RDE100.1RF          RCR100RF

# Wireless room thermostat with auto timer

# RDE100.1RFS

for heating systems

- **Room temperature control**
- **2-position control with On/Off output for heating**
- **Comfort, Economy, Auto Timer and Protection mode**
- **Auto Timer**
- **Adjustable commissioning and control parameters**
- **Battery-powered room thermostat DC 3 V (RDE100.1RF)**
- **Mains-powered receiver AC 230 V (RCR100RF)**
- **Multifunction input for external floor sensor, keycard contact, etc.**

## Use

The RDE100.1RFS is used to control the room temperature in heating systems.

Typical applications:
- Apartments
- Commercial spaces
- Schools

For the control of the following pieces of equipment:
- Thermal valves or zone valves
- Gas or oil boilers
- Fans
- Pumps
- Floor heating systems

## Functions

- Room temperature control via built-in sensor or external input
- Selection of operating mode via touchkey
- Setting time switches (individual days, 7 days, or days 5-2)
- Display of current room temperature or setpoint in °C or °F
- Touchkey lock (manually)
- Setpoint lock
- Periodic pump run
- Reloading factory settings for commissioning and control parameters
- One multifunctional input freely selectable for floor heating temperature limitation function
- Operating mode switchover contact (keycard, window contact, etc.)
- Standalone wireless transmitter and receiver
- Wireless operating frequency 433 MHz

## Temperature control

The RDE100.1RFS acquires the room temperature with its built-in sensor and maintains the setpoint by delivering control commands. The switching differential is 1 K.

| | |
|---|---|
| T | Room temperature |
| SD | Switching differential |
| W | Room temperature setpoint |
| Q14 | Output signal for heating |
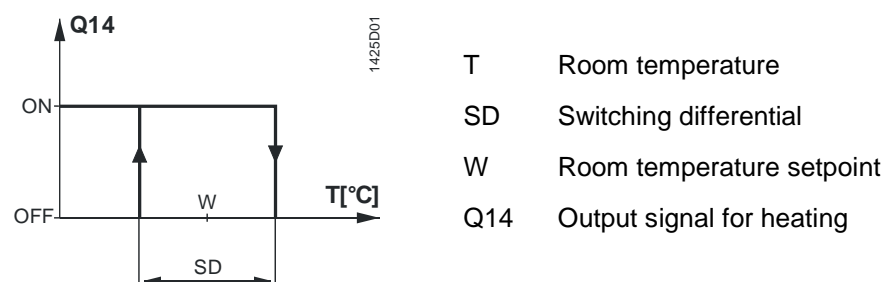
## Floor heating application

The factory setting for this function is Off (disabled) and must be set to "On" if floor heating is used.

The external floor temperature sensor is connected to input X1, ⊥ and acquires the floor temperature. If the floor temperature exceeds the parameterized temperature limit xx ºC (P14 = 1, P15 = 1, P16 = xx ºC), the heating valve is fully closed until the floor temperature returns to a level below the parameterized limit. Typical application is rooms (dry floor).

If the application does not require floor heating temperature limitation but instead uses the external sensor as a source for both room temperature display and control, the parameters will have to be set as follows: P14 = 1, P15 = 0. A typical application is the bathroom (wet floor) where a constant floor temperature is required.

It is not recommended to have **only** an internal built-in room sensor for floor heating since there is a potential risk of overheating.

## Operating mode changeover function

This function offers the keycard application (refer to the section "Operating notes", "Economy mode").

## Periodic pump or valve kick

This function can only be used when a circulating pump or valve is controlled!
It protects the pump or valve against seizing during longer off periods. The pump or valve kick is activated for 3 minutes every 24 hours at 12:00.

| Parameter | Pump state |
|---|---|
| P12 = 0 (default) | Off |
| P12 = 1 | On |
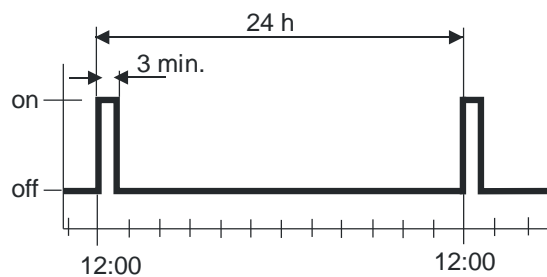
## Type summary

| Product No. | Stock No. | Features |
|---|---|---|
| RDE100.1RF | **S55770-T320** | Battery-powered room thermostat DC 3 V |
| RCR100RF | **S55770-T286** | Receiver AC 230 V |

## Ordering

When ordering, please indicate product No. / stock No. and description.

| Product No. | Stock No. | Description |
|---|---|---|
| RDE100.1RFS | **S55770-T282** | Set consisting of room thermostat and receiver |

Valve actuators/external sensor must be ordered separately.

## Equipment combinations

| Description | | Product No. | Data Sheet |
|---|---|---|---|
| Electromotoric actuators | | **SFA21..** | 4863 |
| Electrothermal actuators (for radiator valves) | | **STA23..** | 4884 |
| Electrothermal actuators (for small valves 2.5 mm) | | **STP23..** | 4884 |
| Damper actuators | | **GDB..** | 4634 |
| Damper actuators | | **GSD..** | 4603 |
| Damper actuators | | **GQD..** | 4604 |
| Rotary damper actuators | | **GXD..** | 4622 |
| Cable temperature sensor | | **QAH11.1** | 1840 |
| Room temperature sensors | | **QAA32 ..** | 1747 |

## Mechanical design

The room thermostat consists of 3 parts:
- Plastic housing which accommodates the electronics, the operating elements and the room temperature sensor
- Mounting plate with screw terminals
- Table stand

The housing engages in the mounting plate and is secured with a screw. The optional table stand snaps onto the rear of the mounting plate.

The RCR100RF receiver consists of 2 parts:
- Plastic housing which accommodates the electronics
- Mounting plate with screw terminals

**Operation and settings**  RDE100.1RF
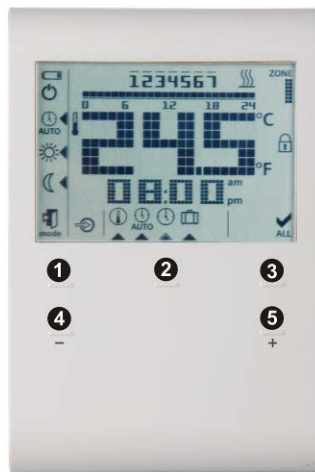


1)  Touchkey for operating mode
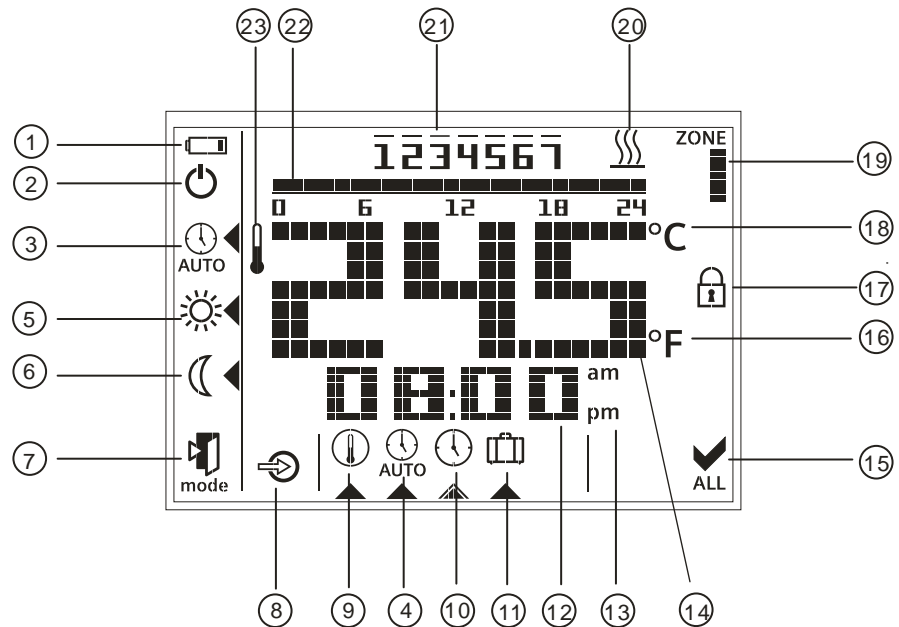
2)  Settings

3)  Ok

4)  Touchkey for decreasing a value

5)  Touchkey for increasing a value

RCR100RF



1)  LED for indication of operating state

2)  LEARN button (or override)

**Display**



| # | Symbol | Description | # | Symbol | Description |
|---|--------|-------------|---|--------|-------------|
| 1 | ▭ | Indicating that batteries need to be replaced | 13 | am pm | Morning: 12-hour format Afternoon: 12-hour format |
| 2 | ⏻ | Protection mode (Protection mode symbol can be enabled via parameter settings) | 14 | 245 | Display of room temperature, setpoint, etc. |
| 3 | ⏱ AUTO | Auto Timer mode | 15 | ✔ ALL | Confirmation |
| 4 | | View and set time switches | 16 | °F | Room temperature in degrees Fahrenheit |
| 5 | ☼ | Comfort mode | 17 | 🔒 | Touchkey lock activated |
| 6 | ☾ | Economy mode | 18 | °C | Room temperature in degrees Celsius |
| 7 | mode | Escape | 19 | ZONE | Display of zone (default is 1) |
| 8 | ⊸ | External input enabled | 20 | ♨ | Heating On |
| 9 | ⊘ | Adjustment of setpoint | 21 | 1234567 | Weekday 1 = Monday Weekday 7 = Sunday |
| 10 | ⏱ | Setting of weekday and time of day | 22 | | Timer bar |
| 11 | 🧳 | Setting of Holiday mode | 23 | | Current room temperature |
| 12 | 08:00 | Display of time of day | | | |

## Mounting and installation notes

Do not mount the thermostat in niches or bookshelves, not behind curtains, not above or near heat sources, and not exposed to direct solar radiation. Mount it about 1.5 m above the floor.
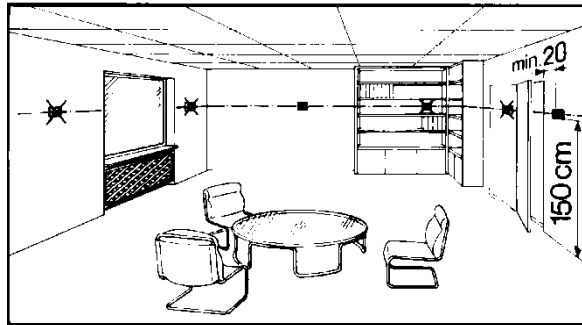


**Mounting** ⚠

- Mount the room thermostat in a clean and dry location without direct air flow from heating/cooling equipment, and not exposed to drip or splash water
- Install the receiver close to the controlled unit if possible
- Choose the location to ensure largely interference-free reception. When mounting the receiver, observe the following:
  - Do not mount in a control panel
  - Do not mount on metallic surfaces
  - Do not mount near electrical cables and equipment such as PCs, TVs, microwaves, etc.
  - Do not mount near larger metallic structures or constructional elements with fine metal meshes such as special glass or special concrete

**Wiring**

See Mounting Instructions CB1M1439xx enclosed with the thermostat.

- ⚠ Ensure that wiring, protection and earthing comply with local regulations
- ⚠ Correctly size the cables to the thermostat and the valve actuators
- ⚠ Use only valve actuators rated for AC 24… 230 V
- ⚠ If the thermostat cannot accommodate all cables, power must be fed to the system via an external terminal block

⚠ **Warning!**
**No internal line protection for supply lines to external consumers.**
Risk of fire and injury due to short-circuits!

- ⚠ Adapt the line diameters as per local regulations to the rated value of the installed overcurrent protection device.
- ⚠ The AC 230 V mains supply line must have a circuit breaker with a rated current of no more than 10 A
- ⚠ Disconnect from power supply before removing the unit from its mounting plate
- ⚠ External inputs X1, ⊥ may carry mains potential. Sensor cables or window contact must be carefully installed before applying power to the thermostat
- ⚠ Make sure the receiver is not connected to power during wiring

## Commissioning notes

**Commissioning**

After power is applied, the thermostat carries out a reset during which all LCD segments flash, indicating that the reset is correctly made. After the reset, the thermostat is ready for commissioning by qualified HVAC personnel.

The control parameters of the thermostat can be set to ensure optimum performance of the entire system (refer to Operating Instructions CB1B1425en, section "Do you want to change parameters?").

**Sensor calibration**

If the temperature shown on the display does not agree with the room temperature effectively measured, the temperature sensor can be recalibrated. For that purpose, adjust parameter P04.

**Setpoint lock**

We recommend to review the setpoint lock (for public spaces) using parameters P06 and P08 and change them as needed.

**Touchpad scanning rate**

Since the thermostat uses touch technology and to minimize battery power consumption, parameter P21 (adjustable from 0.25 to 1.5 seconds) is implemented for the user to adjust.

This means that when, for a certain time, the user does not touch the touchpad, the unit operates in power saving mode and the touchpad is running at a scanning rate of 1 second.

(From the calculation – assuming 4 operations per day on the thermostat, the estimated 1-second scanning rate results in a battery life of 1 year. If the user increases the scanning rate, the batteries' life is extended.

**Change of batteries**

If the battery symbol ⬜ appears, the batteries are almost exhausted and should be replaced. Use alkaline batteries type AAA.

**LED indication on RCR100RF**

For the pairing process between transmitter and receiver, refer to Operating Instructions CB1B1425en, section "Do you want to pair transmitter and receiver?". The table below describes the behavior of the RCR100RF:

| State of receiver | State of LED |
|---|---|
| Power up (or reset) | The red and green LEDs flash alternately for 5 seconds and then change to constantly red. Note: If the receiver was programmed before, it will immediately change to constantly red. |
| Learning mode Successful learning mode | The red and green LEDs flash alternately. If learning was successful, the green LED will flash for 10 minutes. |
| Signal ok and output status change | The green LED is lit. If the output state changes, the green LED flashes for 3 seconds and then changes back to constantly green. |
| Fails to receive wireless data | If the RCR100RF fails to receive wireless data, the red LED will start to flash after 125 minutes. If the RCR100RF signal is recovered, it will resume the previous LED state. |

**Override via the RCR100RF** ⏱

The receiver provides an override function (boiler test, emergency operation). It allows the installer to override the relay to be permanently energized, regardless of the wireless data received.

To activate the override function, press and hold the ⏱ button for at least 10 seconds and release. The LED is constantly green and off once every 5 seconds, indicating that the override function is enabled.

To disable the override function, press the ⏱ button once.

## Operating notes

The RDE100.1RF provides Comfort, Economy, Auto Timer and Protection mode. The difference between Comfort and Economy mode is only the room temperature setpoint. The changeover between Comfort, Economy and Protection mode is made either automatically by the time switch or by pressing the touchkey for the operating mode.

**Comfort mode ☀** When Comfort mode is activated, symbol ☀ appears on the display. The setpoint (20 ºC) can be readjusted by pressing touchkeys **+** and **−**.

**Economy mode ☾** When Economy mode is activated, symbol ☾ appears on the display. The setpoint (16 ºC) can be readjusted by pressing touchkeys **+** and **−**.

With the RDE100.1RF, the user can connect a window contact to input X1, ⊥. Depending on whether the window contact is configured for NO or NC (P14 = 2, P17 = 0 or 1), a change in this state will automatically switch the thermostat from any operating mode to Economy. This feature is suited for public spaces. The factory setting is Off (disabled).

**Protection mode ⏻** If the temperature falls below 5 ºC, the unit automatically activates the heating output. Symbol ⏻ appears only if the icon is enabled via parameter settings.

**Auto Timer ⏲** When Auto Timer mode is enabled, the changeover between the operating modes (Comfort and Economy) takes place automatically. There are 3 options for time switch settings: Individual days, 7 days, or days 5-2. You can select Comfort or Economy mode at 15-minute intervals of the day. The 0:00 to 24:00 hour time bar allows you to set the operating mode throughout the selected day(s).

| Default value | Day/s | Comfort mode | Economy mode |
|---|---|---|---|
| | Mo (1) – Fr (5) | 6:00 – 8:00 hr<br>17:00 – 22:00 hr | 22:00 – 6:00 hr<br>8:00 – 17:00 hr |
| | Sa (6) – Su (7) | 7:00 – 22:00 hr | 22:00 – 7:00 hr |

Refer to Operating Instructions CB1B1425, section "Do you want to enter your own time switch?".

**Holiday mode 🧳** When Holiday mode is activated, symbol 🧳 appears on the display. The setpoint (12 ºC) and the number of days a user is absent can be adjusted by pressing touchkeys **+** and **−**.

## Maintenance note

Thermostat and receiver are maintenance-free.

## Disposal

The devices are considered electronics devices for disposal in term of European Directive 2012/19/EU and may not be disposed of as domestic waste.

- Dispose of the device via the channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.
- Dispose of empty batteries at designated collection points.

## Technical data of RDE100.1RF

| | | |
|---|---|---|
| ⚠ **Power supply** | Operating voltage | |
| | RDE100.1RF | DC 3 V (2 x 1.5 V alkaline batteries AAA) |
| | For battery life (RDE100.1RF), see below (alkaline batteries type AAA). | |
| | Battery life calculation is based on the touchpad scanning rate during idle time (assuming a user presses 4 touchkeys per day): | |
| | Scanning rate 0.25 s | 311 days battery life |
| | Scanning rate 0.5 s | 322 days battery life |
| | Scanning rate 1 s (default) | 357 days battery life |
| | Scanning rate 1.5 s | 377 days battery life |
| **External sensor** | External sensor  (RDE100.1RF) | |
| | 'X1' - '⊥' (reference) | QAH11.1 (NTC 3K) / QAA32 |
| | Temperature range | 0…60 °C |
| | Cable length | Max. 80 m |
| | or | |
| | Digital On/Off | |
| | 'X1' - '⊥' (reference) | On/Off switch |
| **Function data** | Switching differential SD | 1 K |
| | Comfort mode | 20 °C (5...35 °C) |
| | Economy mode | 16 °C (5...35 °C) |
| | Holiday mode | 12 °C (5...35 °C) (standalone) |
| | Built-in room temperature sensor | |
| | Setpoint setting range | 5…35 °C (Comfort/Economy mode) |
| | Accuracy at 25 °C | < ±0.5 K |
| | Temperature calibration range | ±3.0 K |
| | Resolution of settings and displays | |
| | Setpoints | 0.5 °C |
| | Temperature value displays | 0.5 °C |
| **Environmental conditions** | Operation | As per IEC 60721-3-3 |
| | Climatic conditions | Class 3K5 |
| | Temperature | 0…50 °C |
| | Humidity | <95% r.h. |
| | Transport | As per IEC 60721-3-2 |
| | Climatic conditions | Class 2K3 |
| | Temperature | -25…60 °C |
| | Humidity | <95% r.h. |
| | Mechanical conditions | Class 2M2 |
| **Standards and directives** | Storage | As per IEC 60721-3-1 |
| | Climatic conditions | Class 1K3 |
| | Temperature | -25…60 °C |
| | Humidity | <95% r.h. |
| | EU Conformity (CE) | CE1T1420xx[*)] |
| | RCM conformity | CE1T1420en_C1*) |
| | Safety class | II as per EN 60730-1, EN 60730-2-9 |
| | Pollution class | II as per EN 60730-1 |
| | Degree of protection of housing | IP30 as per EN 60529 |
| **Environmental compatibility** | The product environmental declaration CE1E1420xx [*)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal). | |

| Eco design and labelling directives | Based on EU Regulation 813/2013 (Eco design directive) and 811/2013 (Labelling directive) concerning space heaters, combination heaters, the following classes apply: | | |
|---|---|---|---|
| | Application with On/Off operation of a heater | Class I | value 1.0% |
| **General** | Connection terminals for | Solid wires or prepared stranded wires 2 x 1.5 mm$^2$ or 1 x 2.5 mm$^2$ (Min. 0.5 mm$^2$) | |
| | Weight | 0.179 kg | |
| | Color of housing front | RAL9003 | |

*) The documents can be downloaded from http://siemens.com/bt/download.

## Technical data of RCR100RF

| | | | |
|---|---|---|
| ⚠ **Power supply** | Operating voltage | AC 230 V +10/-15% |
| | Power | <10 VA |
| | Frequency | 48...63 Hz |
| | Switching capacity of relays | |
| | Voltage | AC 24...230 V |
| | Current | 8 (2) A |
| ⚠ **Switching outputs (Q11, Q12, Q14)** | Switching voltage | Max. AC 230 V |
| | | Min. AC 24 V |
| | Switching current | Max. 8 A res., 2 A ind. |
| | At AC 230 V | Min. 200 mA |
| ⚡ | **No internal fuse.** | |
| | External preliminary protection with max. C 10 A circuit breaker in the supply lines required under all circumstances. | |
| | External protection for incoming cable | |
| | Circuit breaker | Max. 10 A |
| | Circuit breaker tripping characteristic | Type B, C or D to EN 60898 and EN 60947 |
| | Contact life at AC 230 V | Guide value: |
| | At 8 A res. | 1 x 10$^5$ cycles |
| | Insulating strength | |
| | Between relay contacts and coil | AC 5,000 V |
| | Between relay contacts (same pole) | AC 1,000 V |
| **Electrical connections** | Connection terminals | Screw terminals |
| | For solid wires | 2 x 1.5 mm$^2$ |
| | For stranded wires | 1 x 2.5 mm$^2$ (Min. 0.5 mm$^2$) |
| **Environmental conditions** | Operation | As per IEC 60721-3-3 |
| | Climatic conditions | Class 3K5 |
| | Temperature | 0…50 °C |
| | Humidity | <95% r.h. |
| | Transport | As per IEC 60721-3-2 |
| | Climatic conditions | Class 2K3 |
| | Temperature | -25…60 °C |
| | Humidity | <95% r.h. |
| | Mechanical conditions | Class 2M2 |
| | Storage | As per IEC 60721-3-1 |
| | Climatic conditions | Class 1K3 |
| | Temperature | -25…60 °C |
| | Humidity | <95% r.h. |
| **Standards and directives** | EU Conformity (CE) | CB1T1420xx [*)] |
| | RCM conformity | AS/NZS 4251.1:1999 |
| | Safety class | II as per EN 60730-1, EN 60730-2-9 |

| | | |
|---|---|---|
| Pollution class | II as per EN 60730-1 | |
| Degree of protection of housing | IP30 as per EN 60529 | |

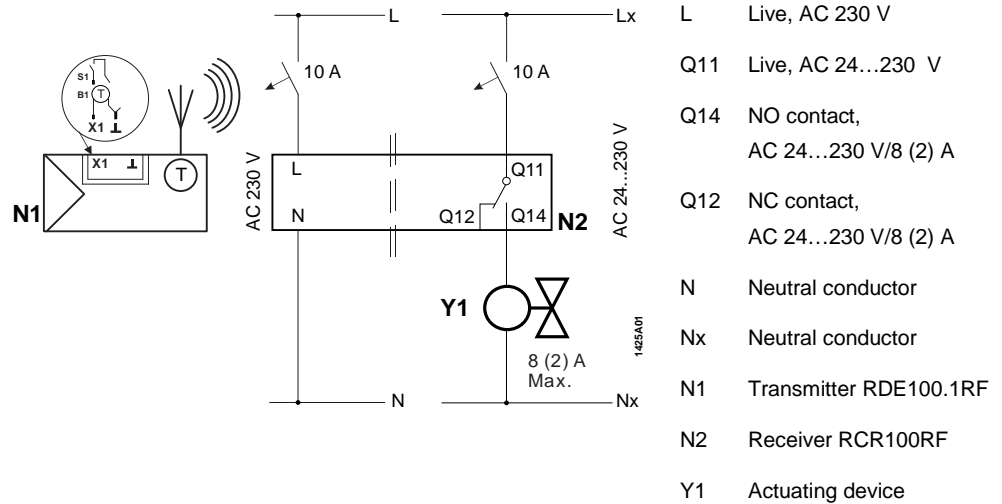**Environmental compatibility**

The product environmental declaration CE1E1420xx [*)] contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).
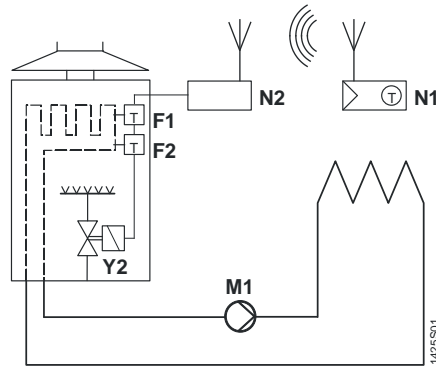
**General**

| | | |
|---|---|---|
| Weight | 0.152 kg | |
| Color of housing front | RAL9003 | |

*) The documents can be downloaded from http://siemens.com/bt/download.

## Connection diagrams



| | |
|---|---|
| L | Live, AC 230 V |
| Q11 | Live, AC 24…230 V |
| Q14 | NO contact, AC 24…230 V/8 (2) A |
| Q12 | NC contact, AC 24…230 V/8 (2) A |
| N | Neutral conductor |
| Nx | Neutral conductor |
| N1 | Transmitter RDE100.1RF |
| N2 | Receiver RCR100RF |
| Y1 | Actuating device |

⚠ L – N AC 230 V / Lx – Nx AC 24…230 V
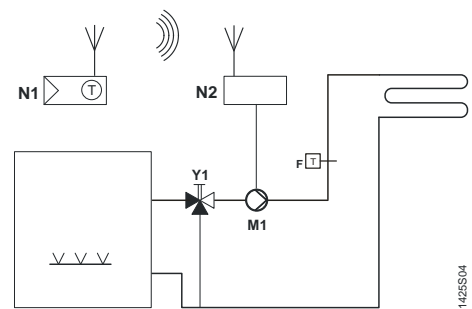
**Application examples**



Room thermostat with direct control of a gas-fired wall-hung boiler
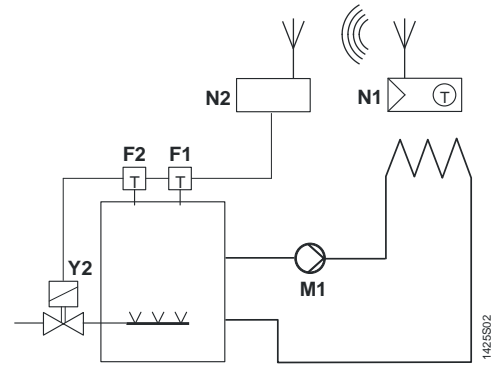


Room thermostat with direct control of a gas-fired floor-standing boiler
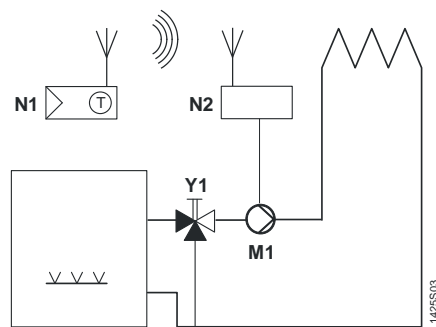


Room thermostat with direct control of a heating circuit pump (precontrol by manual mixing valve)
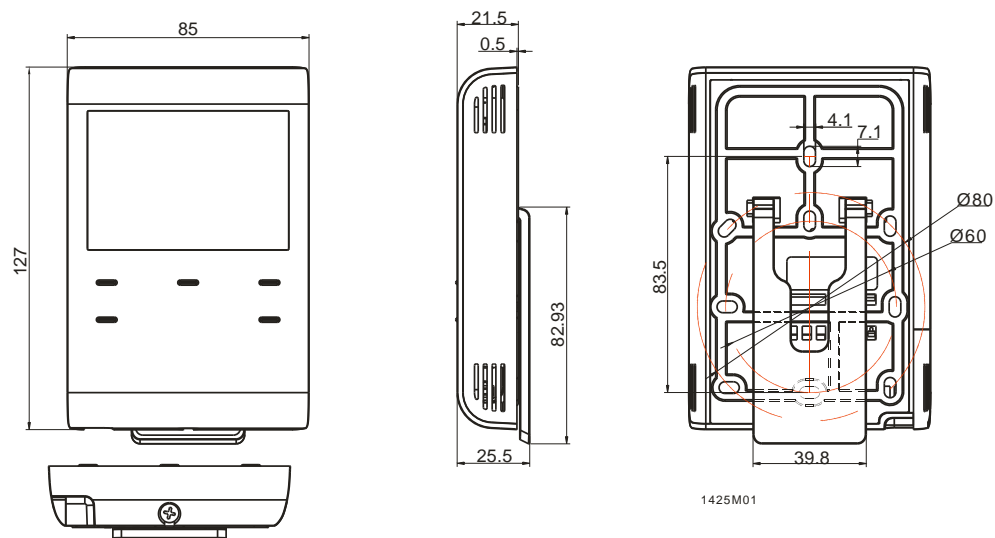


Room thermostat with direct control hydronic floor heating system

F1      Thermal reset limit thermostat
F2      Safety limit thermostat
M1     Circulating pump
N1     RDE100.1RF room thermostat
Y1     3-port valve with manual
        adjustment
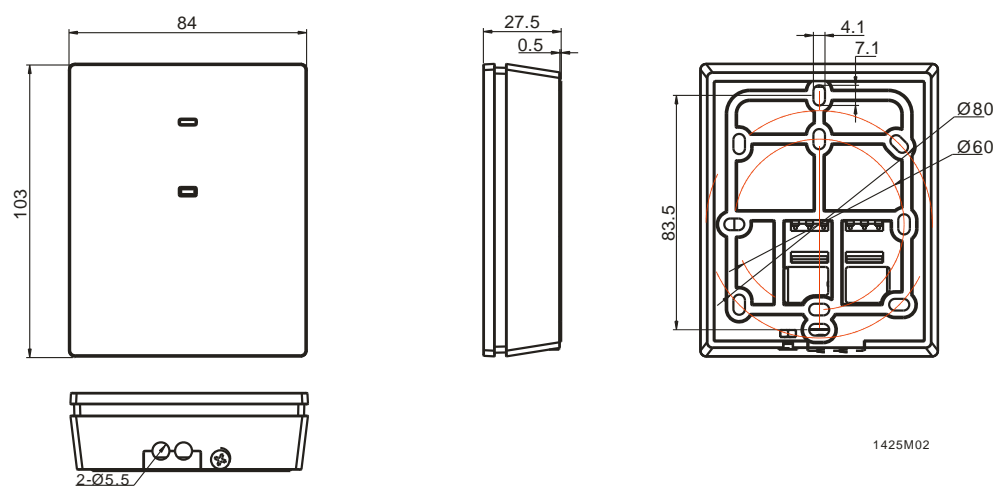Y2     Magnetic valve

**Dimensions**

**Dimensions in mm**    Room thermostat RDE100.1RF



1425M01

Receiver RCR100RF



1425M02

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Siemens    RDE100.1RFS    Wireless room thermostat with auto timer    CB1N1425en
Building Technologies    2015-04-28