



Description

The RTA50 series controllers are microprocessor-based devices designed to control heating / cooling systems with 2 or 4-pipe fan coils or chilled beam systems. They are also suitable for fan coils control with electric resistance or systems that combine fan coils with floor heating systems.

Technical specifications

- Application: fan coils 2 pipes, 4 pipes, 2 pipes with s/w electrical resistance sequence, 2 pipes with floor heating sequence, chilled beams with dew point limit
- Digital regulator with proportional + integral action
- Fan speed control with 0 ... 10 V DC or three-speed output
- Control action for actuators: ON-OFF, PWM, three-point floating, 0 ... 10 V DC
- Output control voltage: actuators for 230 or 24 Vac valves, 0...10 V DC or 230 V AC fan
- Power supply voltage: 230 V AC, 50/60 Hz
- LCD display
- Version with remote room module
- Version with Real Time Clock
- Local Master-Slave control for up to 4 slave controllers
- Mounting on 503 box
- CE certification
- Communication output with Modbus RTU protocol



| Models | Display | Mounting | Color | Control action | Supply |
|---------|----------------|---|-------|-------------------------|----------|
| RTA50HW | ● | Horizontal to 3-module flush-mounting box | White | ON-OFF / PWM | 230 V AC |
| RTA50HG | ● | Horizontal to 3-module flush-mounting box | Grey | ON-OFF / PWM | 230 V AC |
| RTA50VW | ● | Vertical to 3-module flush-mounting box | White | ON-OFF / PWM | 230 V AC |
| RTA50VG | ● | Vertical to 3-module flush-mounting box | Grey | ON-OFF / PWM | 230 V AC |
| RTA51A | - | DIN rail | - | ON-OFF / PWM / Floating | 24 V AC |
| RTA51B | - | DIN rail | - | ON-OFF / PWM / Floating | 230 V AC |
| RTA51HG | Remote display | Horizontal to 3-module flush-mounting box | Grey | - | - |
| RTA51VG | Remote display | Vertical to 3-module flush-mounting box | Grey | - | - |
| RTA51HW | Remote display | Horizontal to 3-module flush-mounting box | White | - | - |
| RTA51VW | Remote display | Vertical to 3-module flush-mounting box | White | - | - |

Input and Output

Digital inputs

Presence contact or time program: (terminals M13-M15)

The contact open indicates the presence in the room (occupied room) and activates the set point on Comfort mode.

Window: (terminals M14-M15)

The contact open indicates the closed window and normal operation. The closing of the contact indicates the opening of the window and the changeover to antifrost operation. This causes valves closure and fan stop. The frost protection activates an ambient set point of 4°C.

Summer / Winter switching: (terminals M22-M23, alternatively temperature remote sensor)

The contact close indicates the presence of hot water in the piping. This causes switching to winter operation. Summer/winter switching can also be carried out by using a temperature sensor connected to the same terminals.

Analog inputs

Air temperature sensor: (M21-M23 terminals)

This NTC sensor normally positioned on the fan coil's return air and has priority over the controller's internal sensor.

Water temperature sensor: (M22-M23 terminals)

If the sensor is present then activate by parameter P22 setting to default on „Without sensor“.

Analog and Digital outputs

Fan:

Fan speed regulation: proportional output 0 ... 10 V DC, 1 mA (terminals M11 and M12).

Additional outputs for 3-speed fans, 230 V AC 50 Hz, max 1.25 A (3 A peak) (terminals M3, M4, M5 e M6).

Actuator heating valve:

ON-OFF or PWM output at 230 V AC 0.8 A suitable for controlling up to 4 thermal actuators (terminals M9 and M8).

Actuator cooling valve:

ON-OFF or PWM output at 230 V AC 0.8 A suitable for controlling up to 4 thermal actuators (terminals M7 and M8).

Auxiliary output:

230 V AC 0.8 A (terminals M10 and M8).

Technical features

| | | |
|----------------------------|--------------------------------------|---|
| Control range | 10...30° C | |
| Power supply | 230 V AC, 50/60 Hz | |
| Analog inputs | | |
| | Room temperature 0...40°C | Return air sensor (remote) (M11 - M13) NTC10K |
| | Water temperature 0...80°C | Strap-on/screw-in sensor (M12 - M13) NTC10K |
| | Sensor relative humidity | 10...90 % rh Internal sensor |
| | CO ² sensor | 0...2000 ppm Internal sensor |
| Digital inputs | Summer winter changeover (M12 - M13) | Open contact = winter |
| | Windows open or ON-OFF (M14 - M13) | Open contact = window closed = ON |
| | Economy reduction (M15 - M13) | Close contact = Economy |
| Digital outputs | Actuator heating valve (M4 - M3) | Min. 5 mA, Max 0,8A |
| | Actuator cooling valve (M5 - M3) | Min. 5 mA, Max 0,8A |
| | Auxiliary output (M6 - M3) | Min. 5 mA, Max 0,8A |
| | Fan 3 speed (M8, M9, M10. M3 common) | Min. 5 mA, Max 1,25A ^(*) |
| Analog output | SELV 0...10 V DC | Max 10 mA |
| Housing | Polycarbonate and ABS RAL9010 | |
| Protection class | IP30 | |
| Working temperature | 0...45° C | |
| Storage temperature | -10...+70° C | |
| Working humidity | 10...90% rh, non condensing | |
| Installation | On 3-module flush-mounting box | |

(*) Connection for one fan only. For more fans use one relay for each speed.

Applications

1) 2-pipe fan coil system

Selectable s/w change-over by button on thermostat (manual), digital input by local or centralized contact, water temperature sensor.

Digital input for economy reduction and for window or power-off contact.

Input for optional remote room sensor.

Command for ON-OFF actuator.

3-speed fan motor or EC motor 0 ... 10 V DC.

Auxiliary output for electrical resistance in sequence to the heat valve.

2) 4-pipe fan coil system

Automatic season change over according to the room temperature.

Digital input for economy reduction and for window or power-off contact.

Input for optional remote room sensor.

Command for ON-OFF actuator.

3-speed fan motor or EC motor 0 ... 10 V DC.

Auxiliary output for electrical resistance in sequence to the heat valve.

3) Floor heating system and 2-pipe fan coil in sequence.

Selectable s/w change-over by button on thermostat (manual), digital input by local or centralized contact, water temperature sensor.

Digital input for economy reduction and for window or power-off contact.

Input for optional remote room sensor.

Command for ON-OFF actuator.

3-speed fan motor or EC motor 0 ... 10 V DC.

Auxiliary output for electrical resistance in sequence to the heat valve.



4) 2-pipe fancoil system only cooling and battery with electrical resistance

Automatic season change over according to the room temperature.
 Digital input for economy reduction and for window or power-off contact.
 Input for optional remote room sensor.
 Command for ON-OFF actuator.
 3-speed fan motor or EC motor 0 ... 10 V DC.
 Command for electrical resistance with PWM regulation.

5) 2-pipe fancoil system and battery with electrical resistance

The electric battery is in sequence with the heating valve in winter while in summer it acts as a heat sequence with a cooling valve.
 Automatic season change over according to the room temperature.
 Digital input for economy reduction and for window or power-off contact.
 Input for optional remote room sensor.
 Command for ON-OFF actuator.
 Command for electrical resistance with PWM regulation.
 3-speed fan motor or EC motor 0 ... 10 V DC.

Parameter table

| Parameter | Parameter description | Default value | Minimum value | Maximum value |
|-----------|--|---------------|---------------|---------------|
| 0 | Local set point. If P38=1 represents the change at P45 | 20 °C | 20-P1 | 20+P1 |
| 1 | Set point limit | 10 K | 20-P1 | 20+P1 |
| 2 | Defines the neutral band | 4 K | 0 K | 5 K |
| 3 | Proportional band | 2 K | 0 K | 5 K |
| 4 | Economy reduction | 2 K | 0 K | 10 K |
| 5 | Stand-by reduction | 6 K | 0 K | 10 K |
| 6 | Anti-freeze temperature | 4 °C | 0 °C | 10 °C |
| 7 | Offset reading of room temperature | 0 K | -5 K | +5 K |
| 8 | Offset reading of room temperature (Remote sensor 1) | 0 K | -5 K | +5 K |
| 9 | Offset reading of water temperature (Sensor 2) | 0 K | -5 K | +5 K |
| 10 | Offset reading sensor 3 | 0 K | -5 K | +5 K |
| 11 | Display visualization mode 0 = room temperature display 1 = Set point display | 0 | 0 | 1 |
| 12 | Type of system 0 = 2 pipe 1 = 4 pipe 2 = Floor heating/cooling + 2 pipe heating/cooling fan-coil 3 = 2 pipes cooling + electrical resistance 4 = 2 pipes heating/cooling + electrical resistance S/W | 0 | 0 | 4 |
| 13 | Fan 0 = Thermostatic S/W 1 = Continuous S/W 2 = Continuous in cooling, thermostatic in heating 3 = Continuous in heating, thermostatic in cooling | 0 | 0 | 3 |
| 14 | EC fan motor with ON-OFF activation Delay EC fan start | 0 sec | 0 sec | 240 sec |
| 15 | Type of output for actuator 1 0 = ON-OFF 1 = PWM | 0 | 0 | 1 |
| 16 | Type of output for actuator 2 0 = ON-OFF 1 = PWM | 0 | 0 | 1 |
| 17 | Digital input 1 0 = active = closed contact 1 = active = open contact 2 = open contact = alarm with LED 3 = open contact = alarm without LED | 0 | 0 | 3 |
| 18 | Digital input 2 0 = active = closed contact 1 = active = open contact | 0 | 0 | 1 |

| | | | | |
|----|--|--------|-------|---------|
| 19 | Analog input 1 0 = NTC10K sensor 1 = 4...20 mA 2 = 0...10 Vcd | 0 | 0 | 2 |
| 20 | Analog input 2 0 = NTC10K sensor 1 = 4...20 mA 2 = 0...10 Vdc | 0 | 0 | 2 |
| 21 | Analog input 3 0 = NTC10K sensor 1 = 4...20 mA 2 = 0...10 Vdc | 0 | 0 | 2 |
| 22 | Water temperature sensor function 0 = S/W changeover and fan consent 1 = S/W changeover 2 = Fan consent 3 = No sensor | 3 | 0 | 3 |
| 23 | S/W changeover mode 0 = Manual by display 1 = Strap-on or water sensor 2 = Automatic from room temperature sensor | 0 | 0 | 2 |
| 24 | Power-off delay fan with primary electric resistance | 60 sec | 0 sec | 240 sec |
| 25 | Fan consent temperature in winter | 35 °C | 26 °C | 50 °C |
| 26 | Fan consent temperature in summer | 16 °C | 10 °C | 25 °C |
| 27 | Fan start delay in heating | 60 sec | 0 sec | 240 sec |
| 28 | Time interval for destratification cycle | 15 min | 1 min | 60 min |
| 29 | Destratification time | 0 min | 0 min | 10 min |
| 30 | Temperature difference value for auxiliary output insertion | 0,5 K | 0 K | 10 K |
| 31 | Fan operating hours to send dirty filter alarm (multiply by 100) | 0 | 0 | 100 |
| 32 | Anti-sill time of the auxiliary exit | 60 sec | 1 sec | 60 sec |
| 33 | Cyclic output insertion (for functional testing) 0 = excluded 1 = inserted | 0 | 0 | 1 |
| 34 | Minimum fan speed value (speed 1) | 2 V | 0 V | 5 V |
| 35 | Speed value 2 fan | 5 V | 0 V | 8 V |
| 36 | Fan speed maximum value (speed 3) | 10 V | 0 V | 10 V |
| 37 | Fan speed with primary electric resistance | 5 V | 0 V | 10 V |
| 38 | Set point priority setting 0 = local 1 = remote | 0 | 0 | 1 |
| 39 | Fan Speed Setting Priority 0 = local 1 = partial remote 2 = absolut remote | 0 | 0 | 2 |
| 40 | Priority setting button 0 = local 1 = remote | 0 | 0 | 1 |
| 41 | ModBus address setting | 0 | 0 | 255 |
| 42 | Modbus speed setting 0 = 9600 Baud 1 = 14400 Baud 2 = 19200 Baud 3 = 38400 Baud | 0 | 0 | 3 |
| 43 | Modbus parity setting 0 = No parity 1 = ODD 2 = EVEN | 0 | 0 | 2 |
| 44 | Modbus Stop Bit Setting 0 = 1 Bit of Stop 1 = 2 Bit of Stop | 0 | 0 | 1 |

| | | | | |
|----|--|--------|-------|---------|
| 45 | Set point value setting from remote | 20 °C | 10 °C | 30 °C |
| 46 | Fan speed setting It is set if P39 is set at 1 and fan speed knob is set at Auto or if P39 is set at 2 | 0 | 0 | 10 V |
| 47 | Integral time | 60 sec | 0 sec | 255 sec |

Installation

The RTA50 controller is installed on the wall into a 503 box.

It is equipped with plug-in terminals, which allow a quick and practical connection to the electrical devices on the fan coil. Alternatively, the remote room module can be installed with a 2-wire connection to the controller.

Modbus communication

The controller is provided with an output for communication with the Modbus RTU protocol.

The connection to the Modbus bus is made with 2 wires connected to the terminals located on the lower left side of the controller. See in the figure: CONN1. (A + B)

Follow the instructions given in the Modbus standards regarding cable type, length and especially the position of the cables with respect to line voltage cables.

Take care not to assign the same address to more than one controller on the same bus.

Electrical wiring

| Terminal | Connection | Terminal | Connection |
|----------|----------------------------------|----------|---|
| 1 | phase power supply | 13 | eco digital input, setpoint reduction |
| 2 | neutral power supply | 14 | window digital input / shutdown |
| 3 | neutral for fan outputs | 15 | common digital inputs |
| 4 | fan-speed 1 | 16 | local bus for slave controllers |
| 5 | fan-speed 2 | 17 | MODBUS output (-) |
| 6 | fan-speed 3 | 18 | MODBUS exit (+) |
| 7 | output for cold actuator / valve | 19 | + 12 V DC power supply |
| 8 | common neutral actuators | 20 | 4 ... 20 mA input |
| 9 | output for hot actuator / valve | 21 | analogue input for remote room sensor |
| 10 | auxiliary output | 22 | analogue input water temperature sensor |
| 11 | 0 ... 10 V DC output for fan (+) | 23 | common analogue inputs |
| 12 | 0 ... 10 V DC output for fan (-) | 24 | remote display connection (-) |
| | | 25 | remote display connection (+) |

Dimensions

RTA50: 135 x 78 x 42 mm. External depth of the 503 box: 14 mm

RTA51 controller without display for DIN rail mounting: 70 x 85 x 61 mm (2 modules)

