

Technical manual

ECC room thermostat

TRA 410, TRA 421




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Safety instructions

1 Safety instructions

-  Please follow the information in the operating instructions.
Failure to observe these instructions can cause functional impairments or even damage the device.
-  Failure to observe the instructions:
SAUTER will not accept any liability for damage caused by the failure to observe these instructions.
-  The device may only be opened by authorised, qualified personnel when it is disconnected from the power supply.
Only use the device when it is in a technically perfect condition.
Adhere to the ambient conditions specified in the fitting instructions.

1.1 Meaning of the safety instructions

-  **Compulsory note**
A compulsory note contains important information that must be observed. Non-adherence can have serious consequences.
-  **General note**
A general note contains information that helps you to better understand the topic described.
-  **Reference note**
This note contains a reference to an external website.
-  **Reference note**
This note contains a reference to one or more documents with further information on this product.

2 General information

2.1 Introduction

These operating instructions provide important information about handling the electronic room thermostat. To allow safe working, all the specified safety information and operating instructions must be adhered to.

The operating instructions must be read carefully before starting any work. They are a part of the product and the company operating the system must keep them where they can be accessed at all times.

2.2 Liability limitation

All of the data and information in these instructions has been assembled based on the applicable standards and directives, the current state of the technology and our many years of know how and experience.

The manufacturer will accept no liability for damage resulting from:

- Failure to observe the safety instructions
- Failure to observe the operating instructions
- Improper usage
- Use of untrained staff
- Unauthorised modifications
- Technical changes

In all other cases, the obligations agreed to in the supply contract apply, as well as the General Standard Terms and Conditions and delivery conditions of the manufacturer, and the statutory regulations in force at the time the contract was signed.

2.3 Intended use

The room thermostat controls, directly or via a control distributor, the connected thermal actuators for unit valves in a unitary control system. Depending on the model, it is suitable for 24 V or 230 V components.

Depending on the model, the device is suitable for

- fixed installation
- recording the actual temperature (room temperature)
- setting the setpoint temperature
- controlling the actual temperature by activating positioning actuators in heating or heating/cooling mode in an assigned area
- connecting an external sensor

All other uses, changes and modifications are expressly forbidden and lead to risks for which SAUTER is not liable.

Setting the setpoint temperature

3 Setting the setpoint temperature

The setpoint temperature is set by turning the rotary knob to the left or the right.

1. Turn the rotary knob to the LEFT.

➡ The temperature is decreased.

Or

1. Turn the rotary knob to the RIGHT.

➡ The temperature is increased.



Fig.1 Front view of TRT 410, 421

4 Functions – settings – parameterisation

The functions, settings and parameterisation of the room-temperature controller are called up using the rotary knob/push button.

- You press the rotary knob to call up menus, activate or deactivate functions, apply settings and change parameters.
- You turn the rotary knob to enter settings and select menus and functions.

The basic level and various menus are provided for simple operation and settings:

	<p>Standard display In the standard display, all room-temperature controllers show the current actual temperature and the active functions. The TRA421 also has a clock function.</p>
	<p>Operating modes Contains all important basic functions and operating modes.</p>
	<p>Settings Contains advanced functions and many setting options.</p>
	<p>Parameters Contains various password-protected system parameters. The optimum balance of the overall system is attained via the corresponding settings.</p>

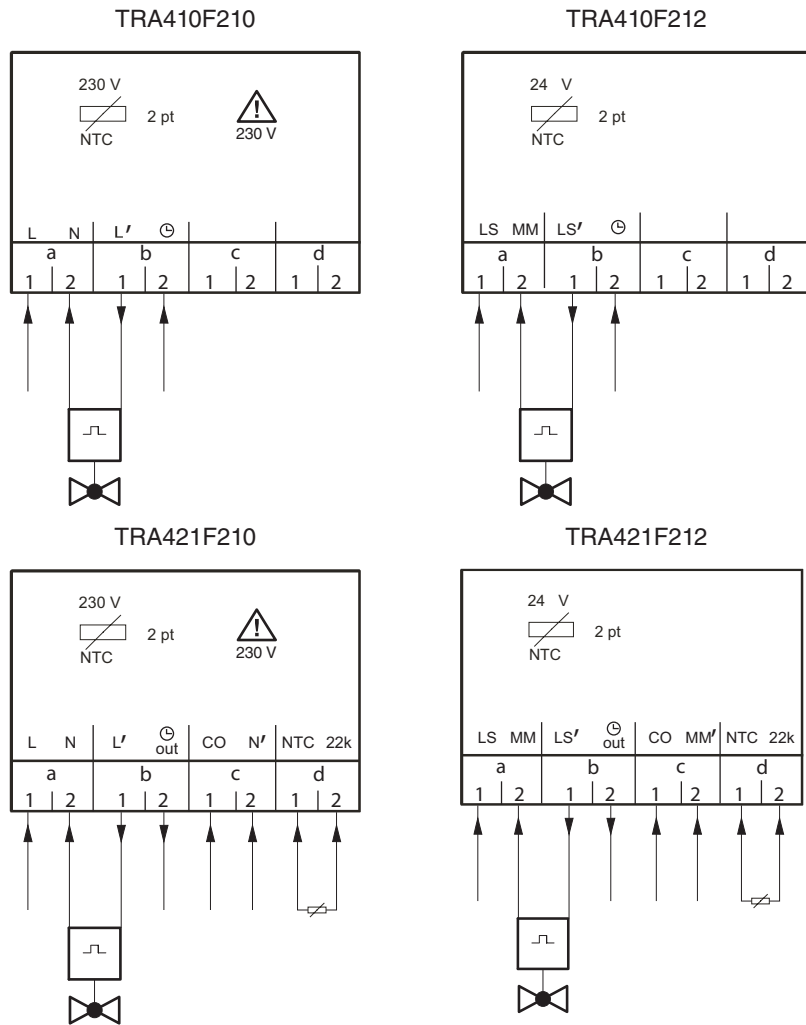
Description of operation

The following table shows basic operation of the setting knob.

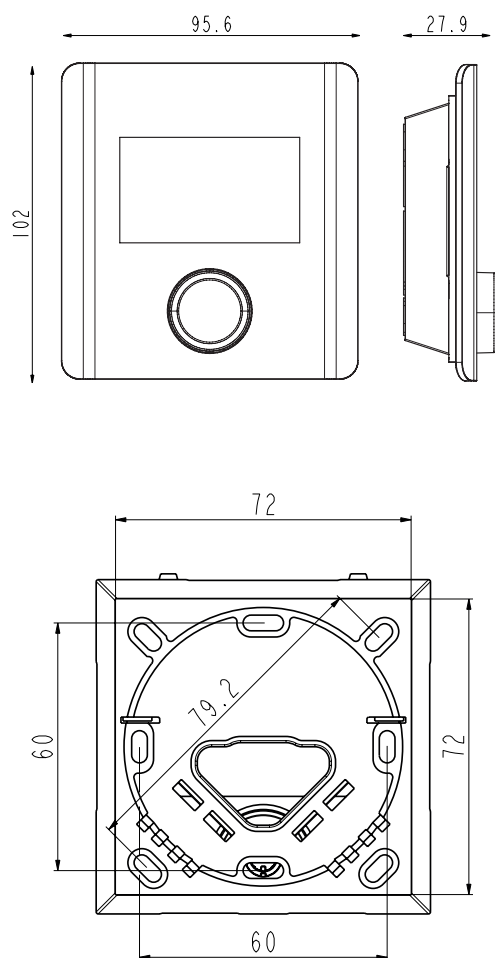
	<p>Adjust setpoint</p>
	<p>Change operating mode</p>
	<p>Set functions and values</p>
	<p>Parameters for technicians</p>

Connection diagrams

5 Connection diagrams



6 Dimension drawing

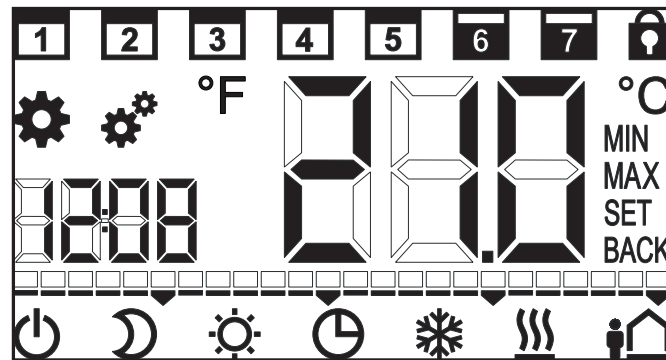


Overview of display

7 Overview of display

















- ① Display
- ② Rotary knob with turning and pressing mechanism



TRA 410	TRA 421	Symbol	Description
✓	✓		Operating modes
✓	✓		Settings
	✓		Parameters
✓	✓		Heating
	✓		Cooling
✓	✓		Normal mode

Overview of display

TRA 410	TRA 421	Symbol	Description
✓	✓		Reduced mode
✓	✓		Out of operation
✓	✓		ECO time programme, internal or external
	✓		Unoccupied
	✓		Time
	✓		Time scale for time programme; one unit = one hour
✓	✓		Current temperature, setpoint temperature
✓	✓		Correction of effect of wall temperature
✓	✓		° Celsius temperature unit
	✓		° Fahrenheit temperature unit
✓	✓	MIN	Minimum limitation of the setpoint temperature
✓	✓	MAX	Maximum limitation of the setpoint temperature
	✓	SET	Confirm entry
✓	✓	BACK	Back
	✓		Working days
	✓		Weekend
✓	✓		Operation locked
	✓		Strength of display backlight

Description of operation

TRA 410	TRA 421	Symbol	Description
	✓		Reset to factory settings
	✓		Time and day programme
	✓		“Setting” time programme
	✓		Setting for min. floor temperature


8 Description of operation








TRA 410	TRA 421	Symbol	Procedure
✓	✓		Press to call up the menu. Press to change to operating modes.
✓	✓		Press to call up the menu. Turn to go to “Settings” Press to change settings.
	✓		Press to call up the menu. Turn to go to “Parameters” Press to change parameters.

8.1 Description of the operating modes






TRA 410	TRA 421	Symbol	Procedure
✓	✓		Press to confirm the selection. TRA 410: Regulate to the defined setpoint temperature TRA 421: Regulate to the preset setpoint temperature in the “Settings” menu
✓	✓		Press to confirm the selection. Note: Decrease via the room thermostat or an external signal or time programme. Both cannot be activated. TRA 410: Decrease of 2 °C. Note: When the decrease is selected, the Decrease input is deactivated. TRA 421: Regulate to the preset reduced temperature in the “Settings” menu. Note: When the decrease is selected, the time programme for the decrease is deactivated.
✓	✓		Switches off the room thermostat. The temperature control is deactivated. Switch on by pressing the rotary knob for 5 seconds. Active functions are displayed. The last active function is applied. Note for TRA 421: The valve and frost protection remain active. The Pilot clock output remains active; switching signals are forwarded.
	✓		Press to confirm the selection. Set the number of days of absence by turning and confirm the entry. The maximum number is 99 days. The function is deactivated when the number of days is set to 0 or the setpoint temperature is adjusted.

Description of operation










TRA 410	TRA 421	Symbol	Procedure
✓	✓		Press to confirm the selection. The operation is locked. The standard display is shown. Press the button for 5 seconds to unlock the operation. A security code for the locking can be entered for TRA 421 - see parameters 030 and 031.
✓	✓	BACK	Press to confirm the selection. The menu is closed. Note: Returns to the basic level if no setting is made for 30 seconds.

TRA 410	TRA 421	Symbol	Procedure
	✓		Set the comfort temperature in the normal heating mode. Factory setting: 21 °C Press to confirm the selection. Turn to set the setpoint temperature that you want. Press to confirm the entry.
	✓		Set the setback temperature in the "Heating" ECO mode. Factory setting: 19 °C Press to confirm the selection. Turn to set the setpoint temperature that you want. Press to confirm the entry.
	✓		Set the comfort temperature in the normal cooling mode. Factory setting: 21 °C Press to confirm the selection. Turn to set the setpoint temperature that you want. Press to confirm the entry.
	✓		Set the setback temperature in the "Cooling" ECO mode. Factory setting: 23 °C Press to confirm the selection. Turn to set the setpoint temperature that you want. Press to confirm the entry.
	✓		Set the min. floor temperature when a sensor is connected and parameterised (parameter 040). Factory setting: 3.0 = approx. 22 °C Press to confirm the selection. Turn to set to a value between 1 and 6. 1.0 = 18 °C and 6.0 = 28 °C. Press to confirm the entry. Note: This setting option is only displayed if the parameter for the floor sensor P040 is activated. This is a comfort temperature. As soon as the floor temperature has been reached, the internal sensor takes over controlling the room.
	✓		Set the temperature for the absence function. Factory setting: 16 °C Press to confirm the selection. Turn to set the temperature that you want. Press to confirm the entry.
✓	✓	MIN MAX	Set the minimum and maximum temperature limit. Factory setting: Min. 5 °C and max. 30 °C Press to confirm the selection. Turn to set the minimum/maximum temperature. Press to confirm the entry.
	✓		Set the time and the weekdays. Turn to set the hours, minutes and day. Press to confirm each entry. In the case of a power failure, the time and weekday settings are stored for approx. 10 hours.


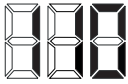
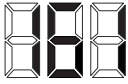





Description of operation

TRA 410	TRA 421	Symbol	Procedure										
	✓	Pr o	<p>Set the time programmes. Factory setting for weekly programme: Programme 1: 06h00 to 08h00 comfort mode Programme 2: 15h00 to 22h00 comfort mode Note: The thin bar at the bottom shows the time scale in hours. The six boxes stand for 6 hours  The thick bar at the top shows the comfort mode in hours .</p> <p>Press to confirm the selection. "Day" is shown in the display , with the weekdays flashing.</p> <p>Turn the button to select the weekdays (Mon-Sun), working days (Mon-Fri), weekend (Sat-Sun) or individual days. Press to confirm.</p> <p>P1 appears in the display . Four time programmes (P1 to P4) are available. Confirm the time programme that you want. Turn the button to select the starting point. Press to confirm. Turn the button to select the finishing point. Press to confirm. Turn to the right to call up the next time programme. Turn to the left (BACK) to leave the time programme.</p>										
✓	✓	CAL	<p>Correction of effect of wall temperature. Factory setting: 0 °C</p> <p>Press to confirm the selection. Turn to set the correction that you want (steps of 0.1 °C). The effect of the wall temperature can be corrected by ±2 °C.</p> <p>Press to confirm the entry.</p>										
	✓	LEd	<p>Set the backlight of the display. Factory setting: 50 Press to confirm the selection. Turn to change or switch off the backlight:</p> <table style="margin-left: 20px;"> <tr> <td>0</td> <td>= off</td> </tr> <tr> <td>25</td> <td>= level 1</td> </tr> <tr> <td>50</td> <td>= level 2</td> </tr> <tr> <td>75</td> <td>= level 3</td> </tr> <tr> <td>100</td> <td>= level 4</td> </tr> </table> <p>Press to confirm the entry.</p>	0	= off	25	= level 1	50	= level 2	75	= level 3	100	= level 4
0	= off												
25	= level 1												
50	= level 2												
75	= level 3												
100	= level 4												
	✓		<p>Reset to factory settings. Press to confirm the selection. Turn to set to "YES" Press the rotary knob for 5 seconds.</p> <p>A restart is performed: all of the settings made are reset to the factory settings. The time and the weekdays have to be set again.</p>										
✓	✓	BACK	<p>Press to confirm the selection. The menu is closed. Note: Returns to the basic level if no setting is made for 30 seconds.</p>										

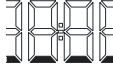


8.2 Description of parameters for TRA 421

Symbol	Procedure
	<p>Changing parameters: Select the "Parameters" menu by pressing and turning twice to the right. The "Code" symbol flashes. Press to confirm the selection. Enter the four-digit service code by turning and pressing. Factory setting: 1234 Press to confirm the entry.</p> <p> symbol is displayed. Press to confirm the entry. The individual digits of the parameter number are entered by turning and pressing. Press to confirm the entry.</p>
	<p>Preset control algorithms for the following applications: Factory setting: 0 0 = standard underfloor heating 1 = low-energy underfloor heating 2 = radiator 3 = passive convector (slow warm-up period) 4 = fan convector (fast warm-up period)</p>
	<p>Activating/deactivating cooling lock Factory setting: 0 0 = deactivated 1 = activated Note: When the cooling lock is activated and the operating mode is set to cooling, the heating mode is also inactive.</p>
	<p>Protects the locking of the operation with a code: Factory setting: 0 0 = deactivated 1 = activated Note: The locking must be activated in the "Operating modes" menu.</p>
	<p>Change the code for locking operation. Factory setting: 0000</p>
	<p>Activating an external sensor. Factory setting: 0 0 = internal sensor is operating 1 = external sensor is operating; internal sensor is deactivated 2 = input for external floor sensor is activated</p> <p>Note: This is a comfort temperature. As soon as the floor temperature has been reached, the internal sensor takes over controlling the room. Set the setpoint temperature of the external sensor in the "Settings" menu</p>
	<p>Setting/correcting the floor temperature. Factory setting: 0 °C A difference in the actual floor temperature can be corrected. Setting range -2 °C to +2 °C.</p>
	<p>Set the duration of the backlight of the display. Factory setting: 15 seconds Determines the time period for which the display is illuminated after operation. Setting range: 0 to 30 seconds (in 5-second steps).</p>

Description of operation

Symbol	Procedure
	<p>Display the status of the output signal. Factory setting: 1 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. 0 = deactivated 1 = activated</p>
	<p>Set the direction of operation of the room controller (NC or NO). Factory setting: 0 The direction of operation of the room controller and the connected thermal actuators can be defined. 0 = normally closed (NC) 1 = normally open (NO)</p>
	<p>Set the frost-protection temperature. Factory setting: 5 °C Activates the frost-protection facility when the temperature falls below the set temperature. Setting range: 5 °C to 10 °C.</p>
	<p>Activate the "optimised time programme" function. Factory setting: 0 If the "optimised time programme" function is activated, 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. 0 = deactivated 1 = activated</p>
	<p>Set the cycle time for the valve protection facility. Factory setting: 14 days Prevents the plug from sticking inside the valve. Setting range: 0 to 28 days</p>
	<p>Determining a pilot clock output. Factory setting: 0 0 = Pilot clock output active by time program 1 = Pilot clock output is inactive according to time program Pilot clock output active when operating mode "ECO" is selected; Pilot clock output active when operating mode "Off" is selected Note: If parameter P230 = 1, the time program for local reduced temperature can be used.</p>
	<p>Defining the actuation duration while the valve protection facility is active. Factory setting: 5 minutes The actuation time can be optimised depending on the running time of the thermal actuator. Setting range: 0 to 10 minutes.</p>
	<p>Change the service code for the service menu. Factory setting: 1234 Note: In order to avoid unwanted access to the service parameters, we recommend that the service code be changed by the installer and documented securely. The service code can be reset - see the settings in "Reset to factory settings".</p>

9 Troubleshooting

Fault/display	Possible cause	Action	To be performed by
	Measured temperature from internal or external sensor outside measuring range	Internal sensor/room sensor <ul style="list-style-type: none"> ▶ Remove external heat sources in the immediate vicinity until the sensor has cooled down. ▶ Reposition the room sensor if necessary. ▶ Check the room thermostat/ external room sensor and replace if necessary. ▶ Check the connection of the external sensor. 	Qualified personnel
	No signal from external sensor	<ul style="list-style-type: none"> ▶ No external sensor present. ▶ External sensor does not correspond to specifications. ▶ Deactivate the external sensor in parameter setting 040. ▶ Check the external sensor and replace if necessary. 	Qualified personnel
	Fault in internal sensor	<ul style="list-style-type: none"> ▶ Set to factory settings in the "Settings" menu. ▶ If the room thermostat is faulty it must be replaced. 	Operating company

10 Disposal

The local, currently valid laws must be observed when disposing of the device. You will find more information on the materials and substances in the Declaration on materials and the environment for this product.

11 Cleaning

Use a dry, solvent-free, soft cloth to clean the room thermostat. Make sure that no setting has been changed during the cleaning.

© Fr. Sauter AG
Im Surinam 55
CH-4016 Basel
Tel. +41 61 - 695 55 55
Fax +41 61 - 695 55 10
www.sauter-controls.com
info@sauter-controls.com

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