SIEMENS

Room Temperature Controller
with 7-Day Time Switch, LCD and
opt. Remote Temperature Sensor   RDE20.1

for heating systems

2-position control with ON/OFF output for heating
Operating modes: normal operation and energy saving mode
7-day time switch and manual operation
Battery-powered DC 3 V
Input for external temperature sensor

Use

The RDE20.1 is used for the control of the room temperature in heating systems.

Typical applications:

- Apartments
- Commercial spaces
- Schools

For the control of the following pieces of equipment:

- Thermic valves or zone valves
- Gas or oil burners
- Fans
- Pumps

Functions

The controller acquires the room temperature with its integrated sensor or external room temperature sensor (QAA32) or external return air temperature sensor (QAH11) – if used – and maintains the setpoint by delivering control commands. The switching differential is 1 K.

Function diagram

T	Room temperature
SD	Switching differential
W	Room temperature setpoint
Q14	Output signal for heating
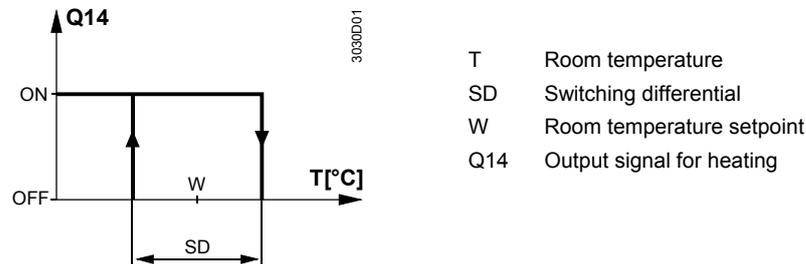
Remote temperature sensor

The RDE20.1 can provide control either according to the internal room temperature or according to a remote temperature. The controller detects automatically when a QAH11 is connected. In this case, the internal temperature sensor is deactivated.

Operating modes

The RDE20.1 provides normal operation and, optionally, energy saving mode or OFF. The difference between normal operation and energy saving mode is only the room temperature setpoint. The changeover between the operating modes can be made either automatically according to the 7-day time switch or manually with the operating mode selector.

Normal operation

When normal operation is activated, symbol " ☼ " appears on the display. The setpoint can be readjusted by pressing buttons ⊕ and ⊖.

Energy saving mode or OFF

When energy saving mode is activated, symbol " ☾ " appears on the display. The set-point can be readjusted by pressing buttons ⊕ and ⊖.

In energy saving mode, the unit can also be switched to "Off". This is accomplished by selecting a setpoint of 5 °C and then keeping button ⊖ depressed for 4 seconds. In that case, the "*OFF*" will appear and the symbol " ☾ " does not appear.

7-day time switch

The changeover between the operating modes can take place either automatically (▪▰▪) or manually (☼, ☾), depending on the position of the operating mode selector. When the operating mode selector is in position " ▪▰▪ ", changeover will take automatically according to the selected switching pattern. For every weekday, a specific switching pattern can be selected.
Factory setting:

Day(s)	Normal operation	Energy saving mode
Mo (1) – Fr (5)	6:00 – 8:00 h and 17:00 – 22:00 h	22:00 – 6:00 h and 08:00 – 17:00 h
Sa (6) – Su (7)	7:00 – 22:00 h	22:00 – 7:00 h

The current setpoint can be temporarily readjusted by pressing buttons ⊕ and ⊖. The setpoint will then be reset to its initial value the next time automatic or manual changeover takes place.

When the operating mode selector is set to " ☼ " or " ☾ ", the RDE20.1 will maintain normal operation or energy saving mode respectively.

Display

The digital display shows the actual room temperature, the time of day, the weekday, the current switching pattern and the symbol of the operating mode currently active. The switching pattern shows normal operation as a double bar and energy saving mode as a single bar with a flashing time pointer. When the heating output is activated, the triangle symbol appears.
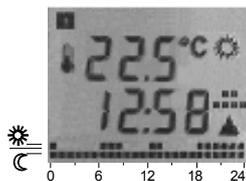
Automatic changeover according to the switching pattern
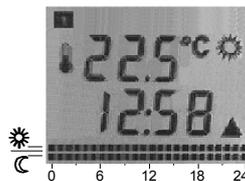
Normal operation
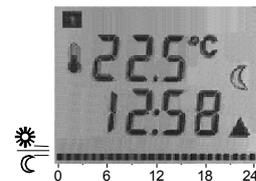
Energy saving mode

Backup

When taking out the batteries, the setpoints and the information required for operating mode changeover are retained for 3 minutes.

Ordering

When ordering, please give name and type reference: room temperature controller RDE20.1.
Sensor and valve actuators are to be ordered as separate items.

Equipment combinations

Type of unit	Type reference	Data sheet
Temperature sensor	**QAH11**	1840
Room sensor	**QAA32**	1747
Electromotoric actuator	**SFA21...**	4863
Electrothermal actuator (for radiator valve)	**STA21...**	4877
Electrothermal actuator (for small valve 2,5 mm)	**STP21...**	4878
2-port and 3-port zone valves	**MXI/MVI421…**	4867
Electromotoric actuator for zone valve V..146..	**SUA21**	4830
Electric actuator	**SUA11/22**	4832
Air damper actuator	**GDB…**	4624
Air damper actuator	**GSD/GQD…**	4606
Rotary damper actuators	**GXD…**	4622
16A extension relay module	**SEZ16**	-

Accessories

| Description	Type reference
Adapter plate 120 x 120 mm for 4" x 4" conduit boxes	ARG70
Adapter plate 96 x 120 mm for 2" x 4" conduit boxes	ARG70.1
Adapter plate for surface wiring 112x130 mm	ARG70.2

The unit consists of two parts:
- A plastic housing with digital display, which accommodates the electronics, the operating elements and the built-in room temperatures sensor
- A mounting base

The housing engages in the mounting base and snaps on.
The base carries the screw terminals.
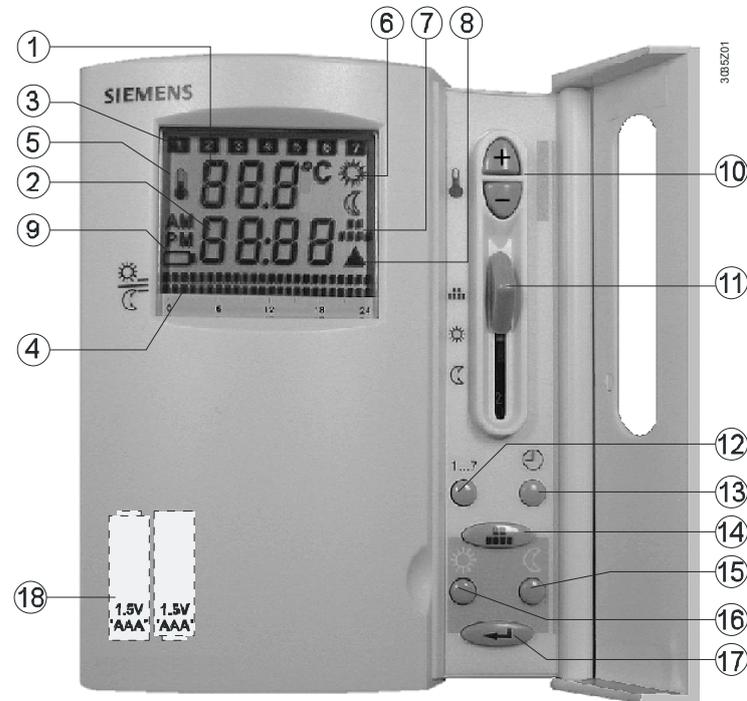
Legend

1 Display of the room temperature in °C or setpoints
2 Current time of day using the format 00:00 ... 23:59
3 Current weekday from 1 (Monday) to 7 (Sunday)
4 Current switching pattern with flashing time pointer
5 ⬛ symbol when actual room temperature is displayed
6 ☼ Normal operation
    ☾ Energy saving mode
7 ▪▪▪ symbol in automatic mode or when selecting the switching pattern
8 ▲ heating on
9 ▭ symbol indicating that batteries need to be replaced
10 Buttons for adjusting the setpoints, the time of day and the switching times
11 Operating mode selector
12 Setting the weekday
13 Setting the time of day
14 Selecting and leaving the setting mode for the switching pattern
15 Setpoint adjustment for energy saving mode
16 Setpoint adjustment for normal operation
17 Button for confirming the switching pattern settings
18 Battery compartment

4/8

Siemens
Building Technologies

Room temperature controllers

CE1N3036en
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The room temperature controller should be mounted in a location where the air temperature can be measured as accurately as possible without getting adversely affected by direct solar radiation or other heat or refrigeration sources.

Mounting height is about 1.5 m above the floor.
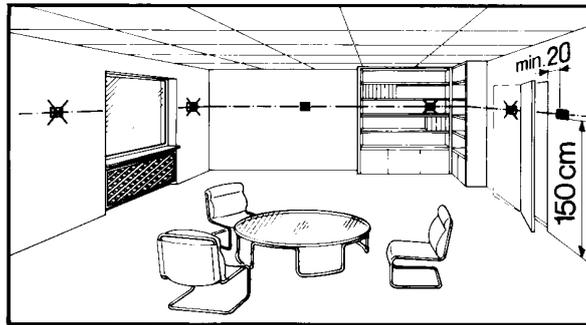
The unit can be fitted to a recessed conduit box.

- Only authorised staff may open the controller.
  Caution: The switching output voltage is from AC24V up to AC250V
- The cables used must satisfy the insulation requirements with regard to mains potential

Mounting, installations and commissioning

When mounting the unit, fix the baseplate first. Then, make the electrical connections and fit and secure the cover (also refer to separate Mounting Instructions).
The controller must be mounted on a flat wall and in compliance with local regulations. If there are thermostatic radiator valves in the reference room, they must be set to their fully open position.

Maintenance

The controller is maintenance-free.

Sensor calibration

If the temperature on the display does not agree with the room temperature effectively measured, the temperature sensor can be recalibrated. For that purpose both buttons ⊕ and ⬅ must be pressed simultaneously for 3 seconds. Then, the temperature displayed can be changed by a maximum of +/- 10 K by pressing the ⊕ and ⊖ buttons. Five seconds after the last push of a button, the controller will automatically return to the normal operational status.

Setpoint limitation

The setpoint limitation is used in some specific applications where the setpoint temperature is required to be above 35°C (Less than 60°C). For that purpose both buttons ⊕ and ⊖ must be pressed simultaneously for 5 seconds. The top row of the LCD will then display 35°C to signify the default setpoint limitation whereas the bottom row will display *SPLt* to signify the setpoint limitation mode. The temperature limitation can be changed by pressing the ⊕ and ⊖ buttons. Five seconds after the last push of a button, the controller will automatically saved the value and return to the normal operational status.

Change of batteries

If the battery symbol appears, the battery power is almost exhausted and the batteries should be replaced. Only AAA alkaline batteries have to be used.

Reset

To reset, first press and hold the button ⊙, then press the two buttons ⊖ simultaneously for 3 seconds. All individual settings will be reset to their standard values.

Technical data

Power supply	Operating voltage	DC 3 V (2 x 1.5 V AAA Alkaline batteries)
	Battery life (RDE20.1)	> 1 years (AAA Alkaline batteries)
	Supply line fusing	max. 10 A
Sensor inputs	**External:**	
	External temperature sensor	QAH11/QAA32, Safety class II
	(Inputs B1, M)	NTC resistor 3 kΩ at 25°C
	Permissible cable length for	max. 20 m, copper cable, 1.5 mm^2
	External sensor (Terminal B1)	
	Tolerance	max. ± 2.5°C
	Internal:	
	Thermistor	10 kΩ ± 1% at 25°C
Outputs	Relay Contacts	
⚠ Switching Outputs (Q11, Q12, Q14)	Switching voltage	max. AC 250 V
		min. AC 24 V
	Switching current	max. 5A res., 2 A ind.
	At 250 V	min. 50 mA
	Contact life at AC 250 V	guide values:
	At 0.1 A res.	2 x 10^6 cycles
	At 0.5 A res.	1 x 10^6 cycles
	At 4 A res.	1.5 x 10^5 cycles
	No load	5 x 10^7 cycles
	Insulating strength	
	Between relay contacts and coil	AC 3750 V for 6 sec.
		AC 2000 V for 60 sec.
	Between relay contacts (same pole)	AC 1000 V for 60 sec.
Operational data	Switching differential SD	1 K
	Setpoint setting range	5…35 °C (normal operation)
		5…60 °C (with setpoint limitation)
		0 (OFF) and 5…35 °C (energy saving mode)
	Factory setting normal operation	20 °C
	Factory setting energy saving mode	8 °C
	Resolution of settings and displays	
	Setpoints	0.5 °C
	Switching times	60 min
	Actual value displays	0.5 °C
	Time of day displays	1 min
	Setpoint Limitation range	35…60 °C
	Factory setting setpoint limitation	35 °C
	Resolution for setpoint limitation	0.5 °C
Electrical connections	Connection terminals	screw clamp terminals
	(via mounting plate)	
	For solid wires	2 x 1.5mm^2
	For stranded wires	1 x 2.5mm^2
		(Minimum 0.5 mm^2)
Environmental conditions	Operation	to IEC 721-3-3
	Climatic conditions	class 3K5
	Temperature	0…+50 °C
	Humidity	<95 % r. h.

Transport	to IEC 721-3-2	
Climatic conditions	class 2K3	
Temperature	-25…+60 °C	
Humidity	<95 % r. h.	
Mechanical conditions	class 2M2	
Storage	to IEC 721-3-1	
Climatic conditions	class 1K3	
Temperature	-25…+60 °C	
Humidity	<95 % r. h.	

Norms and standards	CE conformity to	
	EMC directive	2004/108/EC
	Low voltage directive	2006/95/EC
	C-Tick conformity to	
	EMC Requirement	AS/NZS 4251.1: 1999
	Product standards	
	Automatic electrical controls for	EN 60 730- 1 and
	household and similar use	EN 60 730- 2-9
	Electromagnetic compatibility	
	Emissions (industrial sector)	EN 61000-6-3
	Immunity (domestic sector, light ind.)	EN 61000-6-1
	Safety class	II to EN 60730
	Pollution degree	3
	Degree of protection of housing	IP30 to EN 60529
General	Weight	0.21 kg
	Colour of housing front	white, RAL 9003
	Housing material	ABS (Slider: POM, LCD Lens: GP PS)

Connection diagram
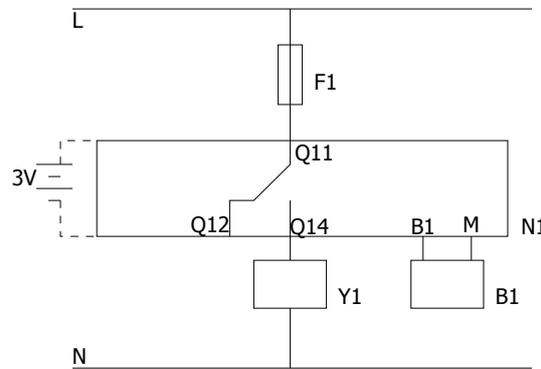
|	
B1	QAH11 external temperatures sensor
N1	RDE20.1 room temperature controller
Y1	Regulating unit
L, N	Live, Neutral AC 24...250 V
B1	Signal input "External temperature sensor"'
F1	External fuse
M	Measuring neutral "External temperature sensor"'
Q11, Q12	N.C. contact (for N.O. valves)
Q11, Q14	N.O. contact (for N.C. valves)

Application examples
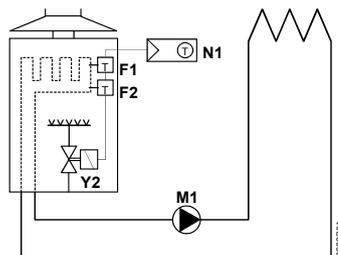
Room temperature controller with direct
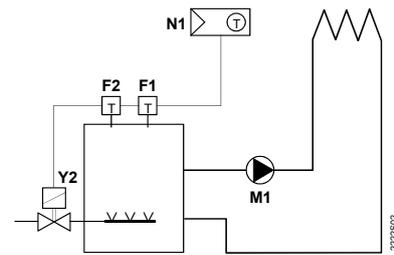
Room temperature controller with direct

control of a gas-fired wall-hung boiler

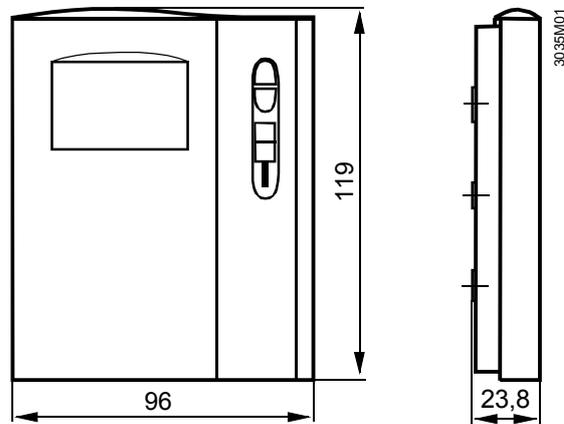control of a gas-fired floor-standing boiler
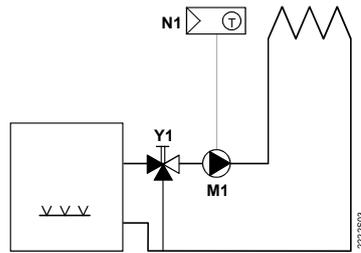
Room temperature controller with direct control of a heating circuit pump (precontrol by manual mixing valve)

F1	Thermal reset limit thermostat	N1	RDE20.1 room temperatures controller
F2	Safety limit thermostat	Y1	3-port valve with manual adjustment
M1	Circulating pump	Y2	Magnetic valve

Dimensions

Controller

Baseplate

Subject to change