

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 VAV 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.


Device variants

Type CR24-A3, same functionality as the CR24-B3 but without an operator panel.

Technical data

Electrical 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
	Connections	Terminal block 1...3: 2.5 mm ² Terminal block 4...8: 1.5 mm ²
Functional data	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 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.)	
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)
Norms und 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
	Ambient conditions	
	– Operation	0...+50°C / 20...90% rH (without condensation)
– Transport and storage	–25...+70°C / 20...90% rH (without condensation)	
Dimensions / Weight	Dimensions (H x W x D)	99 x 84 x 32 mm
	Weight	105 g
Housing colors	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

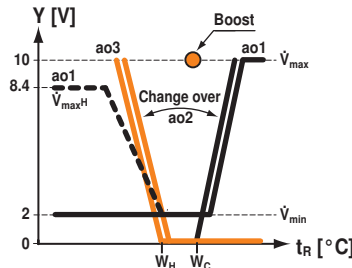
- Energy hold off** In energy saving mode, the room temperature is reduced to building protection level, i.e. either the heating setpoint is significantly reduced or the cooling setpoint is significantly increased, for instance in a room with an open window.
- Stand-by** The room temperature is reduced 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.
- 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 volume flow (\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.
These functions are described in detail on pages 17 to 24.

Configuration / Prinzipial diagram

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 characteristic PI	Control characteristic P



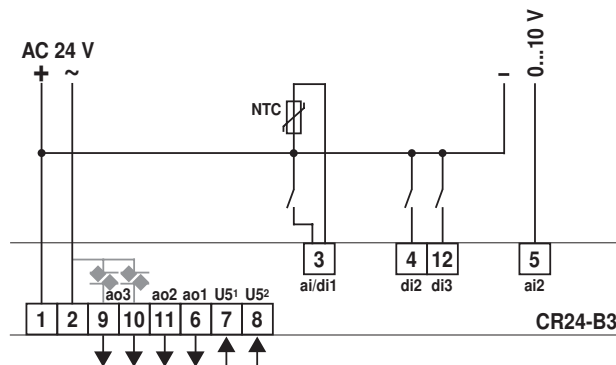
Key			
Y [V]	Output voltage in volt	ao..	Analog outputs
tR [°C]	Room temperature in degrees centigrade	\dot{V}_{max}	Maximum volume flow
WH	Heating setpoint	\dot{V}_{maxH}	Maximum volume flow heating
WC	Cooling setpoint	\dot{V}_{min}	Minimum volume flow

Electrical installation

Wiring diagram

Note

- 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	11	ao2	Heating / Cooling
5	ai2	External setpoint shift	Other connections		
12	di3	Boost / Change-over / Dew point	7	PP1	Diagnostics socket 1
			8	PP2	Diagnostics socket 2