

Temperature controllers for single room applications with one analog output:

- The analog output ao1 can be used in VAV applications to control 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

<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, 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
<b>Outputs</b>	1 x analog	
	– VAV system output (ao1)	(0)2 ... 10 V, max. 5 mA
<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**

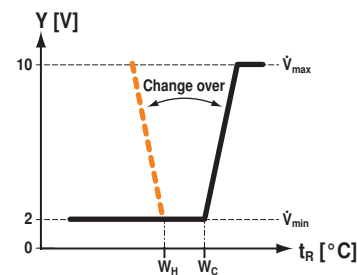
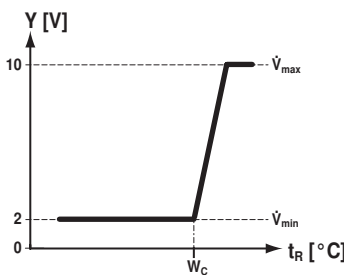
- Energy hold off** In energy saving mode, the room temperature is reduced to building protection level, i.e. either the heating setpoint is significantly reduced or the cooling setpoint is significantly increased, for instance in a room with an open window.
  - Stand-by** The room temperature is reduced 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.
  - 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 <b>normal</b>	P-band <b>wide</b>
2	Input di2 <b>Stand-by</b>	Input di2 <b>Change-over</b>



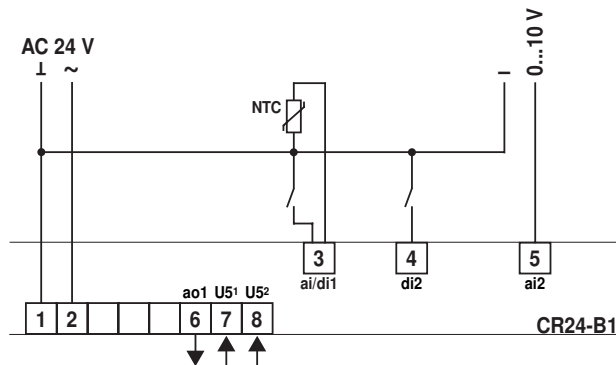
Key			
Y [V]	Output voltage in volt	$\dot{V}_{max}$	Maximum volume flow
$t_R$ [°C]	Room temperature in degrees centigrade	$\dot{V}_{min}$	Minimum volume flow
$W_H$	Heating setpoint		
$W_C$	Cooling setpoint		

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