
RDG100
RDG110
RDG110U


RDG100T
RDG160T
RDG160TU


RDG100T/H

# Wall-mounted room thermostats with LCD

# RDG1…

for fan coil unit applications

for universal applications

for use with compressors in dx type equipment

- **RDG100...: Operating voltage AC 230 V, On/Off, 3-pos. or PWM control outputs**
- **RDG110: Operating voltage AC 230 V, On/Off relay (SPDT) outputs**
- **RDG110U: Operating voltage AC 24 V, On/Off relay (SPDT) outputs**
- **RDG100…/RDG110…: Output for 1-speed and 3-speed**
- **RDG160T…: Operating voltage AC 24 V, DC 0…10 V or On/Off control outputs**
- **RDG160T…: Output for 1-speed, 3-speed or ECM fan DC 0...10 V**
- **Operating modes: Comfort, Economy and Protection**
- **Automatic or manual fan speed**
- **3 multifunctional inputs for keycard contact, external sensor, etc**
- **Automatic or manual heating / cooling changeover**
- **Adjustable commissioning and control parameters**
- **Minimum and maximum setpoint limitation**
- **Backlit display**

**Additional features of RDG100T, RDG160T…, RDG100T/H:**

- **Infrared remote control receiver**
- **Auto Timer mode with 8 programmable timers**
- **Auto timer can be disabled via P02**
- **Auto timer can be disabled via DIP switches (RDG160T…)**
- **Landscape design (RDG100T/H only)**
- **Selectable relay output functions (RDG160T…)**

## Use

The RDG1… room thermostats are designed for use with the following types of system:

**Fan coil units** via On/Off or modulating control outputs:
- 2-pipe system
- 2-pipe system with electric heater
- 2-pipe system and radiator / floor heating
- 4-pipe system
- 4-pipe system with electric heater
- 2-stage heating or cooling system

**Chilled / heated ceilings (or radiators)** via On/Off or modulating control outputs:
- Chilled / heated ceiling
- Chilled / heated ceiling with electric heater
- Chilled / heated ceiling and radiator / floor heating
- Chilled / heated ceiling, 2-stage cooling or heating

**Heat pumps** with dx type equipment:
- 1-stage compressor for heating or cooling
- 1-stage compressor for heating or cooling with electric heater
- 1-stage compressor for heating or cooling and radiator / floor heating
- 1-stage compressor for heating and cooling
- 1-stage compressor for heating and cooling with reversing valve
- 2-stage compressor for heating or cooling

## Functions

- Maintenance of room temperature via built-in temperature sensor or external room temperature / return air temperature sensor
- Automatic or manual changeover between heating and cooling mode
- Selection of applications via DIP switches
- Selection of operating mode via the operating mode button on the thermostat
- 1-speed, 3-speed or DC…10 V fan control (automatic or manual)
- Display of current room temperature or setpoint in °C and/or °F
- Minimum and maximum setpoint limitation
- Button lock (automatic or manual)
- 1 digital input, freely selectable for:
  - Operating mode switchover contact (keycard)
  - Automatic heating / cooling changeover contact
  - Electric heater enable
  - Dewpoint sensor
  - Fault input
- 2 multifunctional inputs, freely selectable for:
  - Operating mode switchover contact (keycard)
  - Automatic heating / cooling changeover sensor
  - External room temperature or return air temperature
  - Dewpoint sensor
  - Electric heater enable
  - Fault input
  - Supply air temperature sensor (RDG160T…)
- Advanced fan control function, i.e. fan kick, fan start, selectable fan operation (enable, disable or depending on heating or cooling mode)
- Purge function together with 2-port valve in a 2-pipe changeover system
- Reminder to clean filters
- Floor heating temperature limit
- Minimum and maximum supply air temperature limitation (RDG160T…)
- Reloading factory settings for commissioning and control parameters

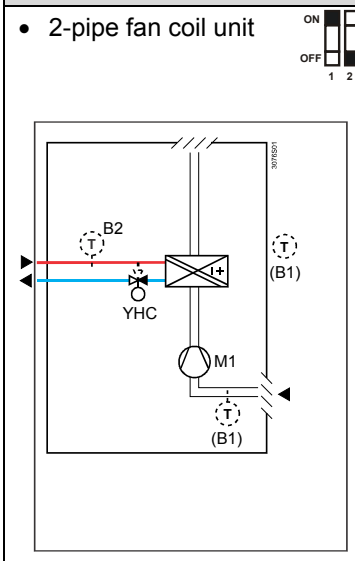
- 7-day time program: 8 programmable timers to switch over between Comfort and Economy mode (RDG100T, RDG160T…, RDG100T/H)
- Infrared remote control (RDG100T, RDG160T…, RDG100T/H)
- Selectable relay function (RDG160T…)
  - For switching OFF external equipment OFF during Protection mode
  - For switching ON external equipment (such as. pump) during H/C demand
  - Output heating/cooling sequence
- Wizard function to select working temperature unit °C or °F (RDG160TU, RDG110U)

## Applications

The room thermostats support the following applications, which can be configured via DIP switches at the rear of the unit. Depending on the thermostat type, On/Off or modulating control outputs are available.

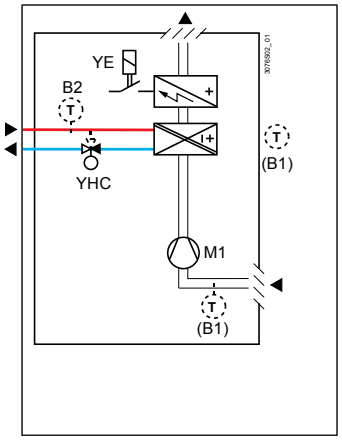
**Applications, DIP setting, Control outputs**

- 2-pipe fan coil unit



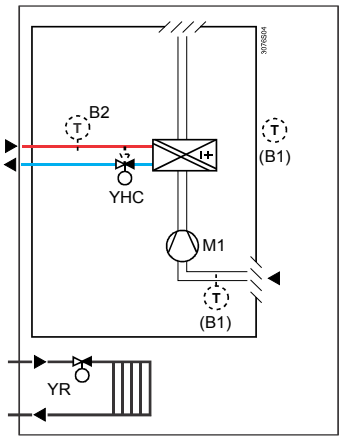

Using RDG100.../RDG110…/RDG160T…

- 2-pipe fan coil unit and electric heater



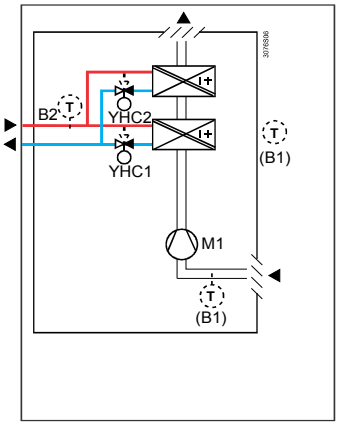

Using RDG100.../RDG110…/RDG160T…

- 2-pipe fan coil unit and radiator / floor heating



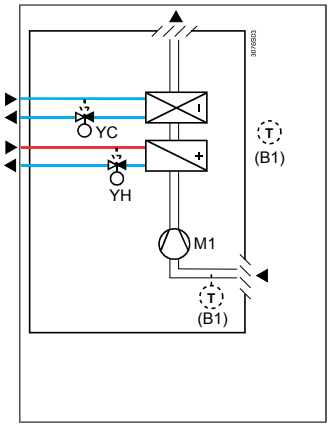

Using RDG100.../RDG110…/RDG160T…

- 2-pipe / 2-stage fan coil unit



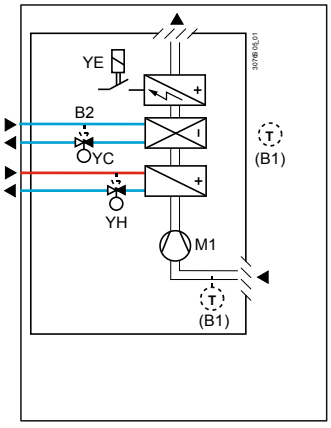

Using RDG100.../RDG110…/RDG160T…

- 4-pipe fan coil unit




Using RDG100.../RDG110…/RDG160T…

- 4-pipe fan coil unit and electric heater

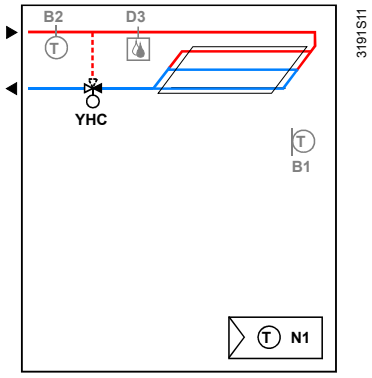



Using RDG100...

| Product no. | Control outputs | Fan |
|---|---|---|
| RDG100... | On/Off, PWM, 3-position | 3-speed, 1-speed |
| RDG110 / RDG110U | On/Off (SPDT) | 3-speed, 1-speed |
| RDG160T / RDG160TU | DC 0...10 V | 3-speed, 1-speed |
| | On/Off, DC 0...10 V | DC 0...10 V ECM |

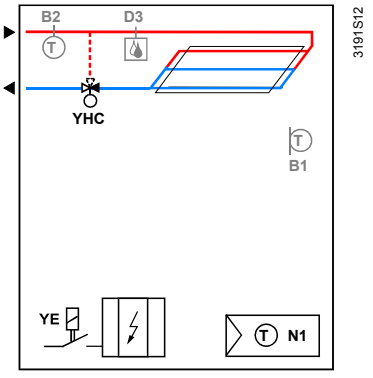
## Applications, DIP setting, Control outputs

- Chilled / heated ceiling

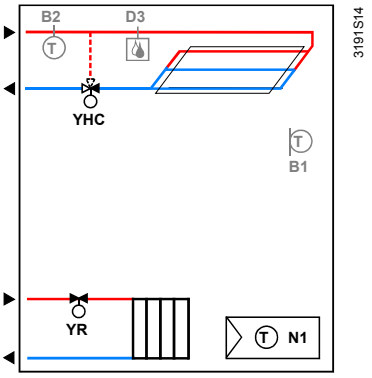

Using RDG100.../RDG110…/RDG160T…

- Chilled / heated ceiling and electric heater

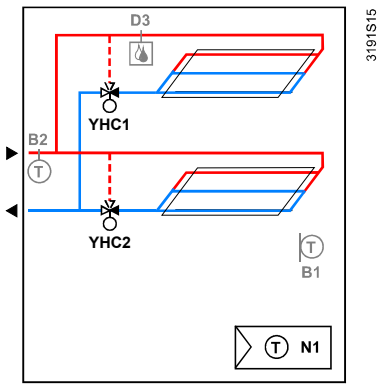

Using RDG100.../RDG110…/RDG160T…

- Chilled / heated ceiling and radiator / floor heating

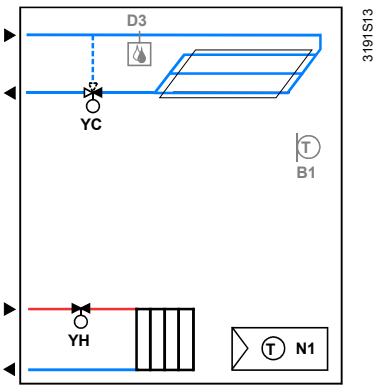

Using RDG100.../RDG110…/RDG160T…

- 2-stage chilled / heated ceiling


Using RDG100.../RDG110…/RDG160T…

- Chilled ceiling and radiator

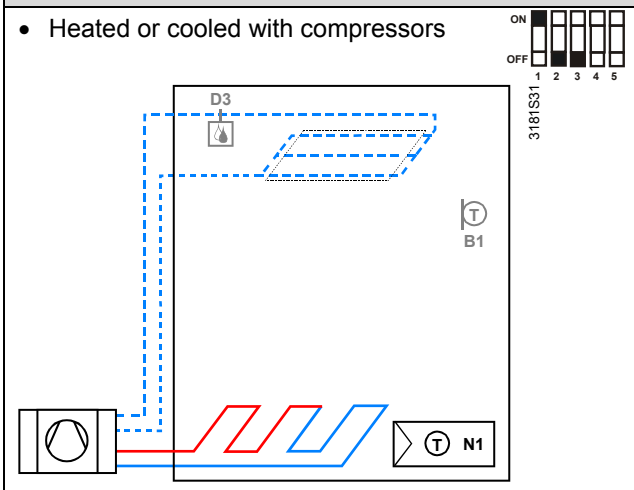




Using RDG100.../RDG110…/RDG160T…

| Product no. | Control outputs |
|---|---|
| RDG100... | On/Off, PWM, 3-position |
| RDG110 / RDG110U | On/Off (SPDT) |
| RDG160T / RDG160TU | On/Off, DC 0...10 V |

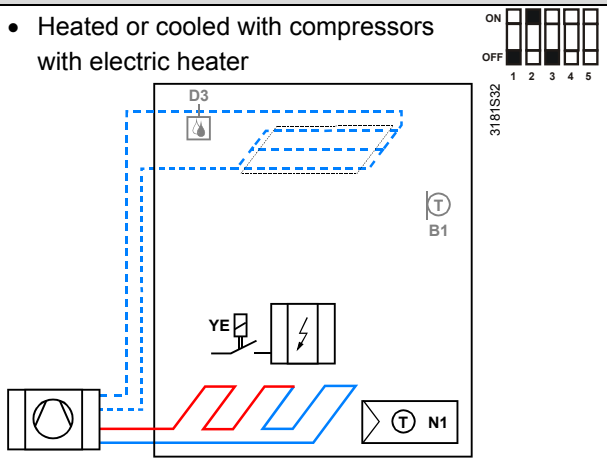
## Applications, DIP setting, Control outputs

- Heated or cooled with compressors



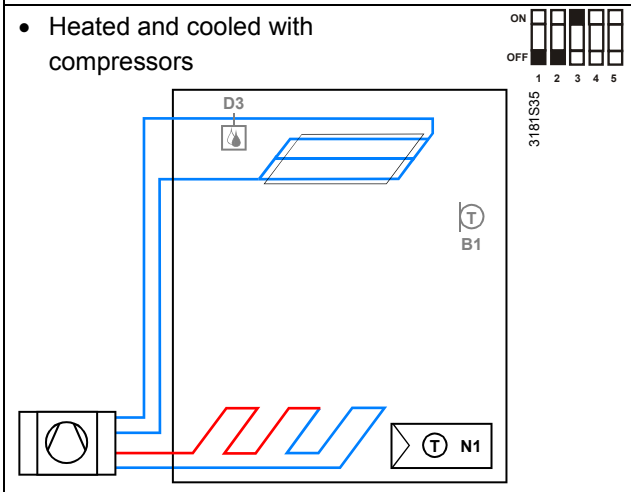

Using RDG110…/RDG160T…

- Heated or cooled with compressors with electric heater



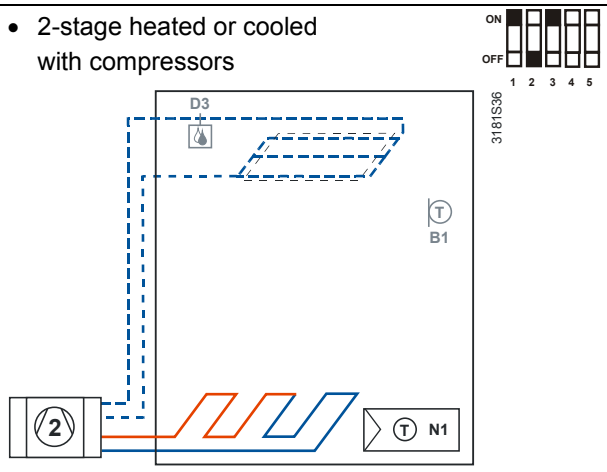

Using RDG110…/RDG160T…

- Heated and cooled with compressors




Using RDG110…/RDG160T…

- 2-stage heated or cooled with compressors




Using RDG110…/RDG160T…

| Product no. | Control outputs | Fan |
|---|---|---|
| RDG110 / RDG110U | On/Off (SPDT) | Disabled, 3-speed, 1-speed |
| RDG160T / RDG160TU | On/Off, DC 0...10 V | Disabled, DC 0...10 V |

Legend

| | | |
|---|---|---|
| YHC.. | Heating/cooling valve actuator | |
| YH | Heating valve actuator | |
| YC | Cooling valve actuator | |
| YE | Electric heater | |
| M1 | 1-speed or 3-speed fan | |
| B1 | Return air temperature sensor or external room temperature sensor (optional) | |
| B2 | Changeover sensor (optional) | |

## Type summary

| Product no. | Features | | | | | | | | | | UL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Operating voltage | Number of control outputs | | | | Time program | Backlit LCD | Infrared receiver [1] | Fan | | |
| | | ON/ OFF | PWM | 3-pos | DC 0..10 V | | | | ECM [2] | 3-speed | |
| **RDG100** | AC 230 V | **3** [3] | **2** [3] | **2** [3] | | | ✓ | | | ✓ | |
| **RDG100T** | AC 230 V | **3** [3] | **2** [3] | **2** [3] | | (✓) [5] | ✓ | ✓ | | ✓ | |
| **RDG100T/H** | AC 230 V | **3** [3] | **2** [3] | **2** [3] | | (✓) [5] | ✓ | ✓ | | ✓ | |
| **RDG110** | AC 230 V | **2** [4] | | | | | ✓ | | | ✓ | |
| **RDG110U** | AC 24 V | **2** [4] | | | | | ✓ | | | ✓ | ✓ |
| **RDG160T** | AC 24 V | | | | **2** | (✓) [5] | ✓ | ✓ | | ✓ | |
| | | **2** [6] | | | **2** [6] | (✓) [5] | ✓ | ✓ | ✓ | | |
| **RDG160TU** | AC 24 V | | | | **2** | (✓) [5] | ✓ | ✓ | | ✓ | ✓ |
| | | **2** [6] | | | **2** [6] | (✓) [5] | ✓ | ✓ | ✓ | | |

1) Infrared remote control must be ordered as a separate item
2) ECM fan output DC 0…10 V
3) On/Off, PWM or 3-position (triac outputs)
4) Relay output (SPDT)
5) Can be disabled via P02 (or via DIP switches on RDG160T…)
6) Either On/Off (relay output) or DC control signal

## Equipment combinations

| | Description | Product no. | Data Sheet |
|---|---|---|---|
| | Infrared remote control  | **IRA211** | 3059 |
| | Cable temperature sensor or changeover sensor, cable length 2.5 m NTC (3 kΩ at 25 °C)  | **QAH11.1** | 1840 |
| | Room temperature sensor NTC (3 kΩ at 25 °C)  | **QAA32** | 1747 |
| | Cable temperature sensor, cable length 4 m NTC (3 kΩ at 25 °C)  | **QAP1030/UFH** | 1854 |
| | Condensation monitor  | **QXA2601 / QXA2602 / QXA2603 / QXA2604** | 3302 |
| On/Off actuators | Electromotoric On/Off valve and actuator (only available in AP, UAE, SA and IN)  | **MVI…/MXI…** | 4867 |
| | Electromotoric On/Off actuator  | **SFA21...** | 4863 |
| | Zone valve actuators (only available in AP, UAE, SA and IN)  | **SUA…** | 4830 |
| On/Off and PWM actuators [*] | Thermal actuator (for radiator valves) AC 230 V, NO  | **STA23...** | 4884 |
| | Thermal actuator (for radiator valves) AC 24 V, NO  | **STA73...** [*] | 4884 [*] |

| | | | |
|---|---|---|---|
| | Thermal actuator AC 230 V (for small valves 2.5 mm), NC  | **STP23…** *) | 4884 |
| | Thermal actuator AC 24 V (for small valves 2.5 mm) NC  | **STP73...** *) | 4884 *) |
| 3-position actuators | Electrical actuator, 3-position (for radiator valves)  | **SSA31...** | 4893 |
| | Electrical actuator, 3-position (for 2- and 3-port valves / V…P45)  | **SSC31…** | 4895 |
| | Electrical actuator, 3-position (for small valves 2.5 mm)  | **SSP31…** | 4864 |
| | Electrical actuator, 3-position (for small valves 5.5 mm)  | **SSB31...** | 4891 |
| | Electrical actuator, 3-position (for CombiValves VPI45)  | **SSD31...** | 4861 |
| | Electromotoric actuator, 3-position (for valves 5.5 mm)  | **SQS35…** | 4573 |
| DC 0…10 V actuators | Electrical actuator, DC 0...10 V (for radiator valves)  | **SSA61...** | 4893 |
| | Electrical actuator, DC 0...10 V (for 2- and 3-port valves / V…P45)  | **SSC61…** | 4895 |
| | Electrical actuator, DC 0...10 V (for small valves 2.5 mm)  | **SSP61…** | 4864 |
| | Electrical actuator, DC 0...10 V (for small valves 5.5 mm)  | **SSB61...** | 4891 |
| | Electrical actuator, DC 0...10 V (for CombiValves VPI45)  | **SSD61...** | 4861 |
| | Electromotoric actuator, DC 0…10 V (for valves 5.5 mm)  | **SQS65…** | 4573 |
| | Electrothermal actuator, AC 24 V, NC, DC 0…10 V, 2 m (for radiator valves and small valves 2.5 mm)  | **STA63** | 4884 |
| | Electrothermal actuator, AC 24 V, NO, DC 0…10 V, 2 m (for radiator valves and small valves 2.5 mm)  | **STP63** | 4884 |

*) With PWM control, it is not possible to ensure exact parallel running of 2 or more thermal actuators. If several fan coil systems are controlled by the same room thermostat, preference should be given to motorized actuators with On/Off or 3-position control.

**Note**

For the parallel operation of the actuators, refer to information in the data sheets of the selected actuators and to this list, depending on which value is lower:

Maximum number of actuators in parallel on the RDG100…
- Max. 6 SS…31… actuators (3-pos)
- Max. 4 ST…23… if used with On/Off control signal
- Max. 10 SFA.., SUA.., MVI.., MXI.. On/Off actuators

Parallel operation of SQS35 is NOT possible.

Maximum number of actuators in parallel on the RDG110…
- Max. 10 On/Off actuators

Maximum number of actuators in parallel on the RDG160T…
- Max. 10 SS…61... actuators (DC)
- Max. 10 ST..23/63/73... actuators (DC or On/Off)
- Max. 10 SFA..., SUA..., MVI..., MXI … On/Off actuators
- Max. 10 SQS65 actuators (DC)

## Accessories

| Description | Product no. | Data Sheet |
|---|---|---|
| Changeover mounting kit (50 pcs / package) | ARG86.3 | 3009 |

## Ordering

| Product no. | Stock no. | Designation |
|---|---|---|
| RDG100 | S55770-T158 | Room thermostat |
| RDG100T | S55770-T159 | Room thermostat, with timer |
| RDG100T/H | S55770-T235 | Room thermostat, with timer, landscape housing |
| RDG110 | S55770-T160 | Room thermostat with relay outputs (AC 230 V) |
| RDG110U | S55770-T361 | Room thermostat with relay outputs (AC 24 V), UL certified |
| RDG160T | S55770-T343 | Room thermostat with timer and DC output for valve and fan (AC 24 V) |
| RDG160TU | S55770-T362 | Room thermostat with timer and DC output for valve and fan (AC 24 V), UL certified |

Order the **IRA211** infrared remote control separately.

Order valve actuators separately.

Order RDG110U and RDG160TU from BT US.

## Mechanical design

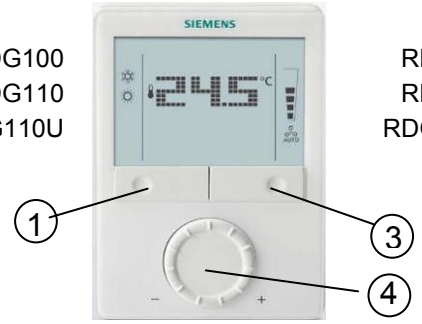
The room thermostat consists of two parts:

- Plastic housing which accommodates the electronics, the operating elements and the room temperature sensor
- Mounting plate with the screw terminals

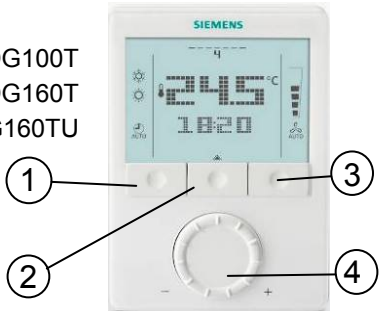
The housing engages in the mounting plate and is secured with 2 screws.

## Operation and settings

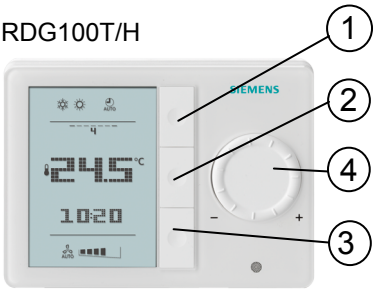
RDG100
RDG110
RDG110U




RDG100T
RDG160T
RDG160TU

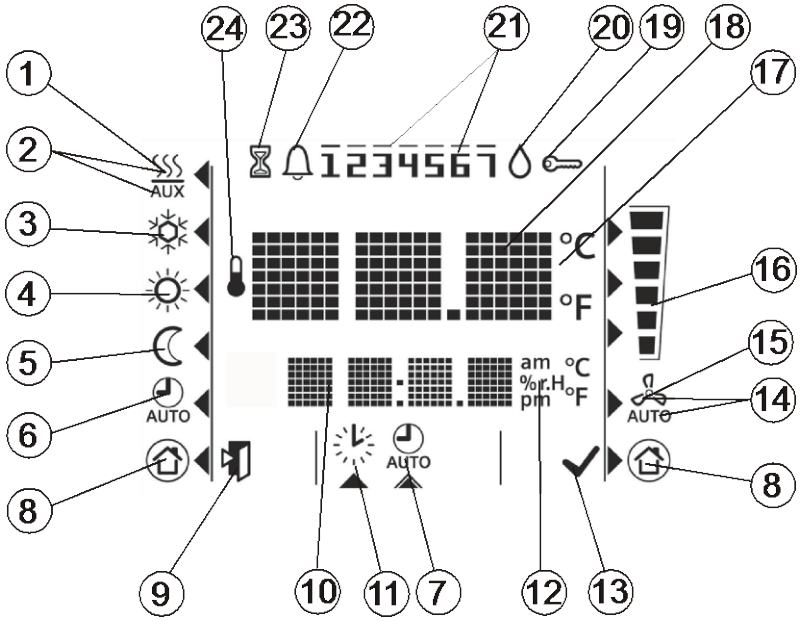



RDG100T/H



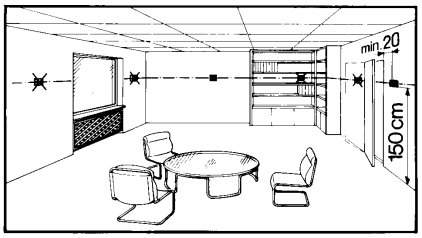

1 Operating mode selector / Esc
2 Button to enter the time and to set the timers
3 Fan mode selector / OK
4 Rotary knob for setpoint and parameter adjustment

**Display**




| # | Symbol | Description | # | Symbol | Description |
|---|---|---|---|---|---|
| 1 | | Heating mode | 14 | AUTO | Automatic fan |
| 2 | AUX | Heating mode<br>auxiliary heater on (2nd stage) | 15 | | Manual fan |
| 3 | | Cooling mode | 16 | | Fan speed: Fan speed 1 |
| 4 | | Comfort mode | | | Fan speed: Fan speed 2 |
| 5 | | Economy mode | | | Fan speed: Fan speed 3 |
| 6 | AUTO | Auto Timer mode | 17 | °C<br>°F | Degrees Celsius<br>Degrees Fahrenheit |
| 7 | | View and set Auto Timer program | | | |
| 8 | | Protection | 18 | | Digits for room temperature and setpoint display |
| 9 | | Escape | 19 | | Button lock |
| 10 | | Digits for time, room temperature, setpoint, etc. | 20 | | Condensation in room (dewpoint sensor active) |
| 11 | | Setting the time of day and the weekday | 21 | 1234567 | Weekday 1…7: 1 = Monday / 7 = Sunday |
| 12 | am<br>pm | Morning: 12-hour format<br>Afternoon: 12-hour format | 22 | | Fault |
| | | | 23 | | Temporary timer function (visible when operating mode is temporarily extended due to prolonged presence or absence) |
| 13 | | Confirmation of parameters | 24 | | Indicates that room temperature is displayed |

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




**Mounting**

⚠

- The room thermostat must be mounted in a clean, dry indoor place and must not be exposed to drip or splash water.

**Wiring**

See Mounting Instructions (M3181, M3183, M3183.1 or M3183.2) enclosed with the thermostat.

⚠

- Comply with local regulations to wire, protect and earth the thermostat.

⚠

**Warning!**
**No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Yx or Yxx)**
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 or AC 24 V supply line must have a circuit breaker with a rated current of no more than 10 A. For AC 24 V US installations, use Class 2 rated power supplies.

⚠

- Properly size the cables to the thermostat, fan and valve actuators for AC 230 V mains voltage.

⚠

- Use only valve actuators rated for AC 230 V on RDG100…, RDG110 and on RDG160T if AC 230V is connected to the "L" terminal.
- Use only 3-speed fan rated with AC 24 V on RDG160TU.

⚠

- Isolate the cables of inputs X1-M / X2-M and D1-GND if the conduit box carries AC 230 V mains voltage.

⚠

- On the RDG100... and RDG110, inputs X1-M and X2-M carry mains potential. If the sensor's cables are extended, they must be suited for mains voltage.
- Inputs X1-M, X2-M or D1-GND of different units (e.g. summer / winter switch) may be connected in parallel with an external switch. Consider overall maximum contact sensing current for switch rating.
- Selectable relay function (RDG160T…). Consider overall maximum current thought the relays.

⚠

- Disconnect power supply before removing the thermostat from the mounting plate!

## Commissioning

1. Select the application via the DIP switches at the rear of thermostat before fitting the front housing to the mounting plate.
2. Power up the thermostat after successfully connecting the line power. The thermostat starts to reset and all LCD segments flash, indicating that the reset was correct.

After the reset, which takes about 3 seconds, the thermostat is ready for commissioning by qualified HVAC staff. The control parameters of the thermostat can be set to ensure optimum performance of the entire system (see Basic Documentation P3181).

**Temperature unit selection wizard (only for RDG110U and RDG160TU)**

The temperature unit selection wizard enables to select the preferable temperature unit display on thermostat between °C and °F.

1. Rotate rotary knob to select the preferable temperature unit.
2. Press the button ✔ (OK) to confirm the selection, and the thermostat goes to normal operating page.

Notes

- Pressing button (Esc) does not confirm the temperature unit selection.
- If the temperature unit is not selected, °C is used by default.

**Control sequence**

- The control sequence may need to be set via parameter P01 depending on the application. The factory setting for the 2-pipe application is “Cooling only”; and “Heating and cooling” for the 4-pipe application.

**Compressor-based application ⚠**

- When the thermostat is used in connection with a compressor, the minimum output on-time (parameter P48) and off-time (parameter P49) for Y11/Y21 (RDG110) must be adjusted to avoid damage to the compressor and shortening its life.

**Calibrate sensor**

- Recalibrate the temperature sensor via parameter P05 if the room temperature displays on the thermostat does not match the room temperature measured.

**Adaptive temperature compensation for el. heating**

- If an electric heater is directly connected to output Y21, the load current of the electric heater should be indicated in parameter P46. (RDG110, Index D and higher only). Default setting: 1 A for loads up to 1 A.

**Setpoint and setpoint range limitation**

- We recommend to review the setpoints and setpoint ranges (parameters P08…P12) and change them as needed to achieve maximum comfort and save energy.

## Disposal

The devices are considered electronics devices for disposal in terms 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.

**RDG100… / RDG110**

⚠ Power supply

| | | |
|---|---|---|
| Rated voltage | | AC 230 V |
| Frequency | | 50/60 Hz |
| Power consumption | RDG100… | Max. 8 VA / 1 W |
| | RDG110 | Max. 12 VA / 2 W |

No internal fuse.
External preliminary protection with max. C 10 A circuit breaker required in all cases.

Outputs

| | | |
|---|---|---|
| Fan control Q1, Q2, Q3-N | | AC 230 V |
| Rating min, max resistive (inductive) | | AC 5 mA…5(4) A |

STOP Note!

**Fans must NOT be connected in parallel!**
Connect one fan directly, for additional fans, one relay for each speed.

| | | |
|---|---|---|
| Control outputs | | |
| Y1, Y2, Y3, Y4-N | RDG100… | AC 230 V, AC 8 mA…1 A |
| Power limitation | | 3 A fast microfuse, cannot be exchanged |
| Y11-N / /Y21-N (NO) | RDG110 | AC 230 V, AC 5 mA…5(3) A |

No internal fuse.
External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances.

Inputs

| | | |
|---|---|---|
| Multifunctional inputs | | |
| X1-M / X2-M | | |
| Temperature sensor input | | |
| Type | | NTC (3 kΩ at 25 °C) |
| Temperature range | | 0...49 °C |
| Cable length | | Max. 80 m |
| Digital input | | |
| Operating action | | Selectable (NO/NC) |
| Contact sensing | | DC 0…5 V, max. 5 mA |
| Parallel connection of several thermostats for one switch | | Max. 20 thermostats per switch. **Do not mix with D1!** |
| Insulation against mains | | N/A, mains potential ⚠ |
| D1-GND | | |
| Operating action | | Selectable (NO/NC) |
| Contact sensing | | SELV DC 6…15 V, 3…6 mA |
| Parallel connection of several thermostats for one switch | | Max. 20 thermostats per switch. **Do not mix with X1 / X2!** |
| Insulation against mains | | 3.75 kV, reinforced insulation |
| Function input | | |
| External temperature sensor, changeover sensor, operating mode switchover contact, dewpoint monitor contact, enable electric heater contact, fault contact | | Selectable |

**RDG110U**

⚠ Power supply

| | |
|---|---|
| Rated voltage | SELV AC 24 V / DC 24 V<br>or |
| DC 24 V: connect G to + and G0 to - | AC 24 V / DC 24 V class 2 (US) |
| Frequency | 50/60 Hz |
| Power consumption | Max. 2 VA / 1 W |
| External supply line protection (EU) | Circuit breaker max. 10 A<br>Characteristic B, C, D<br>according to EN 60898<br>or<br>Power source with current limitation of max. 10 A |

No internal fuse.
External preliminary protection with max. C 10 A circuit breaker required in all cases.

Outputs

| | |
|---|---|
| Fan control Q1, Q2, Q3-G0 | AC 24 V |
| Rating min, max resistive (inductive) | AC 5 mA…5(4) A |

STOP Note!

**Fans must NOT be connected in parallel!**
Connect one fan directly, for additional fans, one relay for each speed.

| | | |
|---|---|---|
| Control outputs | | |
| Y11-G0 / /Y21-G0 (NO) | RDG110U | AC 24 V, AC 5 mA…5(3) A |

No internal fuse.
External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances.

Inputs

| | |
|---|---|
| Multifunctional inputs | |
| X1-M / X2-M | |
| Temperature sensor input | |
| Type | NTC (3 kΩ at 25 °C) |
| Temperature range | 0...49 °C |
| Cable length | Max. 80 m |
| Digital input | |
| Operating action | Selectable (NO/NC) |
| Contact sensing | DC 0…5 V, max. 5 mA |
| Parallel connection of several thermostats for one switch | Max. 20 thermostats per switch. **Do not mix with D1!** |
| Insulation against mains | N/A, mains potential ⚠ |
| D1-GND | |
| Operating action | Selectable (NO/NC) |
| Contact sensing | SELV DC 6…15 V, 3…6 mA |
| Parallel connection of several thermostats for one switch | Max. 20 thermostats per switch. **Do not mix with X1 / X2!** |
| Function input | |
| External temperature sensor, changeover sensor, operating mode switchover contact, dewpoint monitor contact, enable electric heater contact, fault contact | Selectable |

**RDG160T...**

| | | |
|---|---|---|
| ⚠ Power supply | Rated voltage | SELV AC 24 V / DC 24 V<br>or |
| | DC 24 V: connect G to + and G0 to - | AC 24 V / DC 24 V class 2 (US) |
| | Frequency | 50/60 Hz |
| | Power consumption | Max. 2 VA / 1 W |
| | External supply line protection (EU) | Circuit breaker max. 10 A<br>Characteristic B, C, D<br>according to EN 60898<br>or<br>Power source with current limitation of max. 10 A |
| | No internal fuse.<br>External preliminary protection in G-G0 lines with max C 10 A circuit breaker required in all cases. | |
| Outputs | Q1 / Q2 / Q3 / L - N (relay) RDG160T | AC 24...230 V |
| | Q1 / Q2 / Q3 / C – G0 (relay) RDG160TU | AC 24 V class 2 (U.S.) |
| | Use for 3-speed fan control | |
| | Rating min, max resistive (inductive) | 5 mA...5(4) A |
| STOP Note! | **Fans must NOT be connected in parallel!**<br>Connect one fan directly, for additional fans, one relay for each speed. | |
| | Use for actuator control (Q1, Q2) | |
| | Q1 - rating min, max resistive / inductive | 5 mA...1 A |
| | Q2 - rating min, max resistive (inductive) | 5 mA...5(4) A |
| | Max total load current Q1+Q2(+Q3) | 5 A |
| | Use for external equipment (Q1, Q2, Q3) | |
| | Rating min, max resistive / inductive Qx | 5 mA...1 A |
| | Max total load current Q1+Q2+Q3 | 2 A |
| | No internal fuse.<br>External preliminary protection in L line with max C 10 A circuit breakers required in all cases. | |
| | ECM fan control Y50 - G0 | SELV DC 0...10 V,<br>Max. ±5 mA |
| | Actuator control Y10 - G0 / Y20 - G0 (G) | SELV DC 0...10 V,<br>Max. ±1 mA |
| Inputs | Multifunctional inputs | |
| | X1-M / X2-M | |
| | Temperature sensor input | |
| | Type | NTC (3 kΩ at 25 °C) |
| | Temperature range | 0...49 °C |
| | Cable length | Max. 80 m |
| | Digital input | |
| | Operating action | Selectable (NO/NC) |
| | Contact sensing | DC 0…5 V, max. 5 mA |
| | Parallel connection of several thermostats for one switch | Max. 20 thermostats per switch |
| | D1-GND | |
| | Operating action | Selectable (NO/NC) |
| | Contact sensing | DC 6…15 V, 3…6 mA |
| | Parallel connection of several thermostats for one switch | Max. 20 thermostats per switch |
| | Function of inputs | Selectable |
| | External room temperature sensor, heating/cooling changeover sensor, operating mode switchover contact, dewpoint monitor contact, enable electric heater contact, fault contact, monitoring input, supply air temperature | X1: P38<br>X2: P40<br>D1: P42 |

| | | | |
|---|---|---|---|
| **Operational data, all types** | | | |
| | Switching differential, adjustable | | |
| | Heating mode | (P30) | 2 K (0.5…6 K) |
| | Cooling mode | (P31) | 1 K (0.5…6 K) |
| | Setpoint setting and setpoint range | | |
| | Comfort mode | (P08) | 21 °C (5…40 °C) |
| | Economy mode | (P11-P12) | 15 °C/30 °C (OFF, 5…40 °C) |
| | Protection | (P65-P66) | 8 °C/OFF (OFF, 5…40 °C) |
| | Multifunctional inputs X1 / X2 / D1 | | Selectable |
| | Input X1 | | Ext. temperature sensor (P38=1) |
| | Input X2 | | Changeover sensor (P40=2) |
| | Input D1 | | Operating mode switchover (P42=3) |
| | Built-in room temperature sensor | | |
| | Measuring range | | 0…49 °C |
| | Accuracy at 25 °C | | < ± 0.5 K |
| | Temperature calibration range | | ± 3.0 K |
| | Settings and display resolution | | |
| | Setpoints | | 0.5 °C |
| | Current temperature value displayed | | 0.5 °C |
| **Environmental conditions** | Operation | | As per IEC 721-3-3 |
| | Climatic conditions | | Class 3K5 |
| | Temperature | | 0…50 °C |
| | Humidity | | <95% r.h. |
| | Transport | | As per IEC 721-3-2 |
| | Climatic conditions | | Class 2K3 |
| | Temperature | | –25…65 °C |
| | Humidity | | <95% r.h. |
| | Mechanical conditions | | Class 2M2 |
| | Storage | | As per IEC 721-3-1 |
| | Climatic conditions | | Class 1K3 |
| | Temperature | | –25…65 °C |
| | Humidity | | <95% r.h. |
| **Standards and directives** | EU Conformity (CE) | | CE1T3181xx *) |
| | Electronic control type | | 2.B (micro-disconnection on operation) |
| | RCM Conformity | | CE1T3181en_C1 *) |
| | UL (RDG110U / RDG160TU) | | UL 916 PAZX<br>CSA-C22.2 No. 205 PAZX7<br>http://database.ul.com |
| | Safety class | RDG160T | II as per EN60730 |
| | | RDG160TU | III as per EN60730 |
| | Pollution class | | Normal |
| | Degree of protection of housing | | IP30 to EN60529 |
| **Environmental Compatibility** | The product environmental declaration CE1E3181 and CE1E3181_1*) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal). | | |

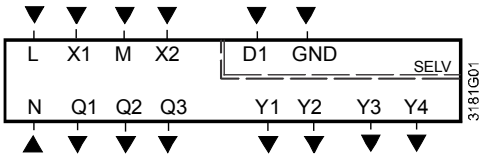
## General

| | | |
|---|---|---|
| Connection terminals | | Solid wires or prepared stranded wires<br>1 x 0.4…2.5 $mm^2$<br>or 2 x 0.4…1.5 $mm^2$ |
| **Note:** For sensors on inputs X1, X2, or D1, the cable length is max. 80 m. | | |
| Minimal wiring cross section on<br>L, N, Q1, Q2, Q3, Y1, Y2, Y3, Y4, Y11, Y21 | | min 1.5 $mm^2$ |
| Housing front color | | RAL 9003 white |
| Weight | RDG100… / RDG110… | 0.30 kg |
| | RDG160T… | 0.32 kg |

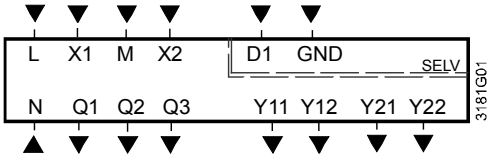
*) The documents can be downloaded from http://siemens.com/bt/download.

## Connection terminals

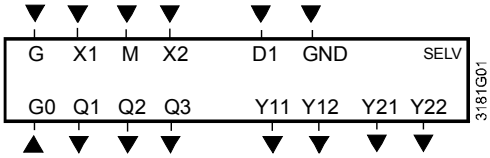
RDG100,
RDG100T,
RDG100T/H



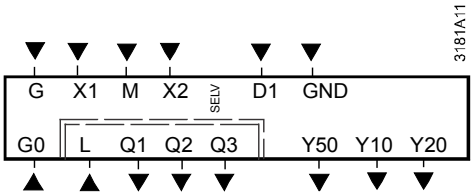

RDG110



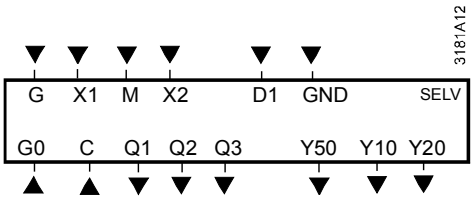

RDG110U




RDG160T




RDG160TU




| | |
|---|---|
| L, N | Operating voltage AC 230 V |
| G, G0 | Operating voltage AC / DC 24 V<br>**Note: For DC 24 V**: G0 = –; G = + |
| X1, X2 | Multifunctional input for temperature sensor (e.g. QAH11.1) or potential-free switch<br>Factory setting :<br>- X1 = external room temperature sensor<br>- X2 = sensor or switch for heating / cooling changeover<br>Change of setting: Parameters P38, P40 |
| M | Measuring neutral for sensor and switch |
| D1, GND | Multifunctional input for potential-free switch.<br>Factory setting: Operating mode switchover contact<br>Change of setting: Parameter P42 |
| Q1 | Control output fan speed "low" |
| Q2 | Control output fan speed "medium" |
| Q3 | Control output fan speed "high" |
| Y1…Y4 | Control output "Valve" AC 230 V<br>(NO, for normally closed valves),<br>output for electric heater via external relay |
| Y11, Y21 | Control output "Valve" AC 230 V for RDG110<br>Control output "Valve" AC 24 V for RDG110U<br>(NO, for normally closed valves),<br>output for compressor or electric heater |
| Y12, Y22 | Control output "Valve" AC 230 V for RDG110<br>Control output "Valve" AC 24 V for RDG110U<br>(NC, for normally open valves) |

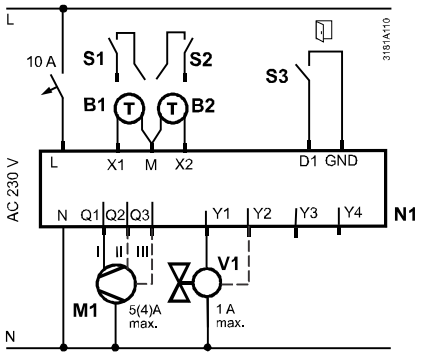
| | |
|---|---|
| G, G0 | Operating voltage AC / DC 24 V<br>**Note: For DC 24 V**: G0 = –; G = + |
| L (-N) | Power supply relay output Q1…3 AC 24…230 V for RDG160T |
| Y10, Y20 | Control output for DC 0…10 V actuator |
| Y50 | Control output "Fan" DC 0...10 V |
| Q1…3 | Control output fan, valve, el. heater or ex. equipment |
| C (-G0) | Power supply relay output Q1…3<br>AC 24 V for RDG160TU |

## Connection diagrams

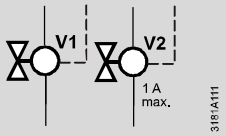
### RDG100…

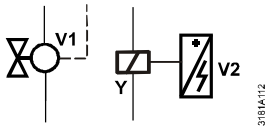
**Application**

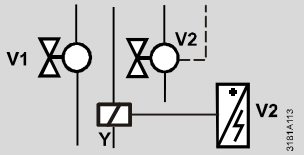
1-speed or 3-speed fan




| | V1 ↓ | V2 ↓ |
|---|---|---|
| • 2-pipe | YHC | |
| • 2-pipe & radiator | YHC | YR |
| • 4-pipe | YH | YC |
| • 2-stage | YHC1 | YHC2 |
| • 2-pipe & el. heater | YHC | YE |
| • 4-pipe & el. heater | YH | YC |
| | YE | |



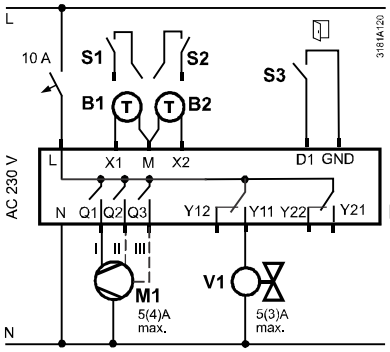



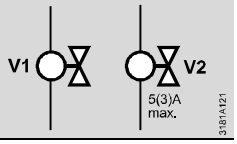
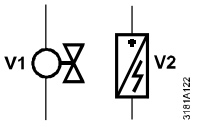
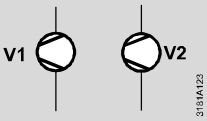
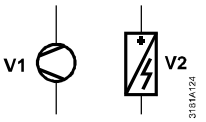
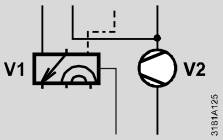

| | |
|---|---|
| N1 | Room thermostat RDG100… |
| M1 | 1-speed or 3-speed fan |
| V | Valve actuators: On/Off, heating, cooling, radiator, heating / cooling, 1st or 2nd stage |
| S1, S2 | Switch (keycard, window contact, etc.) |
| S3 | Switch at SELV input (keycard, window contact) |
| B1, B2 | Temperature sensor (return air temperature, external room temperature, changeover sensor, floor temperature limit, etc.) |
| Q | Relay outputs |
| Y1...Y4 | Triac outputs |
| YH | Heating valve actuator |
| YC | Cooling valve actuator |
| YHC | Heating / cooling valve actuator |
| YR | Radiator valve actuator |
| YE | Electric heater with relay / contactor Y |
| YHC1/YHC2 | 1st / 2nd stage |

**RDG110**

## Application

1-speed or 3-speed fan




| | V1 ↓ | V2 ↓ | |
|---|---|---|---|
| • 2-pipe | YHC | | |
| • 2-pipe & radiator<br>• 4-pipe<br>• 2-stage | YHC<br>YH<br>YHC1 | YR<br>YC<br>YHC2 |  |
| • 2-pipe & el. heater | YHC | YE |  |
| • 1 and 2-stage compressor | C1 | C2 |  |
| • Compressor & el. heater | C1 | YE |  |
| • Compressor & reversing valve | RV | C1 |  |

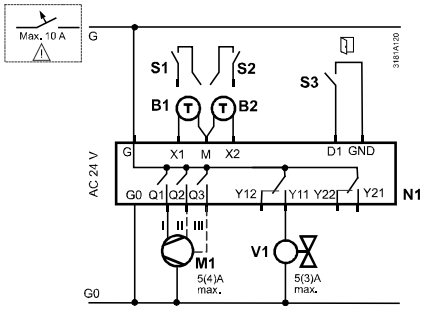


| | |
|---|---|
| N1 | Room thermostat RDG110 |
| M1 | 1-speed or 3-speed fan |
| V | Valve actuators: On/Off, heating, cooling, radiator, heating / cooling, 1st or 2nd stage |
| S1, S2 | Switch (keycard, window contact, etc.) |
| S3 | Switch at SELV input (keycard, window contact) |
| B1, B2 | Temperature sensor (return air temperature, external room temperature, changeover sensor, floor temperature limit, etc.) |
| Q | Relay outputs |
| Y11…Y22 | Relay outputs |
| YH | Heating valve actuator |
| YC | Cooling valve actuator |
| YHC | Heating / cooling valve actuator |
| YR | Radiator valve actuator |
| YE | Electric heater max. 5 A |
| YHC1 / YHC2 | 1st / 2nd stage |
| C1 / C2 | Compressor 1st and 2nd stage |
| RV | Reversing valve |

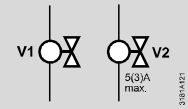
**RDG110U**

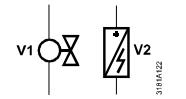
1-speed or 3-speed fan

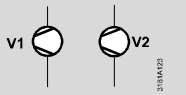
**Application**

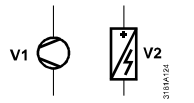


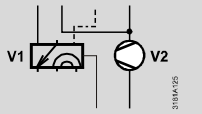

| | V1 | V2 |
|---|---|---|
| • 2-pipe | YHC | |
| • 2-pipe & radiator | YHC | YR |
| • 4-pipe | YH | YC |
| • 2-stage | YHC1 | YHC2 |
| • 2-pipe & el. heater | YHC | YE |
| • 1 and 2-stage compressor | C1 | C2 |
| • Compressor & el. heater | C1 | YE |
| • Compressor & reversing valve | RV | C1 |



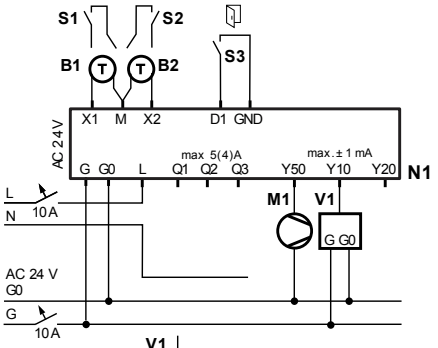




| | |
|---|---|
| N1 | Room thermostat RDG110U |
| M1 | 1-speed or 3-speed fan |
| V | Valve actuators: On/Off or PWM, 3-position, heating, cooling, radiator, heating / cooling, 1st or 2nd stage |
| S1, S2 | Switch (keycard, window contact, etc.) |
| S3 | Switch at SELV input (keycard, window contact) |
| B1, B2 | Temperature sensor (return air temperature, external room temperature, changeover sensor, floor temperature limit, etc.) |
| Q | Relay outputs |
| Y11…Y22 | Relay outputs |
| YH | Heating valve actuator |
| YC | Cooling valve actuator |
| YHC | Heating / cooling valve actuator |
| YR | Radiator valve actuator |
| YE | Electric heater max. 5 A |
| YHC1 / YHC2 | 1st / 2nd stage |
| RV | Reversing valve |
| C1, C2 | Compressor 1st / 2nd stage |

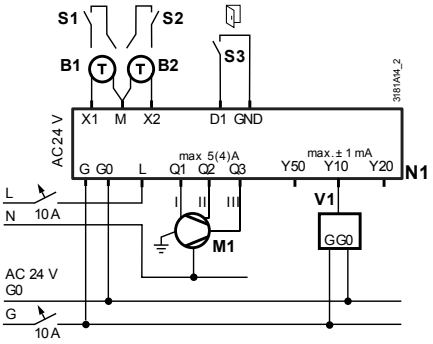
⚠ For US installations, use Class 2 rated power supplies.
For other installations, use circuit breakers with rated current of no more than 10 A.

**RDG160T**

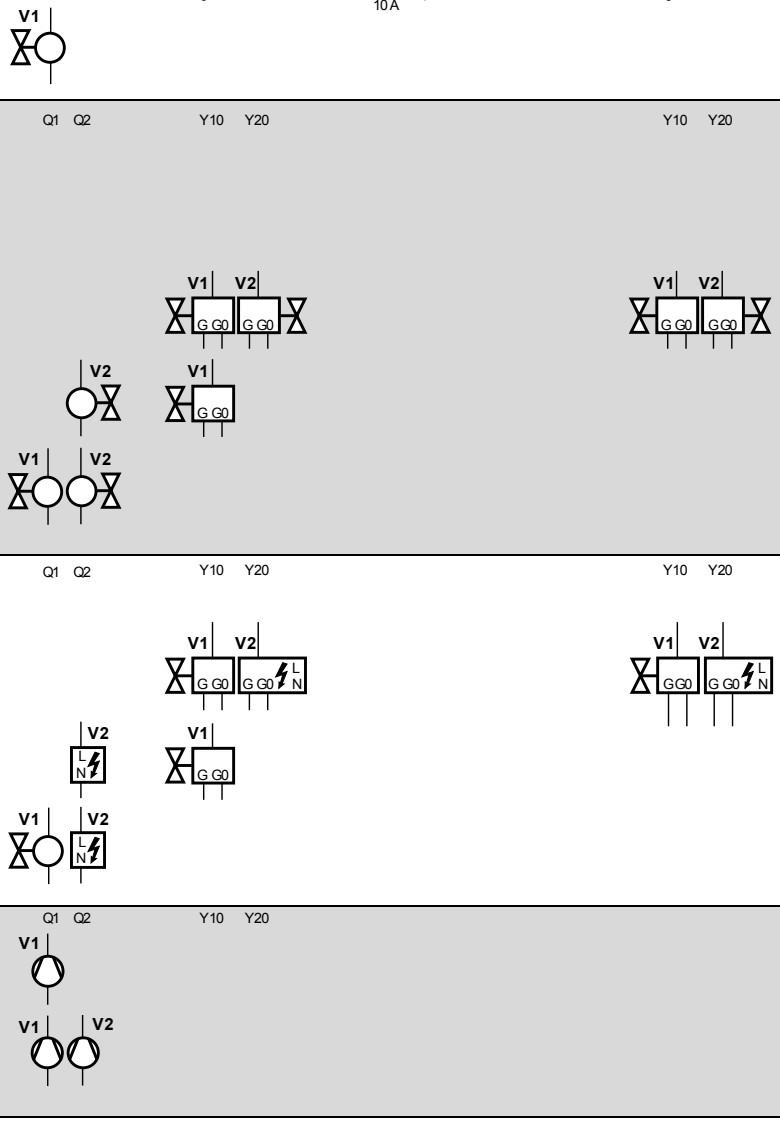
**DC 0...10 V fan**




**1-speed / 3-speed fan**




| **Application** | **V1** | **V2** |
|---|---|---|
| • 2-pipe | YHC | |
| • 2-pipe and radiator | YHC | YR |
| • 4-pipe | YH | YC |
| • 2-stage | YHC1 | YHC2 |
| • 2-pipe and electric heater | YHC | YE |
| • Compressor 1-stage | C1 | |
| • Compressor 2-stage | C1 | C2 |

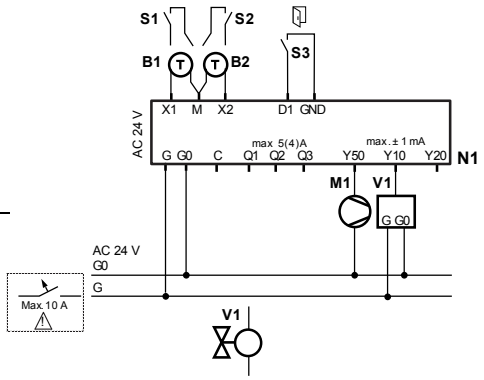



| | | | |
|---|---|---|---|
| N1 | Room thermostat RDG160T | M1 | 1-speed or 3-speed fan, DC 0...10 V fan |
| S1...S3 | Switch (keycard, window contact, presence detector, etc.) | V1, V2 | Valve actuators: On/Off, DC 0...10 V, heating, cooling, radiator, 1st or 2nd stage |
| B1, B2 | Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.) | YH | Heating valve actuator |
| | | YC | Cooling valve actuator |
| YE | Electric heater max. 5 A | YHC | Heating / cooling valve actuator |
| C1, C2 | Compressor 1st / 2nd stage | YHC1 / YHC2 | 1st / 2nd stage |
| | | YR | Radiator valve actuator |

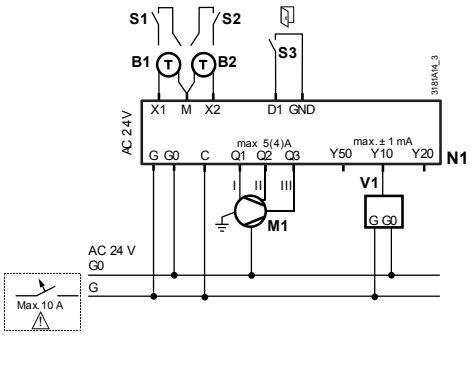
**RDG160TU**

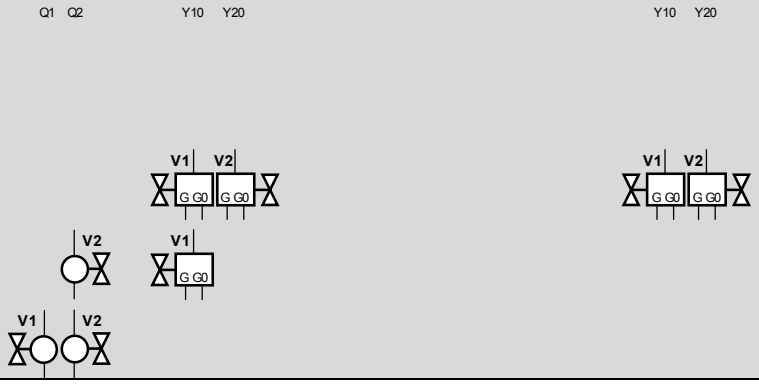
| Application | V1 | V2 |
|---|---|---|
| • 2-pipe | YHC | |
| • 2-pipe and radiator | YHC | YR |
| • 4-pipe | YH | YC |
| • 2-stage | YHC1 | YHC2 |
| • 2-pipe and electric heater | YHC | YE |
| • Compressor 1-stage | YHC1 | |
| • Compressor 2-stage | YHC1 | YHC2 |

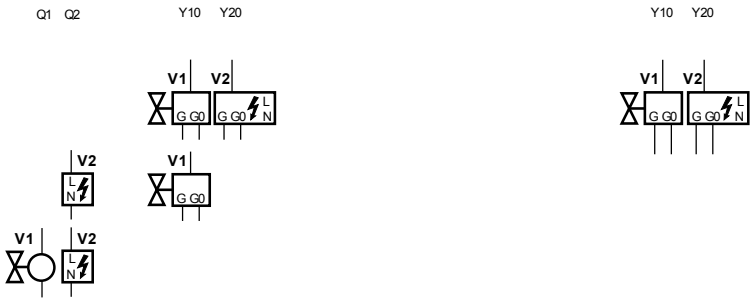
**DC 0...10 V fan**




**1-speed / 3-speed fan**





| | | | |
|---|---|---|---|
| N1 | Room thermostat RDG160TU | M1 | 1-speed or 3-speed fan, DC 0...10 V fan |
| S1...S3 | Switch (keycard, window contact, presence detector, etc.) | V1, V2 | Valve actuators: On/Off, DC 0...10 V, heating, cooling, radiator, 1st or 2nd stage |
| B1, B2 | Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.) | YH | Heating valve actuator |
| YR | Radiator valve actuator | YC | Cooling valve actuator |
| YE | Electric heater max. 5 A | YHC | Heating/cooling valve actuator |
| | | YHC1 / YHC2 | 1st / 2nd stage |

⚠ For US installations, use Class 2 rated power supplies.
For other installations, use circuit breakers with rated current of no more than 10 A.

## Dimensions

All dimensions in mm