

Temperature controllers for single room applications with one analog output and two digital outputs:

- The analog output ao1 for cooling, e.g. in VAV applications to control one or more VAV controllers.
- The digital heating output do3 for
 - electrical reheater with one or two stages, in binary mode with three stages
 - on/off radiator valve


Device variants

Type CR24-A2E, same functionality as the CR24-B2E 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	2 K with 2 resp. 3 stages / 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 30...50°C
	– External setpoint shift (ai2)	0...10 V corresponds to 0...10 K
Outputs	1 x analog, 2 x digital	
	– VAV system output (ao1)	(0)2 ... 10 V, max. 5 mA
	– Heating output (do3), 2 stages	Triac, AC 24 V, max. source current 0.5 A / 10 VA
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

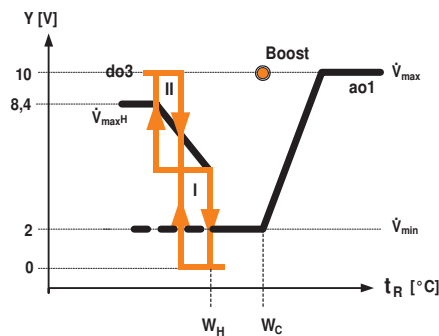
Energy hold off	In energy saving mode, the room temperature is reduced to building protection level, i.e. either the heating setpoint is significantly reduced or the cooling setpoint is significantly increased, for instance in a room with an open window.
Stand-by	The room temperature is reduced to stand-by 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.
Boost	The room can be ventilated with the maximum volume flow (\dot{V}_{\max}) or heated up with the maximum capacity.
Supply air temperature limiter	An optional mounted sensor allows to control the supply air temperature to a maximum of 50°C.
\dot{V}_{\max} at heating	For electrical reheaters the air volume at the heating condition can optionally be increased.
Output mode	The do3 output mode can be set accordingly to the application to <ul style="list-style-type: none"> – stage for one-stage electrical reheater or on/off radiator valve – binary for two-stage electrical reheaters (stage I: $1/3$, stage II: $2/3$) which will be $1/3$, $2/3$, $3/3$
Soft start (Roll-out feature)	The build-in start-up and roll-out of the stage control provides temperature excess protection. This helps to avoid service calls due to switched-off safety chains and reduces the electrical load after a power-fail.
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. <i>These functions are described in detail on pages 17 to 24.</i>

Configuration / Prinzipial diagram

Configuration



DIP	Default-settings	
1		Binary mode
2		\dot{V}_{\max} heating on



Key			
Y [V]	Output voltage in volt	ao1	Cooling output
t_R [°C]	Room temperature in degrees centigrade		System output for Belimo VAV controller
W_H	Heating setpoint	do3	Heating stage I
W_C	Cooling setpoint		Heating stage II
▼ ▲	Output on/off	\dot{V}_{\max}	Maximum volume flow
		$\dot{V}_{\max H}$	Maximum volume flow heating
		\dot{V}_{\min}	Minimum volume flow