Semi Flush-mount
Room Temperature
Controllers with LCD

for 2-pipe, 2-pipe with el. heater and 4-pipe fan coil units
for use with compressors in DX type equipment

- RDF300/RDF400 AC 230 V operating voltage, on/off or 3-position control outputs
- RDF340... AC 24 V operating voltage, DC 0...10 V control outputs
- Output for 3-speed or 1-speed fan
- Two multifunctional inputs for keycard contact, external sensor, etc.
- Operating modes: Comfort, Energy Saving and Protection
- Automatic or manual heating/cooling changeover
- Adjustable commissioning and control parameters
- Minimum and maximum setpoint limitation
- Mounting on recessed rectangular conduit box, 60.3 mm fixing centers

Additional RDF300.02 features
- Backlit LCD

Additional RDF400.01 features
- Backlit LCD
- Infrared remote control receiver
- Auto Timer mode with 8 programmable timers
Use

Applications

To control the room temperature in individual rooms and zones that are:
- Heated or cooled with 2-pipe fan coil units
- Heated or cooled with 2-pipe fan coil units with electrical heater
- Heated and cooled with 4-pipe fan coil units
- Heated or cooled with compressor in DX-type equipment
- Heated or cooled with compressor in DX-type equipment with electrical heater
- Heated and cooled with compressor in DX-type equipment

The RDF300…/RDF400… controls:
- One single or 3-speed fan
- One or two on/off valve actuators
- One on/off valve actuator and one 1-stage electrical heater
- One 3-position valve actuator
- One 1-stage compressor in DX-type equipment or one 1-stage compressor with electrical heater

The RDF340… controls:
- One single or 3-speed fan
- One or two DC 0…10 V valve actuators
- One DC 0…10 V valve actuator and one modulating electrical heater (DC 0…10 V)

Use in systems with:
- Heating or cooling mode
- Automatic heating/cooling changeover
- Manual heating/cooling changeover
- Heating and cooling mode (e.g. 4-pipe system)

Functions

- Maintain room temperature via built-in temperature sensor or external room temperature / return air temperature sensor
- Automatic or manual changeover between heating and cooling mode
- Select applications via DIP switches
- Select operating mode via the operating mode button on the controller
- Single or 3-speed fan control (automatic or manual)
- Display current room temperature or setpoint in °C and/or °F
- Minimum and maximum setpoint limitation
- Keypad lock (automatic and manual)
- Two multifunctional inputs, freely selectable for:
  - Operating mode switchover contact (key card)
  - Automatic heating/cooling changeover sensor
  - External room temperature or return air temperature
  - Dewpoint sensor
  - Electrical heater enable
  - Alarm input
- 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
- Reload factory settings for commissioning and control parameters
- Weekly time program: 8 programmable timers to switch over between Comfort and Economy mode (RDF400.01)
- Optional backlit LCD (RDF300.02/RDF400.01)
- Optional infrared remote control (RDF400.01)
## Applications

The controller supports following applications, which can be configured by DIP-switch on the inner side of the controller front panel. Depending on the type, on/off or modulating control outputs are available.

<table>
<thead>
<tr>
<th>Application and Control output</th>
<th>DIP-switch</th>
<th>Type reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-pipe / 1-stage compressor on/off</td>
<td>ON</td>
<td>RDF300</td>
</tr>
<tr>
<td>2-pipe modulating, DC 0…10 V</td>
<td>ON</td>
<td>RDF340</td>
</tr>
<tr>
<td>2-pipe modulating, 3-position</td>
<td>ON</td>
<td>RDF300</td>
</tr>
<tr>
<td>2-pipe / 1-stage compressor with electrical heater, on/off</td>
<td>ON</td>
<td>RDF300</td>
</tr>
<tr>
<td>2-pipe with electrical heater modulating, DC 0…10 V</td>
<td>ON</td>
<td>RDF340</td>
</tr>
<tr>
<td>4-pipe / compressor for H+C on/off</td>
<td>ON</td>
<td>RDF300</td>
</tr>
<tr>
<td>4-pipe modulating, DC 0…10 V</td>
<td>ON</td>
<td>RDF340</td>
</tr>
</tbody>
</table>

### 2-pipe fan coil unit

- **heating or cooling**
- **2-pipe fan coil unit**
  - **with el. heater**
  - heating or cooling, with auxiliary heater

### 4-pipe fan coil unit

- **heating and cooling**

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## Type summary

<table>
<thead>
<tr>
<th>Type reference</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Operating Voltage</td>
</tr>
<tr>
<td>RDF300 2)</td>
<td>AC 230V</td>
</tr>
<tr>
<td>RDF300.02</td>
<td>AC 230V</td>
</tr>
<tr>
<td>RDF300.02/SL</td>
<td>AC 230V</td>
</tr>
<tr>
<td>RDF400.01</td>
<td>AC 230V</td>
</tr>
<tr>
<td>RDF400.01/SL</td>
<td>AC 230V</td>
</tr>
<tr>
<td>RDF340</td>
<td>AC 24V</td>
</tr>
</tbody>
</table>

1) Infrared remote control is to be ordered as separate item
2) Not available in EU
### Equipment combinations

<table>
<thead>
<tr>
<th>Type of unit</th>
<th>Type reference</th>
<th>Data Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrared remote control</td>
<td>IRA210</td>
<td>3059</td>
</tr>
<tr>
<td>Cable temperature sensor</td>
<td>QAH11.1</td>
<td>1840</td>
</tr>
<tr>
<td>Room temperature sensor</td>
<td>QAA32</td>
<td>1747</td>
</tr>
<tr>
<td>Condensation detector / Supply unit</td>
<td>QXA2000 / AQX2000</td>
<td>1542</td>
</tr>
<tr>
<td><strong>on / off actuators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electromotoric on / off valve and actuator (only available in AP, UAE, SA and IN)</td>
<td>MVI.../MXI...</td>
<td>4867</td>
</tr>
<tr>
<td>Electromotoric on / off actuator</td>
<td>SFA21...</td>
<td>4863</td>
</tr>
<tr>
<td>Thermal actuator (for radiator valve)</td>
<td>STA21...</td>
<td>4893</td>
</tr>
<tr>
<td>Thermal actuator (for small valves 2.5 mm)</td>
<td>STP21...</td>
<td>4878</td>
</tr>
<tr>
<td>Zone valve actuators (only available in AP, UAE, SA and IN)</td>
<td>SUA...</td>
<td>4830</td>
</tr>
<tr>
<td><strong>3-position actuators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical actuator, 3-position (for radiator valve)</td>
<td>SSA31...</td>
<td>4893</td>
</tr>
<tr>
<td>Electrical actuator, 3-position (for small valve 2.5 mm)</td>
<td>SSP31...</td>
<td>4864</td>
</tr>
<tr>
<td>Electrical actuator, 3-position (for small valve 5.5 mm)</td>
<td>SSB31...</td>
<td>4891</td>
</tr>
<tr>
<td>Electromotoric actuator, 3-position (for valves 5.5 mm)</td>
<td>SQS35...</td>
<td>4573</td>
</tr>
<tr>
<td><strong>DC 0..10 V actuators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical actuator, DC 0..10V (for radiator valve)</td>
<td>SSA61...</td>
<td>4893</td>
</tr>
<tr>
<td>Electrical actuator, DC 0..10V (for small valve 2.5 mm)</td>
<td>SSP61...</td>
<td>4864</td>
</tr>
<tr>
<td>Electrical actuator, DC 0..10V (for small valves 5.5 mm)</td>
<td>SSB61...</td>
<td>4891</td>
</tr>
<tr>
<td>Electromotoric actuator, DC 0..10V (for valves 5.5 mm)</td>
<td>SQS65...</td>
<td>4573</td>
</tr>
<tr>
<td>Thermal actuator, DC 0..10V (for small valves and radiator valves)</td>
<td>STS61</td>
<td>4880</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Type of unit</th>
<th>Type reference</th>
<th>Data Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changeover mounting kit (50 pcs/package)</td>
<td>ARG86.3</td>
<td>1840</td>
</tr>
<tr>
<td>Adapter plate 82mm x 82 mm x 10 mm for conduit</td>
<td>ARG70.3</td>
<td>-</td>
</tr>
</tbody>
</table>

### Ordering

When ordering, indicate both product number and name:

**E.g. RDF300 room temperature controller**

Order the **IRA210** infrared remote control separately.

Order valve actuators separately.
The controller consists of 2 parts:

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

The rear of the mounting base contains the screw terminals. The base fits on a rectangular conduit box with 60.3 mm fixing centers. Slide the front panel in the mounting base and snap on.

**Operation and settings**

**RDF300.../RDF340...**

1. Operating mode selector/Standby
2. Change fan operation
3. Adjust setpoint and control parameters

**RDF400...**

1. Change operating mode selector
2. Change fan operation
3. Adjust setpoint, control parameters and time of day
4. Auto Timer program
5. Standby
6. Set time of day and weekday
7. Confirm
8. Infrared receiver

**Display**

1. Operating mode
   - Standby mode
   - Auto Timer mode*
   - Comfort mode
   - Energy Saving mode

2. Display room temperature, setpoints and control parameters.
   - Symbol used to display the current room temperature

3. Heating/cooling mode
   - Cooling mode
   - Heating mode,
   - Electrical heater active

4. Fan mode
   - Auto fan active
   - Fan speed low, medium, high

5. Additional user information (RDF3xx) or current time of day (RDF400)

6. Weekday 1..7 (1 = Monday/7 = Sunday)*

7. Keypad lock active

8. Condensation in room (dewpoint sensor active)

9. Indicate alarm or reminder
   - * only on RDF400...
Mounting and installation

Mount the room controller on a recessed rectangular conduit box with 60.3mm fixing centers. 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

- Devices must be mounted on clean, dry indoor place and not be exposed to dripping or splashing

Wiring

- Comply with local regulations to wire, fuse and earth the controller.
- Properly size the cables to the controller, fan and valve actuators for AC 230 V mains voltage.
- Use only valve actuators rated for AC 230 V on RDF300…/RDF400…
- 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.
- Isolate the cables of SELV inputs X1-M/X2-M if the conduit box carries AC 230 V mains voltage.
- Inputs X1-M or X2-M 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.
- No metal conduits
- No cables provided with a metal sheath
- Disconnect from supply before opening the cover

Commissioning

Set the controller application via the DIP switches before snapping the front panel on the mounting base.

After power is applied, the controller carries out a reset during which all LCD segments flash indicating that the reset was correct. After the reset, which takes about 3 seconds, 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 (see basic documentation P3076).

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

Calibrate sensor

- Recalibrate the temperature sensor if the room temperature displayed on the controller does not match the room temperature measured. To do this, change parameter P05.

Setpoint and 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 device is classified as waste electronic equipment in terms of the European Directive 2002/96/EC (WEEE) and should not be disposed of as unsorted municipal waste. The relevant national legal rules are to be adhered to. Regarding disposal, use the systems setup for collecting electronic waste. Observe all local and applicable laws.

Technical data

⚠️ Power supply

<table>
<thead>
<tr>
<th>RDF300…/RDF400…</th>
<th>RDF340…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>AC 230 V +10/-15 %</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>Max. 8 VA</td>
</tr>
<tr>
<td>Fan control Q1, Q2, Q3-N</td>
<td></td>
</tr>
<tr>
<td>Rating</td>
<td>AC 230 V</td>
</tr>
<tr>
<td></td>
<td>Max. (5) A</td>
</tr>
<tr>
<td>Control output Y11-N/Y21-N (N.O.)</td>
<td></td>
</tr>
<tr>
<td>Rating</td>
<td>AC 230 V</td>
</tr>
<tr>
<td></td>
<td>Max. (5) A</td>
</tr>
<tr>
<td>Control output Y10-G0/Y20-G0</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>SELV DC 0…10 V</td>
</tr>
<tr>
<td></td>
<td>39 mV</td>
</tr>
<tr>
<td></td>
<td>Max. ±1 mA</td>
</tr>
</tbody>
</table>

Inputs

Multifunctional input X1-M/X2-M

| Type            | QAH11.1 (NTC) |
| Digital input:  | Selectable (N.O./N.C.) |
| Operating action| SELV DC 0…5 V/max 5 mA |
| Contact sensing | 4 kV, reinforced insulation |
| Insulation against mains voltage (SELV) |

Function input:

| External temperature sensor, heating/cooling changeover sensor, operating mode switchover contact, dewpoint monitor contact, enable electrical heater contact, alarm contact |
| Selectable |

Operational data

Switching differential, adjustable

| Heating mode (P30) | 2 K (0.5…6K) |
| Cooling mode (P31) | 1 K (0.5…6K) |

Setpoint setting and range

| Comfort mode (P08) | 21°C (5…40 °C) |
| Energy Saving mode (P11-P12) | 15°C/30°C (OFF, 5…40 °C) |
| Standby (P65-P66) | 8°C/OFF (OFF, 5…40 °C) |

Multifunctional input X1/X2

| Selectable 0…6 |
| Input X1 3: (P38) operating mode switchover |
| Input X2 2: (P40) heating/cooling changeover sensor |

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

<table>
<thead>
<tr>
<th>Operation</th>
<th>Climatic conditions</th>
<th>Temperature</th>
<th>Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>As per IEC 721-3-2</td>
<td>Class 2K3</td>
<td>−25...+60 °C</td>
</tr>
<tr>
<td>Storage</td>
<td>As per IEC 721-3-1</td>
<td>Class 1K3</td>
<td>−25...+60 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport</th>
<th>Mechanical conditions</th>
<th>Class 2M2</th>
</tr>
</thead>
</table>

### Standards

- **conformity**
  - EMC directive: 2004/108/EC
  - Low-voltage directive: 2006/95/EC
- **C-tick** conformity to
  - EMC emission standard: AS/NSZ 4251.1:1999
- **RoHS**
  - Reduction of hazardous substances: 2002/95/EC

### 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 (microdisconnection on operation)

### Electromagnetic compatibility

- **Emissions**: IEC/EN 61000-6-3
- **Immunity**: IEC/EN 61000-6-2

### Protective class

- II as per EN 60730

### Pollution class

- Normal

### Degree of protection of housing

- IP 30 to EN 60529

### General

- **Connection terminals**: Solid wires or prepared stranded wires
  - 1 x 0.4…2.5 mm²
  - or 2 x 0.4…1.5 mm²
- **Housing front color**: RAL 9003 white, or similar to RAL 9006 silver
- **Weight**: 0.220 kg
Connection terminals

**RDF300…/RDF400…**

- **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, Y21**: Control output “Valve” AC 230 V (N.O., for normally closed valves), output for compressor or output for electrical heater
- **X1, X2**: Multifunctional input for temperature sensor (e.g. QAH11.1) or potential-free switch
- **M**: Measuring neutral for sensor and switch

**RDF340…**

- **G, G0**: Operating voltage controller AC 24 V
- **L**: Operating voltage for fan 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”
- **Y10, Y20**: Control output for 0…10 V actuator
- **X1, X2**: Multifunctional input for temperature sensor (e.g. QAH11.1) or switch
- **M**: Measuring neutral for sensor and switch

Connection diagrams

**RDF300…, RDF400…**

- **N1**: Room temperature controller RDF300…/RDF400…
- **M1**: 3-speed fan
- **M2**: 1-speed fan
- **Y1, Y2**: Valve actuator
- **E1**: Electrical heater
- **S1, S2**: Switch (keycard, window contact, etc.)
- **B1, B2**: Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.)

**RDF340…**

- **N1**: Room temperature controller RDF340…
- **M1**: 3-speed fan
- **M2**: 1-speed fan
- **Y1, Y2**: Valve actuator
- **YR**: 0…10 signal converter/current valve
- **E1**: Electrical heater
- **S1, S2**: Switch (keycard, window contact, etc.)
- **B1, B2**: Temperature sensor (return air temperature, external room temperature, changeover sensor, etc.)
Dimensions in mm