

# RTL-TH DIGITAL Regulation Box



Work on heating systems must only be done by qualified professional personnel and in accordance with the respective applicable regulations, guidelines and rules of engineering.

**Refer in particular to:**

**DIN EN 1264:** Surface integrated heating and cooling systems

**DIN EN 12828:** Heating systems in buildings

**DIN 18 380:** Heating systems and central hot water heating systems

**VDE 0100:** Creating low voltage systems

**VDI 2035:** Scale formation in domestic water heating systems and water heating systems

**BGV:** German Professional Association Regulations (accident prevention regulations)

*DIN = The German Institute for Standardisation*

*EN = European Standards*

*VDE = German Association for Electrical, Electronic & Information Technologies*

*VDI = Association of German Engineers*



## 1. Features

Features	RTL-TH DIGITAL Regulation Box
Room temperature regulation	✓
Return flow temperature limitation	10 - 50 °C
Room temperature controller	✓
Ventilation	✓
Flowmeter	✓
Electro-thermal actuator	✓
“easy-connect” plug-in connection	✓

## 2. Area of Application

### Heating systems

For combined radiator-surface heatings the RTL-TH DIGITAL Regulation Box is used for the **room temperature-dependent regulation** of the surface heating while limiting the return flow temperature.

## 3. Technical Description

The **regulation box** consists of a wall insulation box with a pre-mounted valve module, an electro-thermal actuator, a protective cap, an air vent plug, a flowmeter for measuring and regulating the volume flow and a wall cover.

The **valve module** is provided with a 3/4“ male thread (Euro taper) for a connection via Simplex compression adapter on the pipe side.

The valve is comfortably activated with the **room temperature controller** RTL-TH DIGITAL.

This programmable temperature controller allows programming switching events (up to 9 per day) and temperatures according to personal needs. After installation the device automatically shows the time of day and the room temperature.

In **AUTO** mode, the heater will be automatically activated according to programmed time and temperature. Program 1 is the default pre-set program (see 8. room temperature controller).

Room temperature will be regulated based on the

room temperature. The return flow temperature of the surface heating (measured by the remote sensor) will be limited. The heater will be switched on when the room temperature drops below the current set-point.

In case of function „Min Return Temp“ (H3) it will be heated if the return temperature drops below the set min-value. This is even when the room temperature is too high (permanent floor temperature).

In case of function „Max Return Temp“ (H3) heating will be stopped if the return temperature exceeds the set max-value. This is even when the room temperature is too low.

Adjusting the maximum return temperature „Max Return Temp“ (H3) is absolutely necessary for reliable and troublefree operation because **otherwise there might be damage to the floor structure!**

#### Caution:

The maximum permissible supply flow temperature of the surface heating must be respected.

## 4. Installation

Note for arranging the regulating box in rooms with showers or bathtubs: **1**

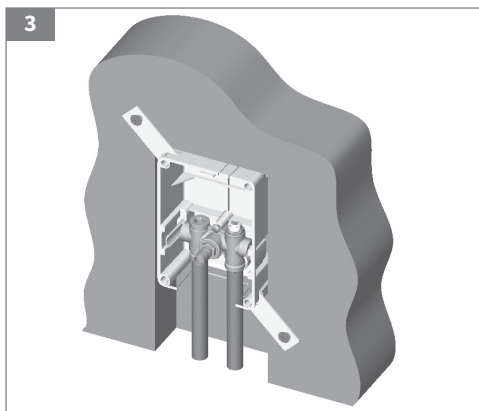
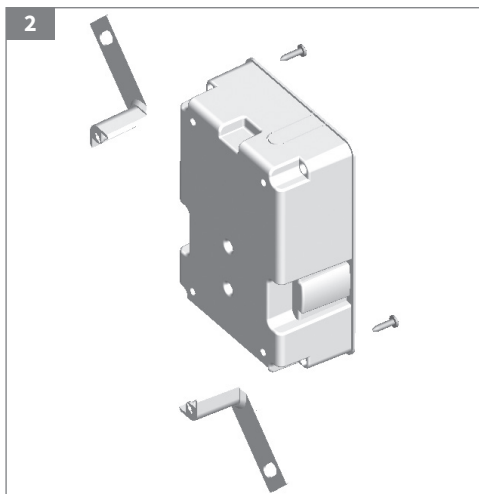
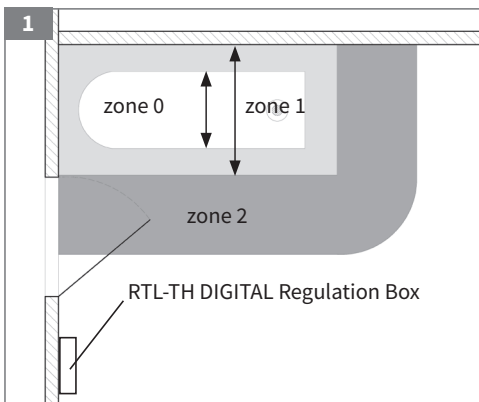
The regulation box has to be arranged outside of the zones 0, 1 and 2 in conformity with DIN VDE 0100-701 to prevent contact with splashing water.

Prepare the insulation box for the mounting by inserting the fixing clips from the backside into the drill holes at the corner points of the box and securing them with the supplied screws so that they cannot fall out. **2**

The fixing clips are arranged crossed-over. The clips can also be exchanged in any way depending upon the construction site situation. The clips can be moved horizontally in order to create a depth compensation as long as the screws have not been finally fixed.

The box is positioned to fixing clips on the rough wall in a sufficiently large wall recess (approx. 180 x 230 mm). Please pay attention to the mark of the protective cap to the surface of the finished wall in order to adjust the box optimally in the depth. Afterwards fix the box with the adjusting screws.

Before the connection of the pipings, the notches on the box are to be formed by breaking out the walls at the corresponding positions.



Please pay attention to a tension-free installation and the correct flow direction (supply flow left - see arrow mark!) when connecting the piping system. Reversely mounted connections cause valve noises and a bad control behaviour. Tension-free compression connection must also be guaranteed when the system is in operation, i.e. expansion loops or appropriate securing of the pipeline must be provided.

Before starting the plaster and wall covering works, the box is to be covered with a protective cap. The remaining space between the box and the wall notch can be filled with PU foam. **3** After finishing the wall covering works, the final mounting is done by removing the protective cap and putting on the wall cover.

### Installation Room Temperature Controller

**Caution:** The room temperature controller must only be opened and installed by a qualified electrician, according to the wiring diagram on the device and in this installation instructions and in compliance with all applicable safety regulations. To maintain compliance with Protection Class II, user access to the rear of the device must be prevented.

This electronic device is an “independently mounted regulation”. It is used to control the temperature only in dry and closed rooms, under normal environmental conditions. It conforms to EN 60730 and works according to operating principle 1C.

The controller should be mounted at a location in the room which:

- can be easily accessed
- is free of curtains, cabinets, shelves, etc.
- allows free air circulation
- is not exposed to direct sunlight
- is not draughty (when doors or windows are opened)
- is not directly influenced by the source of heat
- is not located on an outer wall
- is approx. 1.5 m above the floor

#### Fitting in a conduit box Ø 60 mm **6a**

Remove the display unit

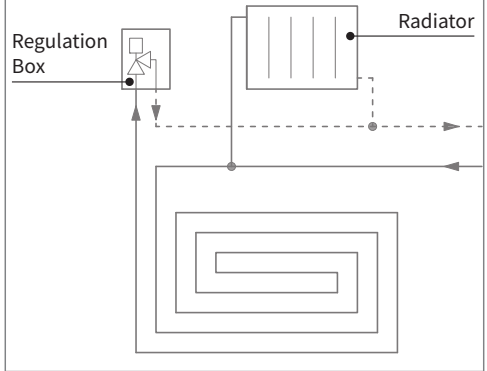
Remove the frame

Mount it following the reverse procedure

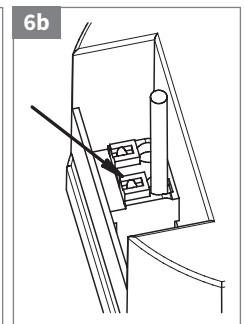
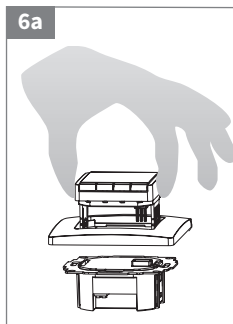
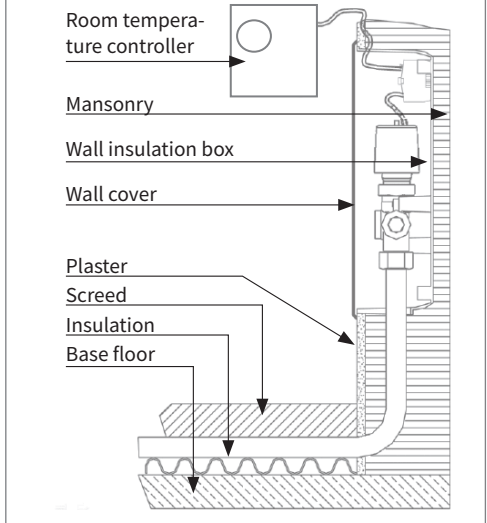
**Caution:** Mounting in plastic wall boxes only.

To insert or remove a flexible wire press pin. **6b**

#### 4 Functional diagram



#### 5 Installation diagram



The plastic tab must be in place to provide insulation between the terminals/wires and the mounting screw. **6c**

## Electric Connection

Remove the splash guard for connecting terminal in the box. **7a**

**Caution:** Disconnect electric circuit from supply.

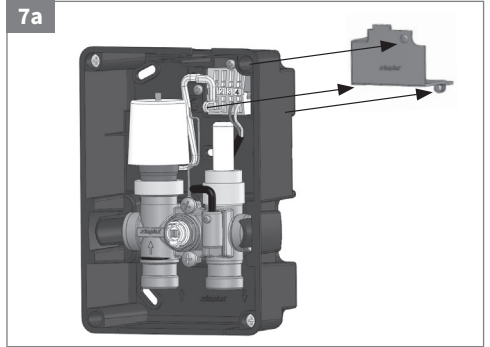
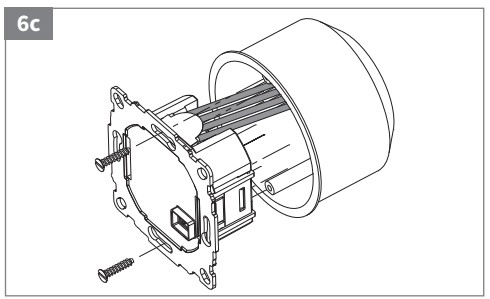
### Connecting according to wiring diagram.

For solid and flexible wires 1 - 2.5 mm<sup>2</sup>.

The return temperature sensor (plug 3 and 4 on the regulation box) can be connected by using a 2-lead cable suitable for 230 V up to 50 m. Avoid laying sensor cable alongside power cables, for example inside a conduit.

The protective earth is pre-wired on the housing and can be connected to the terminal box using the prepared 2-pin terminal connector.

**Caution:** The sensor is at mains voltage.



## Wiring Diagram

### Caution:

Maximum length of removed cable insulation 8 mm.

### Plug 1+2:

Room temperature controller connection

Terminal block

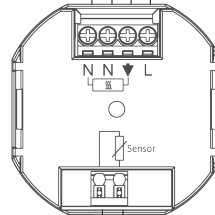
Actuator

230 V ~ 50 Hz

PE

N

L



Plug 3+4:

Return temperature sensor connection

2-pin connector for connecting protective earth

Earthing connection housing

Flowmeter

Return temperature sensor

## 5. Technical Data

### Room Temperature Controller

Type	RTL-TH DIGITAL (type 527 8134)
Supply voltage	230 V AC 50 HZ (195...253 V)
Room temperature setting range	5 °C ... 30 °C; in 0.5 °C steps
Return temperature setting range	10 °C ... 50 °C; in 0.5 °C steps
Temperature resolution	0.1 °C steps
Output Relay	NO contact
Switching current	10 mA ... 10(4) A, 230 V~
Output signal	Pulse width modulation (PWM)
Minimum programmable time	10 min.
Power consumption	~ 1.2 W
Accuracy of clock	< 4 min. / year
Power reserve	~ 10 years
Ambient temperature	operating 0 °C up to 40 °C (without condensation)
Storage	-20 °C up to 70 °C (without condensation)
Voltage and current for the purposes of interference measurements	230 V, 0.1 A
Degree of protection	IP 30
Protection class of housing	II (see installation room temperature controller)
Cable length return temperature sensor	4 - 50 m

### Regulation Box

Angle compensation box	6°
Angle compensation cover	6°
Depth compensation	23 mm
Axial distance valve	50 mm
Connecting dimensions for the pipeline	3/4" male thread, Euro taper DIN EN 16313
Electrical connection	2-lead; 0.5 mm <sup>2</sup>
Cable layout	0.5 mm <sup>2</sup> ; 2-lead

### Actuator

Connection thread	M 30 x 1.5
Rated voltage	230 V ~
Maximum switch-on	0.5 A
Continuous output	2.5 - 3 W
Design	normally closed
Degree of protection / Protection class	IP42 / II
Overtension protection / Position indication	present

### 6. Ventilation

The system can be ventilated as necessary using the ventilation valve installed.

### 7. Flowmeter

Flowmeter regulating valve for the regulating the volume flow. The upper part of the valve consists of a valve cone with a rising spindle and a handwheel for adjustment. The sight glass is installed in the hand wheel where the flow can be read directly in L/min on the printed scale depending upon the position of indicator unit. The adjustment on the flowmeter can be blocked by the delivered stop cap and sealed if desired.

### Volume Flow Regulation

Remove the lock cap. The control is performed by turning the black handwheel whereby the valve cone will be turned down when turning to the right. The volume flow will decrease until reaching the complete blocking. The opening of the valve is performed by turning it in the opposite direction.

### Cleaning Flowmeter

The sight glass and measuring spring can be removed for maintenance and cleaned, even at full system pressure. In order to do so, hold the black

hand wheel firmly and turn to the left to remove the sight glass.

**Do not use any tools when removing the sight glass! Risk of breakage!**

Unscrew the sight glass quickly and removed, together with the spring located inside. The flowmeter locks automatically once the sight glass and spring have been removed. In this condition, there may be some slight water loss from the valve. Clean the sight glass quickly and screw together again in the opposite order.

## 8. Room Temperature Controller

### 8.1 Features

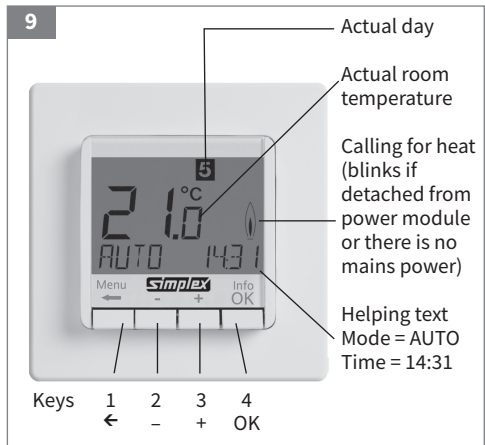
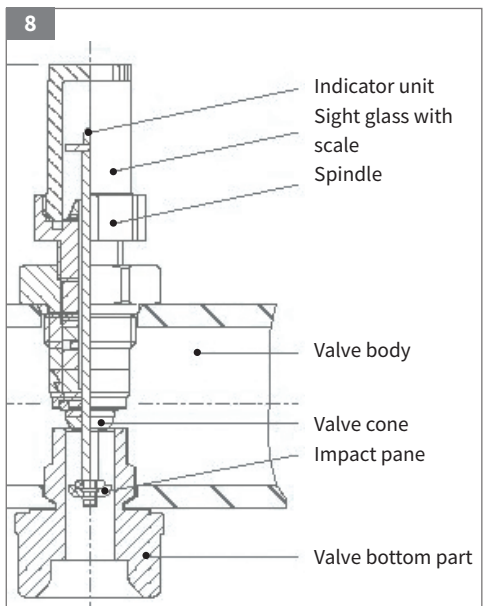
- One line text display for simplified operation
- Back light
- Real time clock (setting of year, month, day, time)
- Automatic Summer- Winter time change over
- Max 9 events per day (each day independently)
- Pre-set and adjustable programs
- Optimum-Start
- Arm chair programming (with display unit removed)
- OFF-Function, key ← to be pressed for 10 sec.
- Holiday-Mode (date from - until can be set)
- Timer (Party) specific temperature for configurable duration
- Energy consumption display (heating on time \* cost) for last 2 days, -week, -month, -year
- Energy cost per hour configurable
- Frost protection
- Range limits for adjusting max and min temp.
- Access protection
- Operating language can be selected
- Valve protection
- Adaptation to valves normally open or normally closed

### 8.2 Operation Instructions

The most important functions at a glance

#### Pre-set programs

There are 3 pre-set time/temperature programs in the controller. Pre-set program 1 is the default (see next page). Therefore, if pre-set program 1 is the best program to suit the application, there will be no need to change the time/temperature settings on the device.



Setting a constant room temperature without the timer programming - function "manual"	<p>Press <b>key 1</b> to access the menu. Press <b>key 3 (+)</b> twice until the menu option <b>MAN</b> appears. Select this mode by pressing <b>key 4 (OK)</b>. Selecting this option will automatically take you from the menu and return you to the normal display mode. <b>MAN</b> will be displayed at bottom left of the display.</p> <p>The desired room temperature can be set using <b>keys 2 (-)</b> and <b>3 (+)</b>. This will apply until altered; timer programs are deactivated.</p>
Activating timer programming - function "automatic"	<p>Press <b>key 1</b> to return to the menu. Press <b>key 3 (+)</b> once until the menu option <b>AUTO</b> appears. Select this mode by pressing <b>key 4 (OK)</b>.</p> <p>Selecting this option will automatically take you from the menu and return you to the normal display mode. <b>AUTO</b> will be displayed at bottom left of the display.</p> <p>If no other selection has been made, pre-set timer program 1 will be active.</p>
Changing the currently selected room temperature	<p>Set the desired room temperature from the normal display by pressing <b>keys 2 (-)</b> or <b>3 (+)</b> and confirm with <b>key 4 (OK)</b>.</p> <p>During the change the desired temperature will flash, then the display will change back to the standard setting (either desired or current temperature, as required – see Complete Instructions G10).</p> <p><i>If the <b>MAN</b> function is active, the change will be permanently set as the new desired temperature. If the <b>AUTO</b> feature is active, the change will be valid until the next programmed timer switch time. When this time is reached, the programmed temperature will be set as the new desired temperature. The program will then continue to run as normal.</i></p>
Selecting pre-set setting times (programs)	<p>Press <b>key 1</b> to return to the menu. Press <b>key 3 (+)</b> six times until the menu option <b>USER SETTINGS</b> appears.</p> <p>Press <b>key 4 (OK)</b> to select this sub-menu. This will bring up menu option <b>6.1 SELECT PROGRAM</b>. Press <b>key 4</b> to select the menu. Select the desired program (1 to 3) with <b>keys 2 (-)</b> or <b>3 (+)</b> and confirm with <b>key 4 (OK)</b>.</p> <p>Leave the menu by pressing <b>key 1 (←)</b> twice.</p>
Programming your own setting times	<p>See room thermostat complete Instructions 8.4</p>

### 8.3 Short Instructions Installer Settings

Setting the return temperature in the floor circuit	<p>Press <b>key 1</b> to access the menu. Press <b>key 3 (+)</b> seven times until the menu option <b>INSTALLER SETTINGS</b> appears.</p> <p>Press <b>key 4 (OK)</b> to select this sub-menu.</p> <p>The menu option H1 <b>APPLICATION</b> will appear. Press <b>key 3</b> two more times to reach menu option H3 <b>RETURN TEMP LIMITS MIN/MAX</b>. Press <b>key 4 (OK)</b> to select this menu. You will first see the lower temperature limit flashing. The standard setting here is <b>OFF</b>. If desired, you can press <b>keys 2 (-)</b> and <b>3 (+)</b> to set the lower temperature limit, i.e. the lowest return water temperature, within the range 10°C to 35°C. The recommended setting is <b>OFF</b>.</p> <p>Confirm the value displayed by pressing <b>key 4 (OK)</b>. You will automatically go back to the display used for setting the upper return temperature limit. This can be altered within the range 10 °C to 50 °C.</p> <p><i><b>Note:</b> due to the latency of the valve actuator, a higher water temperature may briefly be achieved! To avoid unnecessary temperature spikes in the floor temperature, select the minimum temperature for optimal living comfort. The standard setting is 35 °C.</i></p> <p>Confirm again using <b>key 4 (OK)</b> and leave the menu by pressing <b>key 1 (←)</b> twice.</p>
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## 8.4 Detailed Instructions

### Pre-set Programs

There are 3 pre-set time/temperature programs in the controller. Pre-set **program 1** (as shown below) is the default. Therefore, if pre-set program 1 is the

best program to suit the application, there will be no need to change the time/temperature settings on the device. To select another program see G1 (Program select).

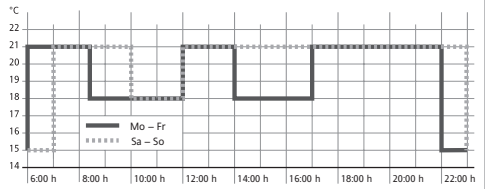
Program 1						
Monday to Friday						
Events	1	2	3	4	5	6
Time	06:00	08:30	12:00	14:00	17:00	22:00
Temperature °C	21.0	18.0	21.0	18.0	21.0	15.0
Saturday and Sunday						
Events	1	2	3	4	5	6
Time	07:00	10:00	12:00	14:00	17:00	23:00/22:00*
Temperature °C	21.0	18.0	21.0	21.0	21.0	15.0

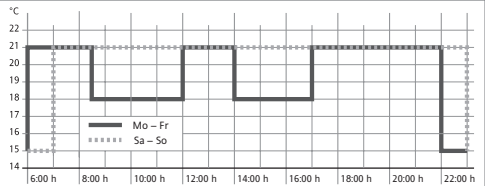
Program 2						
Monday to Friday						
Events	1	2	3	4	5	6
Time	06:00	08:30	12:00	14:00	17:00	22:00
Temperature °C	21.0	18.0	21.0	18.0	21.0	15.0
Saturday and Sunday						
Events	1					2
Time	07:00					23:00/22:00*
Temperature °C	21.0					15.0

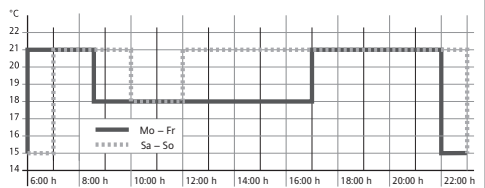
Program 3						
Monday to Friday						
Events	1	2	3	4		
Time	06:00	08:30	17:00	22:00		
Temperature °C	21.0	18.0	21.0	15.0		
Saturday and Sunday						
Events	1	2	3	4		
Time	07:00	10:00	12:00	23:00/22:00*		
Temperature °C	21.0	18.0	21.0	15.0		



\*23:00/22:00 = 23:00 for Saturday



\*23:00/22:00 = 23:00 for Saturday



\*23:00/22:00 = 23:00 for Saturday

### Notes for Programming

- Activated settings terminate automatically 3 min. after the last key press, without saving. They return to the mode which was active before entering the settings, e.g. AUTO, MAN, HOLIDAY, TIMER, AT HOME

- Entering a code: change value with + – key then press OK
- When going through user or installer settings the item number used in the manual will be displayed, e.g. G1 „Program select“
- There may be gaps in the sequence of menu numbers.

### Troubleshooting

1. It is getting warm too late:	a. Are clock and program events set correctly? b. Is the „Optimum Start“ feature switched on? (see H7) Did the controller had enough time (several days) to adapt to the room's characteristics? c. Is an automatic change between Summer and Winter time activated? (see G5)
2. The controller does not accept any changes:	Is access protection switched on? (see G6)
3. The range of temperature setting is limited:	Are temperature limits set (see G7)
4. Temperature display doesn't change:	Is display of set-temperature activated? (see G10)
5. The room heats up too slow:	The return temperature may be limited from the controller's max-limiter (see H3).
6. The room becomes too warm:	The return temperature may be limited from the controller's Min-limiter. (see H3)



## Description of Functions and Operation

How the room temperatur controller can be used.

Change temperature until next switching event	> see <b>keys + - in AUTO</b>
Controlling the temperature according to pre-set profiles	> see <b>main menu, AUTO</b>
Set a constant temperature (manual operation)	> see <b>main menu, MAN</b>
Set temperature for a number of hours	> see <b>main menu, TIMER</b>
Set temperature for a specific date	> see <b>main menu, HOLIDAY</b>
Use a separate program for special days	> see <b>main menu, AT HOME</b>
Adjust the controller to personal needs	> see <b>main menu, USER SETTINGS</b>
Adjust the controller to application needs	> see <b>main menu, INSTALLER SETTINGS</b>

Keys		to confirm / activate
<b>+ - in AUTO (-)</b>	Set temperature temporarily until next switching event. Indicated by „-“ behind <b>AUTO-</b> . First key-press shows set value, following ones change it.	<b>OK</b>
<b>+ - in menu</b>	Scroll through the menu	
<b>OK</b>	Accepts modification / selection	
<b>Info</b>	Show related details in <b>AUTO, MAN, TIMER, HOLIDAY, AT-HOME</b> . To cancel press key again.	
<b>Menu</b>	Enter menus. + - key to move	
<b>←</b>	Go one step back	
<b>← for 10 sec.</b>	Switch off connected load. Display shows <b>OFF</b> . Details see G4	

Main Menu		to confirm / activate
<b>A MENU</b>	Use <b>+ - keys</b> in order to navigate through the menu	
<b>B AUTO</b>	The temperature will be controlled automatically according to the time and temperature of the selected program, see G1. Use <b>+ - keys</b> to change temperature until next switching event.	<b>OK</b>
<b>C MAN</b>	The temperature will be controlled continuously according to the temperature set in this menu. Use <b>+ - key</b> to change temperature.	<b>OK</b>
<b>D TIMER</b>	The temperature will be controlled temporarily according to the hours and temperature set in this menu. On terminating <b>TIMER</b> mode, the previously active mode will be re-activated. <b>HOLIDAY</b> terminates <b>TIMER</b> .	<b>OK</b>
<b>E HOLIDAY</b>	The temperature will be controlled between the dates and the temperature set in this menu. <b>HOLIDAY</b> starts at 0 h of the first day, it ends at 24 h of the last day. In the period of time before <b>HOLIDAY</b> starts, <b>AUTO</b> will be active. While waiting for holiday start date, other mode can be selected ( <b>AUTO, MAN, TIMER, HOME</b> ). <b>INFO</b> provides details of the pending holiday. In this situation holiday period will start automatically when the DATE FROM occurs. When holiday ends it returns to the mode which was in place before activating <b>HOLIDAY</b> .	<b>OK</b>
<b>F AT HOME</b>	The temperature will be controlled automatically according to the time and temperature of the program configured here (independent from <b>AUTO</b> ). The program is the same for all days. Monday's program is used as the pre-set. It needs to be terminated by user, e.g. by selecting <b>AUTO</b> . Usage: for holiday at home, illness etc.	<b>OK</b>
<b>G USER SETTINGS</b>	Customise the controller according to personal requirements	<b>OK</b>
<b>H INSTALLATER SETTINGS</b>	Customise the controller according to application requirements (from installer only)	<b>OK</b>

## Customise the Controller according to Personal Requirements

<b>G</b>	<b>USER SETTINGS</b>	Customise the controller according to personal requirements	default settings ( ) = value range
<b>1</b>	Program select	Select one of the pre-defined programs, see 8.4 (If another program is chosen, settings will not be saved)	P1 (P1 ... P3)
<b>2</b>	Event Setting	Modify Time and Temperature of active program, see 8.4. Each event can be reduced to the previous one or to 00:00 h. Each event can be extended up to 23:50 h, then ->>> is indicating that the event is in the next day. By pressing + or - key at ->>> a time can be adjusted. Max 9 events are possible. The first digit indicates the actual event e.g. 3, 12:00-14:00 shows event 3. Events can be set for day-blocks as well, when selecting days (Mon...Fri, Sat/Sun, Mon...Sun). In order to finish programming, press ← repeatedly.	as selected at G1
<b>3</b>	Clock Settings	Set Date and Time	
<b>4</b>	Off Heating Permanent	Switch off the heater, the controller remains on power. Display reading <b>OFF</b> . Frost protection may happen if selected, see H6. Switching ON again by activating e.g. <b>AUTO</b> or by pressing key ← for 10 sec. When re-activating via key ← or this menu, <b>AUTO</b> will be activated.	NO
<b>5</b>	Summer/Winter time change over	Select if automatic Summer/Winter-Time changeover	YES
<b>6</b>	Key Lock	Protect controller against unauthorised use. Re-activate via code = 93	NO
<b>7</b>	Room temperature limits min/max	Limits the temperature which can be set by the user. If both values are the same, no adjustment is possible. This affects <b>AUTO, MAN, HOL, TIMER, AT-HOME, EVENT SETTING</b> (G2). The active program / mode will not be affected automatically.	5; 30 °C
<b>8</b>	Cost/Hr for Energy	The assumed energy cost per hour (in cent/h) can be set. To use this mode as hour meter set costs/h at 100.	100 (1 ... 999)
<b>9</b>	Energy consumption to date	Shows the approximate energy cost of the controlled area. For the last: 2 days, week (7 days), month (30 days), year (365 days). On the actual day, calculation is up to current time. In case of overflow 9999 will be displayed. This feature mainly can be used for electric heating. Calculation: On-Time of heater x cost per hour see above. Reset see H9	
<b>10</b>	Set temperature to read	Show set temperature instead of room temperature	NO
<b>11</b>	Adjust Temperature	Adjust temperature to personal needs	0.0 (-5.0 ... +5.0)
<b>13</b>	Backlight	Continuously OFF or temporarily illuminates after key press	SHORT (SHORT, OFF)
<b>14</b>	Language	Select preferred operating language	
<b>15</b>	Info	Displays controller-type and -version.	
<b>16</b>	Reset user settings only	Only <b>USER SETTINGS</b> will be set to factory settings. The energy counter will not be re-set; to do this see H9.	NO

## Change Installer Settings

**Caution!** These settings should only be set-up by a qualified person. They can influence safety and the proper functioning of the system.

H	INSTALLATER SETTINGS	Customise the controller according application needs (by installer only)	default settings ( ) = value range
0	Code	Enter Code (= 7) in order to access the menus. It is valid for 1 hour.	
1	Application	Room temperature controller with limiting the return temperature for Simplex Regulation Boxes	regulation box surface heating refer to 1
3	Return temp limits min/max	Limits the return temperature. Selectable is: <b>Minimum return temperature (lower limit):</b> The valve is opened when the selected water temperature falls below and closes automatically when it reaches the programmed temperature limit (constant floor tempering). OFF = no limit <b>Maximum return temperature (upper limit):</b> The valve is closed when the selected return temperature is reached and opens automatically when it falls below the programmed temperature limit. e.g. Min. temp. = 21 °C, the heating water does not sink below 21 °C even if the room is too warm. Max. temp. = 35 °C, the heating water does not rise above 35 °C, even if the room is too cold. If the lower limit is not needed it should be set to OFF.	OFF (OFF, 10...Tmax)  35 °C (Tmin...50)
5	Valve protection	The output will be activated for the specified time each day at 10:00 h in the morning	3 min (OFF, 1 ... 10)
6	Frost protection	Set frost protection temperature. Only if controller is switched OFF, the temperature will be controlled to that value, see G4	5 °C (OFF, 5 ... 30)
7	Optimum start	The set temperature will be reached at the time specified in the program. During pre-heating time, <b>AUTO_</b> will be displayed.	YES
8	Valves NO	If valves normally open have to be used	NO
9	Energy counter reset	The energy counter will be set to 0	NO
10	Display of return temperature	The temperature measured from remote sensor will be displayed (for service purpose)	Temperature
11	Reset all	All <b>INSTALLER</b> and <b>USER SETTINGS</b> will be set to its Factory setting	NO

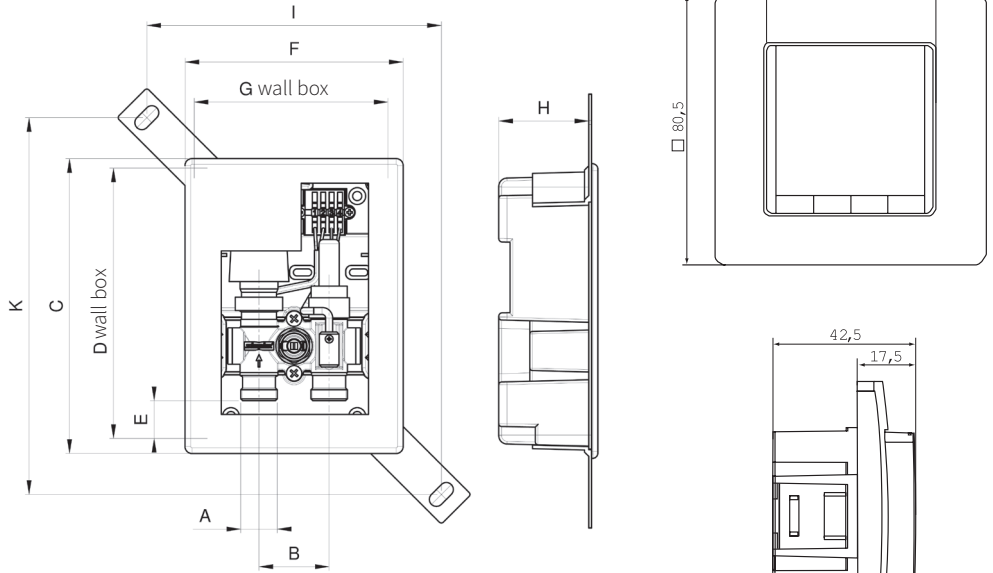
## Error Indication

In case of errors, «Err» is blinking. The following errors can be displayed:

CONFIGURATION	Display- and powermodule do not fit → use only suitable parts → switch off and on power supply
COMMUNIKATION	Communication between display- and power unit fails → unplug and re-plug display unit → switch off and on power supply
EXT SENSOR	1. Error of remote sensor → Let a professional electrician check the wiring (terminal block of regulation box). → replace sensor 2. Over- or under run of valid display range

On all these errors, heating will be activated with 30 % of time.

## Dimensional Drawing

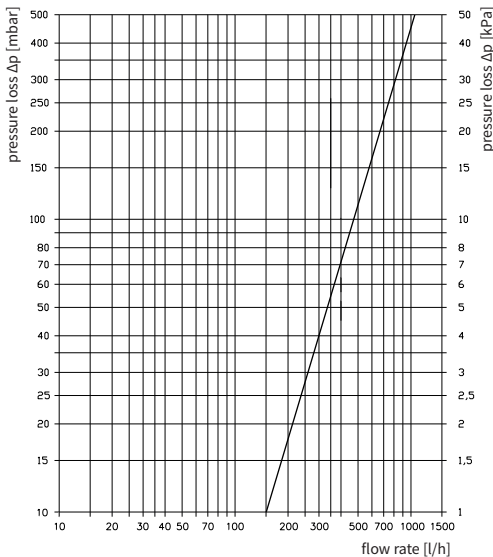


A	B	C	D	E	F	G	H	I	K
G 3/4 a	50	211	197	27	156	138	64	210	270

(Data in mm)

## Pressure Loss Diagram

completely open; kvs value [m<sup>3</sup>/h]: 1.48



## Table of Resistance for Remote Temperature Sensor

Temperature	Resistance	Temperature	Resistance
10 °C	66.8 kΩ	30 °C	26.3 kΩ
20 °C	41.3 kΩ	40 °C	17.0 kΩ
25 °C	33 kΩ	50 °C	11.3 kΩ

## Batteries



In compliance with the EU Directive 2006/66/EC, the button cell battery located on the printed circuit board inside this product, can be removed at the end of the product life, by professional personnel only.

The illustrations are symbolic and may differ from the respective product. Errors and technical changes reserved.

02/2019