

CR24-B2 Single room controllers

Temperature controllers for single room applications with two analog outputs.

- The analog output ao1 can be used in VAV applications to control one or more VAV controllers.
- The analog heating output ao3 supplies a 3-point signal.



Technical data

Nominal voltage	AC 24 V 50/60 Hz
For wire sizing	3 VA, without actuators
Power supply range	AC 19.2...28.8 V
Control characteristics	P
– 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	2 x analog
– VAV system output (ao1)	(0)2 ... 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 84 x 32 mm
Weight	105 g

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.

• Air flush

The room can be ventilated with the maximum volume flow (V_{max}), for instance in order to purge conference rooms, hotel rooms etc.

• 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

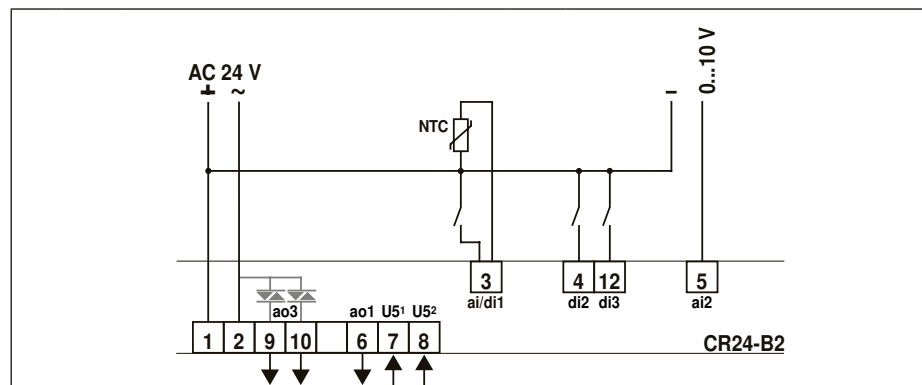
An external DC 0...10 V signal at the analog input ai2 can be used to shift the basic setpoint 0...10 K, for instance for the summer/winter compensation.

These functions are described in detail on pages 11 to 17.

Device variant

Type CR24-A2, same functionality as the CR24-B2 but without an operator panel.

Wiring diagram



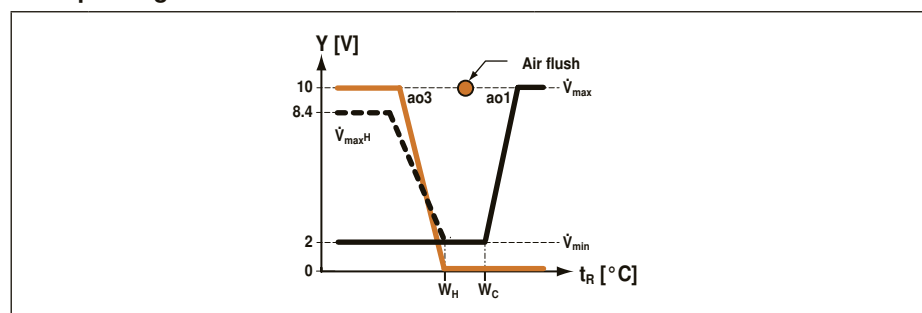
Inputs			Outputs		
3	ai1	External temperature sensor	6	ao1	System output for Belimo VAV controller
	di1	Energy hold off	9/10	ao3	Heating (3-point)
4	di2	Stand by	Other connections		
5	ai2	External setpoint shift			
12	di3	Air flush	7	PP1	Diagnostics socket 1
			8	PP2	Diagnostics socket 2

Configuration



DIP	Default settings	
1	P-band normal	P-band wide
2	\dot{V}_{\max} heating off	\dot{V}_{\max} heating 80%

Principal diagram



Key			
Y [V]	Output voltage in volt	ao..	Analog outputs
t _R [°C]	Room temperature in degrees centigrade	\dot{V}_{\max}	Maximum volume flow
W _H	Heating setpoint	$\dot{V}_{\max H}$	Maximum volume flow heating
W _C	Cooling setpoint	\dot{V}_{\min}	Minimum volume flow