CR24-B3 single room controller

Technical data

Nominal voltage	AC 24 V 50/60 Hz
Power supply range	AC 19.2...28.8 V
Control characteristics	P / PI
– P-band heating / cooling	Selectable: 1.5 / 1.0 K or 3.0 / 2.0 K
External temperature sensor (ai1)	Type NTC, 5 kΩ, sensing range 10...45°C
Heating setpoint	Range 15...36°C (default 21°C)
– Energy hold off	Heating 15°C / cooling 40°C
– Stand-by	Heating –2 K / cooling +3 K
Dead band	1 K
Frost limit temperature	10°C
Operation (CR24-B.. only)	
– Mode switch and status indication (LEDs)	AUTO (green) – ECO (orange) – MAX (red)
– Rotary knob for setpoint adjustment	±3 K
Inputs	2 x analog, 3 x digital
– External temperature sensor (ai1)	Type NTC, 5 kΩ, sensing range 10...45°C
– External setpoint shift (ai2)	0...10 V corresponds to 0...10 K
– Digital inputs (di1, di2, di3)	Contact rating 10 mA
Outputs	3 x analog
– VAV system output (ao1)	(0)2 ... 10 V, max. 5 mA
– Heating / cooling output (ao2)	0...10 V, max. 5 mA
– Heating output (ao3)	3-point, AC 24 V, max. source current 0.5 A / 10 VA (optimized for actuators with a running time of approx. 150 s)
Communication port for field devices	2 x PP (for PC-Tool, MFT remote control etc.)
Housing	Baseplate: NCS2005-R80B light gray (corresponds approx. to RAL 7035) / cover: RAL 9003 signal white
Connections	Terminal block 1... 3: 2.5 mm^2 Terminal block 4...12: 1.5 mm^2
Ambient conditions	
– Operation	0...+50°C / 20...90% rH (without condensation)
– Transport and storage	–25...+70°C / 20...90% rH (without condensation)
Standards	
– Protection class	**III** Safety extra-low voltage
– Degree of protection	IP 30 to EN 60529
– Mode of operation	Type 1 to EN 60730-1
– Software class	A to EN 60730-1
– EMC	**CE** conformity to 89/336/EEC
Dimensions (H x W x D)	99 x 83.7 x 51.3 mm
Weight	105 g

Application

Temperature controllers for single room applications with three analog outputs.
The analog output ao1 can be used in VAV applications to control one or more controllers.
The analog output ao2 can be used to control a heating or cooling sequence (change-over).
The analog heating output ao3 supplies a 3-point signal.

Functions

- Energy hold off
  In energy saving mode, the room temperature is reduced to building protection level, i.e. either the heating setpoint is significantly reduced or the cooling setpoint is significantly increased, for instance in a room with an open window.
- **Stand-by**
  The room temperature is reduced to stand-by level, i.e. either the heating setpoint is slightly reduced or the cooling setpoint is slightly increased, for instance in a room that is temporarily unoccupied.
- **Frost**
  The frost protection function is activated if the actual room temperature falls below 10°C.
- **Change-over**
  Change-over heating or heating/cooling.
- **Chilled ceiling with dew point limiting**
  If the temperature falls below the dew point, the corresponding output is set to 0.
- **Boost**
  The room can be ventilated with the maximum air volume ($\dot{V}_{max}$) or heated or cooled with the maximum capacity.
- **External temperature sensor**
  An external temperature sensor can be connected to the analog input ai1, for instance in order to measure the average room temperature in the exhaust air duct.
- **External setpoint shift**
  An external DC 0...10 V signal at the analog input ai2 can be used to shift the basic setpoint 0...10 K, for instance for the summer/winter compensation.

Device variant

Type CR24-**A**3: same functionality as the CR24-**B**3 but without an operator panel.

DRAFT – CORRECTIONS POSSIBLE

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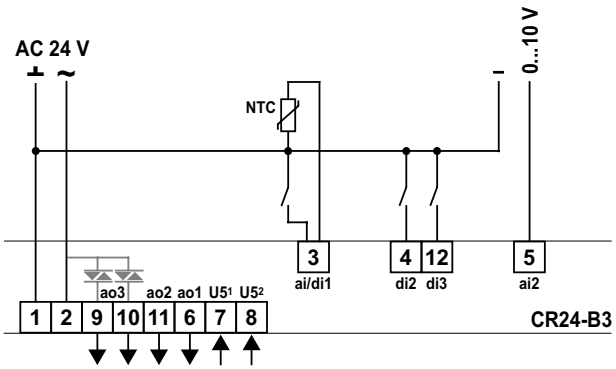
Wiring diagram

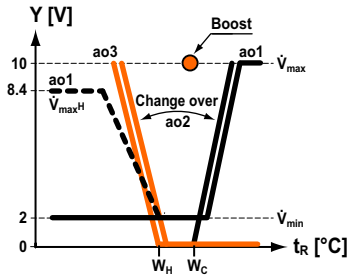


Inputs			Outputs		
3	ai1	External temperature sensor	6	ao1	System output for Belimo VAV controller
	di1	Energy hold off	9/10	ao3	Heating (3-point)
4	di2	Stand by	11	ao2	Heating / cooling
5	ai2	External setpoint shift	**Other connections**		
12	di3	Boost or change-over	7	PP1	Diagnostics socket 1
			8	PP2	Diagnostics socket 2

Configuration

DIP	Default settings	
1	P-band **normal**	P-band **wide**
2	$\dot{V}_{max}$ heating **off**	$\dot{V}_{max}$ heating **80%**
3	Output ao2 **Heating**	Output ao2 **Change-over cooling**
4	Input di3 **Boost**	Input di3 **Change-over dew point**
5	Boost **Temperature-controlled**	Boost $\dot{V}_{max}$
6	Control character **PI**	Control character **P**

Prinziple diagram



Key			
Y [V]	Output voltage in Volt	ao..	Analogue outputs
t_R [°C]	Room temperature in degrees centigrade	$\dot{V}_{max}$	Maximum volume flow
W	Setpoint	$\dot{V}_{maxH}$	Minimum volume flow heating
		$\dot{V}_{min}$	Minimum volume flow