OEM Alpha Thermostat direct Display

The OEM Alpha Thermostat direct Display is a high-quality room thermostat in modern design for the registration and regulation of the desired room temperature, offering maximum user comfort.

The OEM Alpha Thermostat direct Display is available for the operating voltages 24 V and 230 V. A simple room-by-room temperature control is already possible with directly connected actuators. In conjunction with the connection unit OEM Alpha Basis direct, a perfectly matched overall system for surface temperature adjustment can be realized.

The setting of the desired room temperature, and the operation, can be performed comfortably via a rotary control with rotary-push action and soft ratchet. The well-structured and language-neutral display of the high-quality display always clearly indicates all symbols.

Different versions can be chosen in order to comply with the desired requirements. The standard version, without decorative panel, already shows a convincing and modern design. A decorative panel is available for the OEM Alpha Thermostat direct Display to round off the attractive appearance. Customer-specific differentiation is also possible.



1.1 Features

- Available in three versions: Standard, Comfort and Control
- Versions in 24 V and 230 V
- The large, clearly structured LC display with background illumination allows reading the display even in the dark
- Flat design and small dimensions (86 × 86 × 31 mm)
- Stand-alone regulation, or to be realised in the system
- Equipment for heating and cooling systems
- Smart Start / Stop function
- Selectable operating modes
- Comfort programs for heating and cooling operation
- Adjustable reduction temperature
- Correction of actual temperature registration *
- Limitation of the target temperature setting range
- Valve and antifreeze protection function
- Connection for external sensor
- Change-over input
- High-quality decorative panel made of scratch-proof plastics (optional)
- High-quality, modern OEM design
- Suitable for NC and NO operation
- High functional security

The Möhlenhoff OEM product quality ensures easy, intuitive installation, operation and maintenance of the entire system.

*** Note**: Do not perform any temperature correction until 2 hours after commissioning.

1.2 Variants

In the basic version, the OEM Alpha Thermostat direct Display will be delivered as neutral device in white and jet black without logo and decorative panel. The subsequent list shows the available versions.

Type	Version	Operating voltage	Equipment	Scope of supply
RD 40203-10	Standard	24 V	Heating, fixed setback difference, reduction input	• OEM Alpha Thermostat direct Display in individual packaging • Instructions in 12 languages
RD 45203-40	Comfort	24 V	Heating / cooling, change-over, selectable heating system, selectable reduction temperature, reduction input	
RD 45203-60	Control	24 V	Heating / cooling, change-over, selectable heating system, Smart Start / Stop, selectable reduction temperature, reduction output	
RD 20203-10	Standard	230 V	Heating, fixed setback difference, reduction input	
RD 20203-11[1)]	Standard	230 V	Heating, fixed setback difference, reduction input	
RD 25203-40	Comfort	230 V	Heating / cooling, change-over, selectable heating system, selectable reduction temperature, reduction input	
RD 25203-41[1)]	Comfort	230 V	Heating / cooling, change-over, selectable heating system, selectable reduction temperature, reduction input	
RD 25203-60	Control	230 V	Heating / cooling, change-over, selectable heating system, Smart Start / Stop, selectable reduction temperature, reduction output	
RD 25203-61[1)]	Control	230 V	Heating / cooling, change-over, selectable heating system, Smart Start / Stop, selectable reduction temperature, reduction output	

[1)] Switching element = Triac

1.3 Equipment

The OEM Alpha Thermostat direct Display is offered in the versions 24 V and 230 V. Different versions are available; they differ in their functional equipment.

	Standard	Comfort	Control
Heating	✓	✓	✓
Cooling		✓	✓
Change-over of control direction normally closed (NC) / normally open (NO)		✓	✓
Fixed setback difference	✓		
Adjustable target temperature for heating and cooling		✓	✓
Comfort programs			✓
Selectable operating mode: Day / night / automatic operation	✓	✓	✓
Cooling block		✓	✓
Reduction input	✓	✓	
Reduction output			✓
Internal weekly timer			✓
Power reserve			✓
Change-over input		✓	✓
Correction of actual temperature registration	✓	✓	✓
Target temperature limitation	✓	✓	✓
Valve protection function	✓	✓	✓
Antifreeze function	✓	✓	✓
Selectable heating system		✓	✓
Switching output can be deactivated	✓	✓	✓
Smart Start / Stop function			✓
Background illumination	optional	✓	✓
Connection for external sensor			✓

1.4 Accessories

Type	Article description
ES 1000	External temperature sensor for the Control variant – for monitoring the room or floor temperature, and minimum floor tempering
TP 44101-00N TP 44201-00N	Dew point monitor for the Control version – for monitoring the dew point in cooling mode

1.5 Optional extensions and differentiations to the basic version

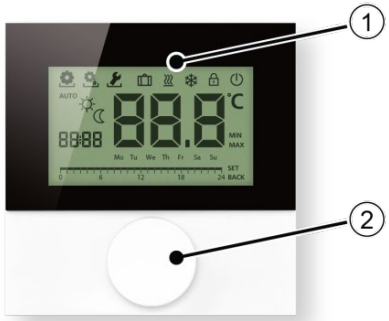
Extension options	
Decorative panel	High quality front panel for the room thermostat Display
Background illumination for Standard model	Extends the Standard model by a display background illumination, allowing to read the display even in the dark

Differentiation possibilities	
Packaging	Individual printing and manufacturing of packaging
Casing	Individual designs, e. g. square, upright, horizontal format, individual colour
Imprint on casing	Marking of the company logo and the individual type designation and the device designation
Installation bottom	Colour adaptation, form change
Rotary control	Individual adaptation of the imprint
Please contact us if you have further wishes.	

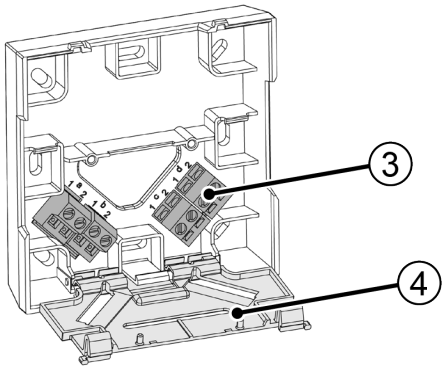
2 Function

All room thermostats OEM Alpha Thermostat direct Display have the same basic functions; further system functions depend on the version and the individual equipment.

2.1 Device overview (example – Alpha Thermostat direct Control)



Top view



Clamp contacts

1	**Display**	• Indication of all displays and menus
2	**Rotary control**	• Rotary-push mechanic system with fine ratchet • Operation and navigation through menus • Target temperature specification - Setting the target temperature for the operating modes heating, cooling by day, and night heating, cooling by night
3	**Connection terminals**	• Screw terminals for the connection lines - Quick connection of a multi-core connection line for voltage supply and signal transmission
4	**Protective cover**	• Protection against accidental contact of live components

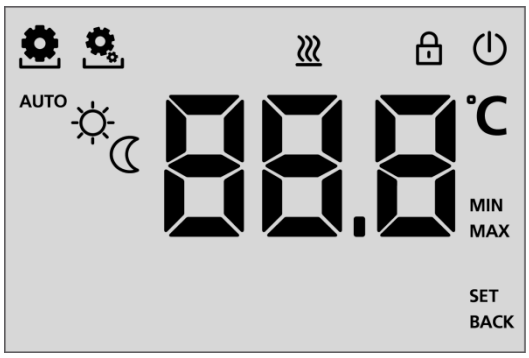
2.2 Operation

Numerous system functions and parameters can be set via the OEM Alpha Thermostat direct Display for user comfort and for energy optimization purposes. A multi-level menu structure avoids the unintended change of important settings. The user can make settings in the menus “Lifestyle functions” and “Settings”. The menu “Service” is reserved for system settings; this level is only intended for expert technicians, and it is protected by a PIN code against unauthorized access.

2.2.1 Displays

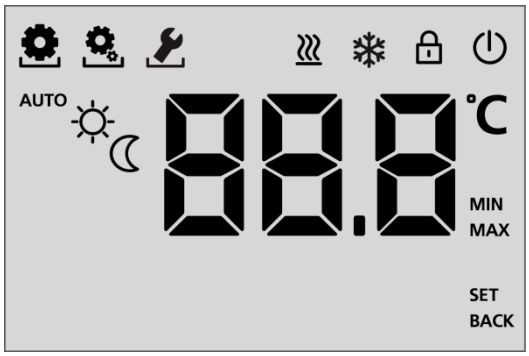
The OEM Alpha Thermostat direct Display has a clear and language-neutral indication. The high-quality display clearly indicates all symbols. The internationally understandable symbols guarantee intuitive operation.

OEM Alpha Thermostat direct Display Standard



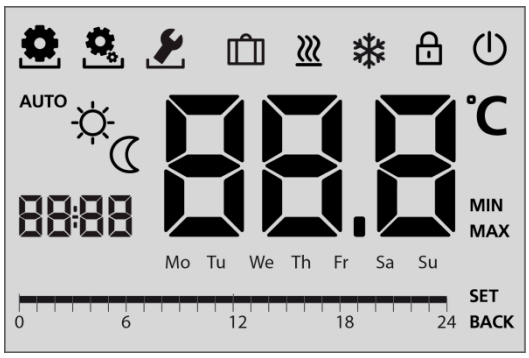
	Lifestyle functions menu		Night operation
	Settings menu	88.8	Target / actual temperature
	Heating	°C	Temperature unit
	Operating lock	MIN	Minimum temperature
	Switching off	MAX	Maximum temperature
AUTO	Automatic operation	SET	Confirm settings
	Day operation	BACK	Back

OEM Alpha Thermostat direct Display Comfort



	Lifestyle functions menu		Day operation
	Settings menu		Night operation
	Service menu	88.8	Target / actual temperature
	Heating	°C	Temperature unit
	Cooling	MIN	Minimum temperature
	Operating lock	MAX	Maximum temperature
	Switching off	SET	Confirm settings
AUTO	Automatic operation	BACK	Back

OEM Alpha Thermostat direct Display Control



	Lifestyle functions menu		Night operation
	Settings menu	88:88	Time
	Service menu	88.8	Target / actual temperature
	Holiday function	°C	Temperature unit
	Heating	MIN	Minimum temperature
	Cooling	MAX	Maximum temperature
	Operating lock	Mo — Su	Weekdays
	Switching off	0 6 12	Time scale
AUTO	Automatic operation	SET	Confirm settings
	Day operation	BACK	Back

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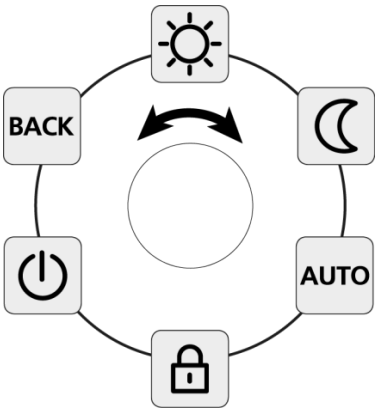
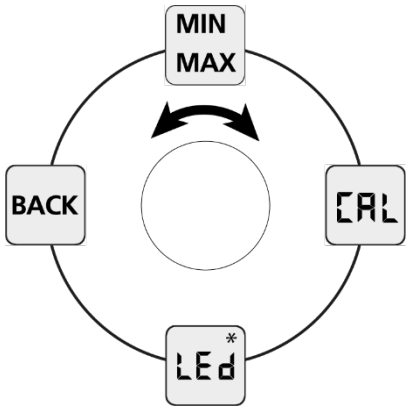
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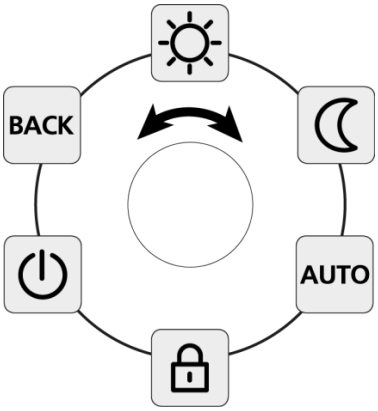
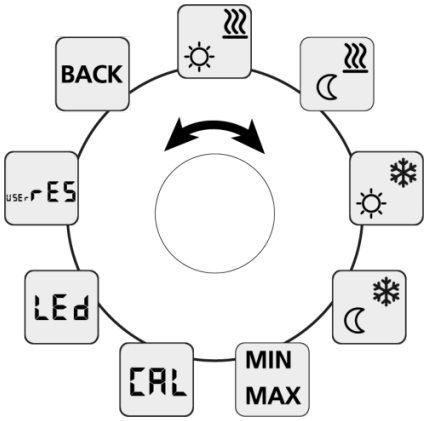
2.2.2 Navigation

The rotary control allows a setting of the desired room temperature and the operation of the comprehensive functions. It allows a comfortable navigation through the intuitive menu structure of the OEM Alpha Thermostat direct Display. Functions are selected by pressing and turning and adapted according to the user's needs. The ratchet of the rotary control always delivers a feel of high quality experienced by the user during navigation. Depending on the variant, the following functions, settings and parameters are available in the individual menu levels.

OEM Alpha Thermostat direct Display Standard

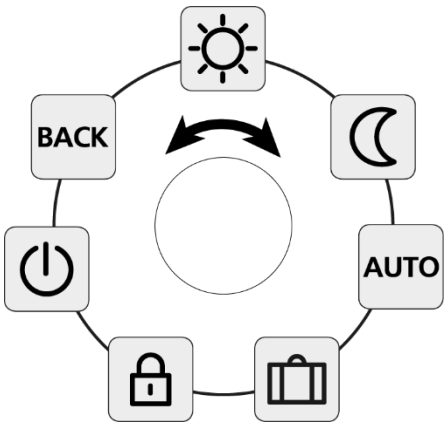
Lifestyle functions	Settings
	 *optional
• Operating modes Day operation, Night operation, Automatic operation • Operating lock as a protection against accidental maladjustment and wrong operation • Switching off the room thermostat and thus the control operation – the antifreeze operation is automatically activated • Back to the basic level	• Limitation of the lowest and highest selectable room temperature • Temperature correction of temperature registration • Display illumination with brightness adjustment for background illumination (optional)

OEM Alpha Thermostat direct Display Comfort

Lifestyle functions	Settings	Service
		• Protected against unauthorized access by PIN code • Individual, optimal adjustment of the installation via system parameters as e.g. - Setting of the applied heating system as e.g. floor heating, radiator, convector etc. - Blocking the switching outputs depending on the activated operating mode (heating / cooling) - Definition of operating locks with / without PIN - Change-over of the control direction of the installation (normally open / normally closed) - Cooling block
• Operating modes Day operation, Night operation, Automatic operation • Operating lock as a protection against accidental maladjustment and wrong operation • Switching off the room thermostat and thus the control operation – the antifreeze operation is automatically activated • Back to the basic level	• Separate selection of the target temperature for different operating modes as e. g. day / night operation • Limitation of the lowest and highest selectable room temperature • Correction of temperature registration • Display illumination with brightness adjustment for background illumination • Resetting the factory settings • Back to the basic level	

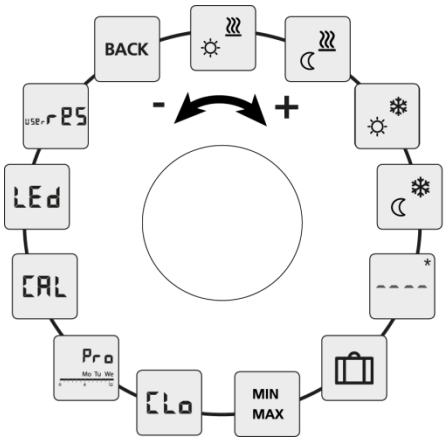
OEM Alpha Thermostat direct Display Control

Lifestyle functions



- Operating modes Day operation, Night operation, Automatic operation
- Holiday mode for a reduction to a defined holiday temperature
- Operating lock as a protection against accidental maladjustment and wrong operation
- Switching off the room control unit and thus the control operation – the antifreeze operation is automatically activated
- Back to the basic level

Settings



*external floor sensor logged in

- Separate selection of the target temperature for different operating modes as e.g. day / night operation and holiday mode
- Limitation of the lowest and highest selectable room temperature
- Setting time and date
- Comfort programs for individual weekdays, week, weekend, and week including weekend
- Correction of temperature registration
- Display illumination with brightness adjustment for background illumination
- Resetting the factory settings

Service

- Protected against unauthorized access by PIN code
- Individual, optimal adjustment of the installation via system parameters as e.g.
  - Setting of the applied heating system as e.g. floor heating, radiator, convector etc.
  - Blocking the switching outputs depending on the activated operating mode (heating / cooling)
  - Deactivation of the valve protection function
  - Activation / deactivation of Smart Start / Stop function
  - Definition of operating locks with / without PIN
  - Change-over of the control direction of the installation (normally open / normally closed)
  - Cooling block

3 Technical data

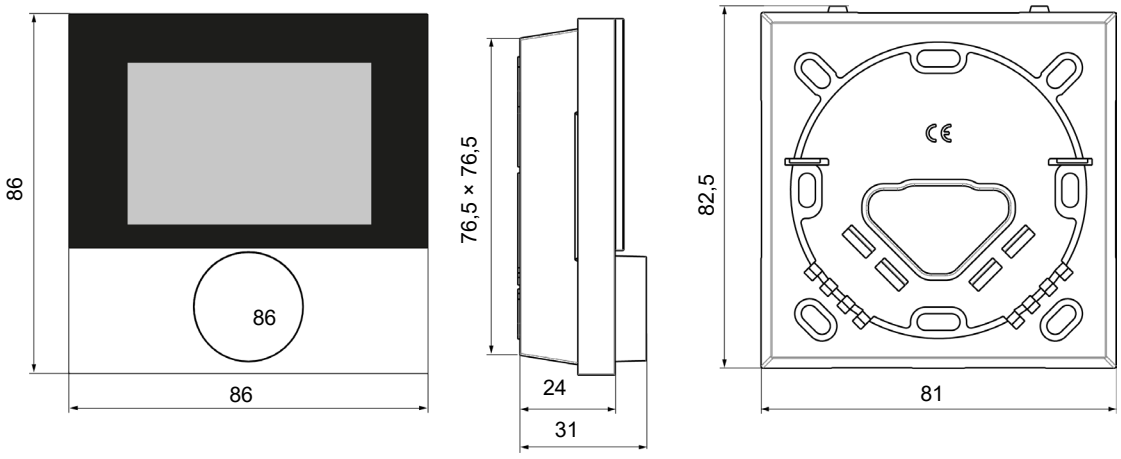
The listed technical data relate to the maximum functional equipment of the OEM Alpha Thermostat direct Display. Individual positions may be omitted depending on the model.

	24 V variant			230 V variant		
	Standard	**Comfort**	**Control**	**Standard**	**Comfort**	**Control**
Type	RD 40203-10	RD 45203-40	RD 45203-60	RD 20203-10 RD 20203-11[1)]	RD 25203-40 RD 25203-41[1)]	RD 25203-60 RD 25203-61[1)]
Operating voltage	24 V ±20 % 50 Hz			230 V ±10 % 50 Hz		
Voltage supply	via base / transformer			via base / mains connection		
Power reserve	-	-	6 hours	-	-	6 hours
Power consumption in idle operation	<0.3 W					
Switching element	Triac			Relay / Triac[1)]		
Switching power	1 A ohmic load			1 A ohmic load, 200 VA inductive / 1A ohmic load[1)]		
Fuse	T1A			T1AH		
Max. number of connectible actuators	5 (max. 3 W / actuator)					
Rated current without valve drives	≤ 20 mA			≤ 2 mA		
Max current draw allowed with connected valve drives	1 A			1 A		
Control direction of actuators to be connected	NC	NC / NO	NC / NO	NC	NC / NO	NC / NO
Target temperature setting range	5 … 30°C					
Target temperature resolution	0.2 °C					
Actual temperature measuring range	0 … 40°C					
Correction of actual temperature registration	±2 °C					
Measuring accuracy of actual temperature	±0,5 K between 17 … 24 °C					
Controlling precision	±0,5 K between 17 … 24 °C					
Type of control	PI					
Output control variable	PWM					
PWM interval	900 sec (15 min)					
Maximum activation duration of the switching output in the PWM interval	810 sec (13.5 min)					
Minimum activation duration of the switching output in the PWM interval	90 sec (1.5 min) all shorter control variables are not output					
Change-over input	–	electronically	electronically	–	electronically	electronically
Cooling block	–	yes	yes	–	yes	yes
Reduction input	yes	yes	–	yes	yes	–
Reduction output of weekly timer / switching current	–	–	yes / 100 mA	–	–	yes / 100 mA
Reduction difference / reduction temperature	2 K	Adjustable value for day and night temperature (heating & cooling)	Adjustable value for day and night temperature (heating & cooling)	2 K	Adjustable value for day and night temperature (heating & cooling)	Adjustable value for day and night temperature (heating & cooling)
Antifreeze temperature	5 °C					
Valve protection function	Once every 14 days for 10 minutes					
Admissible ambient temperature	0 … 50°C					
Admissible storage temperature	-20 … +70 °C					
Admissible ambient humidity	80%, not condensing					
Temperature for ball pressure test	550 °C					
Background illumination	optional	yes	yes	optional	yes	yes
Type of installation	On-surface wall installation					
Connection line	NYM-J 5 x 1.5 mm² /	NYM-O 5 x 1.5 mm²	NYM-O 5 x 1.5 mm²	NYM-J 5 x 1.5 mm² /	NYM-O 5 x 1.5 mm²	NYM-O 5 x 1.5 mm²
Connection terminals	4 screw terminals 0.22 – 1.5 mm²	6 screw terminals 0.22 – 1.5 mm²	8 screw terminals 0.22 – 1.5 mm²	4 screw terminals 0.22 – 1.5 mm²	6 screw terminals 0.22 – 1.5 mm²	8 screw terminals 0.22 – 1.5 mm²
Protection class	III			II		
Degree of protection	IP20					
Rated impulse voltage	1500 V					

Pollution degree		2	
Type action		Type 1	Type 1.C
Material	Casing	ABS	
	Decorative panel	Acrylic glass XT	
Surface structure		anodised	
Colour	Casing	Signal white (RAL 9003), Jet black (RAL 9005) [1)]	
	Rotary control	Signal white (RAL 9003), Jet black (RAL 9005) [1)]	
Weight		105 g ± 0.5 g	
Dimensions (W × H × D)	Casing	86 × 86 × 31 mm	
	Display	58 × 34 mm	
	Decorative panel	86 × 56 × 2 mm	

[1)] Switching element = Triac

3.1 Dimensions



Dimensions (all indications in mm)

3.2 Approvals and certificates

In addition to our numerous internal function and quality tests, all Möhlenhoff products are tested by independent testing institutes.

CE

The CE identification documents that the products placed on the market comply with the applicable requirements of the EU Directives.

TÜVRheinland CERTIFIED
Type Approved
Safety
Regular Production
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The product is certified by the TÜV Rheinland.

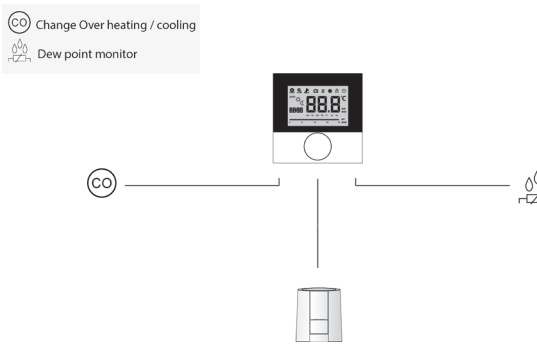
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4 System visualizations

A selection of possible system variants for the realization of a room-by-room temperature control is shown in the following. A stand-alone system can already be performed with an OEM Alpha Thermostat direct Display and with directly connected actuators. A maximum of five actuators can be directly connected to the room thermostat. An individualization of the room-by-room temperature control can be realized by adding to the system of compatible components, as e.g.

- the OEM Alpha Basis direct,
- the OEM Alpha Thermostat direct Analogue, and
- the thermal actuator of the type A 20x05 (230 V) or A 40x05 (24 V) with a power input of 1 watt

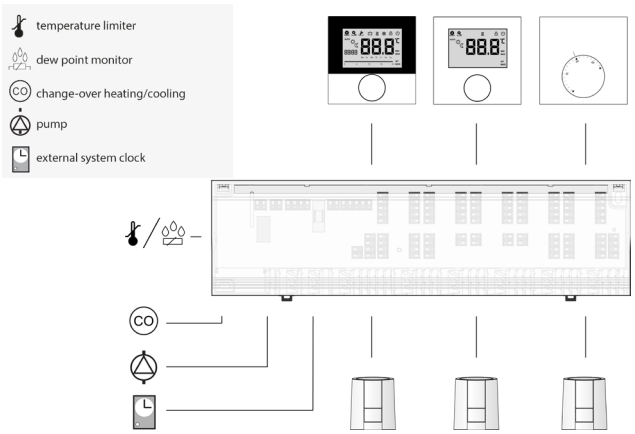
4.1 Stand-alone OEM Alpha Thermostat direct Control – 230 V version



Characteristic	
Heating	✓
Cooling	✓
Simple pump control	
Extended pump / boiler control with lead time and follow-up time	
Connection for external system clock	
Internal weekly timer of an OEM Alpha Thermostat direct Display	✓[1]
Dew point monitor	✓[2]
OEM Alpha Thermostat direct Analogue	
OEM Alpha Thermostat direct Analogue HK	
OEM Alpha Thermostat direct Standard	
OEM Alpha Thermostat direct Comfort	
OEM Alpha Thermostat direct Control	✓

[1]not in combination with an external system clock
[2]Available from software version 01.73

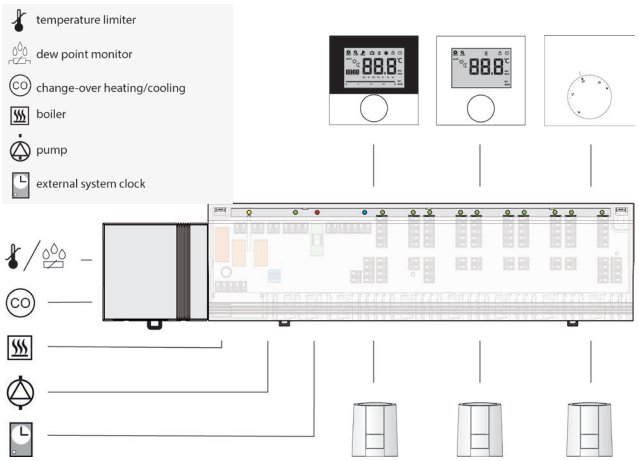
4.2 Thermostat with OEM Alpha Basis direct Standard PLUS – 230 V version



Characteristic	
Heating	✓
Cooling	✓
Simple pump control	✓
Extended pump / boiler control with lead time and follow-up time	
Connection for external system clock	✓[2]
Internal weekly timer of an OEM Alpha Thermostat direct Display	✓[1]
Temperature limiter or dew point sensor	✓
OEM Alpha Thermostat direct Analogue	
OEM Alpha Thermostat direct Analogue HK	✓
OEM Alpha Thermostat direct Standard	
OEM Alpha Thermostat direct Comfort	
OEM Alpha Thermostat direct Control	✓

[1]not in combination with an external system clock
[2]not in combination with the internal weekly timer of an OEM Alpha Thermostat direct Control

4.3 Thermostat with OEM Alpha Basis direct Comfort – 24 V version



Characteristic	
Heating	✓
Cooling	✓
Simple pump control	
Extended pump / boiler control with lead time and follow-up time	✓
Connection for external system clock	✓[2]
Internal weekly timer of an OEM Alpha Thermostat direct Display	✓[1]
Temperature limiter or dew point sensor	✓
OEM Alpha Thermostat direct Analogue	
OEM Alpha Thermostat direct Analogue HK	✓
OEM Alpha Thermostat direct Standard	
OEM Alpha Thermostat direct Comfort	
OEM Alpha Thermostat direct Control	✓

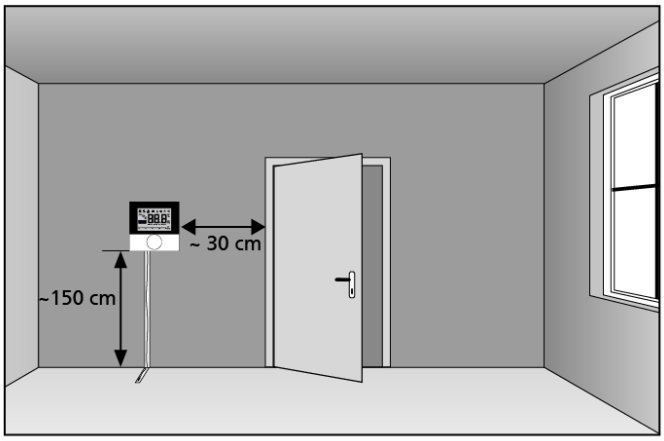
[1]not in combination with an external system clock
[2]not in combination with the internal weekly timer of an OEM Alpha Thermostat direct Control or timer module

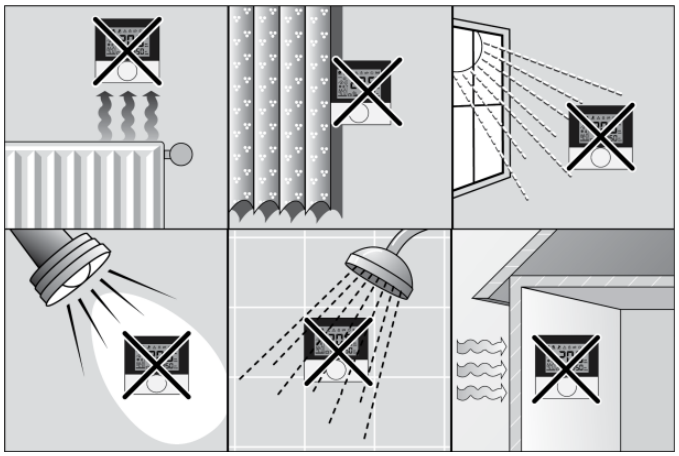
5 Installation notes

The installation of the OEM Alpha Thermostat direct Display can be performed in a few simple, comfortable and intuitive steps.

5.1 Installation place

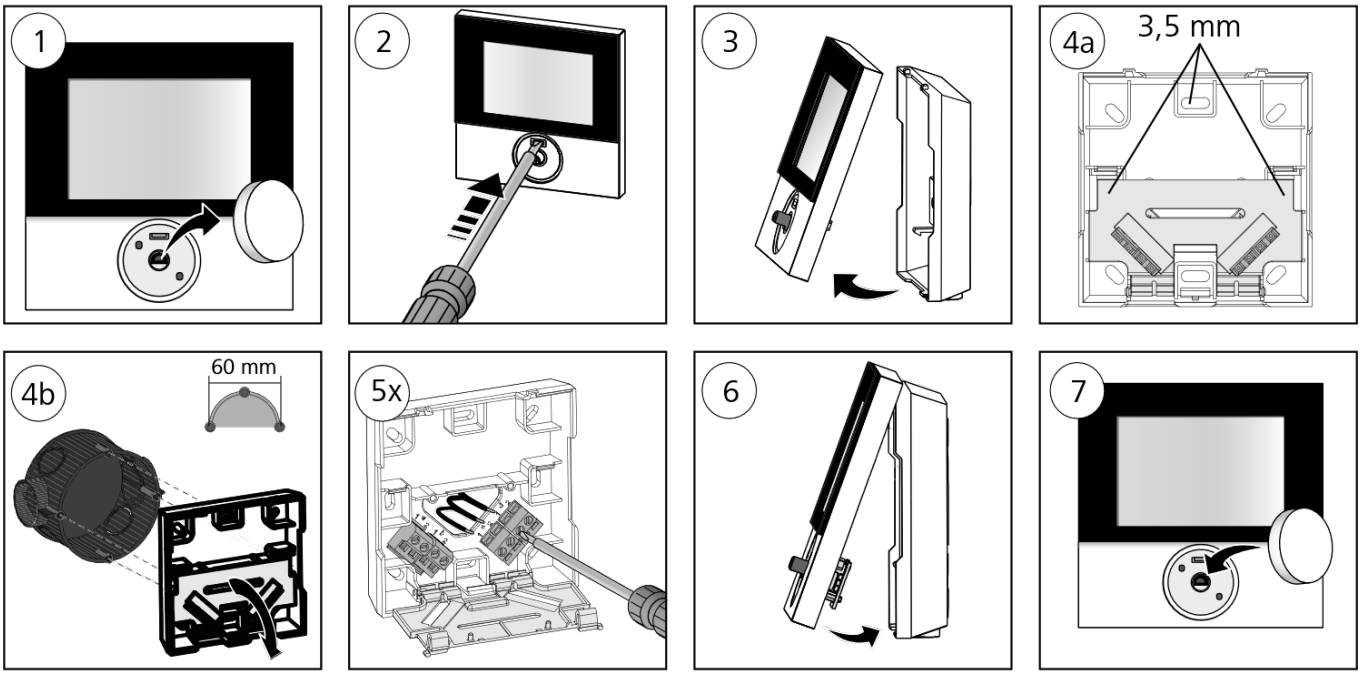
A freely accessible area is recommended for installation in order to allow the OEM Alpha Thermostat direct Display to detect the correct room temperature. There must be no obstacles and additional heat sources at the installation position which could affect the measuring of the exact room temperature.





5.2 Installation

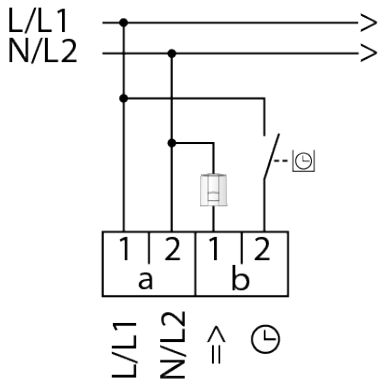
The OEM Alpha Thermostat direct Display is installed comfortably on-surface or in a flush-type box in a few simple steps.



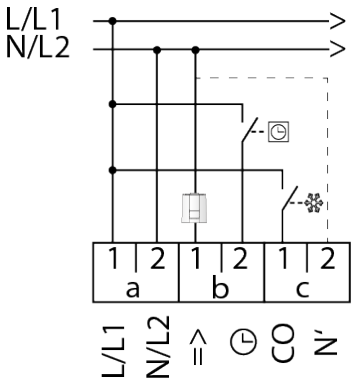
5.3 Electric connection

The wiring between the OEM Alpha Thermostat direct Display ant the components to be connected is realised with a multi-core cable.

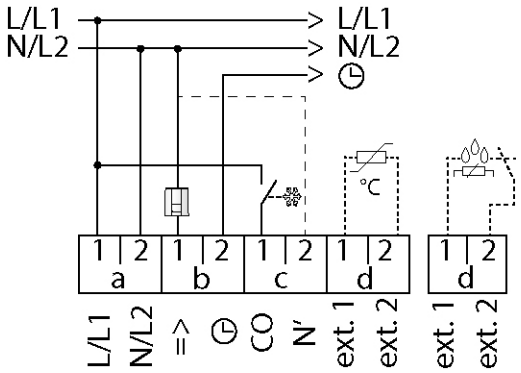
Standard



Comfort



Control



- Mains connection
  - Voltage supply via OEM Alpha Basis direct or via a separate voltage source
- Reduction input **(Standard and Comfort variants)**
  - Reception of an external timer signal for a time-controlled room temperature reduction
- Reduction output **(Control variant)**
  - Forwarding of the switching signals of the internal weekly timer to other components of the OEM Alpha direct: System
- Change Over input
  - Toggle between heating and cooling via an external signal (potential-free contact)
- Connection for actuators
  - Two wiring possibilities for the neutral conductor
    - The neutral conductor can be wired directly from the supply or via the internal connection terminal N‘. In the wiring diagrams, the wiring via the connection terminal N’ is identified with a fine dashed line.
  - Integrated valve protection function
    - A cyclic activation of connected actuators once every 14 days for 10 minutes prevents the valves from clogging during periods without temperature regulation
    - Will be triggered once every 14 days for 10 minutes after the last triggering.
  - Integrated antifreeze function
    - Avoids the freezing of lines during times without temperature control (e.g. in case of longer absence)
    - Inactive in cooling operation
- Connection for external sensor **(Control variant)**
  - For monitoring the room or floor temperature, and minimum floor tempering
    Condition: External temperature sensor must be parameterised and mounted as a floor sensor.
  - Monitoring the dew point in cooling mode on a component, e.g. on the pipe for cold water supply via dew point monitor with potential-free contact

Note: Cables from the dew point monitor and external sensor* must not exceed 3 m.

* NTC, 22 K, $B_{25/85}$ value: 3740 K, cable length: 3 m

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