



RDF310.2/MM

## **Semi-flush mount Room RDF310.2/MM Temperature Controller**

for 2-pipe fan coil units

- Output for on/off valve actuator, 3-wire on/off valve or 1-stage compressor
- 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 1.0 °C or °F
- Operating voltage AC 230 V
- Mounting on recessed rectangular conduit box, fixing centres 60.3mm

## Use

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

- heated or cooled with 2-pipe fan coil units
- cooled with a single compressor in DX type equipment

The controller controls


- a 3-speed fan
- either a valve actuator in a 2-pipe system, or
- a 3-wire ball valve in a 2-pipe system, or
- a 1-stage compressor in DX type equipment

Suitable for use in systems with

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

## Functions

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- Manual changeover between heating and cooling mode
- Maintenance of room temperature with integrated temperature sensor
- Selection of operating mode with the operating mode button  on the controller
- 3-speed fan control (automatic or manual)
- Output for 2-position (on/off) valve actuator, 3-wire (on/off) valve or 1-stage compressor

## Controller

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### Temperature control

The controller acquires the room temperature via its built-in sensor and maintains the setpoint by delivering 2-position valve control commands or compressor output 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  and cooling  symbols on the display show the status of the fan coil. This means that the symbols are also shown while the controller 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 controller maintains the setpoint, which can be adjusted via the + - 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, thus saving costs.

### Protection Mode

When the controller 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, which means that the controller 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 normal operation (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.

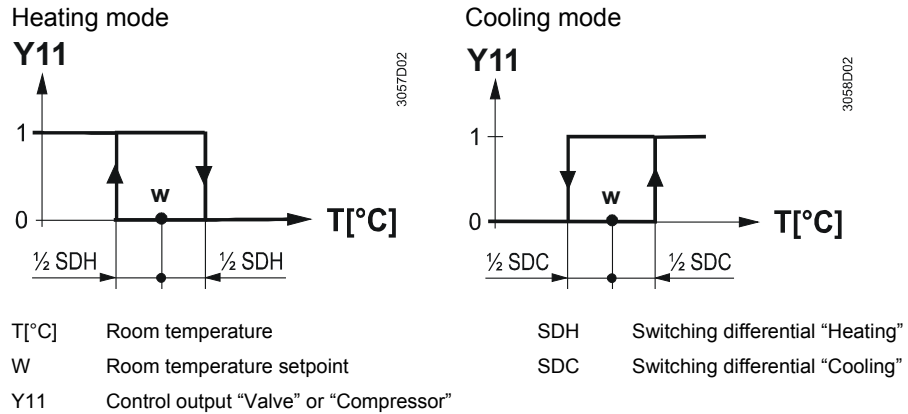
**Control sequences**

**Water-based fan coil application**

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

**Compressor-based application**

Used in conjunction with a 1-stage compressor for cooling only or heating only.



**ON**

The valve or compressor 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 or compressor 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**

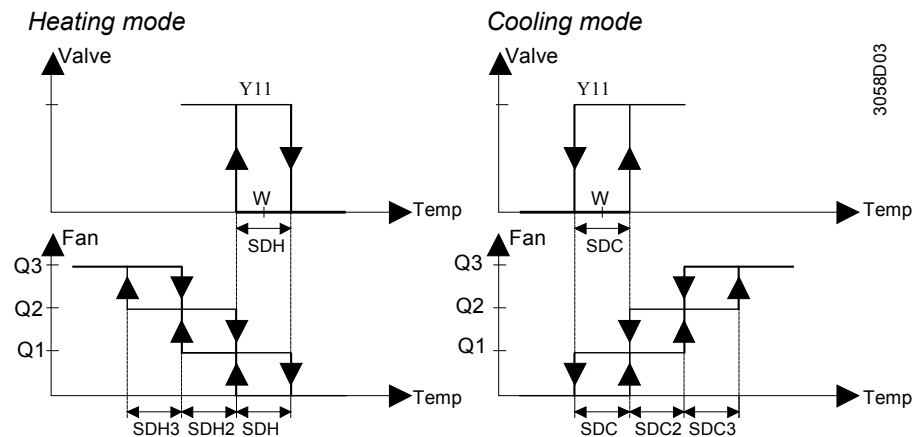
When pressing the heating/cooling changeover button , the controller will change from heating to cooling, or vice versa. If the controller was set to "Cooling only" or "Heating only", changeover will not be possible (parameter P22, factory setting "manual changeover"), instead "NOP" will flash on the 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 will be hold for 1 minute before Y11 and Y12 react.

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 will close 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 normal operation (Comfort mode) using parameter P21; also refer to "Avoiding damage due to moisture".

### 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 using 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 start (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 parameters P03) and the controller is in heating mode, when the temperature is below 0 °C, output Y11 will be energized. In all other cases, output Y11 will be de-energized until the temperature returns to the measuring range, and then the controller will resume Normal operation (Comfort mode).

## Control parameters

A number of control parameters can be readjusted to optimize the control performance. These parameters can also be set during operation without opening the unit. In the event of a power failure, all control parameter settings will be maintained.

### Parameter settings

The parameters can be changed as follows:

1. Set the controller to Protection mode  $\odot$ .
2. Press buttons + and - simultaneously for 3 seconds. Release them and, within 2 seconds, press button + again for 3 seconds. Then, the display will show "P03".
3. Select the required parameter by repeatedly pressing buttons + and -:
 

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graph LR
    P03 -- "+" --> P04
    P04 -- "-" --> P21
    P21 -- "-" --> P22
    P22 -- "+" --> P03
    P04 -.- "3057z03" -.- P21
      
```
4. By pressing buttons + and - simultaneously, the current value of the selected parameter appears, which can be changed by repeatedly pressing buttons + or -.
5. By pressing buttons + and - simultaneously again or 5 seconds after the last press of a button, the last parameter will be displayed again.
6. If you wish to display and change additional parameters, repeat steps 3 through 5.
7. 10 seconds after the last display or setting, all changes will be stored and the controller returns to Protection mode.

### Parameter reset

The factory setting of the control parameters can be reloaded as follows:






1. Set the controller to Protection  $\odot$ .
2. Press buttons + and - simultaneously for 3 seconds. Release them and, within 2 seconds, press operating mode selector button  $\odot$  2 times.

Then, the display will show "888" during the reloading process.

### Control parameters

Parameter	Meaning	Setting range	Factory setting
P03	Setpoint of heating in Protection Mode $\odot$ (Wheat <sub>Stb</sub> )	OFF, 5 °C...Wcool <sub>Stb</sub>	OFF
P04	Setpoint of cooling in Protection Mode $\odot$ (Wcool <sub>Stb</sub> )	OFF, Wheat <sub>Stb</sub> ...40 °C	OFF
P05	Minimum setpoint limitation in Comfort Mode (Wmin <sub>Comf</sub> )	5 °C...Wmax <sub>Comf</sub>	5 °C
P06	Maximum setpoint limitation in Comfort Mode (Wmax <sub>Comf</sub> )	Wmin <sub>Comf</sub> ...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 Normal operation (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

	Type of unit	Type reference	Doc No.
	Electromotoric on/off valve and actuator	<b>MVI.../MXI...</b>	4867
	Electromotoric on/off actuator	<b>SFA21...</b>	4863
	Thermal actuator (for radiator valve)	<b>STA21...</b>	4893
	Thermal actuator (for small valves 2.5 mm)	<b>STP21...</b>	4878
	Zone valve actuators (only available in AP, UAE, SA and IN)	<b>SUA...</b>	4830

## Ordering

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

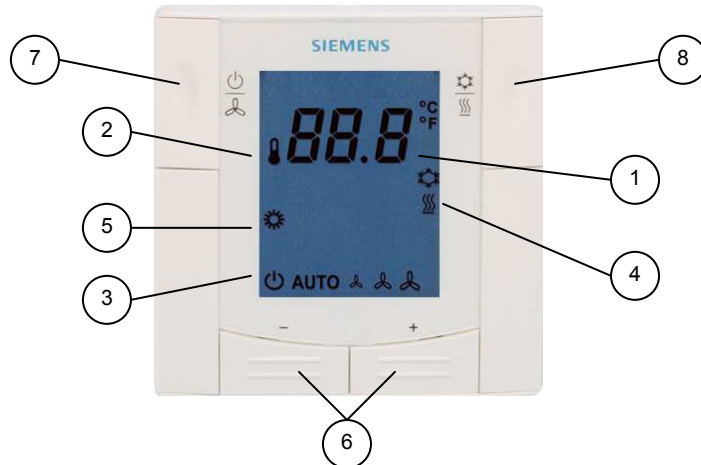
Valve actuators should be ordered separately.

The controller consists of 2 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 rectangular conduit box with fixing centres 60.3mm. The front panel engages in the mounting base and snaps on.

**Setting and operating elements**

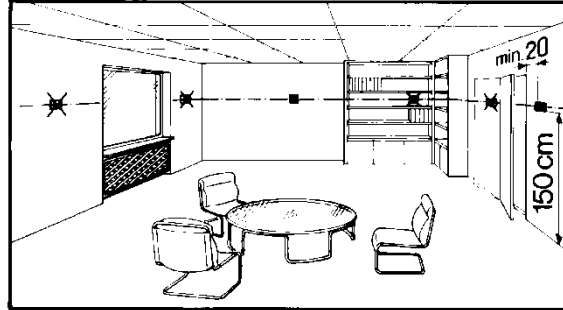


- Legend*
- 1 Display of the room temperature, setpoints and control parameters
  - 2 || Symbol used when displaying the current room temperature
  - 3 Protection mode / fan mode status
    - Protection mode
    - AUTO** Auto fan active
    - ⚙️ Fan speed low, medium, high
  - 4 ⚙️ in cooling mode  
 🔥 in heating mode
  - 5 ⚙️ Normal operation (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 (🔥/⚙️)

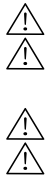
## Mounting and installation

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The room controller can be mounted on a recessed rectangular 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 controller.

- Wiring, fuse and earthing must be installed in compliance with local regulations
- The cables to the controller, fan and valves carry AC 230 V mains voltage and must be appropriate sized
- Only valves rated for AC 230 V may be used
- The AC 230 V mains supply line must have an external fuse or circuit breaker with a rated current of no more than 10 A
- No metal conduits
- No cables provided with a metal sheath
- Disconnect from supply before opening the cover

### Commissioning

After applying power, the controller makes a reset during which all LCD segments flash, indicating that the reset has been correctly made. This takes about 3 seconds. Then, the controller is ready for commissioning by qualified HVAC staff.

The control parameters of the controller can be set to ensure optimum performance of the entire system (please also refer to "[Parameter settings](#)").

### Heating/cooling mode

- Depending on the application, the heating/cooling mode must be set via parameter P22. Factory setting is "Manual heat/cool changeover". When using in "Cooling only" or "Heating only", P22 must be set accordingly.

### Calibrating the sensor

- If the room temperature displayed by the controller does not accord with the room temperature effectively measured, the temperature sensor can be recalibrated. In that case, parameter P07 must be changed.

### 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

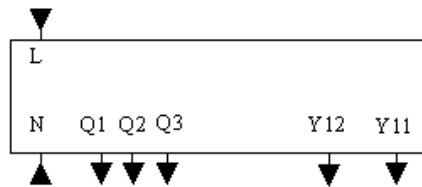
⚠ Power supply	Operating voltage	AC 230 V + 10/-15%	
	Frequency	50/60 Hz	
	Power consumption	Max. 8 VA	
Caution ⚠	No internal fuse. External preliminary fuse with Max C 10A circuit breaker. Required in all cases		
	Outputs		
	Fan control Q1, Q2, Q3-N	AC 230 V	
	Rating	Max. 4(2) A	
	Control output Y11-N (N.O.) / Y12-N (N.C.)	AC 230 V	
	Rating	Max. 4(2) A	
Operational data	Switching differential, adjustable from 0.5...4 K		
	Heating mode (factory setting)	1 K	
	Cooling mode (factory setting)	1 K	
	Setpoint setting range		
	☀ Normal operation (Comfort mode)	5...40 °C	
	○ Protection mode	OFF, 5...40 °C	
	Factory setting of setpoints		
	☀ Normal operation (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	1.0 °C		
Current temperature value displayed	1.0 °C		
Environmental conditions	Operation		
	Climatic conditions	to IEC 721-3-3 class 3K5	
	Temperature	0...50 °C	
	Humidity	<95% r.h.	
	Transport		
	Climatic conditions	to IEC 721-3-2 class 2K3	
	Temperature	-25...60 °C	
	Humidity	<95% r.h.	
	Mechanical conditions	class 2M2	
	Storage		
	Climatic conditions	to IEC 721-3-1 class 1K3	
	Temperature	-25...60 °C	
	Humidity	<95% r.h.	
	Norms and standards	EU Conformity (CE)	CB1T3066xx <sup>*)</sup>
		 N474 C-Tick conformity to	
EMC emission standard		AS/NZS 61000-6-3:2007	
Product standards			
Automatic electrical controls for household and similar use		EN 60730 – 1	
Special requirements for temperature-dependent controls		EN 60730 – 2-9	
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	

General

Connection terminals	solid wires or prepared stranded wires 2 x 0.4-1.5 mm <sup>2</sup> or 1 x 0.4-2.5 mm <sup>2</sup>
Weight	0.17 kg
Color of housing front	white, RAL 9003

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

### Connection terminals

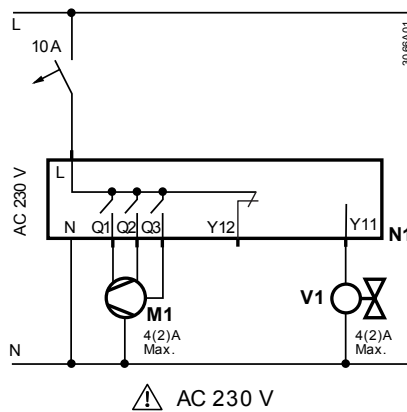


L, N	Operating voltage AC 230 V
Q1	Control output "Fan speed 1 AC 230 V
Q2	Control output "Fan speed 2 AC 230 V
Q3	Control output "Fan speed 3 AC 230 V
Y11	Control output "Valve" AC 230 V (N.O.) or output for compressor
Y12	Control output "Valve" AC 230 V (N.C.)

### Connection diagrams

Application:

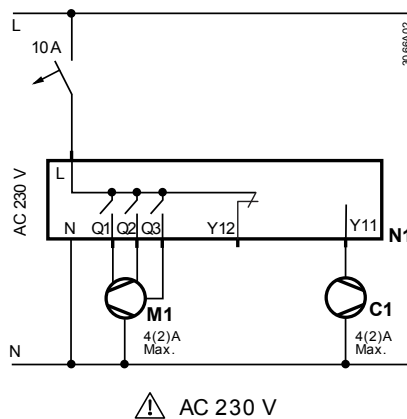
**2-pipe fan coil units**



M1	3-speed fan
N1	RDF310.2/MM
Y1	Zone Valve

Application:

**Compressor in DX type equipment**



M1	3-speed fan
N1	RDF310.2/MM
C1	Compressor

# Dimensions

