Temperature controllers for single room applications with one analog output:

- **The analog output ao1 can be used in VAV applications to contol one or more VAV controllers.**
- **In change-over applications, the analog output ao1 can be changed over from cooling to heating mode via an input.**

Device variants

Type CR24-A1, same functionality as the CR24-B1 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
	– 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, 2 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)	Contact rating 10 mA
Outputs	1 x analog	
	– VAV system output (ao1)	(0)2 ... 10 V, max. 5 mA
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.

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.

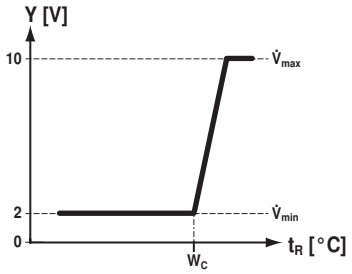
External setpoint shift An external DC 0...10 V signal at the analog input ai2 can be used to shift the basic setpoint 0...10 K, for instance for the summer/winter compensation.

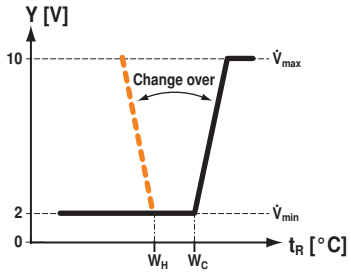
These functions are described in detail on pages 17 to 24.

Configuration / Principal diagramm

Configuration

DIP	Default settings	
1	P-band **normal**	P-band **wide**
2	Input di2 **Stand-by**	Input di2 **Change-over**



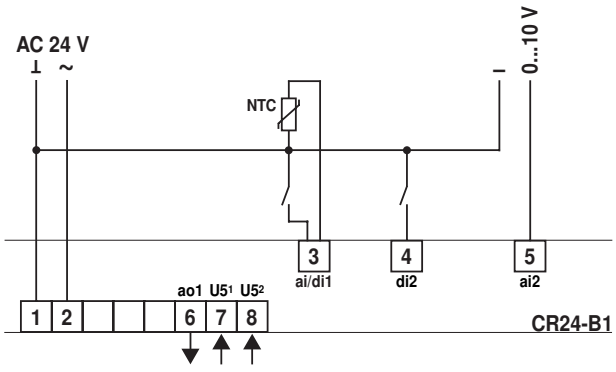


Key			
Y [V]	Output voltage in volt	$\dot{V}_{max}$	Maximum volume flow
t_R [°C]	Room temperature in degrees centigrade	$\dot{V}_{min}$	Minimum volume flow
W_H	Heating setpoint		
W_C	Cooling setpoint		

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	**Other connections**		
4	di2	Stand-by / Change-over	7	PP1	Diagnostics socket 1
5	ai2	External setpoint shift	8	PP2	Diagnostics socket 2

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