

Heating and District Heating Controller

EQJW146F001



Short Instruction Manual

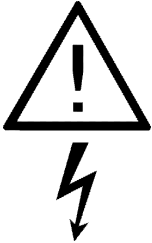
Firmwareversion 2.33,
April 2017

Warranty

We are constantly developing our products further and therefore reserve the right to make changes to the products at any time without prior notice.

We assume no liability for the correctness or completeness of these operating instructions. No liability is assumed for the fact that the buyer can use the products for a certain purpose. Claims of the buyer, in particular claims for damages including loss of profit or other financial losses are excluded. This does not apply if the cause of damage is based on intent or gross negligence. If an essential contractual obligation is negligently breached, our liability shall be limited to the foreseeable damage.

Safety Information



The device may only be mounted, started up or operated by trained and experienced personnel familiar with this product. Proper transport and storage are assumed.

The device is intended for use in power installations. The relevant safety regulations must be observed during connection and maintenance.

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The EQJW146F001 controller is used to control a maximum of two control circuits:

- Control of a primary heat exchanger or boiler. Max. one mixed and one unmixed heating circuit (each weather controlled) as well as the control of the DHW heating on the secondary side.
- Control of a weather-compensated heating circuit and DHW heating with two valves on the primary side.
- Control of two weather-compensated heating circuits with two valves on the primary side.

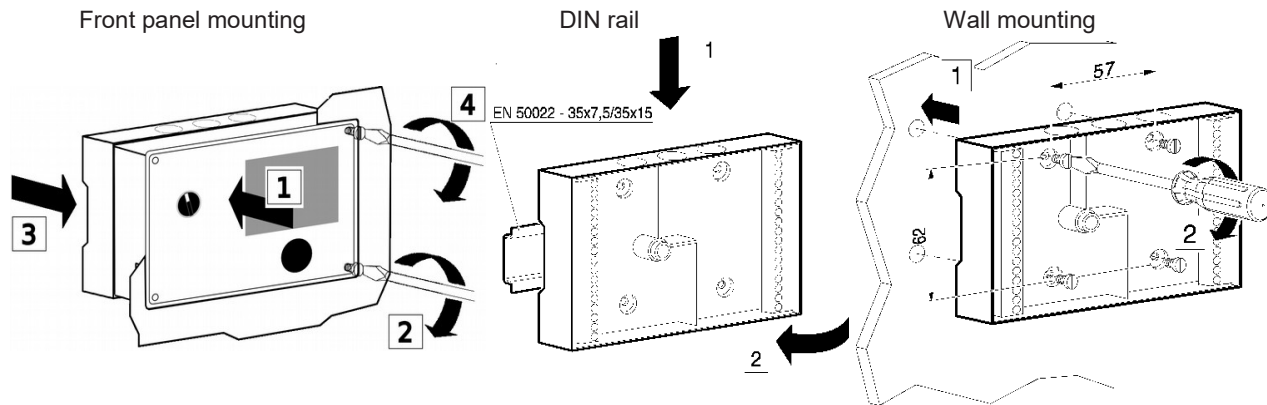
It has eight temperature sensor inputs, two binary inputs, one 0-10V control output and seven switching outputs.

The controller is ready for operation with the factory-set temperatures and time programs. During commissioning, the current time and date must be entered on the controller and system-dependent parameters must be defined.

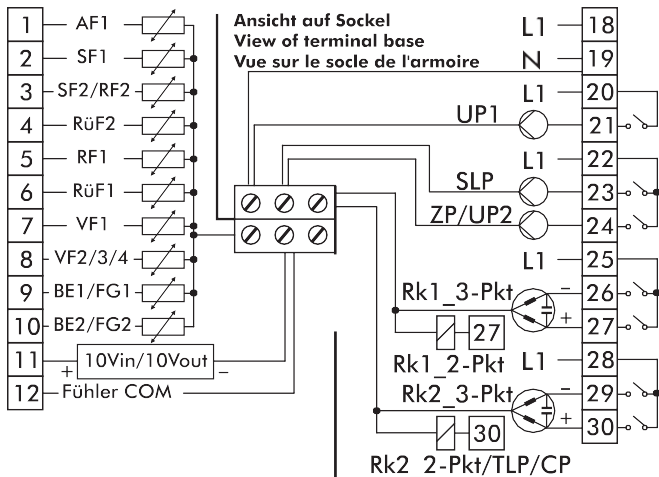
This short instruction manual is intended to provide necessary information during installation and commissioning of the controller. Further information can be found at <http://www.sauter-cumulus.de>.

Installation

Assembly



Electrical connection



Vor Eingriff Netz aus!
 Power off before intervention!
 Couper l'alimentation avant
 toute intervention!

This connection diagram is shown on the back of the controller.

The housing must be opened for the cable connection. For the cable entry, the marked openings at the top, bottom or rear of the rear part of the housing must be broken through and provided with the enclosed choke nipples or suitable cable glands.

Connection of sensors and 0-10V drives

Terminal strips with a cross-section of at least 2 x 0.5 mm² can be connected to the terminal strips on the rear of the housing.

Connection of 3-point/2-point drives and pumps

Connect cables as damp-proof cables with at least 1.5 mm² to the terminals of the controller output. It is recommended to check the running direction of the valve during commissioning.

Operating controls

The operating controls are located on the front of the controller.

Rotary pushbutton



Turn:

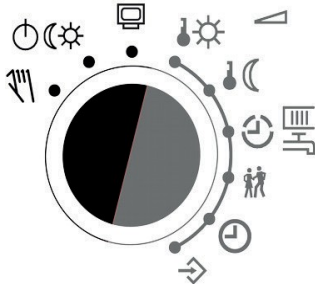
Display, select parameters and function blocks



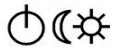
Press:

Confirm adjusted selection or setting

Rotary switch - Operating mode



Information level, rotary switch in normal position

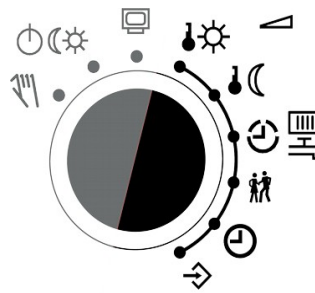


Operating modes



Manual mode:
manual switching of pumps and valves, percentage setting of the output value

Rotary switch - Parameter



Day set point (rated room temperature)



Night set point (reduced room temperature)



Times-of-use for heating/drinking water heating



Special use/party function





Controller time: Setting the time, date and year





Configuration and parameter level


Display

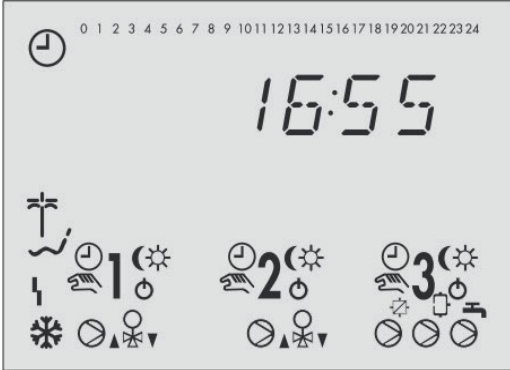
The display indicates the time as well as information about the operation of the controller when the rotary switch is at the normal position  (information level). The times-of-use together with temperatures of the various control circuits can be viewed on the display by turning the rotary pushbutton. The times-of-use are represented by black squares below the row of numbers at the top of the display. Icons indicate the operating status of the controller.

 Vacation mode


 Public holiday


 Operational fault


 Frost protection





1 2 3 Heating circuits

 Automatic mode




 Day mode

 Night mode




 Stand-by mode

 Manual mode




Heating circuit 1

-  Circulation pump UP1
-  Valve HK1 opening
SLP*
-  Valve HK1 closing

Heating circuit 2


-  Circulation pump UP2
-  Valve HK2 opening
-  Valve HK2 closing

DHW circuit (3)

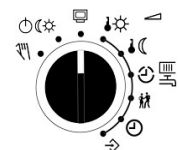
-  Pump output TLP/CP*
-  Storage loading pump
-  Circulation pump ZP*

* UP1, UP2, TLP, CP, SLP and ZP represent the selection display for the pumps in manual mode.

Information level











At the normal switch position  (information level), the time, date, public holidays and vacation periods as well as the temperatures measured by the connected sensors and their set points can be retrieved and displayed.

Depending on the configuration of the controller, the current values of the following data points are displayed one after the other:



Set the rotary switch to information:
the time is displayed.

__ : __ Time

- | | | | |
|---|--|---|---------------------------------------|
|  | Outside temperature |  | Room temperature heating circuit 1, 2 |
|  | Temperature at flow sensor VF,
Heating circuit 1, 2 |  | Temperature at return sensor RüF |
|  | Temperature at flow sensor VF1,
primary exchanger circuit |  | Temperature at storage sensor SF1 |
|  | Temperature at flow sensor VF2, VF4,
DHW |  | Temperature at storage sensor SF2 |
|  | Temperature at solar sensor VF3 |  | Temperature at the storage tank |

Operating modes

- Day mode (rated operation)**

Regardless of the programmed times-of-use and summer mode, the set points relevant for rated operation are used by the controller.
- Night mode (reduced operation)**

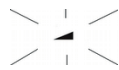
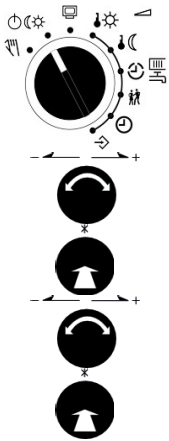
Regardless of the programmed times-of-use, the set points relevant for reduced operation are used by the controller.
- Stand-by mode**

Regardless of the programmed times-of-use, control operation is deactivated. Only the frost protection is activated, if need be.
- Automatic mode**

During the programmed times-of-use, the controller works in rated operation. Outside these times-of-use, the controller is in reduced operation, unless control operation is deactivated depending on the outdoor temperature. The controller switches automatically between both operating modes.
- Manual mode**

Valves and pumps can be controlled manually

Setting the operating modes



1 2 3
1
1

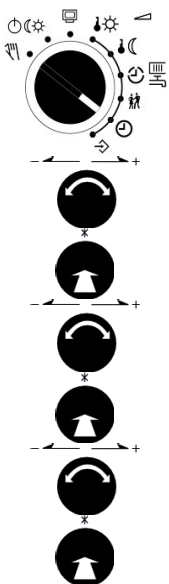
Turn the rotary switch to operating modes. Parameter symbol flashes
In systems with only one control loop (e.g. Anl 1.0), the steps for selecting the control loop are not required..

- Turn the button; **1** Heating circuit 1
- Select the circuit: **2** Heating circuit 2
- Push the button; **3** DHW/Circulation pump
- Confirm the circuit
- Turn the button;
- Select operating mode: ☀, ☾, ⏻ or ⌚
- Push the button;
- Confirm operating mode

Turn back the rotary switch on normal position (Information level)

Remark: In automatic mode, the current phase of the time program for day mode ☀ or night mode ☾ is displayed together with the symbol ⌚ in the information level.

Setting time and date



00:00

Turn the rotary switch to time;
Time and parameter symbol flashing, time is displayed

10:26

Turn the button; Edit the controller time

2000

Push button; Confirm the adjusted time, year is displayed

2008

Turn button; Edit year

01.01

Push button; Confirm year, date is displayed

21.05

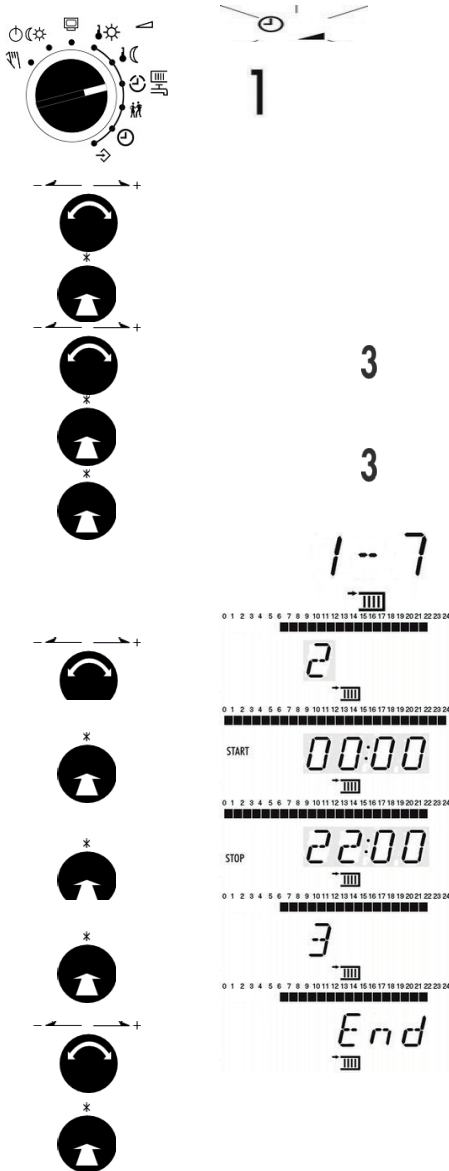
Turn button; Adjust date

10:26

Push button; confirm date, time is displayed

Check and setting the times-of-use

Three times-of-use can be programmed for each day of the week. If only one time-of-use is required, the start and end times of the second time-of-use must be identical. The third time-of-use is then no longer displayed. If two time-of-use periods are required, the start and end times of the third time-of-use must be identical.



Set rotary switch to times-of-use;

Time and parameter symbol flashing, heating (1) is displayed

In systems with only one control circuit (e.g. Anl 1.0), the steps for selecting the control circuit and specifying the DHW circuit are not required. In systems 1.5 and 1.9, only the DHW circuit is controlled, so the steps for selecting the control circuit are omitted.

Turn the button;

Select the circuit:

Push the button;

Confirm the circuit

Turn the button;

1 Heating circuit 1

2 Heating circuit 2

3 DHW/Circulation pump

Specify DHW:

Push button;

Confirm specification



Push button; Symbol for heating and daily digits are displayed

Turn button; select day of week (1 = Monday,

2 = Tuesday, ..., 1-7 = daily)

Times-of-use for weekdays are displayed for checking purposes

Press rotary pushbutton; start time for time-of-use is displayed.

Turn button; change start time for time-of-use

Press button; start time is confirmed

Stop time for times-of-uses is displayed

Turn button; Changing the stop time for the time-of-use

Push button; the stop time is confirmed; the times-of-use for the following day of the week are displayed for checking purposes.

Turn button; 'End' is displayed

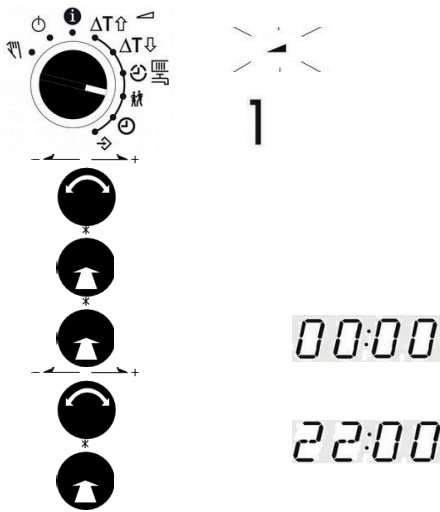
Push button

The time-of-use level for the control circuit is exited

Check and setting party mode

With the Party mode function, the rated operation of the controller (day) - deviating from the set times-of-use - is continued or initiated for the duration of the set party timer. The party timer starts to run when the rotary switch is turned back to one of the operating mode positions. After the party timer has expired, the party function resets to 00:00.

Party mode is set for up to 48 hours in 15-minute increments.



Set rotary switch to party mode;

Parameter symbol flashes, heating (1) is displayed
For systems 1.0, 1.9 and 3.5, the display shows 00:00 or

the remaining time of the set party timer. The steps for selecting the control loop are omitted..

Turn button;

Select control circuit:

Push button;

Confirm control circuit

Push button

1 Heating circuit 1

2 Heating circuit 2

3 DHW/Circulation pump

Party timer for control circuit is displayed

Turn button;

Party timer for control circuit is adjusted

Push button; party timer for control circuit is confirmed, control circuit is displayed

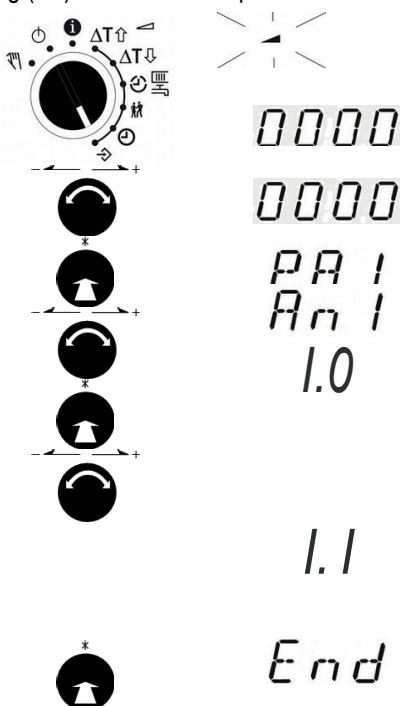
Start-Up

The controller is ready for operation with the factory-set temperatures and time programs. During start-up, the current time and date must be entered on the controller, the system selected and system-dependent parameters defined.

The changes to the controller configuration and parameterization described in this chapter can only be made after entering the valid code number for general parameterization and configuration (page 14).

Setting the system code number

A distinction is made between various hydraulic circuit variants. Each system is represented by a system code number. The systems are shown in the manual. Changing the system code number resets previously set function blocks to the factory setting (FS). Function block parameters and parameter level settings are retained..



Set rotary switch to parameter and functions;

Symbol Parameter flashes,

Key number is displayed

Turn button

Set valid key number (page 14)

Push button

Parameter level 1
(control circuit 1) is
displayed

Push button

Select display 'An1

Push button

System code number is displayed

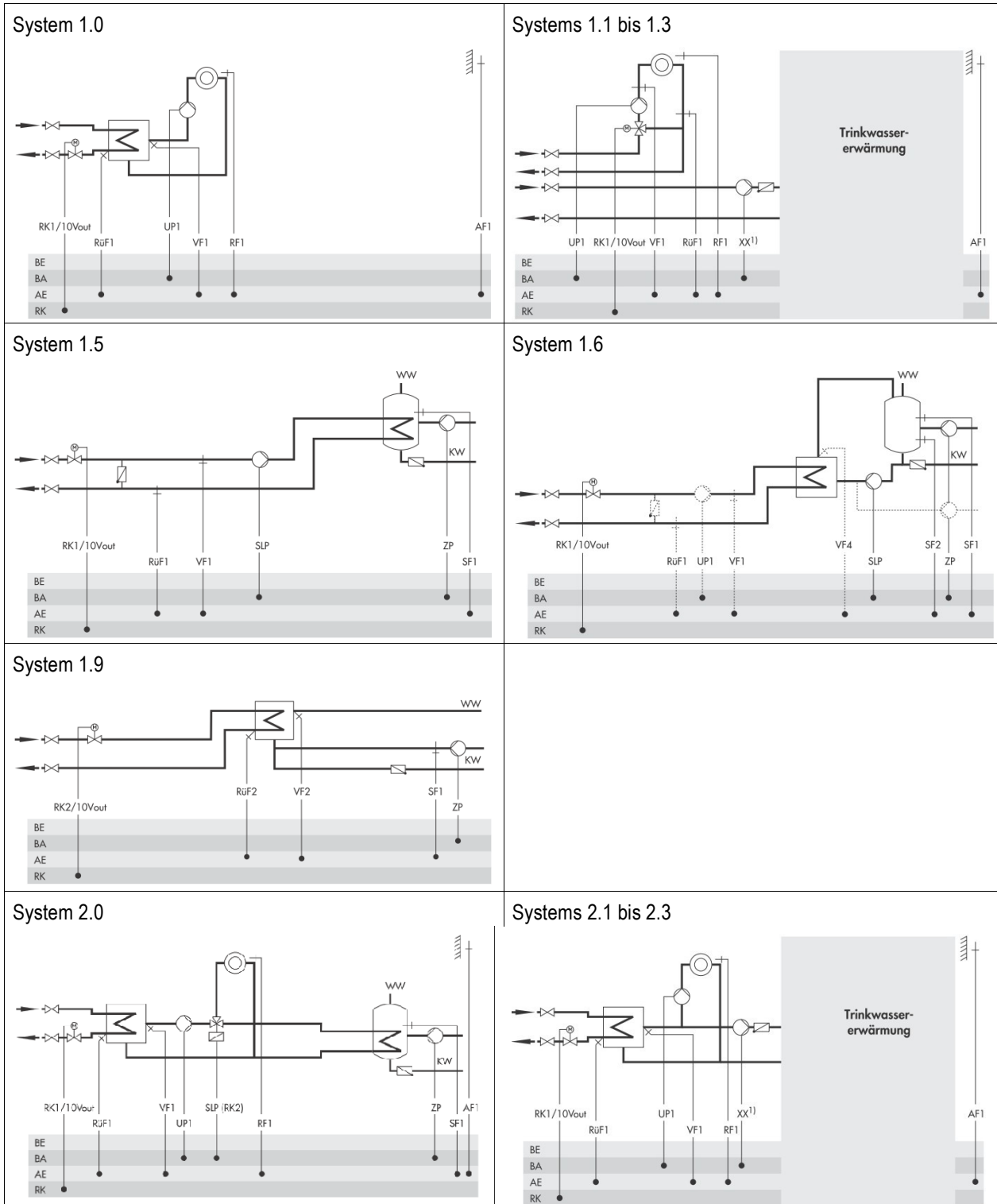
Turn button

Adjust system code

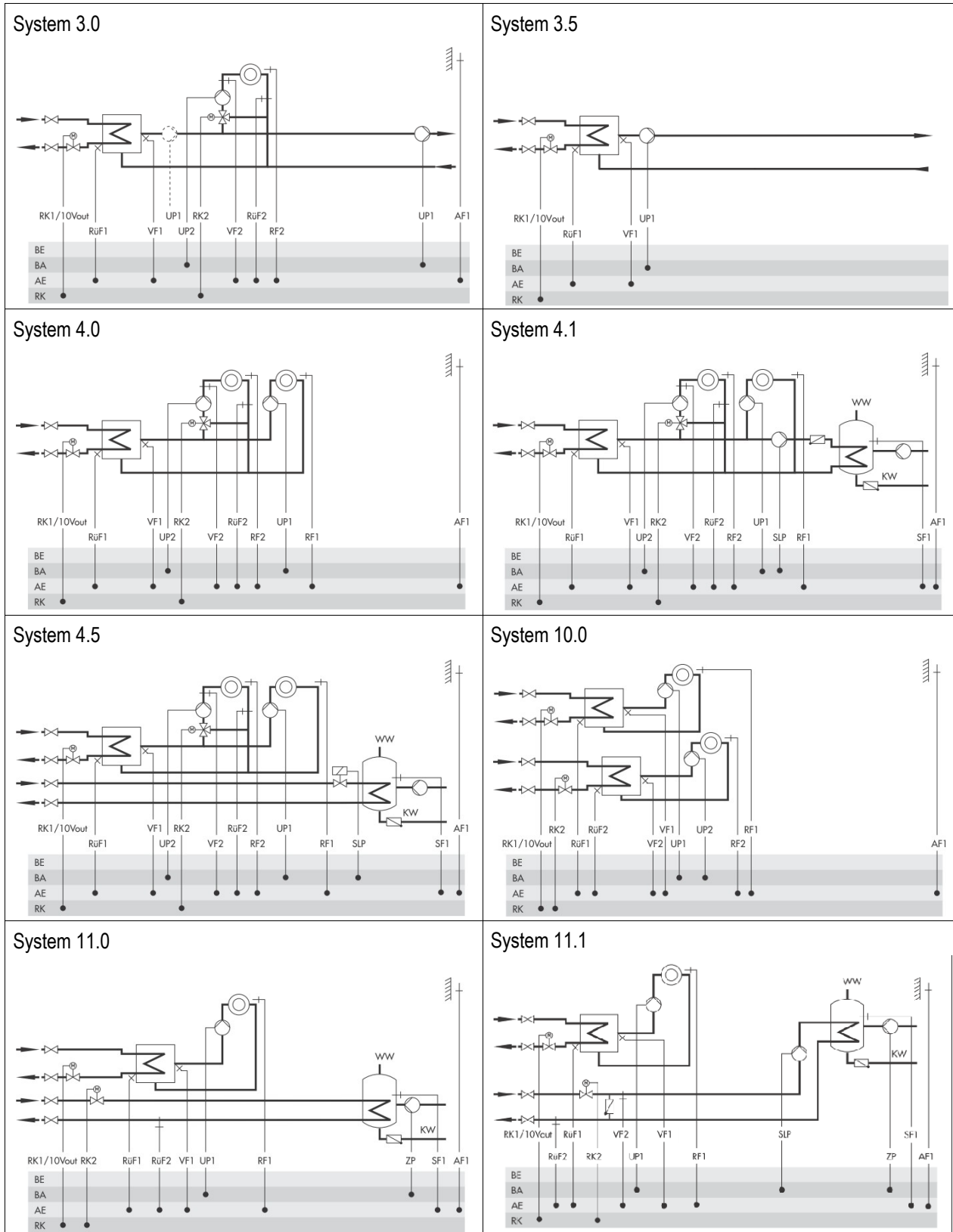
Push button; system code number is confirmed

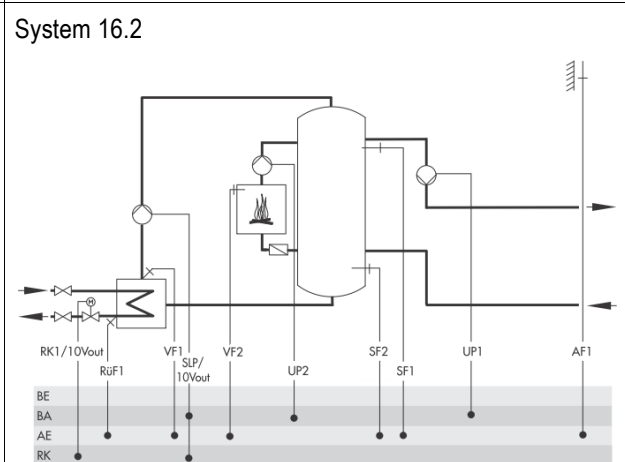
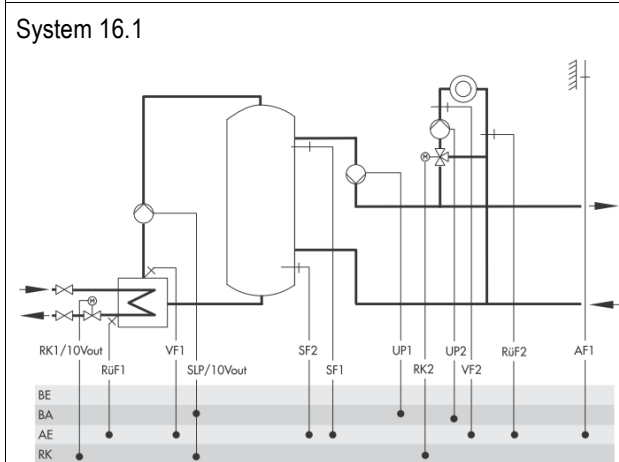
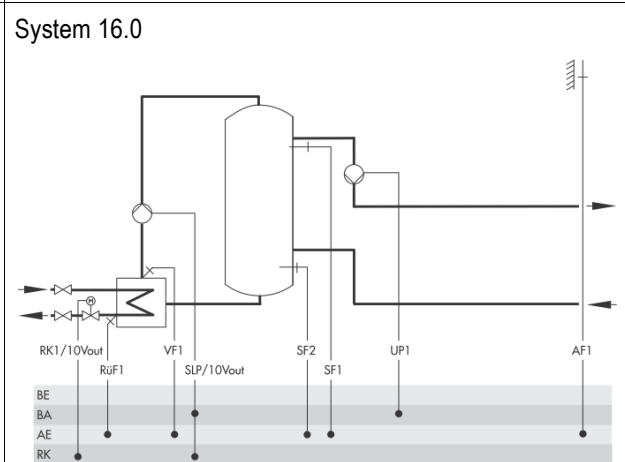
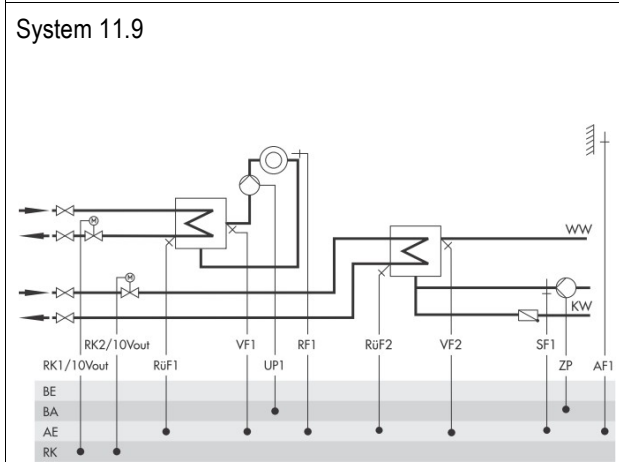
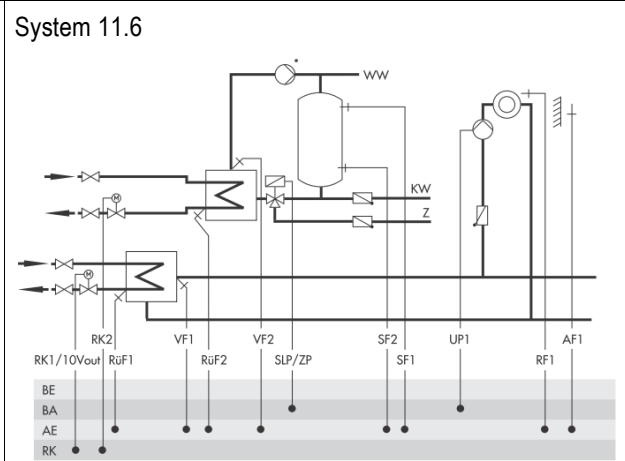
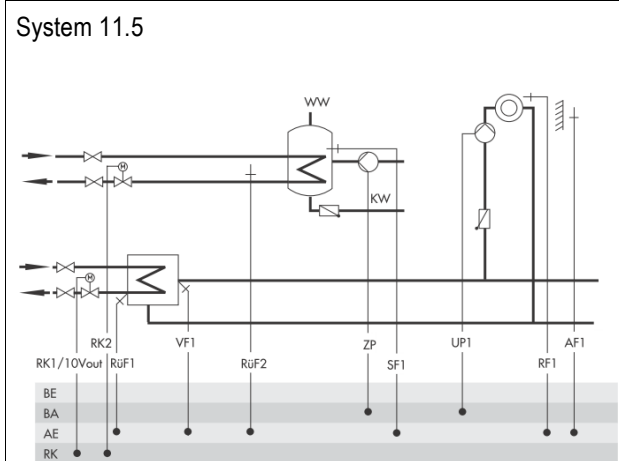
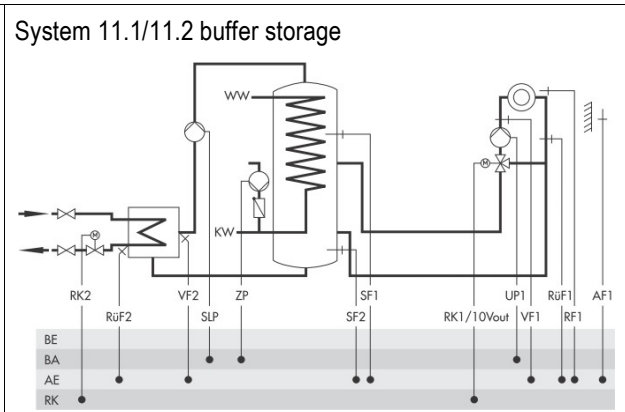
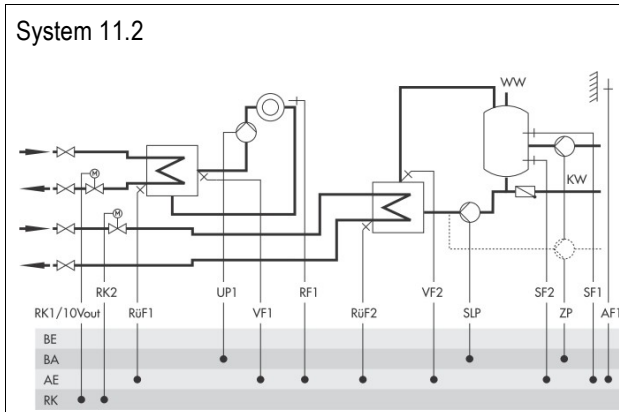
Factory settings for the selected system are set automatically 'End' is displayed - system parameters can be modified as follows

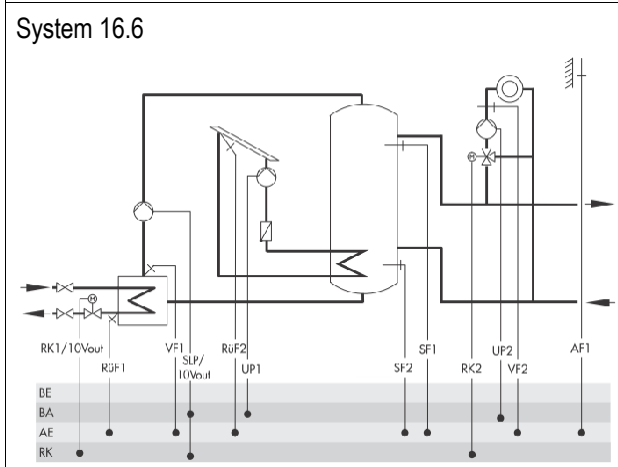
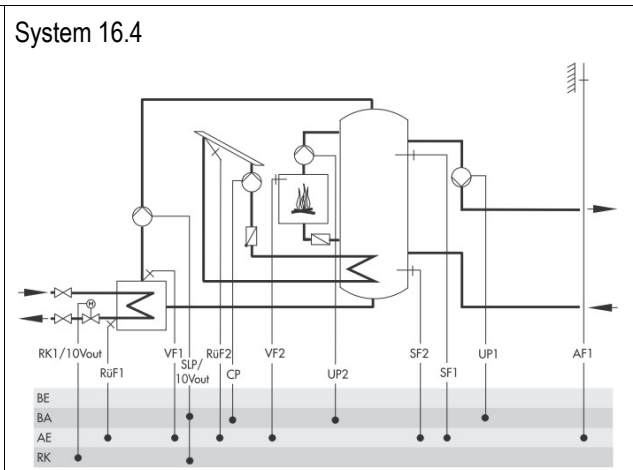
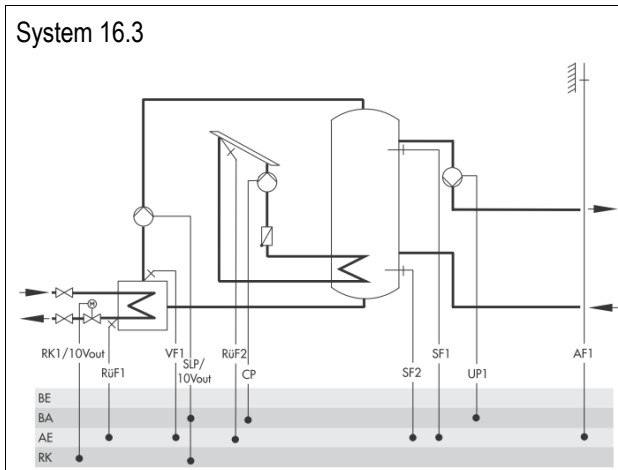
Systems



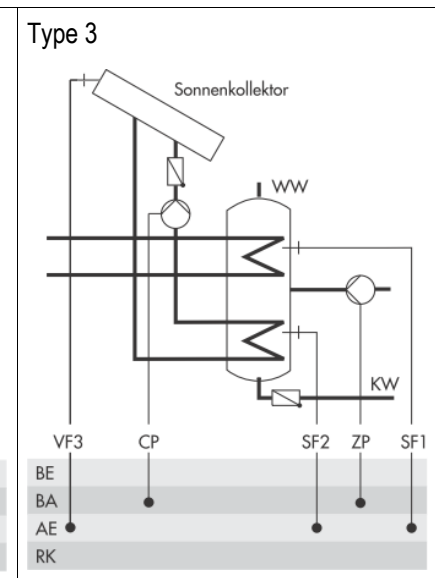
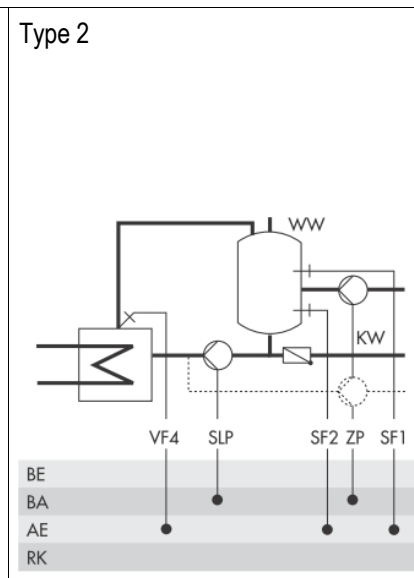
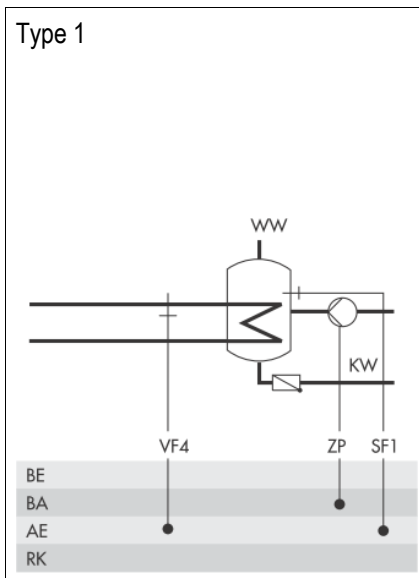
Selection of types for DHW heating for systems 1.x and 2.x: Page 12







Types for DHW heating (systems 1.x and 2.x)



2.1 Activating and deactivating functions

A function is activated via the corresponding function block. The number sequence 0 to 24 at the top of the display represents the function block number. When a configuration level is called, the activated function blocks are identified by a black square on the right below the function block number.

The function blocks are explained in the manual. This document contains a list of functions. The functions are arranged according to topics:

CO1: Heating circuit 1

CO5: cross-system

CO2: Heating circuit 2

CO6: Communication Modbus

CO4: DHW circuit(3)



0000

Set rotary switch to parameter and functions; Parameter symbol flashes, Key number is displayed



0000

Push the button; Set valid key number (page 14)



PA 1

Press the button; Parameter level 1 (control loop 1) is displayed Turn control knob ;



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

CO 1

Select configuration level, activated function blocks are displayed



F05 - 1

Press button; Function block 5 (ON) is displayed



F05 - 0

Turn the button; change function block 5 to OFF



F05 - 1

Press the button; function block 5 (ON) is confirmed; if the function block is not closed, function block parameters can be entered..



End

Turn the button; Select another function block for setting or 'End' for leaving the level.

Change parameter

The parameters are arranged according to subject areas:

- PA1: Heating circuit 1
- PA2: Heating circuit 2
- PA4: DHW
- PA5: cross-system
- PA6: Communication Modbus

		Set rotary switch to parameter and functions; Parameter symbol flashes, Key number is displayed
		Turn the button; Set valid key number (page 14)
		Push the button; Parameter level 1 (control circuit 1) is displayed; turn the button and select the required parameter level.
		Press the button; Parameter is displayed for checking;
		Press the button; Parameter symbol flashes, parameter is displayed for changing;
		Turn the button; parameter is set
		Press the button; parameter is confirmed. The following parameters are displayed and set as described above
		Turn the button; Select further parameters for setting or 'End' for leaving the level.

Resetting to default values

All parameters set over the rotary switch as well as parameters in PA and CO can be reset to their default settings (WE).

		Set rotary switch to parameter and functions; Parameter symbol flashes, Key number is displayed
		Turn the button; Set key number '1991'
		Push the button; Factory settings are saved; all display elements become active for 2 seconds; Key number is displayed for further operation

Key numbers

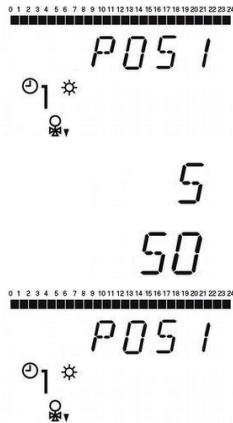
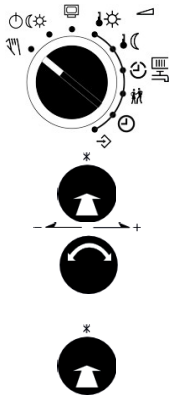
- 1732 General parameterization and configuration
- 1999 Enable / disable extended information level
- 1995 Change key number for parameterization and configuration
- 1991 Load factory settings
- 0010, 25 reserved
- 0073 Activation/deactivation of cable converter 0440210012
- 0002 Restart

Manual operation

Switch to manual mode to configure all outputs, refer to wiring diagram

Select the display taking the control circuit into account.:

- POS1, POS2: Percentage setting of output value (HK1, HK2)
- UP1, UP2: Switching the circulation pump UP1, UP2
- SLP: Switching the storage charging pump
- TLP Switching the exchanger charging pump
- CP Switching the solar circuit pump
- ZP Switching the circulation pump ZP



Set rotary switch to manual mode; display of the setpoint of POS1

Push the button; Presetting of the output value is displayed; Turn the button; Presetting of the output value is set

Push the button; Presetting of the output value is confirmed



To quit manual operation, set the rotary switch to the 'Information' position. The manual positions lose their validity, all outputs are set to the value defined by the control function.

Time display

Note:

Simply setting a rotary switch to the "Manual operation" position does not affect the outputs of the controller. Only the specific setting of the output value or switching state has an effect on the outputs..



The frost protection function is not guaranteed in manual mode..

Malfunction - Error list

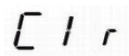
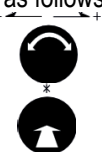
A sensor failure is indicated on the display by a flashing symbol. The message "Error" is displayed immediately. Press the button to open the error level. By turning the button, several faults can be queried under certain circumstances. As long as there is an acute operating fault, the error message remains in the display loop, even if it is not opened by pressing the button.

Note: After changing the system code number or restarting the controller, any error messages are suppressed for approx. 3 minutes.

Error list:

- Err 1 = Sensor failure
- Err 2 = Factory settings read in
- Err 3 = Disinfection temperature not reached
- Err 4 = Maximum charging temperature reached
- Err 6 = Temperature monitoring alarm
- Err 7 = Unauthorized access of BMS has taken place

With the exception of "Err 1", all error messages can be acknowledged in the error level. If an error message is displayed, proceed as follows to acknowledge an error message:



Turn the button; select display "Clr" (Clear)

Press button; error message is confirmed

Function block list

CO1: Heating circuit 1 (HK1) (not system 1.9)*

F	Function	WE	Comment Function block parameters / Range of values
01	Room sensor RF1	0	CO1->F01-1: Room sensor RF1 active not systems 1.5, 1.6, 3.x
02	Outdoor sensor AF1	1	CO1 -> F02 - 1: Waether-compensated control active WE=0 for systems 1.5, 1.6
03	Return flow sensor RüF1	1 1,0	CO1 -> F03 - 1: Sensor and limiting functions active (WE=0 for system 1.2) Function block parameter: KP(limiting factor) / 0,1 to 10,0
04	Cooling control	0	CO1 -> F04 - 1: Cooling control, only with CO1 -> F11 - 1 The cooling control causes the reversal of the operating direction and a minimum limitation of the return flow temperature in HK1. (not systems 1.5, 1.6, 3.x)
05	Underfloor heating Screed drying	0 25 °C 5,0 °C 45 °C 4 days 0,0 °C	CO1->F05-1: Limitation of the adjustment ranges (not systems .5, 1.6, 3.x) Function block parameters: Start temperature / 20 to 60 °C Temperature rise per day / 0.0 to 10.0 °C Maximum temperature / 25.0 to 60.0 °C Maintaining time of max. temp. / 0 to 10 days Temperature reduction per day / 0.0 to 10.0 °C SToP, * STArT, ** STArT, *** STArT
07	Optimization	0	CO1->F07-1: only with • CO1->F01-1 • CO1->F02-1 (not 1.5, 1.6, 3.x)
08	Adaptation	0	CO1->F08-1: only with • CO1->F01-1 • CO1->F02-1 • CO1->F11-0 (not 1.5, 1.6, 3.x)
09	Flash adaptation	0 20 min 0,0	CO1 -> F09 - 1 only with CO1 -> F01 - 1 (not 1.5, 1.6, 3.x) Function block parameters: Cycle time / 0 or 1 to 100 min (20 min) KP (gain) / 0.0 to 25.0 (0.0)
11	Four-point characteristic	0	CO1->F11-1: 4-Point characteristic, only with CO1->F08-0 (not 1.5, 1.6) CO1->F11-0: Gradient characteristic
12	Control mode	1 2,0 120 s 0 s 45 s 5,0 °C 2 min 2 min	CO1 -> F12 - 1: three-step control Function block parameters: KP (proportional gain) / 0.1 to 50.0 Tn (reset time) / 1 to 999 s TV (derivative-action time) / 0 to 999 s TY (valve transit time) / 5, 10, 15, ..., 240 s CO1 -> F12 - 0: On/off control Function block parameters: Hysteresis / 1.0 to 30.0 °C Min. ON time / 0 to 10 min Min. OFF time / 0 to 10 min
13	Limitation of deviation for OPEN signal	0 2,0 °C	CO1 -> F13 - 1 only with CO1 -> F12 - 1 Function block parameter: Max. deviation / 2.0 to 10.0 °C
14	Release HK1 at BE1	0 1	With CO1 -> F14 - 1, FG1 has no function; Options: HK1 activ at bE= 1 or bE=0
15	Processing an external demand in HK1	0	How the external demand is processed in Rk1 depends on CO1 -> F16, CO1 -> F17 and CO7 -> F15.

F	Function	WE	Comment
16	Processing an external demand, 0 to 10 V Input term. 11/12	0 0 °C 120 °C	CO1->F16-1: only with •CO1->F15-1 •CO1->F17-0 Function block parameters: Lower transmission range: 0.0 to 130.0 °C Upper transmission range: 0.0 to 130.0 °C The standard signal output (terminals 11/12) is not available anymore as a control output.
17	Processing an external demand, binary Input term. 03/12	0	CO1 -> F17 - 1: Only with •CO1 -> F15 - 1 CO1 -> F16 - 0 Options bE= 1, bE=0 (bE=1) not in systems with SF2/RF2
18	Request max. flow set point by issuing a 0 to 10 V signal	0 0,0 °C 120 °C 0,0 °C	CO1 -> F18 - 1: The standard signal output (terminals 11/12) is not available anymore as a control output. The maximum flow set point (with boost, if applicable) is demanded by issuing the signal output (0 to 10 V). Function block parameters: Lower transmission range: 0.0 to 130.0 °C Upper transmission range: 0.0 to 130.0 °C Boost of flow temperature demand: 0 to 30 °C
20	External demand for heat due to insufficient heat supply	0	CO1 -> F20 - 1: Demand for an external heat source
21	Speed reduction of the charging pump as a function of charging progress	0 40 °C 50 °C 2 V	CO1 -> F21 - 1: Activation of speed reduction (only 16.x) Function block parameters: Start speed reduction: 5 to 90 °C Stop speed reduction: 5 to 90 °C Min. speed signal: 0 to 10 V

F Function block number, WE Default settings

CO2: Heating circuit 2 (HK2) (Systems 3.x, 4.x and 10.0, 16.6)*

F	Function	WE	Comment
01	Room sensor RF2	0	CO2 -> F01 - 1: Room sensor RF2 active
03	Return flow sensor RüF1	0 1,0	CO2 -> F03 - 1: Sensor and limiting function active (WE=1 for system 10.x) Function block parameter: KP (limiting factor) / 0,1 to 10,0
04	Cooling control	0	CO2 -> F04 - 1: Cooling control, only with CO2 -> F11 - 1 The cooling control causes the reversal of the operating direction and a minimum limitation of the return flow temperature in HK2
05	Underfloor heating Screed drying	0 25 °C 5,0 °C 45 °C 4 days 0,0 °C	CO2-> F05 - 1: Limitation of the adjustment ranges (not .5, .6, 3.x) Function block parameters: Start temperature / 20 to 60 °C Temperature rise per day / 0.0 to 10.0 °C Maximum temperature / 25.0 to 60.0 °C Maintaining time of max. temp. / 0 to 10 days Temperature reduction per day / 0.0 to 10.0 °C SToP, ■ STArT, ■■ STArT, ■■■ STArT
07	Optimization	0	CO2->F07-1: only with •CO2->F01-1 •CO1->F02-1
08	Adaptation	0	CO2->F08-1: only with •CO2->F01-1 •CO1->F02-1 •CO2->F11-0
09	Flash adaptation	0 20 min 0,0	CO2 -> F09 - 1 only with CO2 -> F01 - 1 Function block parameter: Cycle time/0 or 1 to 100 min KP (gain)/0,0 to 25,0
11	Four-point characteristic	0	CO2 -> F11 - 1: 4-point characteristic, only with CO2 -> F08 - 0 CO2 -> F11 - 0: Gradient characteristic

F	Funktion	WE	Bemerkung
12	Control mode	1 2,0 120 s 0 s 45 s 5,0 °C 2 min 2 min	CO2 -> F12 - 1: three-step control Function block parameters: KP (proportional gain) / 0.1 to 50.0 Tn (reset time) / 1 to 999 s TV (derivative-action time) / 0 to 999 s TY (valve transit time) / 5, 10, 15, ..., 240 s CO2 -> F12 - 0: On/off control Function block parameters: Hysteresis / 1.0 to 30.0 °C Min. ON time / 0 to 10 min Min. OFF time / 0 to 10 min
13	Limitation of deviation for OPEN signal	0 2,0 °C	CO2 -> F13 - 1 only with CO2 -> F12 - 1 Function block parameters: maximale Regelabweichung / 2,0 bis 10,0 °C
14	Release HK2 at BE2	0 1	With CO2 -> F14 - 1, FG2 has no function; Options: HK2 activ at bE= 1 or bE=0

F Function block number, WE Default settings

CO4: DHW circuit (systems 1.1–1.3, 1.5, 1.6, 1.9, 2.x, 4.1, 4.5, 11.x)*

F	Function	WE	Comment
01	Storage tank sensor SF1	1	CO4 -> F01 - 0 (not 11.0): Storage tank thermostat, only with CO4 -> F02 - 0 (WE=0 for 1.9, 11.9)
02	Storage tank sensor SF2 with the function stop loading	0	CO4 -> F02 - 1 (not in 1.3, 1.9, 2.3, 11.0 and 11.9): Only with CO4 -> F01 - 1 (WE=1 for 1.2, 1.6, 2.2, 11.2) (not assigned to the solar circuit)
03	Return flow sensor RUF2	0 1,0	CO4 -> F03 - 1: Sensor and limitation function active Function block parameters: KP(limitation factor) / 0.1 to 10.0
05	Flow sensor VF4	0	CO4 -> F05 - 1: Flow sensor VF4 for measuring the storage tank charging temperature active (only 1.1, 1.2, 1.6, 2.2)
06	parallel pump operation	0 10 min 40 °C	CO4 -> F06 - 1: (only 2.1-2.3, 4.1, 4.5) Function block parameters: Termination of parallel operation in case of system deviation / 0 to 10 min Flow limit temperature for parallel operation / 20.0 to 90.0 °C CO4 -> F06 - 0: UP1 deactivated for DHW
07	intermediate heating	1	CO4 -> F07 - 1: after 20 minutes DHW heating 10 minutes heating operation in UP1 circuit CO4 -> F07 - 0: Storage tank charging unlimited in time in priority to UP1 circuit (only: 2.x, 4.1, 4.5)
08	Priority by inverse control	0 2 min 1,0	CO4 -> F08 - 1 only with CO4 -> F09 - 0; (only 1.1-1.3, 4.1, 4.5, 11.x) Function block parameters: Activate priority in case of control deviation / 0 to 10 min KP (influencing factor) / 0.1 to 10.0
09	Priority through lowering operation	0 2 min	CO4 -> F09 - 1 only with CO4 -> F08 - 0 (only 1.1-1.3, 4.1, 4.5, 11.x) Function block parameters: Activation of priority in case of control deviation / 0 to 10 min
10	Circulation pump integrated in exchanger	0	CO4 -> F10 - 1: DHW circuit control active when the circulation pump ZP is in operation (WE=0 for 1.6, 11.2; WE=1 for 11.6)
11	Circulation pump operation during storage tank charging	0	CO4 -> F11 - 1: Circulation pump runs during storage tank charging according to time program CO4 -> F11 - 0: Circulation pump (ZP) switched off during storage tank charging (only 1.1-1.3, 1.5, 1.6, 2.x, 11.1, 11.2)

F	Funktion	WE	Bemerkung
12	Control mode	1 2,0 120 s 45 s 5,0 °C 2 min 2 min	CO24-> F12 - 1: three-step control (only 1.9, 11.x) Function block parameters: KP (proportional gain) / 0.1 to 50.0 (system.x:9: WE=0,6) Tn (reset time) / 1 to 999 s (system.x:9: WE=12 s) TV (derivative action time) / 0 s; do not change value! TY (valve running time) / 5, 10, 15, ..., 240 s (system.x:9: WE=20 s) CO4 -> F12 - 0 On/off control (only in 11.0, 11.1): Function block parameters: Hysteresis / 1.0 to 30.0 °C Min. ON time / 0 to 10 min Min. OFF time / 0 to 10 min
13	Limitation of control deviation for OPEN signal	0 2,0 °C	CO4 -> F13 - 1 only with CO4 -> F12 - 1 (only 1.9, 11.x) Function block parameter: Maximum control deviation / 2.0 to 10.0 °C
14	Thermal disinfection	0 3 00:00 04:00 70,0 °C 10 °C 0 min	CO4 -> F14 - 1 only with CO4 -> F01 - 1 Function block parameter: Weekday / 1, 2, ..., 7, 1-7 Start time / 00:00 to 23:45 Stop time / 00:00 to 23:45 Disinfection temperature / 60.0 to 90.0 °C Set point boost / 0 to 50 °C Hold time Disinfection temperature / 0 to 255 min with setting start time = stop time Select: bE= 1, bE=0 (bE= 1), input terminal 03/12 (only possible without SF2/RF2)
15	SLP ON depending on return temperature	0	For systems 1.5, 1.6, 2.0, 2.1, 2.3, 4.1: CO4 -> F15 - 1. only with CO1 -> F03 - 1 For systems 11.1 and 11.2: CO4 -> F15 - 1 only with CO4 ->F03 - 1
16	External demand has priority	0	with CO4 -> F16 - 1 leads to correspondingly high external demand to excessive Charging temperatures in DHW circuits without control valve (only 1.5, 1.6, 2.x, 4.1)
19	Time program controlled storage tank sensor switching	0	CO4 -> F19 - 1 only with CO4 -> F02 - 1 In day mode SF1 is important, in night mode SF2. (only 1.1-1.3, 1.5, 1.6, 2.x, 4.1, 4.5, 11.1, 11.2)
20	DHW circuit readjusted with globe valve	0	CO4 -> F20 - 1: Return flow temperature limitation by means of globe valve mt VF2 in the Heating coil return of the storage tank (only 11.1)
21	Speed reduction of the charging pump as a function of charging progress	0 40,0 °C 50,0 °C 2 V	CO4 -> F21 - 1: Activation of speed reduction and memory sensor SF2 (only 1.1-1.3, 1.5, 1.6, 2.x, 4.1, 11.1, 11.2); function block parameters: Start speed reduction: 5.0 to 90.0 °C Stop speed reduction: 5.0 to 90.0 °C Min. speed signal: 0 to 10 V

F Function block number, WE Default settings

CO5: System-wide functions (all systems)

Signalisiert der Regler CO5 -> F00 - 1, sind alle Zugriffe auf die Rücklauf-, Volumenstrom- und Leistungseinstellungen gesperrt.

F	Funktion	WE	Bemerkung
01	Sensor initialization	1	CO5 -> F01 - 1, F02 - 0, F03 - 0 Pt 1000
02		1	CO5 -> F01 - 1, F02 - 1, F03 - 0 Ni 1000-DIN
03		0	CO5 -> F01 - 1, F02 - 1, F03 - 0, CO9 -> F01 - 0 Ni 1000-5k
04	Summer mode	0	CO5 -> F04 - 1: Activation of time-controlled summer mode Function block parameters: Start summer mode / 01.01 to 31.12 2 No. of days until activation / 1 to 3 30.09 Stop summer mode / 01.01 to 31.12 1 No. of days until deactivation / 1 to 3 18°C Outdoor temperature limit for summer mode / 0.0 to 30.0 °C

F	Funktion	WE	Bemerkung
05	Delayed outdoor temperature adaptation when temperature decreases	0 3,0 °C	CO5 -> F05, 06 - 1: Function block parameter: Delay per hour/ 1.0 to 6.0 °C
06	Delayed outdoor temperature adaptation when temperature increases		
08	Automatic summer time/winter time changeover	1	Automatic summer/winter time changeover (last Sunday in March and October)
09	Frost protection program II	1 3 °C 3 °C	CO5 -> F09 - 0: Frost protection program I (limited frost protection - only active if all HK in OFF mode) Frost protection limit value / -15 to 3 °C CO5 -> F09 - 1: Frost protection program II (all UP switched on when frost occurs) Frost protection limit value / -15 to 3 °C
16	Release controller at BE1	0	CO5 -> F16 - 0: Return flow temperature limitation only with PI action CO5 -> F16 - 1: Return flow temperature limitation only with P action
19	Return flow temperature limitation with P algorithm	0	CO5 -> F19 - 1: Temperature monitoring active
20	Sensor calibration	1	CO5 -> F20 - 1: Setting all sensor calibration values CO5 - > F20 - 0: Deleting set sensor calibration values
21	Locking manual level	0	CO5 -> F21 - 1: In switch position automatic mode is operated
22	Locking the rotary switch	0	CO5 -> F22 - 1: all rotary switches without function
23	Outdoor temperature received over 0 to 10 V input	0 Input -20,0 °C 50,0 °C	CO5 -> F23 - 1: Outdoor temperature receive/transmit via 0 to 10 V (terminals 11/12) Function block parameters: Operating direction: Input, output Start: -30.0 to 100.0 °C End: -30.0 to 100.0 °C

F Function block number, WE Default settings

CO6: Modbus (all systems)

F	Function	WE	Comment
01	Modbus	1	CO6 -> F01 - 1: Modbus active
02	Modbus 16-bit-addressing	0	CO6 -> F02 - 1: 16-bit-addressing, only with CO6 -> F01 - 1 CO6 -> F02 - 0: 8-bit addressing
03	Modem function	0	CO6 -> F03 - 1 only with CO6 -> F01 - 1, CO6 -> F08 - 1
04	Automatic modem configuration	0	CO6 -> F04 - 1 only with CO6 -> F03 - 1, CO6 -> F08 - 1
05	Lock dial-up	0	CO6 -> F05 - 1: No dial-up to BMS in case of error, only with CO6 -> F03 - 1
06	Dial-up also upon corrected error	0	CO6 -> F06 - 1: Dial-up to BMS also to indicate that an error has been corrected, only with CO6 -> F03 - 1
07	Control system monitoring	0	CO6 -> F07 - 1: Resetting all level bits to "autonomous" when there is no communication, only with CO6 -> F03 - 1
08	Text message	0	CO6 -> F08 - 1: Sending of Text message active
10	Meter bus (only with optional, meter bus/Modbus gateway)	0 255 1434 24h	CO6 -> F10 - 1: Meter bus active Function block parameters: (for WMZ1 to WMZ3) Meter bus address / 0 to 255 Model code / 1434, CAL3, APAtO, SLS Reading mode / 24h, CONT, CoiL For WMZ1 with "1434" and "CONT", select: tAr-A, tAr-E with time schedule

F	Funktion	WE	Bemerkung
11	Flow rate limitation in HK1 using meter bus	0 1,5 m³/h 1,5 m³/h 1,5 m³/h 1	CO6 -> F11 - 1: Only with •CO6->F10 - 1 CO5->F11 - 0 Function block parameters: Maximum limit value /At, 0.01 to 650 m³/h Maximum limit for heating operation* /At, 0.01 to 650 m³/h Maximum limit for drinking water* / 0.01 to 650 m³/h Limiting factor / 0.1 to 10
12	Capacity limitation in HK1 using meter bus	0 1,5 kW 1,5 kW 1,5 kW 1	CO6->F12 - 1 Only with •CO6->F10 - 1 CO5->F10 - 0 Function block parameters: Maximum limit /At, 0.1 to 6500 kW Maximum limit for heating operation* /At, 0.1 to 6500 kW Maximum limit for drinking water* / 0.1 to 6500 kW Limiting factor / 0.1 to 10

F Function block number, WE Default settings

CO7: Device bus (all systems, F02, F03, ... only with CO7 -> F01 - 1)

F	Function	WE	Comment
01	Device bus	1 32	CO7 -> F01 - 1: Device bus active; function block parameters: Device bus address /Auto*, 1 to 32 *Auto = automatic search for free device bus address in the system
02	Time synchronization	0	CO7 -> F02 - 1: Controller sends its system time to all device bus participants every 24 hours.
03	Reserved	0	
04	Reserved	0	
06	Send value AF1	0 1	CO7 -> F06 - 1: (not 1.9); Function block parameter: Register No. / 1 to 4
07	Receive value AF1	0 1	CO7 -> F07 - 1:(not 1.9); Function block parameter: Register No. / 1 to 4
08	Send value AF2	0 2	CO7 -> F08 - 1: (not 1.9); Function block parameter: Register No. / 1 to 4
09	Receive value AF2	0 2	CO7 -> F09 - 1: (not 1.9); Function block parameter: Register No. / 1 to 4
10	Send flow set point HK1	0 5	CO7 -> F10 - 1: In systems 1.5-1.8, 2.x, 3.1-3.4, 4.1-4.3, 7.x, 8.x the storage tank charging set point is transmitted during DHW heating. Function block parameter: Register No. / 5 to 64
11	Send flow set point HK2	0 5	CO7 -> F11 - 1: Function block parameter: Register No. / 5 to 64
13	Send flow set point DHW	0 5	CO7 -> F13 - 1: The Charging temperature boost parameter is generated in PA4 level. Function block parameter: Register No. / 5 to 64
14	Send maximum flow set point	0 5	CO7 -> F14 - 1: The controller already determines the maximum flow set point of its circuits internally and sends this one value to the primary controller; Function block parameter: Register No. / 5 to 64
15	Receive demand in HK1	0 5	CO7 -> F15 - 1: external demand processing in HK1 via device bus (not 1.9); Function block parameter: Register No. / 5 to 64
16	Display error messages from the device bus	0	CO7 -> F16 - 1: Controller generates the message "Err 5" as long as faults are present in other device bus stations.
17	Receive demand in HK2	0 5	CO7 -> F17 - 1: external demand processing in HK2 via device bus (not 1.x, 2.x); Function block parameter: Register No. / 5 to 64
19	Increase in return flow temperature limit value	0	CO7 -> F19 - 1: Increase of return flow temperature limit HK1 with message "DHW-heating active" from the device bus;

		32	Function block parameter: Register No. / 5 to 64
20	"DHW heating active" sending	0 32	CO7 -> F20 - 1: Sending of "DHW-heating active" Function block parameter: Register No./ 5 bis 64
21	Receive release HK1	0 32	CO7 -> F21 - 1: Function block parameter: Register No. / 5 to 64
22	Receive release HK2	0 32	CO7 -> F22 - 1: (not 1.x, 2.x); Function block parameter: Register No. / 5 to 64

F Function block number, WE Default settings

Parameter lists

PA1: Parameters HK1 (heating circuit 1)

PA2: Parameters HK2 (heating circuit 2)

Parameter designation	Range of values	WE	Comment
Gradient, flow	0,2 to 3,2	1,8	
Level (parallel shift)	-30,0 to 30,0 °C	0,0 °C	
Minimum flow temperature	-5,0 to 150,0 °C	20 °C	
Maximum flow temperature	5,0 to 150,0 °C	90 °C	
4-point characteristic			Press the rotary pushbutton () to set the parameters..
Point 1: Outdoor temperature	-50 to 50 °C	1: -15 °C 2: -5 °C 3: 5 °C 4: 15 °C	Outside temperatures of points 2, 3, 4 are marked by squares below the numbers 2, 3, 4. Changed WE with CO1, 2 -> F04 - 1: (point 1: 5.0 °C, point 2: 15.0 °C, point 3: 25.0 °C, point 4: 30.0 °C)
Range of values Point 1: Flow temperature	5 to 130 °C	1: 70 °C 2: 55 °C 3: 40 °C 4: 25 °C	Flow temperatures of points 2, 3, 4 are marked by squares below the numbers 2, 3, 4. Modified WE with CO1, 2 -> F04 - 1: (point 1: 20.0 °C, point 2: 15.0 °C, point 3: 10.0 °C, point 4: 5.0 °C)
Point 1: Reduced flow temperature	5 to 130 °C	1: 60 °C 2: 40 °C 3: 20 °C 4: 20 °C	Reduced flow temperatures of points 2, 3, 4 are due to squares below the digits 2, 3, 4. Changed WE with CO1, 2 -> F04 - 1: (point 1: 30.0 °C, point 2: 25.0 °C, point 3: 20.0 °C, point 4: 15.0 °C)
Point 1: Return flow temperature	5 to 90 °C	1 to 4: 65 °C	Return temperatures of the points 2, 3, 4 are indicated by squares below the numbers 2, 3, 4.
Point 1: Flow rate	At, 0,01 to 650 m³/h	1 to 4: At	Flow rate values of points 2, 3, 4 are indicated by squares below the numbers 2, 3, 4 (only in parameter level PA1)
Point 1: Power	At, 0,1 to 6500 kW	1 to 4: At	Flow values of points 2, 3, 4 are indicated by squares below the numbers 2, 3, 4 (only in parameter level PA1)
OT deactivation value Rated operation	0,0 to 50,0 °C	22,0 °C	
OT deactivation value Reduced mode	-50,0 to 50,0 °C	15,0 °C	
OT switch-on value Rated operation	-50,0 to 5,0 °C	-15,0 °C	
Gradient, return flow	0,2 to 3,2	1,2	
Level, Return	-30,0 to 30,0 °C	0,0 °C	
Return flow temperature foot point	5,0 to 90,0 °C	65 °C	
maximum return temperature	5,0 to 90,0 °C	65 °C	
Set point boost primary exchanger control	0,0 to 90,0 °C	5,0 °C	Only in parameter level PA1
Setpoint for binary demand processing	0,0 to 150,0 °C	40,0 °C	Only in parameter level PA1
Flow set point day	-5,0 to 150,0 °C	50,0 °C	only for short-term adaptation without outdoor sensor
Flow set point night	-5,0 to 150,0 °C	30,0 °C	only for short-term adaptation without outdoor sensor

PA4: Parameter DHW

Parameter designation	Range of values	WE	Comment
Minimum DHW temperature	5,0 to 90,0 °C	40,0 °C	
maximum DHW temperature	5,0 to 90,0 °C	60,0 °C	
switching difference	1,0 to 30,0 °C	5,0 °C	
Charging temperature boost	0,0 to 50,0 °C	10,0 °C	
maximum charging temperature	20,0 to 150,0 °C	80,0 °C	Only with VF4
After-run storage tank charging pump	0,0 to 10,0	1,0	
maximum return temperature	20,0 to 90,0 °C	65,0 °C	
Solar circuit pump on	1,0 to 30,0 °C	10,0 °C	
Solar circuit pump off	0,0 to 30,0 °C	3,0 °C	
maximum storage temperature	20,0 to 90,0 °C	80,0 °C	
DHW control signal for storage tank charging	5 to 100 %	100 %	

PA5: system-wide parameters (all systems)

Parameter designation	Range of values	WE	Comment
Boiler pump on	20 to 90 °C	60 °C	only 16.x
switching difference	0 to 30 °C	5 °C	only 16.x
holidays	01.01 to 31.12		
holiday periods	01.01 to 31.12		

PA6: Modbus

Parameter designation	Range of values	WE	Comment
Station address	1 to 247	255	with CO6 -> F02 - 1: 1 to 32000
Modem dialing pause (P)	0 to 255 min	5 min	
Modem timeout (T)	0 to 255 min	5 min	
Number of dial attempts for GLT calls (C)	1 to 255	15	
Call number to control station (TELnr)			maximum 22 characters; 1, 2, 3, ..., 9, 0; "." = end of a character string
Access number (TAPnr)			"P" = Pause
Subscriber number (mobile phone)			

Technical data

Inputs	8 inputs for temperature sensor (Pt 1000, Ni1000-DIN or Ni1000-5k) and 2 binary inputs, terminal 11 as input 0 to 10V for a demand or outdoor temperature signal
Outputs * Inrush current max. 16 A	2 x three-step signal: load max. 250 V AC, 2A*, alternatively 2 x two-point signal: load max. 250 V AC, 2 A* 3 x pump output: load max. 250 V AC, 2A*; all outputs relay outputs with varistor suppression Terminal 11 as output 0 to 10 V for continuous control HK1 or demand request, load > 5 kΩ
Optional interfaces	1 x Modbus interface (option: USB, RS232, RS485, LAN, modem) Protocol: Modbus RTU; 19200 baud, data format 8N1; RJ45 female connector on side
	1 x connection for data logging module DataMem
	1 x connection for memory module ParaMem
Operating voltage	85 to 250 V, 48 to 62 Hz, max. 1.5 VA
Ambient temperature	0 to 40 °C (operation), -10 °C to 60 °C (storage and transport)
Degree of protection	IP 40 according to EN60529
Class of protection	II according to EN61140
Degree of contamination	2 according to EN60730
Overvoltage category	II according to EN60730
Interference immunity	according to EN 61000-6-1
Emitted interference	according to EN 61000-6-3
Assembly	Front panel mounting, wall mounting or on top hat rail
Housing L x W x H (mm)	144 x 98 x 60
Weight	ca. 0,5 kg



Item list

Item no.	Description
EQJW146F001	Heating and district heating controller
0440210001	Adapter for connecting EQJW126/146 controllers to RS232 (PC)
0440210002	Adapter for connecting the EQJW126/146 controllers to modem
0440210003	Adapter for connecting EQJW126/146 controllers to RS485 bus
0440210004	Adapter for connecting EQJW126/146 controllers to RS485 bus (device bus master)
0440210006	ModBus-MBus Gateway
0440210007	Converter / repeater CoRe02 for RS232 or RS485 interfaces RS485
0440210008	Overvoltage protection SA5000
0440210010	Parameter memory module for transfer of controller parameters
0440210011	Modbus GPRS Gateway
0440210005	Modbus-TCP-Gateway

Notes



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