0-10V input can be used to preset an accumulative set value for the control system (see V-CURVE p. 26).

T-Header (only for Cascades) [F8]
The set value appears after the F button is pressed. The set value corresponds to the maximum required temperature of the consumer circuits from the heating system (incl. hot water preparation). The mixing valve circuits request the
temperature + heating curve distance (expert value).

T-HS [F8/F13 or BUS]
Current measured temperature of all connected heat generators (only if sensors are present)

HS State
Additionally it is indicated whether the heat generator is switched on; in the case of two-stage heat generators, the status of the second stage is also displayed.

T-Return total [F17]
Return flow temperature for start of the refrigeration machines (see [T-Return cooling]).

T-Buffer T/M/B [F3/F2/F1]
(only if buffer storage is installed)
Buffer storage tank temperatures in the discharge area, the charging area and the infeed of alternative energy.

Mod depth
Display the required degree of modulation calculated and the current modulation levels for all active heaters. The ad is only when the corresponding figures are available (configuration, BUS, etc.).

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

DHW—Display

T-DHW	Current hot water temperature and current warm water set temperature as per heating program and operating mode
T-DHW B	Temperature of HW tank in the lower section (infeed/solar)
DHW require	Status heating requirement warm water (On/Off)
DHW pump	Status warm water loading pump (On/Off)
DHW release	Release hot water preparation (On/Off)
T-Circulation	Return flow temperature of the circulation
Circulation pump	Status circulation pump (On/Off)

T-DHW Rated (hot water set temperature)
Display of the currently valid value for control

T-DHW (hot water temperature) [F6]
Display of measured upper storage tank temperature

DHW-T B (storage tank bottom temp.) [F12]
For example for solar or solid fuel infeed or for active charge-through function (CHARGE-THROUGH = 01). Display hot-water tank temperature in infeed area

T-Circulation (return flow temperature of circulation)
Only if temperature control of the circulation function is activated

Heating Circuit 1 / 2—Display

T-Room	Current room temperature and current room set temperature as per heating program and operating mode
Humidity	Display of room humidity (if value is available)
T-Pool	Current pool temperature and pool set temperature
T-DHW	Current warm water temperature and warm water set temperature
T-Flow	Current flow temperature and current flow set temperature
Circuit release	Heating circuit in heating mode (On/Off)
CH Pump	Status of the heating circuit pump (On/Off)
Need-Opti-Time	Previous time required to heat up with heat-up optimisation activated

T-Room (room temperature) [F2/F15]
Only if a sensor or a FBR is connected

T-Pool (pool temperature) [F2/F15]
Only if the heating circuit is configured as pool controller

T-DHW (hot water temperature) [F11/F5]
Only if the heating circuit is configured as hot-water circuit

T-Flow (Flow temperature) [F11/F5]
Display of the measured flow temperature of the heating circuit (only for mixed circuits) and display of the current flow set temperature for the control

Need-Opti-Time (last required heating-up time)
Display of the time last required for heating-up

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Solar / MF (Solar + Multifunction)—Display

T-MF1	Temperature MF sensor 1 (=F11)
MF1	Status of relay MF1 (On/Off)
T-MF2	Temperature MF sensor 2 (=F12)
MF2	Status of relay MF2 (On/Off)
T-MF3	Temperature MF sensor 3 (=F13)
MF3	Status of relay MF3 (On/Off)
T-MF4	Temperature MF sensor 4 (=F14)
MF4	Status of relay MF4 (On/Off)
T-Solar 1	Temperature, collector 1
T-Solar 2	Temperature collector 2
T-DHW	Current hot water temperature and current warm water set temperature as per heating program and operating mode
T-DHW B	Temperature of HW tank in the lower section (infeed/solar)
T-Buffer T	Buffer storage tank temperature removal
T-Buffer M	Buffer storage tank temperature charging zone HS
T-Buffer B	Buffer storage tank solar zone
T-Storage 3	Storage 3 charging zone (F15)
Sol pump 1	Status of collector pump 1
Sol pump 2	Status of collector pump 2
Sol pump 3	Status of the collector pump 3
Charge ST HW	Status storage charging pump 1
Charge ST BU	Status storage charging pump 2 / or the switch-over valve on Sp2
Charge ST 3	Status of storage charging pump 3 / or the switch-over valve on Sp3
Charge DHW2	Status transfer pump on 2nd DHW storage tank [F15] (cascade)
Charge BU2	Status transfer pump on the 2nd buffer storage tank [F15] (cascade)

See the description for multifunction 1-4 under Expert.

! This page only displays those parameters where the corresponding functions have been implemen-ted and activated.

T-MF(1-4) [F11-F14]
A sensor is assigned to the four available multifunction relays respectively. If the sensor is not used by another standard function, a function that requires the sensor may be selected for the relay. In this case the measured value is displayed here.

In some special cases, e.g. when selecting the functions "return flow temperature increase" or "collector pump" the measured value is additionally displayed as T-Return under installation or as T-Solar under Solar/MF

T-Solar (1,2) (collector temperature)
Display of the collector pump temperature/s if solar installation configured via MF relay.

Sol pump (1,2,3) (collector pump status)

Charge ST (DHW,BU,3) (status of storage charging pump)
Status indication of the configured solar pumps. If only one storage tank is charged by the solar system, the associated MF relay must be configured as a storage charging pump (DHW, BU, 3).
A collector pump is only configured if either two collectors (East-West alignment) charge one/ more than one storage tank or if multiple storage tanks are charged by the solar system (switch-over of charging via switch-over valves).

Charge (DHW2,BU2) (status of transfer pump)
Status indication of the transfer pump for cascade storage.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Section 6.0

Section 6.1

Section 6.2

Section 6.3

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Overview

The Start-Up process generally is completed the first time that the control is turned on when commissioning the system. Ensure that all of the wiring connections have been finished beforehand. If the system is configured without the necessary sensors, there may be the possibility of sensor/ communication faults.

The table below outlines the information necessary to be set during the start-up. The following pages outlines the

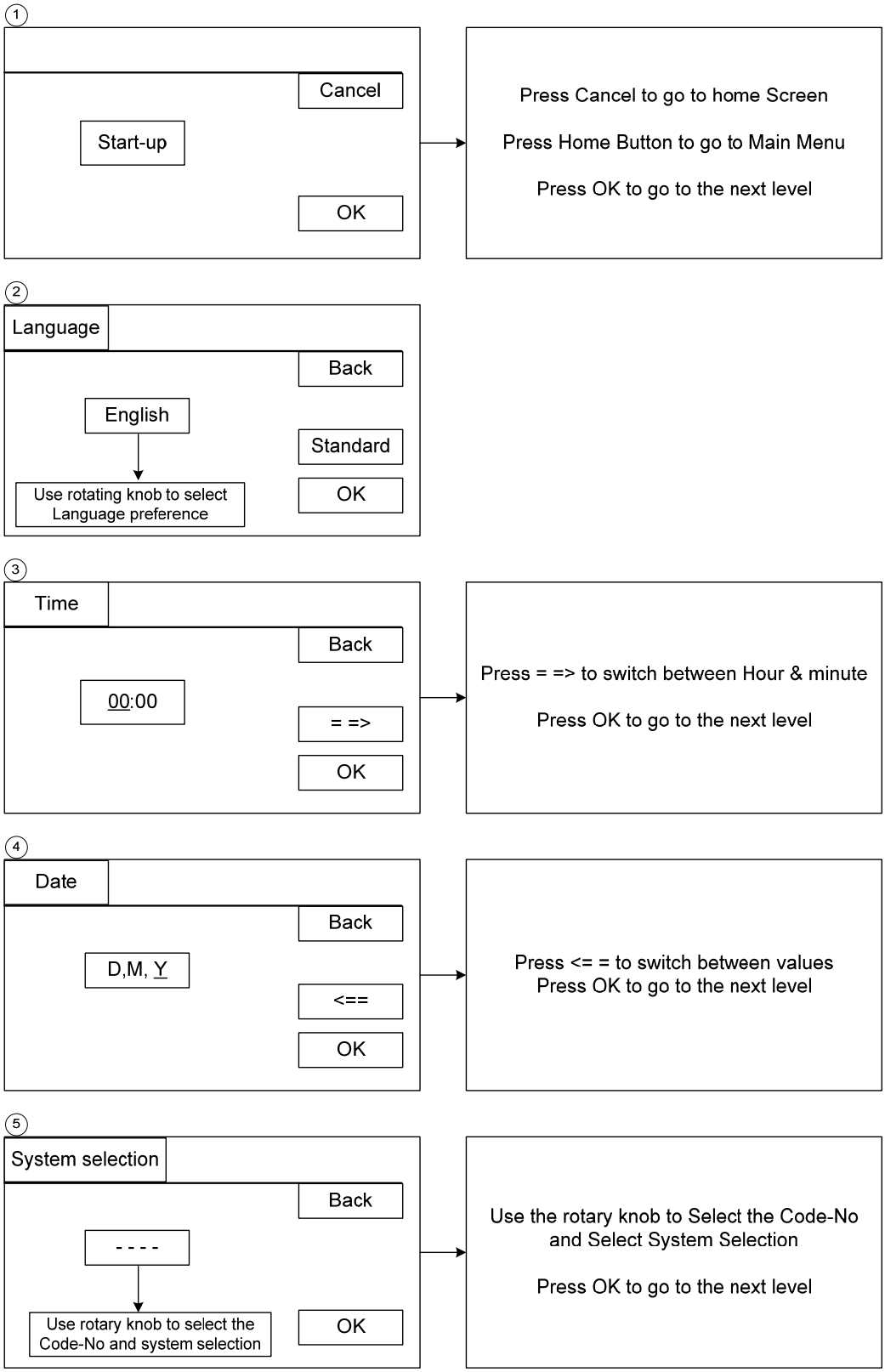
Start-up All the values in this level must be entered in sequence without interruption	
Language	Set language
Time	Set the hour and minute
Date	Set the year, month, day

Designation	Value range	Default
System selection	----, 01 - 10	----
Boiler 1 Type	00 – 06	03
BUS BOILER 1	00 – 05	00
Boiler 2 type	00 – 22	00
Boiler 2 storage	00 - 03	00
Tank type	00, 01, 02	00
Cooling operation	OFF/ON	OFF
Gradient	On/Off	Off
HC Function HC1	Standard, Const supply, Pool, HW, Back	Standard
HC Function HC2	See HC1	Standard
Output boiler stg	00 – 9950 kW	00 kW
MF 1 Function		
MF 2 Function		
MF 3 Function		
MF 4 Function		
F 15 Function		
BUS ID 1		
BUS ID 2		
Sensor		
BUS Scan	On/Off	Off

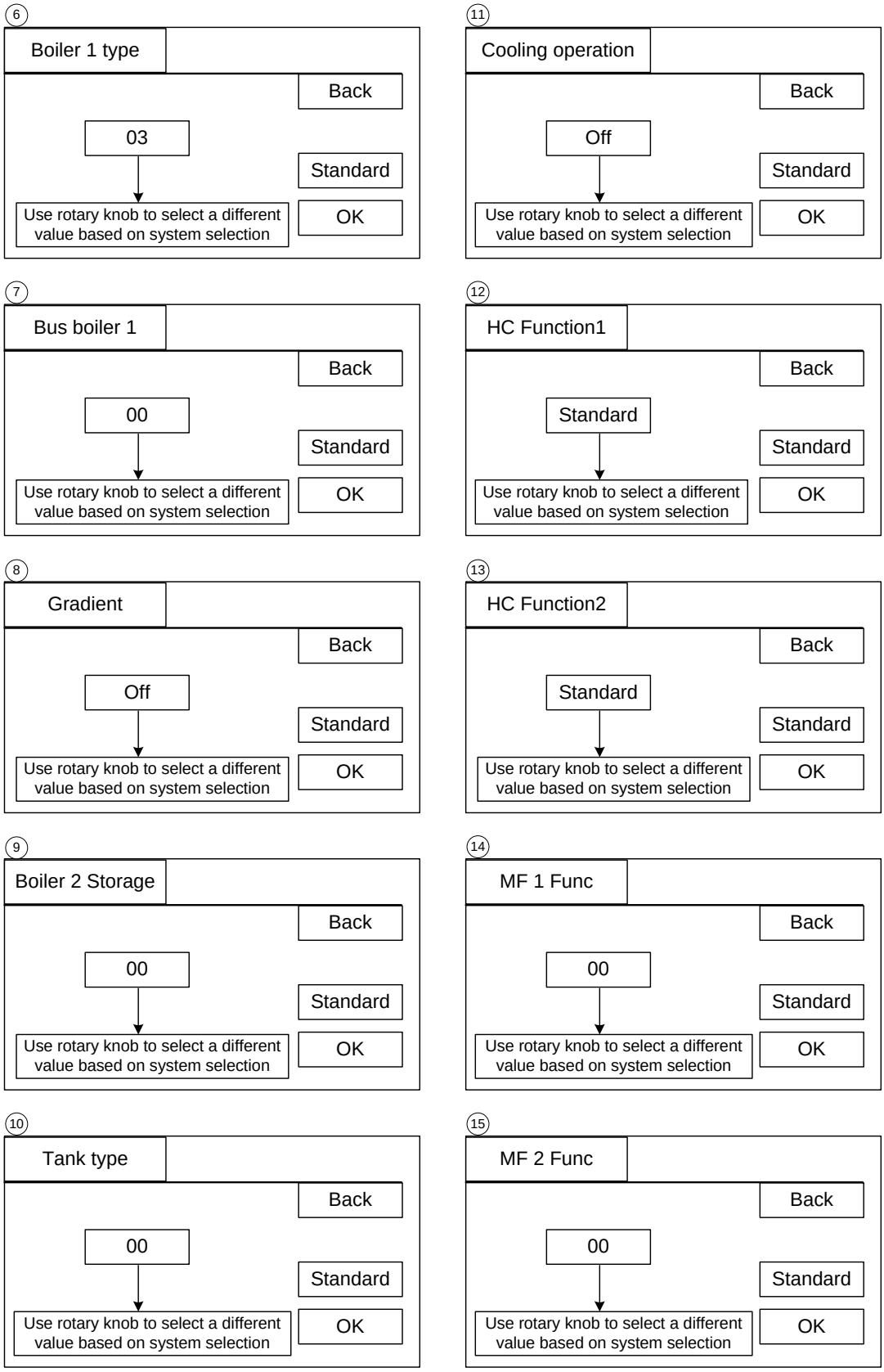
KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up

The setting values below are based on default setting of the control that can be changed based on system selection

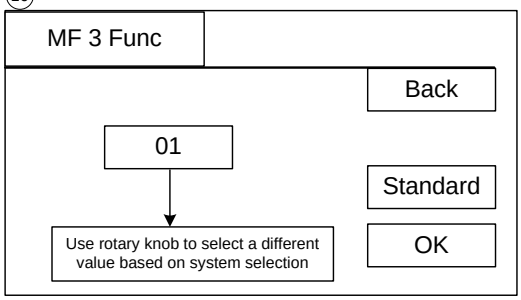


KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice



KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

16



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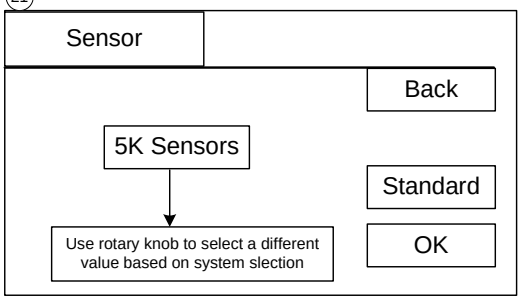

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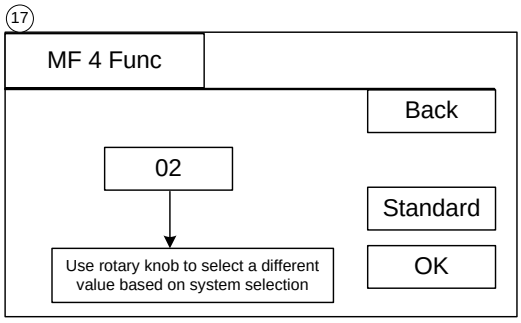

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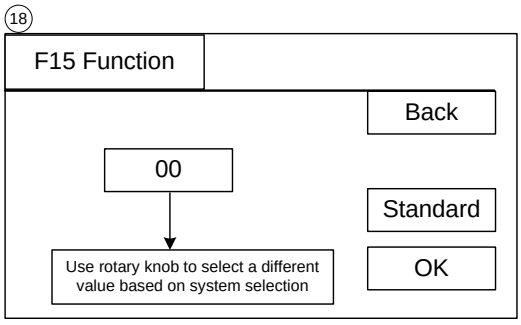

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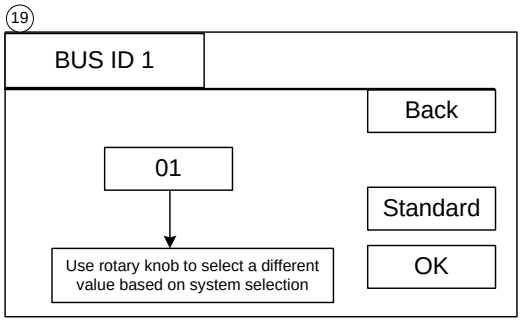

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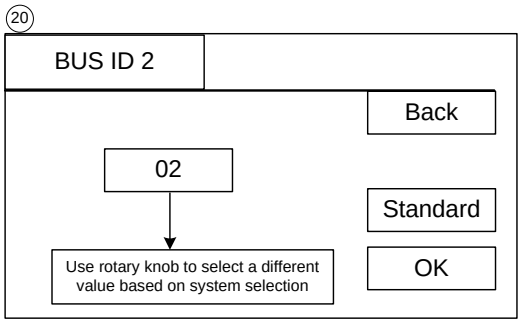


KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-up Settings

English
Select the language

Time
Enter the current time.

Year / Month / Day
Enter the current date

System selection (selecting basic controller functions)
This set value can be used to preset the other values of the start-up level
(see also installation description).

When the installation set value is selected, this also displays "----" = no change to preset => values retain their previously defined status (values on delivery: Merlin 2-stage burner; hot water preparation two mixed heating circuits).

System	Description
01	Cascade Control for Modulating Boilers
02	Cascade Control for Switching Boilers
03	Boiler control with 0-10VDC output
04	Standard Controller with 2 Stage boiler
05	2 Single Stage Boilers with relay outputs
06	Buffer and pellet control with solar function
07	Mixing Valve extension controller
09	Cooling function in heating circuit return
10	Central cooling function and solar integration

Boiler / HS1 Type (first heat generator type)

Type	Description
00	No Heat Generators (MV Extension)
01	Single Stage Boiler switching
02	Single Stage Modulating
03	2 Stage Boiler (SS via A7)
04	2 Single Stage Boiler (SS via A7)
05	Multi-Stage Switching (Cascade via BUS)
06	Multi-Stage Modulating (Cascade via BUS)

BUS BOILER 1 (connection for boiler)

BUS Type	Description
00 Relay	Standard switching
01 CAN BUS	Standard Cascade Switching
02 eBUS	HS without temperature controller Preset Modulation depth Standard (Cascade Modulating)
03 eBUS	HS with Temperature controller Preset desired temperature Not suitable for cascade
04 0-10VDC	Presetting of the desired temperature [DESIRED BOILER T] only for HS1 Type 01, 02 or 03. Burner relays are controlled in parallel. Sensor KF [F8] must be connected
05 0-10VDC	Preset modulation depth only for HS1 Type 02

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings

Boiler 2 type
(second heat generator type relay A7)

00	No secondary heat generator
01	Single stage HS switching
08	Cooling 1
20	Solid fuel integration (additional non-controllable HS) for switching behaviour, see parameter B2 storage
21	Low Loss Header pump
22	Pump for HS1 (e.g. additional HS for cascades)

Boiler (HS) 2 storage
(heat accumulator for HS2)
(Only where Boiler 2 type = Solid fuel)
Warm-up relief applies superordinated:
ON: BOILER T ACTUAL2 > Boiler 2 t min
OFF: BOILER T ACTUAL2 < [Boiler 2 t min – 5K]
BOILER T ACTUAL2 = Solid fuel burner temperature

00	Heating with respect to collector (no storage tank) ON: BOILER T ACTUAL2 > [F8 + Hysteresis stage 2 + 5K] OFF: BOILER T ACTUAL2 < [F8 + Hysteresis stage 2]
01	Heating with respect to storage tank => F1, F3 ON: BOILER T ACTUAL2 > [F3 + Hysteresis stage 2 + 5K] OFF: BOILER T ACTUAL2 < [F1 + Hysteresis stage 2]
02	Heating with respect to HW tank => F6 ON: BOILER T ACTUAL2 > [F6 + Hysteresis stage 2 + 5K] OFF: BOILER T ACTUAL2 < [F6 + Hysteresis stage 2]
03	Heating with respect to STORAGE III (Pool) => F15 ON: BOILER T ACTUAL 2 > [F15 + Hysteresis stage 2 + 5K] OFF: BOILER T ACTUAL2 < [F15 + Hysteresis stage 2]

Start-up protection
Switching off occurs when the temperature of the solid fuel boiler drops below the set limit temperature (Boiler 2 t min) by 5K. The pump is enabled again when the temperature of the solid fuel boiler exceeds the set limit temperature (Boiler 2 t min).

Tank type (heater buffer storage type)

! After activation (01 or 02) it is not possible to connect a FBR for Heating circuit 1.

00	no buffer storage for heating operation
01	Buffer storage for heating operation (F2, F3) HS1 is activated with reference to sensor "buffer top" (F3) DHW-pump function operates on sensor "upper buffer". HW charge pump ON: "Upper buffer" > HWactual + 5K Hysteresis HW charge pump OFF: "Upper buffer" < HWactual
02	Combination storage tank for heating and HW operation HS1 is activated with reference to sensor "buffer middle" (F2) DHW-pump function operates on boiler sensor KF. HW charge pump ON: KF > HWactual + 5K Hysteresis HW charge pump OFF: KF < HWactual
03	Passive buffer storage for heating operation (F1, F3) The buffer will not load by the conventional Heat generator producers. The use occurs, e.g., through solar buffer loading [Buffer charging pump], [return flow temperature increase] or [transfer pump for buffer storage] (sensor usable). In this attitude no change of the regulation of the heating takes place in relation to the without buffers

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings

Cooling mode
(Space cooling via operating mode)
The mode of operation cooling and the necessary settings are released. In the mode of operation cooling the heating circles can be used for the cooling of the room. For this function a refrigerating machine is necessary.

Gradient
ON = HS1 Switching off for Gradient method
OFF = HS1 Switching off by set value + Hysteresis

Switching pattern
The pump is switched on if the temperature of the solid fuel boiler exceeds the temperature of the Reference sensor by the hysteresis (Hysteresis stage 2 + 5K). Switching off occurs when the temperature drops 5K below the switch-on temperature.

HC Function (Heating Circuit Function Selection)

Standard	**Standard heating circuit**
Const Supply	Control for fixed flow temperatures During the heating periods (see heating program) the heating circuit is operated with a fixed preset flow (supply) temperature [T-Flow Day], and during reduced mode operation with a fixed preset flow (supply) temperature [T-Flow Night] accordingly.
Pool	Pool control (only Heating circuit 2) This function can be used to heat a swimming pool. The mixing valve controls the flow temperature for the swimming pool heat exchanger. The sensor for the water temperature of the pool is connected to the room sensor connection for the heating circuit (see FBR) [connector 5+GND or 12+GND]. The flow temperature control operates like normal room control [Room Influence]. The set value for the water temperature can be entered in the user area of the associated heating circuit level [Pool t 1/2/3]. The heating program operates. No heating takes place during the reduction period (frost protection only). The water temperature and the current set value are displayed in the display level [Pool t / T-Pool Desired].
HW	Hot water circuit This function can be used to operate additional hot water circuits. The heating circuit flow sensor is located in the hot water storage tank. The hot water temperature set value can be entered in the user area of the associated heating circuit level [ACTUAL DHW TEMP 1/2/3]. The heating program for the heating circuit acts as an enable program for the storage tank. The storage tank set value is set to 10°C during the reduction period. The boiler controller hot water priority function can be used (partial priority acts like priority).
Return Flow	Return flow temperature increase via mixing valve motor (only for heating circuit 2) The heating circuit flow sensor is used as a boiler return flow sensor. The mixing valve motor controls to the heating circuit set value for 24 hours [Minimum supply t]. **Installation tip:** Dt MV open => boiler flow is fed into the return (=> return flow temperature increase) Mixing valve Closed => heating circuit return is passed through. When the mixing valve motor is open it must be ensured that there is circulation through the boiler (boiler pump).

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Output boiler stg (Boiler output for each stage)
(Only for cascades)
Display of the boiler number and the stage => Selection with Prog button => Input/Adjustment of HS output

- - - = Stage / HS not available

0 = Stage / HS available and deactivated

In the case of boilers with the same output, a boiler release is sufficient; e.g.:

HS1 01 => 01
HS1 02 => 01
HS2 01 => 01 etc.

(depends on the number of heat generators)

Automatic assignment:

After restarting or after a new configuration, the controller searches the bus systems for a heat generator. Within this time period (approx. 1 min) no manual output entries are allowed [Display "SCAN"]. In the case that a heat generator answers with output information, this output is automatically entered into the list. In the case that a heat generator answers without output information, 15kW is entered into the list. This value can then be adjusted manually.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings—Auxiliary relay functions

Solar / MF			
Designation	**Value range**	**Standard**	**IV**
MF (1-4) FUNC	00 - 26	00, 00, 01, 02	
MFR (1-4) t desired	30°C - 90°C	30°C	
MF(1-4) Hyst	2K – 10K	5 K	
MF(1-4) Hyst Off	2K – 10K	2 K	
Solar max temp	80°C – 180°C	110°C	
Solar ON min t	-20°C – 95°C	40°C	
Solar OFF min t	-20°C – 95°C	35°C	
Solar protect t	80°C – 180°C	110°C	
Solar tank cooling	0K – 30K	0 K	
Max T-Storage DHW	10°C – 130°C	60°C	
Max T-Storage BU	10°C – 130°C	85°C	
Max Tank 3 t	10°C – 130°C	30°C	
Solar kick period	0s – 59s	0s	
Solar kick pause	10 – 60min	30min	
Solar kick gradient	01 – 05min	01min	
Use the F button [Cancel] to exit the level			

The multifunction relays = MF relay is assigned one basic function respectively

MF-1: Mixing Valve HC1 OPEN (MF 1 Func = 00)
MF-2: Mixing Valve HC1 CLOSED (MF 2 Func = 00)
MF-3: Collector pump (MF 3 Func = 01)
MF-4: Circulation (time) (MF 4 Func = 02)
If this basic function of a MF relay is not required (configuration of the installation in Installation level), any one of the functions described below may be selected for any unused relay.

The MF-relays 1-4 (A8-A12) are always assigned with a sensor 1-4 (F11-F14) (applies for functions starting from "20" only). If a further sensor is required for a function, this sensor must be connected as F17 (connector III, Pin 2+3).

Must be observed!

! If an MF solar function (07, 08, 09, 23, 27, 28, 29) is activated, no further external solar controller may be connected.

The functions that may be selected for the MF relays 1-4 are described using MF relay 1 as an example.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings—Auxiliary relay functions

Code	Function	Description	Sensor Y / N
00	No MF function		
01	Collector pump	ON: When heat is requested by a consumer OFF: Without consumer heat request If at least one consumer in the system requests heat the pump is switched on. The after-run function runs after the burner has been switched on.	No
02	Circulation (time)	Switching the relay according to the time program for the circulation pump	No Timer
03	Booster pump	ON: When heat is requested by an internal consumer OFF: When no heat is requested by an internal consumer. Follow-up pump action occurs.	No
04	No Function		
05	Pump HS1	The relay may be used to control boiler pump for heat generator 1 (Relay switches with burner relay 1; off delay =5 min). With buffers in the system (Tank type > 00 and sensor BU): In this case the pump is switched on when the temperature of the boiler T actual 1 exceeds the temperature buffer T top by 5K. The pum;p is switched off when the boiler T actual 1 is less than buffer top	No
06	Pump HS2	The relay may be used to control boiler pump for heat generator 2. (Relay switches with burner relay 2; off delay =5 min)	No

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings—Auxiliary relay functions

Code	Function	Description	Sensor Y / N
07	Switch-over valve Storage 2 (buffer)	The valve changes solar production over from hot-water tank to buffer storage if it is not possible for any more collectors to feed the hot-water tank.	No
08	Switchover valve Storage 3 (swimming pool)	The F15 function must be set to a value of 5. The valve changes solar production over from buffer storage to storage tank 3 [F15] if it is not possible for any more collectors to feed the buffer storage.	No
09	Switchover valve Storage 3 (swimming pool)	The F15 function must be set to a value of 5 (only for systems without solar buffer charging). The valve switches the solar production from the hot-water tank to Storage 3 [F15] as soon as the collector is not able to charge into the hot-water tank.	No
12	Remote controlled output Heating circuit 1	The relay can be switched from the control unit of the heating circuit via the BUS (for function, refer to control unit manual).	No
13	Remote controlled output Heating circuit 2	The relay can be switched from the control unit of the heating circuit via the BUS (for function, refer to control unit manual).	No
14-19	Not Used		No
20	Temperature controlled circulation pump	T-CIRCL = Return flow temperature of circulation line ON: T-CIRCL < MFR 1 T DESIRED OFF: T-CIRCL > [MFR 1 T DESIRED + MF 1 HYST] The circulation pump is switched on when the return flow temperature drops below the temperature setting limit (MFR 1 T DESIRED). The pump is switched off again when the return flow temperature exceeds the set limit temperature by the Hysteresis (MF 1 HYST). The set circulation program and the "Circulation with hot water" setting have an overriding function => Switching ON only takes place during enable periods.	Yes
21	Pulsed circulation pump	ON: With short circuit at assigned sensor input OFF: After 5 minutes If a short-cut occurs at the multifunction sensor input the circulation pump is switched on for 5 minutes. Switching on takes place on the edge (once only). The set circulation program and the "Circulation with hot water" setting have an overriding function => Switching ON only takes place during enable periods.	Yes

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings—Auxiliary relay functions

Code	Function	Description	Sensor Y / N
22	Solid fuel boiler integration	(e.g. in connection with 2-stage HS) MFR 1 T ACTUAL or 1-4 = Temperature of the solid fuel boiler BUFFER T BOTTOM = Temperature of buffer storage in the inlet area [F1] ON: MFR 1 T ACTUAL > [BUFFER T BOTTOM (F1) +MF 1 HYST + 5K] OFF: MFR 1 T ACTUAL < [BUFFER T BOTTOM (F1) + MF 1 HYST] Start-up protection: ON: MFR 1 T ACTUAL > MFR 1 T DESIRED OFF: MFR 1 T ACTUAL < [MFR 1 T DESIRED – 5K] The pump is switched on when the temperature of the solid fuel boiler exceeds the temperature of the buffer storage in the inlet area [BUFFER T BOTTOM (F1)] by the hysteresis [MF 1 HYST+ 5K]. Switching off occurs when the temperature drops 5K below the switch-on-temperature. Switching off also occurs when the temperature of the solid fuel boiler drops below the set limit temperature [MFR 1 T DESIRED] by 5K. The pump is enabled again when the temperature of the solid fuel boiler exceeds the set limit temperature [MFR 1 T DESIRED]. <u>Blocking HS1:</u> ON: MFR 1 T ACTUAL > HS set temperature + 5K and solid-fuel boiler pump = ON OFF: MFR 1 T ACTUAL <= HS set temperature or solid-fuel boiler pump = OFF	Yes
23	Collector pump (pump is operational as soon as the collector is able to charge one of the solar storage tanks)	Collector 1 pump only at MFR 4 because of sensor assignment and PT 1000 ***!*** Collector 2 pump only at MFR 3 because of sensor assignment and PT 1000 ***!*** At MF1 and MFR 2 , this function can be used to charge the storage tank from a heat exchanger (without PT 1000 sensor) T-COLLECTOR = Temperature of the solar collector T-L = Temperature of active storage tank at inlet area ON: T-COLLECTOR> [T-B + MF HYST] OFF: T-COLLECTOR< [T- B + MF HYST OFF] The pump is switched on when the temperature of the solar collector exceeds the temperature of the active storage tank (see switch-over valves) in the inlet area by the switch on hysteresis (MF HYST). Switching off occurs when the temperature drops below the temperature [T-B + MF HYST OFF]. A check is conducted before switch-off as to whether a secondary storage tank (see switch-over valves) can be fed. <u>Safety / system protection:</u> OFF: T-T > T-MF SETPOINT ON: T-T < [T-MF SETPOINT – 5K] Switching-off occurs when the temperature of the active storage tank at the upper area of the inlet exceeds the set limit temperature (T-MF SETPOINT). The pump is enabled again when the storage tank temperature drops below the limit temperature by 5K.	Yes

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings—Auxiliary relay functions

Code	Function	Description	Sensor Y / N
24	Return flow temperature increase HS1	RETURN 1 T = Return flow temperature from the installation [= MFR 1 T ACTUAL or 1-4]. ON: RETURN 1 T < MFR 1 T DESIRED OFF: RETURN 1 T > [MFR 1 T DESIRED +MF 1 HYST] The return flow temperature increase pump is switched ON if the return flow temperature drops below the temperature setting limit (MFR 1 T DESIRED). It is switched OFF again when the return flow temperature exceeds the temperature setting limit by the Hysteresis (MF 1 HYST).	Yes
25	Return flow temperature increase HS2	RETURN 2 T = Return temperature of system ON: RETURN 2 T < MFR 1 T DESIRED OFF: RETURN 2 T > [MFR 1 T DESIRED +MF 1 HYST] The return flow temperature increase pump is switched on if the return flow temperature drops below the temperature setting limit (MFR 1 T DESIRED). It is switched off again when the return flow temperature exceeds the temperature setting limit by the Hysteresis (MF 1 HYST).	Yes
26	Return flow temperature increase HS via buffer storage	ON: BUFFER T BOTTOM [F1] > MFR 1 T ACTUAL +MF 1 HYST + 5K OFF: BUFFER T BOTTOM < MFR 1 T ACTUAL+MF 1 HYST The valve to the return flow temperature increase via the buffer storage is opened if the temperature buffer storage low [BUFFER T BOTTOM] exceeds the return flow temperature of the installation [Multifunction sensor 1 or 1-4] by the Hysteresis (MF 1 HYST + 5K). It is switched off again when the temperature buffer storage low drops below the return flow temperature.	Yes

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings—Auxiliary relay functions

Code	Function	Description	Sensor Y / N
27	Storage charging pump 1 (pump operates when the hot-water tank can be charged by the solar system)	***!*** The temperature of the medium used for charging the storage tank is always measured at the MFR 4 sensor [MFR 4 T ACTUAL]. Exception: In the case of function [23] at MFR 4, the sensor assigned to the MF relay storage charging pump 1 is used to determine the temperature of the medium used for charging the storage tank [SOLAR T]. SOLAR T [MFR 4 T ACTUAL] = Temperature of the solar collector SOLAR T [MFR 1-3 T actual] = Temperature of the heat exchanger DWH TANK LOWER T [F12]= Temperature of hot water storage tank in inlet area ON: SOLAR T > [DWH TANK LOWER T + MF HYST] OFF: SOLAR T < [DWH TANK LOWER T + MF HYST OFF] The pump is switched ON when the temperature of the solar collector exceeds the temperature of the storage tank in the inlet area (DWH TANK LOWER T) by the Hysteresis (MF HYST). Switching OFF occurs when the temperature drops below the temperature [DWH TANK LOWER T + MF HYST OFF]. <u>Safety / system protection:</u> OFF: ACTUAL DHW TEMP > T-MF SETPOINT ON: ACTUAL DHW TEMP < [T-MF SETPOINT – 5K] Switching off occurs when the storage tank temperature exceeds the set limit temperature (T-MF SETPOINT). The pump is enabled again when the storage tank temperature drops below the limit temperature by 5K.	Yes

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings—Auxiliary relay functions

Code	Function	Description	Sensor Y / N
28	Storage charging pump 2	The pump operates when the buffer storage tank can be charged by the solar system and the hot-water tank can not be charged by the solar system ! The F15 function must be set to 5. ! The temperature of the medium used for charging the storage tank is always measured at the MFR 4 sensor [MFR 4 T ACTUAL]. Exception: In the case of function [23] at MFR 4, the sensor assigned to the MF relay storage charging pump 2 is used to determine the temperature of the medium used for charging the storage tank [SOLAR T]. SOLAR T [MFR 4 T ACTUAL] = Temperature of the solar collector SOLAR T [MFR 1-3 t actual] = Temperature of the heat exchanger Buffer t bottom [F1] = Temperature of buffer storage in the inlet area ON: SOLAR T > [Buffer t bottom + MF HYST] OFF: SOLAR T < [Buffer t bottom + MF HYST OFF] The pump is switched on when the temperature of the solar collector exceeds the temperature of the storage tank in the inlet area (Buffer t bottom) by the Hysteresis (MF HYST). Switching off occurs when the temperature drops below the temperature [Buffer t bottom + MF HYST OFF]. Safety / system protection: OFF: Buffer t top > T-MF SETPOINT ON: Buffer t top < [T-MF SETPOINT – 5K] Switching off occurs when the storage tank temperature exceeds the set limit temperature (T-MF SETPOINT). The pump is enabled again when the storage tank temperature drops below the limit temperature by 5K.	Yes

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings—Auxiliary relay functions

Code	Function	Description	Sensor Y / N
29	Storage charging pump 3	The pump operates when the storage tank 3 can be charged by the solar system and the buffer storage tank can not be charged by the solar system) ! The temperature of the medium used for charging the storage tank is always measured at the MFR 4 sensor [MFR 4 T ACTUAL]. Exception: In the case of function [23] at MFR 4, the sensor assigned to the MF relay storage charging pump 3 is used to determine the temperature of the medium used for charging the storage tank [SOLAR T]. SOLAR T [MFR 4 T ACTUAL] = Temperature of the solar collector SOLAR T [MFR 1-3 t actual] = Temperature of the heat exchanger Tank 3 t [F15]= temperature of storage tank 3 in the infeed area ON: SOLAR T< [Tank 3 t + MF HYST] OFF: SOLAR T < [Tank 3 t + MF HYST] The pump is switched on when the temperature of the solar collector exceeds the temperature of the storage tank in the inlet area (Tank 3 t) by the Hysteresis (MF HYST). Switching off occurs when the temperature drops below the temperature [Tank 3 t + MF HYST OFF]. Safety / system protection: OFF: Tank 3 t > T-MF SETPOINT ON: Tank 3 t < [T-MF SETPOINT – 5K] Switching off occurs when the storage tank temperature exceeds the set limit temperature (T-MF SETPOINT). The pump is enabled again when the storage tank temperature drops below the limit temperature by 5K. 30 = transfer pump DHW storage tank II ! The F15 function must stand on 4. Relay switches when the temperature of the hot-water storage tank exceeds the temperature F15 by the hysteresis (MF HYST). Switching off occurs when the temperature drops below the temperature [F15 + MF HYST OFF].	Yes

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Start-Up Settings—Auxiliary relay functions

Code	Function	Description	Sensor Y / N
30	Transfer pump DHW storage tank II	The F15 function must be set to 4. The relay switches when the temperature of the hot water storage tank exceeds the temperature F15 by the Hysteresis (MF HYST). Switching off occurs when the temperature drops below the temperature [F15 + MF HYST OFF]	Yes
31	Transfer pump buffer storage tank II	***!*** The F15 function must be set to 4. Relay switches when the temperature of the buffer storage tank exceeds the temperature F15 by the hysteresis (MF HYST). Switching off occurs when the temperature drops below the temperature [F15 + MF HYST OFF].	Yes
32	Direct heating circuit	Heating circuit with fixed flow temperature => T-MF Des In the event of a short circuit at the assigned MF sensor (via room thermostat/timer switch) => Heating circuit pump ON => Preset desired flow temperature to the HS After the sensor short circuit has been eliminated, a run -on time takes effect on the pump.	Yes
33	Thermostat function	ON: T-MF > T-MF DES OFF: ACTUAL DHW TEMP < [T-MF DES – 5K]	Yes
34	bypass valve cooling mode	The relay is switched in cooling mode => separation of the conventional HS from the cooling circuit. => This means hot water preparation during cooling operation is possible (the flow temperature for the HS control is captured by the MF sensor)	Yes

F15 function (sensor function for F15)

Code	Description
00	Room sensor for Heating circuit 2. if a further sensor at the pulse input [IMP = F17] is detected at this position, an FBR is evaluated at F15 and F17. If F17 is used by a different function, an RFB is evaluated at F15.
01	0-10V input for presetting an external collector set temperature. On evaluation see Parameter [V-Curve] in the Expert level /Installation level.
02	Light sensor => without function
03	0..10V input for presetting an external modulation depth. On evaluation see Parameter [V-Curve] in the Expert level /Installation level.
04	Secondary sensor for MF function
05	Storage tank 3 (e.g. pool)

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Auxiliary relay functions—Solar Multifunction

Function	Description
Solar Max Temp	The collector pumps are disabled when the associated collector temperature exceeds the safety threshold set here -> System protection. The pumps are reactivated when the temperature falls below the temperature [maximum collector temperature – 10K].
Solar ON Min T	The collector pump is enabled when the associated collector temperature exceeds the temperature [Solar ON min t].
Solar OFF Min T	The collector pump is disabled when the associated collector temperature drops below the temperature [Solar OFF min t]. This function prevents pump operation without relevant heat production.
Solar Protect	The collector protection temperature protects the collector against overheating. If the collector temperature exceeds the set collector protection temperature and the storage tank temperature is less than 92°C, then the storage tank is fed beyond its maximum temperature to 95°C to cool the collector. The function is interrupted when the collector exceeds its maximum temperature. The function is activated again when the collector temperature drops below the maximum temperature-3K.
Solar Tank Cooling	Parameter = 0 => No storage tank re-cooling If the collector protection function has fed the storage tanks during the day to temperatures in excess of the set maximum storage tank temperatures, then the storage tank can automatically be cooled at night between 1.00 and 6.00 hours by activating this function by switching on the feeding pumps to the set maximum temperature of the storage tank. The storage tank cannot be fed during this period. Recooling can take place only when the temperature of the storage tank exceeds the collector temperature at least by the value of return flow cooling difference +3K hysteresis
Max T-Storage DHW, BU, 3	If a top of tank sensor is installed, it is used to monitor the maximum temperature at this sensor. If this sensor is not installed, the maximum storage tank temperature is monitored at bottom storage tank sensor. In this case, the layering of the tank must be taken into account. The feeding pumps are disabled when the temperature of the storage heater exceed the safety limit temperature set here. System protection: The pumps are reactivated when the temperature falls below the temperature [maximum storage temperature – 5K].
Solar kick period [sec]	Collector pump runtime following pump kick
Solar kick pause [min]	If the collector pump has not run for the duration set here, the pump is activated for the kick duration period.
Sol Kick Gradient [min]	The course of the collector temperature is controlled during this period following a pump kick. If an increase of 0.5K is detected, the pump is started for a further minute.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

BUS ID 1/2
The heating circuits are sequentially numbered starting with "01". heating circuit numbers must not be assigned twice. For replacement controllers however, please enter exactly the same heating circuit numbers as the replaced controller.

Sensor
Selection of sensors 1Kohm and 5Kohm function of programming and system selection.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Section 7.0

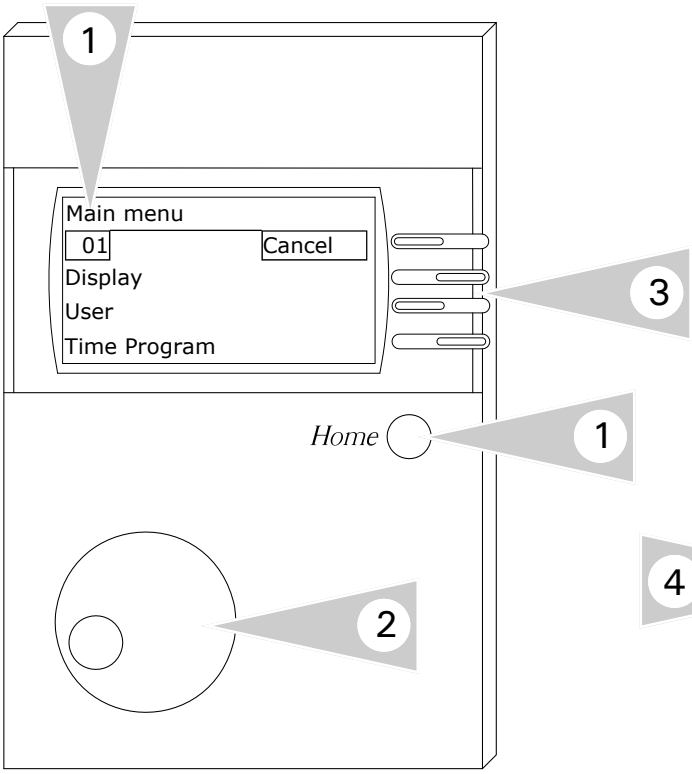
Section 7.1

Section 7.2

Section 7.3

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

User

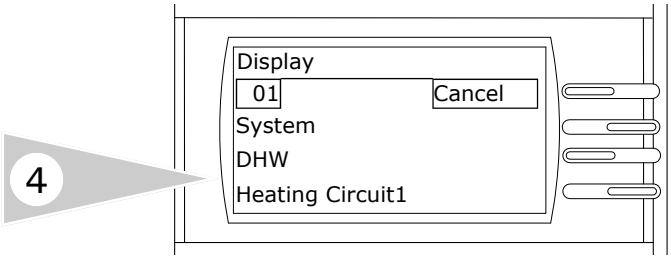


Viewing Information

Note: Temperatures and status information is based on system selection and installed accessories.

1. Press the Home button to display ***Main Menu***

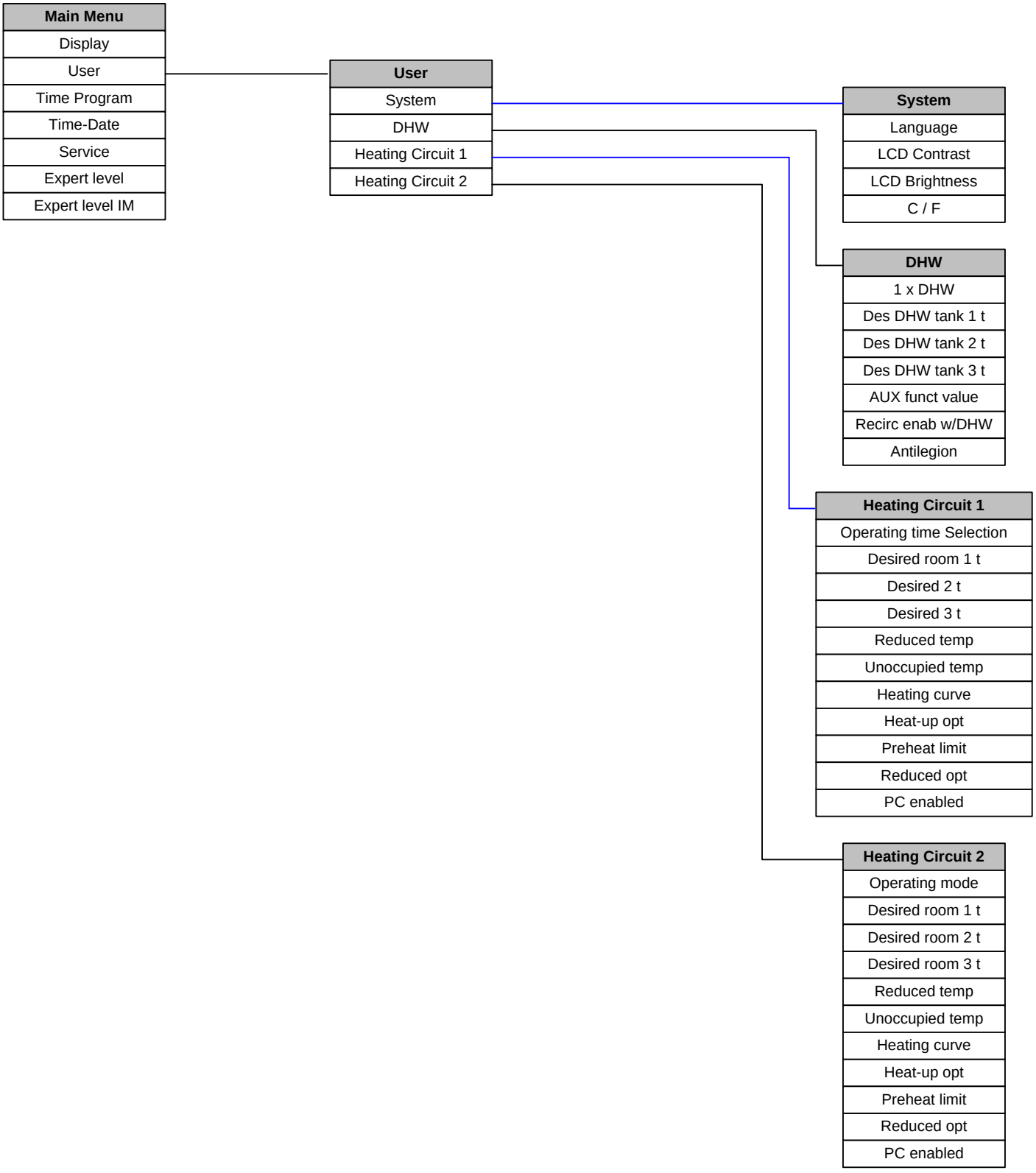
2. Use rotary dial and ensure ***User*** is viewed in the screen.
3. Press the adjacent key beside the word User to select menu option.



4. When in the display mode, select any of the various circuits to view temperatures/status information.
5. When current level is no longer required, pressing the ***Cancel*** button will exit from current screen.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

User Menu Structure Overview



KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

General function description and settings

User

All the settings that can be made by the operator of the system.

System		
Designation	Value range	Standard
Language	Acc. to version	English
LCD Contrast	(-20) – (20)	04
LCD Brightness	00-30	30
°C / °F	Celsius, Fahrenheit	Celsius

DHW Settings			
Designation	**Value range**	**Standard**	**Description**
1x hot water	Off/On	Off	On => The storage tank is enabled for charging for showering outside hot water times. Charging starts when the temperature falls below "T-DHW 1 des" by the switching hysteresis.
T-DHW 1 des	10°C - 70°C	60°C	Required hot water temperature setting T-DHW 1 des => used in first enable time, T-DHW 2 des => used in second enable time, T-DHW 3 des => used in third enable time of hot water program.
T-DHW 2 des	10°C - 70°C	60°C	
T-DHW 3 des	10°C - 70°C	60°C	
BoB-Value	0K – 70K	0 K	Energy saving function for solar or solid fuel integration For settings > "0" the burner is not activated for hot water preparation until the hot water temperature has dropped below the temperature setting by the set value + the switching hysteresis.
Circl-Pump DHW	OFF/ON	OFF	On => The circulation pump runs when the hot water is enabled, but the circulation program is disabled.
Antilegion	OFF/ON	OFF	On => Activation of hot water short time heating function Every 20th time that heating takes place or once per week on Saturday at 01:00 hrs the storage tank is heated up to 65°C. It is possible to set up your own hot water short time heating function using the third hot water enable facility.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

General function description and settings

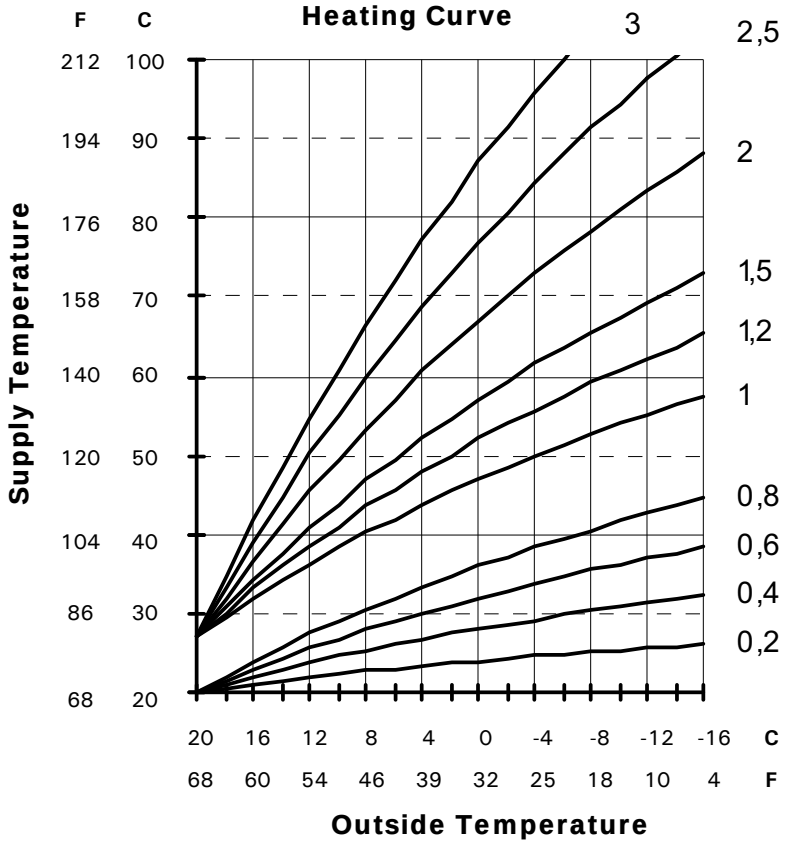
User

Heating circuit 1 / 2			
Designation	**Value range**	**Standard**	**Description**
Operating mode	----, Standby, Time selection 1 / 2, Summer, Heating, Reduced	----	- - - => The controller programming switch applies in this case. When setting an alternative operating mode this only applies to the assigned heating circuit. When the "Standby" and "Summer" operating mode of the controller programming switch are set, this has a reducing effect on all heating circuits and consumer circuits in the entire system.
Desired room 1 t *)	5°C - 40°C	20°C	Required room temperature setting Desired room 1 t => used in first enable time, Desired room 2 t => used in second enable time, Desired room 3 t => used in third enable time of active heating program for this heating circuit. Reduced temp Required room temperature setting during night reduction
Desired room 2 t *)	5°C - 40°C	20°C	
Desired room 3 t *)	5°C - 40°C	20°C	
Reduced temp*)	5°C - 40°C	10°C	
Unoccupied temp	5°C - 40°C	15°C	Required room temperature setting during holidays
Room t cool	--, 20°C - 40°C	25°C	Starting condition for cooling function to room temperature "----" = Without effect => Cooling operation enabled ****)** If the operating mode Cooling is activated at the central control, this temperature is used as the set room temperature for this heating circuit. Cooling operation is activated when the temperature is exceeded. Cooling mode ends when the temperature drops 2K below.
Min TO cooling	--, 0°C – 40°C	27°C	Starting condition for cooling function to outside temperature "----" = Without effect => Cooling operation enabled ****)** If the operating mode Cooling is activated at the central control, cooling operation is activated for this heating circuit when the outside temperature exceeds the temperature set here. Cooling mode ends when the temperature drops 1K below. ****)** If starting conditions are set for room as well as outside temperature, both conditions must be met before cooling operation starts.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

User

Day temp limit	--, (-5)°C–40°C	19°C	Only valid if the function is activated => Set value "Expert level /Heating circuit/Pump function = Temp limits => Pump switching according to heating limit" If the outside temperature that is measured and calculated by the controller exceeds the heating limit specified here, heating is disabled, the pumps switch off and the mixing valves are closed. The heating is enabled again when the outside temperature drops below the set heating limit by 1K (= 1°C). Day temp limit => applies during heating times Night temp limit => applies during reduction times "----" => The heating limit is deactivated. The circulation pump is switched in accordance with the standard function (see chapter entitled "Circulation pump control")
Night temp limit	--, (-5)°C–40°C	10°C	
Heating curve	0.00 - 3.00	1.20	The gradient of the heat slope indicates by how many degrees the flow temperature changes if the outside temperature rises or drops by 1 K. Setting tip: At cold outside temperatures, room temperature too low => Increase heat slope (and vice-versa) At high outside temperature (e.g. 16°C) room temperature too low => correction via set room temperature



The heat slope can best be set at outside temperatures below 5°C. The change in heat slope setting must be made in small steps and at long intervals (min. 5 to 6 hours) because the system must first adjust to the new values each time the heat slope is changed.

Guideline Settings
Underfloor heating S=0.4 to 0.6
Radiator heating S= .0 to 1.5
Baseboard heating S=1.5 to 2.5

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

User

Curve adaptation	OFF/ON	OFF	Only active if an FBR analogue room device is connected (room sensor + operating mode selection) and an outdoor sensor. Function for automatic heal slope setting Starting Conditions: ▶ External temperature < 8°C ▶ Operating mode is automatic (I or II) ▶ Duration of lowering phase at least 6 hours At the beginning of the lowering period, the current room temperature is measured. During the next four hours, this temperature is used as the set-point for the room regulator. The heating curve is calculated from the values determined during this time by the regulator for the flow pipe nominal temperature and the external temperature. ***!*** The parameter remains activated until the adjustment has been completed successfully without an interruption due, for example, to a Start-up protection or the hot water requirement of an external circuit. ***!*** During the adaptation, the water heating and the heating optimisation of the regulator are blocked.
Room Influence	00 - 20	10	Only active if an FBR analogue room device is connected (room sensor + operating mode selection). The HS temperature is increased by the set value when the temperature drops below the required room temperature by 1K. => High values lead to fast control and large HS temperature fluctuations. - - - - => pure weather-dependent control 0 => pure weather-dependent control **) 20 => pure room temperature control **) Special function with room influence = 0 For one-off heating requirements during the night reduction the heating pump continues to run until the next heating period is reached (see chapter entitled "Circulation pump control").
Room t correction	(-5.0)K – (5.0) K	0.0 K	In the case of room control (e.g. with FBR) the measurement can be corrected using this setting if the room sensor is not measuring correctly.

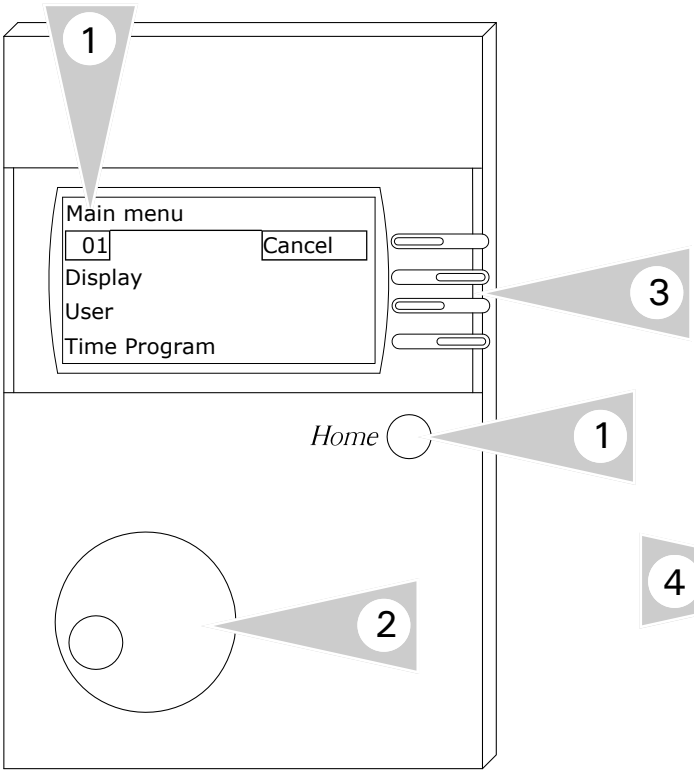
KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

User

Heat-up opt	Off, Outdoor t actual, Room t	Off	Activation of function for automatically bringing forward the start of heating. Example: Heating program 6.00 hrs – 22.30 hrs OFF: Building starts to be heated at 6.00 hrs. ON: Depending on weather and room temperature, heating starts soon enough so that building just reaches the set room temperature at 6.00 hrs. 00 => start of heating not brought forward 01 => brought forward depending on weather 02 => brought forward depending on room temperature *) *) Only active if an FBR analogue room device is connected (room sensor + operating mode selection). ***!*** Heat-up optimisation occurs only if the reduced time of the heating circuit is at least 6 hours.
Preheat limit	0:00 – 3:00 [h]	2:00 [h]	Only active with "Optim Heat = Outdoor t actual or Room t" The start of heating is brought forward by no more than this time.
Reduced opt	0:00 – 3:00 [h]	0:00 [h]	Automatic reduction of burner disabling to end of set heating time. The burner is not restarted before the end of the heating period during the set time period (last heating time only) if it not already in operation. This function prevents short-term heating of the heat generator to the end of the heating period.
PC enabled	0000 - 9999	0000	Code number for enabling access to heating circuit data from a PC "0000" => access PC and terminal is blocked. "0001" => access is free of Terminal / access PC is blocked.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

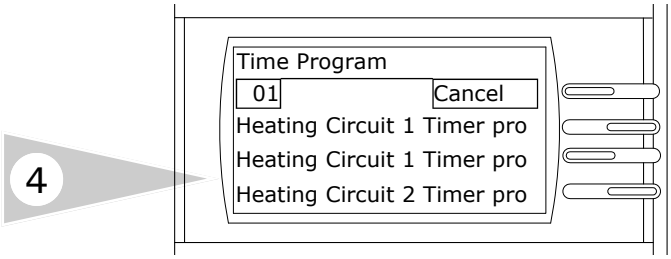
Time Program



Time Program Information

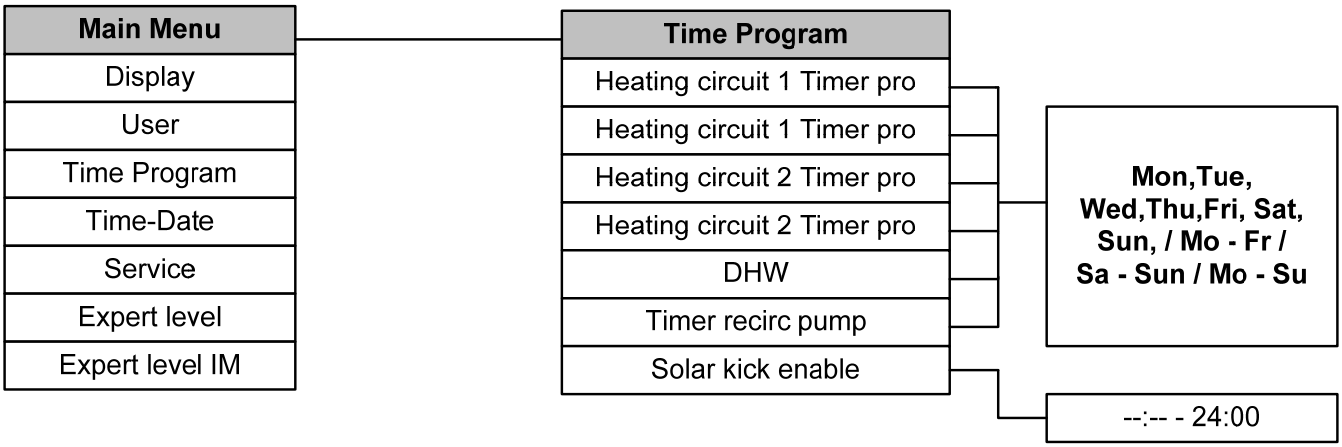
Note: Temperatures and status information is based on system selection and installed accessories.

1. Press the Home button to display ***Main Menu***
2. Use rotary dial and ensure ***Time Program*** is viewed in the screen.
3. Press the adjacent key beside the word User to select menu option.



4. When in the Time Program mode, select any of the various circuits to view heating circuit timer information.
5. When current level is no longer required, pressing the ***Cancel*** button will exit from current screen.

Time Program Menu Structure Overview



KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Time Program

Programs with maximum controller configuration	
Heating circuit 1 Prg1	1. Heating program for heating circuit 1
Heating circuit 1 Prg2	2. Heating program for heating circuit 1
----	----
Heating circuit 2 Prg1	1. Heating program for heating circuit 2
Heating circuit 2 Prg2	2. Heating program for heating circuit 2
----	----
DHW	Program for hot water loading
Circulation	Program for hot water circulation

Press the F button "Time Program"

Use it ◌ to search for the desired time program
=> e.g. "Heating circuit 2 Prog2"

Use the F button [here button 3] to select time program
=> "Heating circuit 2 Prog2" "Monday"

Use it ◌ to search for weekday/block
=> e.g. "Mo - Fr" (Monday – Friday)

Use the F button [OK] to select a block
=> "06:00 -- 08:00", "16:00 -- 22:00", --:-- -- --:--"

Use the F button [OK] to select a time
=> "06:00 -- 08:00", "16:00 -- 22:00", --:-- -- --:--"

Use the rotary knob to adjust the time
=> "06:00 -- 08:00", "17:00 -- 22:00", --:-- -- --:--"

Use the F button [OK] to save a new program
Use the F button [Cancel] to exit a block
When connecting a digital room controller with heating program input, the corresponding heating program in this controller is automatically superseded.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

General function description and settings

Heating circuits and hot water timers

Heating circuit 1

Heating program 1 => factory setting:

Mo. to Fr.: 06:00 to 22.00
Sa. and Su.: 07:00 to 23:00

	Heating time 1		Heating time 2		Heating time 3	
Mo.						
Tu.						
We.						
Th.						
Fr.						
Sa.						
Su.						

Heating program 2 => factory setting:

Mo. to Fr.: 06:00 to 08.00, 16:00 to 22:00
Sa. and Su.: 07:00 to 23:00

	Heating time 1		Heating time 2		Heating time 3	
Mo.						
Tu.						
We.						
Th.						
Fr.						
Sa.						
Su.						

Heating circuit 2

Heating program 1 => factory setting:

Mo. to Fr.: 06:00 to 22.00
Sa. and Su.: 07:00 to 23:00

	Heating time 1		Heating time 2		Heating time 3	
Mo.						
Tu.						
We.						
Th.						
Fr.						
Sa.						
Su.						

Heating program 2 => factory setting:

Mo. to Fr.: 06:00 to 08.00, 16:00 to 22:00
Sa. and Su.: 07:00 to 23:00

	Heating time 1		Heating time 2		Heating time 3	
Mo.						
Tu.						
We.						
Th.						
Fr.						
Sa.						
Su.						

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

General function description and settings

Heating circuits and hot water

DHW

Factory setting:

Mo. to Fr.: 05:00 to 21.00
Sa. and Su.: 06:00 to 22:00

	Heating time 1		Heating time 2		Heating time 3	
Mo.						
Tu.						
We.						
Th.						
Fr.						
Sa.						
Su.						

Circulation

Factory setting:

Mo. to Fr.: 05:00 to 21.00
Sa. and Su.: 06:00 to 22:00

	Heating time 1		Heating time 2		Heating time 3	
Mo.						
Tu.						
We.						
Th.						
Fr.						
Sa.						
Su.						

Kick function enabling (Solar only)

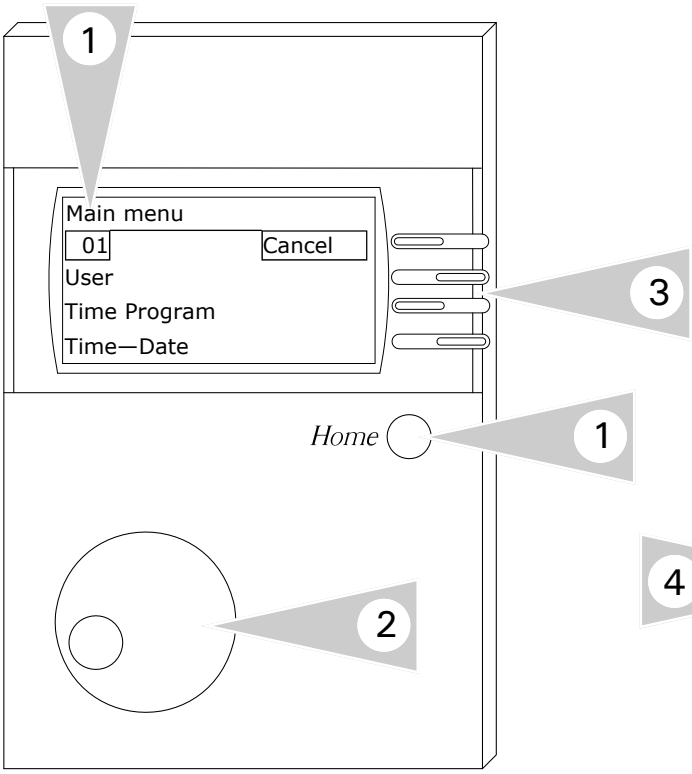
Factory setting:

Mo. to Su.: 00:00 to 24.00

	Heating time 1	
Mo.—Su		

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

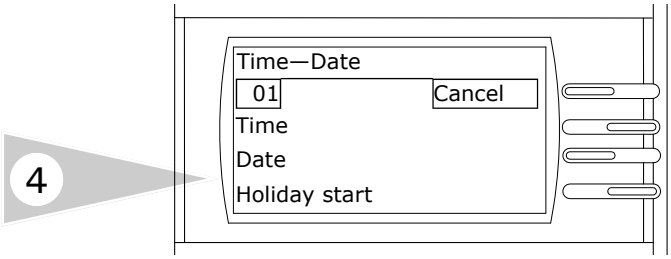
Time—Date



Time—Date Program Information

Note: Temperatures and status information is based on system selection and installed accessories.

1. Press the Home button to display ***Main Menu***
2. Use rotary dial and ensure ***Time—Date*** is viewed in the screen.
3. Press the adjacent key beside the word User to select menu option.



4. When in the Time—Date Program mode, select any of the menu choices to view Time/Date information.
5. When current level is no longer required, pressing the ***Cancel*** button will exit from current screen.

Time-Date Menu Structure Overview

Main Menu
Display
User
Time Program
Time-Date
Service
Expert level
Expert level IM

Time-Date
Time
Date
Holiday start
Holiday End
Start Summer time
End Summer time

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

General function description and settings

Time-Date

Time (hh:mm)	Set hour, F button [==>], hh:mm, set minutes
Date (dd. month yy)	Set year, F button [<==], set month, F button [<==], set day,
Holiday start (dd. month yy)	Set date for begin of the holiday time
Holiday end (dd. month yy)	Set date for end of the holiday time
Start Summertime (dd. month)	Set date for begin of clock change
End Summer time (dd. month)	Set date for end of clock change

Time

(Not for Time Master or DCF in the system)

! There may be a time difference of up to 2 minutes per month (correct time if necessary). If a DCF receiver is connected the correct time is always displayed.

Time Master for all controllers

! If a heating system controller has been set to be the Time Master (time setting for all controllers, see Expert level /Configuration) or a DCF (Radio time receiver) has been installed in the system, the time is blanked out on all the other controllers in the system.

! A max. of one Time Master can be set on the BUS.

Date

Please first set the year and then the month. Then the number of days of the month are calculated during the setting.

Holiday function

! Please do not enter the day of travel as the start date, but the first day of the holiday (no more heating from this day).

! Please do not enter the day of travel as the end date, but the last day on which there is to be no heating. When you arrive home the house should be warm and there should be hot water.

! Stop holiday function => e.g. for early return by pressing the program switch.

Automatic summer/winter time changeover

The current weekday is calculated automatically. It is shown the standard display.

It is possible to change from summer to winter time by entering the date.

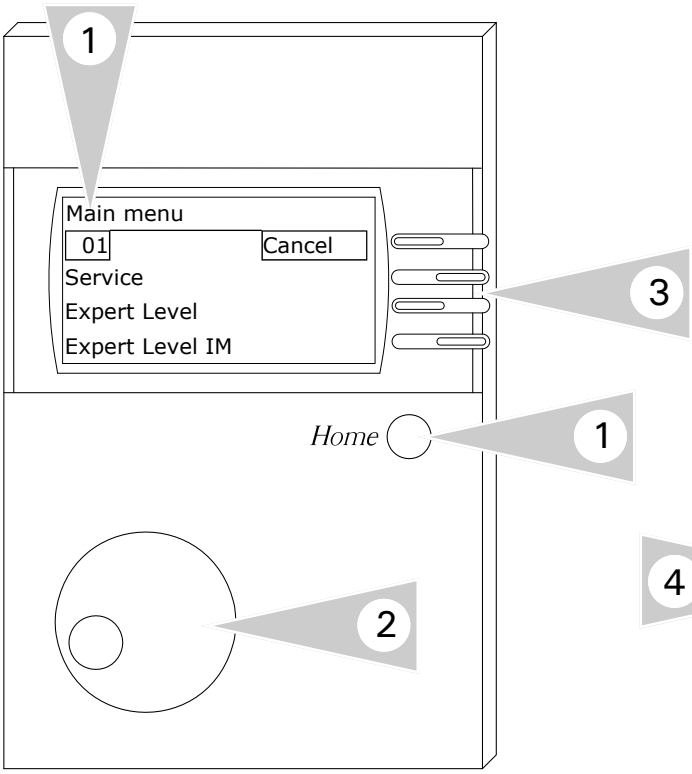
! The default setting is valid for Central European time zones. A modification is only required if the date for the time change is changed by political decree.

! The earliest date on which the change will occur must be set. The controller performs the time change on the Sunday following this date at 2.00 am or 3.00 am.

! If no time change is required, please set month stop to the same value as month start and day stop to the same value as day start.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

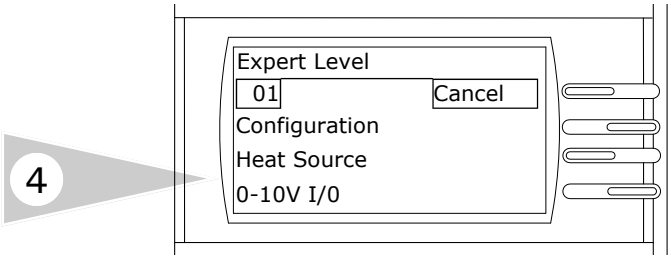
Expert Level



Viewing Information

Note: Temperatures and status information is based on system selection and installed accessories.

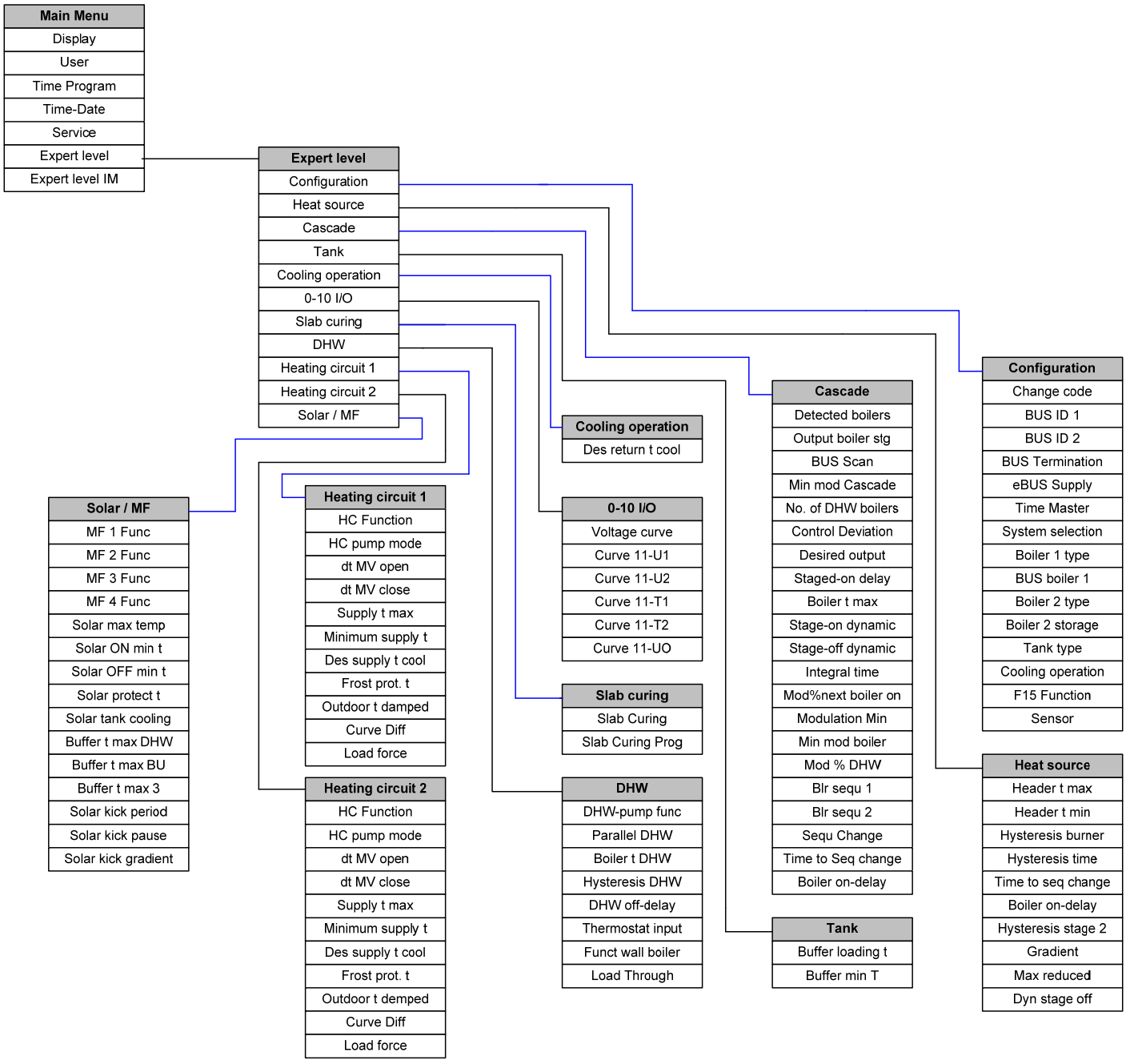
1. Press the Home button to display ***Main Menu***
2. Use rotary dial and ensure ***Expert Level*** is viewed in the screen.
3. Press the adjacent key beside the word User to select menu option.



4. When in the expert level mode, select any of the various circuits to view temperatures/status information.
5. When current level is no longer required, pressing the ***Cancel*** button will exit from current screen.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Expert Level Menu Structure Overview



KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Expert Level

System Configuration

It is only possible to change the fitter set values after entering the code number.

⚠ If these values are set incorrectly, they may cause malfunctions or damage to the system.

Use the F button [OK] to save the code number

Configuration		
Designation	Value range	Standard
Change code	0000 - 9999	0000
BUS ID 1	(00), 01-15	01
BUS ID 2	(00), 01-15	02
BUS Termination	Off/On	On
eBUS Supply	Off/On	On
Time Master	Off/On	Off
System selection	----, 01 - 10	----
HS1 Type	00 – 06	03
BUS BOILER 1	00 – 05	00
Boiler 2 type	00 – 22	00
Boiler 2 storage	00 – 03	00
Tank type	00, 01, 02	00
Cooling operation	Off/On	Off
F15 Function	00 - 05	00
Sensors	1K / 5K Sensors	5k Sens.
Use the F button [Cancel] to exit the level		

Code-No input

1.Set number
F button [==>] next number
2.Set number
F button [==>] next number
3.Set number
F button [==>] next number
4.Set number

Change code

Input of a new code number (It is essential to remember the new code number after adjustment).

BUS ID 1/2

The heating circuits are sequentially numbered starting with "01". heating circuit numbers must not be assigned twice. For replacement controllers however, please enter exactly the same heating circuit numbers as the replaced controller.

BUS Termination (bus termination resistor)

The bus terminating resistor must be available once in the bus system (HG controller or cascade controller).
When installing with a CoCo, set 1 to "Off".
Off => The resistor is not set
On => The resistor is set

eBUS Supply (supply for eBUS)

Switching the eBUS supply on / off in relation to connected devices (power supply balance).

Time Master

(Only without or Time Master in system)
Off = no time master, each heating circuit has its own time
On = controller is time master, all controllers and remote controls take over the time settings of this controller.

! No more than 1 Time Master is permitted in the system!

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Heat Source			
Designation	Value range	Standard	Description
Boiler 1 t max	30°C - 110°C	85°C	(Max. temperature Boiler) Protects the HS from overheating / prevents triggering the LIMITER. ***!*** Caution: Also works with hot water preparation
Boiler 1 t min	10°C - 80°C	40°C	(min temperature Boiler) Decreased condensation build-up in HS with low heat requirements. Switching the HS off is always done earlier when achieving the HS minimum temperature Boiler 1/2 t min + Hysteresis (standard 5 K) => see also Low limit
Boiler 2 t min	10°C - 80°C	40°C	
Header t max	30°C - 110°C	85°C	Maximum temperature setting
Header t min	10°C - 80°C	40°C	Minimum temperature setting
Startup protection	10°C - 85°C	35°C	(Not in cascade operation) Reduces operation in condensation zone. The circulation pumps are switched off and the mixing valves are shut until the boiler has reached the start-up temperature.
Low limit	00, 01, 02	00	(minimum delimiter HS) (Not in cascade operation) Decreased condensation build-up in HS with low heat requirements. Switching the HS off is always done earlier when achieving the HS minimum temperature Boiler 1 t min + Hysteresis (5K) 00 = Minimum delimiter for heat curve The HS switches on if the requested temperature has been exceeded by the using components. 01 = Minimum delimiter with heat requirement The HS holds at least the set minimum temperature Boiler 1 t min <u>at heating requirements</u> (pump release). 02 = Permanent minimum delimiter (24) The HS holds 24h at least the set minimum temperature Boiler 1 t min. at heating requirements (Pump release).

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Expert Area

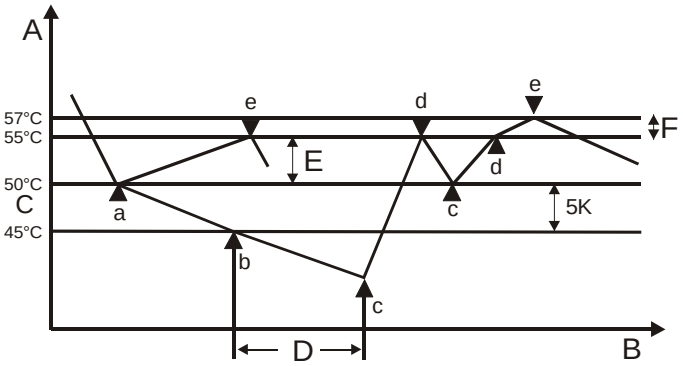
Hysteresis (or Hysteresis burner)	5K – 20K	5 K	Function for optimising the boiler operation with differing heat-generator loads. The <u>effective</u> switching hysteresis is reduced linearly after the burner is switched on from the set Hysteresis to the minimum hysteresis (=5K) during the hysteresis time. **Low heat consumption** In this case the high effect. Short run-times and frequent burner operation are prevented. **High heat consumption** During longer periods of burner operation (high heating load) the hysteresis is automatically reduced to 5K. This prevents the heat generator from heating to unnecessarily high temperatures.
Hysteresis time	00 min – 30 min	00 min	
Time to sequence change (Boiler Rotation)	00 - 800 hours	00 hours	For operation with at least 2 heat generators there is the option to rotate the boiler sequence after the operating hours specified here of the first heat generator of the active sequence. 00 = no HS Sequence
Boiler on-delay (time delay for 2nd stage)	00 min – 30min	00 min	Min. delay time after switching on or with switching HS, also when switching a layer off until switching the next layer on. ***!*** 00 = 10 sec; For correct settings, also ensure the internal Boiler on-delay for the closed burner control.
Hysteresis stage 2	2K – 20K	2 K	(for solid fuel/2nd burner) (only for 2-stage burners or solid fuel integration) Solid fuel integration: Hysteresis for the charging pump 2. Burner 2 and burner stage 2: see next page => Switching pattern for 2-stage burners
Gradient	On/Off	Off	(only applies for HS 1) This method permits early switch off of a heat generator when heat consumption is low. Example: Pellet boiler => When heat consumption is low, a pellet boiler may possibly need to be switched off before the set temperature is reached (burnt out). The optimum switch off point is determined from the speed of the temperature increase of the pellet boiler ([K/min] = gradient). On = Switch off according to gradient method Off = Switch off by set value + Hysteresis

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Max reduced	1 - 20K	10K	The value set determines the earliest switch off point as a difference to the maximum temperature Max T-HS for heat generator HS1: Min. switch off point = Max T-HS – Max reduced
Dyn stage off	0.5K/min - 10K/min	2 - K/min	Load-sensitive, premature deactivation of the HS by the gradient of the temperature increase [K/min]. When the HS is operating without load, the gradient value is high. When the HS reaches or exceeds the gradient set here, the HS is switched off at the earliest dynamic switch off point (Max T-HS - Max reduced). If the temperature increase is less, the switch off point is increased linearly up to Max T-HS.
Boiler temp reduct	Off/On	Off	**Boiler temp reduct** (activation of the emergency cooling function for HS) **with Cool start t** (starting temperature for cooling) ***!*** Valid for the first boiler and the solid fuel boiler (multifunction relay or boiler 2) If the emergency cooling function for the heat generators is activated (Boiler temp reduct = On), then the heating circuits commence operation with Supply t max (provided emergency cooling is permitted in the heating circuit) as soon as the set temperature Cool start t is exceeded by one of the heat generators. The emergency cooling function terminates when the temperature drops below the starting temperature Cool start t by 5K.
Cool start t	30°C - -120°C	95°C	
Use the F button [Cancel] to exit the level			

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Switching pattern for 2-stage burners



A Boiler temperature
B Time
C Boiler temperature setting
D Boiler on-delay (blocking time 2. burner stage)
E Hysteresis (dynamic switching hysteresis)
F Hysteresis stage 2 (Hysteresis for shutdown)
a Stage 1 on
b Start of blocking time 2. Burner stage
c Stage 2 on (Stage 2 enable)
d Stage 2 off
e Stage 1 off (cancel Stage 2 enable)

! This switching patterns is also effective for operating two switching heat generators via the burner relays A6 and A7.

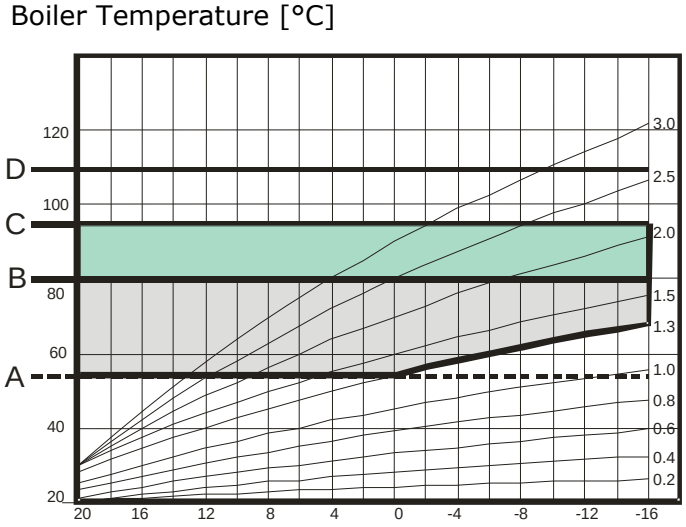
Switch on the 1st Burner stage when temperature drops below set temperature of the boiler.
Switch off the 1st Burner stage when the temperature setting is exceeded by the hysteresis.
Switch on the 2nd Burner stage
- after start of 1st Burner stage
- and temperature drops below set temperature by 5K (= Start of the Boiler on-delay)
- and expiry of the Boiler on-delay (= Release 2nd burner stage)

Switch off 2nd Burner stage when the temperature setting is exceeded by the hysteresis.
Switch 2nd Burner stage when temperature drops below set temperature of the heat generator.
Switch off the 1st Burner stage when 2nd stage enabled after temperature setting exceeded by the value [Hysteresis + Hysteresis stage 2]

Switching behaviour of the demand boiler with gradient method

Parameter Gradient = On => Premature deactivation (or deactivation in due time) of a heat generator (burnt out in the case of pellet)

A) Min T-HS = Minimum heat generator temperature => Switch off point to minimum temperature or calculated desired temperature (here according to heat slope 1,3)
B) [(Max T-HS) – (Max reduced)] = Earliest switch off point using gradient procedure; takes effect when heat consumption is low (rapid heat generator temperature increase)
C) Max T-HS = Latest switch off point using gradient procedure; takes effect when heat consumption is high (slow HS temperature increase)
D) Cool start t = When the HS reaches this temperature, the emergency cooling function via the consumer circuits is activated.



Heat slope diagram (setting aid)

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Expert Area—Set values for Cascade Control

Cascade Settings			
Designation	**Value range**	**Standard**	**Description**
Detected boilers	Display only		Display of heat generators automatically reported via BUS with bus ID (boiler no.). An "X" on the display indicates that a heat generator has responded on the BUS.
Output boiler stg	00 – 9950 kW	00 kW	Display of the HS number and the stage => Selection with Prog button => Input/Adjustment of HS output - - - - = Stage / HS not available 0 = Stage available and deactivated In the case of heat generators with the same output, a boiler release is sufficient; e.g.: HG 1 01 => 01 HG 1 02 => 01 HG 2 01 => 01 etc. (depending on the number of boilers) <u>Automatic Assignment:</u> After restarting or after a new configuration, the controller searches the bus systems for a heat generator. Within this time period (approx. 1 min) no manual output entries are allowed [Display "SCAN"]. In the case that a heat generator answers with output information, this output is automatically entered into the list. In the case that a heat generator answers without output information, 15kW is entered into the list. This value can then be adjusted manually.
BUS Scan	On/Off	Off	This function searches for heat generators on the BUS. If the displayed configuration is correct, it can be saved using the "Config OK" button. This procedure will overwrite all the current values.
Min Mod Cascade	00 – 100 %	00	If the cascade controller calculates an overall modulation rate greater than zero and less than "min Mod Cascade," the overall modulation rate is set to the value "min Mod Cascade." The Lock Time is simultaneously set to 10s.
NO. OF DHW BOILERS	01 - 08	00	00 = HW preparation via header 01 - 08 = Number of heat generators in the cascade which are coupled out of the cascade hydraulically for hot water preparation. ***!*** It is essential that the HW Modules are at the beginning of the BUS ID sequence => 01 - xx.
Control Deviation	[K]	Display	Display of the header control variance (set temperature – actual temperature).

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Expert Area—Set values for Cascade Control

Desired output	0-100 [%]	Display	Display of currently required total output % (0-100) => Calculated set value from control system = System load in per cent. The value is calculated, floating, and does not take any skips caused by the switching operation into account.
Switch Value	(-99) - 0 – (99)	Display	Internal control value => only for switching cascade! If this value reaches "0", the next heat generator is also connected (only after the delay time has elapsed). If the switching value reaches "-0", the last heat generator is switched off. If the desired temperature is exceeded by 1K, the last heat generator is also switched off.
Stage-on delay	Remaining [min]	Display	Display of current delay time. Only if "delay = 0" is it possible to operate the next heat generator.
Boilers t max	50°C – 110°C	90°C	Protects individual heat generators in the cascade from overheating / prevents triggering LIMITER (limiter value). This parameter is used to set a temperature at which the different heat generators switch themselves off, or - in the case of modulating heat generators - modulate themselves down. The heat generators are switched on again if they drop below this temperature by 5K ***!*** The Max T-HS temperature must be higher than the maximum collector temperature.
Stage-on dynamic	20 - 500 K	100 K	Small value = fast connection Large value = slow connection E Values set too low can lead to overheating or short-term connection of a heat generator. Calculation: If the cumulative system deviation in Kelvin reaches the set value A, this results in connection of all heat generator stages.
Stage-off dynamic	20 - 500 K	100 K	Small value = fast deactivation Large value = slow deactivation E Values set to high can lead to overheating and triggering the STB Calculation: If the cumulative system deviation in Kelvin reaches the set value A, this results in deactivation of all heat generators.
Integral time	5 - 500	50	E Control value: Changing this value can cause the control system to overshoot. The recommended default settings should be retained. ***!*** Small values cause the mixing valve to adjust quickly and can lead to oscillation.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Expert Area—Set values for cascade control

Mod% next boiler on	50% - 100%	80 %	If this modulation degree is exceeded the next heat generator in sequence is connected after the delay time elapses.
Modulation Min	10% - 60%	30 %	If values drop below this modulation degree the last heat generator of the current sequence is switched off.
Min mod boiler	0% - 60%	30 %	Connection of the next heat generator will only occur, if the resulting modulation degree for the different heat generators then exceeds the value set here. => For optimum operation with maximum number of burners: Set "Mod % next boiler on" = 0 and "Modulation Min" to the minimum modulation degree for heat generator stages.
Mod % DHW	40% - 100%	80 %	Entry of the set modulation degree for the heat generators in hot water operation (see NO. OF DHW BOILERS).
Blr sequ 1	-	1 2 3 4 5 6 7 8	Entry of the sequence in which the heat generators are set into operation in Blr sequ 1. F button [==>] Boiler number selection Input of the boiler number
Blr sequ 2	-	8 7 6 5 4 3 2 1	Entry of the sequence in which the heat generators are set into operation in Blr sequ 2. F button [==>] Boiler number selection Input of the boiler number **!** With respect to two-stage heat generators, the second stage is always switched after the first stage.
Sequ Change	Blr sequ 1, Blr sequ 2, Timed, Seq change, Rotating, Sorting	01	▶ Blr sequ 1 only ▶ Blr sequ 2 only ▶ Timed: Change between Blr sequ 1 and 2 according to operating hours of the first heat generator of the active sequence. ▶ Seq change: Conversion for heat generator with a different nominal output: When the second boiler is switched on, the first boiler will be put out of operation until activated again. ▶ Rotating: The first boiler of the sequence is placed in last position of the current sequence after the sequence switching time has elapsed. ▶ Sorting: New boiler sequence by means of automatic sorting according to operating hours in the event of sequence change (sequence change according to operating hours of the first heat generator of the active sequence).

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Time to seq change	0 - 800 hours	0 hours	For operation with at least 2 heat generators there is the option to swap the boiler sequence after the operating hours specified here of the first heat generator of the active sequence. 00 = no HS Sequence
Boiler on-delay	00 min – 30 min	00 min	Min. delay time after switching on or with switching HS, also when switching a layer off until switching the next layer on. ***!*** 00 = 10 sec; For correct settings, also ensure the internal Boiler on-delay for the closed burner control. **.*) These parameters can be additionally set in the menu Heat generator adjustable**
Use the F button [Cancel] to exit the level			

Settings for one stage modulating boilers

Modulation			
Designation	**Value range**	**Standard**	**Description**
Min mod boiler	00 – 100%	00	If the controller calculates an overall modulation rate greater than zero and less than "Min mod boiler," the overall modulation rate is set to the value "Min mod boiler." The Boiler on-delay is simultaneously set to 10s.
Stage-on dynamic	20 – 500 K	100 K	Small value = fast high-modulate Large value = slow high-modulate ⚠ Values set too low can lead to overheating of the HS and triggering the STB. Calculation: If the cumulative system deviation in Kelvin reaches the set value A, the effect this is the modulation of 100%
Stage-off dynamic	20 – 500 K	100 K	Small value = fast deactivation Large value = slow deactivation ⚠ Values set to high can lead to overheating of the HS and triggering the STB Calculation: Reaches the summed rule difference in Kelvin the adjusted value, thus this causes the disconnection of all HS.
Use the F button [Cancel] to exit the level			

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Expert Area—Set values for buffer storage

Buffer			
Designation	**Value range**	**Standard**	**Description**
Buffer loading t	40°C – 90°C / OFF/Requirement	Requirement	Temperature to which the buffer storage must be charged at the sensor "sensor middle". Sensor "buffer top" = Terminal 6 operates on "HS Off". Parameter value = OFF: In this setting the buffer will not load by the conventional heat generator. The feeler "Buffer M " is not used. The use occurs, e.g., through MF functions like [return flow temperature increase] or [transfer pump for buffer storage]. Parameter value = Requirement: The requirement (e.g. heat slope) derived from max. value formation + 5K hysteresis operates on sensor "buffer middle". Parameter value >= 40°C <=90°C: The set value + 5K hysteresis operates on sensor "buffer top".
Buffer min t	10°C – 90°C	10°C	When this function is active, the "buffer upper" sensor limits the heat emission for the heating circuits in the range below the minimum buffer temperature. The heating circuit pumps are switched Off. Switching off the heating circuits only occurs if: Outside temperature > frost protection temperature.
Use the F button [Cancel] to exit the level			

Set values for cooling mode

(Only when HS type = cooling is selected)

If a refrigerating machine is present, cooling mode can be activated using the operating mode selector switch. The refrigerating machines are regulated to the return flow temperature [Des return t cool] (switching hysteresis 2K).

Cooling operation			
Designation	**Value range**	**Standard**	**Description**
Des return t cool	5°C – 25°C	15°C	In Cooling operating mode, the refrigeration machine is switched on when the temperature set here is exceeded in the return flow at the sensor [F17]. The refrigeration machine is switched off when the temperature at [F17] drops below this temperature [Des return t cool – 2K].
Use the F button [Cancel] to exit the level			

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Expert Area—Set values for 0-10V Input/Output

If the controller assigns the HS with the set temperature through a voltage input, the 0-10V output on the controller can be adjusted using the following parameters on the voltage input of the HS.

If the 0-10V input of the controller is used for a temperature requirement, the evaluation of the current signal is defined using the same parameters.

Important set values for 0-10V I/O
Configuration/BUS BOILER 1 = 04 => Output of the temperature setting of the heat generator via the 0-10V output signal.

Configuration/BUS BOILER 1 = 05 => Output of the set modulation depth via the 0-10V output signal.

Configuration / F15 Function = 01 => Evaluation of the preset external header temperature setting via the 0-10V output signal.

Configuration/F15 function = 03 => Evaluation of the preset external modulation depth via the 0..10V input.

0-10V I/O			
Designation	**Value range**	**Standard**	**IV**
V-CURVE	00 - 11	00	
CURVE 11-U1	0.00V – 10.00V	4.00	
CURVE 11-U2	0,00V – 10.00V	0,10	
CURVE 11-T1	00°C - 120°C	20	
CURVE 11-T2	00°C - 120°C	90	
Curve 11-UO	0.00V – 10.00V	5.00	
Use the F button [Cancel] to exit the level			

Table of voltage curves that can be chosen

No.	U1	U2	T1	T2	UA
0	2.0	10.0	0	90	2.0
1	2.5	0.3	38	80	5.0
2	2.5	0.3	38	75	5.0
3	2.5	0.3	38	45	5.0
4	4.0	0.1	20	85	5.0
5	4.0	0.1	20	75	5.0
6	4.0	0.1	20	55	5.0
7	4.0	0.1	30	87	5.0
8	4.0	0.1	38	87	5.0
9	4.0	0.1	38	73	5.0
10	4.0	0.1	38	53	5.0
11	4.0	0.1	20	90	5.0

V-Curve (only for 0-10V input/output)
One of the defined voltage curves or free-definition curve 11 can be selected here for configuring the voltage input and the voltage output.

Curve 11-xx (only when V-Curve = 11)
Using parameters U1, U2, T1, T2 and UA, a special voltage curve can be defined.

U = Voltage, T = Temperature, UA = HS OFF

U1, T1 => Point 1 on the voltage curve
U2, T2 => Point 2 on the voltage curve

The line between these limit points defines the voltage curve.

UA => Starting with this voltage, HS = OFF
(UA must lie outside of the valid voltage values)

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Set values for slab curing program

Slab curing		
Designation	**Value range**	**Standard**
Slab curing	Off/On	Off
Slab curing prog	See explanation!	
Use the F button [Cancel] to exit the level		

Preset values

Day	T-Flow	Own settings
1	25	
2	25	
3	25	
4	55	
5	55	
6	55	
7	55	
8	25	
9	40	
10	55	
11	55	
12	55	
13	55	
14	55	
15	55	
16	55	
17	55	
18	55	
19	55	
20	40	
21	25	
23	--	
24	--	
25	--	
26	--	
27	--	
28	--	

! Start day is not included:
The Slab curing prog starts with the "Day 1" temperature setting and switches to "Day 1" at 00.00 hrs and then to the next day at 00.00 hrs and so on. The current day is marked with an "x" in the "Slab curing prog".

! After the function has been cancelled/ terminated the controller continues heating using the set operating mode. If no heating is required, set the operating mode to i = Standby / OFF.

Slab curing (activation of Slab curing drying process)
The Slab curing prog can be used for function heating in accordance with DIN 4725 – 4 and for heating freshly laid screed ready for flooring.

! Screed drying can only be carried out for mixing valve circuits.

After starting, the program runs through the set flow temperatures. The integrated mixing valve circuits control to the set flow temperature. The boiler provides this temperature irrespective of the operating mode that has been selected. This is marked in the standard display by the entry "SLAB CURING" and a display of the current flow temperature.

The freely adjustable program runs for a maximum of 28 days. The flow temperatures can be set to a value of between 10°C and 60°C for each day. The entry "----" stops the program (also during operation for the following day).

Slab curing prog (settings)
F button => Slab curing prog
⊙ Select day => Temperature is displayed
F button [OK] => Activate the day for the adjustment
⊙ Set the flow temperature;
F button [OK] => Save setting
⊙ => Select Next Day or exit the Slab curing prog using the F button [Cancel].

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

DHW Information

DHW			
Designation	**Value range**	**Standard**	**Description**
DHW-pump func	Off/On	On	The charging pump is not switched until the boiler temperature exceeds the storage tank temperature by 5K. It is switched off when the boiler temperature drops below the storage tank temperature. This prevents the storage tank from being cooled by the boiler when hot water preparation starts.
Parallel DHW	Partial prior, On, Off, Parallel all	Partial prior	Partial prior => Partial priority HW: The heating circuits are blocked during hot water preparation. The mixing valves close and the heating circuit pumps switch off. The mixing valve circuits are enabled again when the boiler has reached the temperature of hot water temperature setting + boiler superheating [ACTUAL DHW TEMP + BOILER T DHW]. If the boiler temperature drops below the enable temperature by the switching hysteresis [Hysteresis DHW] again, the mixing valve circuits are blocked again. On => Pump parallel running: Only the direct heating circuits are blocked during hot water preparation. The mixing valve circuits continue to be heated. The hot water preparation is extended by this function. Off => Warm water priority operation: The heating circuits are blocked during hot water preparation. The mixing valves close and the heating circuit pumps switch off. Parallel all => Pump parallel running also for the direct heating circuit: During hot water preparation all heater circuits continue to be heated. The hot water preparation is extended by this function. When the boiler temperature exceeds the maximum flow temperature of the direct heating circuit by 8K, the heating circuit pump for this circuit is switched off (overheating protection). The heating circuit pump is switched on again when the boiler temperature drops below the temperature [maximum flow temperature + 5K].
BOILER T DHW	00K – 50K	20K	Heat generator setting with hot water preparation = hot water temperature setting + BOILER T DHW ***!*** The boiler must be run at a higher temperature during hot water preparation so that the hot water temperature in the storage tank can be reached via the heat exchanger.

Expert Area

Hysteresis DHW	5K – 30K	5 K	Hot water preparation is started when the temperature of the hot water storage tank drops below the temperature setting by the hysteresis [Hysteresis DHW]. The hot water preparation stops when the storage tank reaches the temperature setting (the temperature setting is set to 65°C during hot water short time heating operation).
DHW off-delay	00 min – 30 min	00 min	00 min => Standard function: The charging pump continues to run for 5 minutes after the burner has switched off. If heat is requested by a heating circuit the run-down is cancelled. The charge pump blocking kicks in and can also cause the run-down function to be cancelled.
Thermostat input	Off/On	Off	00 => Hot water preparation via storage tank sensor 01 => Hot water preparation via thermostat: The hot water preparation is started by a short circuit at the storage tank sensor connecting terminals. It stops when the short circuit is removed.
Funct wall boiler	Off/On	Off	Boiler temperature setting with hot water preparation = hot water actual temperature + BOILER T DHW With this function the exhaust gas losses occurring during hot water preparation can be reduced with modulating heat generator using the adapted boiler temperature setting.
Load Through	Off/On	Off	(only with F12 = DWH TANK LOWER T) The charge through function can be activated by connecting a hot water storage tank bottom sensor. ACTUAL DHW TEMP = Temperature of hot water tank in removal area Storage tank charging: ON: ACTUAL DHW TEMP < T-DHW Rated - Hysteresis DHW OFF: DWH TANK LOWER T > T-DHW Rated The charging process of the storage tank only terminates when the lower storage tank set temperature has been reached.
Use the F button [Cancel] to exit the level			

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Heating circuit 1/2 Information

The parameters in this level change in accordance with the heating circuit function that has been selected [HC FUNCTION]

Heating circuit 1 / 2			
Designation	**Value range**	**Standard**	**Description**
HC Function	Standard, Const supply, Pool, HW, Back	Standard	Standard =>favourite heating circuit Const supply => Control for fixed flow temperatures During the heating periods (see heating program) the heating circuit is operated with a fixed preset flow temperature [T-Flow Day], and during reduced mode operation with a fixed preset flow temperature [T-Flow Night] accordingly. <u>Pool => Pool control (only Heating circuit 2)</u> This function can be used to heat a swimming pool. The mixing valve controls the flow temperature for the swimming pool heat exchanger. The swimming pool water temperature sensor is connected to the room sensor [F15] for the heating circuit (see FBR). The flow temperature control operates like normal room control [Room Influence]. The set value for the water temperature can be entered in the user area of the associated heating circuit level [Pool t 1/2/3]. The heating program operates. No heating takes place during the reduction period The water temperature and the current set value are displayed in the display level [Pool t / T-Pool Desired]. <u>HW => Hot water circuit</u> This function can be used to operate additional hot water circuits. The heating circuit flow sensor is located in the hot water storage tank. The hot water temperature set value can be entered in the user area of the associated heating circuit level [ACTUAL DHW TEMP 1/2/3]. The heating program for the heating circuit acts as an enable program for the storage tank. The storage tank set value is set to 10°C during the reduction period. The boiler controller hot water priority function can be used (partial priority acts like priority). <u>Return flow => Return flow temperature increase via mixing valve (Heating circuit 2 only)</u> The heating circuit flow sensor is used as a boiler return flow sensor. The mixing valve controls to the heating circuit set value for 24 hours [Minimum supply t]. **Installation tip:** Dt MV open => boiler flow is fed into the return (=> return flow temperature increase) dt MV close => heating circuit return is passed through. When the mixing valve is open it must be ensured that there is circulation through the boiler (boiler pump).

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Heating circuit 1 / 2 Information

HC pump mode	Standard, Temp limits, Only timeprog, Continuous	Standard	The circulation pumps are switched off if heating is not required. The mixing valve motors are closed at the same time => "The heating circuit is switched off". (Switch on with 1K hysteresis) <u>Standard => Standard circulation pump control</u> ▶ Room temperature-dependent control OFF: Room temperature > room set value + 1K ▶ Weather-dependent control during heating operation OFF: Outside temperature > room set value ▶ Weather-dependent control during reduction operation (Room Influence =0) OFF: The switch-off occurs during the transition to reduction operation. The pump runs continuously after being switched on. ON: Room temperature < room set value (Room Influence = "--") OFF: Flow temperature setting < 20°C. <u>Temp limits => Pump switching in accordance with Temp limits</u> ▶ Heating time OFF: Outside temperature < set heating limit day ▶ Reduction period OFF: Outside temperature < set heating limit night <u>Only timeprog => Pump switching as per heating program</u> Heating time: Pump is ON; Heating circuit is enabled Reduction period: Pump is OFF; Heating circuit is blocked <u>Continuous</u> The pump runs continuously for 24 hours! The heating circuit is permanently enabled.
Dt MV open (not for HW circuit)	5-25	18	Speed setting at which the mixing valve opens when a control difference occurs. The control difference at which the mixing valve opens without interruption is entered in Kelvin. ***!*** Small values cause the mixing valve to adjust quickly and can lead to oscillation.
Dt MV close (not for HW circuit)	5-25	12	Speed setting at which the mixing valve closes when a control difference occurs. The control difference at which the mixing valve closes without interruption is entered in Kelvin. ***!*** Small values cause the mixing valve to adjust quickly and can lead to oscillation.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Expert Area

Heating circuit 1 / 2 Information

Supply t max	20°C - 110°C	80°C	The measured temperature setting for the heating circuit flow is limited to the maximum flow temperature setting (overheating protection). ⚠ The heating circuit pump of the direct heating circuit is not switched off until the boiler temperature exceeds the set maximum flow temperature by 8K. The heating circuit pump is already switched on again when the boiler temperature drops below the temperature [maximum flow temperature + 5K].
Minimum supply t	10°C - 110°C	10°C	The measured temperature setting of the heating circuit flow is increased to the minimum flow temperature setting (e.g. with air heating).
Des supply t cool	OFF, CLOSE, 10°C – 25°C	15°C	In the Cooling operating mode, this temperature is adjusted via the mixing valve in the heating circuit flow. OFF = Heating circuit is not cooled (Mixing valve Close, Pump Off) CLOSE = Mixing valve as bypass valve (Mixing valve Close, Pump On)
Frost prot. t	----; (-15)°C – (5)°C	0°C	If the outside temperature drops below the programmed value, the system switches to frost protection mode (pumps are switched on). "----" Frost protection mode is deactivated!
Outdoor t damped	0:00 – 24:00	0:00	The selected outside temperature delay must be matched to the type of construction of the building. In the case of heavy structures (thick walls), a long delay must be selected since a change in outside temperature affects the room temperature later accordingly. With light structures (walls have no storage effect) the delay should be set (0 hrs.).
Curve Diff	0K – 50K	5 K	The boiler temperature that is required for a mixing valve circuit is calculated by adding the calculated temperature setting for the heating circuit flow to the heating curve distance. The heating curve distance compensates for sensor tolerances and heat loss up to the mixing valve.
Load force	Off/On	On	On => The heating circuit can be used by higher-order functions (e.g. emergency cooling function of a heat generator to protect from overheating; heat removal during service mode) as a heat sink/consumer. The heating circuit is heated at the maximum flow temperature setting for the duration of the function.
Use the F button [Cancel] to exit the level			

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

General function description and settings

General Information

Heating circuit control

Weather-dependent control
The boiler or flow temperature is determined via the set heat slope to suit the measured outside temperature in such a way that the set value for the room is approximately set if the heating system is configured correctly.
=> Exact setting of the heat slope is extremely important for weather-dependent control.
The circulation pump is controlled weather-dependently. The circulation pump is switched on if there is a heating demand and in Frost-protection mode.

Room sensor influence
The current room temperature can be included in computation of the required flow temperature via a present room temperature sensor.
The influence factor (parameter list) can be set between 0 (fully weather-dependent regulation) and 20 (room temperature regulation with minimal outdoor temperature influence). Position "----"
deactivates room temperature control. Positions "----" and "0" indicate differences for demand-dependent circulation pump control.

Hot water generation

Hot water generation
The programmed hot water temperature is stabilised by switching the hot-water storage charging pump and the burner. Storage tank charging starts when the storage tank temperature drops below the temperature setting by 5K. Storage tank charging stops when the temperature setting is reached.

BoB => operation without burner

For operation with solar energy for instance. In this operating mode the burner is only enabled when values drop below the set tolerance limit.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

General function description and settings

General Information

Frost protection function

The frost protection circuit prevents the heating system from freezing by automatically switching heating operation on.

Outdoor sensor frost protection
If the measured outside temperature drops below the set frost protection temperature the room temperature setting is set to 5°C for the relevant heating circuit. The heating circuit is enabled:

- ▶ the pumps are switched on
- ▶ the heat request is sent to the boiler

"----" => outdoor sensor frost protection deactivated
The function stops when the outside temperature increases to 1K above the frost protection temperature setting.

Boiler frost protection
The boiler frost protection is activated when the boiler temperature drops below 5°C. The boiler is switched on until the boiler temperature exceeds the "Boiler 1 t min".

Flow or storage tank sensor frost protection
The sensor frost protection is activated when the flow or storage tank temperature drops below 7°C. Only the relevant pump is switched on.

The sensor frost protection is deactivated when the flow or storage tank temperature increases to above 9°C.

Frost protection via room sensor
If the room temperature drops below 5°C the frost protection function is activated.
The room temperature setting for the relevant heating circuit is set to 5°C. The heating circuit is enabled:

- ▶ the pumps are switched on
- ▶ the heat request is sent to the boiler

eBUS burner controls

The controller supports the operation of burner controls via the implemented eBUS. The unit is connected by means of the Terminals (FA eBUS).

Heat request: Controller => Burner / FA
05h07h [in data byte 7 = Process water desired value the burner must not interpret bit 7] additionally

Data/Status: Burner/FA => Controller

05h03h

Requirements for operation:

The burner control unit (FA) must transmit a valid eBUS message.
The eBUS supply must be activated if the burner does not also supply the BUS => Expert level / System (tap without information => Test function with and without eBUS supply)

EEPROM check

Every 10 minutes, a check is conducted automatically in order to establish whether the settings of the controller lie within the specified limits. If a value is found to be out-of-range, it is substituted by the related default value. The range transgression is indicated the Fault number 81.

In this case, the user should check the important settings of the controller. The error message goes out after the unit is restarted (RESET).

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

General function description and settings

General Information

Circulation pump control

Switched according to heating requirement

Demand-dependent circulation pump control (automatic summertime switchover) switches the circulation pumps off if there is no heating demand. The mixing valves are closed at the same time.

Conditions for switch-off:

Room temperature-dependent control
The room temperature exceeds the set desired temperature.

Weather-dependent control
Outside temperature exceeds room temperature set value or flow temperature set value drops below 20°C.

! If the room temperature factor is "0", the pump continues to run during the reduced operation period after a one-off heating demand.

Switched according to temp limits

If the outside temperature that is measured and calculated by the controller exceeds the heating limit specified here, heating is disabled, the pumps switch off and the mixing valve valves are closed. The heating is enabled again when the outside temperature drops below the set heating limit by 1K (= 1°C).

Day temp limit => applies during heating times
Night temp limit => applies during reduction times

Delayed pump switch-off

In the case of switch-off of the circulation pumps, the circulation pumps are not switched off until 5 minutes later if one of the burners was on during the last 5 minutes before the switch-off instant.

Pump blocking protection

The controller effectively prevents the pumps blocking following longer periods out of operation. The integrated protection function switches on all pumps which have not been in operation during the past 24 hours for 5 seconds at 12.00 hours every day.

Mixing valve motor blocking protection

If the mixing valve has not moved for 24 hours it is fully
opened at approximately 03:00 hrs. (once only). The heating circuit pump is switched off during this time.

The maximum flow temperature is monitored. Cancelled at maximum flow temperature – 5K.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

General function description and settings

General Information

Cooling operation

If a refrigerating machine is present, cooling mode can be activated using the operating mode selector switch. => Hot water loading is only possible by means of the conventional heat generators.

If a bypass valve for cooling operation (MF) is activated, the bypass valve is switched in the Cooling operational mode.

The refrigerating machines and associated HS pumps are switched on when required by the heating circuits until the return flow temperature has fallen below the desired temperature [Des return t cool]. The switching hysteresis is 2K.

Des supply t cool (only in installation cooling mode)
In the Cooling operating mode, this temperature is adjusted via the mixing valve in the heating circuit flow.
OFF = Heating circuit is not cooled (Mixing valve Valve Closed, Pump Off)
CLOSE = Mixing valve valve as bypass valve (Mixing valve Valve Closed, Pump On)

The heating circuits reverse the adjustment of the mixing valve. When enabled, the mixing valve
controls the temperature to the temperature [Des supply t cool] (see description of parameters).
The pumps are switched according to the parameters set for heating operation. With room control, regulation occurs according to the temperature [Room t cool].

Weather-dependent cooling:
Cooling mode is enabled when the set outside temperature [Min TO cooling] is exceeded. Cooling operation is set again 1K below the limit temperature.

Room temperature-dependent cooling:
Cooling operation (heating circuit enabling) is enabled when the temperature [Room t cool] is exceeded. Cooling operation ends 2K below the set temperature.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Section 8.0

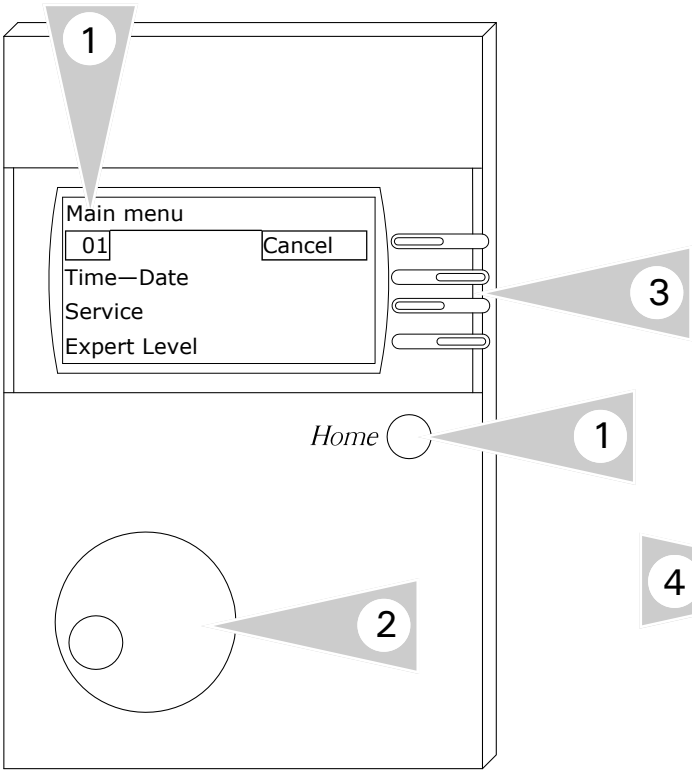
Section 8.1

Section 8.2

Section 8.3

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Relay status and test

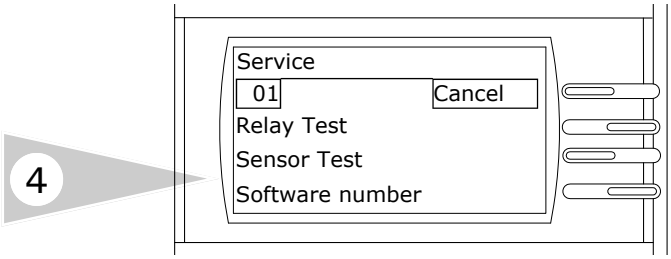


Viewing Information

Note: Temperatures and status information is based on system selection and installed accessories.

1. Press the Home button to display ***Main Menu***

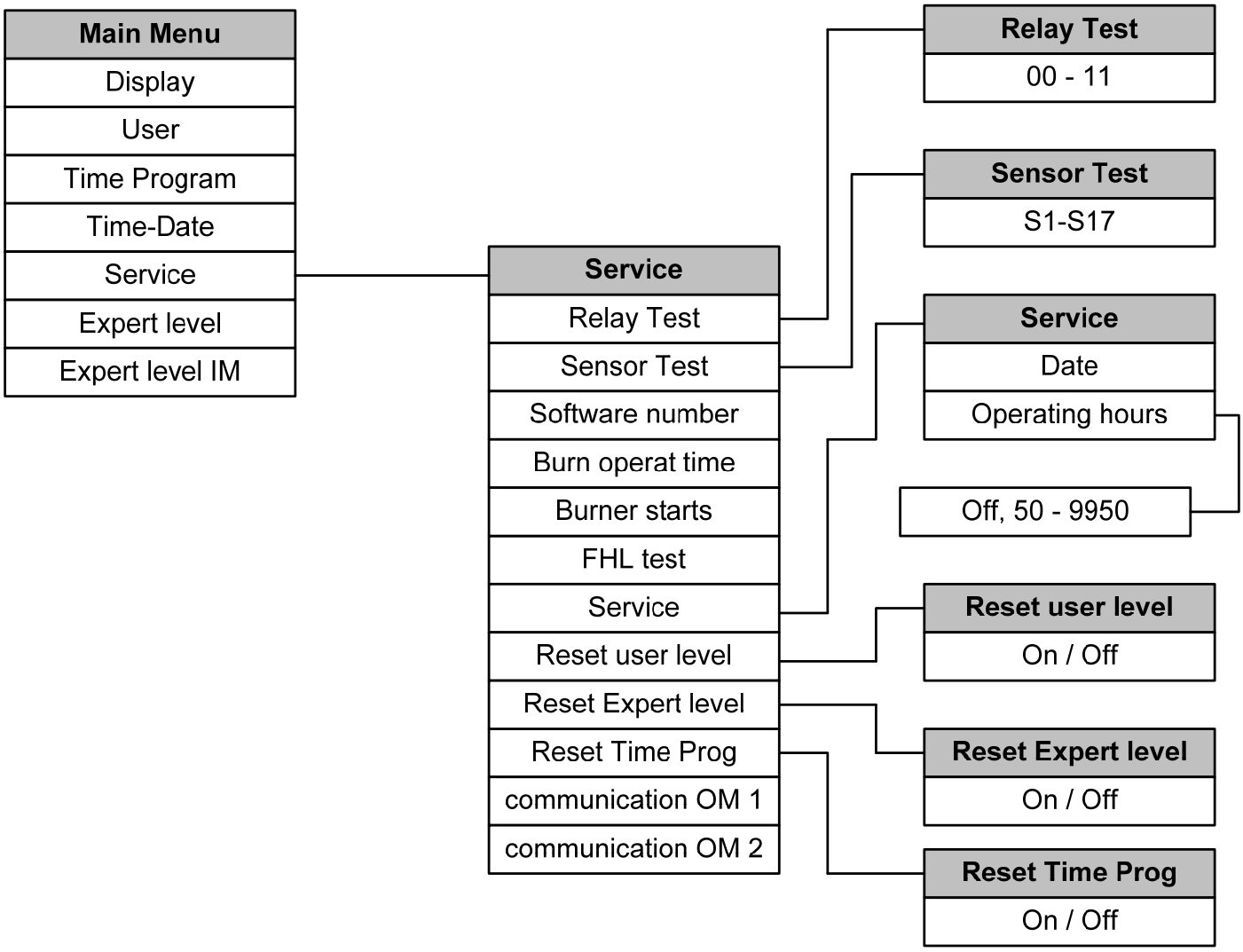
2. Use rotary dial and ensure ***Service*** is viewed in the screen.
3. Press the adjacent key beside the word User to select menu option.



4. When in the service mode, select any of the various circuits to view tests/information.
5. When current level is no longer required, pressing the ***Cancel*** button will exit from current screen.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Relay Status and Test Menu Structure Overview



KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Relay status and test

This area contains values for the customer service engineers in order to provide rapid access.

User the F button to select a level (e.g. Relay

#	Description
00	Normal mode => Relay after control
01	A1: Pump, Heating circuit 1
02	A2: Pump, Heating circuit 2
03	A3: Hot water charging pump
04	A4: Dt MV open, Heating circuit 2
05	A5: Dt MV close, Heating circuit 2
06	A6: HS 1 On
07	A7: HS 2 On [2-stage:HS 1+2 (after 10s) ON]
08	A8: Dt MV open Heating circuit 1 / Multi-function 1
09	A9: Dt MV close Heating circuit 1 / Multi-function 2
10	A10: Multifunction 3
11	A12: Collector pump / Multifunction 4

Relay test

Use the shaft encoder to select the relay (01-11) => The selected relay is switched on. All other relays are switched off.

Exception: Burner 2; the burner stage 1 remains switched on here, since otherwise the second burner stage cannot be activated

! A code number must be entered for this function.

Code-No Entry

1.Set number
F button [==>] next number
2.Set number
F button [==>] next number
3.Set number
F button [==>] next number
4.Set number
Use the F button [OK] to activate the Code-No
=> "Relay Test"

⚠ The relay test is automatically cancelled after 5 minutes without an operation.

Sensor test

Sensor	Description
Sensor 01	Buffer storage temperature Lower
Sensor 02	Buffer storage temperature middle or room temperature Heating circuit 1
Sensor 03	Upper buffer storage temperature
Sensor 05	Flow temperature, Heating circuit 2
Sensor 06	Upper hot water temperature
Sensor 08	Heat generator / header temperature
Sensor 09	Outside temperature
Sensor 11	Flow temperature Heating circuit 1 temperature multifunction 1
Sensor 12	Hot water temperature lower or temperature multifunction 2
Sensor 13	Solid fuel HS temperature or collector 2 or temperature multifunction 3
Sensor 14	Collector 1 temperature or temperature 4
Sensor 15 Light 0-10V	Room temperature Heating circuit 2 or measured value of the light sensor or voltage value 0-10V input
Sensor 17	Return flow temperature of whole heating system for cooling operation

Use the F button to start the sensor test with, use ⟲ to select the sensor => temperature is displayed; use the F button [Cancel] to end the sensor test

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Sensor values / characteristic curve

Temperature		5Kohm NTC	1Kohm PTC	PT1000
-60°C	-76°F	698961 Ω	470 Ω	
-50°C	-58°F	333908 Ω	520 Ω	
-40°C	-40°F	167835 Ω	573 Ω	
-30°C	-22°F	88340 Ω	630 Ω	
-20°C	-4°F	48487 Ω	690 Ω	922 Ω
-10°C	14°F	27648 Ω	755 Ω	961 Ω
0°C	32°F	16325 Ω	823 Ω	1000 Ω
10°C	50°F	9952 Ω	895 Ω	1039 Ω
20°C	68°F	6247 Ω	971 Ω	1078 Ω
25°C	77°F	5000 Ω	1010 Ω	
30°C	86°F	4028 Ω	1050 Ω	1118 Ω
40°C	104°F	2662 Ω	1134 Ω	1155 Ω
50°C	122°F	1801 Ω	1221 Ω	1194 Ω
60°C	140°F	1244 Ω	1312 Ω	1232 Ω
70°C	158°F	876 Ω	1406 Ω	1270 Ω
80°C	176°F	628 Ω	1505 Ω	1309 Ω
90°C	194°F	458 Ω	1607 Ω	1347 Ω
100°C	212°F	339 Ω	1713 Ω	1385 Ω
110°C	230°F	255 Ω	1823 Ω	1422 Ω
120°C	248°F	194 Ω	1936 Ω	1460 Ω

As-delivered condition = 5KOhm NTC sensor. The start-up level for setting the installed sensors appears once after switching on the power supply and switching into operating mode. It can be reactivated again by briefly switching the supply voltage off.

! Due to the tolerances of sensors, deviations of +/- 2K (2°C) are normal between various temperature displays. Temperatures which change rapidly can have higher deviations for short periods due to the different time-related behaviour of various sensors.

Exceptions:

- The sensor inputs F13 + F14 must always be operated using a PT1000 sensor.
- Connecting an analogue remote control FBR is detected automatically. Thus, the previous and the new version can be connected to the controller.
- The controller provides the option of performing a room temperature guided control through the connection of a room sensor to the FBR terminals 1 and 2. In this case, only a 5KOhm NTC sensor can be used.

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Reset Information

Other entries (Service area) Use ⟳ to select a value	
Software number XXX.XX	Software number with index
Manual Sequence (1-8; only with code no.)	Starting different burner stages of the cascade
Burn operat time	Burner time for all stages
Burner starts	Burner starts for all stages
FHL test	Safety temperature limiter test with heat generator temperature display =>Start with F button (hold down)!
Service (only with code no.)	Input of date or hours for service messages
Reset user level	Load user parameter factory settings
Reset Expert level (only with code number)	Load expert parameter factory settings
Reset Time Prog	Load time program factory settings
Communication OM 1	Remote control HC1 on BUS
Communication OM 2	Remote control HC2 on BUS
Use the F button [Cancel] to exit the level	

Software number XXX.XX

Display software number with index (please specify if you experience problems / have questions about the controller)

Manual Sequence (only with code number)

(only for cascades in "Service" operation mode)
Use F button to open level and search using. ⟳
After selecting the heat generator with the F button, an output can be selected for this boiler.
With respect to multi-stage heat generators, the second stage can be activated by means of presetting an output value > 50%. After closing the service functions the entries are reset automatically.

Burn operat time and Burner starts

For example, select "Burn operat time" (F button).

=> Shows the current values (⟳)
Reset display: Use the F button to select the boiler and the level. Use the F button to "Reset"
Use the F button [Cancel]=> to exit the level

FHL test

Start the FHL test (F button). Use ⟳ to search for the boiler. Use the F button to select the boiler
=> Display heat generator temperature.
Press and hold the "Start" button until the STL is activated:
Burner I ON all pumps OFF and all mixing valves CLOSED

The temperature can be observed in the display.

Service

By date

Activation by entering date for the yearly service message.
Delete programmed annual message:
Set the value date => year to "Off" (< 01) in the General/Service/Customer Service level.

After operating hours

Activation by entering operating hours of the installation after which a service message should be put out.
Delete programmed message:
Set the value Operating hours to "Off" (< 50) in the General/Service/Customer Service level.

Delete the displayed maintenance message

Press the F button, use ⟳ to set the repeat value to "00", confirm with F button [OK].

Reset …

The three value groups can be reset to the factory setting using the Reset function.
Use the F button to select the Reset function, use ⟳ to set it to "On" and use the [OK] button to load the standard values. Use the F button [Cancel] to exit the level (or Home button).

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Appendix

Troubleshooting—Error Messages

Fault	Fault description
Communication error	
E 90	Adr. 0 and 1 on bus. Bus IDs 0 and 1 may not be used simultaneously.
E 91	Bus ID used. The set bus ID is already in use by another device.
E 200	Communication error HS1
E 201	Communication error HS2
E 202	Communication error HS3
E 203	Communication error HS4
E 204	Communication error HS5
E 205	Communication error HS6
E 206	Communication error HS7
E 207	Communication error HS8
Internal error	
E 81	EEPROM error. The invalid value has been replaced with the default value E Check parameter values!
Sensor defective (break/short circuit)	
E 69	F5: Flow sensor HC2
E 70	F11: Flow sensor HC1, sensor Multifunction1
E 71	F1: Buffer storage tank bottom sensor
E 72	F3: Buffer storage tank top sensor
E 75	F9: Outdoor sensor
E 76	F6: Storage tank sensor
E 78	F8: Boiler sensor / Collector sensor (cascade)
E 80	Room sensor HC1, F2: Buffer middle sensor
E 83	Room sensor HC2, F15: Pool sensor (Storage tank 3)
E 135	F12: HW Storage tank bottom sensor, Multifunction 2
E 136	F13 (PT1000): HS2, Collector2, Multifunction 3
E 137	F14 (PT1000): Collector 1, Multifunction 4

When an error occurs in the heating system, the associated error number appears in the controller's display. Please refer to the table below for the significance of the displayed error code.
The system must be restarted after a fault has been remedied => RESET.

RESET : Brief device shut-off (mains switch). Controller restarts, reconfigures itself and continues to operate with the values that have already been set.

RESET the set values:
The overwriting of the set values with standard values can be performed separately in the "Service level" for the "User" and "Expert level " parameters and the "Time Programs".

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Appendix

Trouble shooting

General

If your system malfunctions you should first check that the controller and the control components are correctly wired.

Sensors:
All sensors can be checked in the "General/ Service/Sensor test" level. All the sensors that are connected must appear in this level with plausible measurements.

Actuators (Mixing valve motor, pumps=>only with code no.):
All actuators can be checked in the "General/ Service/Relay test" level. All relays can be individually switched using this level. This makes it easy to check whether these components have been correctly connected (e.g. mixing valve motor direction of rotation).

BUS connection:
<u>In control units with connection to</u>
Mixing valve => Communication symbol appears in standard display (" ⇔ " or " ⇔ " depending on version) or at "Service / Communic MM 1"
HS controller => Displays the outside and the HS temperature (see "Display/Installation")

<u>In HS controller with connection to</u>
Control unit => Room temperature displayed and current room temperature setting blanked out "----" (see "Display/heating circuit")

<u>In mixing valve expansion controllers with connection to</u>
HS controller => Displays the outside and the HS temperature (see "Display/Installation")
Control unit => Room temperature displayed and current room temperature setting blanked out "----" (see "Display/heating circuit")

In case of communication problems

Check connecting cables: Bus lines and sensor lines must be laid separately, away from mains cables! Poles switches?
Check bus feed: There must be at least 8V DC between the "+" and "-" terminals of the BUS connector [connectors 18+19]. If you measure a lower voltage, an external power supply must be installed.

Pumps do not switch off

Check pump switching => Type of pump switching in the Expert level heating circuit

Pumps do not switch off

Check operating mode => Standard ◴ (test ✳)
Check time and heating program => Heating time
Check pump switching mode:
Default => Outside temperature > Room set temperature?
Temp limits => Outside temperature > Valid heating limit?
Room control => Room temperature > Temperature setting + 1K

Appendix

Trouble shooting

Pumps do not switch off

Check operating mode => Standard ⏲ (test ✳)
Check time and heating program => Heating time

Check pump switching mode:
Default =>Outside temperature > Room set temperature?

Temp limits => Outside temperature >
Valid heating limit?

Room control => Room temperature >
Temperature setting + 1K

Burner does not switch off at correct time

Check minimum boiler temperature and type of minimum delimiter => Protect from corrosion

Burner will not switch on

Check HS set temperature => The set temperature must be greater than the HS temperature.
Check operating mode => Standard ⏲ (test ✳)
With solar: Check burner blocking (BOB)

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Appendix

Technical data

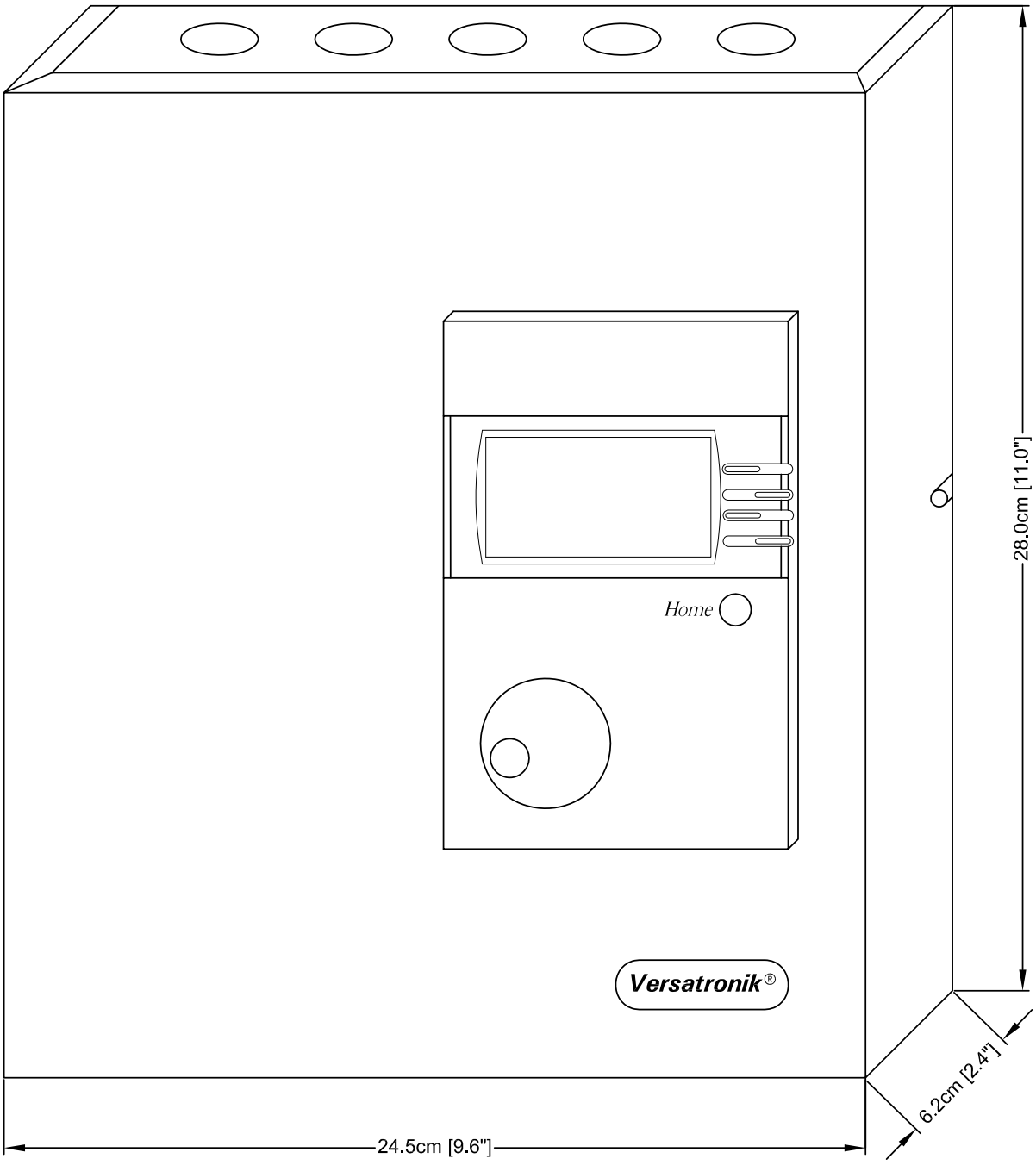
Supply voltage	120VAC
Power consumption	0.4A (no loads)
Switching capacity of the relays	120VAC, 4A
Maximum current on terminal L1'	6,3 A
Permitted ambient temperature during operation	0 to 50°C
Permitted room temperature during storage	-20 to 60°C
Sensor resistances Tolerance in ohms Temperature tolerance Tolerance in ohms Temperature tolerance Tolerance in ohms	NTC 5 kW (AF,KF,SPF,VF) ± -1% at 25°C +/- 0.2K at 25°C PTC 1010W (AFS,KFS,SPFS,VFAS) ± -1% at 25°C +/- 1.3K at 25°C PT1000 sensor with 1 kW +/- 0,2% at 0 °C

KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Appendix

Technical data

Front Dimensions

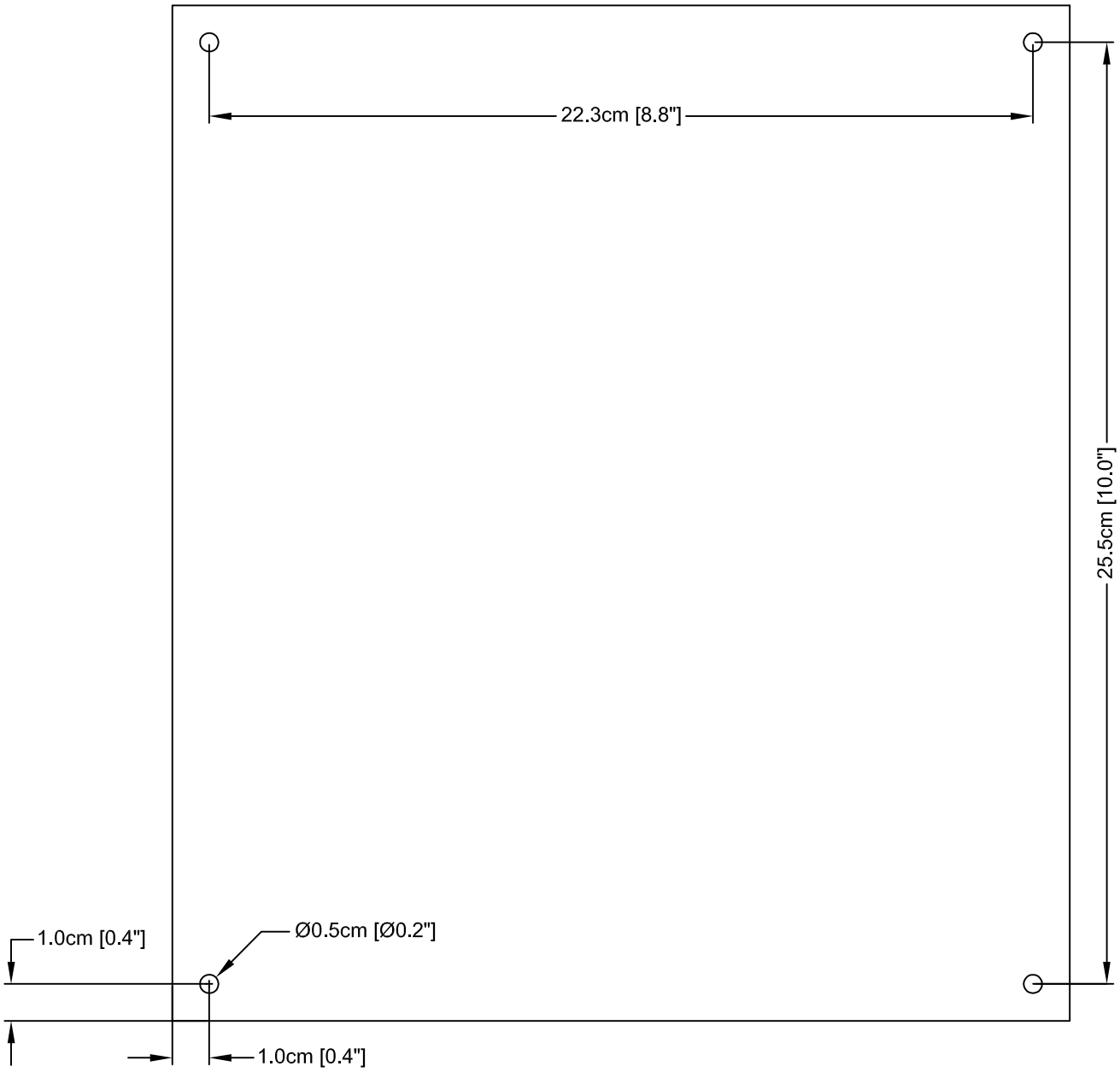


KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

Appendix

Technical data

Rear Dimensions



KWE P/N 394003 Versatronik 200 V1.3 Draft 04/2010 Technical information subject to change without notice

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