Control components for VAV terminal units

RC

For the individual temperature control in rooms

Lower operating costs due to intelligent sensor technology

- Temperature range 10 – 45 °C
- For variable air volume systems and 2-pipe or 4-pipe air water systems
- With integral temperature sensor

Optional equipment

- Room occupant can select the operating mode
- Remote control for RC/M1

Room temperature controller ETN-24-VAV-227-P

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Application

Application

- Room temperature controller
- Ideally suited for the control of VAV terminal units using Easy, Compact, or Universal controllers
- Comfortable room temperature control
- Low energy consumption due to demand-based operating modes
- Cooling and/or heating
- Device versions with different output sequences for many different ventilation and air conditioning systems, including air-water systems.

Description

Variants

- B1: Room temperature controller with one analog output for cooling or heating (changeover)
- B2: Room temperature controller with two analog outputs for cooling or heating (3 point)
- B3: Room temperature controller with three analog outputs for cooling or heating (0 – 10 V DC and 3 point)
- M1: Room temperature controller with two analog outputs for cooling or heating (0 – 10 V DC)

Functional description

Room temperature controller and VAV terminal unit, including control components, form a functional unit that allows occupants to control the room temperature individually and at the lowest possible energy consumption. It also allows to control the water valves of hot water or cold water systems.
Room temperature control is a closed loop control. The controller is fitted with a temperature sensor that measures the room temperature. The setpoint can be a constant value or it can be changed by room occupants. The controller compares the actual value with the setpoint value and alters the volume flow rate setpoint value and/or the valve settings accordingly.
The room temperature control is P control or PI control.
Maximum energy efficiency is achieved because of demand-based operating modes that can be activated by the room occupant or at a higher level.

Operating modes

Energy-saving mode

The room temperature is such that devices will not suffer, i.e. the setpoint temperature for heating is very low, and the setpoint temperature for cooling is very high, for example in a room with an open window.

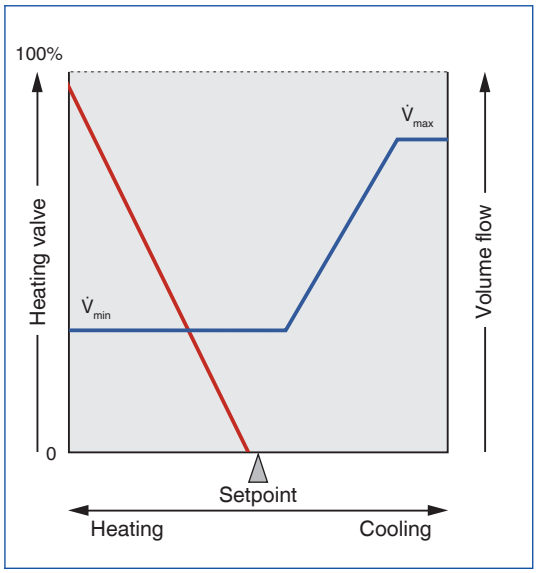
Standby mode
The setpoint temperature for heating is just slightly reduced, and the setpoint temperature for cooling is just slightly increased, e.g. for a room that is currently not used.

Frost mode
If the room temperature falls below 10 °C, the anti-freeze function is activated.

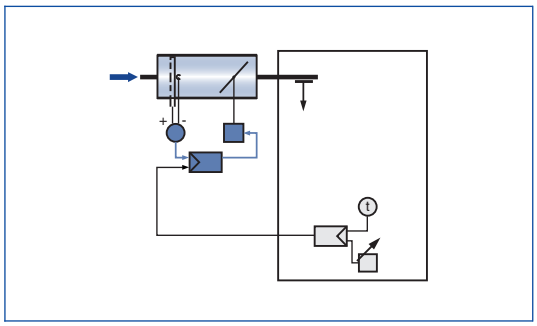
Changeover
Changeover from cooling to heating or from heating to cooling.

Boost
Room ventilation with the maximum volume flow rate ($\dot{V}_{max}$), or maximum heating or cooling.

Control diagram with heating and cooling sequence



Single operation



Room temperature controller CR24-B1

Supply voltage	24 V AC ± 20 %, 50/60 Hz
Power rating	3 VA
External temperature sensor	NTC, 5 kΩ, 10 – 45 °C
External setpoint changes	0 – 10 V DC corresponding to 0 – 10 K
Output for variable volume flow	0 – 10 V DC, 5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
EC conformity	EMC according to 2004/108/EG
Dimensions (B × H × T)	84 × 99 × 32 mm
Weight	0.105 kg

Room temperature controller CR24-B2

Supply voltage	24 V AC ± 20 %, 50/60 Hz
Power rating	3 VA
External temperature sensor	NTC, 5 kΩ, 10 – 45 °C
External setpoint changes	0 – 10 V DC corresponding to 0 – 10 K
Output for variable volume flow	0 – 10 V DC, 5 mA max.
Output for heating valve	3-point, 24 V AC, max. 0.5 A, 10 VA, optimised for actuators with a running time of approx. 150 s
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
EC conformity	EMC according to 2004/108/EG
Dimensions (B × H × T)	84 × 99 × 32 mm
Weight	0.105 kg

Room temperature controller CR24-B3

Supply voltage	24 V AC ± 20 %, 50/60 Hz
Power rating	3 VA
External temperature sensor	NTC, 5 kΩ, 10 – 45 °C
External setpoint changes	0 – 10 V DC corresponding to 0 – 10 K
Output for variable volume flow	0 – 10 V DC, 5 mA max.
Output for heating/cooling	0 – 10 V DC, 5 mA max.
Output for heating valve	3-point, 24 V AC, max. 0.5 A, 10 VA, optimised for actuators with a running time of approx. 150 s
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
EC conformity	EMC according to 2004/108/EG
Dimensions (B × H × T)	84 × 99 × 32 mm
Weight	0.105 kg

Room temperature controller ETN-24-VAV-227-P

Supply voltage	24 V AC, 50/60 Hz
Power rating	1.2 VA
External temperature sensor	Thermistor 50 kΩ at 45 °C
Analog outputs for cooling operation, heating operation	0 – 10 V DC, max. 5 mA
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
EC conformity	EMC according to 2004/108/EC
Dimensions (B × H × T)	92 × 80 × 22 mm
Weight	0.136 kg

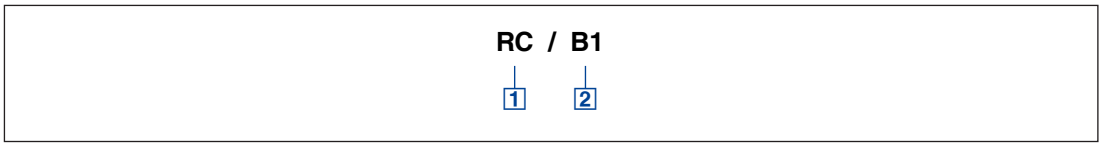
This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

Room temperature controller for the control of VAV terminal units Attractive unit for wall mounting, with a setpoint adjuster and a push button to select the operating mode Integral temperature sensor (NTC) and input for external temperature measuring unit. Voltage output 0 – 10 V DC for connection to an electronic volume flow controller for cooling, or for heating and cooling in changeover mode.

Technical data

- Supply voltage: 24 V AC, 50/60 Hz
- Power rating:3 VA
- External setpoint changes: 0 – 10 V DC
- Output for variable volume flow: 0 – 10 V DC

RC



1 Type
RC Room temperature controller

2 Type
B1 CR24-B1
B2 CR24-B2
B3 CR24-B3
M1 ETN-24-VAV-277V-P
M2 Remote control for M1

RC/M1

Type	ETN-24-VAV-277V-P

Room temperature controller CR24-B1

Room temperature controller CR24-B2

Room temperature controller CR24-B3

Room temperature controller ETN-24-VAV-227-P

Remote control for room temperature controller ETN-24-VAV-227-P

Any attachments are to be defined with the order code of the VAV terminal unit.

Application

- Room temperature controller CR24-B1 with one output, for room applications
- Cooling or heating (changeover)
- Analog output 0 – 10 V DC for the control of VAV terminal units with Easy, Compact or Universal controllers

Parts and characteristics

- Attractive unit for wall mounting, signal white (RAL 9003)
- Integral temperature sensor
- Setpoint adjuster
- Operating mode push button
- Status indicator light

- Analog output 0 – 10 V DC for variable volume flow control
- Analog inputs 0 – 10 V DC for external temperature sensor and for setpoint changes by an external unit
- Digital inputs for energy-saving mode, standby operation or changeover
- Micro switch for configuration
- Communication connection for adjustment devices

Commissioning

- Configure the control function using a micro switch
- Functional test

Application

- Room temperature controller CR24-B2 with two outputs, for room applications

- Cooling and heating
- Analog output 0 – 10 V DC for the control of VAV terminal units with Easy, Compact or

Universal controllers
– 3-point output for heating

Parts and characteristics
– Attractive unit for wall mounting, signal white (RAL 9003)
– Integral temperature sensor
– Setpoint adjuster
– Operating mode push button
– Status indicator light
– Analog output 0 – 10 V DC for variable volume flow control
– 3-point output for controlling a heating valve
– Analog inputs 0 – 10 V DC for external temperature sensor and for setpoint changes by an external unit
– Digital inputs for energy-saving mode, standby operation or changeover
– Micro switch for configuration
– Communication connection for adjustment devices

Commissioning
– Configure the control function using a micro switch
– Functional test

Application
– Room temperature controller CR24-B3 with three outputs, for room applications
– Cooling and heating
– Analog output 0 – 10 V DC for the control of VAV terminal units with Easy, Compact or Universal controllers
– Analog output 0 – 10 V DC cooling or heating (changeover)
– 3-point output for heating

Parts and characteristics
– Attractive unit for wall mounting, signal white (RAL 9003)
– Integral temperature sensor
– Setpoint adjuster
– Operating mode push button
– Status indicator light
– Analog output 0 – 10 V DC for variable volume flow control
– Analog output 0 – 10 V DC for controlling a water valve
– 3-point output for controlling a heating valve
– Analog inputs 0 – 10 V DC for external temperature sensor and for setpoint changes by an external unit
– Digital inputs for energy-saving mode, standby operation or changeover
– Micro switch for configuration
– Communication connection for adjustment devices

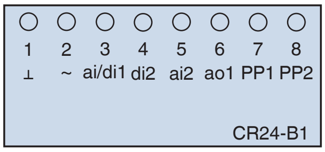
Commissioning
– Configure the control function using a micro switch
– Functional test

Application
– Room temperature controller ETN-24-VAV-227V-P with two outputs, for room applications
– Cooling and heating
– Analog output 0 – 10 V DC for the control of VAV terminal units with Easy, Compact or Universal controllers (cooling operation)
– Analog output 0 – 10 V DC controlling the reheating

Parts and characteristics
– Attractive unit for wall mounting, white
– Setpoint adjuster
– Operating mode push button
– Integral temperature sensor
– Analog input for external temperature sensor
– Display for temperature and status
– Analog output 0 – 10 V DC for variable volume flow control
– Analog output 0 – 10 V DC controlling a heating valve
– Communication connection for adjustment devices

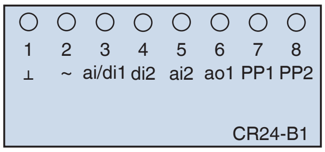
Commissioning
– Configuring the control function
– Functional test

RC/B1, Terminal connections



1 ⊥: Neutral
2 ~: Supply voltage
3 ai/di1: External temperature sensor or energy-saving mode
4 di2: Standby/Changeover
5 ai2: External setpoint changes
6 ao1: Volume flow controller
7 PP1: Diagnosis connection 1
8 PP2: Diagnosis connection 2

RC/B1, Terminal connections



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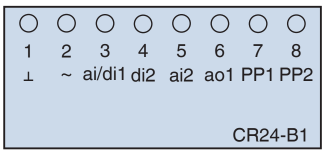
RC/B1, Terminal connections



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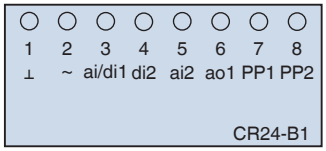
RC/B1, Terminal connections



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