# OEM Alpha Room Thermostat direct Display

The OEM Alpha Room 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 Room 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 Base Station 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 Room Thermostat direct Display in order 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 x 86 x 31 mm)
- Stand-alone regulation, or to be realised in the system
- Equipment for heating and cooling systems
- Smart Start / Smart 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 temperature 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.

## 1.2   Variants

In the basic version, the OEM Alpha Room Thermostat direct Display will be delivered as neutral device without logo and decorative panel, and in white. 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 Room Thermostat direct Display in individual packaging<br>Instructions in 12 languages |
| RD 45203-40 | Comfort | 24 V | Heating/cooling, change-over, selectable heating system, selectable reduction temperature | |
| RD 45203-60 | Control | 24 V | Heating/cooling, change-over, selectable heating system, Smart Start / Smart Stop, selectable reduction temperature, reduction output | |
| RD 20203-10 | 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 | |
| RD 25203-60 | Control | 230 V | Heating/cooling, change-over, selectable heating system, Smart Start / Smart Stop, selectable reduction temperature, reduction output | |

## 1.3  Equipment

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

### 1.3.1  Equipment overview

|  | 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 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 / Smart Stop function |  |  | ✓ |
| Background illumination | optional | ✓ | ✓ |
| Connection for external sensor |  |  | ✓ |

Möhlenhoff

## 1.4  Accessories

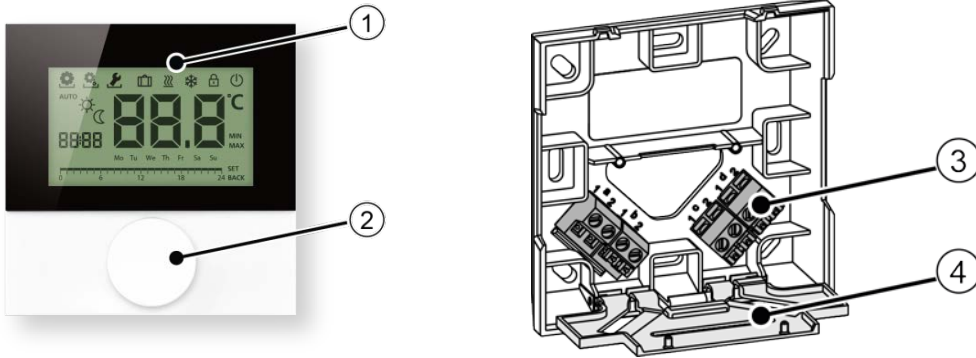| Type | Article description |
|---|---|
| ES 1000 | External temperature sensor for the Control variant – for monitoring the room or floor temperature, and minimum floor tempering |

## 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. | |

**Möhlenhoff GmbH**          ☎ +49 5341 8475 0
Museumstraße 54a            kontakt@moehlenhoff.de          130647.1527
38229 Salzgitter            www.moehlenhoff.de

Möhlenhoff

# 2   Function

All room thermostats OEM Alpha Room 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<br>• Operation and navigation through menus<br>• Target temperature specification<br>  - Setting the target temperature for the operating modes heating, cooling by day, and night (ECO) |
| 3 | **Connection terminals** | • Screw terminals for the connection lines<br>  - 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 Room Thermostat direct Display for user comfort and for energy optimisation 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 Room 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.
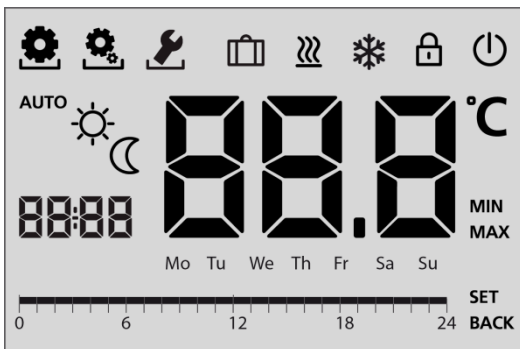
**OEM Alpha Room Thermostat direct Display Standard**



| | | | |
|---|---|---|---|
| ⚙ | 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 Room Thermostat direct DisplayComfort

| Symbol | Description | Symbol | Description |
|---|---|---|---|
| ⚙ | 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 Room Thermostat direct Display Control

| Symbol | Description | Symbol | Description |
|---|---|---|---|
| ⚙ | 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 | ⎯ | Time scale |
| AUTO | Automatic operation | SET | Confirm settings |
| ☀ | Day operation | BACK | Back |

### 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 Room Thermostat direct Display. Functions are selected by pressing and turning, and adapted according to the user's needs. The ratchet of the r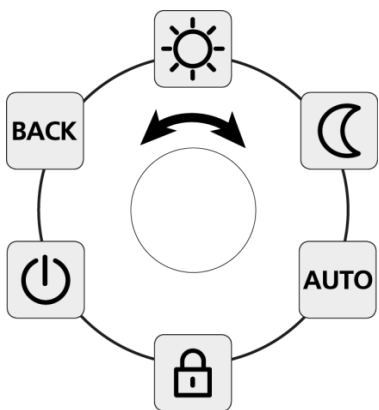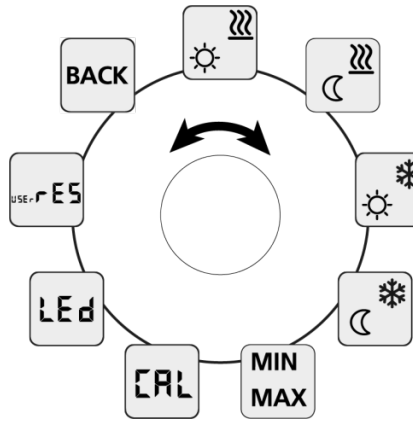otary control always delivers a feel of high quality experienced by the user during navigation. Depending on the variant, the following functions, settings and parameters are available in the individual menu levels.
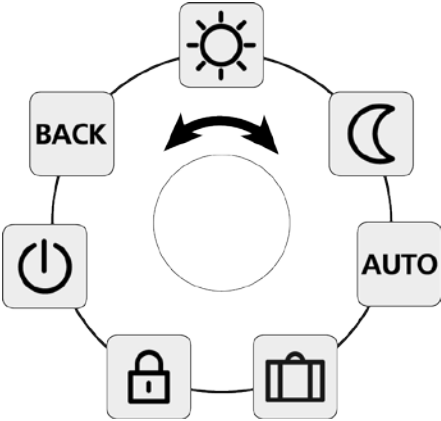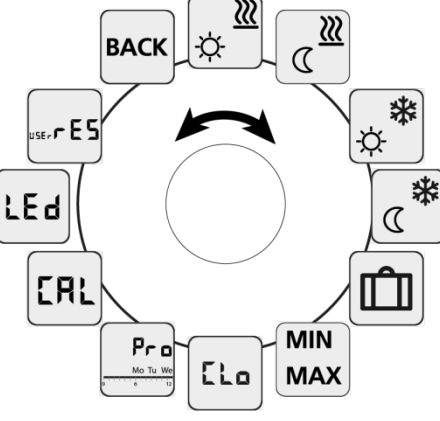
**OEM Alpha Room Thermostat direct Display Standard**

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

**OEM Alpha Room Thermostat direct DisplayComfort**

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

**OEM Alpha Room Thermostat direct Display Control**

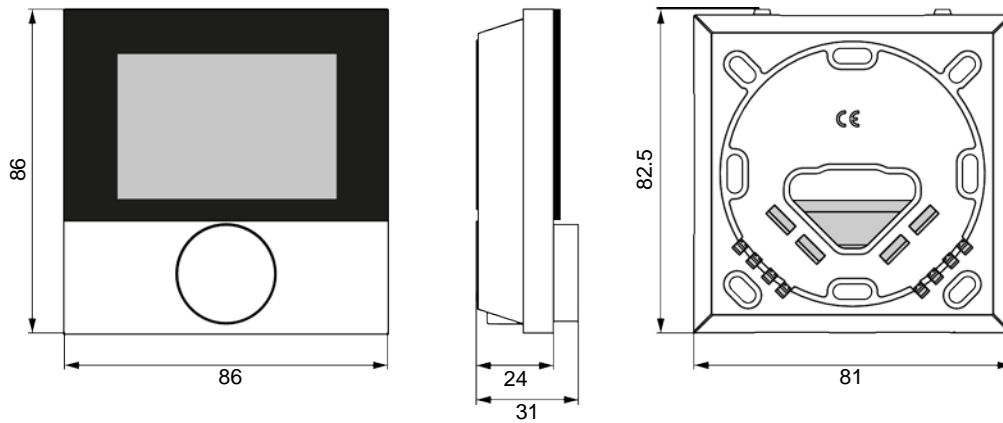| Lifestyle functions | Settings | Service |
|---|---|---|
|  |  | • Protected against unauthorised access by PIN code<br>• Individual, optimal adjustment of the installation via system parameters as e. g.<br>  - Setting of the applied heating system as e. g. floor heating, radiator, convector etc.<br>  - Blocking the switching outputs depending on the activated operating mode (heating/cooling)<br>  - Deactivation of the valve protection function<br>  - Activation/deactivation of Smart Start / Smart Stop function<br>  - Definition of operating locks with/without PIN<br>  - Change-over of the control direction of the installation (normally open/normally closed)<br>  - Cooling block |
| • Operating modes Day operation, Night operation, Automatic operation<br>• Holiday mode for a reduction to a defined holiday temperature<br>• Operating lock as a protection against accidental maladjustment and wrong operation<br>• Switching off the room control unit and thus the control operation – the antifreeze operation is automatically activated<br>• Back to the basic level | • Separate selection of the target temperature for different operating modes as e. g. day/night operation and holiday mode<br>• Limitation of the lowest and highest selectable room temperature<br>• Setting time and date<br>• Comfort programs for individual weekdays, week, weekend, and week including weekend<br>• Correction of temperature registration<br>• Display illumination with brightness adjustment for background illumination<br>• Resetting the factory settings | |

# 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 25203-40 | RD 25203-60 |
| Operating voltage | 24 V ±20 % 50 Hz | | | 230 V ±10 % 50 Hz | | |
| Voltage supply | via base / external supply unit or transformer | | | via base / mains connection | | |
| Power reserve | - | - | 10 hours | - | - | 10 hours |
| Power consumption in idle operation | <0.3 W | | | | | |
| Switching element | Triac | | | Relay | | |
| Switching power | 1 A ohmic load | | | 1 A ohmic load, 200 VA inductive | | |
| Fuse | T1A | | | T1AH | | |
| Max. number of connectible actuators | 5 (max. 3 W/actuator) | | | | | |
| Control direction of connectible actuators | NC | NC/NO | NC/NO | NC | NC/NO | NC/NO |
| Target temperature setting range | 5 to 30°C | | | | | |
| Target temperature resolution | 0.2 °C | | | | | |
| Actual temperature measuring range | 0 – 40°C | | | | | |
| Correction of actual temp. registration | ±2 °C | | | | | |
| Measuring accuracy of actual temperature | ±0,5 K between 17 and 24 °C | | | | | |
| Controlling precision | ±0,5 K between 17 and 24 °C | | | | | |
| Change-over input | - | electronically | electronically | - | electronically | electronically |
| Cooling block | - | yes | yes | - | yes | yes |
| Reduction input | yes | yes | - | yes | yes | - |
| Reduction output / switching current | - | - | yes/100 mA | - | - | yes/100 mA |
| Reduction difference / reduction temperature | 2 °C | Adjustable value for day and night temperature (heating & cooling) | Adjustable value for day and night temperature (heating & cooling) | 2 °C | 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 to 50°C | | | | | |
| Admissible storage temperature | -20 to +70 °C | | | | | |
| Admissible ambient humidity | 80%, not condensing | | | | | |
| 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 | | | | | |
| Material — Casing | ABS | | | | | |
| Material — Decorative panel | Acrylic glass XT | | | | | |
| Surface structure | Anodised | | | | | |
| Colour — Casing | Pure white (RAL 9010) | | | | | |
| Colour — Rotary control | Pure white (RAL 9010) | | | | | |
| Weight | 105 g ± 0.5 g | | | | | |
| Dimensions (W x H x D) — Casing | 86 x 86 x 31 mm | | | | | |
| Dimensions (W x H x D) — Display | 58 x 34 mm | | | | | |
| Dimensions (W x H x D) — Decorative panel | 86 x 56 x 2 mm | | | | | |

## 3.1   Dimensions



*Dimensions (all indications in mm)*

## 3.2   Approvals & certificates

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

CE

The product is certified by the TÜV Rheinland.

Möhlenhoff

# 4   System visualisations

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 Room Thermostat direct Display and with directly connected actuators. A maximum of five actuators can be directly connected to the room thermostat. An individualisation of the room-by-room temperature control can be realized by adding to the system of compatible components, as e. g.

- the OEM Alpha Base Station 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
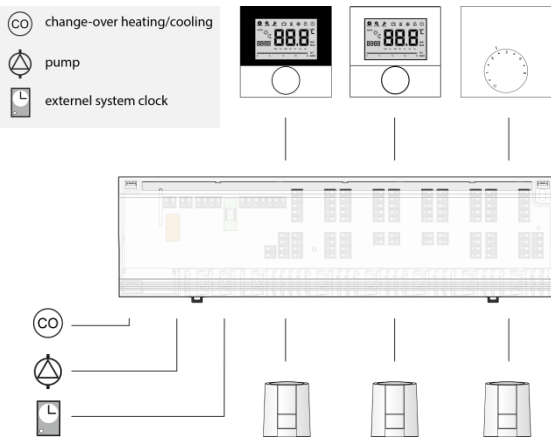
## 4.1   Stand-alone OEM Alpha Thermostat direct Control – 230 V version
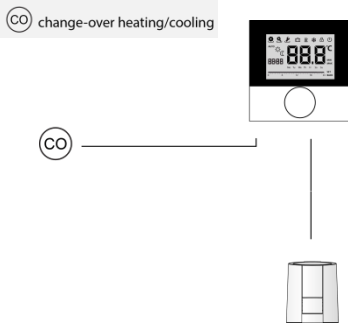
| Characteristic | |
|---|---|
| Heating | ✓ |
| Cooling | ✓ |
| Simple pump control | |
| Extended pump/boiler control with lead time and follow-up time | |
| Connection for external system clock | |
| Internal timer of an OEM Alpha Thermostat direct Display | ✓[1] |
| Temperature limiter or dew point 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

## 4.2   Room thermostat with OEM Alpha Base Station direct Standard Plus – 230 V version
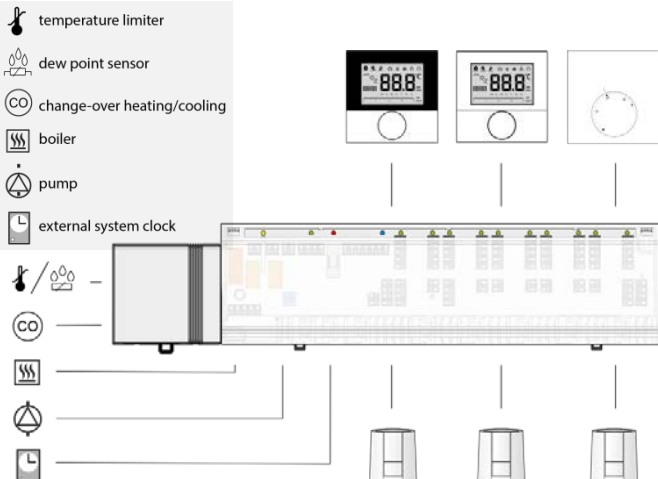
| Characteristic | |
|---|---|
| Heating | ✓ |
| Cooling | ✓ |
| Simple pump control | ✓ |
| Extended pump/boiler control with lead time and follow-up time | |
| Connection for external system clock | ✓[2] |
| Internal timer of an OEM Alpha Thermostat direct Display | ✓[1] |
| Temperature limiter or 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 external timer of OEM Alpha Thermostat direct Control
[3]only suitable for the operating mode Heating

## 4.3   Room thermostat with OEM Alpha Base Station 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 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 external timer of an OEM Alpha Thermostat direct Control or timer module
[3]only suitable for the operating mode Heating (not in CO operation)

# 5  Installation notes

The installation of the OEM Alpha Room 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 Room 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.
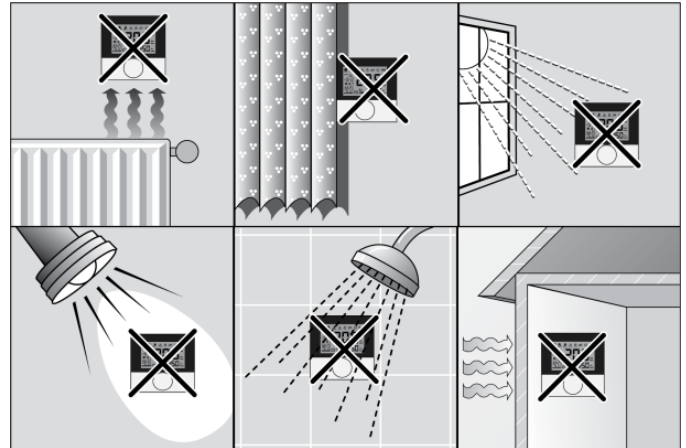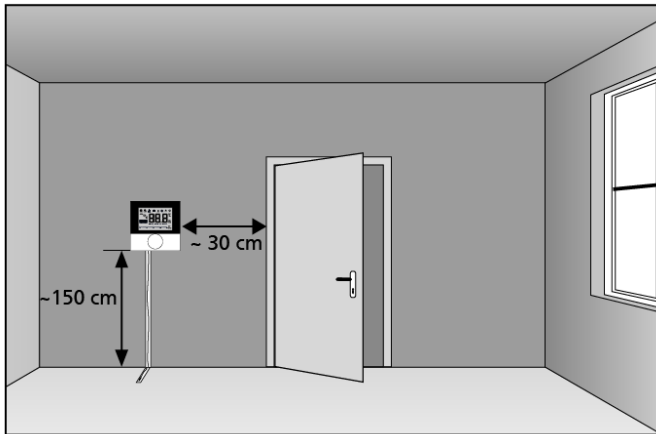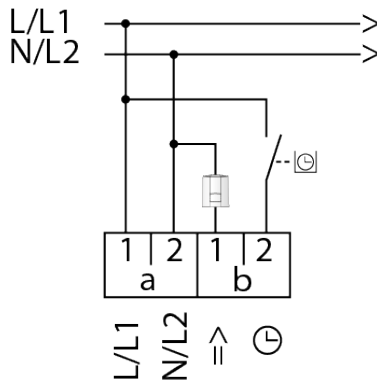


## 5.2  Installation

The OEM Alpha Room Thermostat direct Display is installed comfortably on-surface or in a flush-type box in a few simple steps.
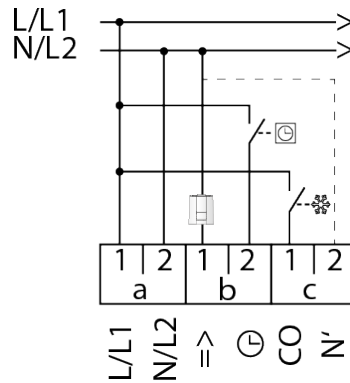
Möhlenhoff
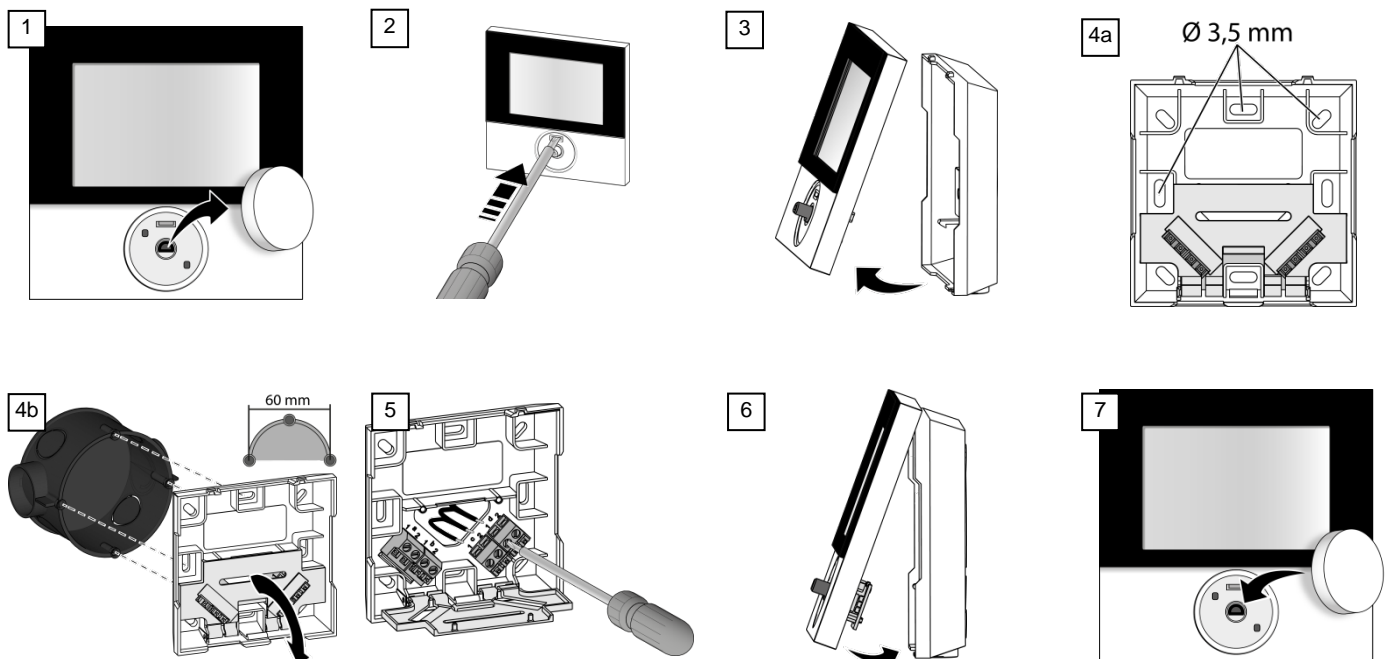
## 5.3   Electric connection

The wiring between the OEM Alpha Room Thermostat direct Display and the components to be connected is realised with a multi-core cable.
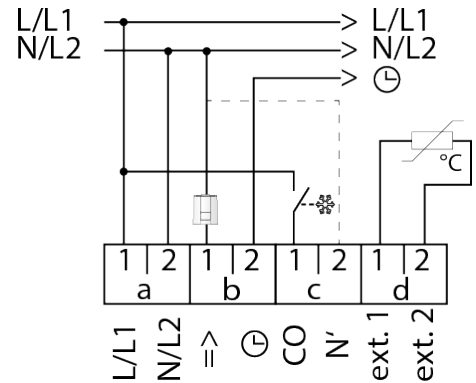
| Standard | Comfort | Control |
| --- | --- | --- |



- Mains connection
  - Voltage supply via OEM Alpha Base Station direct or via a separate voltage source
- Reduction input (Standard variant)
  - Reception of an external timer signal for a time-controlled room temperature reduction
- Reduction output (Control variant)
  - Forwarding of the internal timer signal 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 of external sensor
  - For monitoring the room or floor temperature, and minimum floor tempering