

Thermal regulation



# GM CF CLIMA

Climate compensation controller



**USER MANUAL**





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## INTRODUCTION

### FOREWORD

This manual indicates the intended use of the product and provides instructions for, installation, assembly and operation of the product.



The instruction manual must be read and used as follows:

- Read the instruction manual carefully and consider it an integral part of the product;
- The manual must be available to the user at all times and be easily accessible to those responsible, transport personnel, installation, operation, maintenance, repair and final dismantling personnel;
- Store the manual throughout the life of the unit in areas protected from humidity and heat, and use it in such a way that its contents are not damaged. Do not remove, tear or rewrite parts of the manual for any reason.
- Ensure that any updates received are incorporated into the text;
- If you wish to receive any updates/additions to the manual, or if the manual is lost or partially damaged and you can no longer read its contents in full, you can download the latest revision by scanning the QR-Code on the back cover of the manual itself or by visiting our website [www.rdz.it](http://www.rdz.it).
- This manual reflects the state of the art at the time the product was put on the market and cannot be considered inadequate simply because it has been subsequently updated on the basis of new experience.
- RDZ S.p.A. has the right to update production and manuals, without the obligation to update previous production and manuals, except in exceptional cases, we invite you to contact us for further information and for possible proposals to improve the manual.

Pay close attention to the following symbols and their meanings. Their function is to emphasise particular information such as:

	<b>WARNING: with reference to additions or suggestions for the correct use of the product.</b>
	<b>ATTENTION: dangerous situations that may occur when using the product to avoid damage to property and the product itself.</b>
	<b>DANGER: referring to hazardous situations that may occur when using the product to ensure the safety of persons.</b>



## GENERAL WARNINGS

Carefully observe the special danger warnings in this manual;

- The employer is obliged to ensure that the operator has the aptitude requirements for installing the product and has carefully read the manual;
- The employer must also carefully inform the operator of the risks of accidents and in particular of the risks arising from noise, of the personal protective equipment provided and of the general accident prevention rules laid down by international laws or standards and those of the country of destination of the product;
- Before starting work, ensure that the safety devices function correctly and that there is no doubt about their operation; otherwise, otherwise do not proceed with the installation of the product;
- In all lifting operations, make sure the product is securely anchored to prevent accidental tipping or falling.
- If you notice any anomaly after unpacking the product, do not use the unit and contact a service centre authorised by the manufacturer.
- After unpacking the product, make sure it is intact; the packaging elements must not be left within reach of children as they are potential sources of danger.
- It is forbidden to operate the unit in any other way than indicated or to neglect operations necessary for safety.
- All operators and maintenance personnel must read this manual in its entirety and comply with its contents;
- Constant and careful preventive maintenance always guarantees the high operational safety of the product;
- Never postpone necessary repairs and have them carried out only by authorised personnel, and use only original spare parts.
- Clean the unit with a damp cloth; do not use abrasive products or materials.
- Do not use liquid or corrosive detergents to clean the unit, do not spray water or other liquids on the unit as they could damage components or even cause electric shocks.

### LIABILITY

The product is guaranteed according to the contractual agreements made at the time of sale.



**FAILURE TO COMPLY WITH THE RULES SET OUT IN THIS MANUAL AND ANY MODIFICATION TO THE PRODUCT NOT PREVIOUSLY AUTHORISED WILL IMMEDIATELY INVALIDATE THE WARRANTY.**

- The manufacturer disclaims all liability and warranty claims in the following cases:
  - The indicated warnings and safety regulations, including those in force in the country of installation, are not observed;
  - Failure to comply with the indications given in this manual;
  - Damage to persons, animals or property resulting from incorrect installation and/or improper use of products and equipment;
  - Inaccuracies or printing and transcription errors in this manual;
  - Events unrelated to the normal and correct use of the product.
- In any case, should the user attribute the incident to a product defect, he must prove that the damage occurred was a main and direct consequence of this "defect".
- Always use only original spare parts for maintenance or repairs.
- In the event of a fault, do not attempt repairs yourself and do not have repairs carried out by unauthorised technicians. This will invalidate the warranty.
- The manufacturer also reserves the right to discontinue production at any time and to make any changes it deems useful or necessary without prior notice.



## **SAFETY WARNINGS**

### **GENERAL SAFETY RULES**

The standards described in this manual form an integral part of the product delivery.

They are also intended for the operator who has already been expressly instructed to carry out this type of installation and contain all the necessary and indispensable information for the safe operation and optimal installation of the product.

This product is a component that forms part of complex installations: where foreseen, it is the responsibility of the electrical installer to draw up a general diagram of the installation and external electrical connections.

The Manufacturer's technical office is available at the numbers indicated on the back of this booklet for advice or special technical requests.



**All operators must comply with international accident prevention regulations and those of the country of destination of the unit in order to avoid possible accidents.**



**INITIAL START-UP MUST ONLY BE CARRIED OUT BY QUALIFIED PERSONNEL AUTHORISED BY THE MANUFACTURER.**

The product's plumbing, electrical systems and installation rooms must comply with the safety, accident prevention and fire prevention regulations in force in the country of use.

### **PRODUCT KNOWLEDGE**

The product must only be used by users who have acquired all the necessary information on optimal use: provisions, warnings and tips, function of controls, indicators and alarms, warning lamps and the various signs illustrated in this manual.

### **WEAR PROTECTIVE CLOTHING**

Each operator must use personal protective equipment such as gloves, head protection helmet, safety goggles, safety shoes and noise protection ear muffs.

### **FIRST AID**

Place a first-aid box near the product installation area, check periodically that the first-aid box is complete.

Ensure first aid telephone numbers are nearby..

In any case, always comply with the safety regulations in force in the country of use.

### **INTERVENTION AND MAINTENANCE**

It should be remembered that the manual can never replace adequate experience of the installer/maintenance technician; for some particularly demanding installation or maintenance operations, this manual constitutes a reminder of the main activities



to be performed by operators with specific training already acquired.

Please read the following tips carefully:

- Operators' workplaces must be kept clean, tidy and free of objects that may restrict free movement;
- Operators must avoid clumsy operations in awkward positions that may affect their balance;
- Operators should pay attention to the risks of entrapment and entanglement of clothing and/or hair in moving organs; the use of ear muffs to contain long hair is recommended; Operators' workplaces must be kept clean, tidy and free of objects that may restrict free movement;
- The use of chains, bracelets and rings may also constitute a hazard;
- The workplace must be adequately lit for the intended operations. Insufficient or excessive lighting can pose risks;
- Constant and careful maintenance of the product always guarantees a high level of operational safety.
- Do not remove or deteriorate protections, labels and inscriptions, especially those required by law and, if no longer legible, replace them.



## DISPOSAL

### WEEE INFORMATION NOTE



**Pursuant to art. 26 of Italian Legislative Decree 14 March 2014, no. 49 "Implementation of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)", regarding reducing the use of hazardous substances in electrical and electronic equipment, in addition to waste disposal.**

The crossed out wheelie bins symbol on the equipment indicates that, at the end of its useful life, the product must be collected separately from general waste. The lubrication oil for the compressors must be recovered and sent to collection centres; The structure and the various components, if they can no longer be used, must be demolished and divided up according to the type of product: this is particularly important for the copper and aluminium components, which are included in the machine in moderate quantities. Therefore, at the end of its useful life, the user must take the equipment to a designated electrical and electronic waste collection point, or return it to the installer that, against the purchase of an equivalent appliance, it is obliged to collect the product for disposal free of charge. Appropriate differentiated waste collection for subsequent recycling, treatment and environment-friendly disposal of the discarded equipment helps preventing possible negative environmental and health effects and encourages recycling of the component materials of the equipment. Illegal disposal of the product by the user entails the application of sanctions provided by the regulations in force.





# 1 INSTRUCTIONS FOR USE

## 1.1 DESCRIPTION



The climate compensation controller is used in water based heating and cooling systems.

Mounted directly on 3- and 4-way mixing valves.

It controls the temperature based on the measured outside (external) temperature and the heating curve.

Additionally, the product can also control a circulation pump. A room thermostat for remote temperature change can also be connected.



### DESCRIPTION

1		Return
2		Move to the left / Decreasing the value
3		Move to the right / Increasing the value
4		Menu entry / Confirmation of selection
5		USB port for software updates and connection to a personal computer
6		Graphic display
7		Button Help
8		Manual operation clutch
9		Release button
10		Power cable
11		Pump cable
12		Pre-wired connection box for sensors and communication
13		Heat source / return temperature probe
14		Medium temperature probe mounted behind the mixing
15		Outdoor sensor

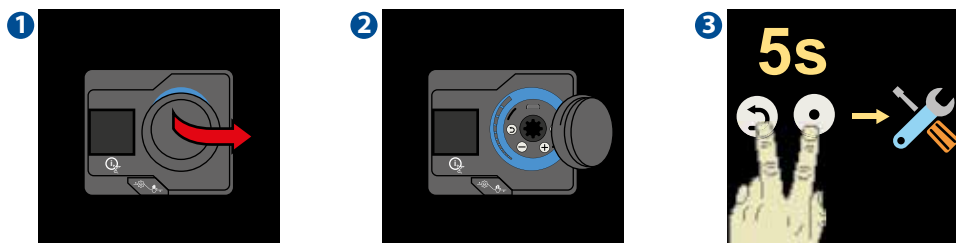


## 1.2 INITIAL CONTROLLER SETUP

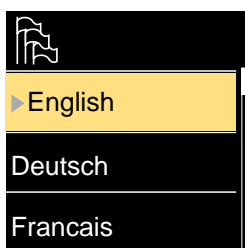
The controller is equipped with an innovative “Easy start” function, which allows the initial setting of the controller in just four steps:

- LANGUAGE SETUP
- HYDRAULIC SCHEME SETUP
- SELECTION BETWEEN HEATING AND COOLING MODE
- SETUP OF HEATING (COOLING) CURVE

Upon the first connection of the controller to the power supply network, the first step of the controller setup is displayed after the program version and logo. The manual movement button must be removed for the setup. The Easy start function is activated by pressing the buttons and and holding them both down together for 5 seconds.



### LANGUAGE SETUP

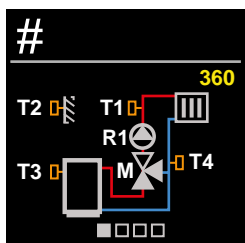


Use the buttons and to select the requested language. Confirm the selected language by pressing .

If you've mistakenly selected the wrong language, you can return to the language selection with the button.

Later, you can change the language in the “Display” menu.

### HYDRAULIC SCHEME SETUP

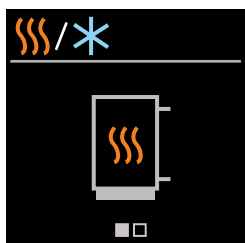


You can select the hydraulic scheme for the controller operation. Use the buttons and to navigate between schemes. Confirm the selected scheme with the button.

If you have mistakenly selected the wrong scheme, you can return to the diagram selection with the button.

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

### SELECTION BETWEEN HEATING AND COOLING

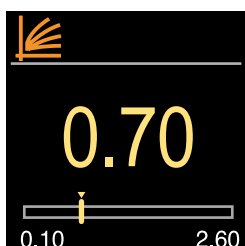


You can select heating or cooling with the buttons and . Confirm the selection with the button .

If you have mistakenly selected the wrong mode, you can return to the mode selection with the button.

Later, you can change operation mode in the main menu.

### SETUP OF HEATING (COOLING) CURVE



Depending of step 3, you can set steepness of heating or cooling curve. The steepness can be set with the button and . Confirm the set steepness with the button.

If you have mistakenly selected the wrong steepness, you can return to selecting the steepness with the button.

Later, you can change the stepness of the heating curve with the user parameter P2.1 and cooling curve with the user parameter P2.6.

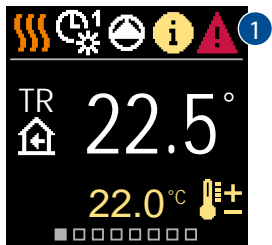


### 1.3 BASIC SCREENS

All important data on the operation of the controller can be seen in the six basic screens. Use the buttons and to navigate between the basic screens.

#### STATUS BAR

Operation mode, notifications and alerts appear in the top third of the screen.

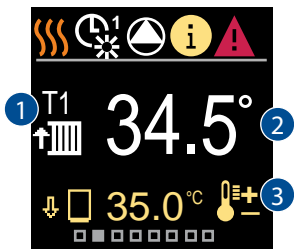


SYMB.	DESCRIPTION	
	Room heating	
	Room cooling	
	Operation according to program timer 1 - day temperature	<b>The number indicates the selected program timer</b>
	Operation according to program timer 1 - night temperature	
	Requested day temperature operation mode	
	Requested night temperature operation mode	
	Switch off	
	MANUAL operation mode	
	Circulation pump is working	
	Turn the valve to the left	
	Turn the valve to the right	
	Manual intervention - the clutch is activated	
	PARTY operation mode	
<b>ECO</b>	ECO operation mode	
	HOLIDAY operation mode	
	Automatic heating switch off	
	Floor drying	
	Operation with constant stand-pipe temperature	
	Boost heating	
	AUX function at input T4	
	<b>Message:</b> in the event that the maximum temperature is exceeded or the safety function is activated, the controller notifies you with a yellow symbol on the display. When the maximum temperature is no longer exceeded or when a protection function has switched off, a gray symbol will turn on to note the recent event. The list of alerts can be viewed in the <b>"Information"</b> menu.	
	<b>Warning:</b> in the event of a sensor or communication connection failure, the controller informs you of the error with a red symbol on the display. If the error is corrected or is no longer present, a gray symbol indicates a recent event. The list of errors can be viewed in the <b>"Information"</b> menu.	



## TEMPERATURES

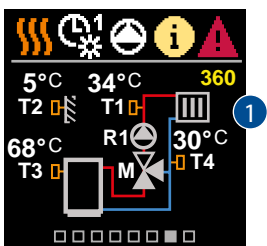
The number of temperatures displayed on the screen depends on the selected hydraulic scheme and controller settings.



SYMBOL	DESCRIPTION
	Calculated or requested temperature
	Room temperature
	Stand-pipe temperature
	Outdoor temperature
	Return-pipe temperature
	Source temperature
<b>T1, T2, T3, T4</b>	Temperature measured by sensors T1, T2, T3 and T4
<b>TA</b>	Outdoor temperature, obtained through the bus connection
<b>TQ</b>	Heat source temperature, obtained through the bus connection
<b>Error</b>	Temperature sensor error
<b>---</b>	Temperature sensor not connected
	Limitation of heating circuit temperature due to the unsurpassed heat source temperature.
	Limitation of the heating circuit temperature due to exceeding the maximum difference between the stand-pipe and return-pipe or exceeding the maximum power of the heating circuit.
	Rise of heating circuit temperature due to the exceeded protection temperature of the heat source.
	Return temperature
<b>2</b>	Measured temperature
<b>3</b>	Requested or calculated temperature

## HYDRAULIC SCHEME

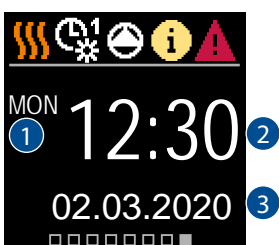
The screen shows the selected hydraulic scheme with the display of measured temperatures



	DESCRIPTION
<b>1</b>	Hydraulic scheme with screen showing the measured temperatures

## TIME AND DATE

The screen shows the day of the week, the current time and date.



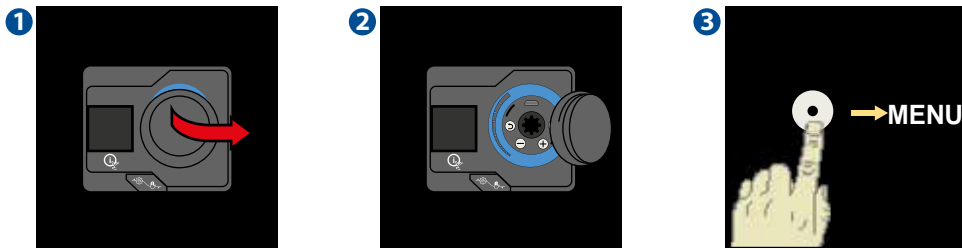
	DESCRIPTION
<b>1</b>	Day of the week
<b>2</b>	Time
<b>3</b>	Date





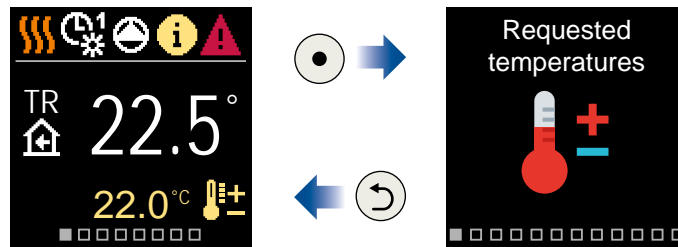
## 1.4 HELP

By pressing the button we can start the display animation, which leads us to the additional settings menu.



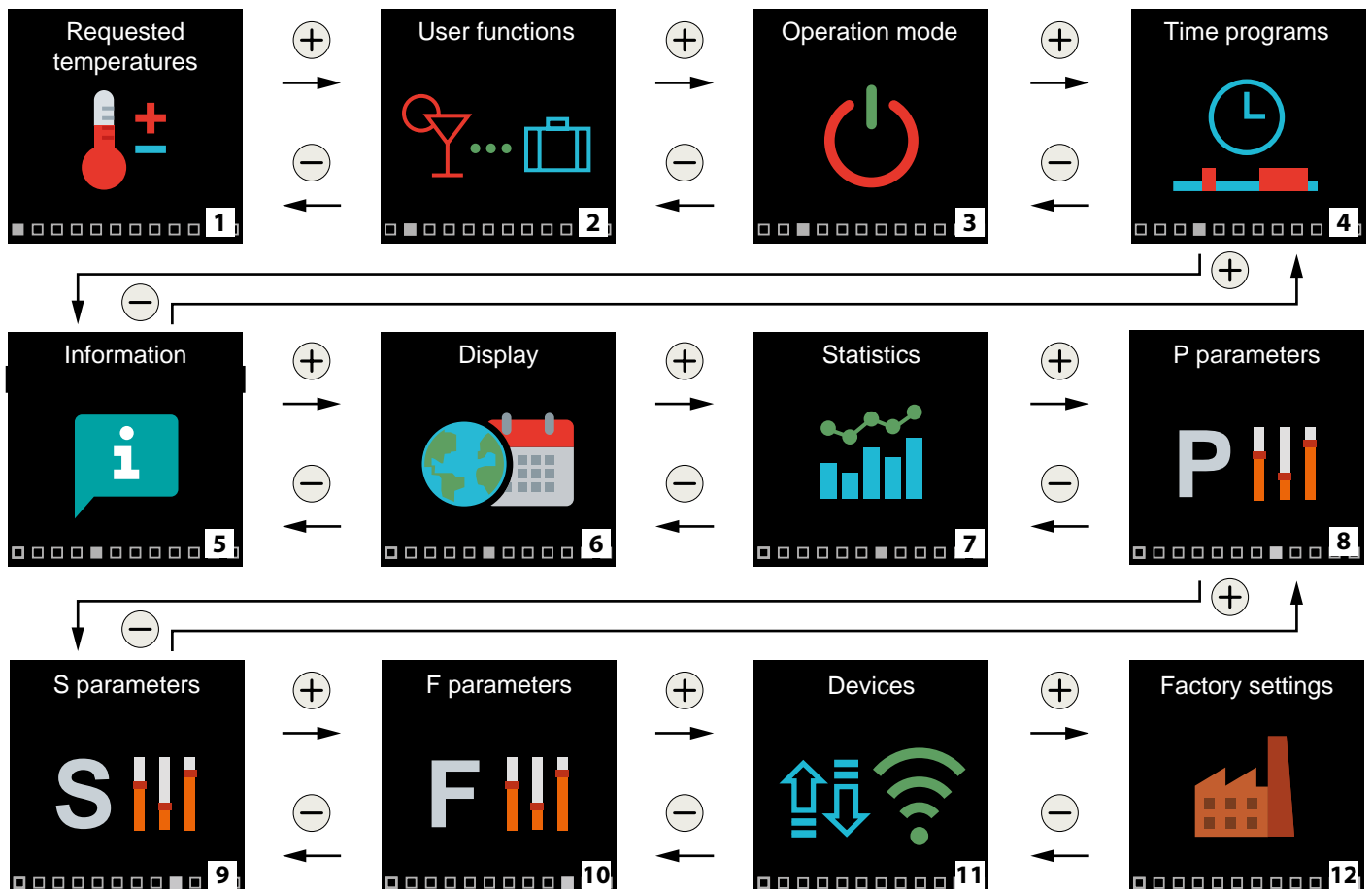
### ENTERING AND NAVIGATING THROUGH THE MENU

Press the button to enter the menu. Navigate through the menu with the and buttons and use the button to confirm your selection. Press the button to return to the previous screen.



### MENU STRUCTURE AND DESCRIPTION

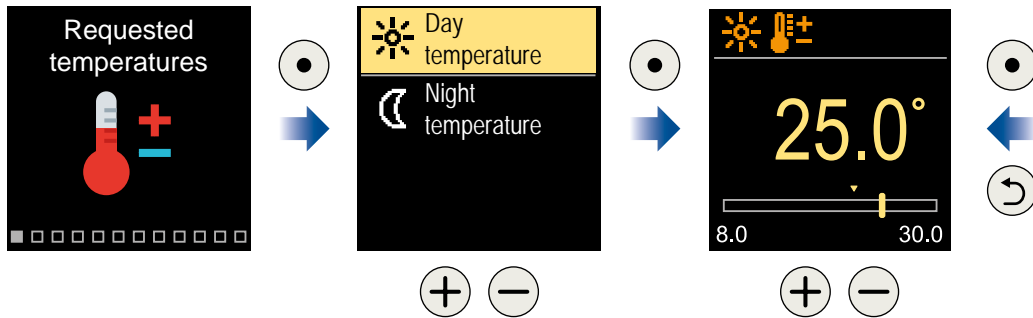
The menu consists of twelve main groups:





### 1.4.1 REQUESTED TEMPERATURES

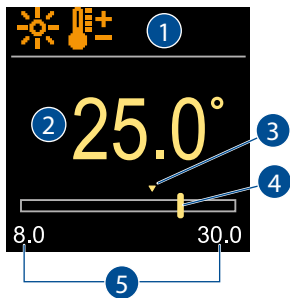
In the menu, you can change the setting of the requested temperatures. Navigate through the menu with the  $\oplus$  and  $\ominus$  buttons and use the  $\odot$  button to confirm your selection. A new screen with temperatures will open.



### SETTINGS AND CHANGES

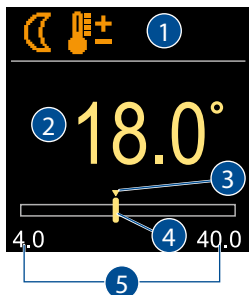
Use the  $\oplus$  and  $\ominus$  buttons to select the requested temperature and confirm it with the  $\odot$  button. Exit the setting with the  $\curvearrowright$  button.

#### • Day temperature



DESCRIPTION	
1	Requested day temperature
2	Current value of settings
3	Default value
4	Current value of the requested temperature
5	Setting range

#### • Night temperature



DESCRIPTION	
1	Requested night temperature
2	Current value of settings
3	Default value
4	Current value of the requested temperature
5	Setting range

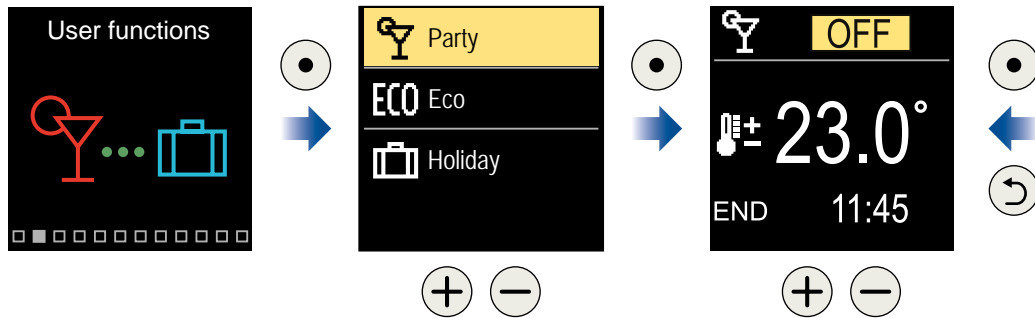
When the controller is in Heating mode, the symbol of the requested temperature is colored orange, and when the controller is in Cooling mode, the symbol is colored blue.



## 1.4.2 USER FUNCTIONS

User functions enable additional comfort and benefits of using the controller.

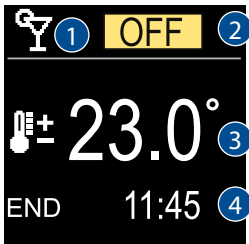
Navigate through the menu with the  $\oplus$  and  $\ominus$  buttons and use the  $\odot$  button to confirm your selection. The screen for turning on and setting the user function opens.



## SETTINGS AND CHANGES

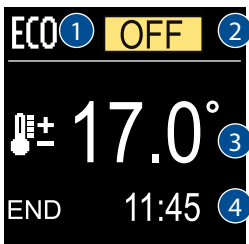
With the buttons  $\oplus$  and  $\ominus$  you can change the setting value and with the button  $\odot$  you can move on to the next setting.

### • PARTY mode



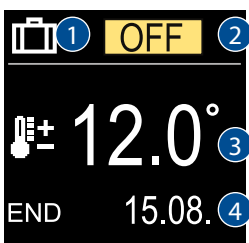
DESCRIPTION	
1	<b>PARTY</b> : activates the operation according to the requested comfort temperature until the set end time.
2	<b>ON</b> active function <b>OFF</b> function not active
3	Requested temperature
4	Function end time

### • ECO mode



DESCRIPTION	
1	<b>ECO</b> <b>ECO</b> : activates the operation according to the requested saving temperature until the set end time.
2	<b>ON</b> active function <b>OFF</b> function not active
3	Requested temperature
4	Function end time

### • HOLIDAY mode

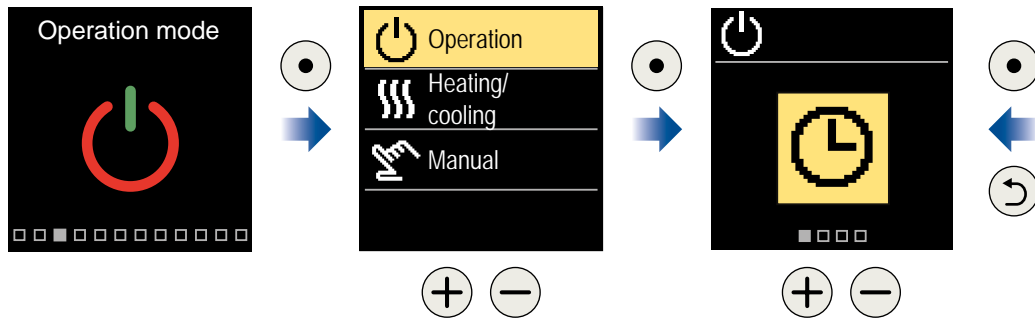


DESCRIPTION	
1	<b>HOLIDAY</b> : activates the operation according to the requested saving temperature until the set end time.
2	<b>ON</b> active function <b>OFF</b> function not active
3	Requested temperature
4	Function end time



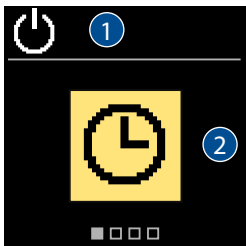
### 1.4.3 OPERATION MODE

In the menu, you can select the requested operation mode and other operation options. Navigate through the menu with the  $\oplus$  and  $\ominus$  buttons and use the  $\odot$  button to confirm your selection.



### OPERATION SELECTION

In the menu, you can select the requested operation mode with the  $\odot$  button. Use the buttons  $\oplus$  and  $\ominus$  to select the requested operation. Exit the setting by pressing  $\odot$  or  $\curvearrowright$ .



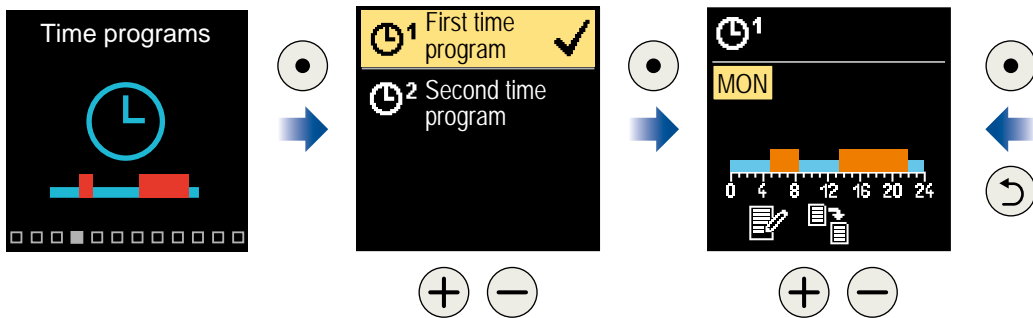
1		2			
OPERATION		FUNCTIONS			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION		
	<b>OPERATION:</b> selects the requested operation mode		Operation according to the selected time program with day and night temperature which is set on the controller.		
			Requested day temperature operation mode.		
			Requested night temperature operation mode.		
			Switch-off. Frost protection remains active, if operation mode heating is selected.		
	<b>HEATING / COOLING:</b> selects the requested heating or cooling operation mode.		Heating is active		
			Cooling is active		
	<b>MANUAL:</b> is used when testing the heating system or in the event of a malfunction. The control output can be manually switched on, switched off or automatic operation can be selected. With the buttons $\oplus$ and $\ominus$ you can move between the individual outputs R1, M + or M-, and with the button $\odot$ you can select the AUTO, OFF or ON status. Exit the setting by pressing $\curvearrowright$ .	<b>OUTPUT</b> <b>SENSORS</b>			
		R1	AUTO ON OFF	T1	Measured temperature
		M+		T2	
		M-		T3	
T4					



### 1.4.4 TIME PROGRAMS

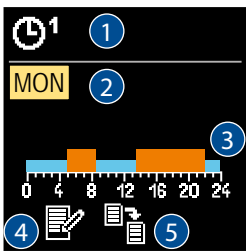
Weekly time programs enable automatic switchover between day and night temperature. There are two time programs available. A check mark next to the time program tells which time program is selected for operation.

Navigate through the menu with the  $\oplus$  and  $\ominus$  buttons. With the button  $\odot$  you can select the time program for operation and with the button  $\odot$  you can enter the setting of the selected time program.



### EDITING AND COPYING TIME SCHEDULES

With the buttons  $\oplus$  and  $\ominus$  you can select the day for which you want to edit or copy the time program and confirm it with the button  $\odot$ . Now, with the buttons  $\oplus$  and  $\ominus$  select the icon to edit or copy the time program and confirm it with the button  $\odot$ .



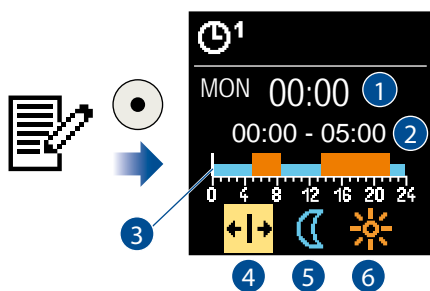
	SYMBOL	DESCRIPTION
1	$\odot^1$ $\odot^2$	Time program
2	LUN	Selected day
3		Visualisation: <ul style="list-style-type: none"> <li>☀ daytime scheduling</li> <li>🌙 night scheduling</li> </ul>
4		Time program editing
5		Time program copying

• Default settings of time programs:

PROGRAMS	DAYS	TIMES
$\odot^1$	MON - FRI	05:00 - 07:30 e 13:30 - 22:00
	SAT-SUN	07:00 - 22:00
$\odot^2$	MON - FRI	06:00 - 22:00
	SAT-SUN	07:00 - 22:00

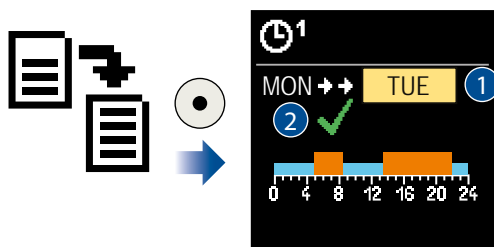


• **Time program editing:** with the button select the requested icon to scroll or draw the interval; using the buttons and you can draw the requested course of the time interval. Exit the time program editing by pressing the button .



	SYMBOL	DESCRIPTION
1	00:00	Current cursor time
2	00:00 - 05:00	Current interval
3		Cursor
4		Free cursor scrolling: moving it to the time slot displays program start and end times.
5		Night temperature interval drawing
6		Day temperature interval drawing

• **Time program copying:** with the buttons and you can select the day for which you want to edit or copy the time program of the displayed day. Confirm the time program copying by pressing the button . Exit the time program copying by pressing the button .

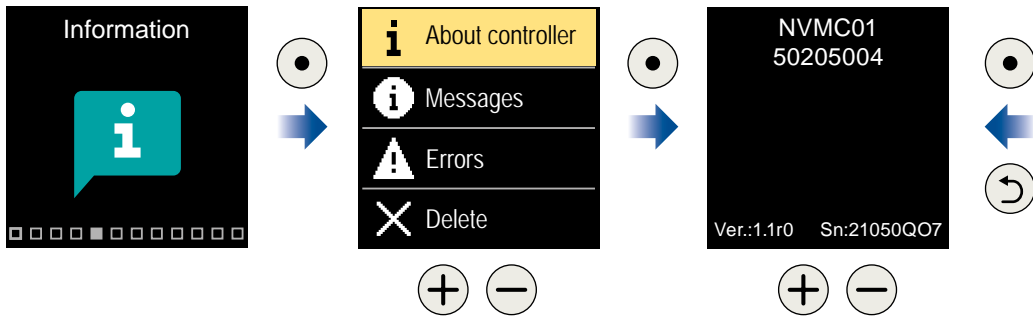


	SYMBOL	DESCRIPTION
1	   	Selection of days to copy: choose from a single day or a range of days (Monday through Friday, Monday through Sunday, and Saturday through Sunday).
2		Copy confirmation



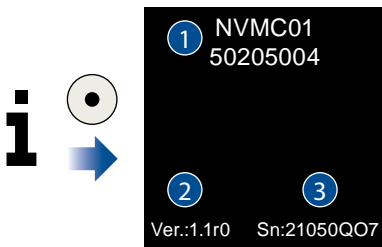
### 1.4.5 INFORMATION

The menu is used to display information about the controller, notifications and errors. Navigate through the menu with the  $\oplus$  and  $\ominus$  buttons and use the  $\odot$  button to confirm your selection. Exit the screen with the button  $\odot$ .



### SELECTION AND EDITING OF INFORMATION

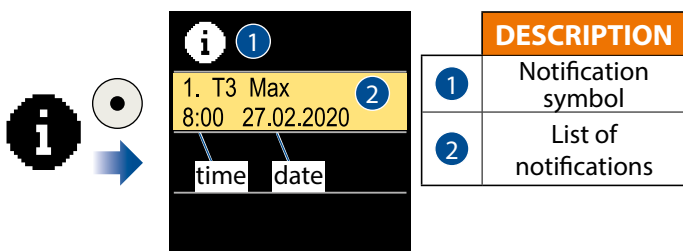
• **About controller:** the basic information about the controller is displayed on the screen:



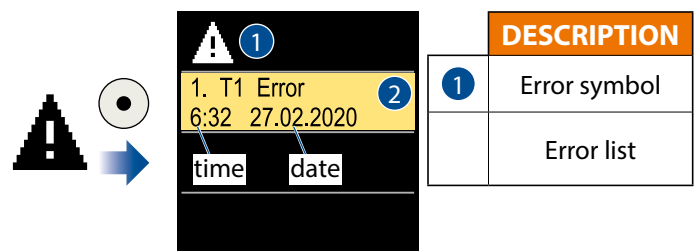
DESCRIPTION	
1	Type of controller
2	Program version
3	Serial number

Navigate through the notifications or through the errors list with the  $\oplus$  and  $\ominus$  buttons. Exit the screen with the button  $\odot$ .

• **Messages:** a list of messages is displayed on the screen with the time and date of the individual message.

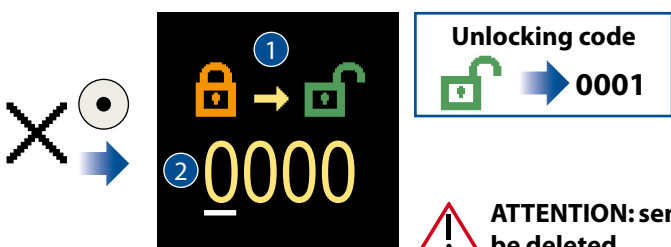


• **Errors:** a list of errors is displayed on the screen with the time and date of the individual errors.



• **Deleting the messages and errors:** the list of messages and errors is deleted. The list of warnings for errors of all unconnected sensors is also deleted. The deletion must be confirmed by entering the 4-digit unlock code.

With the buttons  $\oplus$  and  $\ominus$  you can change the value and with the button  $\odot$  you can move on to the next position and confirm the unlocking. Exit the screen with the button  $\odot$ .



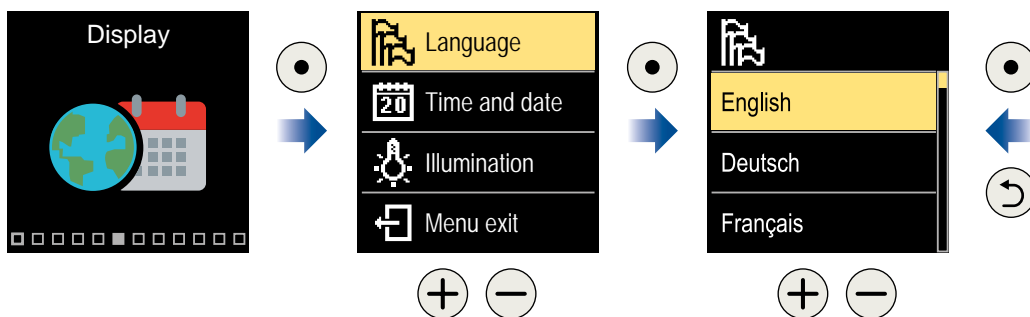
DESCRIPTION	
1	Unlocking symbol
2	Code entry field

**ATTENTION:** sensor errors that are essential for the controller operation cannot be deleted.



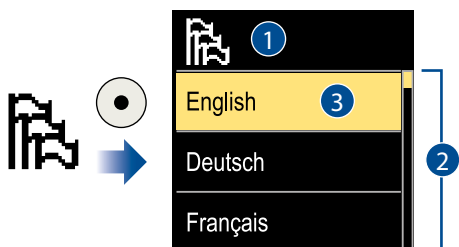
### 1.4.6 DISPLAY

The menu is for basic on-screen display settings. Navigate through the menu with the **+** and **-** buttons and use the **•** button to confirm your selection **↻**.



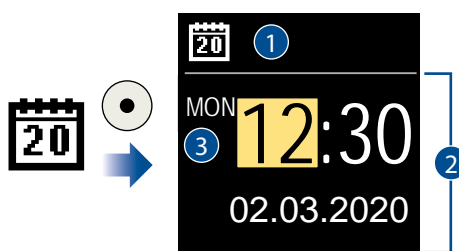
### SELECTING AND CHANGING BASIC SETTINGS

• **Language selection:** use the **+** and **-** buttons to select the language and confirm it with the **•** button. Exit the setting by pressing **↻**.



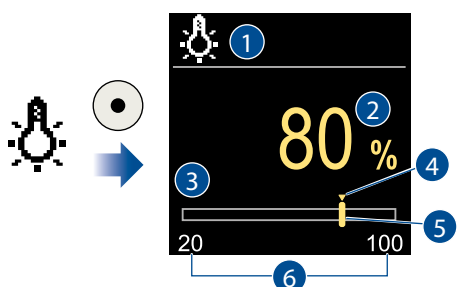
DESCRIPTION	
1	Language symbol
2	Language list
3	Selected language

• **Time and date settings:** with the buttons **+** and **-** you can change the value and with the button **•** you can move on to the next data. Exit the screen with the button **↻**.



DESCRIPTION	
1	Time and date symbol
2	Time and date
3	Day of the week

• **Adjusting the screen brightness:** use the **+** and **-** buttons to adjust the brightness and confirm it with the **•** button. Exit the setting with the **↻** button.

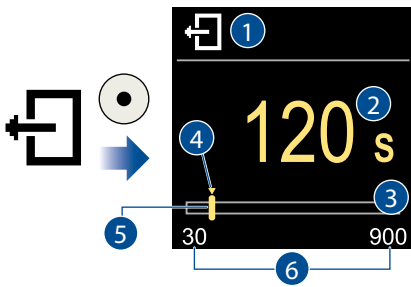


DESCRIPTION	
1	Brightness symbol
2	Current brightness value
3	Graphic display of the setting
4	Default value
5	Current value
6	Setting range





• **Setting the menu exit time:** you can set the time to automatically exit the menu. With the  $\oplus$  and  $\ominus$  buttons you can set the automatic exit time and confirm it with the  $\odot$  button. Exit the setting with the  $\curvearrowright$  button.

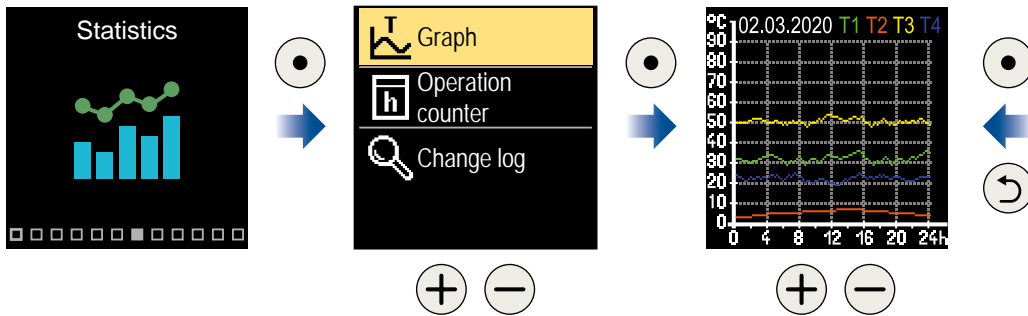


DESCRIPTION	
1	Exit time symbol
2	Current value of the exit time
3	Graphic display of the setting
4	Default value
5	Current value
6	Setting range



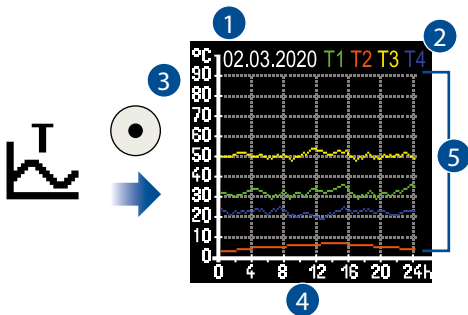
### 1.4.7 STATISTICS

The menu is intended to display detailed information on the operation of the controller. Navigate through the menu with the  $\oplus$  and  $\ominus$  buttons and use  $\odot$  button to confirm your selection.



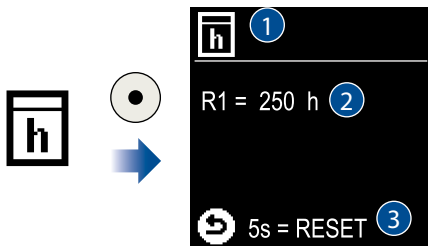
### VISUALIZATION

• **Graph:** 24-hour temperature graph for all four temperature sensors is displayed on the screen. With the buttons  $\oplus$  and  $\ominus$  you can browse the temperature graphs for the last 7 days of operation. Exit the setting by pressing  $\odot$ .



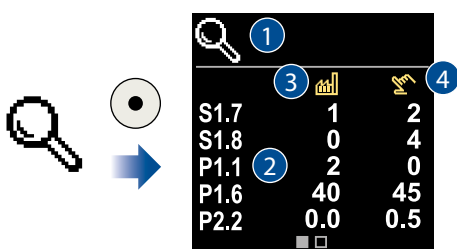
DESCRIPTION	
1	Date
2	Legend
3	Temperature axis (°C)
4	Time axis (hours)
5	Graphic display of the course of temperatures

• **Operation counter:** the display shows the number of operation hours of the R1 circulation pump output. By pressing the button  $\odot$  for 5 seconds, you can reset the counter to 0. Exit the setting by pressing  $\odot$ .



DESCRIPTION	
1	Operation counter symbol
2	Number of operation hours
3	Counter reset

• **Change log:** a list of changed P, S and F parameters of the controller is displayed on the screen. Navigate through the change list with the  $\oplus$  and  $\ominus$  buttons. Exit the screen with the button  $\odot$ .



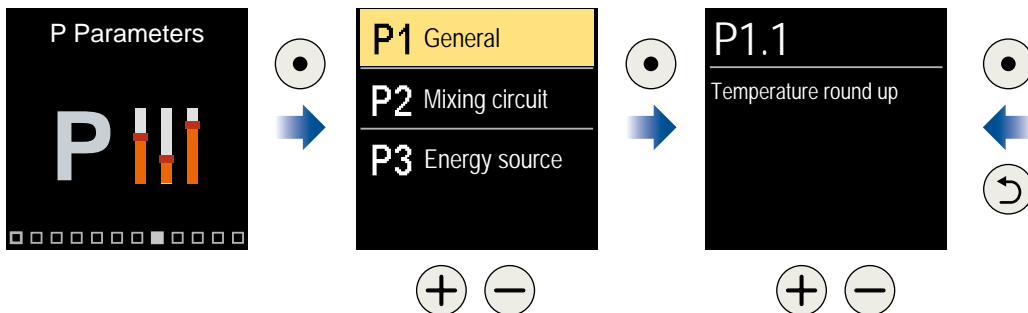
DESCRIPTION	
1	Change log symbol
2	Parameter mark
3	Default value
4	Changed value



### 1.4.8 USER P PARAMETERS

The menu is used to display and set user parameters. The parameters are classified into groups **P1** - basic settings, **P2** - settings for the heating circuit and **P3** - settings for the power source.

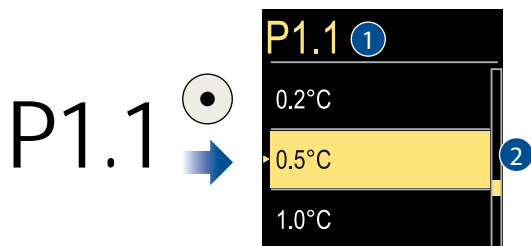
Navigate through the menu with the **+** and **-** buttons. When you use the **●** button to select the requested parameter group, a display will open describing the first parameter in the group.



### SELECTION AND MODIFICATION OF THE PARAMETER

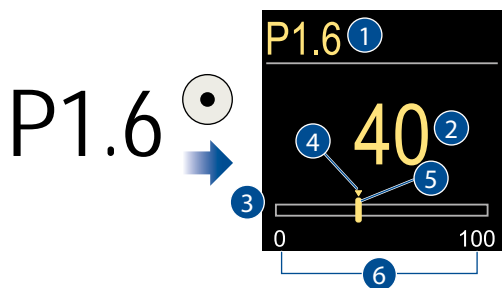
With the **+** and **-** buttons navigate through the parameters in the selected group. The parameter you want to change is selected by pressing the **●** button. The parameter setting screen, which can take the form of a menu or a slider, opens. Exit the setting by pressing **↶**.

#### • Example 1: menu format setting




DESCRIPTION	
1	Parameter mark
2	Parameter settings list

#### • Example 2: slider format setting



DESCRIPTION	
1	Parameter mark
2	Current value
3	Graphic display of the setting
4	Default value
5	Current value
6	Setting range

**LIST OF PARAMETERS**

<b>group P1 - BASIC SETTINGS</b>				
<b>PARAMETER</b>	<b>PARAMETER NAME</b>	<b>DESCRIPTION</b>	<b>SETTING RANGE</b>	<b>DEFAULT VALUE</b>
<b>P1.1</b>	Temperature round up	You set the accuracy of displayed temperatures.	- 0,1 °C - 0,2 °C - 0,5 °C - 1 °C	0,5 °C
<b>P1.2</b>	Automatic shift of clock to summer/winter time	With the help of a calendar, the controller carries out the automatic changeover between summer and winter time.	- No - Yes	Yes
<b>P1.4</b>	Tones	By setting this field you define sound signals of the controller.	- Off - Keypad - Errors - Keypad and errors	Keypad
<b>P1.6</b>	Sensitivity of "Help" key	This setting sets the sensitivity of the  key.	0 ÷ 100%	40%
<b>P1.7</b>	Automatic switchover summer/winter	Automatic switch-off of heating in accordance to average oneday outdoor temperature.	- No - Yes	Yes
<b>P1.8</b>	Average outdoor temperature for summer/winter switchover (°C)	Setting of average one-day outdoor temperature at which the heating should switch-off.	10 °C ÷ 30 °C	18 °C
<b>P1.9</b>	Outdoor temperature for activation of frost protection (°C)	Setting of outdoor temperature by which the frost protection will activate and run boiler at minimum temperature.	-30 °C ÷ 10 °C	2 °C
<b>P1.10</b>	Requested room temperature by frost protection (°C)	Setting of room temperature when heating is switched off.	2 °C ÷ 12 °C	6 °C
<b>P1.12</b>	Level of protection against frost	With this setting, we determine the level of protection against frost that depends on the assessment of the possibilities for frost on the facility. - <b>No protection:</b> choose, when there is no possibility of frost on the facility. - <b>Level 1:</b> choose, when there is a possibility of frost on the facility and room temperature sensor isn't connected. - <b>Level 2:</b> choose, when there is a possibility of frost on the facility and room temperature sensor is connected. - <b>Level 3:</b> choose, when the possibility of frost on the facility is considerable and parts of the heating system are particularly exposed to freezing.	- No protection - Level 1 - Level 2 - Level 3 (greatest protection)	Level 1
<b>P1.13</b>	Compensation of the effect of building on outdoor temperature sensor	This setting enables compensation of the effect of heat passing through the exterior walls of a heated building on the temperature of the outdoor sensor.	-5,0 °C ÷ 0,0 °C	-2,0 °C

**group P2 - HEATING CIRCUIT SETTINGS**

PARAMETER	PARAMETER NAME	DESCRIPTION	SETTING RANGE	DEFAULT VALUE
P2.1	Heat curve steepness	Heating curve steepness indicates what temperature is required for the heating bodies by a determined outdoor temperature.	0,1 ÷ 2,6	0,5 - floor 1,0 - radiators
P2.2	Parallel shift of heating curve (°C)	Parallel shift of heating curve (calculated stand pipe temperature). Use this setting to eliminate deviation between actual and set-point room temperature.	-15 °C ÷ 15 °C	0 °C
P2.3	Duration of BOOST heating	Duration of boosted room temperature by changeover from night to day heating period.	0 ÷ 200 min	0 min
P2.4	Room temp. increase by boost heating (°C)	Setting of boost temperature by changeover from night to day heating period.	0 °C ÷ 8 °C	3 °C
P2.6	Cooling curve steepness	Cooling curve steepness indicates what temperature is required for the cooling bodies by a determined outdoor temperature.	0,1 ÷ 2,6	0,5
P2.7	Parallel shift of cooling curve (°C)	Parallel shift of cooling curve (calculated stand pipe temp.). Use this setting to eliminate deviation between actual and set-point room.	-15 °C ÷ 15 °C	0 °C

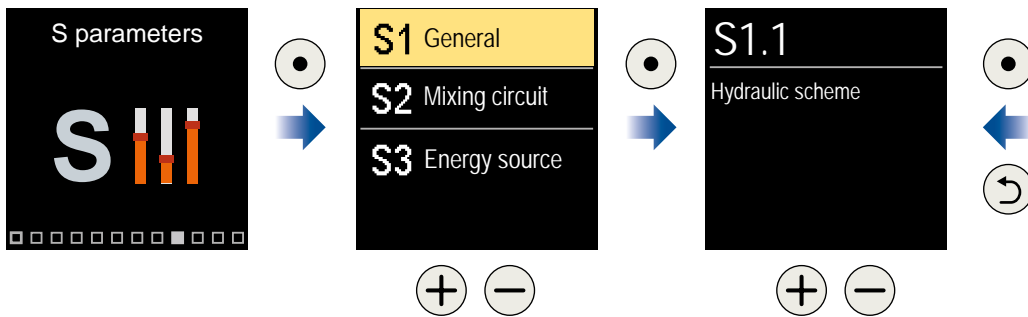
**group P3 - SETTINGS FOR ENERGY SOURCE**

PARAMETER	PARAMETER NAME	DESCRIPTION	SETTING RANGE	DEFAULT VALUE
P3.1	Minimum boiler temperature	Setting of minimal boiler temperature	1 °C ÷ 90 °C	30 °C



### 1.4.9 SERVICE S PARAMETERS

The menu is used to display and set user parameters. The parameters are classified into groups **S1** - basic settings, **S2** - settings for the heating circuit and **S3** - settings for the power source. Navigate through the menu with the  $\oplus$  and  $\ominus$  buttons. When you use the  $\odot$  button to select the requested parameter group, a display will open describing the first parameter in the group.

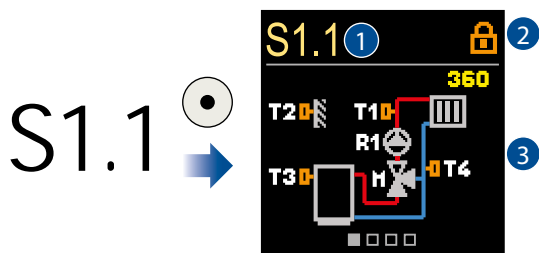


### SELECTION AND MODIFICATION OF THE PARAMETER

With the  $\oplus$  and  $\ominus$  buttons navigate through the parameters in the selected group. The parameter you want to change is selected by pressing the  $\odot$  button. The parameter setting screen opens.



**ATTENTION: Only a trained professional shall perform the changing of service parameters.**



DESCRIPTION	
1	Parameter mark
2	Parameter is locked
3	Current value

The S parameters are locked at the factory, so they must be unlocked by entering the 4-digit unlock code before changing. With the buttons  $\oplus$  and  $\ominus$  you change the value and with the button  $\odot$  you move on to the next position and confirm the unlocking.



DESCRIPTION	
1	Unlocking symbol
2	Code entry field

When the parameter is unlocked, you can use the buttons  $\oplus$  and  $\ominus$  to set the requested value and press  $\odot$  confirm. Exit the setting by pressing  $\curvearrowright$ .



## LIST OF PARAMETERS

group S1 - BASIC SETTINGS				
PARAMETER	PARAMETER NAME	DESCRIPTION	SETTING RANGE	DEFAULT VALUE
S1.1	Hydraulic scheme	Selection of hydraulic scheme	360 ÷ 360b	360
S1.2	Code for unlocking the service settings	This setting enables the change of code which is necessary to unlock the service settings. <b>WARNING! Keep new code on a safe place. Without this code is impossible to change service settings.</b>	0000 ÷ 9999	0001
S1.3	Actuator opening direction	Setting of actuator turning direction - valve opening.	- Left - Right	Right
S1.4	Antiblock function for mixing valve and pump	If no control output has been switched on in a specific time frame (in a week or day), it automatically turns on for 60 seconds.	- No - Yes, weekly - Yes, daily	Yes, weekly
S1.5	Cooling operation mode	Set up the cooling operation mode: - <b>Auto:</b> Room and outdoor temperature are considered. - <b>Outdoor temperature:</b> Only the outdoor temperature is considered. - <b>Room temperature:</b> Only the room temperature is considered. - <b>Constant temperature:</b> The stand-pipe calculation is constant in the daily time interval (setup of parameter S2.11).	- Auto - Outdoor temperature - Room temperature - Constant temperature	Auto
S1.6	Selection of sensor T3 function	Set the operation mode for sensor T3.	- No sensor - Room sensor - Source sensor	Source sensor
S1.7	Selection of sensor T4 function	Set the operation mode for sensor T4. If return pipe sensor is selected, a limitation of temperature difference between stand and return pipe needs to be set with parameter S2.13. Thus the maximum power of the heating circuit will be limited.	- No sensor - Room sensor - Return pipe sensor	No sensor
S1.8	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 h
S1.9	Selection of AUX (T4) input function	Set the operation mode of the controller if a short circuit is detected at the AUX (T4) input. - <b>Day temperature:</b> Operation according to the requested day temperature. - <b>Night temperature:</b> Operation according to the requested night temperature. - <b>Cooling:</b> Switching the controller operation mode to cooling. - <b>Time program:</b> Operation according to selected time program. - <b>Boost heating:</b> Activation of boost heating function.	- No function - Day temperature - Night temperature - Cooling - Time program - Boost heating	No function
S1.17	Sensor T1 calibration (°C)	Correction of measured temperature for sensor T1	5 °C ÷ 5 °C	0 °C
S1.18	Sensor T2 calibration (°C)	Correction of measured temperature for sensor T2	5 °C ÷ 5 °C	0 °C
S1.19	Sensor T3 calibration (°C)	Correction of measured temperature for sensor T3	5 °C ÷ 5 °C	0 °C
S1.20	Sensor T4 calibration (°C)	Correction of measured temperature for sensor T4	5 °C ÷ 5 °C	0 °C



group S2 - HEATING CIRCUIT SETTINGS				
PARAMETER	PARAMETER NAME	DESCRIPTION	SETTING RANGE	DEFAULT VALUE
S2.1	Influence of room temperature deviation	Setting the influence of the room thermostat reading on the calculated supply temperature. A lower value indicates a smaller influence, a higher value indicates a larger influence.	0,0 ÷ 3,0	1
S2.2	Influence of room sensors T3 and T4	Set whether the room sensor T3 or T4 influences the controller operation. - <b>Auto:</b> Room sensor has influence if room unit isn't connected. - <b>Yes:</b> Room sensor has influence. - <b>No:</b> Room sensor has no influence. This function has meaning only if the analog room sensor is selected with the parameter S1.6 (for T3) or S1.7 (for T4).	- Auto - Yes - No	Auto
S2.4	Pump operation mode	Setting of pump operation mode. Settings have the following meaning: - <b>Standard:</b> Circulation pump of mixing circuit - regular. - <b>First program:</b> Operation according to first time program. - <b>Second program:</b> Operation according to second time program. - <b>Selected program:</b> Operation according to selected time program.	- Standard - First program - Second program - Selected program	Standard
S2.5	Minimum stand-pipe temperature	Setting of minimum stand-pipe temperature limitation.	10 °C ÷ 90 °C	20 °C
S2.6	Maximum stand-pipe temperature	Setting of maximum stand-pipe temperature limitation.	20 °C ÷ 150 °C	45°C - floor 85°C - radiators
S2.7	Backlash of mixing valve	Setting of mixing valve running time to compensate the backlash of actuator and mixing valve assembly, which occurs by change of rotation direction.	0 ÷ 5 s	1 s
S2.8	Mixing valve P - constant	Setting of mixing valve position correction intensity. Smaller value means shorter movements, higher value means longer 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.	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.	0,4 ÷ 2,5	1
S2.11	Minimum stand-pipe temperature for cooling	Setting of minimum stand-pipe temperature in cooling mode. <b>CAUTION! Too low stand-pipe temperature can cause dewing of heating bodies and pipelines.</b>	10 °C ÷ 20 °C	15 °C
S2.12	Heating-off temperature shift	Shift of calculated stand-pipe temperature for heating switchoff.	-10 °C ÷ 10 °C	0 °C
S2.13	Limitation of temperature difference between stand and return pipe	Setting of maximal difference between stand-pipe and returnpipe temperature. Limiting the highest power of heating system.	3 °C ÷ 30 °C	10 °C
S2.14	Constant stand-pipe temperature	Selection of operation with constant stand-pipe temperature. Setting range is 10 ÷ 140 °C. This function deactivates weather compensated control of mixing valve.	- No - Yes	No
S2.15	Circulation pump switch-off delay	Setting of delayed circulation pump switch-off when there is no requirement for heating.	0 ÷ 10 min	3 min





<b>S2.16</b>	Influence of room temperature deviation for cooling	Set the value of gain of room temperature deviation for cooling. Lower value means lower influence, higher value means higher influence.	0,0 ÷ 3,0	1
<b>S2.19</b>	Initial valve movement from open position	Setting of initial valve movement duration when moving from open position. With this setting the valve is moved to its control range and immediate controller respond at startup of system.	0,0 ÷ 30 s	20 s
<b>S2.20</b>	Initial valve movement from closed position	Setting of initial valve movement duration when moving from closed position. With this setting the valve is moved to its control range and immediate controller respond at startup of system.	0,0 ÷ 30 s	20 s

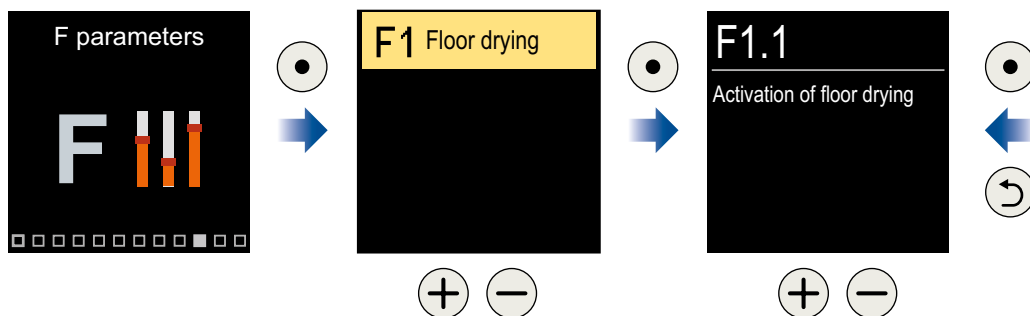
### group S3 - SETTINGS FOR ENERGY SOURCE

<b>PARAMETER</b>	<b>PARAMETER NAME</b>	<b>DESCRIPTION</b>	<b>SETTING RANGE</b>	<b>DEFAULT VALUE</b>
<b>S3.1</b>	Maximum boiler temperature	Setting of maximal boiler temperature.	60 °C ÷ 160 °C	90 °C
<b>S3.2</b>	Boiler temperature increase for mixing circuit	Setting of difference between boiler temperature and calculated stand-pipe temperature.	0 °C ÷ 25 °C	5 °C
<b>S3.3</b>	Minimum boiler return-pipe temperature	Setting of minimal boiler returnpipe temperature in scheme with 4-way rotary valve. The valve is closed until the return-pipe temperature is higher than set value.	10 °C ÷ 90 °C	45 °C



### 1.4.10 FUNCTION F PARAMETERS

The menu is used to display and set function parameters. Group F1 contains the parameters for the setting of floor drying. Navigate through the menu with the  $\oplus$  and  $\ominus$  buttons. When you use the  $\odot$  button to select the requested parameter group, a display will open describing the first parameter in the group.

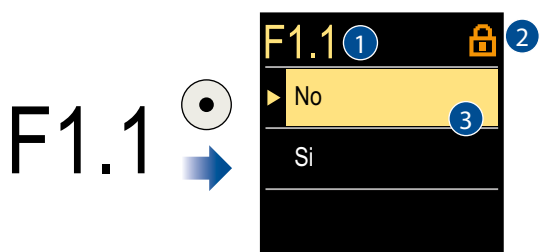


### SELECTION AND MODIFICATION OF THE PARAMETER

With the buttons  $\oplus$  and  $\ominus$  navigate through the parameters in the selected group  $\odot$ . The parameter you want to change is selected by pressing the  $\odot$  button. The parameter setting screen opens.



**ATTENTION:** The procedure for setting F parameters is the same as for service parameters.



DESCRIPTION	
1	Parameter
2	Parameter is locked
3	Current value

To be able to make the change, enter the unlock code using the  $\oplus$  and  $\ominus$  buttons; use the  $\odot$  button to move to the next position and confirm the unlock.



DESCRIZIONE	
1	Unlocking symbol
2	Code entry field

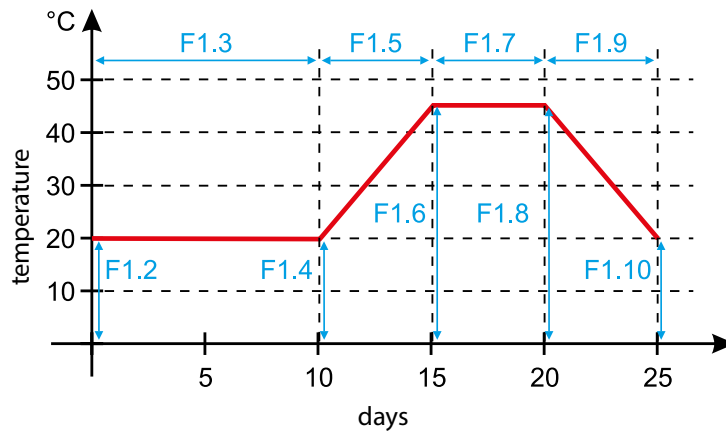
When the parameter is unlocked, you can use the buttons  $\oplus$  and  $\ominus$  to set the requested value and press  $\odot$  confirm. Exit the setting by pressing  $\rightarrow$ .



## LIST OF PARAMETERS

group F1 - FLOOR DRYING SETTINGS			
PARAMETER	PARAMETER NAME	SETTING RANGE	DEFAULT VALUE
F1.1	Floor drying	- No - Yes	No
F1.2	Interval 1: Start temperature	10 °C ÷ 60 °C	20 °C
F1.3	Interval 1: Duration	1 ÷ 15 days	10 days
F1.4	Interval 2: Start temperature	10 °C ÷ 60 °C	20 °C
F1.5	Interval 2: Duration	1 ÷ 15 days	5 days
F1.6	Interval 3: Start temperature	10 °C ÷ 60 °C	45 °C
F1.7	Interval 3: Duration	1 ÷ 15 days	5 days
F1.8	Interval 4: Start temperature	10 °C ÷ 60 °C	45 °C
F1.9	Interval 4: Duration	1 ÷ 15 days	5 days
F1.10	Interval 4: End temperature	10 °C ÷ 60 °C	20 °C

### • Floor drying profile - factory setting:

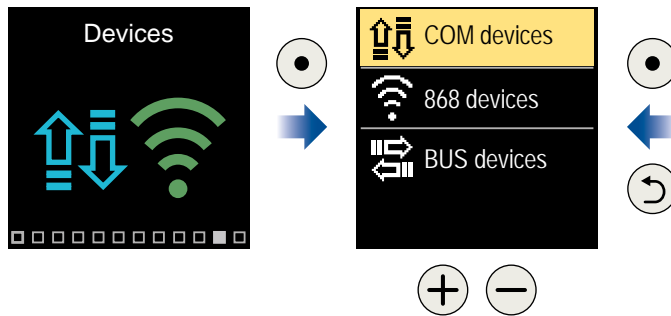


After the floor has dried, the function switches off automatically.



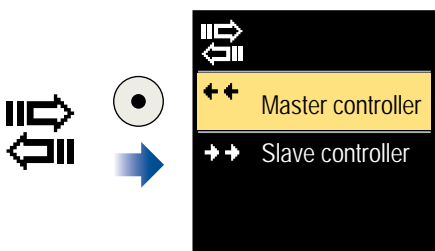
### 1.4.11 DEVICES

The menu is used to display and set the devices connected to the controller. Devices are divided according to the type of communication they use.



### BUS DEVICE

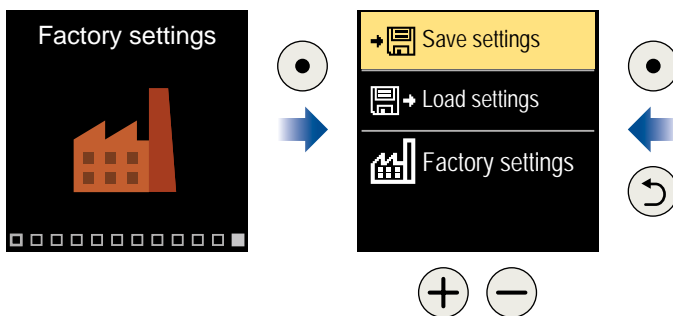
The list of devices with which the controller is connected to the BUS connection is displayed on the screen. Navigate through the list with the (+) and (-) buttons. Exit the screen with the button (↶).



SYMBOL	DESCRIPTION
	Wired BUS connection between controllers.
	The master controller is connected to the BUS connection.
	The slave controller is connected to the BUS connection.

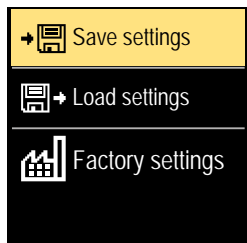
### 1.4.12 FACTORY SETTINGS

The menu contains tools for resetting the controller to saved or factory settings.



### SELEZIONE E MODIFICA DELLE IMPOSTAZIONI

Navigate through the menu with the (+) and (-) buttons. When you use the (●) button to select the requested command, a display will open for unlocking or confirming the command. Exit the setting with the (↶) button.



SYMBOL	DESCRIPTION
	Save user settings as a backup. With the buttons (+) and (-) you change the value and with the button (●) you move on to the next position and confirm the unlocking. 
	Load user settings from backup. If a backup doesn't exist, this command is not executed.
	Restores all parameters to default values and restarts the controller initial setup.



## 2 BASIC OPERATION DESCRIPTIONS

### 2.1 MIXING HEATING CIRCUIT

#### STAND-PIPE TEMPERATURE CALCULATION FOR HEATING

The calculation of the stand-pipe temperature for heating is limited by the maximum temperature of the stand-pipe – parameter S2.6 and by the minimum temperature of the stand-pipe – parameter S2.5. The influence of the room temperature deviation on the stand-pipe calculation can be set up with the parameter S2.1. The heating curve steepness can be set up with the parameter P2.1 and parallel shift of the heating curve with the parameter P2.2.

#### STAND-PIPE TEMPERATURE CALCULATION FOR COOLING

The stand-pipe temperature calculation for cooling is limited by the set minimum temperature of the stand-pipe for cooling – parameter S2.11. The influence of the room temperature deviation on the stand-pipe calculation can be set up with the parameter S2.16. The cooling curve steepness can be set up with the parameter P2.6 and parallel shift of the cooling curve with the parameter P2.7.

#### HEATING OPERATION

If the calculated temperature of the stand-pipe is not slightly higher than the room temperature, the mixing valve closes and circulation pump turns off. If the room temperature is not measured, the mixing valve closes when the outdoor temperature approaches the requested room temperature. With the parameter S2.12, the required difference between the calculated temperature of the stand-pipe and room temperature, at which the mixing valve is deactivated, can be increased or reduced. If heating is not required or not activated, the value 4°C will show as the calculated stand-pipe temperature and the circulating pump will switch off with a delay – parameter S2.15. Other pump operation modes can be selected with parameter S2.4.

#### COOLING OPERATION

If the calculated temperature of the stand-pipe is not slightly lower than the room temperature, the mixing valve closes and circulation pump turns off. If the room temperature is not measured, the mixing valve closes when the outdoor temperature approaches the requested room temperature. With the parameter S2.12, the required difference between the calculated temperature of the stand-pipe and room temperature, at which the cooling is deactivated, can be increased or reduced. If cooling is not required or not included, the value 34°C will show as the calculated stand-pipe temperature and the circulating pump will switch off with a delay – parameter S2.15. Other pump operation modes can be selected with parameter S2.4.

#### 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 and P2.4. By setting the Boost function, the time required to achieve the requested room temperature after the transition from the night into day time interval can be reduced.

#### HEATING CIRCUIT POWER LIMITATION ( $\Delta T$ LIMITATION)

When you want to limit the maximum starting power of an individual heating circuit, you use an additional sensor T4 to measure the return-pipe temperature of the mixing heating circuit. The setup for the parameter S1.7 - Return-pipe is required and with the parameter S2.13, the maximum permissible difference between the temperature of the stand-pipe and return-pipe can be set up. The controller now restricts the stand temperature by not exceeding the set-up difference between the stand and return temperature.

#### OPERATION WITH 4-WAY VALVE SCHEME

When the outdoor temperature is lower than the requested room temperature or the heat source temperature reaches the value which is set in parameter P3.1 - the circulation pump will start working. The mixing valve will start opening when the temperature which is measured by sensor T4 reaches value which is set in parameter S3.3 - Minimum boiler return-pipe temperature.

### 2.2 HEATING AND COOLING CURVE

The curve steepness indicates what temperature is required for the heating or cooling bodies by a determined outdoor temperature. The steepness value depends mainly on the system type (floor, wall, radiator) and insulation of the building. If you have enough data, you can determine the heating curve steepness with a calculation, otherwise it's from experience, based on the evaluation of the heating system dimensioning and building insulation. The heating curve steepness is set correctly, if the room temperature remains stable, even if there are large outdoor temperature changes.




## DETERMINING THE HEATING CURVE STEEPNESS

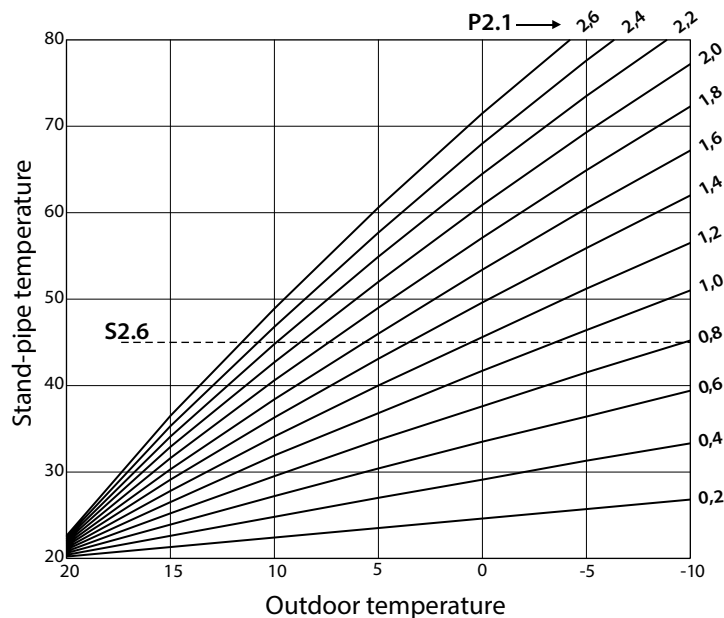
While the outdoor temperature is above +5°C, you can adjust the room temp. by changing the day or night temp, or with the parallel shift of the heating curve (parameter P2.2). If the object temp. is too low because of low outdoor temperatures, the heat curve steepness needs to be increased. If the object temp. is too high because of 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:

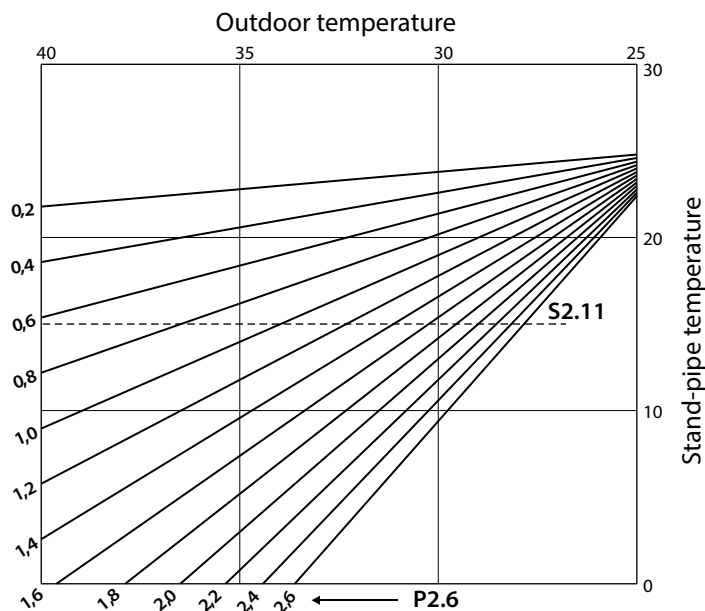
SYSTEM	STEEPNESS SETTING RANGE
Floor	0,2 - 0,8
Wall	0,5 - 1,0
Radiator	0,7 - 1,4

 By adjusting the heating curve the controller is adapted to the regulated building. For optimal controller operation, the right setting of the heat curve steepness is very important.

## HEAT CURVE DIAGRAM



## COOLING CURVE DIAGRAM





## 2.3 OPERATION MODES WITH SENSOR FAILURE

PROBLEM	OPERATION
The outdoor sensor is not connected	<ul style="list-style-type: none"> <li>• <b>Heating:</b> the controller regulates the stand-pipe to a constant temperature, which is:               <ul style="list-style-type: none"> <li>- 25°C higher than the the requested day temperature; for radiator heating systems</li> <li>- 10°C higher than the requested day temperature; for floor heating systems.</li> </ul> </li> <li>• <b>Cooling:</b> in the daytime interval, the supply temperature is equal to the setting of parameter S2.11, and in the nighttime interval, cooling is switched off.</li> </ul>
The stand-pipe sensor is not connected or has a failure	<ul style="list-style-type: none"> <li>• <b>Heating:</b> the heating does not work and the mixing valve closes.</li> <li>• <b>Cooling:</b> cooling does not work and the mixing valve closes.</li> </ul>
The boiler sensor is not connected or has a failure.	The controller assumes that the boiler temperature is equal to the set maximum boiler temperature. The mixing valve control is working.
The return-pipe sensor is not connected or has a failure.	The controller operates without the influence of the return-pipe sensor.

## 2.4 RESISTANCE OF PT1000 TEMPERATURE SENSORS

TEMP. [°C]	RESISTANCE [Ω]	TEMP. [°C]	RESISTANCE [Ω]	TEMP. [°C]	RESISTANCE [Ω]	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	1515	190	1722
30	1117	85	1328	140	1536	195	1740

## 2.5 CLUTCH AND MANUAL VALVE DISPLACEMENT

Pressing the clutch (1) activates the manual valve displacement. You can now move the mixing valve by turning the button (2). To return to automatic operation, press the clutch (1). again. When the clutch is activated, the clutch symbol appears on the display (3).

3 Manual movement - active valve clutch



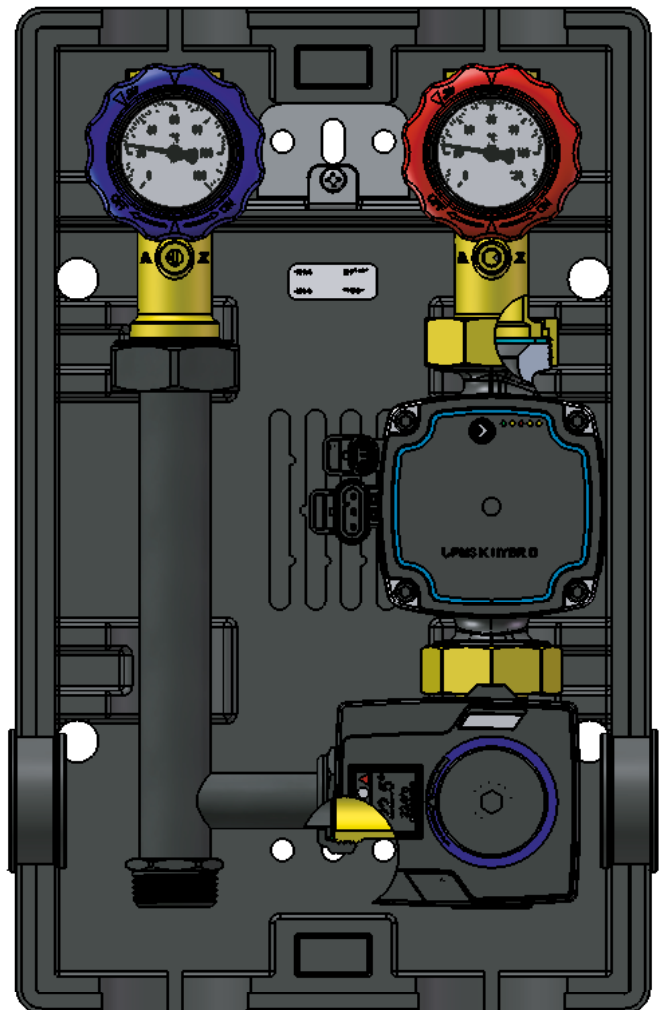
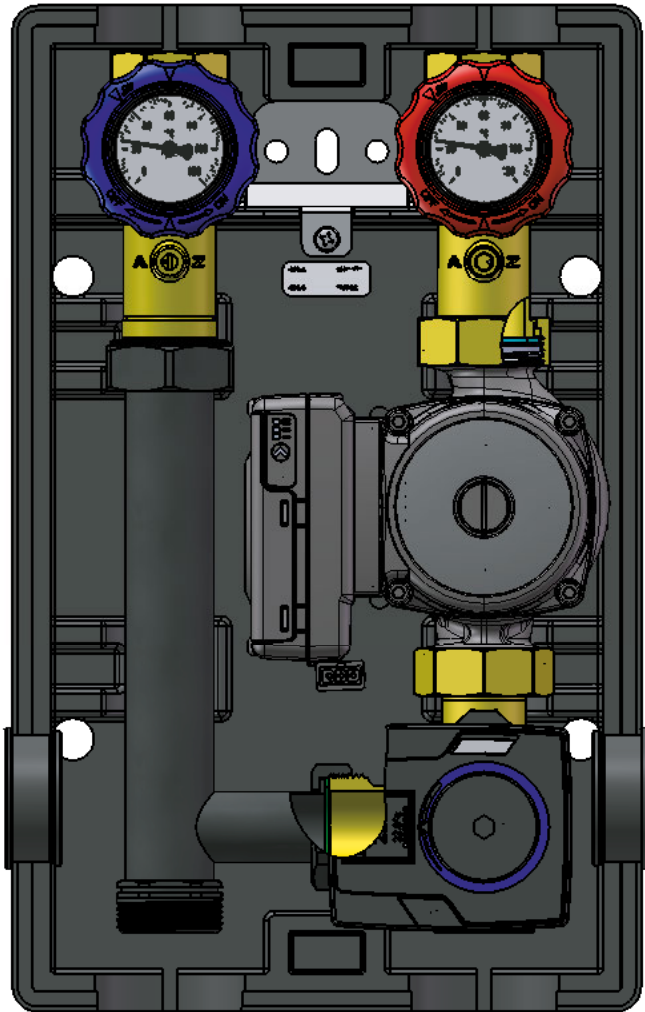


### 3 CONTROLLER INSTALLATION

In a warm interior, the controller can be mounted directly on the mixing valve with the help of the accessories provided.



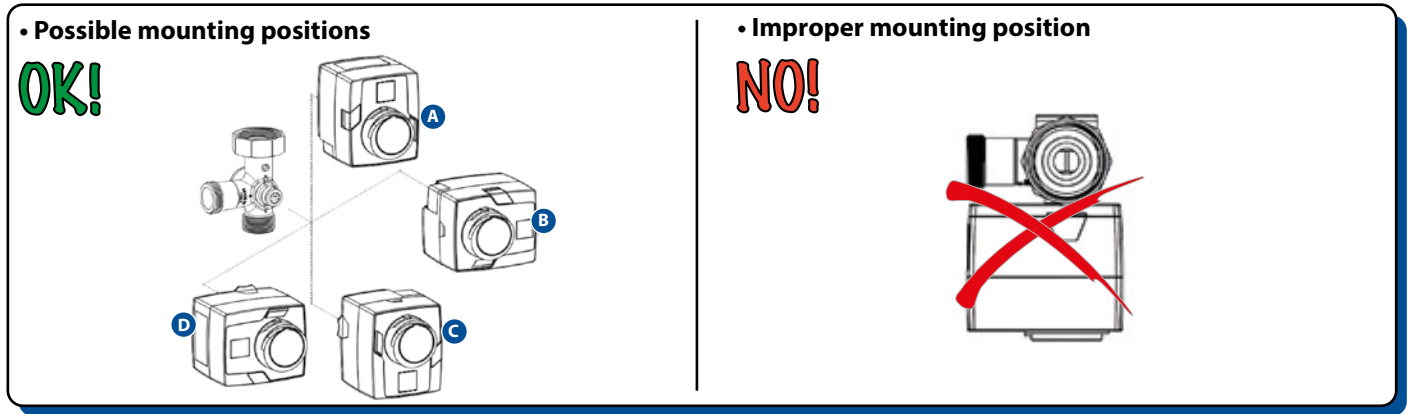
**ATTENTION:** Avoid close proximity to any strong electromagnetic fields.





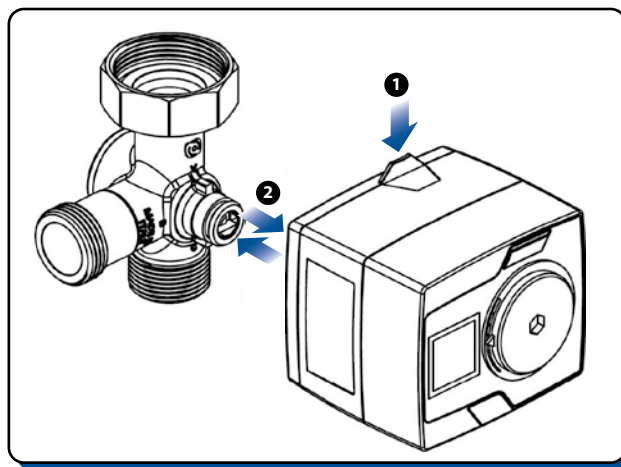


The controller can be mounted on the valve in four different positions, the display will always automatically orient itself horizontally.



### MOUNTING/DISMOUNTING THE CONTROLLER ON A MIXING VALVE

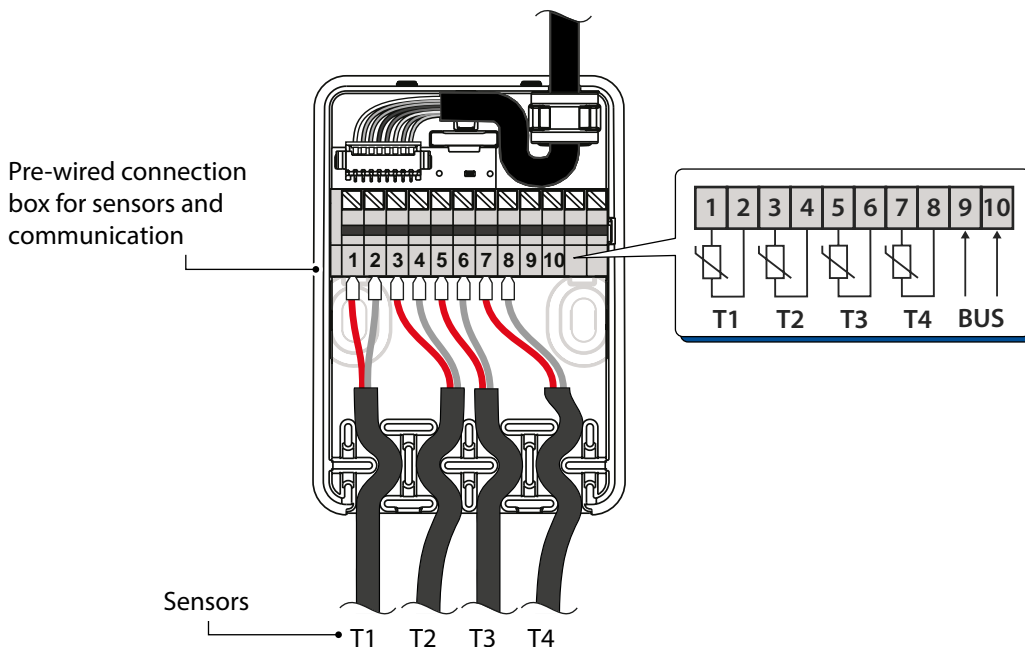
To mount or dismount the controller, press and hold the pushbutton (1), and then slide the actuator on or off the valve spindle (2).



## 3.1 CONNECTION

### CONNECTION OF TEMPERATURE SENSORS

Temperature sensors and connections between controllers are connected to a pre-wired connecting rail. The controller allows the connection of four Pt1000 temperature sensors (connection terminals 1 to 8). The sensor function depends on the hydraulic diagram and setup of parameters S1.6 and S1.7.





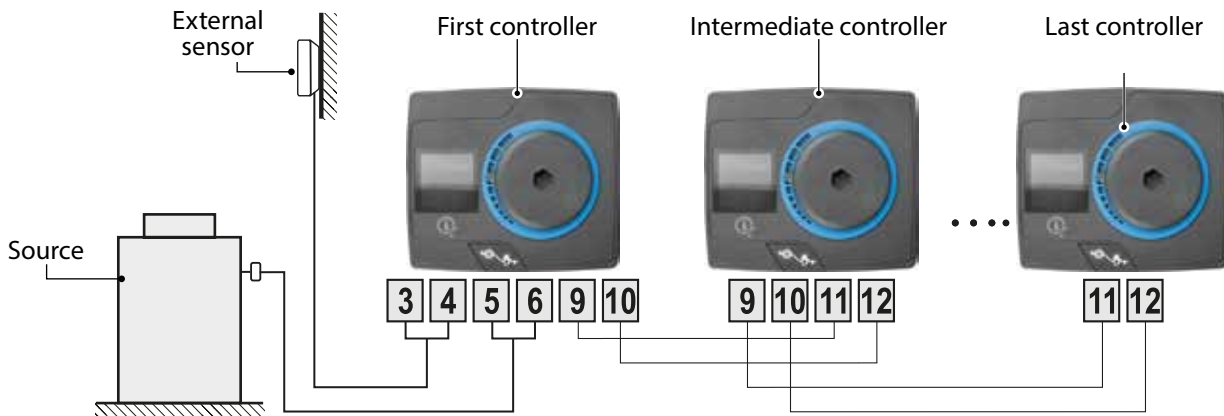
## BUS CONNECTION OF CONTROLLERS

The first or leading controller physically controls the energy sources, while the other controllers only control the heating circuits.



**The outdoor temperature sensor and the sensor of the heat source temperature must be connected to the first controller.**

### • Example of BUS connection of NVMC01 controllers:



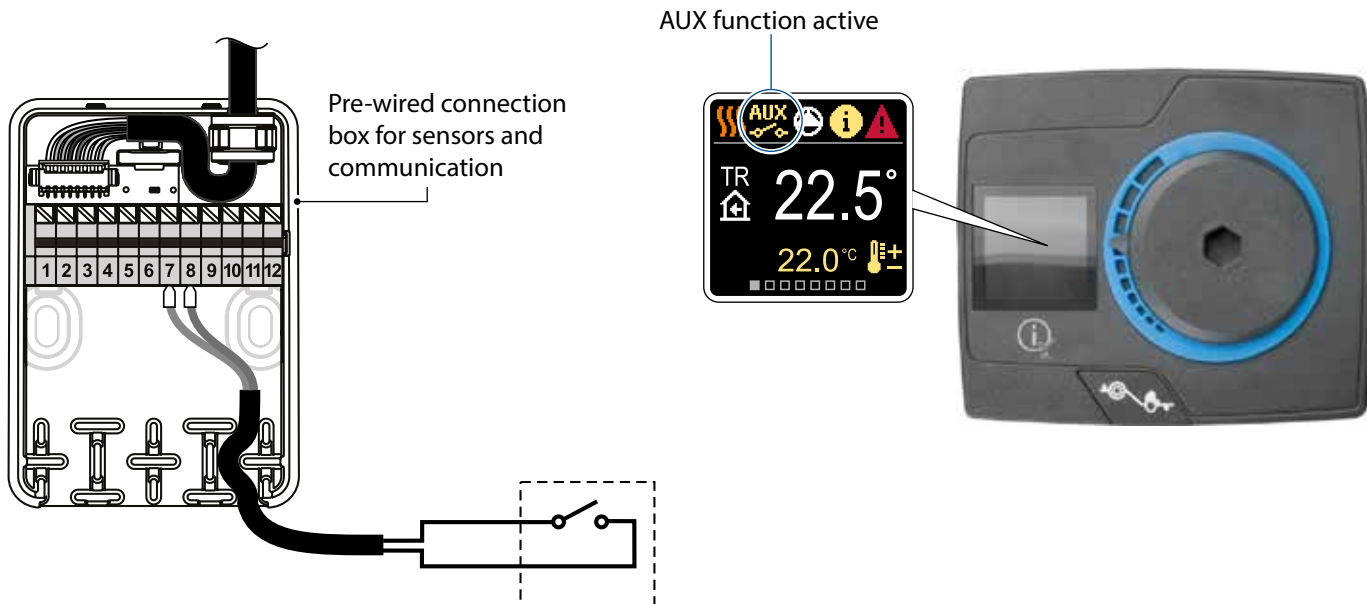
## AUX function at input T4

Input T4 can also be used for external actuation of the controller. The external actuation options are set with parameter S1.9.

When a short circuit is detected at input T4, the following is activated:

- switch to daily temperature if parameter is set to S1.9 = Daily temperature.
- switch to night temperature if parameter is set to S1.9 = Night temperature
- switch from heating to cooling if parameter is set to S1.9 = Cooling.
- switch to operation according to the selected time program if the parameter is set to S1.9 = Time program.
- Boost heating function if parameter is set to S1.9 = Boost.

When the AUX function is activated, the AUX symbol appears on the display.





## 4 TECHNICAL DATA

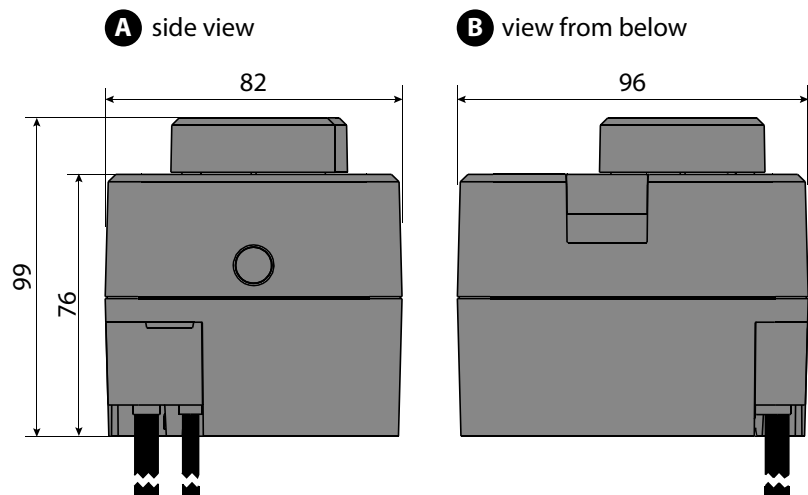
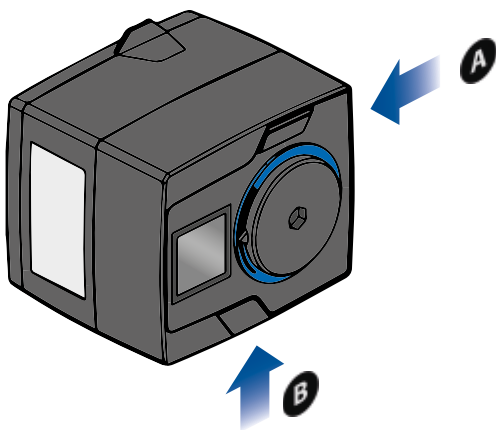
### GENERAL TECHNICAL DATA - CONTROLLER

Dimension (w x h x l)	96 x 82 x 99 mm
Controller weight	~ 800 gr
Controller casing	PC - thermoplastic
Torque	6 Nm
Rotation angle	90 °
Rotation speed	2 min / 90 °
Type of operation	3 point, PID
Supply voltage	230 V ~ 50 Hz
Energy consumption in operation	3,5 W
Energy consumption in standby	max 0,5 W
Circulation pump control	2 point (ON-OFF), 1 (1) A230 V ~
Degree of protection	IP42 according to EN60529
Safety class	I according to EN 60730-1
Accuracy of built-in clock	±5 min / year
Permissible ambient temperature	da 5 °C a +40 °C
Permissible relative humidity	max 85 % rH to 25 °C
Storage temperature	from -20 °C to +65 °C
Storing data without power	min. 10 years

### TECHNICAL CHARACTERISTICS - SENSORS

Temperature sensor type	Pt1000
Sensor resistance	1078 Ohm a 20 °C
Temperature range	-25 °C ÷ 150 °C, IP32
Min. section of sensor conductors	0,3 mm <sup>2</sup>
Max. length of sensor conductors	max. 10 m

## 5 DIMENSIONS





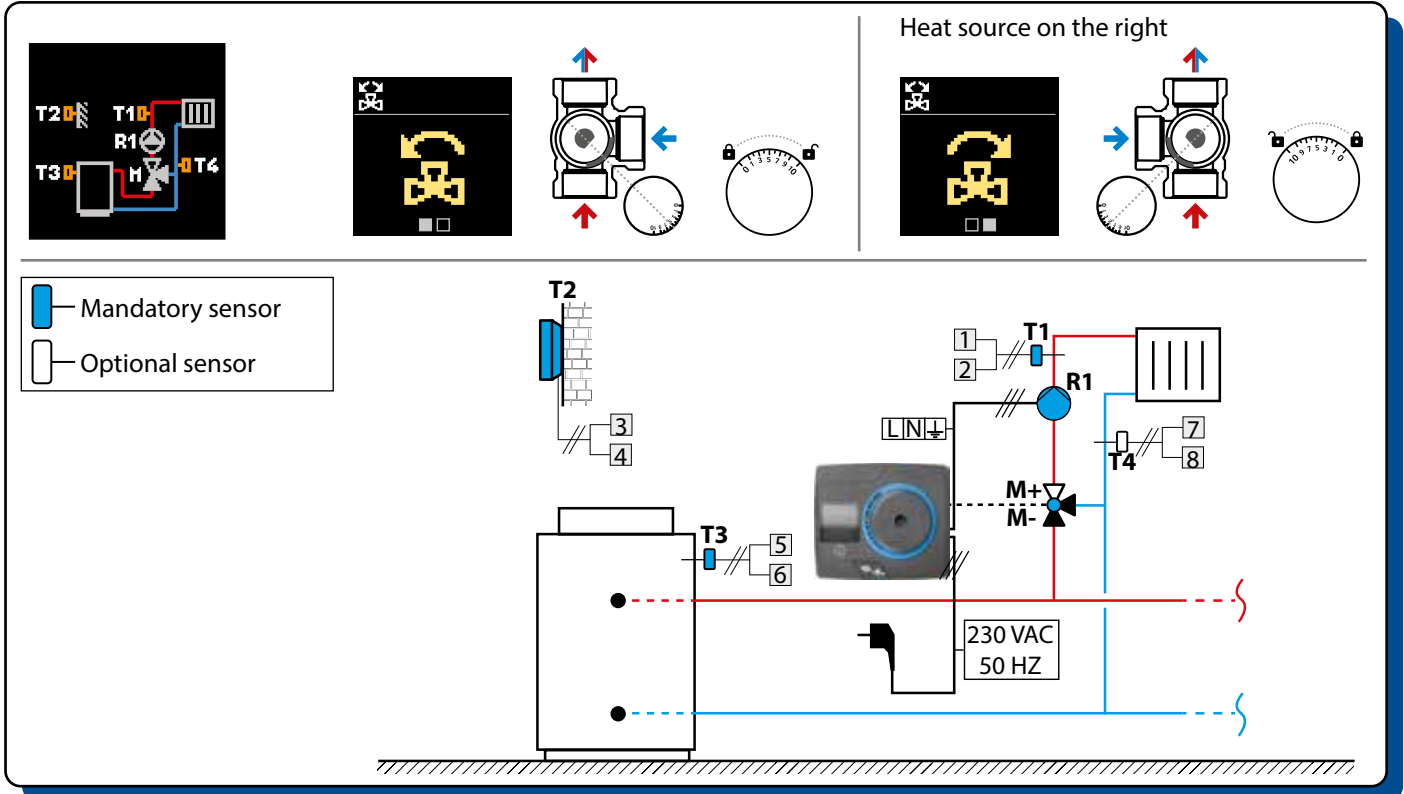
# 6 HYDRAULIC SCHEMES



**ATTENTION!** Installation schemes show the principle of operation and do not contain all the auxiliary and safety elements! The applicable regulations must be observed during installation!

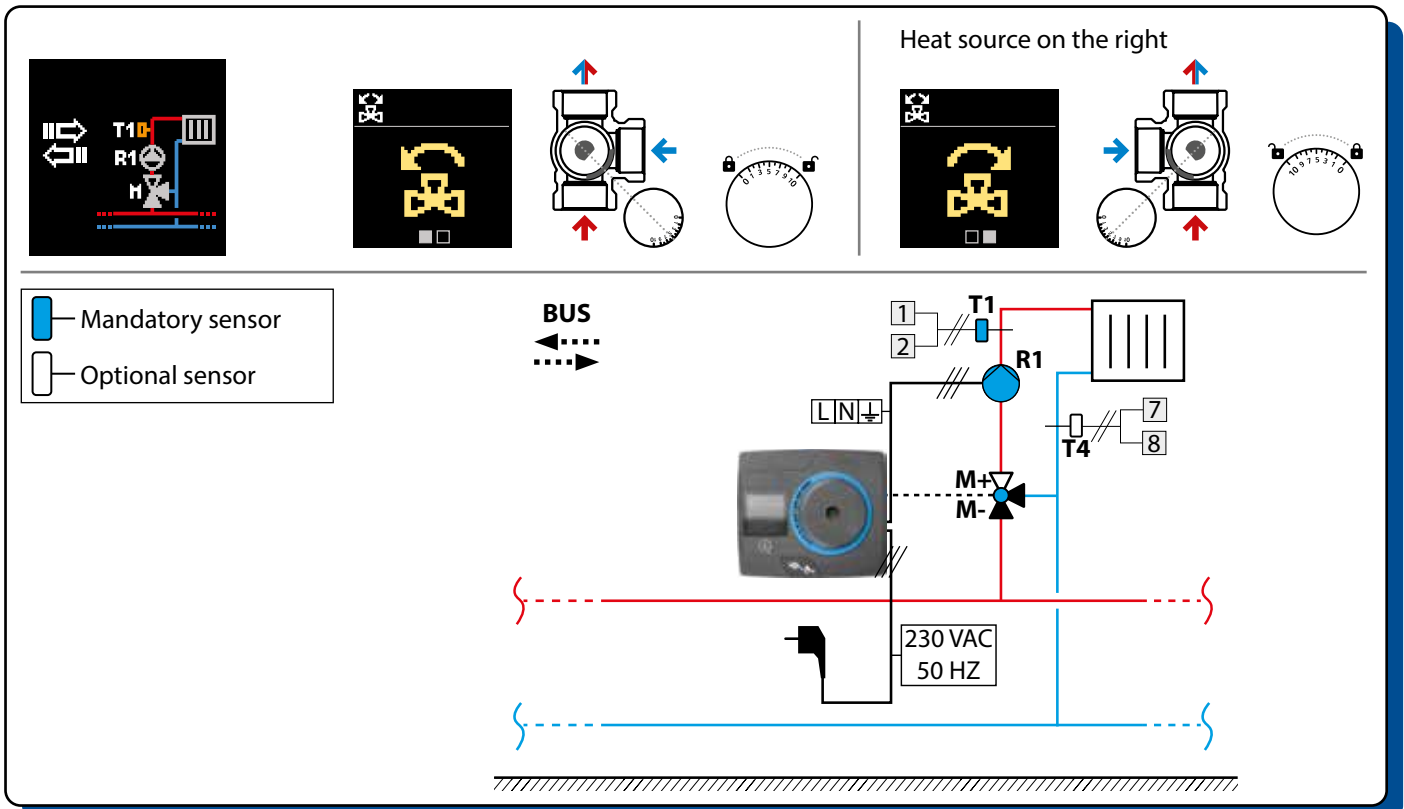
## SCHEME 360 - HEATING CIRCUIT

Diagram with a 3-way mixing valve mounted on the supply pipe (radiator or manifold heating).



## SCHEME 360B - ADDITIONAL HEATING CIRCUIT

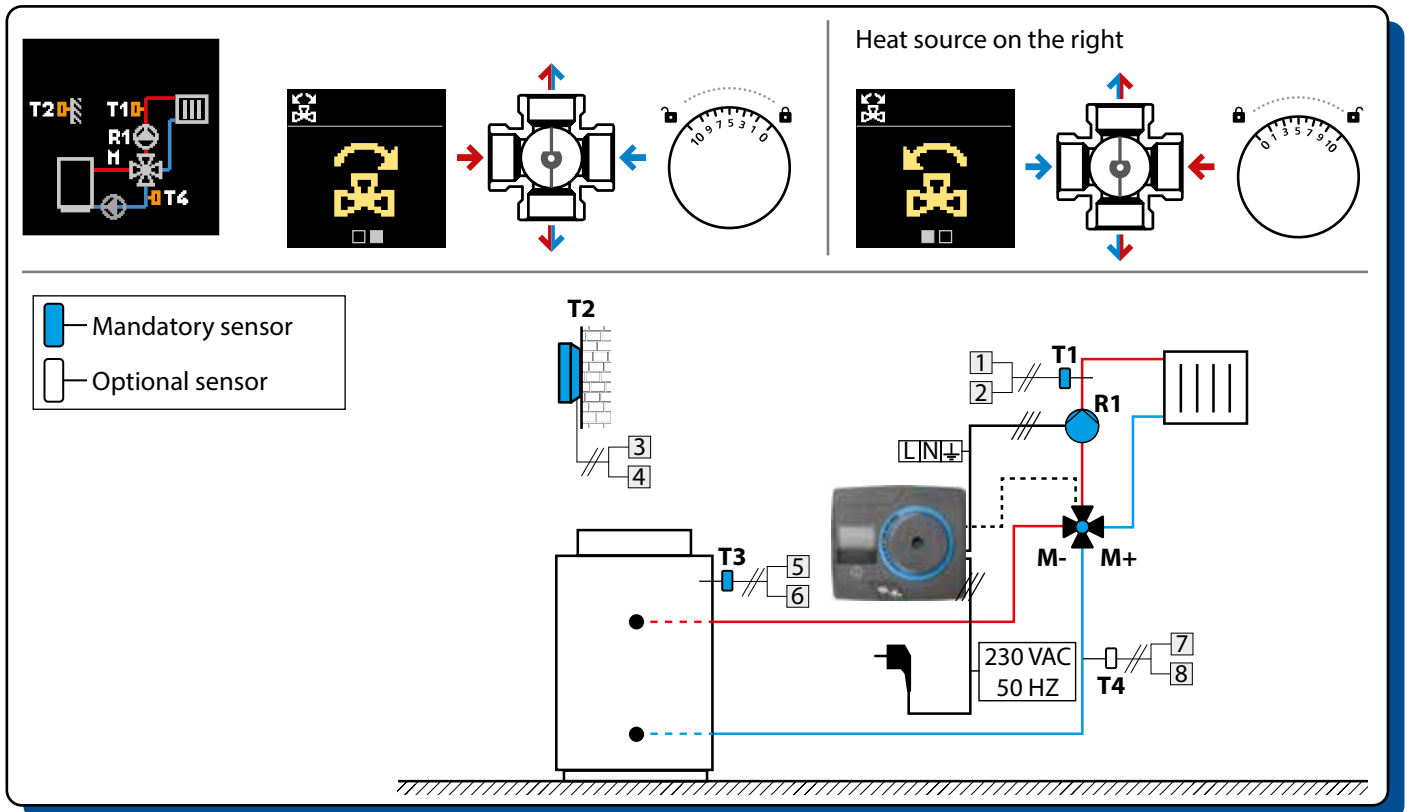
Diagram with a 3-way mixing valve mounted on the supply pipe (radiator or manifold heating). This version allows for connecting more controllers using BUS communication.



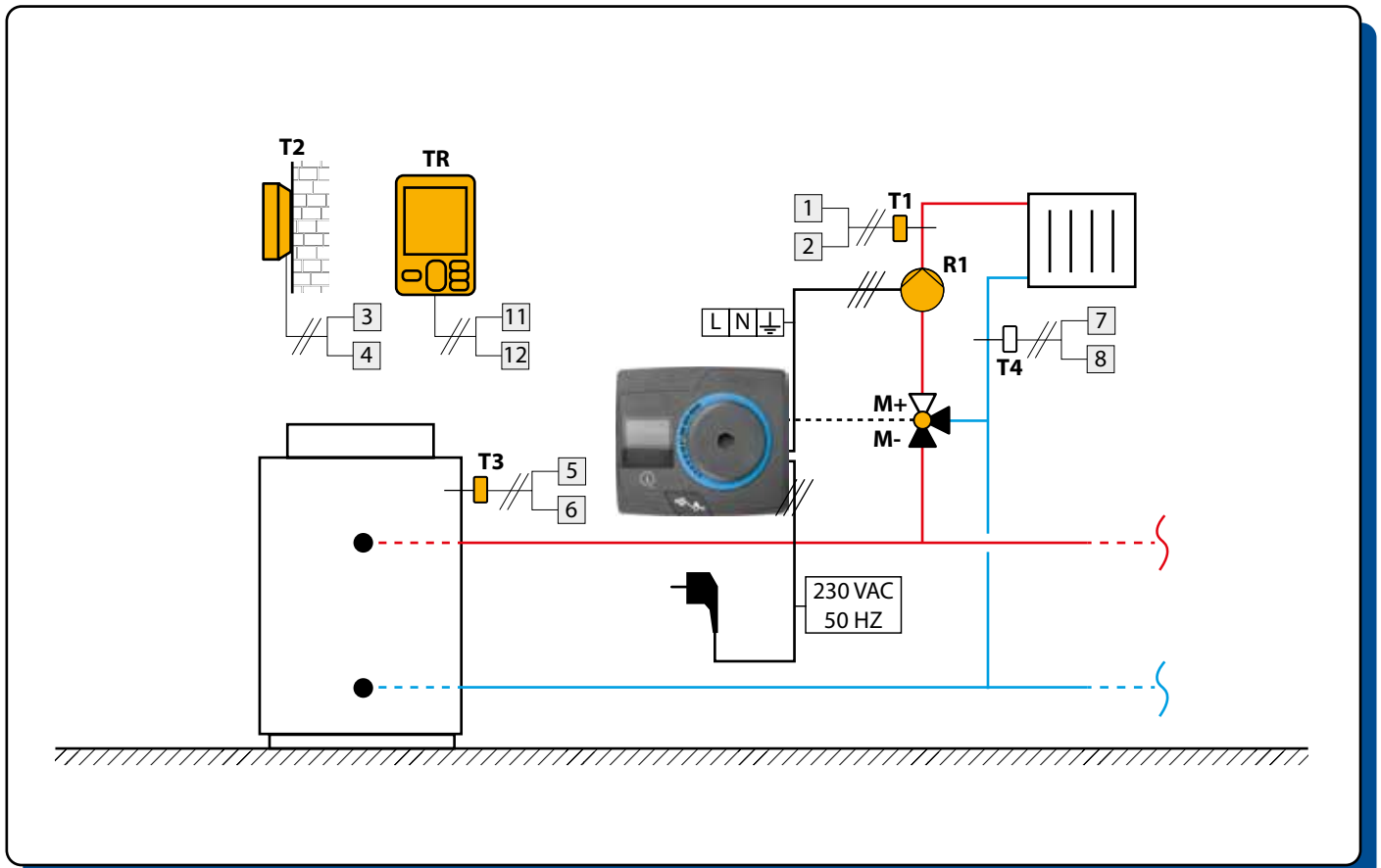


### SCHEME 361 - HEATING CIRCUIT

Diagram with a 4-way mixing valve (radiator or manifold heating) with the return temperature protection function active.



### SCHEME - OPERATION WITH ROOM TEMPERATURE CONTROLLER







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