

ENG

Weather compensated heating controller

DEU

Witterungsgeführter Heizungsregler

FRE

Régulateur de chauffage

ITA

Regolatore climatico

DUT

Weersafhankelijke warmteregelaar



KMS-D, KMS-D+



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INTRODUCTION

Weather compensated controllers KMS-D and KMS-D+ are modern microcontroller based devices, produced in digital SMT technology.

KMS-D controllers are intended for control of direct and/or mixing heating circuit or two mixing heating circuits and d. h. w. warming with boiler, solar collectors and other energy sources.



For initial setup see Initial controller setup, page 9!

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USER MANUAL

CONTROLLER DESCRIPTION

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1 - Graphic display.

2 - **Esc** button (Esc - return to previous).

3 - **◀** button (one step back, decrease).

4 - USB connector for connecting personal computer.

5 - **OK** button (enters a menu, confirms selection).

6 - **Help** button (Help).

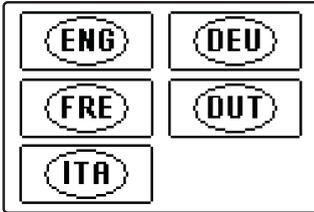
7 - **▶** button (one step forward, increase).

INITIAL CONTROLLER SETUP

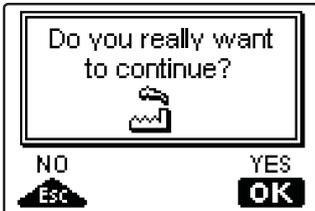
KMS-D and KMS-D+ heating controllers are equipped with an innovative solution “Easy start” which enables the setup of controller in just three or four easy steps.

When the controller is connected to the power supply for the first time, the display first shows the program version and company logo and then the first step of the procedure for controller settings is started.

STEP 1 - LANGUAGE SETUP



Use buttons ◀ and ▶ to select the requested language.
Confirm the selected language by pressing **OK**.

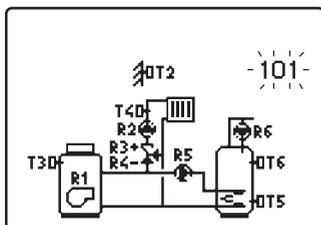


The controller requires a confirmation of language selection with the **OK** button.

In case you chose the wrong language, return to the language selection with the **Esc** button.

STEP 2 - HYDRAULIC SCHEME SETUP

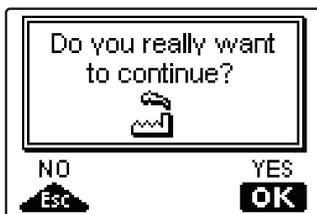
ENG



Select a hydraulic scheme for controller operation. Move between schemes with buttons ◀ and ▶. Confirm the selected scheme by pressing **OK**.



All schemes with mixing heating circuit are available for radiators and floor/wall heating.



The controller requires a confirmation of language selection with the **OK** button. In case you choose the wrong scheme, return to scheme selection with the **Esc** button.

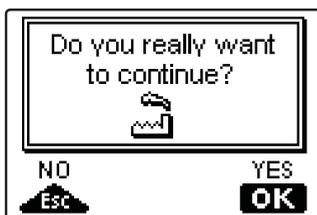


Later you can change the selected hydraulic scheme with service parameter S1.1.

STEP 3 - SETUP OF HEATING CURVE STEEPNESS FOR THE FIRST CIRCUIT



Set the heating curve steepness for the first heating circuit. Change the value with buttons ◀ and ▶. Confirm the selected value by pressing **OK**.



The controller requires a confirmation of the set heating curve steepness with the **OK** button. In case you choose the wrong heating curve steepness, return to heating curve steepness selection with the **Esc** button.



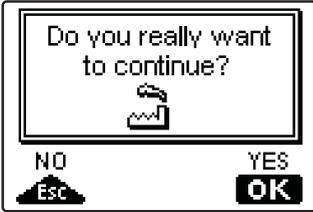
Later you can change the heating curve steepness with parameter P2.1. The meaning of heating curve steepness is detailed on page 37.

STEP 4 - SETUP OF THE HEATING CURVE STEEPNESS FOR THE SECOND CIRCUIT¹



Set the heating curve steepness for the second heating circuit.

Change the value with buttons ◀ and ▶.
Confirm the selected value by pressing **OK**.



The controller requires a confirmation of the set heating curve steepness with the **OK** button.

In case you choose the wrong heating curve steepness, return to heating curve steepness selection with the **Esc** button.



Later you can change the heating curve steepness with parameter P3.1. The meaning of heating curve steepness is detaily described on page 37.



The first and the second heating circuit is marked with number on hydraulic schemes.



RESET

*Disconnect the controller from power supply. Press and hold the **Help** button and connect power supply.*

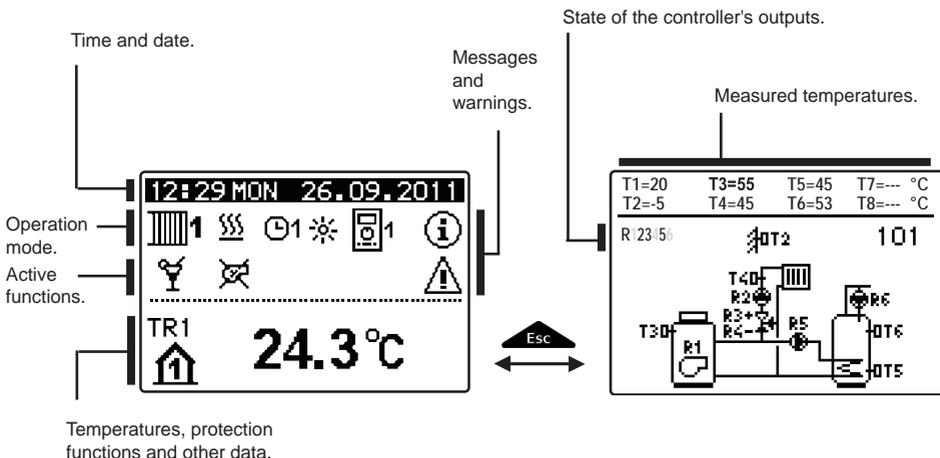
Attention! *The controller will be reset and requires additional setting. When the controller is reset, all of its previous settings are deleted.*

¹ This setting is not available in schemes with only one heating circuit.

GRAPHIC LCD DISPLAY

On the LCD display we can look up all the important data for the controller operation.

DESCRIPTION AND PRESENTATION OF THE BASIC SCREEN:



Review of data on the screen:

In the middle of the screen are displayed operation mode and active user functions. To switch between heating circuits and the screen with the hydraulic scheme review use the **Esc** button.

Temperatures, active outputs, protection functions and other data appear in the bottom section of the screen. To review temperatures and other data, use buttons **◀** and **▶**. The number of sensors and other data displayed on the screen depends on the selected hydraulic scheme and controller settings.



*If you wish to retrieve the requested data after using the keyboard, look for the data with buttons **◀** and **▶**, then confirm it by pressing the **OK** button for 2 seconds.*



*If you press the **Esc** button for 2 seconds, the temperature review will change from a single line review into a double line review or vice versa. In the two-line temperature review, the measured temperature appears in the first line, and the requested or the calculated temperature appears in the second line.*

DESCRIPTION OF SYMBOLS PRESENTED ON THE DISPLAY

SYMBOLS FOR HEATING CIRCUITS

Symbol	Description
 1	The first (mixing) heating circuit.
 2	The second (direct or mixing) heating circuit.
	D. h. w. warming.

SYMBOLS FOR OPERATION MODE INDICATION

Symbol	Description
	Room heating.
	Room cooling.
	Operation according to program timer - day temperature. *
	Operation according to program timer - night temperature. *
	Requested day temperature operating mode.
	Requested night temperature operating mode.
	D. h. w. warming according to program timer - switch-on interval. *
	D. h. w. warming according to program timer - switch-off interval. *
	Switch off.
	Permanent switch-on of d. h. w. warming.
	Manual operation mode.

SYMBOLS FOR USER FUNCTIONS

Symbol	Description
	PARTY operation mode.
	ECO operation mode.
	Holiday operation mode.
	One-time d. h. w. warming.
	Anti legionella protection.
	Liquid fuel boiler switched-off (blocked).
	Solid fuel boiler switch-on.

* The number indicates the first or the second time program.

Symbol	Description
	Automatic switchover to summer heating mode.
	Floor drying.
	Operation with constant stand-pipe temperature.
	Remote activation.
	Boost heating.

SYMBOLS FOR INDICATION OF TEMPERATURES AND OTHER DATA

Symbol	Description
	Measured temperature.
	Calculated or requested temperature.
	Room temperature.*
	Outdoor temperature.
	Liquid fuel boiler temperature.
	Solid fuel boiler temperature.
	Gas boiler temperature.
	Temperature of heat source obtained through BUS connection.
	Combined (liquid and solid fuel) boiler temperature.
	Heat source temperature - supply temperature sensor.
	Stand-pipe temperature.*
	Return-pipe temperature.*
	Domestic hot water temperature.
	Heat accumulator temperature.
	Solar collectors temperature.
	Floor temperature. *

* The number indicates the first or the second heating circuit.

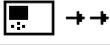
Symbol	Description
	Boiler return-pipe temperature.
	Flue gases temperature.
	Temperature of the area where heat pump is installed.
	D. h. w. circulation pipe temperature.
	Solar collectors temperature - programmable differential thermostat.
	Solid fuel boiler temperature - programmable differential thermostat.
	Heat accumulator temperature - programmable differential thermostat.
	D. h. w. storage tank temperature - programmable differential thermostat.
	Bypass pump - programmable differential thermostat.
	Burner.
	Burner - second stage.
	Bypass pump of the heating circuit (flashing means the pump will switch-off after expiration of delay time).
R12345678 R12345678	Status of the controller's control outputs - relays are switched on. Status of the controller's control outputs - relays are switched off.
	Mixing valve - closing.
	Mixing valve - opening.
	Change-over valve - direct circuit.
	Change-over valve - d. h. w. storage tank.
	D. h. w. warming pump.
	Circulation pump for d. h. w.
	Solar collectors pump.
	Boiler bypass pump.
	Boiler circulation pump.
	Heat pump.
	Electric heater.
	Electric heater for d. h. w.
	Boiler switchover, d. h. w. switchover

Symbol	Description
	Output operation according to program timer.
T1, T2, T3,...T8	Temperature measured by sensors T1, T2, T3, T4, T5, T6, T7 or T8.
TR1, TR2 TA TQ	Temperature measured by a room sensor or room unit DD2+. Outdoor temperature, obtained through the bus connection. Heat source temperature, obtained through the bus connection.

SYMBOLS FOR PROTECTION FUNCTIONS

Symbol	Description
	Liquid fuel boiler overheating protection.
	Solid fuel boiler overheating protection.
	Solar collectors overheating protection.
	Accumulator overheating protection.
	D. h. w. storage tank overheating protection.
	D. h. w. storage tank overheating protection - cooling directed into the boiler.
	D. h. w. storage tank overheating protection - cooling directed into the collectors.
	Frost protection - heating circuit.
	Frost protection - boiler switch-on to minimum temperature.

SYMBOLS FOR THE INDICATION OF COMMUNICATION BETWEEN DEVICES

Symbol	Description
	Devices connected to communication port com.
	Room unit DD2+ is connected. The number beside room unit indicates, whether this is the first or the second room unit.
	State of the controller in bus connection.
	Standalone controller - not in bus network.
	The first controller in bus network.
	Intermediate controller in bus network.
	The last controller in bus network.

SYMBOLS FOR MESSAGES AND WARNINGS

Symbol	Description
	<p>Message</p> <p>In the event of exceeding the maximum temperature or when a protection function is switched on, the symbol on display flashes. When maximum temperature is no longer exceeded or when a protection function has switched off, a turned on symbol will note the recent event. By pressing the  button, the message review screen is retrieved.</p>
	<p>Warning</p> <p>In the event of sensor malfunction, bus network error or com connection error, the symbol on display flashes. When the error is eliminated or is no longer present, a turned on symbol will note the recent event. By pressing the  button, the message review screen is retrieved.</p>

HELP, MESSAGES AND WARNINGS SCREEN

By pressing the  button, the help, messages and warnings screen is retrieved. A new window opens with the following icons:



Short instructions

Short instructions on the use of controller.



Controller version

Review of the controller type and program version.



Messages

List of exceeded maximum temperatures and list of activated protection functions. By pressing the buttons  and  navigate through the list of messages. Exit the list by pressing the .



Warnings

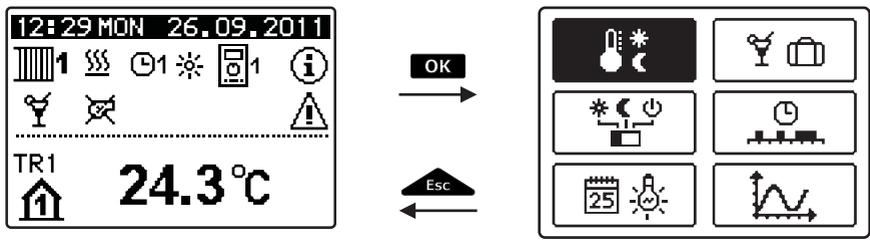
List of sensors and other component malfunctions. By pressing the buttons  and  navigate through the list of messages. Exit the list by pressing the .



Delete list of messages and warnings

Delete list of messages, list of warnings and all unconnected sensors. Attention: You will not be able to delete the sensors necessary for the controller's operation.

ENTERING AND NAVIGATING THROUGH THE MENU

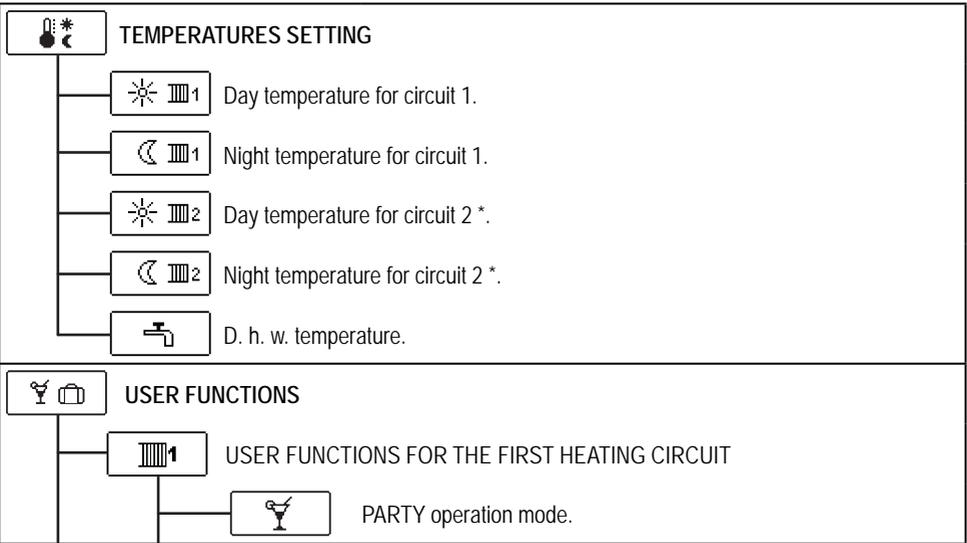


To enter the menu press the **OK** button.
 To navigate through the menu, use buttons **◀** and **▶**, and confirm your selection by pressing the **OK** button.

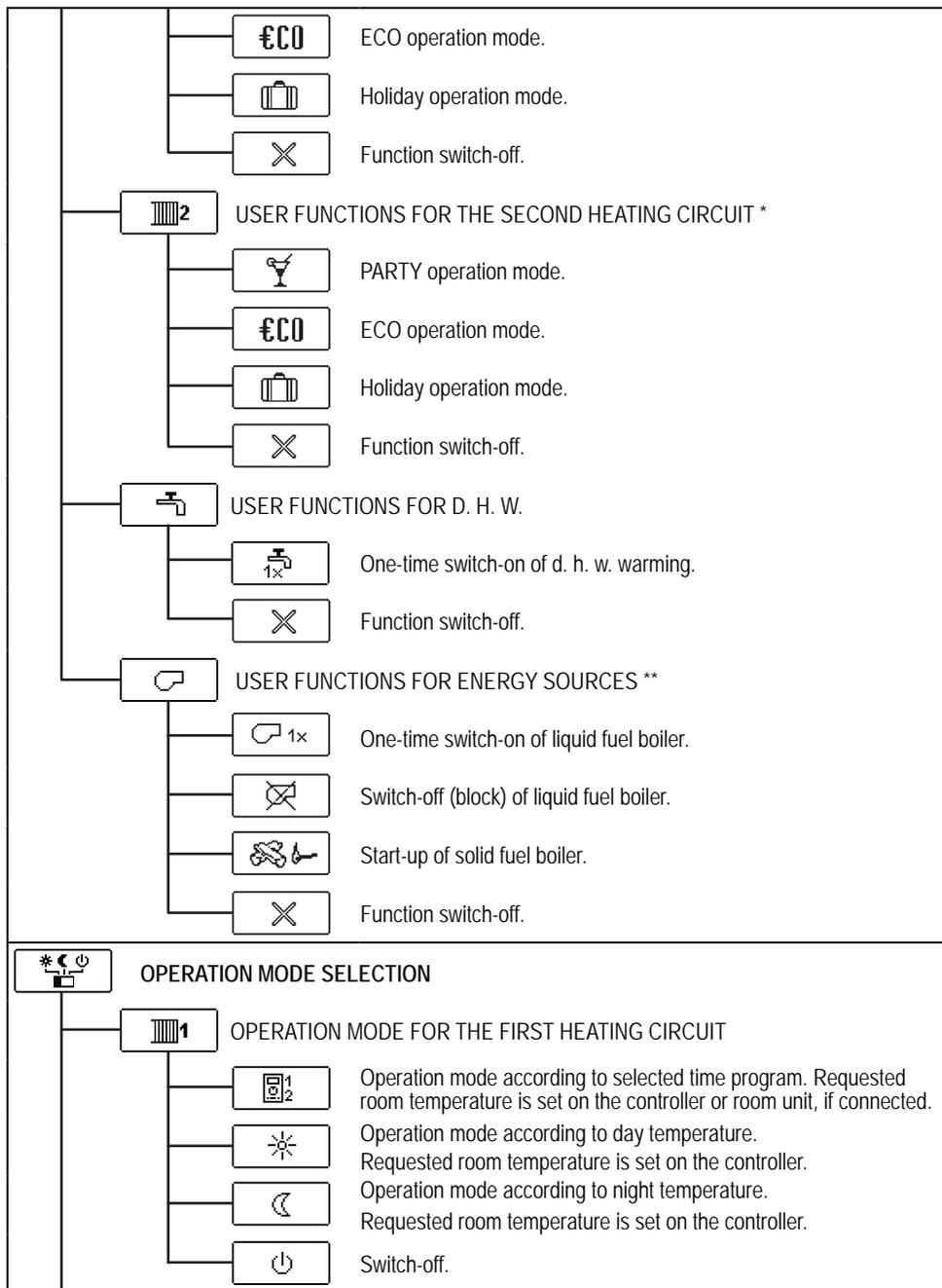
You can return to the previous screen by pressing **Esc**.

i *If no button is pressed for some time, the screen illumination will be switched off or reduced according to the setting.*

MENU STRUCTURE AND DESCRIPTION

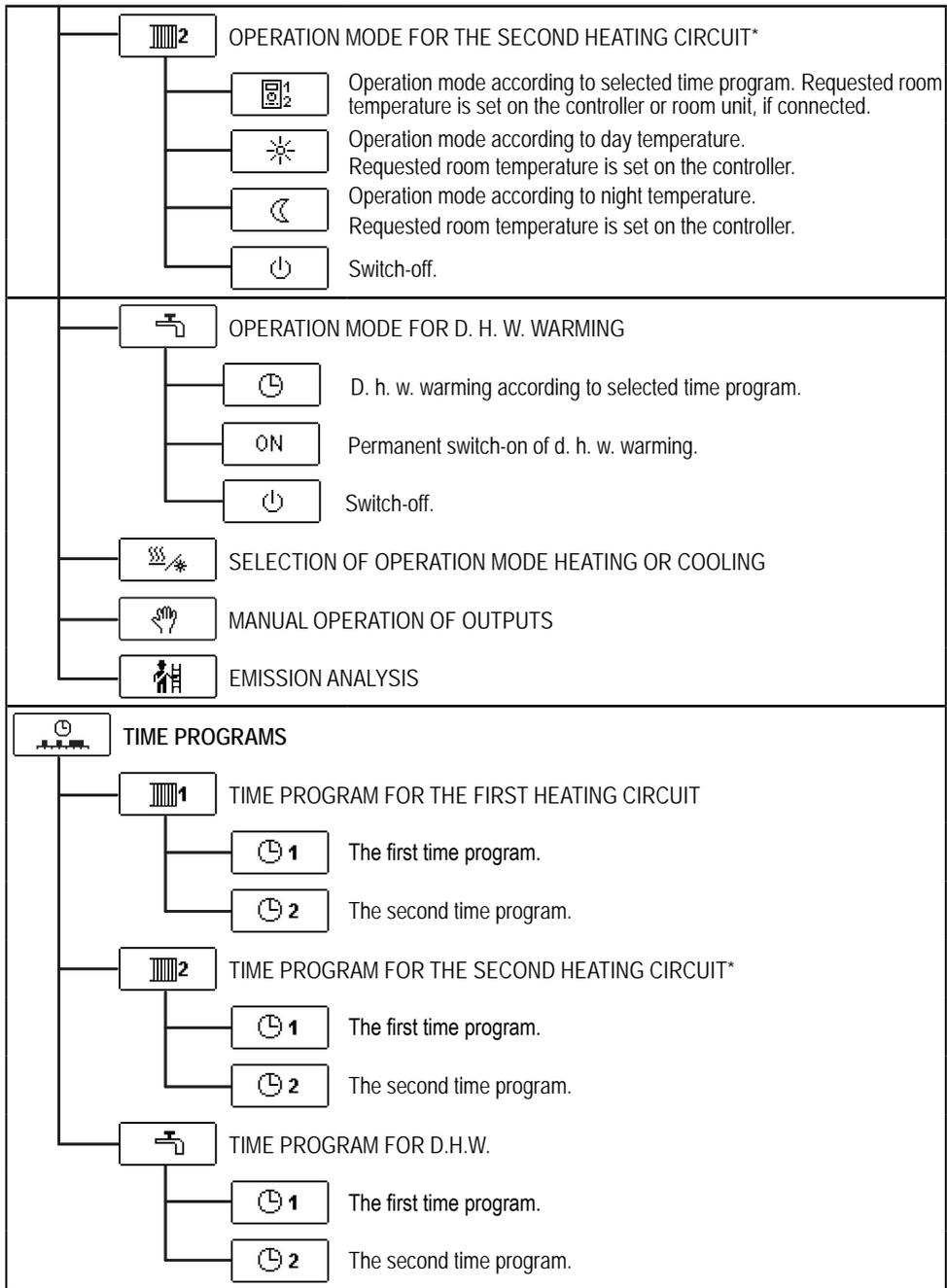


* The setting is only available in schemes with two heating circuits.

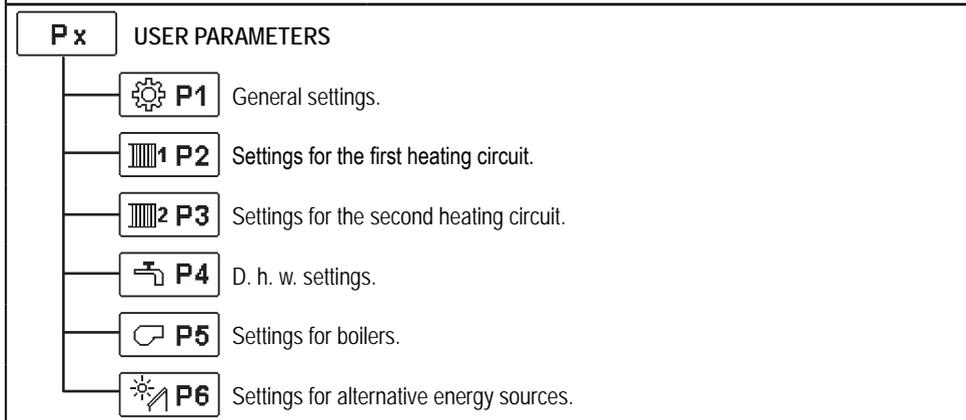
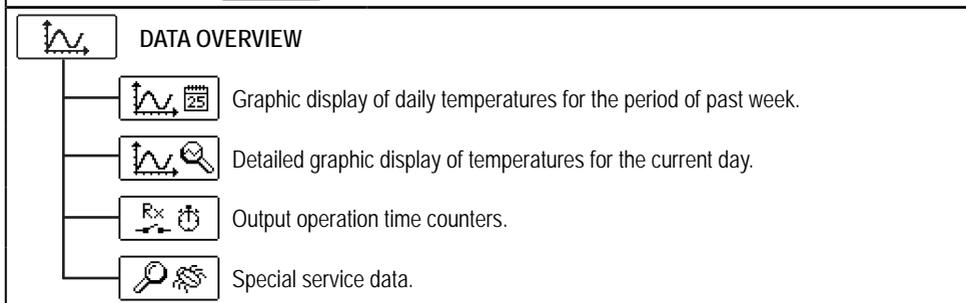
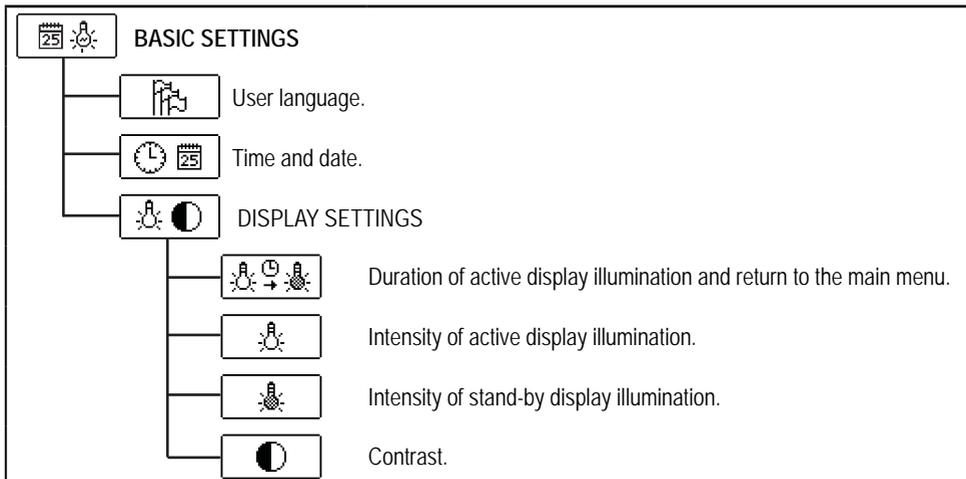


* The setting is only available in schemes with two heating circuits.

** The setting is only available in schemes with changeover of heat sources.



* The setting is only available in schemes with two heating circuits.



S x SERVICE PARAMETERS**S1**

General service parameters.

**S2**

Service parameters for the first heating circuit.

**S3**

Service parameters for the second heating circuit.

**S4**

Service parameters for d. h. w.

**S5**

Service parameters for boilers.

**S6**

Service parameters for alternative energy sources.

F x FUNCTION PARAMETERS**F1**

Parameters for floor drying.

RESET FACTORY SETTINGS**RESET**

Reset of controller parameters.

**RESET**

Reset of time programs.

**RESET**

Reset of all settings and initial controller setup.

**RESET**

Save user settings.

**RESET**

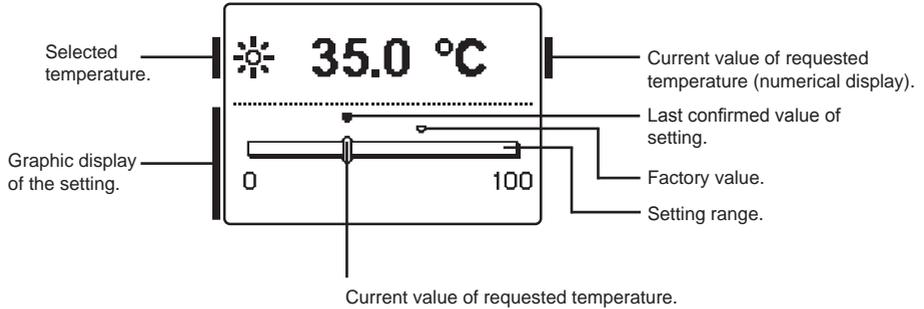
Upload user settings.



TEMPERATURE SETTINGS

The menu displays the temperatures available by selected hydraulic scheme.

Select the temperature with buttons ◀, ▶ and **OK**. A new screen with temperatures will open.



Set the requested temperature with buttons ◀ and ▶, and confirm it with the **OK** button.

Exit the setting by pressing **Esc**.



USER FUNCTIONS

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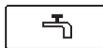
User functions enable additional comfort and benefits of using the controller. The following user functions are available in the menu:



First heating circuit



Second heating circuit*



Domestic hot water



Energy sources **

USER FUNCTIONS FOR THE FIRST AND SECOND HEATING CIRCUIT:



PARTY operation mode

PARTY function activates operation according to the requested comfort temperature. Select Party function with buttons ◀ and ▶, and activate it with the **OK** button. To set the expiration time and requested temperature, select the  icon again.

Now use the ◀ and ▶ buttons to select the setting you wish to change and press the **OK** button. The value will begin to flash. Change the value with buttons ◀ and ▶, and confirm it by pressing the **OK** button.

Exit the setting by pressing the  button.



ECO operation mode

ECO function activates operation according to the requested saving temperature. Select Eco function with buttons ◀ and ▶, and activate it with the **OK** button. To set the expiration time and requested temperature, select the  icon again.

Now use the ◀ and ▶ buttons to select the setting you wish to change and press the **OK** button. The value will begin to flash. Change the value with buttons ◀ and ▶, and confirm it by pressing the **OK** button.

Exit the setting by pressing the  button.

* Functions are available only by schemes with two heating circuits.

** Functions are available only by schemes with liquid fuel boiler and solid fuel boiler.



Holiday operation mode

HOLIDAY function activates operation according to the requested saving temperature up to selected date.

Select Holiday function with buttons ◀ and ▶, and activate it with the **OK** button. To set the expiration date and requested temperature, select the  icon again.

Now use the ◀ and ▶ buttons to select the setting you wish to change and press the **OK** button. The value will begin to flash. Change the value with buttons ◀ and ▶, and confirm it by pressing the **OK** button.

Exit the setting by pressing the  button.

USER FUNCTIONS FOR D. H. W. WARMING:

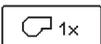


One time activation of d. h. w. warming

This function activates immediate d. h. w. warming to the requested temperature. When the requested d. h. w. temperature is reached, the function deactivates automatically.

Use buttons ◀ and ▶ to select the one-time d. h. w. warming and activate it by pressing the **OK** button. Exit the setting by pressing the  button.

USER FUNCTIONS FOR HEAT SOURCES:



One-time activation of liquid fuel boiler

This function activates immediate switchover from solid fuel boiler or heat accumulator to liquid fuel boiler. One-time activation of liquid fuel boiler can only be activated if solid fuel boiler or heat accumulator temperature is lower as calculated circuit temperature.

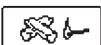
Use buttons ◀ and ▶ to select the one-time activation of liquid fuel boiler and activate it by pressing the **OK** button. Exit the setting by pressing the  button.



Switch-off (block) of liquid fuel boiler

Use this function, when you wish to switch off or block liquid fuel boiler and heat only with solid fuel boiler. This function does not have an automatic deactivation and must be deactivated manually.

Use buttons ◀ and ▶ to select blocking of liquid fuel boiler and activate it by pressing the **OK** button. Exit the setting by pressing the  button.



Start-up of solid fuel boiler

This function deactivates liquid fuel boiler and is used whenever we wish to start-up the solid fuel boiler. If the solid fuel boiler does not reach the requested heating temperature in certain period of time, the liquid fuel boiler activates again. Use buttons ◀ and ▶ to select the startup of solid fuel boiler and activate it by pressing the **OK** button. Exit the setting by pressing the  button.



You can abort all user functions at any time by selecting the  icon.



OPERATION MODE SELECTION

In the menu are selection of operation mode for each heating circuit, for d. h. w. warming and other operation modes. Following operation modes are available in the menu.



First heating circuit



Second heating circuit *



Domestic hot water



Manual operation



Switchover between heating and cooling



Emissions analysis

OPERATION MODE FOR THE FIRST AND THE SECOND HEATING CIRCUIT:



Operation according to selected time program

Operation according to the selected time program with day and night temperature which is set on the controller.



Operation according to the selected time program with day and night temperature which is set on the room unit DD2+.



Operation mode according to day temperature

Controller operates according to the requested day temperature which is set on controller.



Operation mode according to night temperature

Controller operates according to the requested night temperature which is set on controller.



Switch-off

Controller is switched off. Frost protection remains active, if operation mode heating is selected. Overheating protection remains active, if operation mode cooling is selected.

OPERATION MODE FOR W. H. W. WARMING:



D. h. w. warming according to selected time program

D. h. w. is warmed according to the selected time program.



Permanent activation of d. h. w. warming

D. h. w. warming operates continuously.



Switch-off

D. h. w. is not being warmed.

* The menu is only available in schemes with two heating circuits.

MANUAL OPERATION MODE:

This operation mode is used when testing the heating system or in the event of a malfunction. Each control output can be manually switched on, off or set to operate automatically.

R1 = AUTO	T1= 22.4 °C
R2 = AUTO	T2= 18.4 °C
R3 = AUTO	T3= 20.8 °C
R4 = AUTO	T4= 25.4 °C
R5 = AUTO	T5= 55.5 °C
R6 = AUTO	T6= 50.5 °C
R7 = AUTO	T7= ERR=
R8 = AUTO	T8= ERR=

Move between individual outputs **R1** to **R8** with buttons ◀ and ▶. Select the output by pressing the **OK** button. Value ON, OFF or AUTO will begin to flash. Now you can change the output status with buttons ◀ and ▶. Confirm the setting by pressing the **OK** button.

Exit the setting by pressing the  button.

HEATING AND COOLING MODE SELECTION:

To switchover between heating and cooling select icon and press key **OK**.



Heating



Cooling



Cooling control is operated thermostatically according to the requested room temperature, with a constant stand-pipe temperature. The temperature is set with parameters S2.12 and S3.12.



For cooling function a room sensor or a room unit DD2+ needs to be connected and the system for cooling water supply must be switched on.



When switching between heating and cooling, you should change the requested day and night temperature.

EMISSION ANALYSIS:

This operation mode is intended for emission measurement. Controller activates burner and maintains boiler temperature between 60 °C and 70 °C by adequate activation of burner load (heating circuits, domestic hot water) and in such way provides boiler operation without burner switch-off's.

Function automatically expires after 20 minutes or it can be switched off earlier by selecting the icon once again.



TIME PROGRAM SETTINGS

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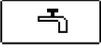
Weekly time programs enable automatic switchover between day and night temperature or activation and deactivation of domestic hot water warming.



First heating circuit

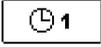


Second heating circuit

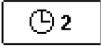


Domestic hot water

For each heating circuit there are two time programs available:



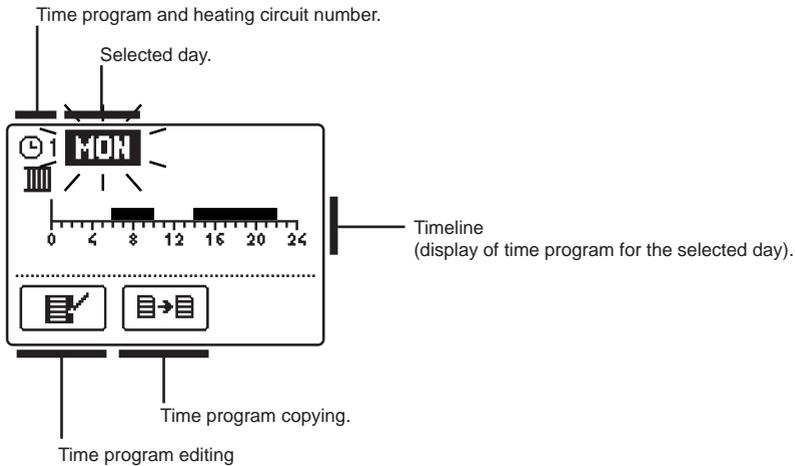
First time program



Second time program

Modifying the time program

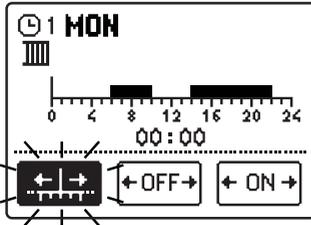
Select the requested heating circuit and time program with buttons ◀, ▶ and **OK**. A new screen will appear:



Select the day, which you wish to edit or copy with buttons ◀, ▶ and **OK**. Now use buttons ◀, ▶ and **OK** to select the icon for time program management  or the icon for time program copying .



Time program editing



A new screen appears with the display of time program and three icons for editing the program:



- free movement of the cursor



- drawing of switch-off interval or night temperature



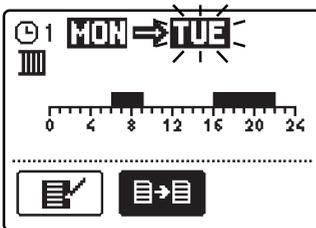
- drawing of switch-on interval or day temperature

Select the requested command icon with buttons ◀ ▶ and confirm the selection by pressing the **OK** button. Cursor will appear on the time line. Now draw the requested time interval course with buttons ◀ and ▶. Finish drawing of time program by pressing the **OK** button.

Exit the time program editing by pressing the **Esc** button.



Time program copying



A new screen appears with the display of time program for the selected day. On the top of the screen you will find the field for the selection of day or a group of days into which you wish to copy your time program.

Select the day or a group of days with buttons ◀ and ▶. Press the **OK** button to copy.

Exit the copying by pressing the **Esc** button.

Default settings of time programs

The first time program for room heating and d. h. w. warming **⌚1**

Day	Switch-on interval.
MON.-FRI.	05:00 - 07:30 13:30 - 22:00
SAT.-SUN.	7:00 - 22:00

The second time program for room heating and d. h. w. warming **⌚2**

Day	Switch-on interval.
MON.-FRI.	06:00 - 22:00
SAT.-SUN.	7:00 - 23:00



BASIC SETTINGS

ENG

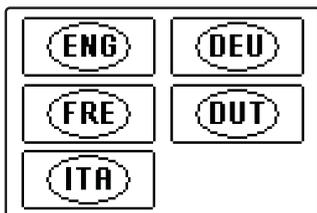
This menu is intended for the setting of language, time, date and display.



User language

Select the requested user language with buttons ◀, ▶ and confirm it by pressing the **OK** button.

Exit the setting by pressing the **Esc** button.



Time and date



The exact time and date is set in the following manner:

Move through individual data with buttons ◀ and ▶. With the **OK** button select the data you wish to change. When data begins to flash, change it with buttons ◀ and ▶, and confirm it by pressing the **OK** button.

Exit the setting by pressing the **Esc** button.



Display settings

The following settings are available:



Duration of active display illumination and return to the main menu.



Intensity of active display illumination.

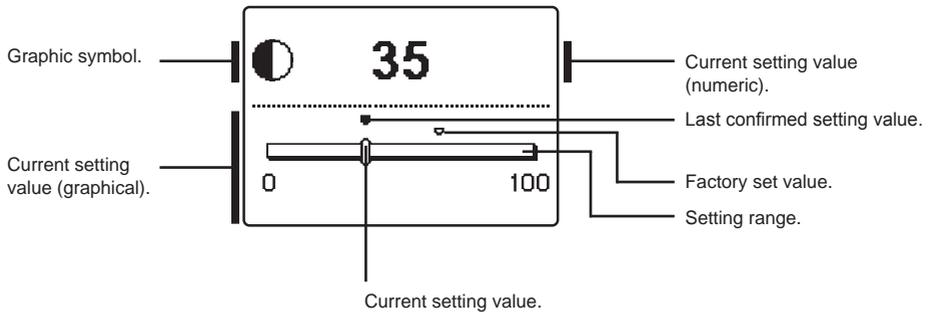


Intensity of standby display illumination.



Contrast.

Select and confirm the requested setting with buttons **◀**, **▶** and **OK**:

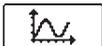


You can change the setting with buttons **◀**, **▶** and confirm it by pressing the **OK** button.

Exit the setting by pressing the **Esc** button.



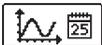
*Change of setting is stored only if confirmed with the **OK** button.*



DATA OVERVIEW

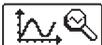
ENG

The following icons for accessing data on the controller operations are available in the menu:



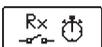
GRAPHIC DISPLAY OF DAILY TEMPERATURES FOR THE PERIOD OF PAST WEEK

Graphic display of daily temperature course for each sensor. Temperatures are recorded for the past week of operation.



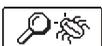
DETAILED GRAPHIC DISPLAY OF TEMPERATURES FOR CURRENT DAY

Detailed graphic display of temperature course in the current day for each sensor. The frequency of temperature recording can be set with parameter P1.7.



OUTPUT OPERATION TIME COUNTERS

Displayed are operation times of controller's outputs.



SPECIAL SERVICE DATA

These serve to provide diagnostics for technical support.



*You can review temperature graphs by moving between sensors with buttons ◀ and ▶. Press button **OK** on selected sensor. Date begins to flash.*

*Now move between days with buttons ◀ and ▶. Press button **OK** to return to sensor selection.*

*You can change the range of temperature display on the graph with the **Help** button.*

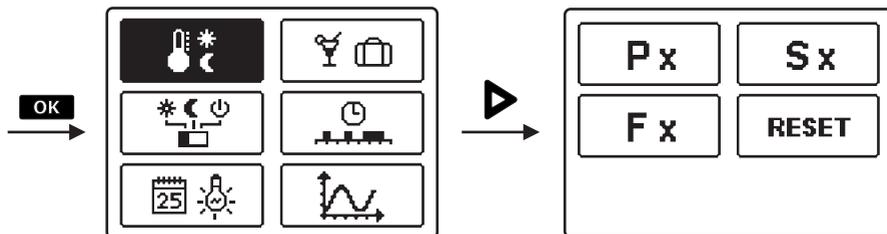
*Exit temperature review by pressing the **Esc** button.*

SERVICE SETTINGS MANUAL

ENG

CONTROLLER PARAMETERS

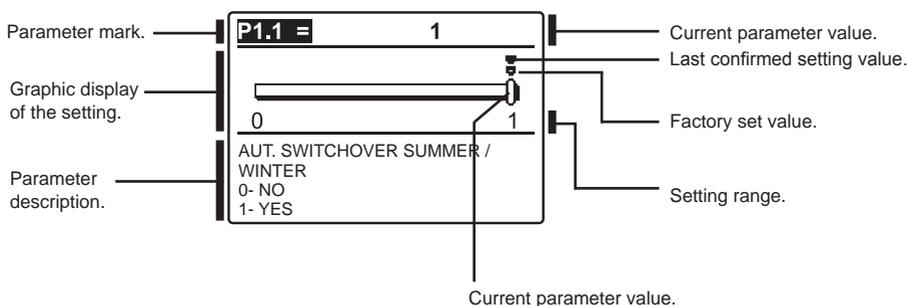
All additional settings and adaptations of the controller's operations are performed with the help of parameters. Available are user, service and function parameters. Located are on the second menu screen.



In each group, only the parameters used in the selected hydraulic scheme can be seen. Factory set values of parameter settings also depend on the selected hydraulic scheme.

P x USER PARAMETERS

User parameters are divided into the following groups: **P1** - general settings, **P2** - settings for the first heating circuit, **P3** - settings for the second heating circuit, **P4** - settings for domestic hot water, **P5** - settings for boilers, and **P6** - settings for alternative energy sources. When you select the requested group of parameters in the menu, a new screen appears:



You can change the settings by pressing the **OK** button. The setting value will begin to flash. Now you can change it with buttons **◀** and **▶**. Confirm the setting by pressing the **OK** button. Now you can move on to another parameter with buttons **◀** and **▶**, and repeat the procedure.

Exit the parameter settings by pressing the **Esc** button.



General settings:

Parameter	Parameter name	Parameter description	Setting range	Default setting
P1.1	AUT. SWITCHOVER SUMMER / WINTER	Automatic switch-off and switch-on of heating in respect to average one-day outdoor temperature.	0- NO 1- YES	1
P1.2	AVERAGE OUTDOOR TEMP. FOR SUMMER / WINTER SWITCHOVER	Setting of average one-day outdoor temperature at which the heating should switch-off or switch-on.	10 ÷ 30 °C	18
P1.3	OUTDOOR TEMP. FOR ACTIVATION OF FROST PROTECTION	Setting of outdoor temperature by which the frost protection will activate and run boiler at minimum temperature.	-30 ÷ 10 °C	-10
P1.4	REQUESTED ROOM TEMP. WHEN HEATING IS SWITCHED OFF	Setting of requested room temperature when heating is switched off.	2 ÷ 12 °C	6
P1.5	TEMPERATURE ROUND UP	Precision of displayed temperatures.	0- 0.1 °C 1- 0.2 °C 2- 0.5 °C 3- 1 °C	2
P1.6	AUT. SHIFT OF CLOCK TO SUMMER / WINTER TIME	With the help of a calendar, the controller carries out the automatic clock changeover between summer and winter time.	0- NO 1- YES	1
P1.7	PERIOD OF TEMPERAT. LOGGING	By setting this field you define how often the measured temperatures are saved.	1 ÷ 30 min	5
P1.8	TONES	By setting this field you define whether key pressing is accompanied with sound signals or not.	0- OFF 1- KEYPAD 2- ERRORS 3- KEYPAD & ERRORS	1
P1.9	ADVANCED DISPLAY OF TEMPERATURES	Advanced display of temperatures displays temperatures on main screen in double rows. First row is measured temperature; second row is required or calculated temperature.	0- NO 1- YES	1



Settings for the first heating circuit:

Parameter	Parameter name	Parameter description	Setting range	Default setting
P2.1	HEAT CURVE STEEPNESS	Heating curve steepness indicates what temperature is required for the heating bodies by a determined outdoor temperature. See chapter Heating curve.	0,2 ÷ 2,2	0,7 - floor 1,0 - radiators
P2.2	PARALLEL SHIFT OF HEATING CURVE	Setting of parallel shift of heating curve or calculated stand-pipe temperature. Use this setting to eliminate deviation between actual and required room temperature.	-15 ÷ 15 °C	0
P2.3	DURATION OF BOOST HEATING	Duration of boosted room temperature by changeover from night to day heating period.	0 ÷ 200 min	0
P2.4	ROOM TEMPERATURE INCREASE BY BOOST HEATING	Boost room temperature increase by changeover from night to day heating period.	0 ÷ 8 °C	3

P3

Settings for the second heating circuit:

Parameter	Parameter name	Parameter description	Setting range	Default setting
P3.1	HEAT CURVE STEEPNESS	Heating curve steepness indicates what temperature is required for the heating bodies by a determined outdoor temperature. See chapter Heating curve.	0,2 ÷ 2,2	0,7-floor 1,0- radiators
P3.2	PARALLEL SHIFT OF HEATING CURVE	Setting of parallel shift of heating curve or calculated stand-pipe temperature. Use this setting to eliminate deviation between actual and required room temperature.	-15 ÷ 15 °C	0
P3.3	DURATION OF BOOST HEATING	Duration of boosted room temperature by changeover from night to day heating period.	0 ÷ 200 min	0
P3.4	ROOM TEMPERATURE INCREASE BY BOOST HEATING	Boost room temperature increase by changeover from night to day heating period.	0 ÷ 8 °C	3
P3.5	HEAT CURVE STEEPNESS FOR ADDITIONAL DIRECT CIRCUITS	Setting of heat curve steepness for additional direct heating circuits.	0,2 ÷ 2,2	1,2
P3.6	PARALLEL SHIFT OF HEATING CURVE FOR ADD. DIRECT CIRCUITS	Parallel shift of heating curve for additional heating circuits. Values 16 ÷ 90 set directly the boiler temperature when additional direct heating circuit is activated.	-15 ÷ 15 °C 16 ÷ 90 °C	6

P4

Settings for domestic hot water:

Parameter	Parameter name	Parameter description	Setting range	Default setting
P4.1	D. H. W. TEMPERATURE IN OFF PERIOD	Setting of d. h. w. temperature in OFF program timer interval.	4 ÷ 70 °C	4
P4.2	PRIORITY OF D. H. W. WARMING TO CIRCUIT 1	Setting if d. h. w. heating has priority to room heating in circuit 1.	0- NO 1- YES	0
P4.3	PRIORITY OF D. H. W. WARMING TO CIRCUIT 2	Setting if d. h. w. heating has priority to room heating in circuit 2.	0- NO 1- YES	0
P4.7	TIME PROGRAM FOR D. H. W. CIRCULATION	Selection of d. h. w. warming time program which will be used for d. h. w. circulation. Setting 1 is first time program for domestic hot water warming. Setting 2 is second time program for domestic hot eater warming. Setting 3 is selected time program for domestic hot water warming.	1- PROG. 1 2- PROG. 2 3- SELECT. PROG.	3
P4.8	RUNNING TIME FOR D. H. W. CIRCULATION PUMP	Setting of running time for d. h. w. circulation pump. Pump running period is always followed by the pump stand-by period.	0 ÷ 600 sec	300

Parameter	Parameter name	Parameter description	Setting range	Default setting
P4.9	STAND-BY TIME FOR D. H. W. CIRCULATION PUMP	Setting of stand-by time for d. h. w. circulation pump. Pump stand-by period is always followed by the pump running period.	1 ÷ 60 min	10



Settings for boilers:

Parameter	Parameter name	Parameter description	Setting range	Default setting
P5.1	MIN. LIQUID FUEL BOILER TEMP.	Setting of min. liquid fuel boiler temperature.	10 ÷ 90 °C	35
P5.2	MIN. SOLID FUEL BOILER TEMPERATURE	Setting of min. solid fuel boiler temperature.	10 ÷ 90 °C	55
P5.3	MIN. HEAT ACCUMULATOR TEMP.	Setting of min. temperature for heat transfer from storage tank.	20 ÷ 70 °C	30



Settings for alternative energy sources:

Parameter	Parameter name	Parameter description	Setting range	Default setting
P6.1	SWITCH-ON DIFFERENCE FOR COLLECTORS OR SOLID FUEL BOILER	Setting of difference between solar collectors or solid fuel boiler temperature and storage tank or heat accumulator temperature by which the circulation pump shall switch-on.	5 ÷ 30 °C	12
P6.2	SWITCH-OFF DIFFERENCE FOR COLLECTORS OR SOLID FUEL BOILER	Setting of difference between solar collectors or solid fuel boiler temperature and storage tank or heat accumulator temperature by which the circulation pump shall switch-off.	1 ÷ 25 °C	4
P6.3	MIN. TEMPERATURE OF COLLECTORS OR SOLID FUEL BOILER	Setting of min. solar collector or solid fuel boiler temperature to activate the circulation pump.	10 ÷ 60 °C	35

With adjustment of heating curve the controller is adapted to the building. Proper heating curve adjustment is very important for optimal heating control. Heating curve steepness indicates, what temperature is required for the heating bodies by a determined outdoor temperature. The steepness value depends mainly on the heating system type (floor, wall, radiator, convector heating) and insulation of the building.

Determining the heating curve steepness

If you have enough data, you can determine the heating curve steepness with a calculation, otherwise from experience, based on the evaluation of heating system dimensioning and building insulation.

The heating curve steepness is set correct, if the room temperature remains stable, even by large outdoor temperature changes.

While the outdoor temperature is above + 5 °C, you can adjust the room temperature by changing the day or night temperature or with the parallel shift of the heating curve (parameters P2.2 and P3.2).

If the object is underheated by low outdoor temperatures, the heat curve steepness needs to be increased.

If the object is overheated by low outdoor temperatures, the heat curve steepness needs to be decreased.

The maximum steepness increase/decrease should not be greater than 0.1 to 0.2 units per one observation. At least 24 hours must pass between two observations.

Preferred settings of the heating curve steepness:

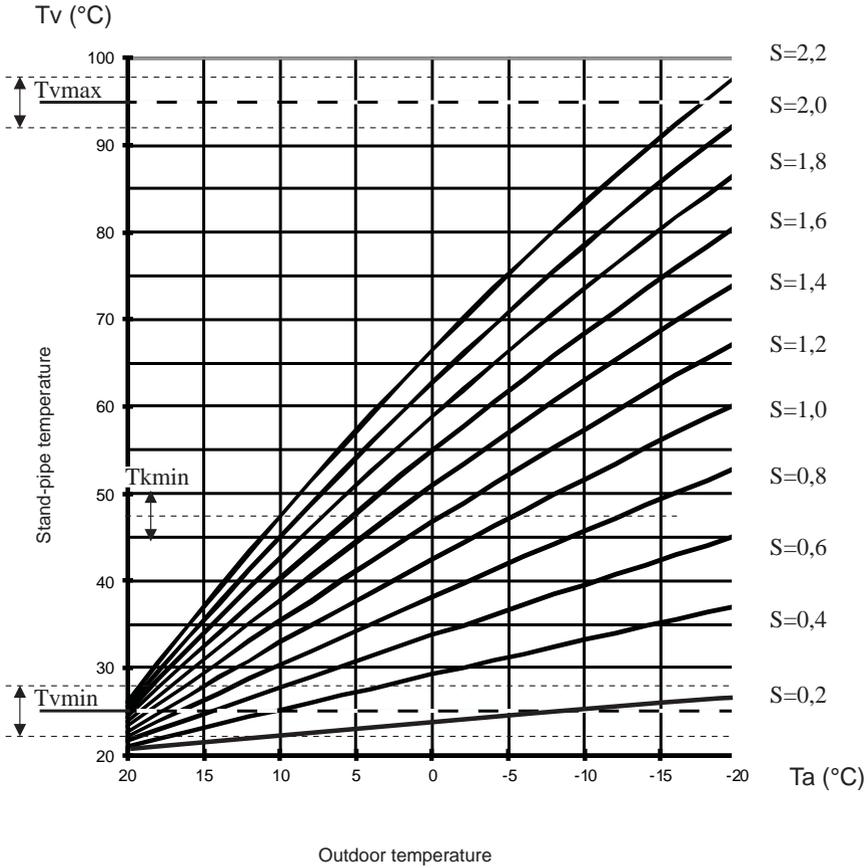
Heating system:	Setting range:
floor	0,2 - 0,8
wall	0,4 - 1,0
radiator	0,8 - 1,4



With adjusting the heat curve steepness, the controller is tuned with the building. For optimal controller operation, the right setting of the heat curve steepness is very important.

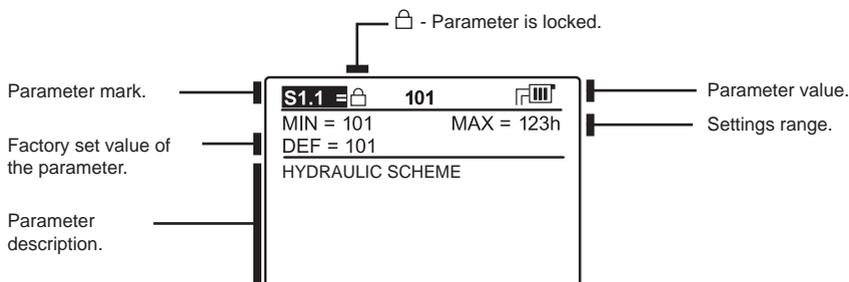
Heat curve diagram

ENG

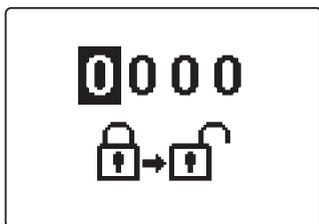


Service parameters are divided into the following groups: **S1** - general settings, **S2** - settings for the first heating circuit, **S3** - settings for the second heating circuit, **S4** - settings for domestic hot water, **S5** - settings for boilers in **S6** - settings for alternative energy sources.

Service parameters enable you to choose among various additional functions and adaptations of controller's operation. When you select the requested parameter group, a new screen appears:



You can change the setting by pressing the **OK** button. Parameters are locked by default. A new screen appears for the entry of unlocking code:



Use buttons **◀** and **▶** to find the number you wish to change and press the **OK** button. When the number begins to flash, you can change it with buttons **◀** and **▶**, and confirm it by pressing the **OK** button. When the correct code is entered, the controller will unlock the parameters and return to the menu with the selected group of parameters. Exit the unlocking code entry by pressing the **Esc** button.



The factory set code is 0001.

You can change the parameter value with buttons **◀** and **▶**. Confirm the selection by pressing the **OK** button. Now you can move on to another parameter with buttons **◀** and **▶**, and repeat the procedure.

Exit parameter settings by pressing the **Esc** button.



Only a trained professional shall perform the changing of service and function parameters.



General service settings:

ENG

Parameter	Parameter name	Parameter description	Setting range	Default setting
S1.1	HYDRAULIC SCHEME	Selection of hydraulic scheme.	depends on type of controller	/
S1.2	CODE FOR UNLOCKING THE SERVICE SETTINGS	This setting enables the change of code which is necessary to unlock the service settings (S and F parameters). WARNING! Keep new code on a safe place. Without this code is impossible to change service settings.	0000 - 9999	0001
S1.3	TEMPERATURE SENSOR TYPE	Selection of temperature sensors PT1000 or KTY10.	0- PT1000 1- KTY10	0
S1.4	T1 SENSOR FUNCTION	Selection of function for sensor connected to input T1. 1- RF, room sensor in circuit 1 2- EF1, sensor for limitation of max. floor temperature in circuit 1. Max. floor temperature is set with parameter S2.11. 3- RLF1, return pipe sensor in circuit 1. Activates limitation of difference between stand and return pipe and by that the limitation of max. heating circuit power. Max. difference is set with parameter S2.14. 4- KTF, sensor in solar collectors. Activates the solar differential thermostat. (Cold sensor for differential thermostat is T8, pump is controlled with output R6, operation mode is set with parameters P6 and S6). 5- KF2, sensor in solid fuel boiler. Activates the solid fuel boiler differential thermostat. (Cold sensor for differential thermostat is T8, pump is controlled with output R6, operation mode is set with parameters P6 and S6). 6- BF3, d. h. w circulation with temperature sensor. Sensor is placed onto (hot) exit pipe from storage tank. D. h. w. circulation pump is activated if temperature increase is detected. Duration time of circulation is set with parameter P4.8. 7- SVS, d. h. w. circulation with flow switch. D. h. w. circulation pump is activated if contact are closed. Duration time of circulation is set with parameter P4.8. 8- BF2, auxiliary sensor in d. h. w. storage tank. It is installed in upper third of storage tank. Warming of d. h. w. will activate only when BF2 sensor detects drop of temperature. 9- AGF, flue gas temperature sensor for boiler. Warning is displayed on the screen, if flue gas temperature rises above value of parameter S5.18. 10- RFHP, room sensor in ambient where d. h.w. heat pump is installed. D. h. w. warming with other heat sources is disabled if room temperature is higher as set with parameter S4.11. 11- RLKF, boiler return-pipe sensor. Controller maintains min. level of boiler return-pipe temperature set with parameter S5.14. For this setting it is necessary to have a hydraulic system with primary boiler circulation pump or hydraulic system with boiler bypass pump (parameter S4.9=4).	1- RF1 2- EF1 3- RLF1 4- KTF 5- KF2 6- BF3 7- SVS 8- BF2 9- AGF 10- RFHP 11- RLKF	1

Parameter	Parameter name	Parameter description	Setting range	Default setting
S1.5	T8 SENSOR FUNCTION	<p>Selection of function for sensor connected to input T8.</p> <p>1- RF2, room sensor in circuit 2</p> <p>2- EF2, sensor for limitation of max. floor temperature in circuit 2. Max. floor temperature is set with parameter S3.11.</p> <p>3- RLF2, return pipe sensor in circuit 2. Activates limitation of difference between stand and return pipe and by that the limitation of max. heating circuit power. Max. difference is set with parameter S3.14.</p> <p>4- RF1, room sensor in circuit 1</p> <p>5- EF1, sensor for limitation of max. floor temperature in circuit 1. Max. floor temperature is set with parameter S2.11.</p> <p>6- RLF1, return pipe sensor in circuit 1. Activates limitation of difference between stand and return pipe and by that the limitation of max. heating circuit power. Max. difference is set with parameter S2.14.</p> <p>7- BF3, d. h. w circulation with temperature sensor. Sensor is placed onto (hot) exit pipe from storage tank. D. h. w. circulation pump is activated if temperature increase is detected. Duration time of circulation is set with parameter P4.8.</p> <p>8- SVS, d. h. w. circulation with flow switch. D. h. w. circulation pump is activated if contact are closed. Duration time of circulation is set with parameter P4.8.</p> <p>9- BF2, auxiliary sensor in d. h. w. storage tank. It is installed in upper third of storage tank. Warming of d. h. w. will activate only when BF2 sensor detects drop of temperature.</p> <p>10- AGF, flue gas temperature sensor for boiler. Warning is displayed on the screen, if flue gas temperature rises above value of parameter S5.18.</p> <p>11- RFHP, room sensor in ambient where d. h.w. heat pump is installed. D. h. w. warming with other heat sources is disabled if room temperature is higher as set with parameter S4.11.</p> <p>12- RLKF, boiler return-pipe sensor. Controller maintains min. level of boiler return-pipe temperature set with parameter S5.14. For this setting it is necessary to have a hydraulic system with primary boiler circulation pump or hydraulic system with boiler bypass pump (parameter S4.9=4).</p>	<p>1- RF2</p> <p>2- EF2</p> <p>3- RLF2</p> <p>4- RF1</p> <p>5- EF1</p> <p>6- RLF1</p> <p>7- BF3</p> <p>8- SVS</p> <p>9- BF2</p> <p>10- AGF</p> <p>11- RFHP</p> <p>12- RLKF</p>	1

Parameter	Parameter name	Parameter description	Setting range	Default setting
S1.6	DIGITAL INPUT T1 AND T6	This setting defines controller operation mode if short circuit is detected on input T1 or T6. 1- Day temperature operation mode, regardless to currently selected operation mode. See also parameter S1.9. 2- Additional direct circuit is connected. Temperature requirements of additional direct circuit (P3.5 and P3.6) are also considered for calculation of requested boiler temperature. By schemes with two heat sources the switchover to other heat source is done with delay, set with parameter S5.15. 3- Additional direct circuit is connected. Temperature requirements of additional direct circuit (P3.5 and P3.6) are also considered for calculation of requested boiler temperature. By schemes with two heat sources the switchover to other heat source is done without delay. 4- Switchover from heating to cooling operation mode. 5- Boost heating function is activated. This setting disables regular boost heating function which is activated by changeover from night to day temperature period. 6- Liquid fuel boiler is blocked. Controller will operate only with solid fuel boiler. 7- Counter for boiler operation time.	1- REMOTE ACTIV. 2- DIR. CIRC., DELAYED SWITCHOVER 3- DIR. CIRCUIT 4- COOLING 5- BOOST 6- BOILER LOCKOUT 7- BURNER COUNTER	1
S1.7	ANTI-BLOCK FUNCTION	All outputs that haven't been activated in the last week are activated on Friday between 20:00 and 20:15. for 60 seconds.	0- NO 1- YES	0
S1.8	REMOTE ACTIVATION VIA BUS	Selection if remote activation can be activated only local or also from master controller.	1- LOCALY 2- LOCALY & FROM MASTER	2
S1.9	CIRCUITS FOR REMOTE ACTIVATION	Selection of circuits affected by remote activation.	1- CIRCUIT 1 2- CIRCUIT 2 3- CIRCUIT 1 & 2	3
S1.10	BUILDING TYPE (TIME CONSTANT)	Selection of building type (time constant). For heavy (thick walls) and good isolated buildings select higher value. For light (thin walls, no heat accumulation) and poor isolated objects select lower value.	0 ÷ 12 h	0
S1.13	SENSOR T1 CALIBRATION	Correction of displayed measured temperature for sensor T1.	-5 ÷ 5 K	0
S1.14	SENSOR T2 CALIBRATION	Correction of displayed measured temperature for sensor T2.	-5 ÷ 5 K	0
S1.15	SENSOR T3 CALIBRATION	Correction of displayed measured temperature for sensor T3.	-5 ÷ 5 K	0
S1.16	SENSOR T4 CALIBRATION	Correction of displayed measured temperature for sensor T4.	-5 ÷ 5 K	0
S1.17	SENSOR T5 CALIBRATION	Correction of displayed measured temperature for sensor T5.	-5 ÷ 5 K	0
S1.18	SENSOR T6 CALIBRATION	Correction of displayed measured temperature for sensor T6.	-5 ÷ 5 K	0
S1.19	SENSOR T7 CALIBRATION	Correction of displayed measured temperature for sensor T7.	-5 ÷ 5 K	0
S1.20	SENSOR T8 CALIBRATION	Correction of displayed measured temperature for sensor T8.	-5 ÷ 5 K	0

Service settings for the first heating circuit:

Parameter	Parameter name	Parameter description	Setting range	Default setting
S2.1	INFLUENCE OF ROOM TEMP. DEVIATION	Set the influence of room temperature deviation. Lower value means lower influence, higher value means higher influence.	0,0 ÷ 3,0	1
S2.2	INFLUENCE OF ROOM SENSOR T1 OR T8	Setting of room sensor T1 or T8 influence on the operation of first circuit. 1- automatic room sensor influence - room sensor has no influence if room unit DD2+ is connected - room sensor has influence if room unit DD2+ isn't connected 2- room sensor has influence 3- room sensor has no influence This setting has affect only if S1.4=1 (for sensor T1) or S1.5=4 (for sensor T8).	1- AUTO 2- YES 3- NO	1
S2.3	INFLUENCE OF DD2+ ROOM SENSOR	Setting of DD2+ room sensor influence on the operation of first circuit. 1- influence has only room unit DD2+ controlling the first circuit (coding switch on room unit S.2=OFF). It can be set on first, second or both room units. 2- influence has only first room unit DD2+ (coding switch on room unit S.4=OFF) 3- influence has only second room unit DD2+ (coding switch on room unit S.4=ON) 5- room unit DD2+ has no influence	1- AUTO 2- 1. DD2+ 3- 2. DD2+ 4- 1. & 2. DD2+ 5- NO	1
S2.4	PUMP OPERATION MODE	Setting of pump operation mode. Settings have the following meaning: 1- STAND. (circulation pump of mixing circuit - regular) 2- pump switches off, if requested room temperature is reached (only direct circuit) 3- operation according to time program P1 4- operation according to time program P2 5- SEL. PROG. (operation according to selected time program)	1- STAND-ARD 2- SWITCH-OFF 3- PROG. P1 4- PROG. P2 5- SE-LECTED PROGRAM	1
S2.5	MINIMUM STAND-PIPE TEMPERATURE	Setting of minimum stand-pipe temperature limitation, when heating is active.	10 ÷ 90 °C	20
S2.6	MAXIMUM STAND-PIPE TEMPERATURE	Setting of maximum stand-pipe temperature limitation.	20 ÷ 150 °C	45- floor 85- radiat.
S2.7	STILL STAND OF MIXING VALVE CONTROL	Setting of stand-pipe temperature deviation by which the mixing valve control is in stand-by.	1,0 ÷ 3,0 °C	1
S2.8	MIXING VALVE P - CONSTANT	Setting of mixing valve position correction intensity. Smaller value means shorter movements, higher value means longer mixing valve movements.	0,5 ÷ 2,0	1
S2.9	MIXING VALVE I - CONSTANT	Setting of mixing valve control frequency - how often mixing valve position is being controlled. Smaller value means low frequency, higher value means higher frequency of mixing valve corrections.	0,4 ÷ 2,5	1
S2.10	MIXING VALVE D - CONSTANT	Sensitivity of mixing valve for stand-pipe temperature changes. Smaller value means low sensitivity, higher value means high sensitivity.	0,0 ÷ 2,5	1

Parameter	Parameter name	Parameter description	Setting range	Default setting
S2.11	MAX. FLOOR TEMPERATURE	Setting of maximum floor temperature limitation by floor heating. Setting is active only if floor sensor is installed and parameter S1.4=2 (for sensor T1) or S1.5=5 (for sensor T8).	10 ÷ 50 °C	25
S2.12	MINIMUM STAND-PIPE TEMPERATURE IN COOLING MODE	Setting of minimum stand-pipe temperature in cooling mode. CAUTION! Too low stand-pipe temperature can cause dewing of heating bodies and pipelines.	10 ÷ 20 °C	15
S2.13	SHIFT OF TEMPERATURE, REQUIRED TO ACTIVATE STAND-PIPE CONTROL	Shift of calculated min. stand-pipe temperature by which the mixing valve control will activate. Negative values mean activation of mixing valve control by lower calculated stand-pipe temperatures, positive values mean activation of mixing valve control by higher calculated stand-pipe temperatures.	-10 ÷ 10 °C	0
S2.14	LIMITATION OF TEMP. DIFFERENCE BETWEEN STAND AND RETURN PIPE	Setting of maximal difference between stand-pipe and return-pipe temperature. This way the highest power of heating system is limited. Limitation of difference between stand and return pipe is activated with parameter S1.4=3 (for sensor T1) or S1.5=6 (for sensor T8).	3 ÷ 30 °C	10
S2.15	CONSTANT STAND-PIPE TEMPERATURE	Selection of operation with constant stand-pipe temperature. Setting range is 10 ÷ 140 °C. CAUTION: This function deactivates weather compensated control of mixing valve.	0- NO 1- YES	0
S2.16	CIRCULATION PUMP SWITCH-OFF DELAY	Setting of circulation pump switch-off delay when there is no requirement for heating.	0 ÷ 10 min	5

 **S3**

Service settings for the second heating circuit:

Parameter	Parameter name	Parameter description	Setting range	Default setting
S3.1	INFLUENCE OF ROOM TEMPERAT. DEVIATION	Set the influence of room temperature deviation. Lower value means lower influence, higher value means higher influence.	0,0 ÷ 3,0	1
S3.2	INFLUENCE OF ROOM SENSOR T8	Setting of room sensor T8 influence on the operation of second circuit. 1- automatic room sensor influence - room sensor has no influence if room unit DD2+ is connected - room sensor has influence if room unit DD2+ isn't connected 2- room sensor has influence 3- room sensor has no influence This setting has affect only if S1.5=1.	1- AUTO 2- YES 3- NO	1
S3.3	INFLUENCE OF DD2+ ROOM SENSOR	Setting of DD2+ room sensor influence on the operation of first circuit. 1- influence has only room unit DD2+ controlling the first circuit (coding switch on room unit S.3=OFF). It can be set on first, second or both room units. 2- influence has only first room unit DD2+ (coding switch on room unit S.4=OFF) 3- influence has only second room unit DD2+ (coding switch on room unit S.4=ON) 5- room unit DD2+ has no influence	1- AUTO 2- 1. DD2+ 3- 2. DD2+ 4- 1. & 2. DD2+ 5- NO	1

Parameter	Parameter name	Parameter description	Setting range	Default setting
S3.4	PUMP OPERATION MODE	Setting of pump operation mode. Settings have the following meaning: 1- STAND. (circulation pump of mixing circuit - regular) 2- pump switches off, if requested room temperature is reached (only direct circuit) 3- operation according to time program P1 4- operation according to time program P2 5- SEL. PROG. (operation according to selected time program)	1- STAND-ARD 2- SWITCH-OFF 3- PROG. P1 4- PROG. P2 5- SE-LECTED PROGRAM	1
S3.5	MINIMUM STAND-PIPE TEMPERATURE	Setting of minimum stand-pipe temperature limitation, when heating is active.	10 ÷ 90 °C	20
S3.6	MAXIMUM STAND-PIPE TEMPERATURE	Setting of maximum stand-pipe temperature limitation.	20 ÷ 150 °C	45- floor 85- radiat.
S3.7	STILL STAND OF MIXING VALVE CONTROL	Setting of stand-pipe temperature deviation by which the mixing valve control is in stand-by.	1,0 ÷ 3,0 °C	1
S3.8	MIXING VALVE P - CONSTANT	Setting of mixing valve position correction intensity. Smaller value means shorter movements, higher value means longer mixing valve movements.	0,5 ÷ 2,0	1
S3.9	MIXING VALVE I - CONSTANT	Setting of mixing valve control frequency - how often mixing valve position is being controlled. Smaller value means low frequency, higher value means higher frequency of mixing valve corrections.	0,4 ÷ 2,5	1
S3.10	MIXING VALVE D - CONSTANT	Sensitivity of mixing valve for stand-pipe temperature changes. Smaller value means low sensitivity, higher value means high sensitivity.	0,0 ÷ 2,5	1
S3.11	MAX. FLOOR TEMPERATURE	Setting of maximum floor temperature limitation by floor heating. Setting is active only if floor sensor is installed and parameter S1.5=2.	10 ÷ 50 °C	25
S3.12	MINIMUM STAND-PIPE TEMPERATURE IN COOLING MODE	Setting of minimum stand-pipe temperature in cooling mode. CAUTION! Too low stand-pipe temperature can cause dewing of heating bodies and pipelines.	10 ÷ 20 °C	15
S3.13	SHIFT OF TEMPERATURE, REQUIRED TO ACTIVATE STAND-PIPE CONTROL	Shift of calculated min. stand-pipe temperature by which the mixing valve control will activate. Negative values mean activation of mixing valve control by lower calculated stan-pipe temperatures, positive values mean activation of mixing valve control by higher calculated stand-pipe temperatures.	-10 ÷ 10 °C	0
S3.14	LIMITATION OF TEMP. DIFFERENCE BETWEEN STAND AND RETURN PIPE	Setting of maximal difference between stand-pipe and return-pipe temperature. This way the highest power of heating system is limited. Limitation of difference between stand and return pipe is activated with parameter S1.5=3.	3 ÷ 30 °C	10
S3.15	CONSTANT STAND-PIPE TEMPERATURE	Selection of operation with constant stand-pipe temperature. Setting range is 10 ÷ 140 °C. CAUTION: This function deactivates weather compensated control of mixing valve.	0- NO 1- YES	0
S3.16	CIRCULATION PUMP SWITCH-OFF DELAY	Setting of circulation pump switch-off delay when there is no requirement for heating.	0 ÷ 10 min	5

Service settings for domestic hot water:

Parameter	Parameter name	Parameter description	Setting range	Default setting
S4.1	OUTPUT R5 FUNCTION	Setting of output R5 alternative operation mode. 1- operation according to selected hydraulic scheme 2- d. h. w. warming with electric heater 3- operation according to selected program timer for d. h. w. warming. 4- control of primary boiler pump 5- output is used for d. h. w. circulation. 6- d. h. w. warming without temp. difference (by warming with heat pump).	1- SCHEME 2- EL. HEATER 3- PROG. TIMER 4- PRIM. PUMP 5- CIRCULATION 6- WITHOUT DIFF.	1
S4.2	HYSTERESIS FOR D. H. W. WARMING	Setting of difference between switch-on and switch-off point for domestic hot water warming.	2 ÷ 20 °C	6
S4.3	MAX. D. H. W. TEMPERATURE	Setting of max. allowed d. h. w. temperature. If this temperature is exceeded the warming will stop unconditionally.	50 ÷ 90 °C	80
S4.4	D. H. W. OVERHEATING PROTECTION	Setting of overheating protection for d. h. w. storage tank. If requested d. h. w. temperature by warming with solar collectors or solid fuel boiler is exceeded (S4.10), controller activates (when possible) cooling: 1- into collectors 2- into boiler 3- into collectors and boiler	0- OFF 1- COLLECTORS 2- BOILER 3- BOTH	0
S4.5	LEGIONELLA - ACTIVATION	Activation of legionella function.	0- NO 1- YES	0
S4.6	LEGIONELLA - ACTIVATION DAY	Setting of day when the legionella protection should activate.	1- MON 2- TUE 3- WEN 4- THU 5- FRI 6- SAT 7- SUN	5
S4.7	LEGIONELLA - ACTIVATION TIME	Setting of hour when the legionella protection should activate.	0 ÷ 23 h	5
S4.8	MIN. D. H. W. TEMP. BY WARMING WITH SOLID FUEL BOILER OR HEAT ACCUMULATOR	Controlled heat source (oil boiler, heat pump, electric heater) will not activate if d. h.w. can be warmed to min. temperature with solid fuel boiler or heat accumulator. Setting 6 and 7 defines that d. h.w. should always be warmed to requested temperature: 6- with delayed switchover to controlled heat source 7- without delayed switchover to controlled heat source	1- 45 °C 2- 50 °C 3- 55 °C 4- 60 °C 5- 65 °C 6- OFF, DELAY 7- OFF, WITHOT DELAY	3

Parameter	Parameter name	Parameter description	Setting range	Default setting
S4.9	FUNCTION OF CIRCULATION OUTPUT	Setting of alternative operation mode for d. h. w. circulation output. 1- output is used for d. h. w. circulation 2- output is used d. h. w. warming with electric heater 3- output is used to control second stage of 2-stage burner 4- output is used to control boiler return temperature (bypass pump), set also parameter S1.4=11 (for sensor T1) or S1.5=12 (for sensor T8). 5- output is used to control primary boiler pump CAUTION! Circulation output is R6 or R7 depends on selected hydraulic scheme.	1- D. H. W. CIRC. 2- EL. HEATER 3- BURNER 2nd STAGE 4- BYPASS PUMP 5- PRIMARY PUMP	1
S4.10	REQ. D. H. W. TEMP. BY WARMING WITH COLLECTORS OR SOLID FUEL BOILER	With this setting is set requested d. h. w. temperature if it is being warmed with solid fuel boiler or solar collectors.	50 ÷ 90 °C	70
S4.11	MIN. AMBIENT TEMP. FOR D. H. W. HEAT PUMP	D. h. w. is warmed only with heat pump if ambient temperature is above the set point temperature. D. h. w. warming from central heating system will activate when the ambient temperature drops below set-point temperature. Set parameter S1.4=10 (for sensor T1) or S1.5=11 (for sensor T8) to activate this function.	5 ÷ 30 °C	16
S4.12	D. H.W. WARMING PUMP SWITCH-OFF DELAY	Setting of d. h. water warming pump switch-off delay after d. h. w. was warmed.	0 ÷ 10 min	5

 **S5**
Service settings for boilers:

Parameter	Parameter name	Parameter description	Setting range	Default setting
S5.1	MAXIMUM BOILER TEMPERATURE	Setting of maximal liquid fuel boiler temperature.	60 ÷ 160 °C	90
S5.2	BURNER HYSTERESIS AND OPERATION MODE	Setting of burner operation mode and hysteresis. 1- Relay is energized if there is no demand for heating, regardless to heat source temperature. This way we block operation of heat sources with independent controller. Such control is required for Rotex boilers. 2- relay is energized when there is need for heating, regardless to heat source temperature. This way we activate operation of independent heat sources, such as (wall hung gas boiler or heat pump). 3 ÷ 20- burner control hysteresis.	1- SWITCH-OFF 2- SWITCH-ON 3- 20 °C-HYSTERESIS	8
S5.3	BOILER TEMPERATURE INCREASE FOR CIRCUIT 1	Setting of boiler temperature increase in comparison with calculated stand-pipe temperature for circuit 1.	0 ÷ 25 °C	5
S5.4	BOILER TEMPERATURE INCREASE FOR CIRCUIT 2	Setting of boiler temperature increase in comparison with calculated stand-pipe temperature for circuit 2.	0 ÷ 25 °C	5
S5.5	BOILER TEMP. INCREASE FOR D. H. W. WARMING	Setting of boiler temperature increase in comparison with requested d. h. w. temperature.	0 ÷ 25 °C	10

Parameter	Parameter name	Parameter description	Setting range	Default setting
S5.6	BOILER STAND-BY AT MIN. TEMPERATURE	Setting of boiler stand-by at min. boiler temperature. This setting has affect only if heating operation mode is active.	0- ON 1- DAY TEMP. PERIOD 2- OFF	2
S5.7	BURNER SWITCH-OFF BY SOLID FUEL BOILER TEMP. INCREASE	Setting of solid fuel boiler temperature increase that causes liquid fuel boiler to switch off. Monitoring period is 2 minutes.	0- NO 1 ÷ 5 °C	4
S5.12	SOLID FUEL BOILER PROTECTION TEMP.	Setting of solid fuel boiler protection temperature. If this temperature is exceeded, controller gradually starts to increase calculated stand-pipe temperature in circuit 1 and 2.	70 ÷ 90 °C	77
S5.13	MAX. SOLID FUEL BOILER OR HEAT ACCUMULATOR TEMP.	Setting of max. solid fuel boiler temperature or heat accumulator temperature. If this temperature is exceeded controller transfers surplus heat to d. h. w. storage tank and heating circuits. Limitation of max. stand-pipe temperature in heating circuits remains active.	60 ÷ 160 °C	90
S5.14	MIN. BOILER RETURN-PIPE TEMP.	Setting of min. allowed boiler return-pipe temperature for classic or high-temperature boilers. This setting is valid only by schemes with boiler return pipe limitation. Also set parameter S1.4=11 (for sensor T1) or S1.5=12 (for sensor T8).	10 ÷ 90 °C	50
S5.15	SWITCHOVER DELAY TO CONTROLLED HEAT SOURCE	By systems with two heat sources, controller switches to heating with oil boiler when the deficit of heat occurs. Switchover is carried out with delay. Smaller value means higher heating comfort due to shorter delay by switchover, higher value means higher energy saving due to longer delay by switchover.	0,1 ÷ 3,0	1
S5.16	INVERTED OUTPUT FOR SWITCHOVER BETWEEN HEAT SOURCES	By schemes with two heat sources it can be set if output for switchover between two heat sources is inverted.	0- NORMAL 1- INVERTED	0
S5.17	FLUE GASES TEMP. FOR SWITCHOVER TO SOLID FUEL BOILER	In schemes with double fireplace boiler (scheme #117 and # 118) the flue gases sensor can be used to measure solid fuel flue gases temperature (parameter S1.4=9). In such cases the switchover from oil boiler to solid fuel boiler is activated also if flue gases temperature exceeds set-point temperature. Set also parameter S1.4=9 (for sensor T1) or S1.5=10 (for sensor T8).	70 ÷ 350 °C	130
S5.18	MAX. FLUE GASES TEMPERATURE	Setting of max. flue gases temperature. If flue gases temperature exceeds settled value, controller indicates it. Set also parameter S1.4=9 (for sensor T1) or S1.5=10 (for sensor T8).	70 ÷ 350 °C	200

Service settings for alternative energy sources:

Parameter	Parameter name	Parameter description	Setting range	Default setting
S6.1	PROTECTION OF MAX. COLLECTORS OR SOLID FUEL BOILER TEMPERATURE	With this setting is activated protection of max. solar collector or solid fuel boiler temperature. If solar collector or solid fuel boiler temperature is exceeded, circulation pump in solar system will activate although d. h. w. temperature is already reached.	0- NO 1- YES	1
S6.2	MAX. TEMPERATURE OF COLLECTORS OR SOLID FUEL BOILER	Setting of maximum solar collectors or solid fuel boiler temperature.	90 ÷ 290 °C	120
S6.3	EMERGENCY SHUT-DOWN TEMPERATURE FOR COLLECTORS OR SOLID FUEL BOILER	If solar collector or solid fuel boiler emergency shutdown temperature is exceeded, circulation pump will stop unconditionally.	120 ÷ 350 °C	160
S6.4	COLLECTOR'S FROST PROTECTION	If the temperature drops below the set point value (S6.5), the solar pump switches -on to prevent freezing in the collectors and pipelines. NOTE: This setting is suitable only for climates areas where the temperature only occasionally drops below the freezing point.	0- NO 1- YES	0
S6.5	COLLECTOR'S FROST PROTECTION TEMPERATURE	Setting of temperature by which the collector's frost protection should activate.	-30 ÷ 10 °C	4
S6.6	OPERATION OF LIQUID FUEL BOILER	Setting if d. h. w. warming with oil boiler and solar collectors or solid fuel boiler can operate at the same time or oil boiler shall activate with delay after warming with solar collectors or solid fuel boiler has been stopped.	-1- PARALELL 0 ÷ 600 MIN-DELAY OF LIQUID FUEL BOILER	120
S6.7	CIRCUITS WITH DELAYED ACTIVATION OF LIQUID FUEL BOILER	Selection of circuits where oil boiler shall activate with delay after warming with solar collectors or solid fuel boiler. 1- domestic hot water 2- heating circuits 3- domestic hot water and heating circuits	1- D. H. W. 2- CIRCUITS 3- BOTH	1
S6.8	SOLAR PUMP KICK FUNCTION	Special algorithm activates the solar pump to switch -on for short intervals. This way realistic temperature of collectors is obtained. This function is used especially with vacuum (tube) collectors or with classic collectors if the sensor is fitted outside of the collector body.	0- NO 1- YES	0
S6.9	RESPECT MIN. TEMPERATURE OF COLLECTORS OR SOLID FUEL BOILER	We define whether and how the minimum collector or solid fuel boiler temperature is respected.	0- NO 1- YES 2- YES, SWITCH-ON	2
S6.10	OPERATION MODE OF COLLECTORS OR SOLID FUEL BOILER CIRCULATION PUMP	Setting of circulation pump ON/OFF or RPM operation mode. RPM modulation of the pump is done with 5 stages (40 %, 55 %, 70 %, 85 %, 100 % RPM).	0- ON/OFF 1- RPM	1
S6.11	MINIMUM RPM FOR PUMP	Minimum RPM stage for modulation of circulation pump. 1- 40 % RPM 2- 55 % RPM 3- 70 % RPM	1- 40 % 2- 55 % 3- 70 %	1
S6.12	FULL-RPM RUNNING TIME OF COLLECTORS OR SOLID FUEL BOILER CIRCULATION PUMP	When the differential condition is fulfilled, the circulation pump runs at max. RPM for a setted time. Afterwards the pump is running with RPM modulation (if enabled with parameter S6.10=1).	5 ÷ 300 s	20

Parameter	Parameter name	Parameter description	Setting range	Default setting
S6.13	LOCATION OF COLD SENSOR FOR DIFF. THERMOSTAT	Cold sensor (T8) place of mount, if it is being used for differential thermostat. In exact we define storage device which is being warmed with solar collectors or solid fuel boiler.	1- D. H. W. TANK 2- HEAT ACCUMULATOR	1
S6.14	HEAT PUMP OPERATION MODE	Setting if heat pump should operate in ON/OFF or weather compenstaed mode.	1- ON/OFF 2- WEATHER COMPEN-SATED	2
S6.15	MAX. HEAT PUMP OUTPUT TEMPERATURE	Setting of max. heat pump output temperature when operating in weather compenstaed mode.	40 ÷ 70 °C	50
S6.16	HEAT PUMP HYSTERESIS	Setting of hysteresis for heat pump operation.	2 ÷ 10 °C	4
S6.17	MIN. OUTDOOR TEMP. FOR HEAT PUMP OPERATION	Setting of min. outdoor temperature below which the heat pump should switch off.	-30 ÷ 10 °C 11- NO LIMITATION	-10

F x

PARAMETERS FOR FLOOR DRYING

Group F1 contains the parameters for the setting of floor drying.

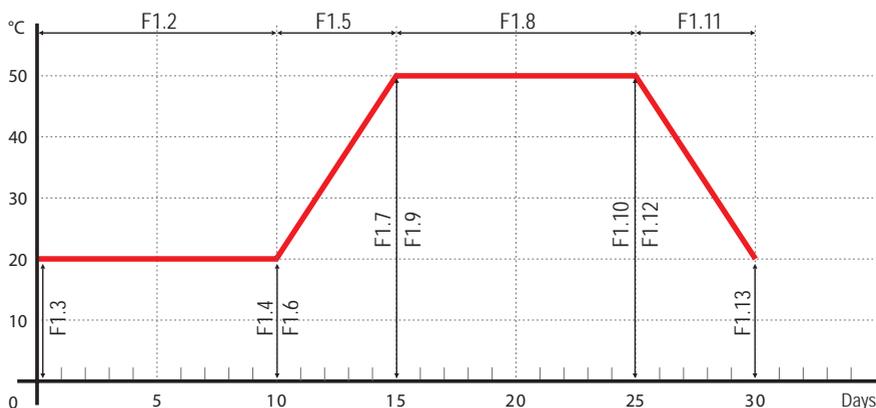


The procedure for F parameters setting is the same as the procedure for service settings (see 38).

F1

Table with descriptions of parameters:

Parameter	Parameter name	Setting range	Default setting
F1.1	FLOOR DRYING	0- NO 1- CIRCUIT 1 2- CIRCUIT 2 3- CIRCUIT 1 & 2	0
F1.2	INTERVAL 1: DURATION	1 ÷ 15 days	10
F1.3	INTERVAL 1: START TEMPERATURE	10 ÷ 60 °C	20
F1.4	INTERVAL 1: END TEMPERATURE	10 ÷ 60 °C	20
F1.5	INTERVAL 2: DURATION	1 ÷ 15 days	5
F1.6	INTERVAL 2: START TEMPERATURE	10 ÷ 60 °C	20
F1.7	INTERVAL 2: END TEMPERATURE	10 ÷ 60 °C	50
F1.8	INTERVAL 3: DURATION	1 ÷ 15 days	10
F1.9	INTERVAL 3: START TEMPERATURE	10 ÷ 60 °C	50
F1.10	INTERVAL 3: END TEMPERATURE	10 ÷ 60 °C	50
F1.11	INTERVAL 4: DURATION	1 ÷ 15 days	5
F1.12	INTERVAL 4: START TEMPERATURE	10 ÷ 60 °C	50
F1.13	INTERVAL 4: END TEMPERATURE	10 ÷ 60 °C	20

Floor drying profile - default setting:**RESET****DEFAULT SETTINGS**

The menu contains the tools to help you set the controller.

RESET**RESET OF CONTROLLER PARAMETERS**

Resets all parameter settings P1, P2, P3, P4, P5, P6, S1 (except S1.1), S2, S3, S4, S5, S6 and F to factory set values.

RESET**RESET OF TIME PROGRAMS**

Deletes the set time programs and retrieves factory set time programs.

RESET**RESET OF CONTROLLER AND RE-START OF THE FIRST SETTING**

Restores all parameters to default values and restarts the controller initial setup.

SAVE**SAVE USER SETTINGS**

Saves all controller settings as a safety copy.

LOAD**LOAD USER SETTINGS**

Uploads all controller settings from the safety copy. If a safety copy doesn't exist, this command is not executed.



Before executing the commands listed above, the controller requires a confirmation of the selected command.

MIXING HEATING CIRCUIT**Stand-pipe temperature calculation**

The upper limit of stand-pipe temperature calculation is set with maximum stand-pipe temperature - parameters S2.6 and S3.6, lower limit is set with minimum stand-pipe temperature - parameters S2.5 and S3.5. Parameters S2.1 and S3.1 are used to set the influence of room temperature deviation on the calculation of stand-pipe temperature, and with the parameters P2.2 and P3.2 you can adjust the parallel shift of heating curve.

Heating switch off

If the calculated stand-pipe temperature isn't for few °C higher than the room temperature, the heating is automatically switched off. Heating is automatically switched off if room temperature is not measured and when the outdoor temperature approaches the required temperature. The temperature difference between calculated stand-pipe temperature and room temperature at which the boiler will switch off can be increased or decreased with parameters S2.13 and S3.13.

At automatic heating switch off, a temperature of 4 °C is set for stand-pipe temperature and the circulation pump is switched off with delay - parameters S2.16 and S3.16. Other pump operation modes can be selected with parameters S2.4 and S3.4.

Intensive - BOOST heating

Define time and intensity of intensive (BOOST) heating, which is activated at transition of time program from night to day heating interval with parameters P2.3, P2.4 for the first and P3.3 and P3.4 for the second heating circuit.

Limitation of ΔT or power of first heating circuit

To limit the maximum power of the heating circuit, use the T1 or T8 sensor, to measure the return-pipe temperature. Set the parameter S1.4=3 or S1.5=5, then set the maximum difference between stand-pipe and return-pipe temperature with parameter S2.14.

Limitation of ΔT or power of second heating circuit

To limit the maximum power of the heating circuit, use the T8 sensor, to measure the return-pipe temperature. Set the parameter S1.5=5, then set the maximum difference between stand-pipe and return-pipe temperature with parameter S3.14.

Limitation of return temperature into the boiler

Install T1 or T8 sensor into the return-pipe into the boiler and set parameter S1.4=11 or S1.5=12. If return-pipe temperature drops below the minimum temperature - parameter S5.14, the mixing valve will gradually close. This action relieves the boiler and prevents condensation in boiler fireplace. To assure proper operation, the hydraulic connection must feature primary circulation of boiler water.

DIRECT HEATING CIRCUIT

Required supply temperature for the direct heating circuit is provided directly by controlling the boiler temperature.

Heating switch off

If the calculated stand-pipe temperature isn't for few °C higher than the room temperature, the heating is automatically switched off. Heating is automatically switched off if room temperature is not measured and when outdoor temperature approaches the required temperature. The temperature difference at which the boiler will switch off can be increased or decreased with parameter S3.13.

At automatic heating switch off, a temperature of 4 °C is set for stand-pipe temperature and the circulation pump is switched off with delay - parameter S3.16. Other pump operation modes can be selected with parameter S3.4.

LIQUID FUEL BOILER

For the required liquid boiler temperature, the highest temperature from the list below is taken:

- calculated first stand-pipe temperature, increased for the value of parameter S5.3,
- calculated second stand-pipe temperature, increased for the value of parameter S5.4,
- requested d. h. w. temperature, increased for the value of parameter S5.5,
- calculated boiler temperature of an additional direct heating circuit,
- calculated boiler temperature from slave controllers in BUS connection.

The lower limit of the liquid boiler temperature is the minimum boiler temperature - parameter P5.1, and the upper limit is the maximum boiler temperature - parameter S5.1.

Burner hysteresis is set with parameter S5.2. Burner switches off when boiler temperature exceeds the calculated boiler temperature for more than 60 % of the hysteresis, and switches back on when boiler temperature drops below more than 40 % of the hysteresis.

With parameter S5.2 you can select an alternative burner operation mode:

S5.2=1, operation of burner without boiler temperature sensor. Burner output is activated when there is no need for heating. Burner output is deactivated when there is need for heating.

S5.2=2, operation of burner without boiler temperature sensor. Burner output is activated when there is need for heating. Burner output is deactivated when there is no need for heating.

When there is no need for boiler operation, the calculated boiler temperature is 4 °C.

In the following cases, the frost protection function can activate boiler:

- if outdoor temperature drops below the frost protection temp. - parameter P1.3
- if boiler temperature, stand-pipe temperature or room temperature drops below 4 °C.

Liquid fuel boiler protection

If liquid boiler temperature drops below the minimum boiler temperature - parameter P5.1, the mixing valve will gradually begin to close.

In case if liquid boiler temperature exceeds the maximum boiler temperature - parameter S5.1, boiler protection is activated.

At this point, the maximum boiler temperature - parameters S2.6 and S3.6 is set for the calculated stand-pipe temperature. The d. h. w. warming pump is also activated. The protection is deactivated, when boiler temperature drops below the maximum boiler temperature.

Control of a two-stage burner

To control the two-stage burner, set the parameter S4.9=3. The first stage of the burner is controlled by relay R1, and the second stage is controlled by relay R6 or R7, depending on the dedicated relay for d. h. w. circulation by selected scheme.

The second stage is switched on, when boiler temperature drops 4°C below the switch-on temperature for the first stage, or if boiler temperature remains below the switch-on temperature for the first stage for more than 15 minutes.

The second stage is switched off when the temperature in the boiler is less than 4°C below the switch-off temperature for the first stage.

SOLID FUEL BOILER

Solid fuel boiler protection

If solid boiler temperature drops below the minimum temperature - parameter P5.2, the mixing valve will gradually begin to close. In case if solid boiler temperature exceeds the optimal operation temperature, the controller proportionally increases the calculated stand-pipe temperature.

In such way boiler overheating is prevented and the surplus heat is dissipated into the building.

If solid fuel boiler temperature exceeds the maximum boiler temperature - parameter S5.13, the mixing valve gradually opens up to the maximum stand-pipe temperature - parameters S2.6 and S3.6. The protection is deactivated, when boiler temperature drops below the maximum boiler temperature.

HEAT ACCUMULATOR

If temperature of heat accumulator drops below the set minimum heat accumulator temperature (parameter P5.3), the mixing valve will gradually begin to close. If heat accumulator temperature exceeds the maximum heat accumulator temperature (parameter S5.13), the heat accumulator overheating protection is activated, which opens the mixing valve up to the maximum stand-pipe temperature (parameters S2.6 and S3.6). The protection is deactivated, when heat accumulator temperature drops below the maximum temperature.

HEAT PUMP

Control of heat pump by schemes 122, 122b, 122c and 122d

The heat pump (HP) has 2 operation modes, depending on parameter S6.14 setting:

- S6.14 = 1 - HP is activated whenever there is a demand for heating and remains switched on for all the time. If outdoor temperature drops below the limit outdoor temperature, set with parameter S6.17, HP is switched off.
- S6.14 = 2 - HP heat pump is controlled according to the outdoor temperature and maintains the calculated heat accumulator temperature. Max. operation temperature of HP is limited with parameter S6.15. If outdoor temperature drops below limit outdoor temperature set with parameter S6.11, HP is switched off.

PUMP FOR RETURN-PIPE TEMPERATURE INCREASE (BYPASS PUMP)

This option is available for classic liquid fuel boilers and solid fuel boilers with no connection to heat accumulator. Circulation pump output (R6 or R7) can be used to control the bypass pump to increase boiler return temperature. Such operation mode is set with parameter S4.9=4. Install the T1 or T8 sensor in the boiler return-pipe before the bypass connection and set parameter S1.4=11 (for sensor T1) or S1.5=12 (for sensor T8). If return-pipe temperature drops below the temperature set by parameter S5.14, the pump is switched on.

DOMESTIC HOT WATER

D. h. w. warming with liquid fuel boiler

Set the required d. h. w. temperature for the inactive time program interval with parameter P4. If boiler temperature exceeds the maximum boiler temperature (parameter S5.1), the d. h. w. will be warmed up to the maximum temperature set with parameter S4.3. D. h. w. warming pump is switched off with delay. The delay time is set with parameter S4.12.

D. h. w. warming with solid fuel boiler

When a solid fuel boiler is in operation, the d. h. w. is warmed to the required temperature (parameter S4.10) independent of the time program.

If solid fuel boiler temperature exceeds the maximum boiler temperature - parameter S5.13, the maximum allowed d. h. w. temperature (parameter S4.3) is set for required d. h. w. temperature.

D. h. w. warming in storage tank with integrated heat pump

In this case, a special operation mode of d. h. w. control is activated by setting the parameter. S1.4=10 (for sensor T1) or S1.5=11 (for sensor T8). Install a room sensor in the room, where the heat pump is located, and connect it to the T1 or T8 terminals. Controller will block the d. h. w. warming with boiler if the heat pump room temperature is higher as set with parameter S4.11.

D. h. w. warming with solar collectors

The basic operation of the solar collectors system is determined by switch-on difference, switch-off difference and minimum temperature of solar collectors - parameters P6.1, P6.2 and P6.3.

D. h. w. is warmed up to the requested temperature, set with parameter S4.10.

If d. h. w. is warmed and the temperature of solar collectors exceeds the maximum temperature of solar collectors - parameter S6.1, d. h. w. warming is allowed up to the maximum d. h. w. temperature - parameter S4.3.

D. h. w. warming is switched off unconditionally, if the d. h. w. temperature exceeds the maximum temperature - parameter S4.3, or if solar collectors temperature exceeds the maximum temperature - parameter S6.3.

When d. h. w. is warmed with solar collectors, you can set the liquid fuel boiler operation mode with parameter S6.6:

S6.6= -1, simultaneous operation of both heat sources.

S6.3= 0 ÷ 600, the boiler will be switches on with set delay after deactivation of the solar system. Parameter value sets minutes of delay.

D. h. w. warming with an electric heater

You can reprogram the output for d. h. w. warming with boiler (R5) to control the electric heater for d. h. w. warming by setting the parameter S4.1=2.

D. h. w. will be warmed up to the requested temperature according to the time program for d. h. w. warming.

You can also program the output for the circulation pump (R6 or R7) to control the electric heater for d. h. w. warming by setting the parameter S4.9=2 .

D. h. w. will be warmed up to the requested temperature according to the time program for d. h. w. warming.



To control the electric heating body, a power relay and a thermal fuse must be connected.

Priority of d. h. w. warming over room heating

With parameters P4.2 and P4.3 you can set the priority of d. h. w. warming over room heating. By direct heating circuit is suggested to set priority to d. h. w. warming.

Return cooling of domestic hot water (Recooling)

If d. h. w. exceeds with the maximum temperature - parameter S4.10, a cooling of the d. h. w. into the boiler or into the solar collectors can be activated - parameter S4.4.

Pump-kick function for solar collector

Pump-kick function for solar collector pump is set with parameter S6.8=1. If collector temperature is higher as minimum collector temperature, the pump is activated each 15 minutes for 10 seconds. This way a realistic collector temperature is acquired. This setting is used in case if collector sensor isn't mounted directly into the collector body.

DOMESTIC HOT WATER CIRCULATION

The d. h. w. circulation pump is operating according to the time program for the d. h. w. circulation - parameter P4.7. The pump is operating with running and standby intervals which are set with parameters P4.8 and P4.9.

D. h. w. circulation on output R5

With parameter setting S4.1=5 the R5 output can be programmed for the activation of d. h. w. circulation with temperature sensor. This option is available only by hydraulic schemes, which do not have d. h. w. circulation implemented by default.

D. h. w. circulation with the use of sensor

If T1 or T8 sensor is free, it can be used to activate the d. h. w. circulation with parameter S1.4=6 (for sensor T1) or S1.5=8 (for sensor T8).

The sensor needs to be installed on the exit pipe from the d. h. w. storage tank (hot pipe). Whenever an immediate temperature rise for at least 5 K is detected, the d. h. w. circulation pump is switched on for the time set with parameter P4.8.

D. h. w. circulation with flow switch

If T1 or T8 sensor is free, it can be used to activate the d. h. w. circulation with a flow switch - parameter S1.4=6 (for sensor T1) or S1.5=8 (for sensor T8).

The switch needs to be installed on the exit pipe from the d. h. w. storage tank (hot pipe). If flow switch detects flow, the d. h. w. circulation pump is switched on for the time set with parameter P4.8.

REMOTE HEATING ACTIVATION

Setting the parameter S1.6=1 enables a remote activation of room heating and d. h. w. warming with telephone controlled switch Telewarm G1-D or Telewarm G44 or any other device with a potential-free control switch. Room heating according to the requested day time temperature and d. h. w. warming are activated if a short circuit is detected on input T1 or T6.

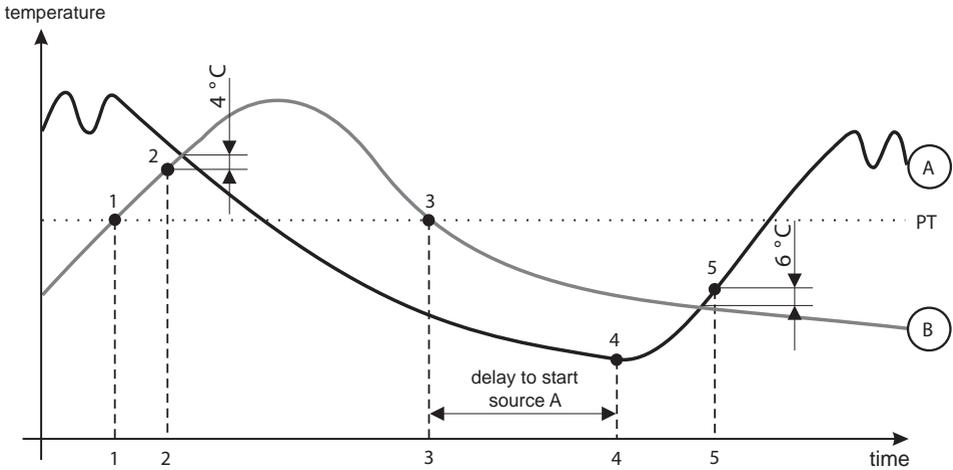
In a BUS connection of more controllers the request for remote activation on master controller is accepted also on slave controllers if defined with parameter S1.8.

OPERATION OF HEATING SYSTEMS WITH TWO HEAT SOURCES

KMS-D and KMS-D+ controllers feature fully automatic operation of heating systems with two heat sources, for example with solid and liquid fuel boiler. Systems can operate with or without a heat accumulator. The hydraulic connection of the two heat sources can be parallel or serial. In parallel connection only one heat source can operate at the time, in serial connection both heat sources can operate simultaneously.

Operation diagram for hydraulic schemes with two heat sources:

ENG



LEGEND:

- A - liquid fuel boiler (heat source A)
- B - solid fuel boiler or heat accumulator (heat source B)
- PT - switchover temperature

Switch-over from liquid (A) to solid (B) fuel boiler or to heat accumulator

When the heat source B temperature exceeds the switchover temperature PT (point 1), the heat source A is switched off.

Switchover temperature PT is the highest temperature of listed below:

- minimum temperature of heat source B, increased for 10 °C,
- highest calculated stand-pipe temperature for the mixing circuit 1 or 2 (upper limit of this temperature is 5 K lower as set with parameter S5.12),
- measured d. h. w. temperature, increased for 10 °C (upper limit of this temperature is set with parameter S4.8).

When the heat source B temperature approaches to heat source A temperature, the switchover valve turns to the heat source B (point 2).

Switch-over from solid fuel boiler or heat accumulator (B) to liquid fuel boiler (A)

If the heat source B temperature drops below switchover temperature PT (point 3) and heating demand cannot be covered anymore, the countdown to activate heat source A is started. Bigger difference between required temperature and actual temperature of heat source B results in earlier activation of heat source A. Smaller difference between required temperature and temperature of heat source B results in later activation of heat source A.

After the countdown, the heat source A is switched on again (point 4).

When the heat source A temperature exceeds the heat source B temperature for 6 °C, the switchover valve turns to the heat source A (point 5).

OPERATION OF SWITCHOVER VALVE BY SYSTEMS WITH TWO HEAT SOURCES

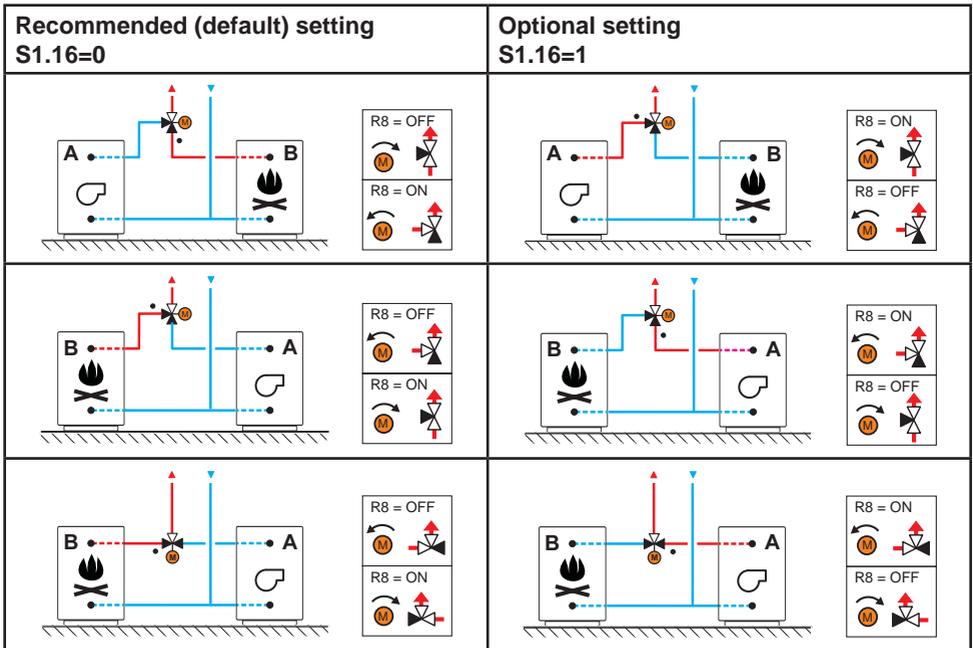
For control of switchover valve use 2-point actuator with spring return or classic 2-point actuator with phase-return function.

Dot mark on hydraulic schemes indicates valve gate with open flow when the actuator is in base position. It is advised to have this valve gate connected to the solid fuel boiler or heat accumulator or to supply pipe of liquid fuel boiler by scheme 121.

With setting of parameter S5.16=1 the output R8 can operate inverted. This setting provides further options of switchover valve connection, as shown on pictures below.

SWITCHOVER BETWEEN TWO HEAT SOURCES:

Parallel connection

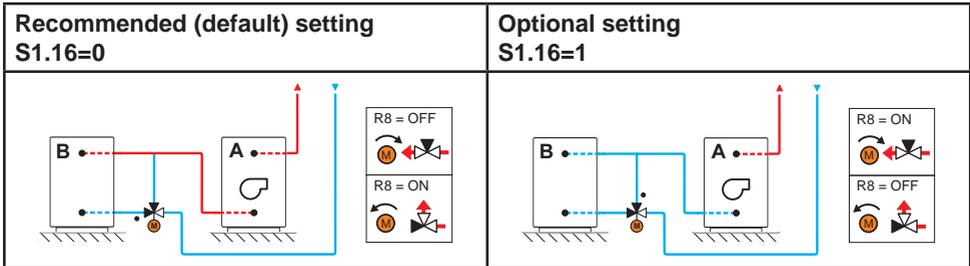


LEGEND:

A - liquid fuel boiler

B - solid fuel boiler or heat accumulator

• - valve gate with open flow when the actuator is in base position



LEGEND:

A - liquid fuel boiler

B - solid fuel boiler or heat accumulator

• - valve gate with open flow when the actuator is in base position

SETTING THE MINIMUM RPM FOR PUMP R6

A nominal system flow needs to be defined on behalf of installed collector surface. Nominal system flow varies between 0.5 to 1.2 l/min for each square meter of installed collectors or according to the manufacturer's recommendations (example: 3 solar collectors with total surface of 6 m² need to have nominal system flow of 5.4 l/min, if basic flow in system is 0.9 l/m for each square meter of installed collectors).

Next, manually activate circulation pump R6 on max. RPM - see chapter Manual mode on page 27. Set pump speed switch to level where system flow is slightly higher as nominal flow in system. Adjust the system flow with flow valve to match the nominal system flow.

Now, set (with the controller) the R6 RPM to 40 % and check on flow meter if there is flow in system. If there is no flow in system, raise the R6 RPM to 55 %. If there is still no flow in system, raise the R6 RPM to 70 % or raise the pump speed and repeat the whole procedure again. If min. pump RPM was changed it needs to be set with parameter S6.11.

DIFFERENTIAL CONTROLLER

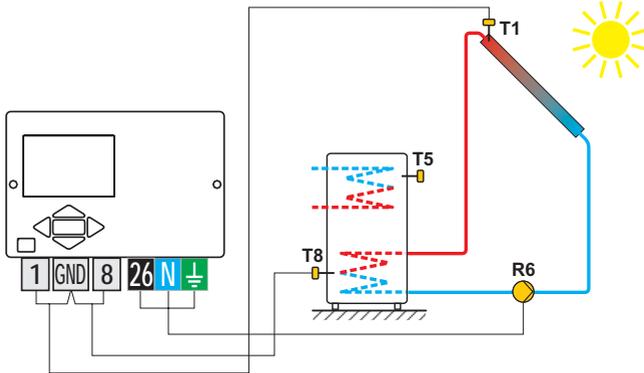
The KMS-D controllers feature programmable differential controller. It can be activated by schemes with indication ΔT , by setting the parameter S1.4=4 for solar collector or S1.4=5 for solid fuel boiler. Activation of differential controller function is possible if R6, T1 and T8 aren't used by scheme. Output R6 is semi conductor relay and enables pump speed control.

APPLICATION OF DIFFERENTIAL CONTROLLER FOR SOLAR COLLECTORS

Required parameter settings for application with storage tank:

S1.4 = 4

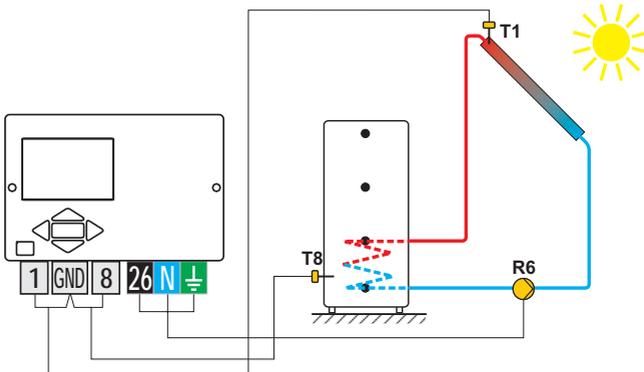
S6.13 = 1



Required parameter settings for application with heat accumulator:

S1.4 = 4

S6.13 = 2

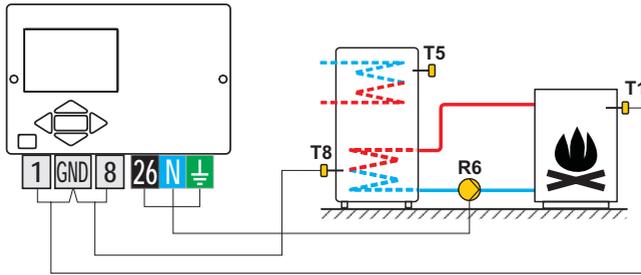


APPLICATION OF DIFFERENTIAL CONTROLLER FOR SOLID FUEL BOILER

Required parameter settings for application with storage tank:

S1.4 = 5

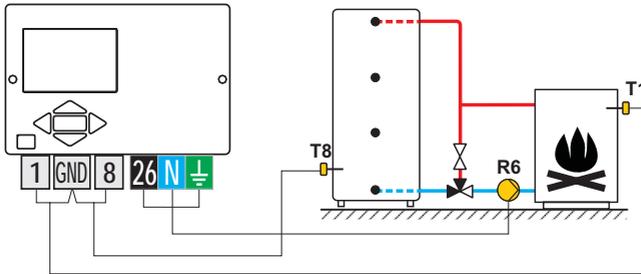
S6.13 = 1



Required parameter settings for application with heat accumulator:

S1.4 = 5

S6.13 = 2



Differential controller can be activated in schemes 108, 108b, 109, 109b, 111, 113, 116, 116b, 116c, 117, 118, 119, 120, 121, 122, 122b, 122c, 122d, 123e, 123f and 123h.

Schemes 104, 104b, 104c, 104d, 104e, 107b, 105, 106 and 107b already include a differential control of the solar system.

OPERATION MODES IN CASES OF SENSOR MALFUNCTION

Outdoor sensor is not connected or has a failure

In such case, the controller operates as a P-controller according to room temperature deviation. If room temperature sensor also has a failure or is not connected, the controller will maintain constant stand-pipe temperature, which is:

- 25 °C higher as the set day or night temperature; for radiator heating system,
- 10 °C higher as the set day or night temperature; for floor heating system.

Stand-pipe sensor is not connected or has a failure

The controller assumes a 120 °C stand-pipe temperature and deactivates room heating. Heating can be reactivated only by manual operation mode.

Liquid fuel boiler sensor is not connected or has a failure.

The controller assumes a 85 °C boiler temperature and activates the burner, if heating is required. The boiler temperature can be set manually on a boiler thermostat.

Solid fuel boiler sensor is not connected or has a failure.

The controller assumes a 85 °C solid fuel boiler temperature. Switchover valve turns to the solid fuel boiler.

Room sensor is not connected or has a failure.

Room heating operates uninterrupted, according to the outdoor temperature.

Return-pipe sensor is not connected or has a failure.

Room heating operates uninterrupted, without influence of return-pipe temperature.

The sensors of d. h. w. storage tank are not connected or have a failure

If one sensor has a failure, the controller uses only the other sensor. If both sensors have a failure, the controller switches off the pump for d. h. w. warming.

Solar collector sensor is not connected or has a failure.

The circulation pump for d. h. w. warming with solar collectors is deactivated.

TABLE: resistance of Pt1000 temperature sensors

Temp. [°C]	Resistance [Ω]						
-20	922	35	1136	90	1347	145	1555
-15	941	40	1155	95	1366	150	1573
-10	961	45	1175	100	1385	155	1592
-5	980	50	1194	105	1404	160	1611
0	1000	55	1213	110	1423	165	1629
5	1020	60	1232	115	1442	170	1648
10	1039	65	1252	120	1461	175	1666
15	1058	70	1271	125	1480	180	1685
20	1078	75	1290	130	1498	185	1703
25	1097	80	1309	135	1415	190	1722
30	1117	85	1328	140	1536	195	1740

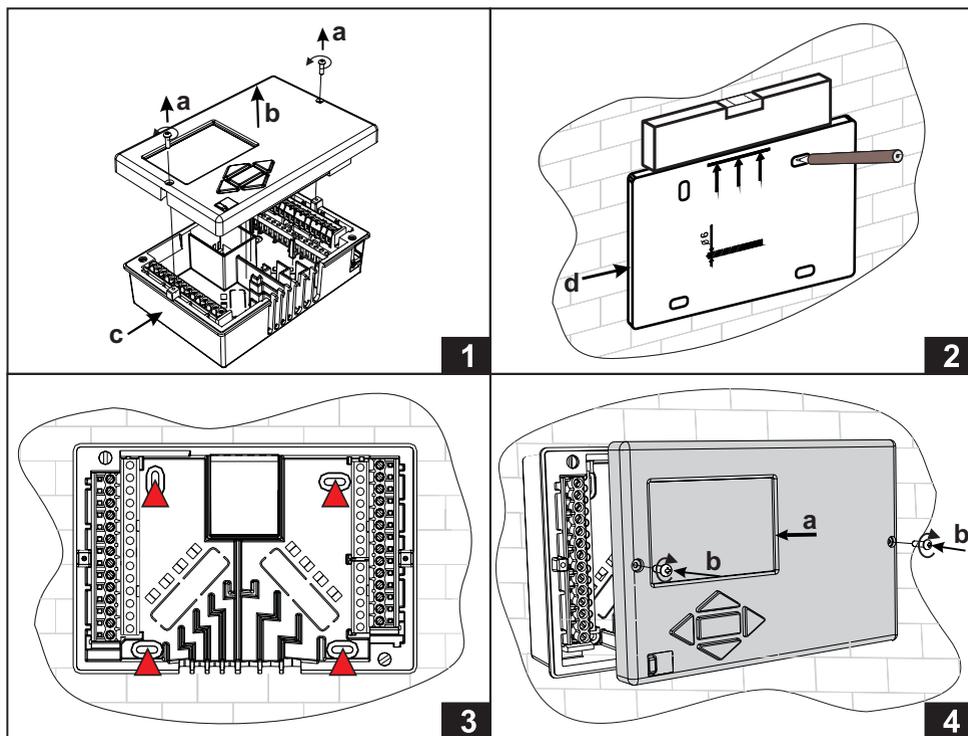
INSTALLATION MANUAL

CONTROLLER INSTALLATION

Install controller in dry indoor area away from strong electromagnetic fields.
The controller is foreseen for wall installation or boiler panel installation with standard cutout of 138 x 92 mm.

WALL INSTALLATION

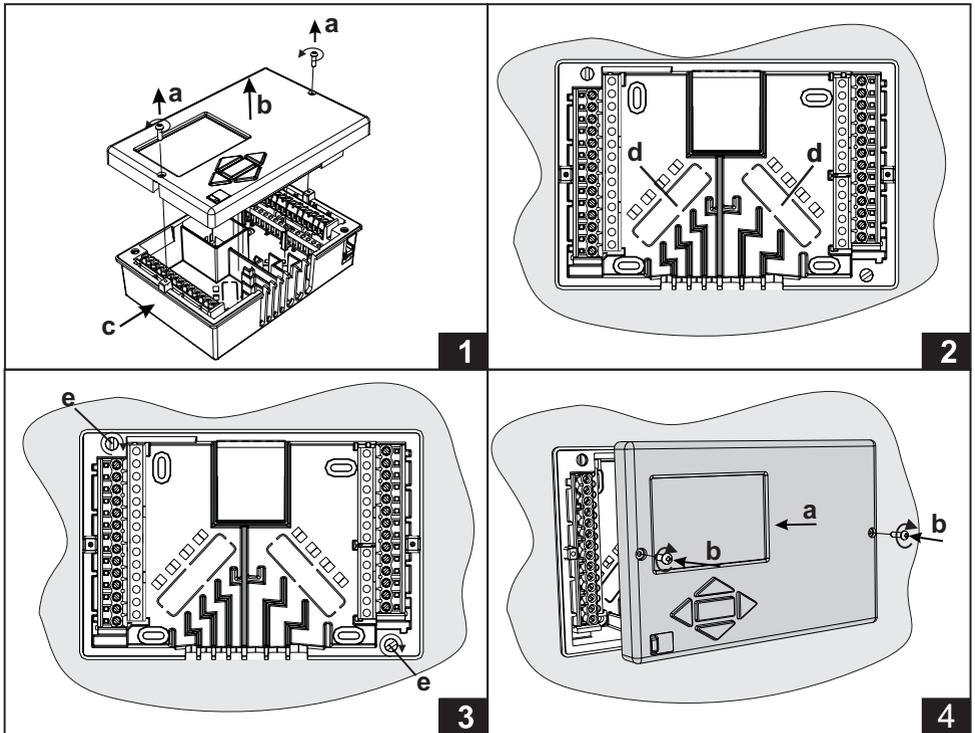
The installation onto a wall is carried out in the following way:



1. Unscrew both screws (a) from the controller (b) and remove it from the base (c).
2. Cutout the drilling template from package, mark drilling holes on the wall and drill them.
3. Mount the socket on the wall with four screws.
4. Carry out electrical connection, put the controller (a) back into the base, and fasten it with screws (b).

INSTALLATION INTO THE BOILER PANEL CUTOUT

The installation into a boiler panel cutout is carried out in the following way:



1. Unscrew both screws (a) from the controller (b) and remove it from the base (c).
2. Remove cable inlet lids (d) and place the cables. Left cable inlet is for sensor cables, right cable inlet is for power supply cables.
3. Place the base into the boiler and fasten it with the mounting hooks (e).
4. Carry out electrical connection, put the controller (a) back into the base, and fasten it with screws (b).

ELECTRIC CONNECTION OF THE CONTROLLER

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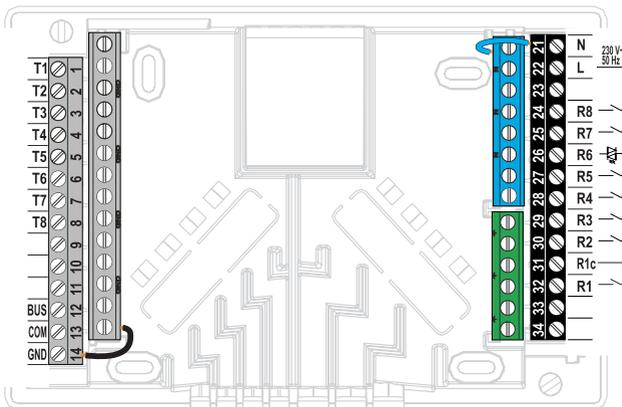
Every heating controller project must be based on calculations and plans that are exclusively your own and pursuant to the regulations in force. Images and texts in these manuals serve as examples and the issuer does not assume any responsibility for them. Issuer liability for unprofessional, false or incorrect information or consequential damage is explicitly excluded. We reserve the right to technical errors or changes without giving prior notice.

Installation of controller devices shall be done by a qualified technician or an authorised organisation. Prior to any intervention into the wiring, make sure that the main switch is switched off. Low voltage installation regulations IEC 60364 and VDE 0100, statutory provisions for accident prevention, statutory provisions for environmental protection and other national rules shall be observed.

Before you open the housing, make sure that all poles of electrical supply had been disconnected. Failure to follow these instructions can lead to serious injuries, such as burns or even threat to human life.

The controller must be connected via switch for all poles. Spacing at switch's open contacts shall be at least 3 mm.

All low voltage connections, such as connections of temperature sensors, must be placed separately from power supply connections. All temperature sensor connections shall be placed into the left field and all power supply connections shall be placed in the right field of the controller.



Immersion sensor

Immersion sensor is intended to be installed into immersion tube in boiler, heat accumulator, d. h. w. storage tank, solar collectors or elsewhere. Ensure proper contact between sensor and tube. Secure the sensor with a fastener or a screw.

Surface sensor

Install the surface sensor onto the stand-pipe above the bypass pump or after the mixing valve. Clean the selected spot on the pipe first. Place the sensor onto the cleaned spot and secure it with the enclosed clip spring.

Outdoor temperature sensor

Install the outdoor temperature sensor onto the facade facing north or north-west, approximately 2 m above ground. Installation above the windows, vents or on the facade facing south is not allowed.

First remove the protective cover and unscrew two screws from the cover. Use the enclosed wall screw to fix the sensor to the selected spot. Feed the cable into the sensor through cable inlet at the bottom side and connect it.

Room temperature sensor

Install the room temperature sensor onto an indoor wall in a living area, where is not sunlit and enough distant from sources of heat and wind. Remove the cover and screw the base onto the selected spot approximately 1.5 metres above ground. You can also install it onto wall box or directly onto a wall. A 2-wire signal cable is required for electrical connection. If there are thermostatic valves installed onto radiators in the room, where room unit is located, the thermostatic valves have to be fully opened. If room sensor is connected to terminal T1, the required parameter setting is S1.4=1. If room sensor is connected to terminal T8, the required parameter setting is S1.5=1.

ROOM UNIT DD2+

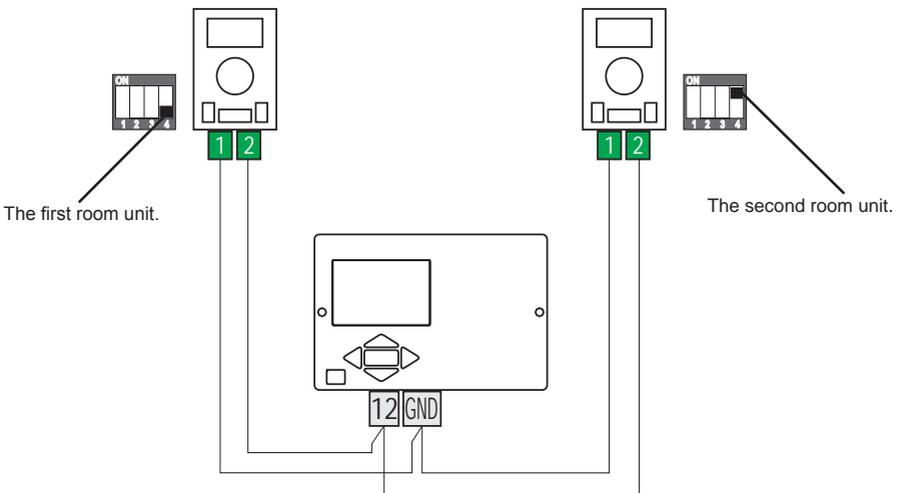
ENG

The KMS-D controllers enable connection of DD2+ room unit which measures room temperature and enables the setting of requested day and night temperature, as well as selection of operation mode. Up to two room units can be connected to a single KMS-D controller.

Setting of coding switches on room unit DD2+:

	Required setting.
	Room unit is controlling circuit 1.
	Room unit is not controlling circuit 1.
	Room unit is controlling circuit 2.
	Room unit is not controlling circuit 2.
	The first room unit.
	The second room unit.

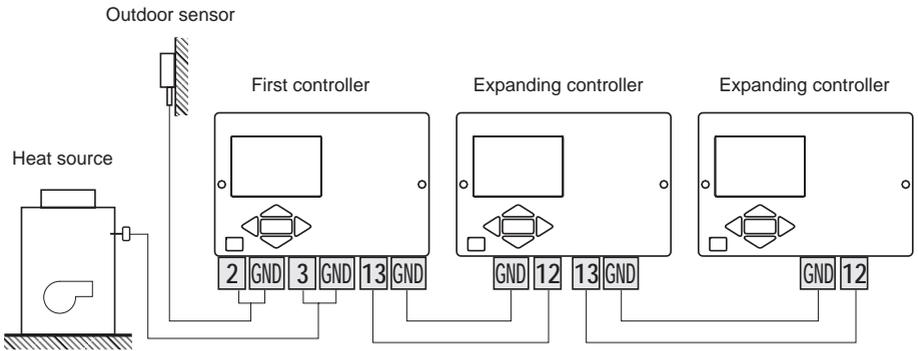
Scheme for connecting room unit DD2+:



BUS CONNECTION TO KMS-D, KMS-D+ CONTROLLERS

With BUS connection any number of KMS-D, KMS-D+ controllers can be connected to network. The first or the master controller physically controls heat sources, while the other (slave) controllers control only the heating circuits.

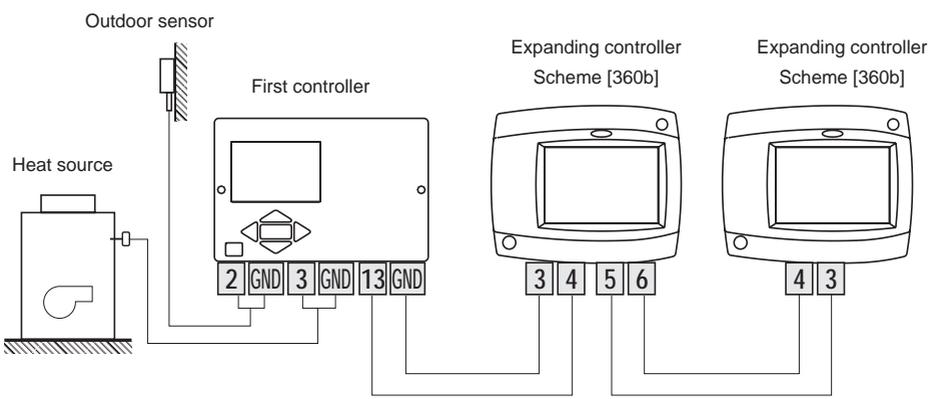
Important: Outdoor and boiler temperature sensors need to be connected to the master controller.



BUS CONNECTION TO WHMS CONTROLLERS

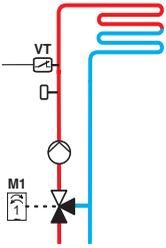
With BUS connection any number of KMS-D or KMS-D+ with WHMS controllers can be connected to network. The first or the master controller physically controls heat sources, while the other (slave) controllers control only the heating circuits.

Important: Outdoor and boiler temperature sensors need to be connected to the master controller.



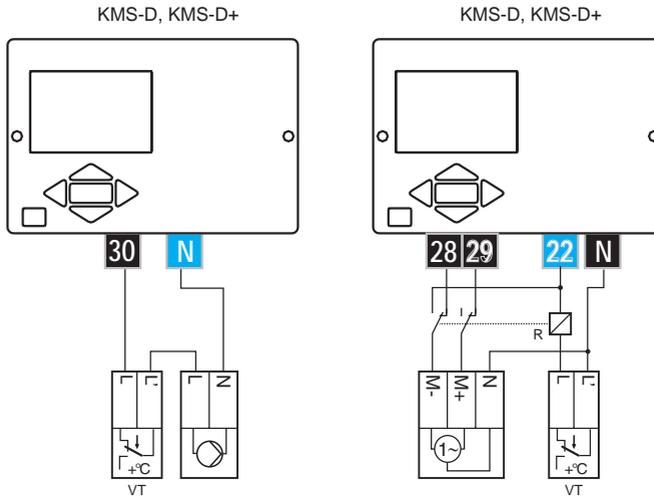
INSTALLATION AND CONNECTION OF VT SAFETY LIMITER

ENG



In the case of floor or wall heating, a safety limiter VT should be installed.

Use a (capillary) tube-wall, surface or an immersion thermostat with a switching contact. Install it above the stand-pipe heating sensor. Set the maximum allowed stand-pipe temperature for floor heating (usually between 40 °C and 60 °C) or the temperature which is at least 5 °C higher as the set maximum allowed stand-pipe temperature on the controller - parameters 2.6 and S3.6.



Example 1:
Exceeding the safety limiter temperature will deactivate the circulation pump.

Example 2:
Exceeding the safety limiter temperature will close the mixing valve.

Legend: VT - safety limiter

SENSOR SIMULATION AND CONTROLLER OPERATION TEST

The KMS-D and KMS-D+ controllers have a special function installed, which enables simulations of all sensors. With the help of this function, user can test controller operation. This function is intended for the cases of start-up, maintenance or testing of the controller.

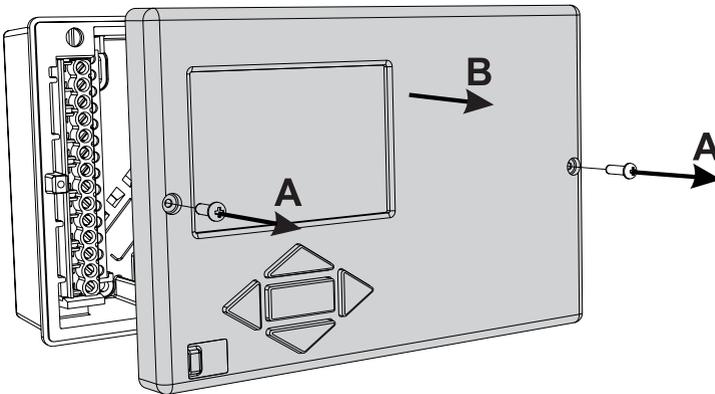
Sensor simulation is activated in the following way. First, by pressing the **Esc** button select the screen with hydraulic scheme display. Now, press the **Esc** button and hold it for 10 seconds. The controller will switchover to the simulation mode.

Move between sensors by pressing the **OK** button. With buttons **◀** or **▶** set the temperature value for each selected sensor. The simulated sensor mark will change from T to S.

Simulation operation mode is deactivated by pressing the **Esc** button for 10 seconds or if no button is pressed for more than 5 minutes.

CONTROLLER FAILURE AND SERVICING

In the event of failure or damage to the controller, only the module shall be sent to service. The base should stay mounted without disconnecting the cables.



Demount the controller in the following way:

Loosen the screw (A) and drag the controller module (B) towards yourself.

Now replace controller module or send it to the authorized service centre.



Before you start dismantling the controller, make sure the main power supply switch is turned off.

TECHNICAL DATA

ENG

Dimensions [w x h x d]:	144 x 96 x 49 mm
Controller weight	465 g
Body material	ASA + PC - thermoplastic
Supply voltage	230 V AC, 50 Hz
Own consumption	5 VA
Cable cross section	0.5 to 0.75 mm ²
Degree of protection	IP20 according to EN 60529
Protection class.....	I according to EN 60730-1
Permissible ambient temperature	5 °C to +40 °C
Permissible relative humidity max.	85 % Rh at 25 °C
Storage temperature	-20 °C to +65 °C
Relay output	
R1	pot. free, max. 4 (1) A ~, 230 V ~
R2, R3, R4, R5, R7, R8	4 (1) A ~, 230 V ~
Triac output	
R6	1 (1) A ~, 230 V ~
Timer	
Type	7-day program timer
Min. interval.....	15 minutes
Built-in clock accuracy	± 5 min / year
Software class.....	A
Data retention	min. 10 years

Technical characteristics - temperature sensors

Type of temperature sensors	Pt1000 or KTY10
Resistance of temperature sensors	
Pt1000	1078 Ohm at 20 °C
KTY10	1900 Ohm at 20 °C
Temperature scope	
Outdoor sensor AF	25 ÷ 65 °C, IP32
Immersion sensor TF	25 ÷ 150 °C, IP32
Surface sensor VF	0 ÷ 85 °C, IP32
Flue gases sensor CF	20 ÷ 350 °C, IP32
Conductor cross section	0,14 to 0.34 mm ²
Max. cable length.....	30 m

DECLARATION OF CONFORMITY

Heating controllers KMS-D are conformed with the following directives:

- LVD: Low Voltage Directive 2006/95/EC,
- EMC: Electromagnetic Compatibility Directive 2004/108/EC,
- RoHS: Directive on hazardous substances in electrical and electronic equipment, 2002/95/EC.

PRODUCT DESCRIPTION:

Weather compensated heating controller

Model:

KMS-D, KMS-D+

STANDARDS USED:

EN 60730-1, EN 60730-2-9, EN 60730-2-11,
EN 12098-1, EN 61000-6-1, EN 55014-1.



WARRANTY

The product is manufactured in accordance with applicable standards and is factory tested. The product for which we give a guarantee to work flawlessly, if you abide by the instructions given. We will provide maintenance service and spare parts necessary for the product in term of life of the product or at least 7 years.

The warranty is 36 months from date of purchase of the product, which prove to document the purchase. The cost of transporting the product during the warranty period, the delivery and repair service to recognize the presentation of the invoice at the applicable rates for public services (post office or railway).

During the warranty period will be at their expense, remove all the defects and deficiencies within a period not to exceed 30 days if the guarantee is enforced with all the documents and product deliveries done in the headquarters or the nearest authorized OEG workshop. If during the warranty period the product is not corrected within 30 days of notification of failure, the product to the purchaser's request, replaced with a new one.

For reflex loss, both for the actual damage to property or lost profits that may result from use of or defect in the product are not responsible. It also does not recognize the cost of assembly and disassembly as well as any other direct or indirect costs, claims or fees charged to us for possible complaints.

This warranty is void if it is found that the pre-repair by an unauthorized person or if the product has been damaged due to improper handling or force majeure.

DISPOSAL OF OLD ELECTRICAL AND ELECTRONIC EQUIPMENT

Disposal of old electrical and electronic equipment (Applies to European Union Member States and other European countries with separate collection system).



This symbol on the product or its packaging indicates that it should not be disposed as household waste. Product must be submitted at the collection points for waste electrical and electronic equipment (WEEE). With the proper disposal of this product will prevent a negative impact on the environment and human health which could otherwise be caused by its erroneous removal. Recycling materials reduces consumption of new raw materials. For more information about recycling this product, please contact the relevant departments, waste disposal service or the shop where you bought it.

IMPORTANT

ATTENTION: Installation schemes show operation principles and do not include all auxiliary and safety elements! Observe the regulations in force when performing installations!

WICHTIG

ACHTUNG: Die Installationsschemas verweisen auf das Betriebsprinzip und verfügen nicht über alle Hilfs- oder Sicherheitselemente. Bei der Montage die gültigen Vorschriften beachten!

IMPORTANT

ATTENTION ! Les schémas d'installation montrent les principes de fonctionnement et ne contiennent pas tous les éléments de sécurité ou de secours ! Respectez les règlements en vigueur pour le montage !

IMPORTANTE

ATTENZIONE: Gli schemi di installazione illustrano il principio di funzionamento e non contengono tutti gli elementi aggiuntivi e di sicurezza! Durante l'installazione attenersi alle disposizioni di legge vigenti!

BELANGRIJK

LET OP: De installatieschema's hebben betrekking op het bedrijfsprincipe en beschikken niet over alle hulp- en/of veiligheidselementen. Tijdens de montage de geldende voorschriften in acht nemen!



- possibility of free programming of differential controller
- Möglichkeit der Frei-programmierung von Differenzregler
- possibilité d'une programmation libre de régulateur différentiel
- possibilità del termostato differenziale
- mogelijkheid tot vrije programmering van differentieelregelaar

- - valve gate with open flow when the actuator is in base position
- Markiert den Anschluss der offen in der Ausgangsposition des Umschaltventils ist
- raccordement de la vanne de commutation qui est ouvert lorsque le moteur est en position de départ
- collegamento della valvola di commutazione che si apre quando l'avvio a motore è nella posizione di base
- stroom van de afsluitklep is open wanneer de aandrijving in basispositie staat



Switching valves must be in primary position (without control voltage), switched to the solid fuel boiler or heat accumulator.

Die Umschaltventile müssen in der Ausgangsposition (ohne Schaltspannung) auf den Festbrennstoffkessel oder den Speicher geschaltet sein.

Les vannes de commutation doivent être couplée en position primaire (sans tension de commande), à la chaudière à combustible solide ou accumulateur de chaleur.

Le valvole di selezione devono essere nella posizione di base (senza la tensione di alimentazione) inserite sulla caldaia a combustibile solido ovvero sul serbatoio di calore.

Schakelkranen moeten in eerste stand staan (zonder voltagebeheer), op de boiler voor vaste vloeistof of warmteaccumulator.



If the controller is in bus connection, you can not activate the additional differential thermostats.

Wenn der Regler in BUS Verbindung steht, kann man den Zusatz Differenzthermostaten nicht aktivieren.

Si le régulateur est en connexion de bus, vous ne pouvez pas activer des thermostats différentiel supplémentaires.

Non è possibile inserire un ulteriore termostato differenziale sul regolatore in collegamento M-Bus.

Als de regelaar in bus-verbinding is, kunt u de extra differentieelthermostaten niet activeren.

101 (KMS-D, KMS-D+)

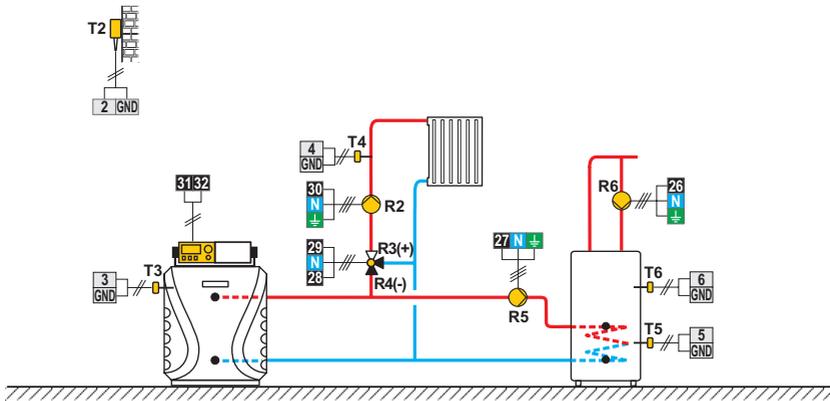
Oil boiler, mixing circuit, d. h. w. storage tank.

Flüssigbrennstoffkessel, Mischerheizkreis, Brauchwassererwärmer.

Chaudière à fioul, circuit mélangeur, chauffe-eau sanitaire.

Caldaia a olio, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Olieketel, mengcircuit, warmwatertank.



101b (KMS-D, KMS-D+)

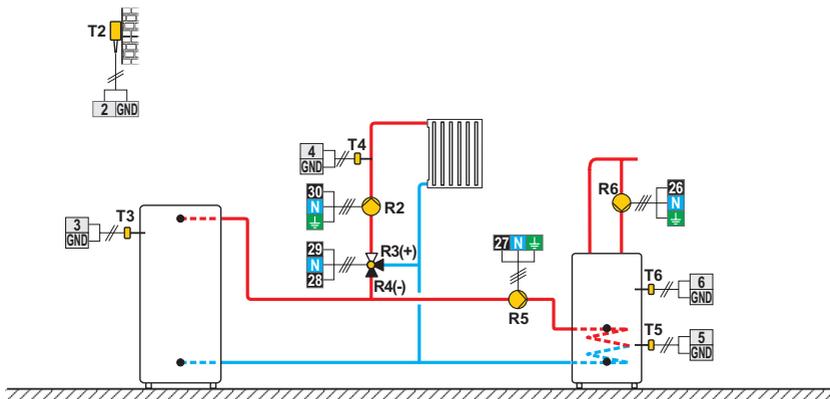
Heat accumulator, mixing circuit, d. h. w. storage tank.

Wärmespeicher, Mischerheizkreis, Brauchwassererwärmer.

Ballon d'eau chaude, circuit mélangeur, chauffe-eau sanitaire.

Serbatoio di calore, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Warmteaccumulator, mengcircuit, warmwatertank.



101c (KMS-D, KMS-D+)

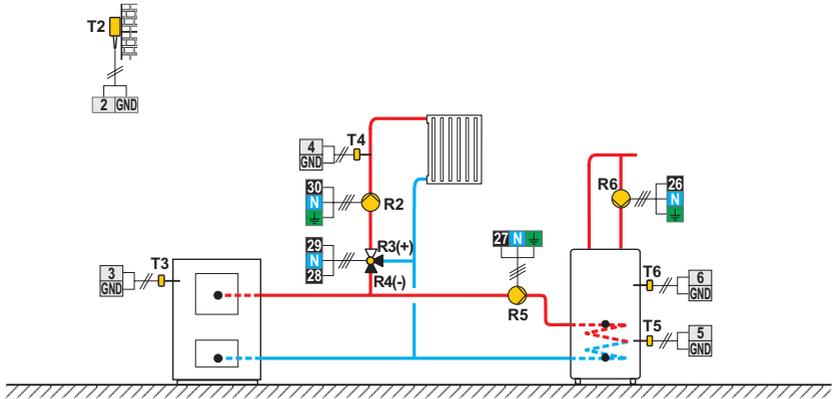
Solid fuel boiler, mixing circuit, d. h. w. storage tank.

Festbrennstoffkessel, Mischerheizkreis, Brauchwassererwärmer.

Chaudière à fioul, circuit mélangeur, chauffe-eau sanitaire.

Caldaia a olio, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Boiler voor vaste brandstof, mengcircuit, warmwatertank.



101d (KMS-D, KMS-D+)

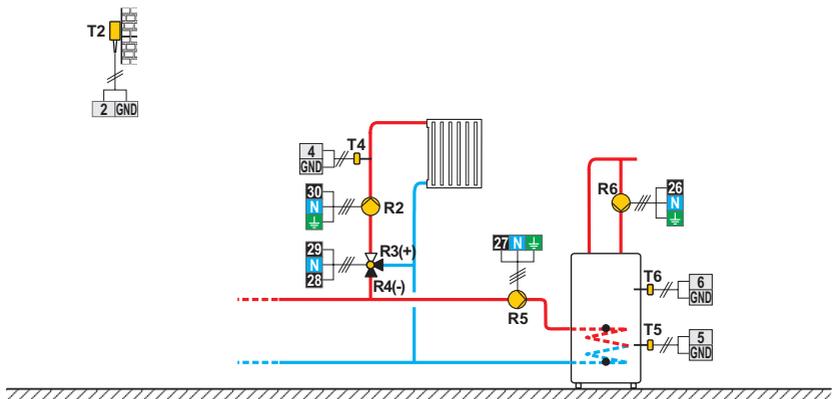
Without boiler system - d. h. w. storage tank.

System ohne Kessel - Mischerheizkreis, Brauchwassererwärmer.

Système sans chaudière - circuit mélangeur, chauffe-eau sanitaire.

Sistema senza caldaia - circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Zonder boilersysteem - warmwatertank.



101e (KMS-D, KMS-D+)

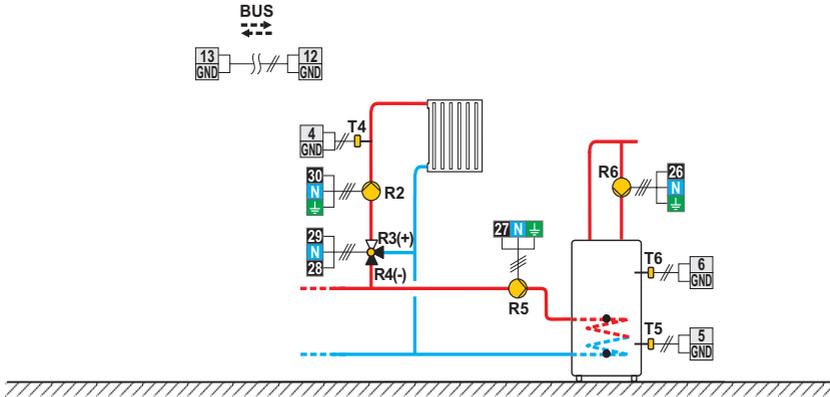
Extension of the scheme - mixing circuit, d. h. w. storage tank.

Erweiterungsschema - Mischerheizkreis, Brauchwassererwärmer.

Schéma d'extension - circuit mélangeur, chauffe-eau sanitaire.

Sistema di allargamento - circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Uitbreiding van het schema - mengcircuit, warmwatertank.



102 (KMS-D, KMS-D+)

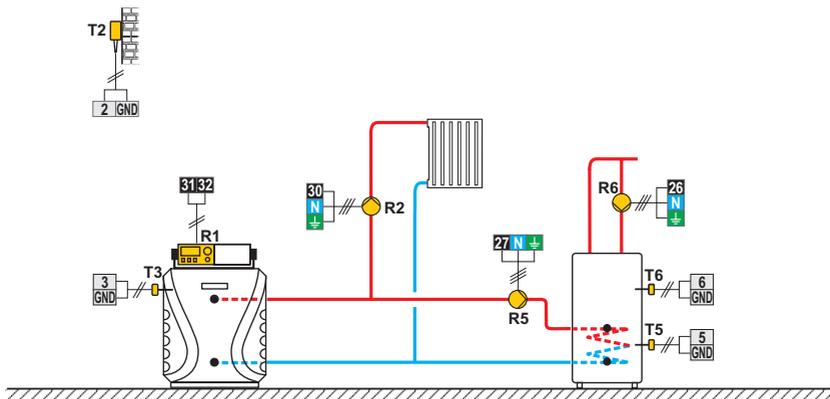
Oil boiler, direct circuit, d. h. w. storage tank.

Flüssigbrennstoffkessel, Direktheizkreis, Brauchwassererwärmer.

Chaudière à fioul, circuit direct, chauffe-eau sanitaire.

Caldala a olio, circuito diretto, dispositivo di riscaldamento dell'acqua sanitaria.

Olieketel, direct circuit, warmwatertank.



103 (KMS-D, KMS-D+)

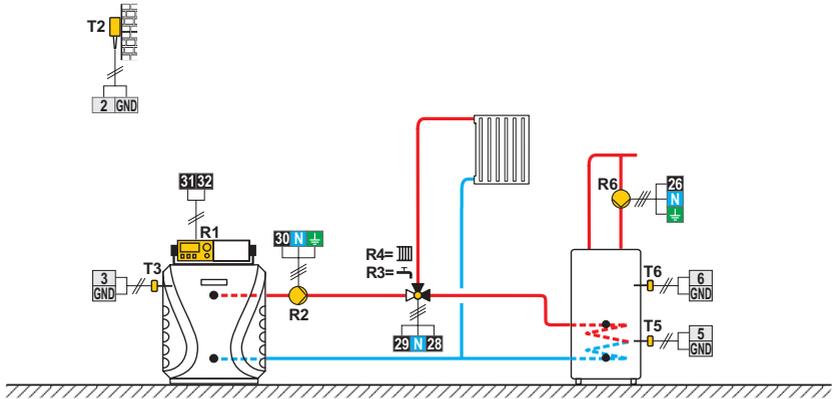
Oil boiler, direct circuit, d. h. w. storage tank.

Flüssigbrennstoffkessel, Direktheizkreis, Brauchwassererwärmer.

Chaudière à fioul, circuit direct, chauffe-eau sanitaire.

Caldaia a olio, circuito diretto, dispositivo di riscaldamento dell'acqua sanitaria.

Olieketel, direct circuit, warmwatertank.



104 (KMS-D, KMS-D+)

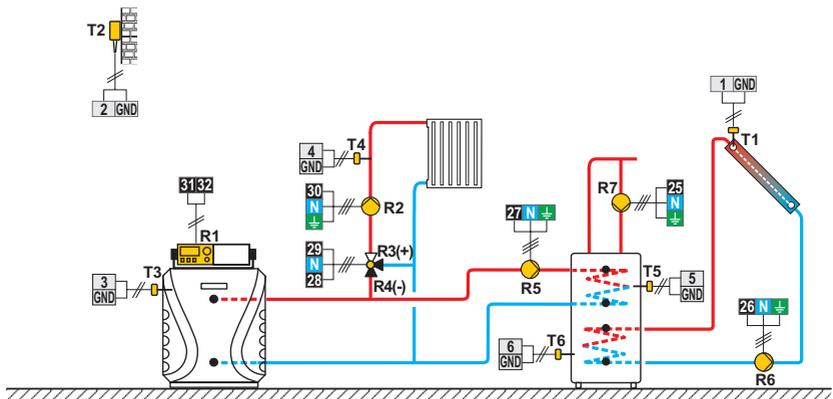
Oil boiler, mixing circuit, d. h. w. storage tank, solar collectors.

Flüssigbrennstoffkessel, Mischerheizkreis, Brauchwassererwärmer, Solarkollektoren.

Chaudière à fioul, circuit mélangeur, chauffe-eau sanitaire, capteurs solaires.

Caldaia a olio, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria, collettori solari.

Olieketel, mengcircuit, warmwatertank, zonnecollectoren.



104b (KMS-D, KMS-D+)

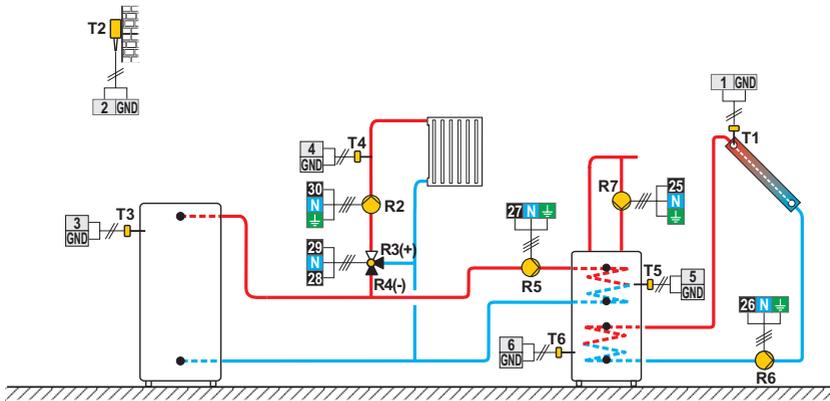
Heat accumulator, mixing circuit, d. h. w. storage tank, solar collectors.

Wärmespeicher, Mischerheizkreis, Brauchwassererwärmer, Solarkollektoren.

Ballon d'eau chaude, circuit mélangeur, chauffe-eau sanitaire, capteurs solaires.

Serbatoio di calore, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria, collettori solari.

Warmteaccumulator, mengcircuit, warmwatertank, zonnecollectoren.



104c (KMS-D, KMS-D+)

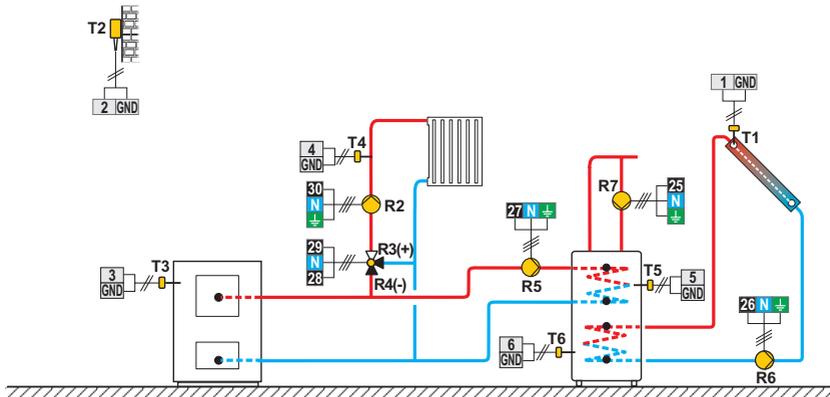
Solid fuel boiler, mixing circuit, d. h. w. storage tank, solar collectors.

Festbrennstoffkessel, Mischerheizkreis, Brauchwassererwärmer, Solarkollektoren.

Chaudière à combustible solide, circuit mélangeur, chauffe-eau sanitaire, capteurs solaires.

Caldaja a combustibile solido, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria, collettori solari.

Boiler voor vaste brandstof, mengcircuit, warmwatertank, zonnecollectoren.



104d (KMS-D, KMS-D+)

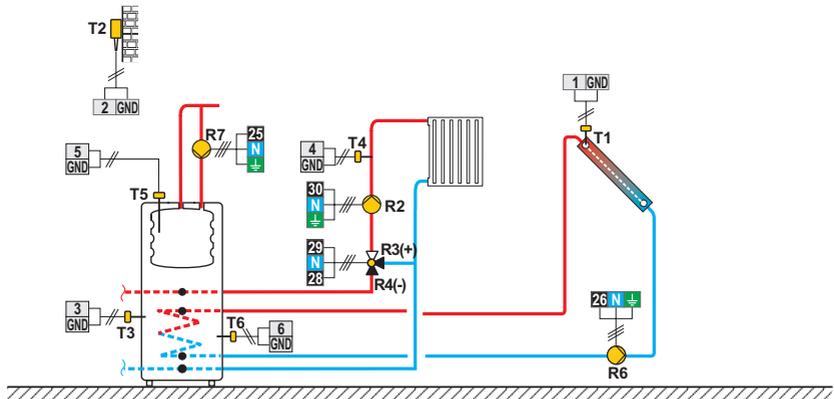
Heat accumulator with integrated d. h. w. storage tank, mixing circuit, solar collectors.

Wärmespeicher mit eingebauten Brauchwassererwärmer, Mischerheizkreis, Solarkollektoren.

Ballon d'eau chaude avec chauffe-eau sanitaire intégré, circuit mélangeur, capteurs solaires.

Serbatoio di calore con dispositivo di riscaldamento incorporato per l'acqua sanitaria, circuito di miscelato, collettori solari.

Warmeteaccumulator met geïntegreerde warmwatertank, mengcircuit, zonnecollectoren.



104e (KMS-D, KMS-D+)

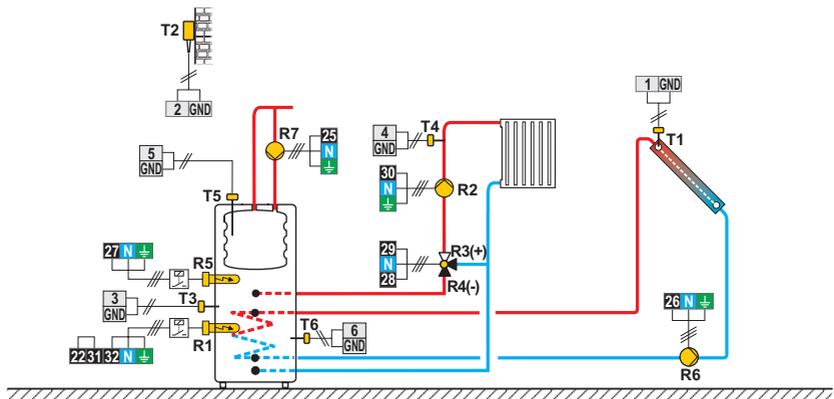
Heat accumulator with integrated d. h. w. storage tank, mixing circuit, solar collectors.

Wärmespeicher mit eingebauten Brauchwassererwärmer, Mischerheizkreis, Solarkollektoren.

Ballon d'eau chaude avec chauffe-eau sanitaire intégré, circuit mélangeur, capteurs solaires.

Serbatoio di calore con dispositivo di riscaldamento incorporato per l'acqua sanitaria, circuito di miscelato, collettori solari.

Warmeteaccumulator met geïntegreerde warmwatertank, mengcircuit, zonnecollectoren.



104f (KMS-D, KMS-D+)

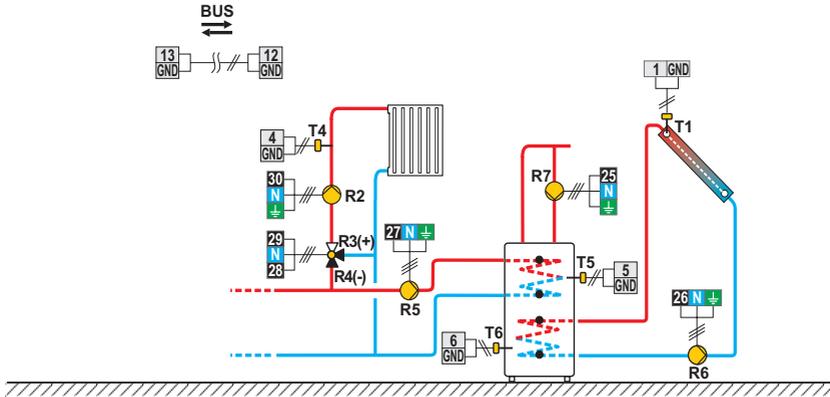
Extension of the scheme - mixing circuit, d. h. w. storage tank.

Erweiterungsschema - Mischerheizkreis, Brauchwassererwärmer, Solarkollektoren.

Schéma d'extension - circuit mélangeur, chauffe-eau sanitaire, capteurs solaires.

Sistema di allargamento - circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria, collettori solari.

Uitbreiding van het schema - mengcircuit, warmwatertank.



105 (KMS-D, KMS-D+)

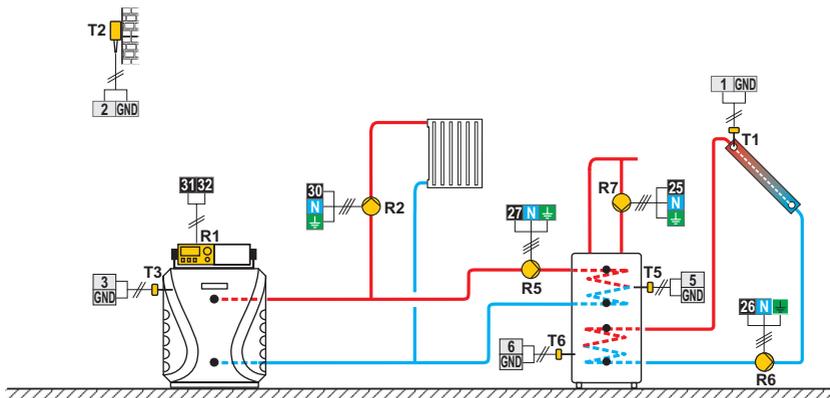
Oil boiler, direct circuit, d. h. w. storage tank, solar collectors.

Flüssigbrennstoffkessel, Direktheizkreis, Brauchwassererwärmer, Solarkollektoren.

Chaudière à fioul, circuit direct, chauffe-eau sanitaire, capteurs solaires.

Caldalaia a olio, circuito diretto, dispositivo di riscaldamento dell'acqua sanitaria, collettori solari.

Olieketel, direct circuit, warmwatertank, zonnecollectoren.



106 (KMS-D, KMS-D+)

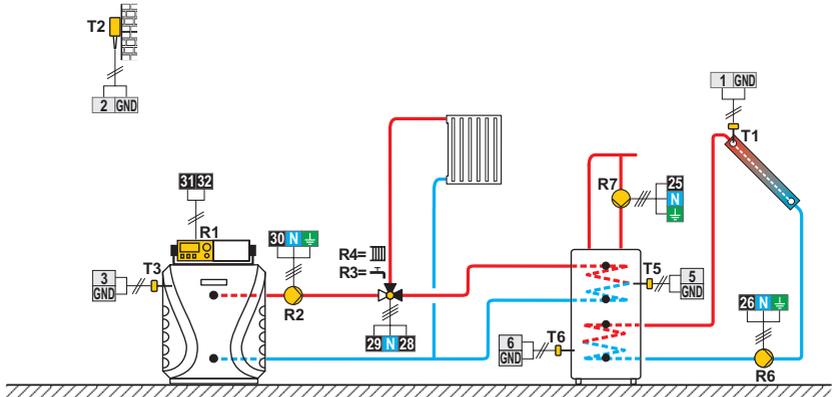
Oil boiler, direct circuit, d. h. w. storage tank, solar collectors.

Flüssigbrennstoffkessel, Direktheizkreis, Brauchwassererwärmer, Solarkollektoren.

Chaudière à fioul, circuit direct, chauffe-eau sanitaire, capteurs solaires.

Caldaia a olio, circuito diretto, dispositivo di riscaldamento dell'acqua sanitaria, collettori solari.

Olieketel, direct circuit, warmwatertank, zonnecollectoren.



107 (KMS-D, KMS-D+)

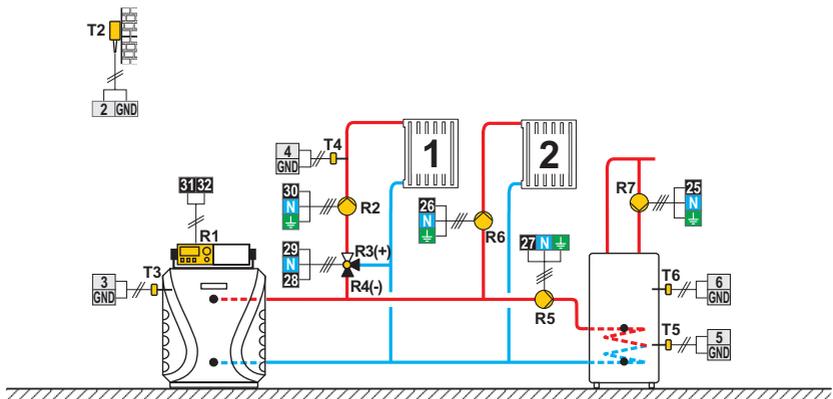
Oil boiler, direct circuit, d. h. w. storage tank.

Flüssigbrennstoffkessel, Direktheizkreis, Mischerheizkreis, Brauchwassererwärmer.

Chaudière à fioul, circuit direct, circuit mélangeur, chauffe-eau sanitaire.

Caldaia a olio, circuito diretto, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Olieketel, mengcircuit, direct circuit, warmwatertank.



107b (KMS-D, KMS-D+)

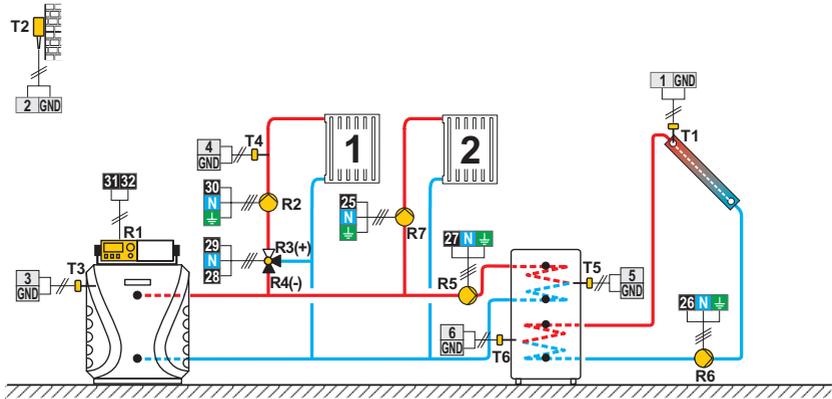
Oil boiler, direct circuit, d. h. w. storage tank, solar collectors.

Flüssigbrennstoffkessel, Direktheizkreis, Mischerheizkreis, Brauchwassererwärmer, Solarkollektoren.

Chaudière à fioul, circuit direct, circuit mélangeur, chauffe-eau sanitaire, capteurs solaires.

Caldaja a olio, circuito diretto, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria, collettori solari.

Olieketel, direct circuit, warmwatertank, zonnecollectoren.



108 (KMS-D, KMS-D+)

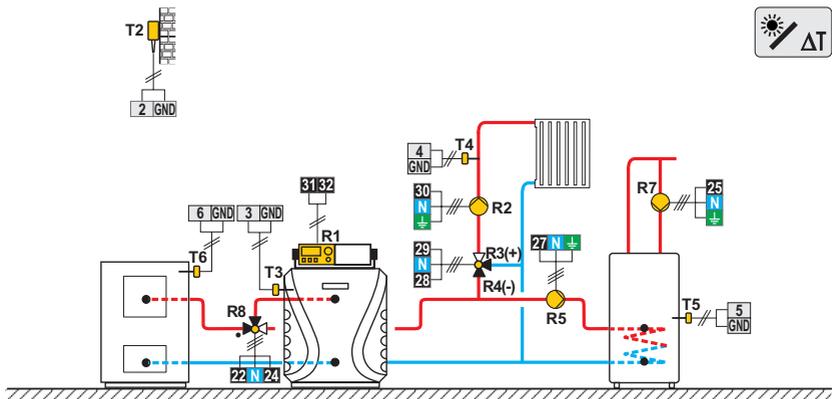
Solid fuel boiler, oil boiler, mixing circuit, d. h. w. storage tank.

Festbrennstoffkessel, Flüssigbrennstoffkessel, Mischerheizkreis, Brauchwassererwärmer.

Chaudière à combustible solide, chaudière à fioul, circuit mélangeur, chauffe-eau sanitaire.

Caldaja a combustibile solido, caldaia a olio, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Boiler voor vaste brandstof, olieketel, mengcircuit, warmwatertank.



108b (KMS-D, KMS-D+)

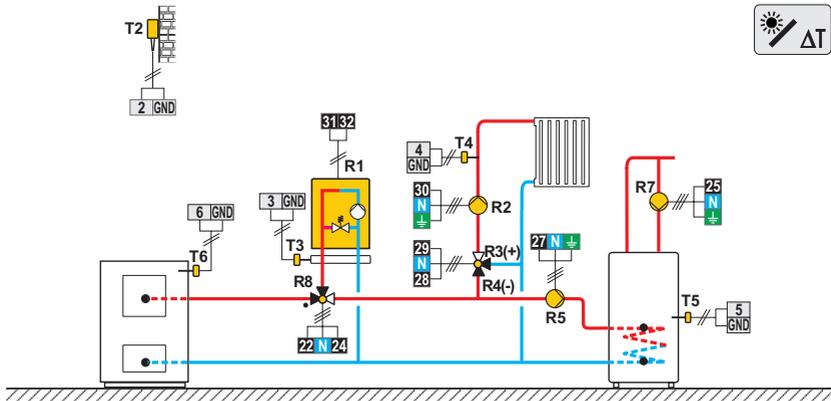
Solid fuel boiler, gas boiler, mixing circuit, d. h. w. storage tank.

Festbrennstoffkessel, Gaskessel, Mischerheizkreis, Brauchwassererwärmer.

Chaudière à combustible solide, chaudière à gaz, circuit mélangeur, chauffe-eau sanitaire.

Caldaia a combustibile solido, caldaia a gas, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Boiler voor vaste brandstof, gasboiler, mengcircuit, warmwatertank



109 (KMS-D, KMS-D+)

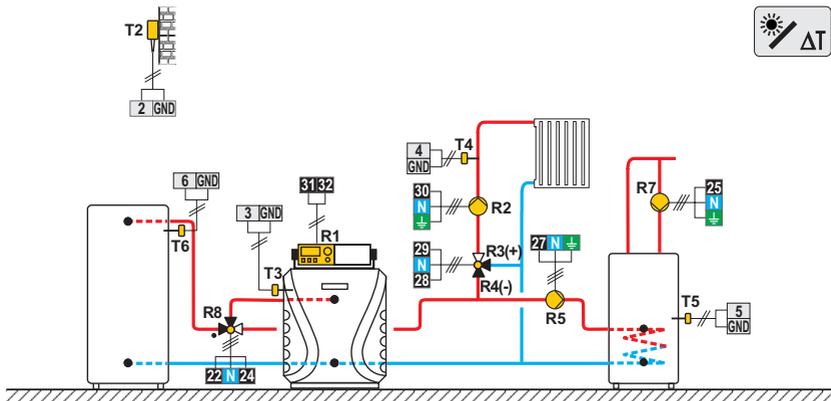
Heat accumulator, oil boiler, mixing circuit, d. h. w. storage tank.

Wärmespeicher, Flüssigbrennstoffkessel, Mischerheizkreis, Brauchwassererwärmer.

Ballon d'eau chaude, chaudière à fioul, circuit mélangeur, chauffe-eau sanitaire.

Serbatoio di calore, caldaia a olio, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Warmteaccumulator, olietel, mengcircuit, warmwatertank



109b (KMS-D, KMS-D+)

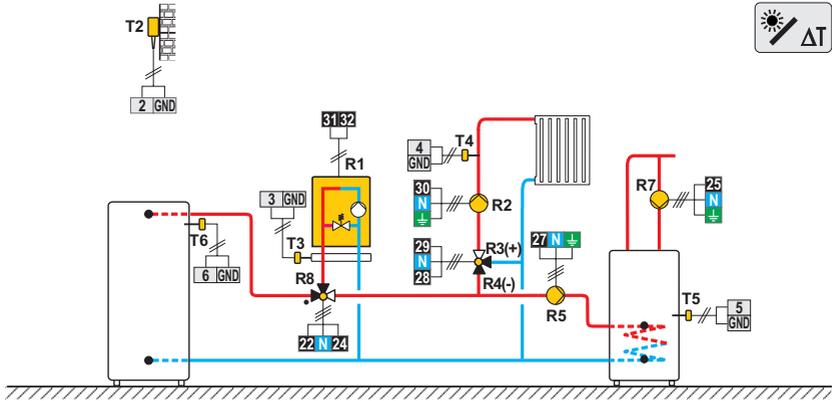
Heat accumulator, gas boiler, mixing circuit, d. h. w. storage tank.

Wärmespeicher, Gaskessel, Mischerheizkreis, Brauchwassererwärmer.

Ballon d'eau chaude, chaudière à gaz, circuit mélangeur, chauffe-eau sanitaire.

Serbatoio di calore, caldaia a gas, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Warmeeteaccumulator, gasboiler, mengcircuit, warmwatertank.



110 (KMS-D, KMS-D+)

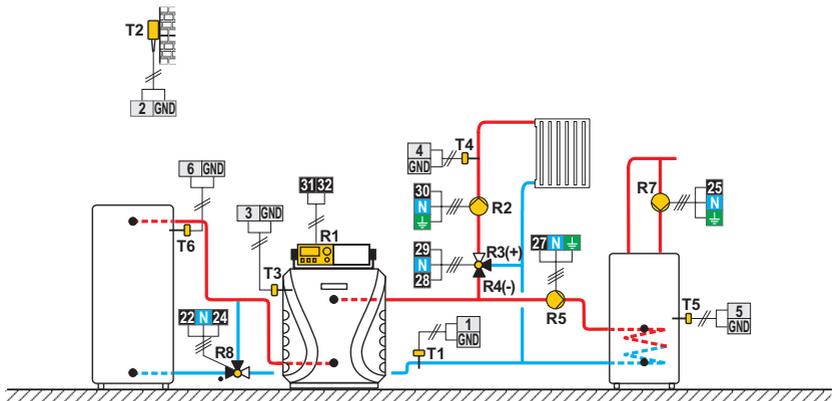
Heat accumulator, oil boiler, mixing circuit, d. h. w. storage tank.

Wärmespeicher, Flüssigbrennstoffkessel, Mischerheizkreis, Brauchwassererwärmer.

Ballon d'eau chaude, chaudière à fioul, circuit mélangeur, chauffe-eau sanitaire.

Serbatoio di calore, caldaia a olio, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Warmeeteaccumulator, olietel, mengcircuit, warmwatertank.



110b (KMS-D, KMS-D+)

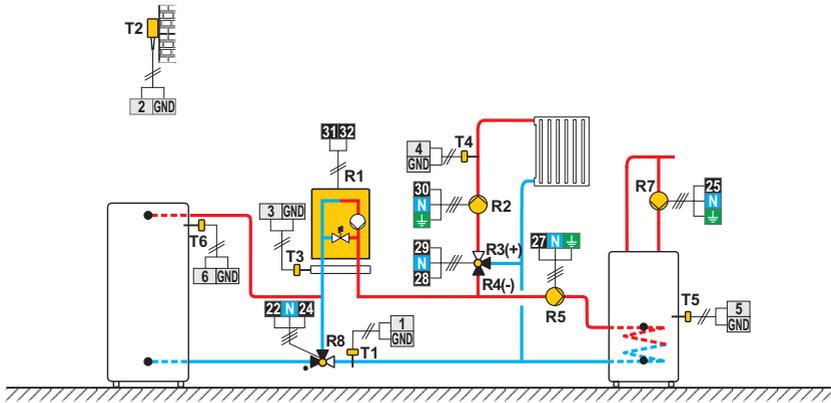
Heat accumulator, gas boiler, mixing circuit, d. h. w. storage tank.

Wärmespeicher, Gaskessel, Mischerheizkreis, Brauchwassererwärmer.

Ballon d'eau chaude, chaudière à gaz, circuit mélangeur, chauffe-eau sanitaire.

Serbatoio di calore, caldaia a gas, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Warmeteaccumulator, gasboiler, mengcircuit, warmwatertank.



110c (KMS-D, KMS-D+)

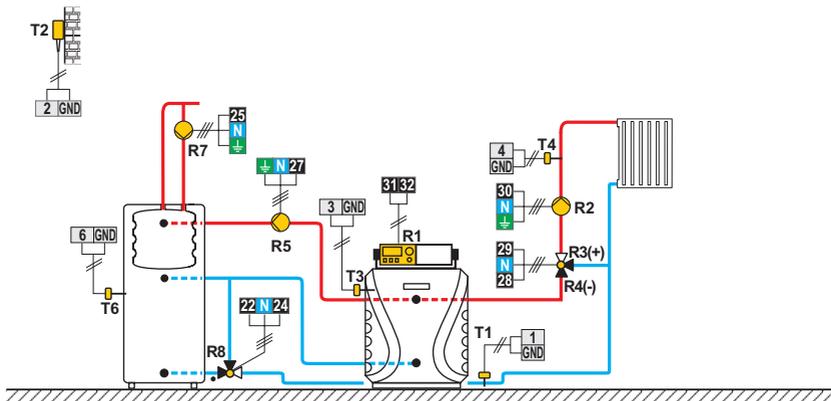
Heat accumulator with integrated d. h. w. storage tank, oil boiler, mixing circuit.

Wärmespeicher mit eingebauten Brauchwassererwärmer, Flüssigbrennstoffkessel, Mischerheizkreis.

Ballon d'eau chaude avec chauffe-eau sanitaire int., chaudière à fioul, circuit mélangeur.

Serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, caldaia a olio, circuito di miscelato.

Warmeteaccumulator met geïntegreerde warmwatertank, olietel, mengcircuit.



111 (KMS-D, KMS-D+)

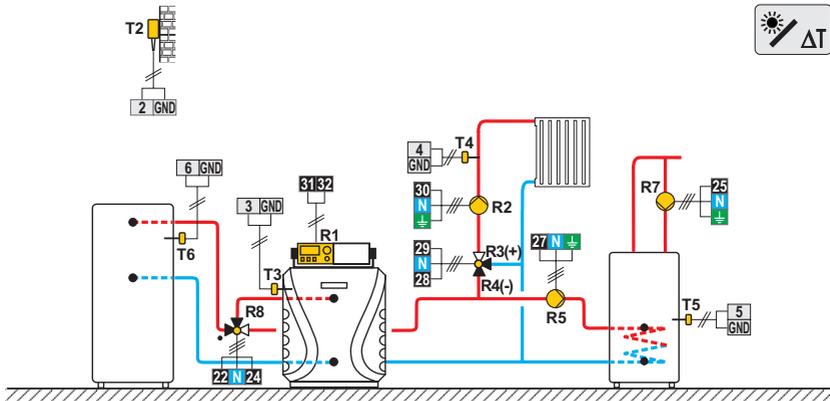
Heat accumulator, oil boiler, mixing circuit, d. h. w. storage tank.

Wärmespeicher, Flüssigbrennstoffkessel, Mischerheizkreis, Brauchwassererwärmer.

Ballon d'eau chaude, chaudière à fioul, circuit mélangeur, chauffe-eau sanitaire.

Serbatoio di calore, caldaia a olio, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Warmteeaccumulator, olieketel, mengcircuit, warmwatertank.



112 (KMS-D, KMS-D+)

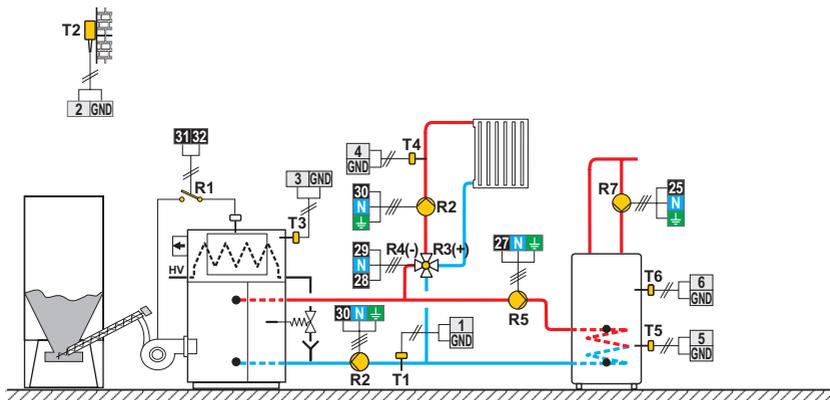
Pellet boiler, mixing circuit, d. h. w. storage tank.

Pelletkessel, Mischerheizkreis, Brauchwassererwärmer.

Chaudière à pellets, circuit mélangeur, chauffe-eau sanitaire.

Caldaia a pellet, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Pelletboiler, mengcircuit, warmwatertank.



113 (KMS-D, KMS-D+)

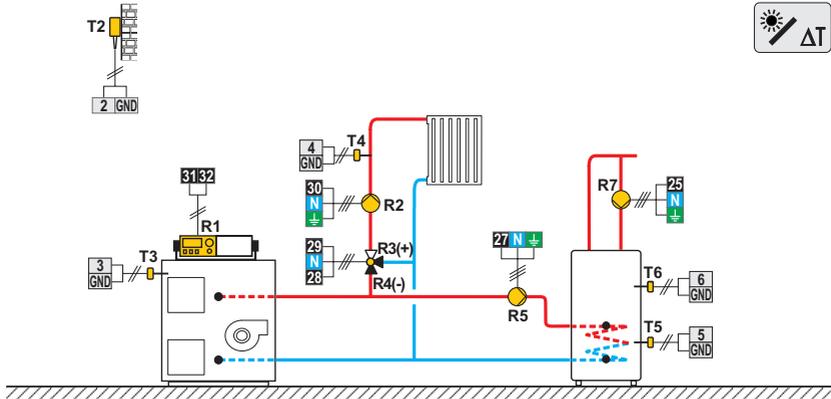
Combination (solid fuel / oil) boiler, mixing circuit, d. h. w. storage tank.

Kombikessel (Festbrennstoff/Oil), Mischerheizkreis, Brauchwassererwärmer.

Chaudière combinée (combustible solide/fioul), circuit mélangeur, chauffe-eau sanitaire.

Caldaia combinata (a combustibile solido/olio), circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Combinatie (vaste brandstof / olie) boiler, mengcircuit, warmwatertank.



114 (KMS-D, KMS-D+)

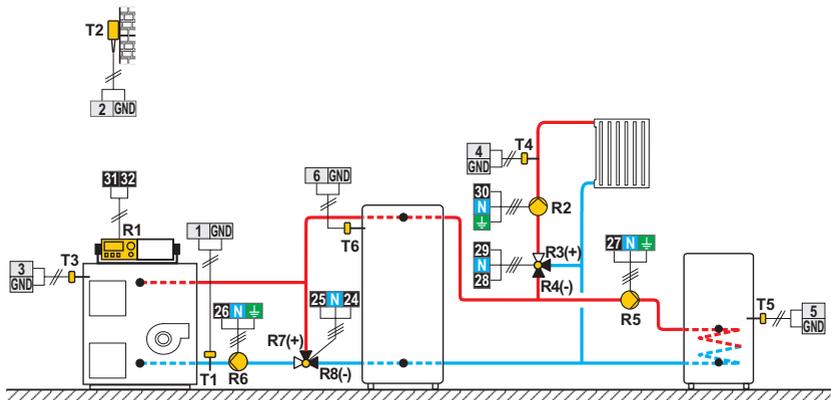
Combination (solid fuel / oil) boiler, heat accumulator, mixing circuit, d. h. w. storage tank.

Kombikessel (Festbrennstoff/Oil), Wärmespeicher, Mischerheizkreis, Brauchwassererwärmer.

Chaudière combinée (combustible solide/fioul), ballon d'eau chaude, circuit mélangeur, chauffe-eau sanitaire.

Caldaia combinata (a combustibile solido/olio), serbatoio di calore, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Combinatie (vaste brandstof / olie) boiler, warmteaccumulator, mengcircuit, warmwatertank.



114b (KMS-D, KMS-D+)

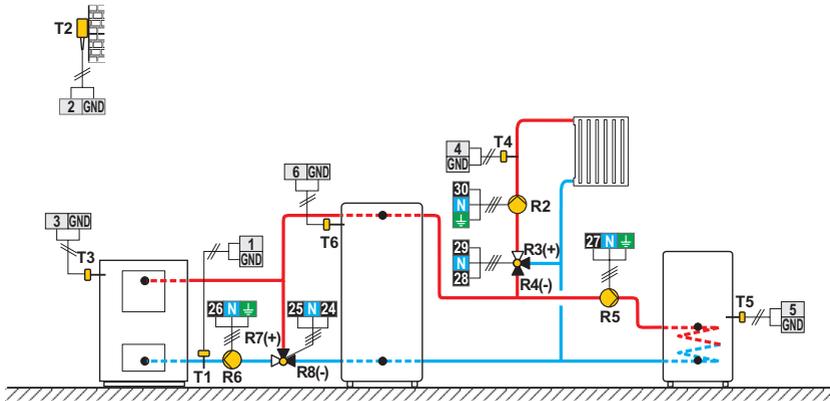
Solid fuel boiler, heat accumulator, mixing circuit, d. h. w. storage tank.

Festbrennstoffkessel, Wärmespeicher, Mischerheizkreis, Brauchwassererwärmer.

Chaudière à combustible solide, ballon d'eau chaude, circuit mélangeur, chauffe-eau sanitaire.

Caldaia a combustibile solido, serbatoio di calore, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Boiler voor vaste brandstof, warmteaccumulator, mengcircuit, warmwatertank.



115 (KMS-D, KMS-D+)

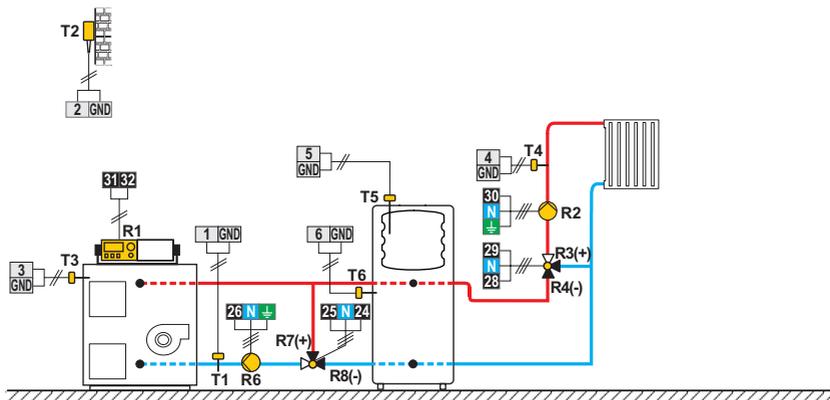
Combination (solid fuel / oil) boiler, heat accumulator with integrated d. h. w. storage tank, mixing circuit.

Kombikessel (Festbrennstoff/Oil), Wärmespeicher mit eing. Brauchwassererwärmer, Mischerheizkreis.

Chaudière combinée (combustible solide/fioul), ballon d'eau chaude avec chauffe-eau sanitaire int., circuit mélangeur.

Caldaia combinata (a combustibile solido/olio), serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, circuito di miscelato.

Combinatie (vaste brandstof / olie) boiler, warmteaccumulator met geïntegreerde warmwatertank, mengcircuit.



115b (KMS-D, KMS-D+)

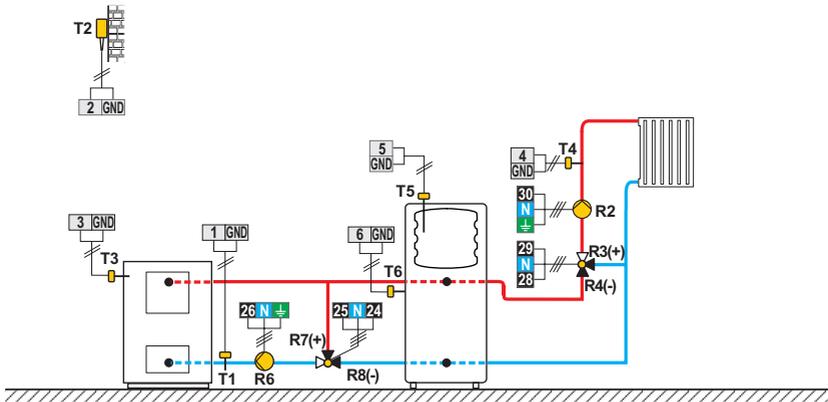
Solid fuel boiler, heat accumulator, mixing circuit, d. h. w. storage tank.

Festbrennstoffkessel, Wärmespeicher, Mischerheizkreis, Brauchwassererwärmer.

Chaudière à combustible solide, ballon d'eau chaude, circuit mélangeur, chauffe-eau sanitaire.

Caldaia a combustibile solido, serbatoio di calore, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Boiler voor vaste brandstof, warmteaccumulator, mengcircuit, warmwatertank.



115c (KMS-D, KMS-D+)

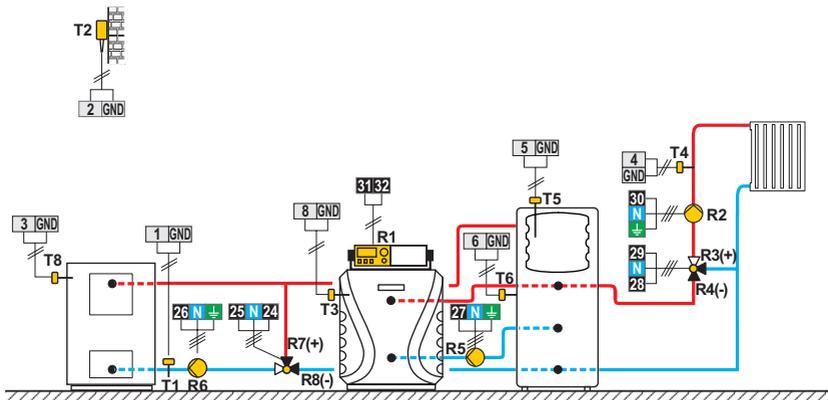
Oil boiler, solid fuel boiler, heat accumulator with integrated d. h. w. storage tank, mixing circuit.

Flüssigbrennstoffkessel, Festbrennstoffkessel, Wärmespeicher mit eingebauten Brauchwassererwärmer, Mischerheizkreis.

Chaudière à fioul, chaudière à combustible solide, ballon d'eau chaude avec chauffe-eau sanitaire intégré, circuit mélangeur.

Caldaia a olio, caldaia a combustibile solido, serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, circuito di miscelato.

Olieketel, boiler voor vaste brandstof, warmteaccumulator met geïntegreerde warmwatertank, mengcircuit.



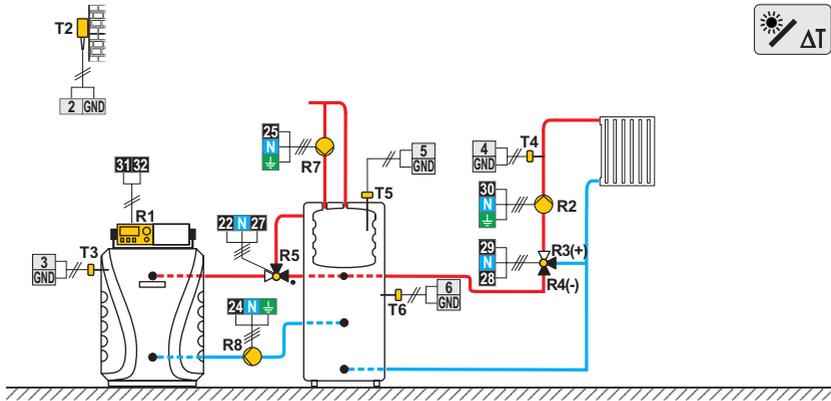
116c (KMS-D, KMS-D+)

Oil boiler, heat accumulator with integrated d. h. w. storage tank, mixing circuit.

Flüssigbrennstoffkessel, Wärmespeicher mit eingebauten Brauchwassererwärmer, Mischerheizkreis.

Chaudière à fioul, ballon d'eau chaude avec chauffe-eau sanitaire intégré, circuit mélangeur.

Caldaja a olio, serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, circuito di miscelato
Olieketel, warmteaccumulator met geïntegreerde warmwatertank, mengcircuit.



117 (KMS-D, KMS-D+)

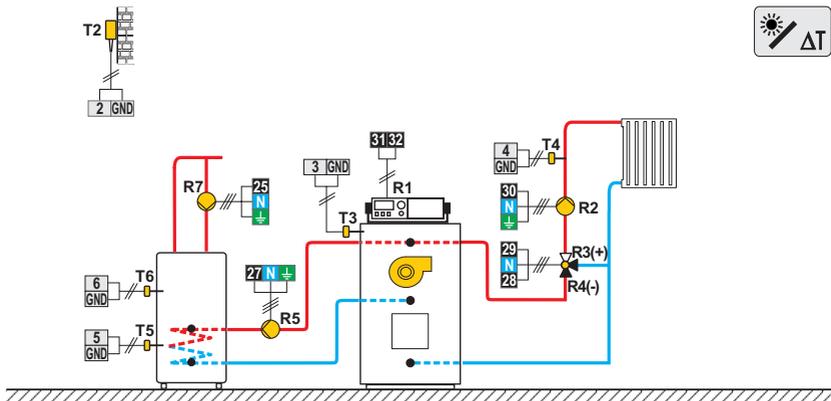
Combination (solid fuel / oil) boiler, mixing circuit, d. h. w. storage tank.

Kombikessel (Festbrennstoff/Oil), Mischerheizkreis, Brauchwassererwärmer.

Chaudière combinée (combustible solide/fioul), circuit mélangeur, chauffe-eau sanitaire.

Caldaja combinata (a combustibile solido/olio), circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Combinatie (vaste brandstof / olie) boiler, mengcircuit, warmwatertank.



118 (KMS-D, KMS-D+)

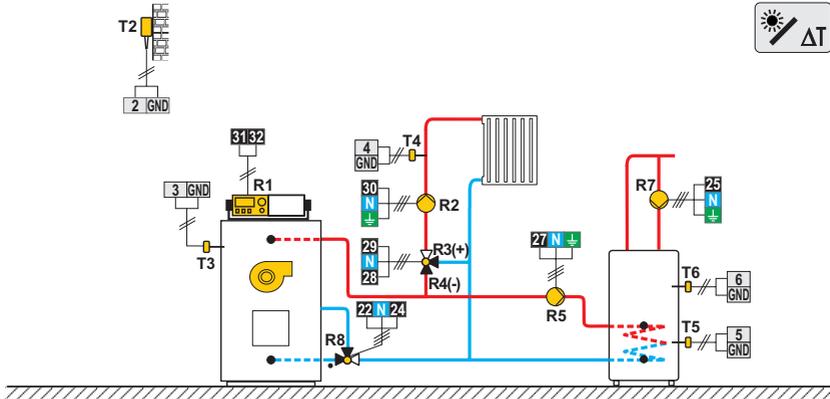
Combination (solid fuel / oil) boiler, mixing circuit, d. h. w. storage tank.

Kombikessel (Festbrennstoff/Öl), Mischerheizkreis, Brauchwassererwärmer.

Chaudière combinée (combustible solide/fioul), circuit mélangeur, chauffe-eau sanitaire.

Caldaia combinata (a combustibile solido/olio), circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Combinatie (vaste brandstof / olie) boiler, mengcircuit, warmwatertank.



119 (KMS-D, KMS-D+)

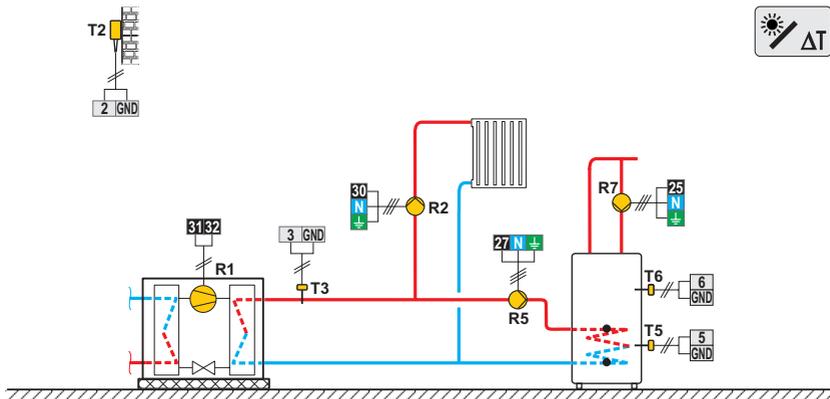
Heat pump, direct circuit, d. h. w. storage tank.

Wärmepumpe, Direktheizkreis, Brauchwassererwärmer.

Pompe à chaleur, circuit direct, chauffe-eau sanitaire.

Pompa di calore, circuito diretto, dispositivo di riscaldamento dell'acqua sanitaria.

Warmtepomp, direct circuit, warmwatertank.



120 (KMS-D, KMS-D+)

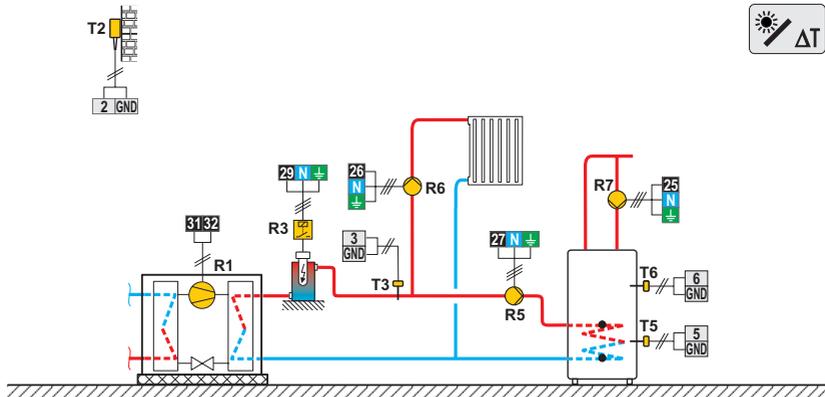
Heat pump with electric reheating, direct circuit, d. h. w. storage tank.

Wärmepumpe, Nachwärmung mit Elektrik, Direktheizkreis, Brauchwassererwärmer.

Pompe à chaleur, chauffage électrique d'appoint, circuit direct, chauffe-eau sanitaire.

Pompa di calore, riscaldamento elettrico, circuito diretto, dispositivo di riscaldamento dell'acqua sanitaria.

Warmtepomp met elektrishe verwarming, direct circuit, warmwatertank.



121 (KMS-D, KMS-D+)

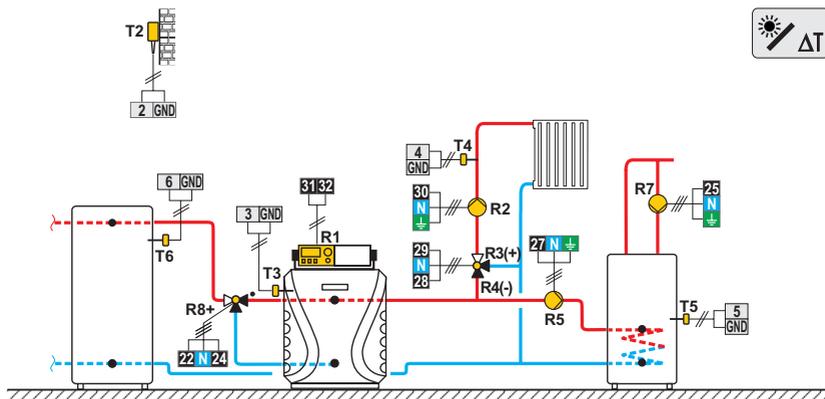
Oil boiler, heat accumulator, mixing circuit, d. h. w. storage tank.

Flüssigbrennstoffkessel, Wärmespeicher, Mischerheizkreis, Brauchwassererwärmer.

Chaudière à fioul, ballon d'eau chaude, circuit mélangeur, chauffe-eau sanitaire.

Caldaia a olio, serbatoio di calore, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Olieketel, warmteaccumulator, mengcircuit, warmwatertank.



122 (D-KMS, KMS-D+)

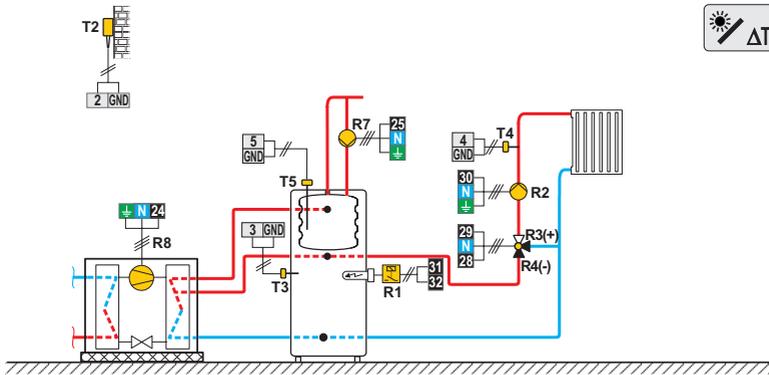
Heat pump, heat accumulator with integrated d. h. w. storage tank, mixing circuit.

Wärmepumpe, Wärmespeicher mit eingebauten Brauchwassererwärmer, Mischerheizkreis.

Pompe à chaleur, ballon d'eau chaude avec chauffe-eau sanitaire int., circuit mélangeur.

Pompa di calore, serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, circuito di miscelato.

Warmtepomp, warmteaccumulator met geïntegreerde warmwatertank, mengcircuit.



122b (KMS-D, KMS-D+)

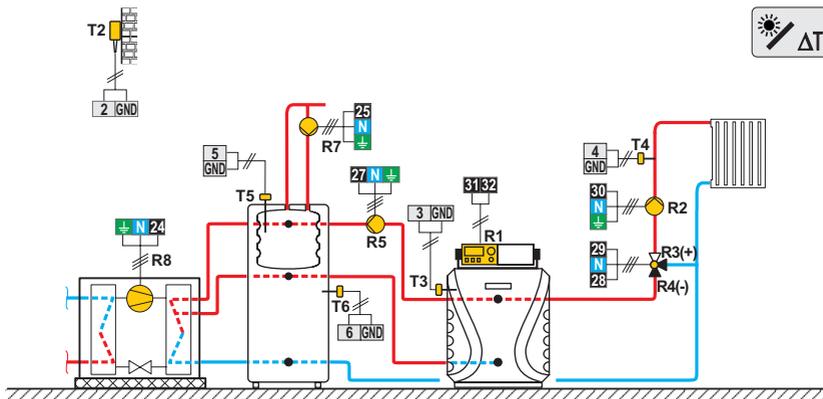
Heat pump, oil boiler, heat accumulator with integrated d. h. w. storage tank, mixing circuit.

Wärmepumpe, Flüssigbrennstoffkessel, Wärmespeicher mit eingebauten Brauchwassererwärmer, Mischerheizkreis.

Pompe à chaleur, chaudière à fioul, ballon d'eau chaude avec chauffe-eau sanitaire, circuit mélangeur.

Pompa di calore, caldaia a olio, serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, circuito di miscelato.

Warmtepomp, olieketel met geïntegreerde warmwatertank, mengcircuit.



122c (D-KMS, KMS-D+)

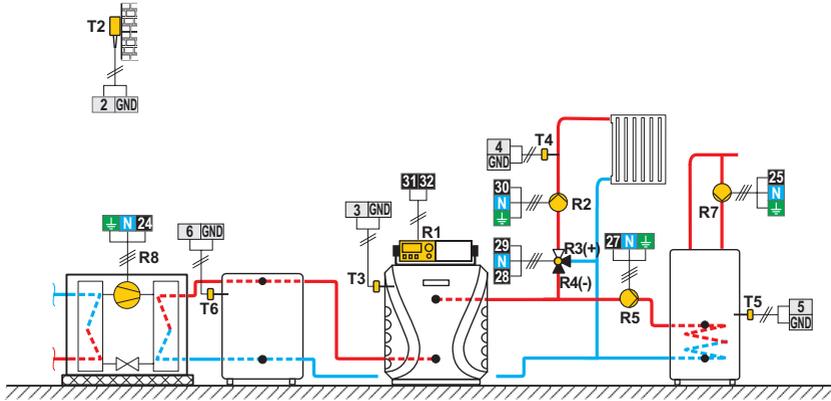
Heat pump, oil boiler, heat accumulator, mixing circuit, d. h. w. storage tank.

Wärmepumpe, Flüssigbrennstoffkessel, Wärmespeicher, Mischerheizkreis, Brauchwassererwärmer.

Pompe à chaleur, chaudière à fioul, ballon d'eau chaude, circuit mélangeur chauffe-eau sanitaire.

Pompa di calore, caldaia a olio, serbatoio di calore, circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Warmtepomp, warmteaccumulator, mengcircuit, warmwatertank.



122d (KMS-D, KMS-D+)

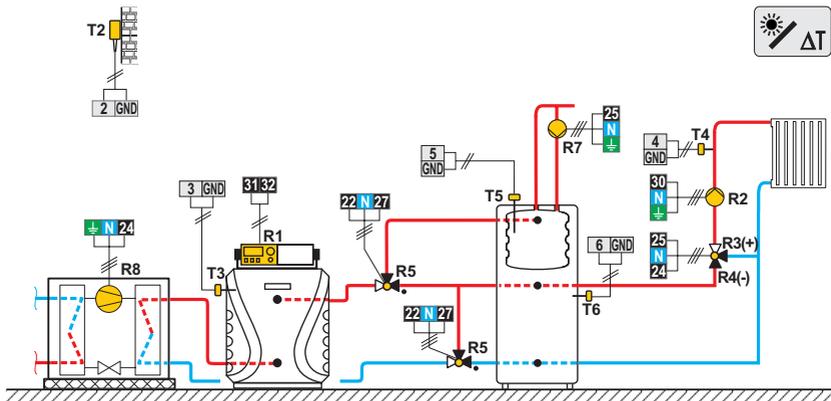
Heat pump, oil boiler, heat accumulator with integrated d. h. w. storage tank, mixing circuit.

Wärmepumpe, Flüssigbrennstoffkessel, Wärmespeicher mit eingebauten Brauchwassererwärmer, Mischerheizkreis.

Pompe à chaleur, chaudière à fioul, ballon d'eau chaude avec chauffe-eau, sanitaire, circuit mélangeur.

Pompa di calore, caldaia a olio, serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, circuito di miscelato.

Warmtepomp, olieketel met geïntegreerde warmwatertank, mengcircuit.



123 (KMS-D+)

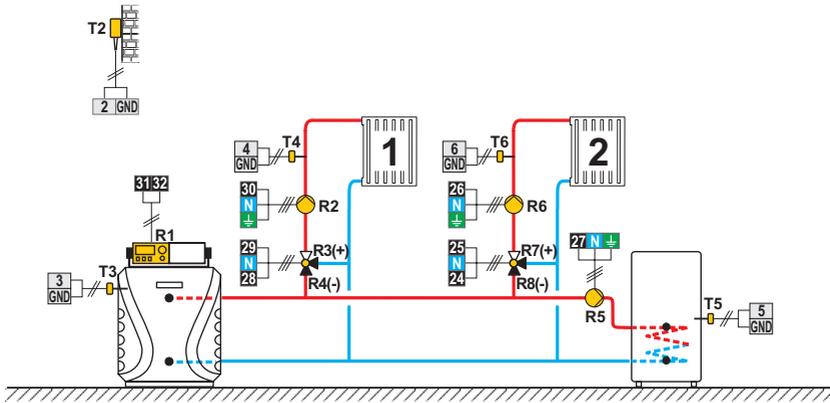
Oil boiler, 2x mixing circuit, d. h. w. storage tank.

Flüssigbrennstoffkessel, 2x Mischerheizkreis, Brauchwassererwärmer.

Chaudière à fioul, 2x circuit mélangeur, chauffe-eau sanitaire.

Caldaia a olio, 2x circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Olieketel, 2x mengcircuit, warmwatertank.



123b (KMS-D+)

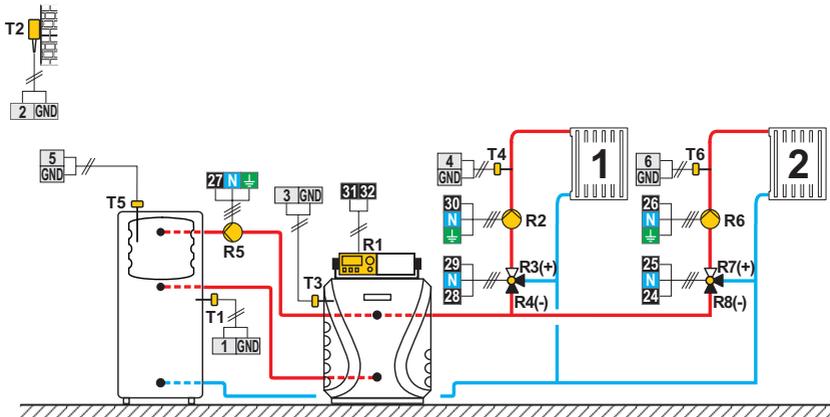
Oil boiler, heat accumulator with integrated d. h. w. storage tank, 2x mixing circuit.

Flüssigbrennstoffkessel, Wärmespeicher mit eingebauten Brauchwassererwärmer, 2x Mischerheizkreis.

Chaudière à combustible liquide, ballon d'eau chaude avec chauffe-eau sanitaire int., 2x circuit mélangeur.

Caldaia a combustibile liquido, serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, 2x circuito di miscelato.

Olieketel, warmteaccumulator met geïntegreerde warmwatertank, 2x mengcircuit.



123c (KMS-D+)

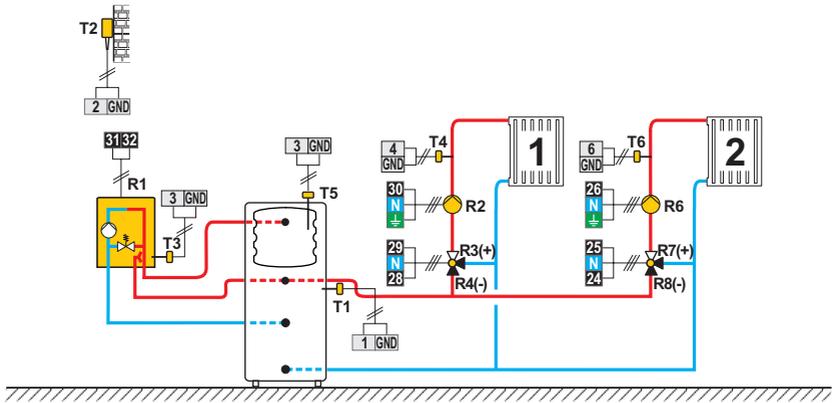
Gas boiler, heat accumulator with integrated d. h. w. storage tank, 2x mixing circuit.

Gaskessel, Wärmespeicher mit eingebauten Brauchwassererwärmer, 2x Mischerheizkreis.

Chaudière à gaz, ballon d'eau chaude avec chauffe-eau sanitaire int., 2x circuit mélangeur.

Caldaia a gas, serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, 2x circuito di miscelato.

Gasboiler, warmteaccumulator met geïntegreerde warmwatertank, 2x mengcircuit.



123d (KMS-D+)

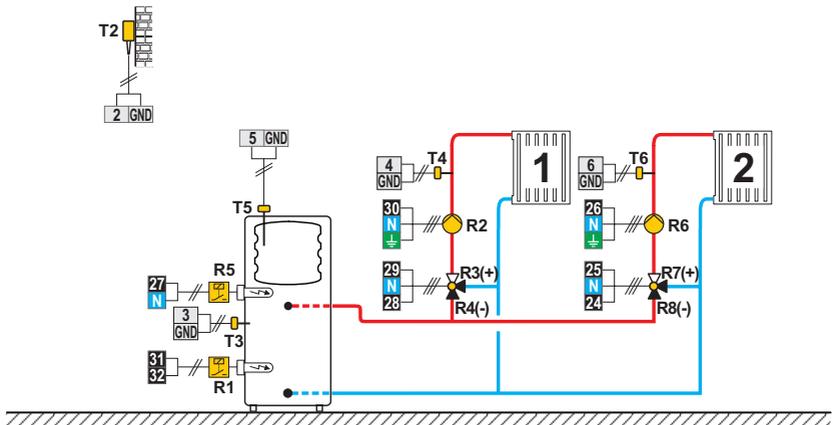
Expansion Scheme - heat accumulator with integrated d. h. w. storage tank, 2x mixing circuit.

Erweiterungsschema - Wärmespeicher mit eingebauten Brauchwassererwärmer, 2x Mischerheizkreis.

Schéma d'extension - ballon d'eau chaude avec chauffe-eau sanitaire int., 2x circuit mélangeur.

Schema di allargamento - serbatoio di calore con dispositivo incorporato per il riscaldamento dell'acqua sanitaria, 2x circuito di miscelato.

Uitbreidingschema - warmteaccumulator met geïntegreerde warmwatertank, 2x mengcircuit.



123e (KMS-D+)

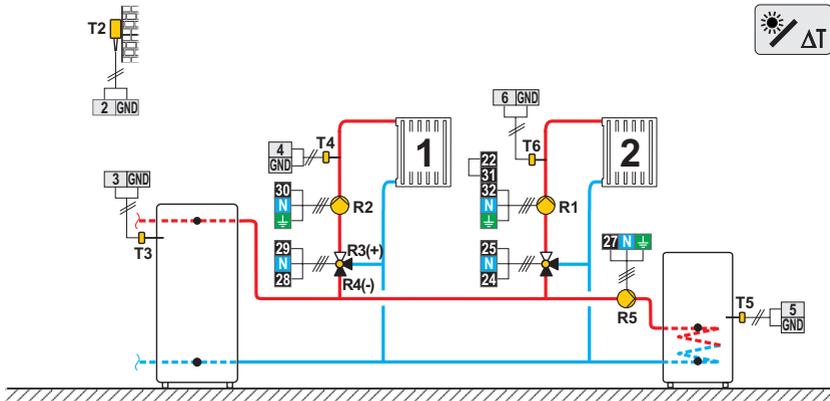
Heat accumulator, 2x mixing circuit, d. h. w. storage tank.

Wärmespeicher, 2x Mischerheizkreis, Brauchwassererwärmer.

Ballon d'eau chaude, 2x circuit mélangeur, chauffe-eau sanitaire.

Serbatoio di calore, 2x circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Warmeaccumulator, 2x mengcircuit, warmwatertank.



123f (KMS-D+)

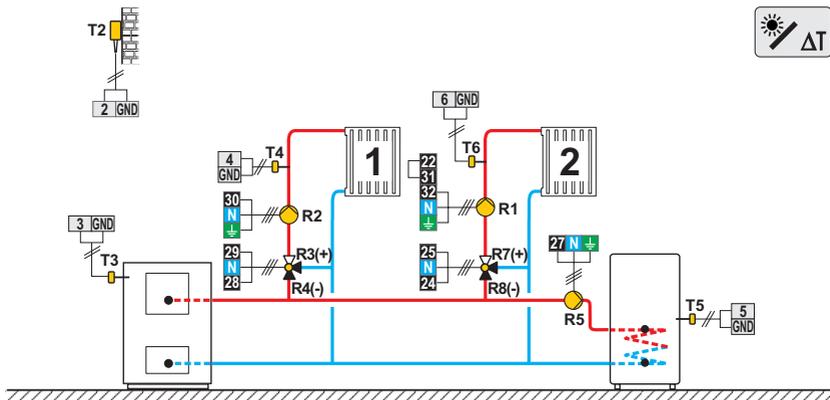
Solid fuel boiler, 2x mixing circuit, d. h. w. storage tank.

Festbrennstoffkessel, 2x Mischerheizkreis, Brauchwassererwärmer.

Chaudière à combustible solide, 2x circuit mélangeur, chauffe-eau sanitaire.

Caldaià a combustibile solido, 2x circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Boiler voor vaste brandstof, 2x mengcircuit, warmwatertank.



123g (KMS-D+)

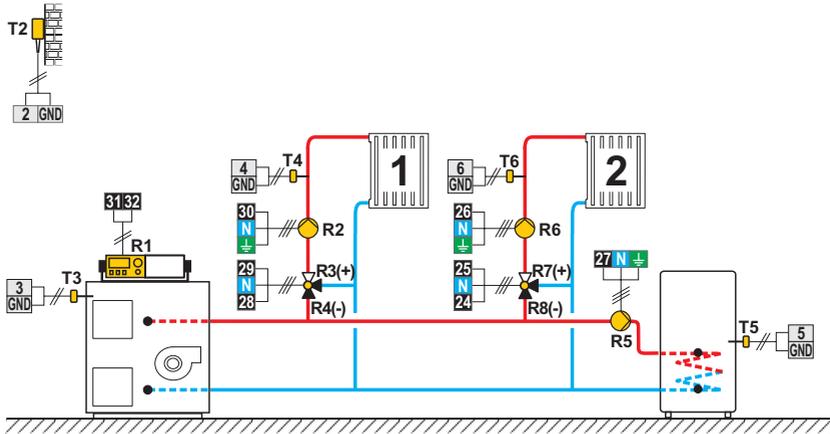
Free standing (solid fuel / oil) boiler, 2x mixing circuit, d. h. w. storage tank.

Kombikessel (Festbrennstoff/Öl), 2x Mischerheizkreis, Brauchwassererwärmer.

Chaudière combinée (combustible solide/fioul), 2x circuit mélangeur, chauffe-eau sanitaire.

Caldaia combinata (a combustibile solido/olio), 2x circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Vrijstaande boiler (voor vaste brandstof / olie), 2x mengcircuit, warmwatertank.



123h (KMS-D+)

Expansion Scheme, 2x mixing circuit, d. h. w. storage tank.

Erweiterungsschema, 2x Mischerheizkreis, Brauchwassererwärmer.

Schéma d'extension, 2x circuit mélangeur, chauffe-eau sanitaire.

Sistema di allargamento, 2x circuito di miscelato, dispositivo di riscaldamento dell'acqua sanitaria.

Uitbreidingschema, 2x mengcircuit, warmwatertank.

