TEF234 – Electronic room thermostat with display 230V & 24V

COMAP proposes a new control system for heating and cooling underfloor. Consisting of a 6 or 10-channels controller (MCF234), analogic (TAF234) or electronic (TEF234) room thermostats and thermal actuators (TE24) to control the various circuits, it enables optimum temperature control, by area or room.

Item code	Description
C411014001	Electronic room thermostat, heating, 230V - Biofloor
C411015001	Electronic room thermostat, heating, 24V - Biofloor
C411016001	Electronic room thermostat, heating&cooling, 230V - Biofloor
C411017001	Electronic room thermostat, heating&cooling, 24V - Biofloor

Application

For individual unitary control (2-point) in residential and business spaces with Triac output for up to 6 thermal actuators. The room thermostat can be used as a standalone product or together with the MCF234 electric distributor for Biofloor underfloor heating systems.

Description

- Electronic room thermostat for 24 V or 230 V for heating or heating/cooling with display.
- Clear LCD with backlight on TRA 421.
- Silent-switching Triac output (24 V types).
- Easy to wire up.
- NTC sensor.
- Time schedule and pilot clock output integrated in heating & cooling version.
- Optimized time schedule for comfort control and energy saving
- Input for lowering the room temperature
- Input for heating/cooling change over.
- Input for external temperature sensor.
- Cooling lock function on versions for heating/cooling
- Integrated “NC” and “NO” change over.
- Modern design with ergonomic setpoint adjuster
- Restriction of temperature setting range.
- Automatic frost protection facility at 5 °C and valve protection facility.

Technical features

- Housing: Thermoplastic PC+ABS - Lower section: Signal white (RAL9003)
- Cover: White (RAL 9016)
- Fitting: Wall, recessed junction box.
- Weight: 130g and 140g for heating/cooling model.

	24V	230V
Power supply	24V ±20% - 50 Hz	230V ±10% - 50 Hz
Power consumption	<0,3W in idle slate	
Setting range	5...30 °C	
Switching difference	±0,2 K	
Decrease	2K or adjustable for heating/cooling model	
Ambient temperature	0...50 °C	
Ambient humidity	5…80 % HR sans condensation	
Fuse	T1A	T1AH
Outputs		
Number of actuators	4 max. in parallel	5 max. in parallel
Switching element	Triac	Relais
Switch rating	1A	1 A (0,8 A inductive)
Pilot timer (H/C version)	100mA	100mA
Inpouts		
ECO	voltage detection 24V	voltage detection 230V
Heating/cooling	voltage detection 24V	voltage detection 230V
Remote sensor (H/C version)	NTC 22kΩ	
Protection IP	IP 20 (EN 60529)	
Protection class	III (EN 60730)	II (EN 60730)
CE conformity according to EMC Directive 2004/108/EC	EN 61000-6-1, EN 61000-6-3	
Low-voltage directive 2006/95/EC	EN60730-1, EN60730-2-9	
Connection terminals	Screw terminals 0,22 à 1,5 mm²	
Connection cable	Rigid : NYM-J/NYM-O (max. 5 x 1,5 mm²) Flexible : H03V2V2H2-F / H05V2V2H2-F	

Description of operation

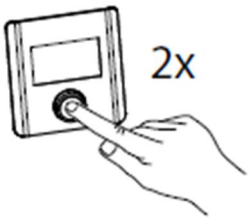
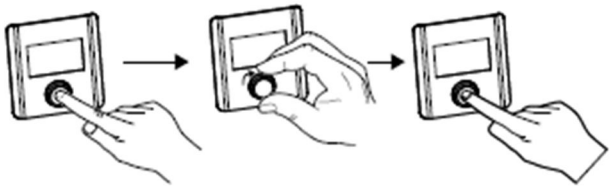
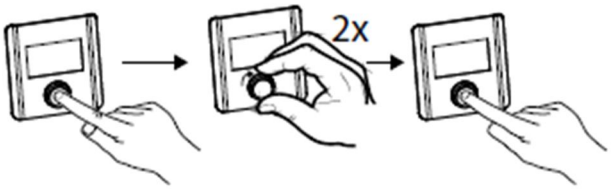
	Heating only C411014001 C411015001	Heating and cooling C411016001 C411017001
Heating	√	√
Heating / Cooling		√
Permanent set-back – ECO mode	√	
Adjustable set-back – ECO mode		√
Normal operating modes – reduced – OFF	√	√
Time schedule integrated and adjustable		√
Optimized time programme		√
Set-back input	√	
Change-over input		√
Pilot clock output (set-back)		√
Selection of heating system: Floor – radiator – convector		√
Setpoint for temperature restriction	√	√
10-hour backup power supply		√
Selection of NC or NO		√
Valve protection function	√	√
Frost protection function	√	√
LCD with backlight		√
Connection for floor sensor		√

Main operation

For intelligent unitary control (2-point) in residential and business spaces.

- With relay output at 230 V: Up to 5 thermal actuators.
- With Triac outputs at 24 V: Up to 4 thermal actuators.
- The room temperature is measured by a temperature sensor and compared with the current setpoint. Depending on the control offset, the heating in the room is increased or reduced.
- If there is a heat requirement, the thermal actuator is activated. Room temperature adjustments, control and operation are performed using the rotary knob/button.
- The required symbols are indicated in the large display.
    - The thermal actuator output is also indicated.
    - The symbol for heating or cooling flashes slowly when an output is active.

The following table shows how to adjust basic settings using the setting knob.

	Adjust setpoint
	Change operating mode
	Set functions and values
	Parameters for technicians

Description of operation: TEF234 heating

- The room thermostatTEF234, which is suitable for heating, features proportional-integral control.
- The setpoint temperature can be adjusted by turning the button.
  - This value is either accepted automatically after 5 seconds or by pressing the button.
  - The operating modes or settings can be displayed using two menu structures and then adjusted using the pushable rotary knob.

Operating modes

- The operating mode can be set by pressing the knob twice.
- The following options can be selected by turning the rotary knob to the left or right:

	*Normal operation*
	*ECO*
	*Eco In/ Auto*
	*Locking*
	*Switch-off*
BACK	*Back*

Note

The operating mode currently set is not visible. If, for example, normal operation is active, only ECO mode and the operating mode ECO-In/Auto is shown.

"Normal" or "ECO" operating modes

If ECO operating mode is selected, ECO can be operated either using the pre-set and reduced temperature of 2 °C or via the external input with a timer.
The room thermostat detects a voltage supplied by the electrical distributor, external timer or pilot signal from the TEF234.
If the input is active, the room thermostat automatically switches to ECO mode.
As soon as the room thermostat is inactive, it switches to normal operation.

Locking the operating knob

The "turn and push" operating knob can be locked.
Press the button for 5 seconds to unlock.

Switching off the thermostat

The room thermostat can be switched off.
Temperature control is deactivated and the output is dormant.
The valve protection facility and the frost protection facility remain active at 5 °C, however.

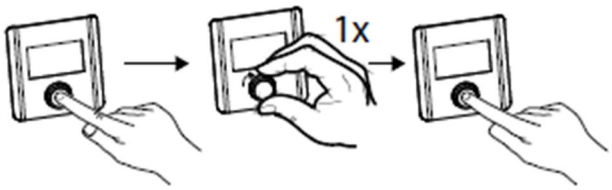
Valve protection facility

The valve protection function is activated at 14-day intervals for 10 minutes if no temperature regulation has taken place (output open). The actuator is activated and opens the valve.

Frost protection facility
The integrated frost protection facility is permanently set to 5 °C. This function prevents pipes from freezing when regulation is inactive.

Back
Returns to the basic level or one level back.

Settings
The settings can be selected as follows:



The following options are available:

MIN	Min. limitation
MAX	Max. limitation
CAL °C	Actual value correction
BACK	Back

Setpoint limitation
A minimum and maximum setpoint limit can be set.

Actual value correction
The influence of the wall temperature can be compensated by ±2 °C. The compensated temperature is the temperature indicated in the display.

Back
Returns to the basic level or one level back.

Description of operation: TEF234 heating/cooling version

- The TEF234 room thermostat is suitable for heating and cooling and offers different pre-set PI controls.
- Quasi 2-point control can be parametrized for systems with fast response times, such as fan coil units.
- The setpoint temperature can be adjusted by turning the button. This value is either accepted automatically after 5 seconds or by pressing the button.
- The operating modes or settings can be displayed using three menu structures and then adjusted using the pushable rotary knob.

Operating modes

The operating mode can be set by pressing the knob twice.
The following options can be selected by turning the rotary knob to the left or right:

	*Normal operation*
	*ECO*
	*Eco In/ Auto*
	*Unoccupied*
	*Locking*
	*Switch-off*
BACK	*Back*

Note

The operating mode currently set is not visible. If, for example, normal operation is active, only ECO mode and the operating mode ECO-In/Auto is shown.

“Normal” or “ECO” operating modes

If ECO operating mode is selected, ECO can be operated either using the adjustable reduced temperatures or via the internal time programme.
The preset temperature for normal operation (21 °C) or reduced operation (19 °C) is automatically accepted by manual change-over of the operating mode or when switching using the time programme.
These values can be defined in the “Settings” menu.
The pilot clock output is always active in accordance with the time programme and independently of the operating mode.

Entering unoccupied periods

The number of days the building will be unoccupied can be defined by turning. You can set a maximum of 99 days.
The temperature controller switches to the set reduced temperature of 16 °C.
The reduced temperature can be changed or it automatically switches back to the preset temperature once the set number of days has elapsed.
The function can be deactivated by setting the number of days to 0. See Settings for information on presetting the value.

Locking the operating knob and the public authority version

The “turn and push” operating knob can be locked. Press the button for 5 seconds to unlock.
On the public authority version, the locking mechanism can be secured with an access code.
For more information, see the parameter Par-030.

Switching off the thermostat

The room thermostat can be switched off. Temperature control is deactivated and the output is dormant.
The valve protection facility and the frost protection facility remain active at 5 °C, however.

Valve protection facility

The valve protection function is activated at 14-day intervals for 10 minutes if no temperature regulation has taken place (output open). The actuator is activated and opens the valve.
The valve protection facility is also active for the Normally open direction of operation.

Frost protection facility

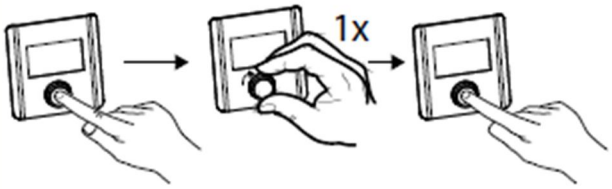
The integrated frost protection facility controls in accordance with the set frost protection value and nprevents pipes from freezing during periods with no regulation.

Back

Returns to the basic level or one level back.

Settings

The settings can be selected as follows:



The following options are available:

	Heating°C Normal operation
	Heating °C ECO
	Cooling°C Normal operation
	Cooling°C ECO
	Unoccupied
MIN MAX	Min./max. Limitation
CLo	Clock/day
Pro	Time programme
CAL °C	Actual value correction
LEd	Lighting
USEr	Factory setting
BACK	Back

Temperature specifications in normal operation – Heating or Cooling

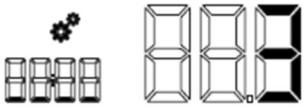
The factory temperature setting is 21 °C. The advantage of this function is that the value is applied again when the operating mode is changed or when a switch is made using the switching programme.

Temperature specifications in ECO mode – Heating or Cooling

The factory temperature setting is 19 °C or 23°C. The advantage of this function is that the value is applied again when the operating mode is changed or when a switch is made using the switching programme.

Temperature specifications for the floor sensor

If a floor sensor is connected and activated in parameter 040, the following symbol is displayed next:



The factory setting is 3 which correspond to approx. 22 °C. It is possible to change this:

°C	18	19	20	21	22	23	24	25	26	27	28
	1		2		3		4		5		6

When serving as a floor sensor, a comfortable floor temperature is controlled. As soon as this comfort temperature has been reached, the internal sensor continues to control the room.

Temperature specifications in unoccupied mode

The temperature for this mode can be adjusted between 5 °C and 20 °C. The factory setting is 16 °C.

Setpoint limitation

A minimum and maximum setpoint limit can be set.

Time and weekday

The time and weekday must be entered for the time programme.
When restarting or once the 10-hour backup power supply has run out, this setting must be renewed.

Time programme

An individual temperature profile for each day provides the ideal comfort level with the minimum energy consumption.
4 time programmes for any day are available in the room thermostat.
The settings can be made during the week (Monday to Sunday), on a working day and on the weekend or every day.
Two time programmes are preset for the week: Normal operation from 6 am to 10 am and from 3 pm to 10 pm.
A set-back mode is activated for the hours in between. Additional time programmes can be programmed for temperature requirements that differ from these.
The room controller includes a pilot clock output and is always active in accordance with the time programme and independently of the operating mode.
This output can be used to switch further room thermostats to set-back mode, such as using an MCF234 control distributor, for example.

Actual value correction

The influence of the wall temperature can be compensated by ±2 °C.
The compensated temperature is the temperature indicated in the display.

Setting the backlight

The backlight of the display can be switched on and off.

Resetting to factory settings

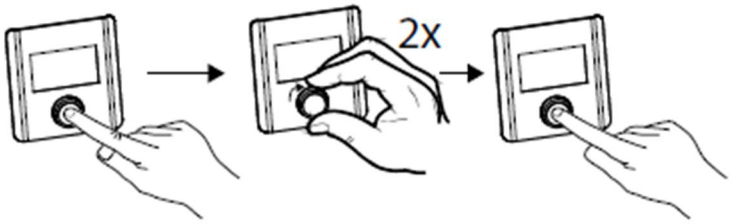
All settings and changed access codes can be reset to factory settings.
The button must be pressed for 5 seconds in order to confirm the reset.
The room thermostat is restarted after the reset. The time and weekdays have to be re-entered.

Back

Returns to the basic level or one level back.

Parameters

To set the parameters, please proceed as follows:



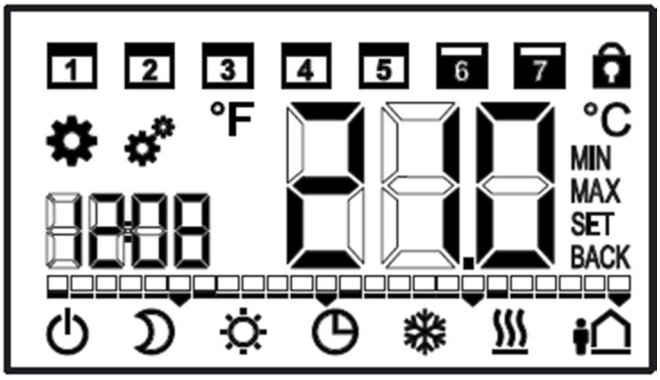
The corresponding settings are shown in the manual.

Parameter	Description
Par-010	Preset control algorithms for the following applications: • Standard underfloor heating – PWM control • Low-energy underfloor heating – PWM control • Radiator – PWM control • Passive convector (slow warm-up period) – PWM control • Fan coil units – PI quasi 2-point control
Par-020	Activating/deactivating cooling lock • The cooling lock prevents the controlled room from cooling down. • When the cooling lock is activated and the operating mode is set to cooling, the heating mode is also inactive.
Par-030	Locking the operation with a code or public authority version. • Locking must also be activated in the operating mode menu. These settings cannot be changed. • The locking code is requested when the button is pressed for 5 seconds.
Par-031	• Codes for locking operation can be adjusted to between 0000 and 9999.
Par-040	Activating an external sensor • Instead of an internal sensor, an external sensor can also be connected. • When using as an external room sensor, the internal sensor of the room thermostat is deactivated. • Setting the setpoint temperature of the external sensor in the "Settings" menu.
Par-041	Setting for correcting the floor temperature • Any different measurement of the actual floor temperature can be corrected. • Setting range -2 °C to +2 °C
Par-050	Adjusting the time period for which the display is illuminated. Determines the time period for which the display is illuminated after operation. • The setting range is from 0 to 30 seconds in 5-second steps.
Par-090	Displaying the output signal status on the thermal actuator. • When the output for thermal actuators is active, the heating or cooling symbol flashes slowly. • If this output is inactive, the symbol is displayed continuously.

Par-110	Setting the direction of operation of the room controller (NC – normally closed, or NO – normally open). Factory setting: NC, normally closed. • The direction of operation of the room controller and, in turn, the output for thermal actuators is reversed. • Thermal actuators (NO) must be used to do so. • When using this function together with the MCF234 control distributor the direction of operation must also be set to NO on the control distributor.
Par-161	Setting the frost-protection temperature. • Automatically activates the frost-protection facility when the temperature goes below the set temperature of 5 °C. • The limit value can be set to between 5 °C and 10 °C.
Par-170	Activate the “optimized time programme”. • If the “optimized time programme” function is activated (factory setting), the setpoint is reached at the defined time. • In order to reach the setpoint, heating or cooling mode is initiated in good time ahead of the defined time. • In order to save energy, the time needed to reach the temperature for reduced operation in good time is calculated.
Par-190	Setting the cycle time for the valve protection facility • The cycle time for the valve protection function can be set. • This function prevents the valve cone from sticking inside the valve. • If the function is set to 0 days, the function is deactivated. • The factory setting is every 14 days independently of the condition of the output during this period.
Par-191	Defining the actuation duration while the valve protection facility is active. • The actuation time can be optimized depending on the running time of the thermal actuator. • The factory setting is 5 minutes.
Par-420	Service code 1234 is used to adjust the service menu. • In order to avoid unwanted access to the service parameters, we recommend that the service code be changed by the installer and documented in a safe location. • The service code can be reset. See the Settings for “Resetting to factory settings”.

Display

An LCD is used, dimensions 58 x 34 mm



7	Weekday	SET	Confirm
	Unlocking	BACK	Level back
	Operating mode		Switching times
	Setting/parameter		Switch-off
°F	Fahrenheit		ECO reduction
	Actual value and setpoint		Normal operation
°C	Celsius		Time programme
MIN	Minimum setpoint limit		Cooling
MAX	Maximum setpoint limit		Heating
			Unoccupied

Backup power supply

Once the backup power supply has run out (approx. 10 hours), the settings are not lost.

Only the time and weekday have to be re-entered.

Switching output display

Whether the switching output is active and the thermal actuator is being controlled is indicated on the display.
If the output is active, the “Heating” or “Cooling” symbol flashes slowly.
The switching output display can be activated or deactivated from the “Parameters” menu.

Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the “Description of operation” section.
All related product regulations must also be adhered to. Changing or converting the product is not admissible.

Engineering and fitting notes

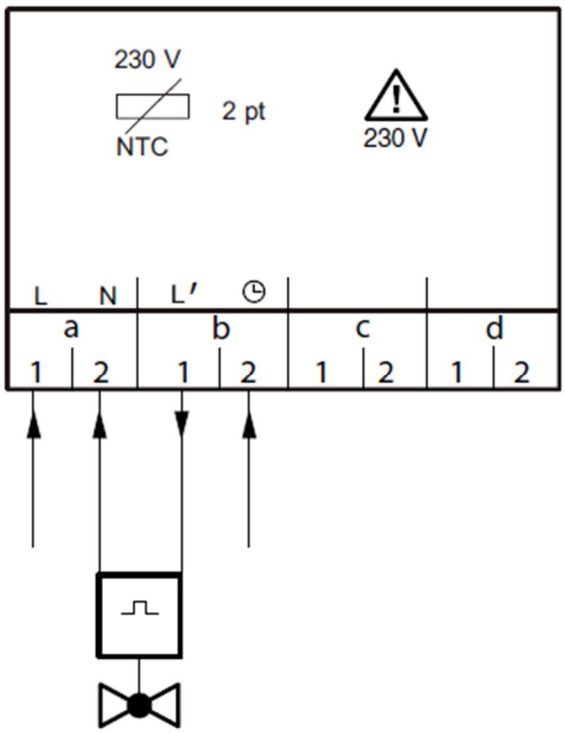
Place of installation approx. 1.5 m above the floor on an interior wall. The location must be protected from direct sunlight and other heat sources, e.g. televisions, lamps or radiators, and also from draughts.

Disposal

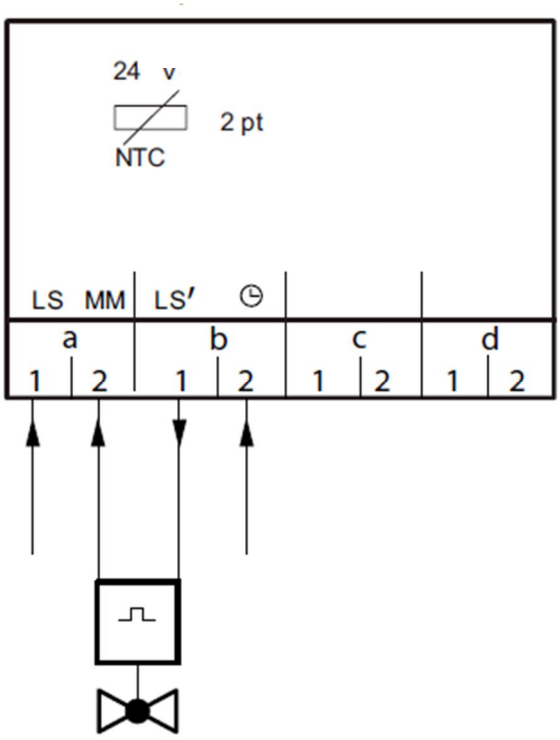
When disposing of the product, observe the currently applicable local laws.

Connection diagram

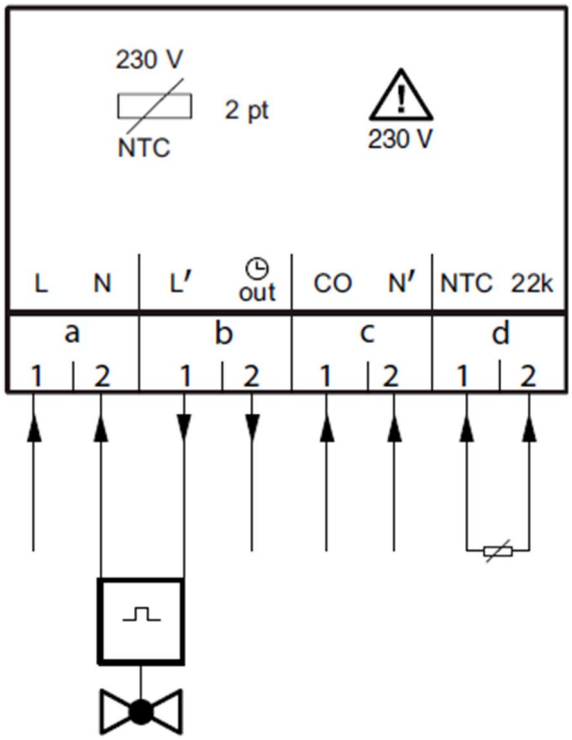
230V – C411014001



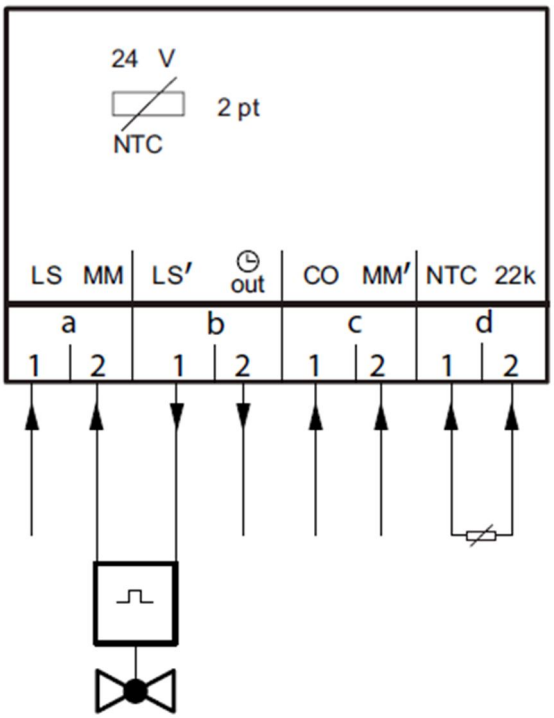
24V – C411015001



230V – C411016001

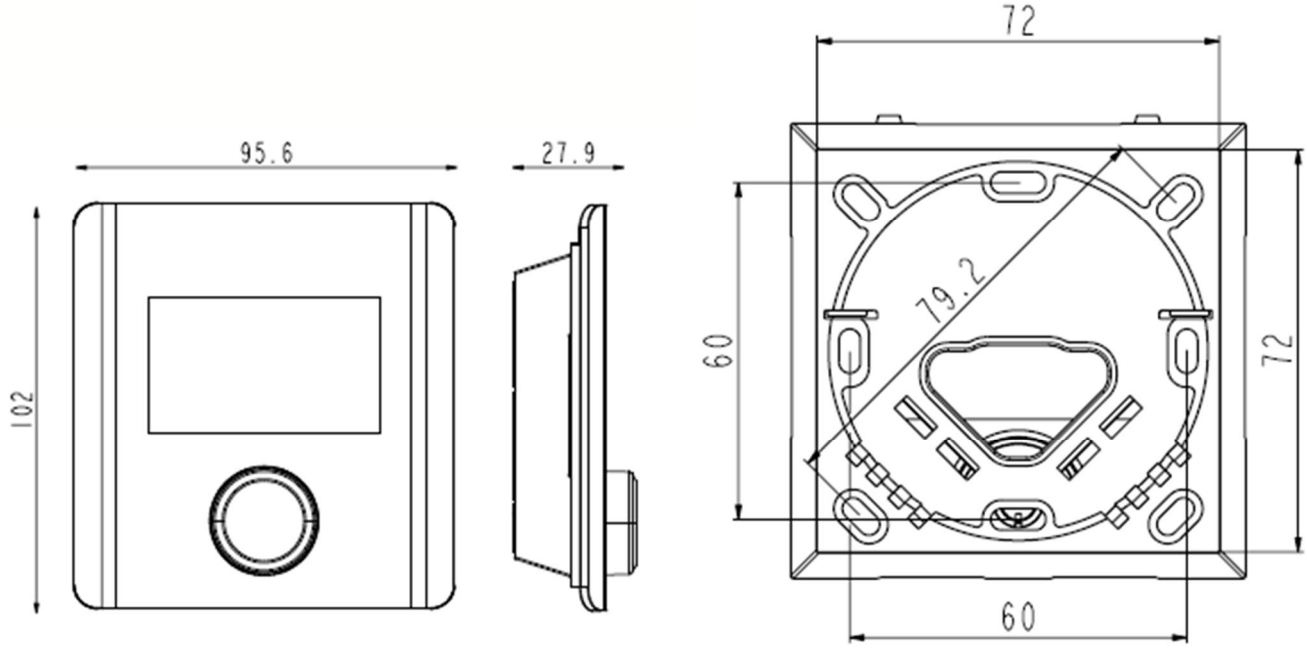


24V – C411017001



Dimension drawing

Electronic room thermostat - TEF 234



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