

Temperature controllers for single room applications requiring two 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



Technical 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
Control characteristics	P
– P-band heating / cooling	2 K with 2 resp. 3 steps / 2.0 K
External temperature limiter (ai1)	Sensor type NTC, 5 kΩ, sensing range 40...55 °C
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
Room protection (Frost)	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
Inputs	2 x analog, 3 x digital
– External temperature sensor (ai1)	Type NTC, 5 kΩ
– External setpoint shift (ai2)	0...10 V corresponds to 0...10 K
– Digital inputs (di1, di2, di3)	Contact rating 10 mA
Outputs	2 x analog
– VAV system output (ao1)	(0)2 ... 10 V, max. 5 mA
– Heating output (do3)	Triac, AC 24 V, max. source current 0.5 A / 10 VA
Communication port for field devices	2 x PP (for PC-Tool, MFT remote control etc.)
Housing	Baseplate: NCS2005-R80B light gray (corresponds approx. to RAL 7035) / Cover: RAL 9003 signal white
Connections	Terminal block 1... 3: 2.5 mm ² Terminal block 4...12: 1.5 mm ²
Ambient conditions	
– Operation	0...+50 °C / 20...90% rH (without condensation)
– Transport and storage	–25...+70 °C / 20...90% rH (without condensation)
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
Dimensions (H x W x D)	99 x 84 x 32 mm
Weight	105 g

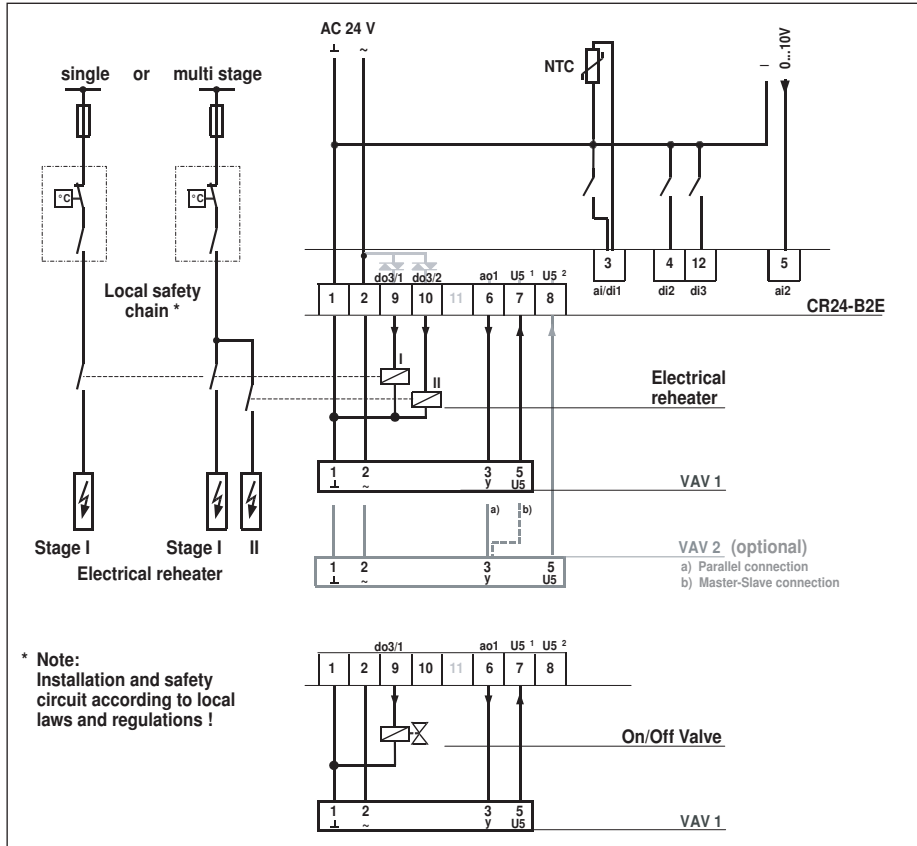
Functions

- **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.
- **Room protection (Frost)**
The room 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
 - **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.

Device variant

Type CR24-A2E, same functionality as the CR24-B2E but without an operator panel.

Wiring diagram



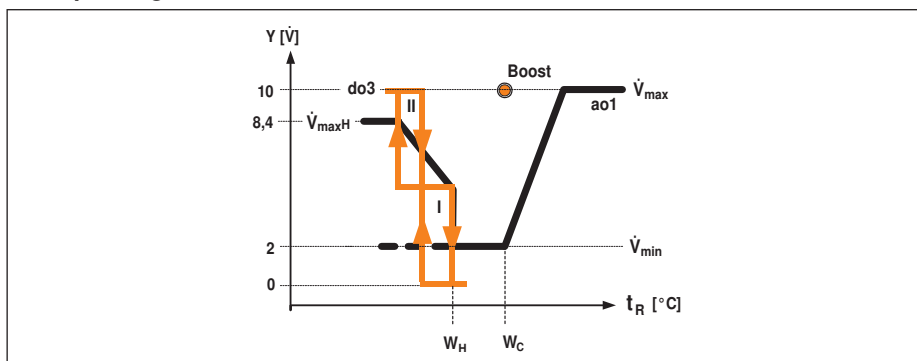
Inputs		Outputs		
3	ai1	Supply air temperature limiter		
	di1	Energy hold off		
4	di2	Stand by		
5	ai2	External setpoint shift		
12	di3	Other connections		
		7	PP1	Diagnostics socket 1
		8	PP2	Diagnostics socket 2

Configuration



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

Principal diagram



Key		
Y [V]	Output voltage in volt	ao1
t_R [°C]	Room temperature in degrees centigrade	
W_H	Heating setpoint	do3
W_C	Cooling setpoint	
▼ ▲	Output on/off	\dot{V}_{max}
		\dot{V}_{maxH}
		\dot{V}_{min}