



RDF310.2/MM

## Flush-mounted Room Thermostat

RDF310.2/MM

for 2-pipe fan coil units

- Output for on/off valve or 3-wire on/off valve actuator
- 3-speed fan control: Automatic or manual
- Manual heating/cooling changeover or continuous Cooling only / Heating only
- Operating modes: Comfort, Protection
- Adjustable commissioning and control parameters
- Optional display of room temperature or setpoint
- Minimum and maximum setpoint limitation
- Display temperature in increments of 0.5 °C
- Operating voltage AC 230 V
- Mounting on recessed square conduit box, fixing centres 60.3 mm
- User and parameter settings can be retained or restored with power loss

## Use

For controlling the room temperature in individual rooms and zones that are...

- heated or cooled with 2-pipe fan coil units


The thermostat controls...

- a 3-speed fan
- an on/off valve actuator in a 2-pipe system

Suitable for use in systems with...

- continuous heating or cooling mode
- manual heating/cooling changeover

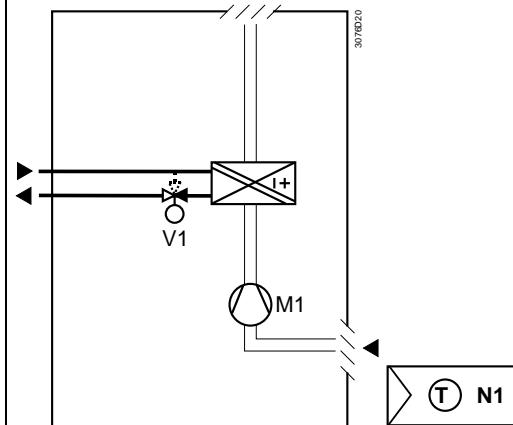
## Functions

- Manual changeover between heating and cooling mode
- Maintenance of room temperature with integrated internal temperature sensor
- Selection of operating mode with the operating mode button  on the thermostat
- 3-speed fan control (automatic or manual)
- Output for 2-position (on/off) valve or 3-wire (on/off) valve actuator

## Applications

### Application and output signal, diagram

- **2-pipe fan coil unit** ON/OFF (heating **or** cooling)



V1 Heating/cooling valve actuator

M1 3-speed fan

N1 Thermostat

## Operation

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### Temperature control

The thermostat acquires the room temperature via its built-in sensor and maintains the setpoint by delivering 2-position valve control commands.

The switching differential is 1 K in heating mode and 1 K in cooling mode (adjustable via parameters P08 and P09).

### Display

The display shows the acquired room temperature or the setpoint of the current operating mode. This can be selected via parameter P18. Factory setting is display of the current room temperature.

The heating symbol  or the cooling symbol  displays to indicate the output status of the relays connected to the fan coil. This means that the symbol does not display when the thermostat operates in the neutral zone. If the thermostat is under manual heating or cooling changeover, the heating symbol  or the cooling symbol  displays permanently to indicate the control sequence. i.e. heating or cooling. This means that the symbol displays when the thermostat operates in the neutral zone.

If required, room temperature and setpoint can also be displayed in °F in place of °C by changing parameter P17.

## Operating modes

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The following operating modes are available:


### Comfort Mode

In Comfort mode, the thermostat maintains the setpoint, which can be adjusted via the + and - buttons. The fan can be set to automatic or manual fan speed: Low, medium or high.

#### *Tip!*

The setpoint setting range can be limited to a minimum (P05) and maximum (P06). This helps prevent the waste of energy, and saving costs.

### Protection Mode

When the thermostat is in Protection mode , the relevant setpoints of heating or cooling are maintained. These setpoints can be adjusted via control parameters P03 and P04. Factory setting of both setpoints is OFF, indicating the thermostat is not activated when in Protection mode.

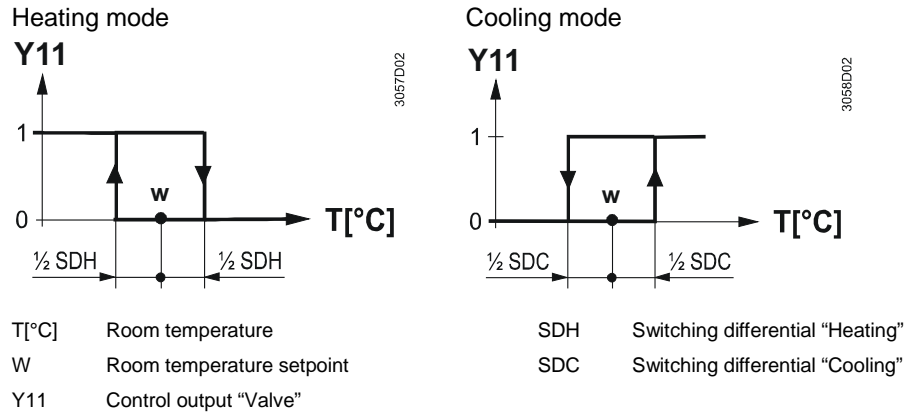
### Avoiding damage due to moisture

To avoid damage due to moisture in very warm and humid climatic zones resulting from lack of air circulation in Comfort mode, the fan can be kept running all the time (e.g. in apartments or shops during unoccupied periods), when setting parameter P21 "ON in dead zone". In this case, the fan keeps running at minimum fan speed 1 in the neutral zone.

**Control sequences**

**Water-based fan coil application**

Used in conjunction with a valve, either for heating/cooling with changeover, or heating only, cooling only.



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


1. the acquired room temperature lies by half the switching differential below the setpoint (heating mode) or above the setpoint (cooling mode), and
2. control output Y11 was not energized for more than the "Minimum output off time" (factory setting 1 minute)

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

1. the acquired room temperature lies by half the switching differential above the setpoint (heating mode) or below the setpoint (cooling mode), and
2. control output Y11 was energized for more than the "Minimum output on time"; (factory setting 1 minute)

**Note:** Control output Y12 delivers a control command which is inverted to the control command at output Y11 and which can be used for normally open valves.

**Heating/cooling mode**

When you press the heating/cooling changeover button  , the thermostat changes from heating to cooling, or vice versa.

If the thermostat is set to "Cooling only" or "Heating only" via P22, the manual changeover function on the button is not available (the factory setting of parameter P22 is "manual changeover"). Instead, "NOP" flashes on the display, indicating continuous cooling or heating is set respectively.

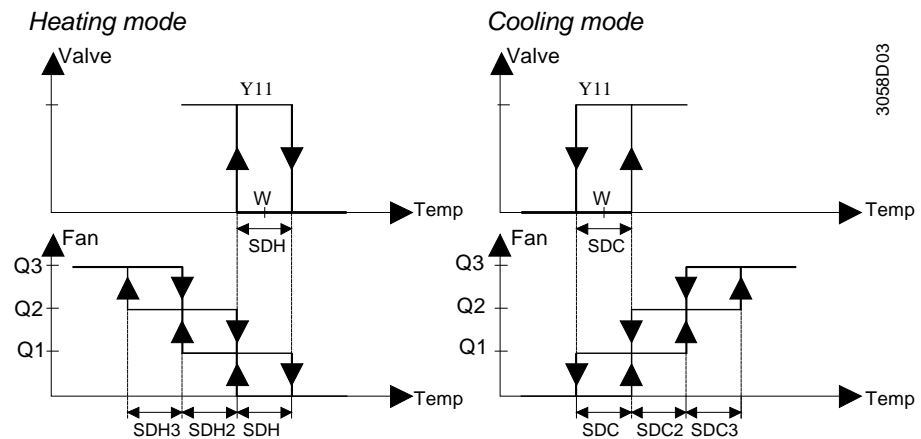
**Minimum output on/off time Y11 and Y12**

The minimum output on/off time of Y11 and Y12 is fixed at 1 minute. It means that any readjustment of the setpoint or of Heating/Cooling Mode changeover lasts for 1 minute before Y11 and Y12 react.

## Fan operation

The fan operates either in automatic mode or at the selected speed when using manual mode. In automatic mode, the fan speed depends on the setpoint and the current room temperature. When the room temperature reaches the setpoint, the control valve is closed and the fan either remains in fan speed 1 or switches off (parameter P21, factory setting: fan speed 1 in dead zone).

In "Temperature-dependent" fan control the fan switches off (please see diagram below). The individual switching differentials of the fan speed 1 (Q1 only) can be adjusted via control parameters P08 – P09. The individual switching differentials of the fan speed 2 and 3 (Q2 and Q3) are fixed at 1K.



### Ventilation always on

If desired, fan control can be set to "Temperature-independent", which means that ventilation is always on, even within the dead zone, using at least fan speed 1. This can be selected individually for Comfort mode via parameter P21; also refer to "Avoiding damage due to moisture" on page 3).

### Dwelling time

In automatic mode, a dwelling time of 2 minutes (factory setting) is active. The fan maintains that speed for at least 2 minutes before it switches to the next speed. This dwelling time can be adjusted from 1...5 minutes via parameter P14.

### Fan start

Whenever the fan starts from standstill, it starts with speed 3 for 1 second in order to guarantee a safe fan motor starts (to overcome inertia and friction).

## Error handling

### Temperature out of range

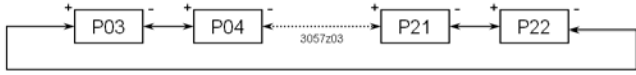
When the room temperature is out of the measuring range, which means above 49 °C or below 0 °C, the display shows the limiting temperature in flashing figures, e.g. "0 °C" or "49 °C".

If the current setpoint is not OFF (see parameter P03) and the thermostat is in heating mode, when the temperature is below 0 °C, output Y11 is energized. In all other cases, output Y11 is de-energized until the temperature returns to the measuring range, and then the thermostat resumes Comfort mode.

## Control parameters

To optimize the control performance, you can use local HMI to adjust a number of control parameters. Proceed as follows to change the control parameter.

### Parameter settings

1. Set the thermostat to Protection mode  $\odot$ .
2. Press and hold the + and – buttons simultaneously for 3 seconds. Release them and, within 2 seconds, press and hold the + button again for 3 seconds. Then, **P03** displays.
3. Select the required parameter by pressing the + and – buttons:  

4. Press the + and – buttons simultaneously. The current value of the selected parameter displays on the screen. Press the + or – button to change the value.
5. You can either press the + and – buttons simultaneously to confirm the change or wait for 5 seconds to have the change saved automatically.
6. Repeat steps 3 through 5 to change more parameters.
7. 10 seconds after the last display or setting, all changes are saved and the thermostat returns to Protection mode.

### Parameter reset

Reload the factory setting of the control parameters as follows:

1. Set the thermostat to Protection mode  $\odot$ .
2. Press the + and – buttons simultaneously for 3 seconds. Release them and, within 2 seconds, press the  $\odot$  button twice.






Then **888** displays during the reloading process.

### Control parameters

Parameter	Meaning	Setting range	Factory setting
P03	Setpoint of heating in Protection Mode $\odot$ ( $W_{heatStb}$ )	OFF, 5 °C... $W_{coolStb}$	8 °C
P04	Setpoint of cooling in Protection Mode $\odot$ ( $W_{coolStb}$ )	OFF, $W_{heatStb}$ ...40 °C	OFF
P05	Minimum setpoint limitation in Comfort Mode ( $W_{minNorm}$ )	5 °C... $W_{maxNorm}$	5 °C
P06	Maximum setpoint limitation in Comfort Mode ( $W_{maxNormf}$ )	$W_{minNorm}$ ...40 °C	35 °C
P07	Sensor calibration	-3...3 K	0 K
P08	Switching differential heating mode SDH	0.5...4 K	1 K
P09	Switching differential cooling mode SDC	0.5...4 K	1 K
P14	Dwelling time of auto fan speeds	1...5 min	2 min
P17	Selection of °C or °F	°C or °F	°C
P18	Display of temperature or setpoint	OFF: Setpoint ON: Room (or return air) temperature	ON
P21	Fan control in Comfort mode	OFF in dead zone ON in dead zone	ON
P22	Heating/cooling mode	0: Heating only 1: Cooling only 3: Manual H/C changeover	3: Manual

## Equipment combinations

ON/OFF actuators

Type of unit		Product no.	Data sheet
Electromotoric ON/OFF actuator		<b>SFA21...</b>	4863
Electromotoric ON/OFF valve and actuator (only available in AP, UAE, SA and IN)		<b>MVI.../MXI...</b>	4867
Zone valve actuators (only available in AP, UAE, SA and IN)		<b>SUA...</b>	4832
Thermal actuator (for radiator valve)		<b>STA23...</b>	4884
Thermal actuator (for small valves 2.5 mm)		<b>STP23...</b>	4884

## Ordering

When ordering, please indicate the product name, product number and SSN number:  
(e.g. **room thermostat, RDF310.2/MM, S55770-T187**)

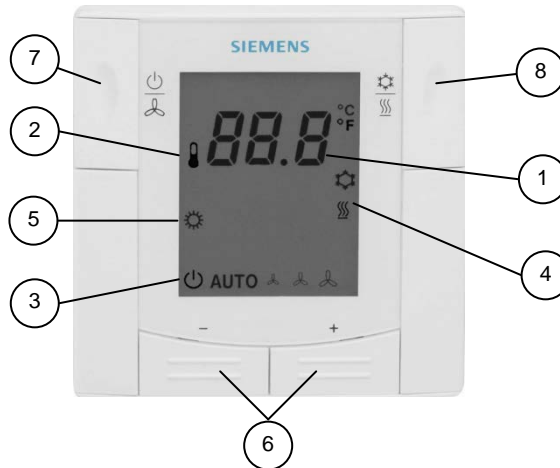
Valve actuators should be ordered separately.

The thermostat consists of two parts:

- Front panel which accommodates the electronics, the operating elements and the built-in room temperature sensor
- Mounting base with the power electronics

The mounting base carries on the rear side the screw terminals. It fits on a square conduit box with fixing centres 60.3mm. The front panel engages in the mounting base and snaps on.

**Setting and operating elements**



*Legend*

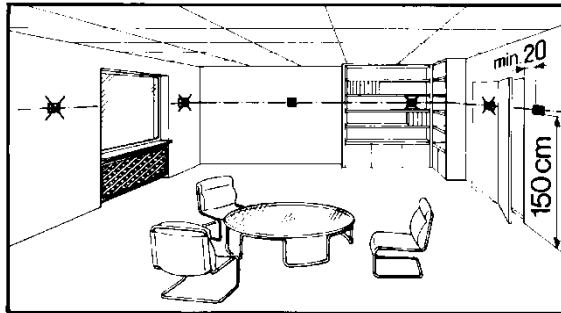
- 1 Display of the room temperature, setpoints and control parameters
- 2 || Symbol used when displaying the current room temperature
- 3 Protection mode / fan mode status  
 ○ Protection mode  
**AUTO** Auto fan active  
 Fan speed low, medium, high
- 4 output is energized (auto mode) / manual cooling mode (manual mode)  
 output is energized (auto mode) / manual heating mode (manual mode)
- 5 Comfort mode
- 6 Buttons for adjusting the setpoints and control parameters
- 7 Button for changing fan operation and Protection mode
- 8 Manual heating/cooling changeover ()



## Mounting and installation

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The thermostat can be mounted on a recessed square conduit box with fixing centres of 60.3 mm. The mounting location on a wall should not be in niches or bookshelves, not behind curtains, above or near heat sources and wind outlet or inlet, and not exposed to direct solar radiation. Mounting height is about 1.5 m above the floor.



### Wiring



Please also refer to the Mounting Instructions M3066... enclosed with the thermostat.

- Wiring, protection and earthing must be installed in compliance with local regulations.

#### Warning!

#### No internal line protection for supply lines to external consumers (Q1, Q2, Q3, Y11, Y12)

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 an external circuit breaker with a rated current of no more than 10 A.
- Only valves rated for AC 230 V may be used.
- Disconnect from supply before opening the cover



### Commissioning

After applying power, the thermostat makes a reset during which all LCD segments flash, indicating that the reset has been correctly made. This takes about 3 seconds. Then, 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 (please also refer to "[Parameter settings](#)").

#### Heating/cooling mode

- Set the heating/cooling mode via parameter P22 depending on the application. Factory setting is "Manual heat/cool changeover". Set P22 accordingly in "Cooling only" or "Heating only" mode.

#### Calibrating the sensor

- When the room temperature displays on the thermostat does not match the room temperature effectively measured, you can recalibrate the temperature sensor via parameter P07.

#### Setpoint and range limitation

- For comfort and energy saving reasons, it is suggested to review the setpoints and setpoint ranges (parameters P03...P06), if necessary, to change them accordingly.

### Disposal







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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.

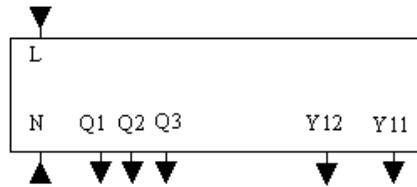
## Technical data

⚠ Power supply	Operating voltage	AC 230 V + 10/-15%
	Frequency	50/60 Hz
	Power consumption	Max. 4 VA
Caution 	<b>No internal fuse!</b>	
	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	5 mA...4(2) A
	Control output Y11-N (N.O.) / Y12-N (N.C.)	AC 230 V
Operational data	Rating	5 mA...4(2) A
	Switching differential	
	Heating mode	0.5...4 K (factory setting: 1 K)
	Cooling mode	0.5...4 K (factory setting: 1 K)
	Setpoint setting range	
	 Comfort mode	5...40 °C
	 Protection mode	OFF, 5...40 °C
	Factory setting of setpoints	
	 Comfort mode	20 °C
	 Protection (heating and cooling) mode	OFF
	Built-in room temperature sensor	
	Measuring range	0...49 °C
	Accuracy at 25 °C	<±0.5 K
	Temperature calibration range	±3.0 K
	Resolution of settings and display	
Temperature setpoints	0.5 °C	
Current temperature value displayed	0.5 °C	
Environmental conditions	Operation	to IEC 60721-3-3
	Climatic conditions	class 3K5
	Temperature	0...50 °C
	Humidity	<95% r.h.
	Transport	to IEC 60721-3-2
	Climatic conditions	class 2K3
	Temperature	-25...60 °C
	Humidity	<95% r.h.
	Mechanical conditions	class 2M2
	Storage	to IEC 60721-3-1
	Climatic conditions	class 1K3
	Temperature	-25...60 °C
Humidity	<95% r.h.	
Norms and standards	EU Conformity (CE)	CB1T3066xx <sup>*)</sup>
	 RCM conformity	AS/NZS 61000-6-3:2007
	Electronic control type	2.B (micro-disconnection on operation)
	Devices of safety class	II as per EN 60730-1
	Pollution class	II as per EN 60730-1
	Degree of protection of housing	IP 30 as per EN 60529
	Environmental conditions	The product environmental declaration CB1E3066en <sup>*)</sup> contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

General

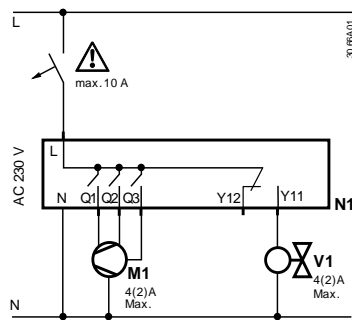
Connection terminals	solid wires or prepared stranded wires 1 x 0.4-1.5 mm <sup>2</sup>
Weight	0.17 kg
Color of housing front	white, RAL 9003
*) The documents can be downloaded from <a href="http://siemens.com/bt/download">http://siemens.com/bt/download</a> .	

**Connection terminals**

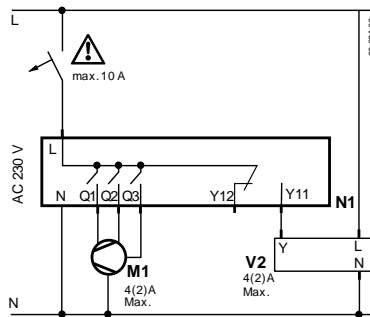


- L, N Operating voltage AC 230 V
- Q1 Control output "Fan speed 1 AC 230 V
- Q2 Control output "Fan speed 2 AC 230 V
- Q3 Control output "Fan speed 3 AC 230 V
- Y11 Control output "Valve" AC 230 V (N.O.)
- Y12 Control output "Valve" AC 230 V (N.C.)

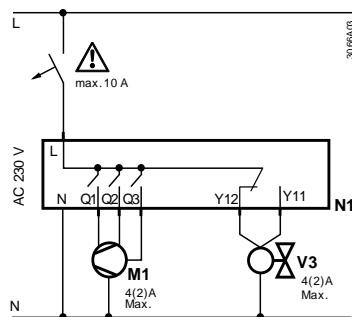
**Connection diagrams**



- N1 RDF310.2/MM
- V1 On/off valve AC 230 V
- M1 3-speed fan



- N1 RDF310.2/MM
- V2 Electromotoric actuator, e.g. SUA21/1
- M1 3-speed fan



- N1 RDF310.2/MM
- V3 3-wire on/off (SPDT) zone valve
- M1 3-speed fan

## Dimensions

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