

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.



### Device variants

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

### Technical data

<b>Electrical data</b>	Nominal voltage	AC 24 V 50/60 Hz
	For wire sizing	3 VA, without actuators
	Power supply range	AC 19.2...28.8 V
	Connections	Terminal block 1...3: 2.5 mm <sup>2</sup> Terminal block 4...8: 1.5 mm <sup>2</sup>
<b>Functional data</b>	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 for example Belimo type TFK
	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	
Communication port for field devices	2 x PP (for PC-Tool, MFT remote control etc.)	
<b>Inputs</b>	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
<b>Outputs</b>	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)
<b>Norms und standards</b>	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	<b>CE</b> conformity to 89/336/EEC
	Ambient conditions	
	– Operation	0...+50°C / 20...90% rH (without condensation)
– Transport and storage	–25...+70°C / 20...90% rH (without condensation)	
<b>Dimensions / Weight</b>	Dimensions (H x W x D)	99 x 84 x 32 mm
	Weight	105 g
<b>Housing colors</b>	Baseplate	NCS2005-R80B light gray (corresponds approx. to RAL 7035)
	Cover	RAL 9003-Signalweiss

### Safety notes



- The controller is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- It may only be installed by suitably trained personnel.  
All applicable legal or institutional installation regulations must be complied with.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

**Product features**

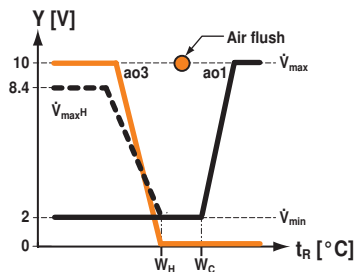
- Energy hold off** In energy saving mode, the room temperature is reduced to building protection level, i.e. either the heating setpoint is significantly reduced or the cooling setpoint is significantly increased, for instance in a room with an open window.
- Stand-by** The room temperature is reduced 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 ( $\dot{V}_{max}$ ), 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 17 to 24.*

**Configuration / Principal diagramm**

**Configuration**



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



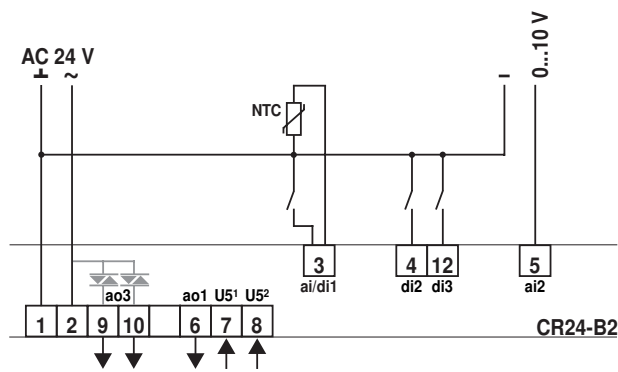
Legende			
Y [V]	Output voltage in volt	ao..	Analog outputs
tR [°C]	Room temperature in degrees centigrade	$\dot{V}_{max}$	Maximum volume flow
WH	Heating setpoint	$\dot{V}_{maxH}$	Maximum volume flow heating
WC	Cooling setpoint	$\dot{V}_{min}$	Minimum volume flow

**Electrical installation**

**Wiring diagram**

**Notes**

- Connect via safety isolation transformer.
- Parallel connection of other actuators possible. Note the performance data.



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	<b>Other connections</b>		
5	ai2	External setpoint shift	7	PP1	Diagnostics socket 1
12	di3	Air flush	8	PP2	Diagnostics socket 2