



Room Temperature Controller

RCC30

for four-pipe fan coil units

Outputs for on / off valve actuators

Outputs for three-speed fan

Control depending on room or return air temperature

Operating modes: normal, energy saving and frost protection or OFF

Operating mode changeover input for remote control

Selectable control parameters

Operating voltage AC 230 V

Use

Typical use:

- Control of the room temperature in individual rooms that are heated or cooled with four-pipe fan coil units.
- For opening or closing a valve
- for switching a three-speed fan.

Functions

The controller acquires the room temperature with its integrated sensor or external room temperature sensor (QAA32) or external return air temperature sensor (QAH11.1) - if used - and maintains the setpoint by delivering control commands to the 2-point-valve.

The switching differential is adjustable. It can be 1 or 4 K in heating mode and 0.5 or 2 K in cooling mode.

Fan operation

The fan is switched to the selected speed via control output Q1, Q2 or Q3.

When the function "Temperature-dependent fan control" is activated (can be selected with DIP switch no.1), the fan is switched on / off depending on the temperature, that is, together with the valve.

It is switched off by

- leaving the heating or cooling sequence, provided the function "Temperature-dependent fan control" is activated, or
- manually changing to standby ⓪ , provided plant conditions do not call for frost protection mode, or
- activating an external operating mode changeover switch, provided plant conditions do not call for energy saving or frost protection mode, or
- turning the controller's power supply off.

Heating mode

ON

The heating valve receives the **OPEN** command via control output Y11 when

1. the measured room temperature lies by half the switching differential below the setpoint, and
2. the heating valve has been fully closed for more than one minute.

OFF

The heating valve receives the **CLOSE** command via control output Y11 when

1. the measured room temperature lies by half the switching differential above the setpoint, and
2. the heating valve has been fully open for more than one minute.

Cooling mode

ON

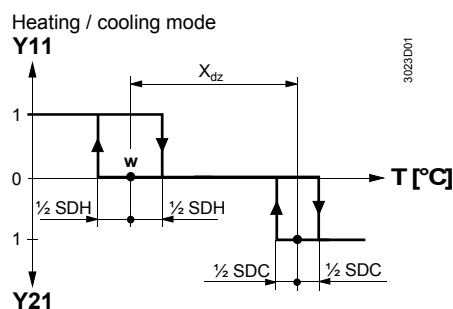
The cooling valve receives the **OPEN** command via control output Y21 when

1. the measured room temperature lies by half the switching differential plus the dead zone above the setpoint ($x \geq w + x_{dz} + \frac{1}{2} \text{SDC}$) and
2. the cooling valve has been closed for more than one minute.

OFF

The cooling valve receives the **CLOSE** command via control output Y21 when

1. the measured room temperature lies by half the switching differential plus the dead zone below the setpoint ($x > w + x_{dz} - \frac{1}{2} \text{SDC}$) and
2. the cooling valve has been open for more than one minute.



| | |
|----------|--------------------------------------|
| T | Room temperature |
| SDH | Switching differential "Heating" |
| SDC | Switching differential "Cooling" |
| X_{dz} | Dead zone |
| w | Room temperature setpoint |
| Y11 | Manipulated variable "Heating valve" |
| Y21 | Manipulated variable "Cooling valve" |

Return air temperature

The RCC30 provides control either depending on the measured room temperature or depending on the fan coil unit's return air temperature. Changeover is automatic if a QAH11.1 cable temperature sensor is connected to the device.

Energy saver

The room temperature setpoint can be limited in increments of 1 K by making use of the minimum and maximum limitation facility. Arbitrary setpoint readjustments can thus be prevented.

Operating modes

The following operating modes are available:

Normal operation

Heating or cooling mode with automatic changeover and with manually selected fan speed III, II or I. In normal operation, the controller maintains the adjusted setpoint in heating mode and, in cooling mode, a temperature level represented by the setpoint plus the dead zone.

Frost protection mode

The frost protection function is activated only when DIP switch no.4 is set to OFF. Frost protection mode can be activated either

- by manually switching to standby ☺
- by activating the external operating mode changeover switch, provided DIP switch no.2 is set to OFF

If the room temperature falls below 8 °C, the controller will automatically switch to frost protection mode. In that case, the heating valve opens and the fan operates at the selected speed. If the operating mode selector is in position standby ☺, the fan will operate at speed I. The room temperature is maintained at a setpoint of 8 °C and the setpoint adjusted by the user will be ignored.

If frost protection mode is locked (DIP switch no.4 in position ON), standby is locked also, which means that the controller will not switch to standby but to OFF.

Energy saving mode

In energy saving mode, the setpoint of heating is 16 °C and the setpoint of cooling 28 °C, independent of the position of the setpoint knob. This operating mode will be activated when input D1 for operating mode changeover is active and DIP switch no.2 is set to ON.

Operating mode changeover switch

A changeover switch can be connected to status input D1-GND. When the switch closes its contact (caused by an open window, for instance), the operating mode will change from normal operation to energy saving mode (provided DIP switch no.2 is set to ON), or from normal operation to standby (provided DIP switch no.2 is set to OFF). If the room temperature falls below 8 °C and if DIP switch no.4 is set to OFF, frost protection mode will become active.

The operating action of the switch (N.C. or N.O.) can be selected.

Ordering

When ordering, please give name and type reference.

The QAH11.1 temperature sensor (used as a return air temperature sensor) and zone valves are to be ordered as separate items.

Equipment combinations

| Type of unit | Type reference | Data sheet |
|---|-----------------|------------|
| Temperature sensor | QAH11.1 | 1840 |
| Room sensor | QAA32 | 1747 |
| Motoric on/off actuator | SFA21... | 4863 |
| Thermal actuator (for radiator valve) | STA21... | 4893 |
| Thermal actuator (for small valve 2,5 mm) | STP21... | 4878 |

Mechanical design

The unit consists of two parts:

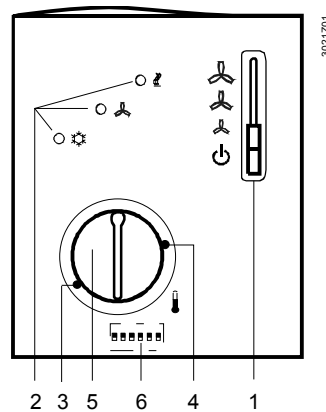
- A plastic housing which accommodates the electronics, the operating elements and the built-in room temperature sensor
- A mounting base

The housing engages in the mounting base and snaps on.


The base carries the screw terminals.

The DIP switches are located at the rear of the housing.

Setting and operating elements



Legend

1. Operating mode selector
(standby , heating or cooling mode with manual selection of fan speed)
2. LEDs for indicating heating mode, cooling mode and fan operation
3. Setting facility for minimum setpoint limitation
(in increments of 1 K)
4. Setting facility for maximum setpoint limitation
(in increments of 1 K)
5. Room temperature setpoint knob

6. Set of DIP switches

| DIP switch no. | Meaning | Position ON | Position OFF |
|----------------|---|--|--|
| 1 | Fan control | Fan control is temperature-dependent in all operating modes | Fan control in normal operation is temperature-independent ¹⁾ |
| 2 | Operating mode change-over via external switch | Changeover between normal operation and energy saving mode | Changeover between normal operation and standby ¹⁾ |
| 3 | Operating action of switch for external operating mode changeover | Changeover activated when contact of switch is closed (N.O.) ¹⁾ | Changeover activated when contact of switch is open (N.C.) |
| 4 | Standby | Frost protection function not enabled | Frost protection function enabled ¹⁾ |
| 5 | Switching differential | 1 K in heating mode ¹⁾ 0.5 K in cooling mode ¹⁾ | 4 K in heating mode 2 K in cooling mode |
| 6 | Dead zone in normal operation | 2 K ¹⁾ | 5 K |

1) Factory setting

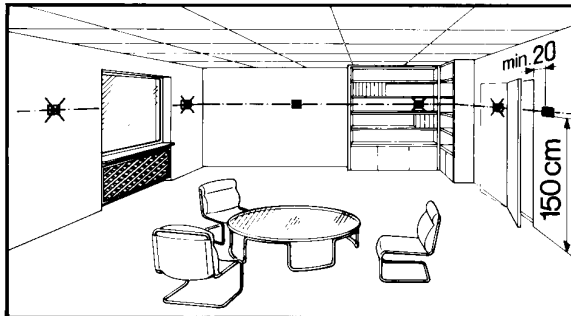
Accessories

| 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 |

Engineering notes

Mounting, installation and commissioning notes

Mounting location: on the wall or inside the fan coil unit. Not in niches or bookshelves, not behind curtains, above or near heat sources and not exposed to direct solar radiation. Mounting height is about 1.5 m above the floor. The connecting wires can be run to the controller from a recessed conduit box.



Check the settings of the DIP switches no.1 through no.6 and change them if required. If setpoint limitation is required, use the minimum and maximum limitation facility (energy saver).






After applying power, the controller makes a reset during which the fan LED flashes, indicating that the reset has been correctly made. This takes about 3 seconds. Then, the controller will be ready to operate and the LED stops flashing,



- The cables used must satisfy the insulation requirements with regard to mains potential.
- Sensor input B1-M carries mains potential. If the sensor's cables must be extended, the cables used must be suited for mains voltage

The controller is supplied with Mounting Instructions.

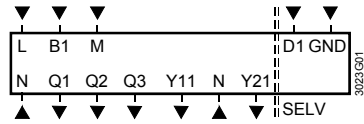
Technical data

| | | |
|---------------------------------|---|--|
| ⚠ Power supply | Operating voltage | AC 230 V + 10/-15 % |
| | Frequency | 50/60 Hz |
| | Power consumption | max. 6 VA |
| | Control outputs Q1, Q2, Q3 | AC 230 V |
| | Rating | max. 600 VA |
| | Control output Y11, Y21 (N.O. contacts) | AC 230 V |
| | Rating | max. 300 VA |
| | Signal input B1 for return air sensor | QAH11.1, Safety class II NTC resistor 3kΩ at 25°C |
| | Status input D1 and GND | |
| | Contact sensing | SELV DC 6-15 V / 3-6 mA |
| Insulation against mains | 4 kV | |
| Operational data | Perm. cable length with copper cable 1.5 mm ² for connection to terminals B1, B2 and D1 | 80 m |
| | Setpoint setting range | 8...30 °C |
| | Max. control deviation at 25 °C | max. ±0.7 K |
| | Switching differential in heating mode SDH (selectable) | 1 K or 4 K |
| | Switching differential in cooling mode SDC (selectable) | 0.5 K or 2 K |
| | Dead zone in normal operation | 2 K or 5 K |
| | Setpoint «Energy saving mode  », heating | 16 °C |
| | Setpoint «Energy saving mode  », cooling | 28 °C |
| | Setpoint «Standby  » | 8 °C |
| | Environmental conditions | Operation |
| Climatic conditions | | class 3K5 |
| Temperature | | 0...+50 °C |
| Humidity | | <95 % r.h. |
| Transport | | to IEC 721-3-2 |
| Climatic conditions | | class 2K3 |
| Temperature | | -25...+70 °C |
| Humidity | | <95 % r.h. |
| Mechanical conditions | | class 2M2 |
| Storage | | to IEC 721-3-1 |
| Climatic conditions | class 1K3 | |
| Temperature | -25...+70 °C | |
| Humidity | <95 % r.h. | |
| Norms and standards |  conformity to | |
| | EMC directive | 89/336/EEC |
| | Low voltage directive | 73/23/EEC and 93/68/EEC |
| |  ^{N474} C-Tick conformity to | |
| | EMC emission standard | AS/NSZ 4251.1:1994 |
| | Product standards | |
| | Automatic electrical controls for household and similar use | EN 60 730 – 1 and EN 60 730 – 2 - 9 |
| | Electromagnetic compatibility | |
| | Emissions | EN 50 081-1 |
| | Immunity | EN 50 082-1 |
| Safety class | II to EN 60 730 | |
| Pollution class | normal | |
| Degree of protection of housing | IP30 to EN 60 529 | |

General

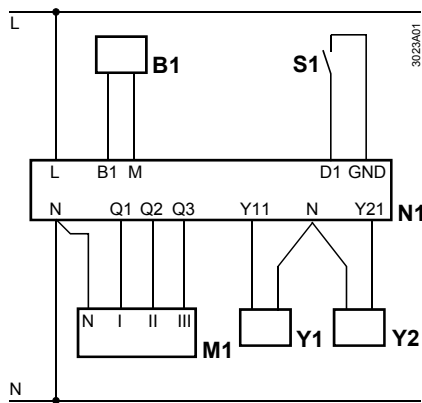
| | |
|-------------------------|---|
| Connection terminals | Use solid wires or prepared stranded wires. 2 x 0.4-1.5 mm ² or 1 x 2.5 mm ² |
| Weight | 0.23 kg |
| Colour of housing front | White, NCS S 0502-G (RAL9003) |

Connection terminals



- L, N Operating voltage AC 230 V
- B1 Status input "Return air temperature sensor"
- M Measuring neutral "Return air temperature sensor"
- D1, GND Status input for potential-free operating mode changeover switch (operating action can be selected)
- Q1 Control output "Fan speed I", AC 230 V
- Q2 Control output "Fan speed II", AC 230 V
- Q3 Control output "Fan speed III", AC 230 V
- Y11 Control output "Valve", AC 230 V
- Y21 Control output "Valve", AC 230 V

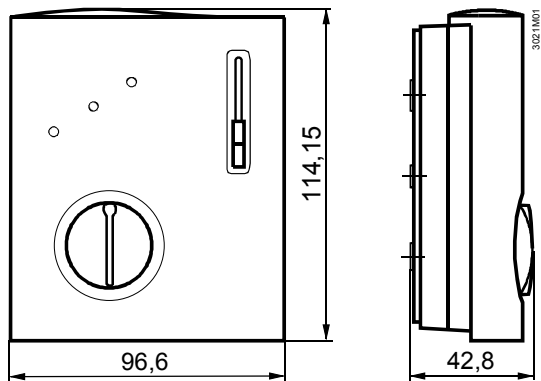
Connection diagram



- B1** Return air temperature sensor (QAH11.1)
- M1** Three-speed fan
- N1** RCC30 room temperature controller
- S1** External operating mode changeover switch
- Y1** Zone valve MVE.../ MXE... for heating mode
- Y2** Zone valve MVE.../ MXE... for cooling mode

Dimensions

unit



baseplate

