Temperature controller for rail mounting PID controller, dimensions 75 x 22.5 mm Model CS4R

Applications

- Plant construction and industrial ovens
- Process engineering
- Plastics technology and processing
- Ventilation and air-conditioning
- General industrial applications

Special features

- Control mode configurable (PID, PI, PD, $^{ON}/_{OFF}$)
- Integrated auto-tuning
- Selectable control output - relay, logic or 4 ... 20 mA
- Multi-function input for Pt100, thermocouples and standard industrial signals
- Optional with heater burnout alarm and serial interface



Temperature controller, model CS4R

Description

The model CS4R is a compact digital temperature controller for the display, control and monitoring of temperature.

The controller features a multi-function input, meaning the configuration of the sensor input can be set. Thus the flexibility of the controller is considerably increased, and warehousing is made easier. An alarm output for monitoring the actual value is also available as standard.

The control parameters can be set across broad ranges. Auto-tuning, which facilitates finding the optimal control parameters, can be activated.

The controllers are intended for DIN-rail mounting. The control output can be set either as relay (for slow control), as logic level for the control of electronic solid-state relays (for fast control and high current loads) or as a continuous 4 ... 20 mA output.

The versions with 4 ... 20 mA control output can be reconfigured by the user and operated as a transmitter with 4 ... 20 mA output signal.

A heater burnout alarm for the heater current monitoring and a serial interface RS-485 are available optionally.

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Specifications

Display	
Actual value	7-segment LED, 4-digit, red, character size 7.5 mm
Set point	7-segment LED, 4-digit, green, character size 7.5 mm
Indication range	-1999 ... 9999

Input	
Number and type	1 multi-function input for resistance thermometers, thermocouples and standard signals
Input configuration	Selectable via terminal connections and menu-driven programming
Resistance thermometer	Pt100, JPt100, 3-wire, max. permissible resistance per connecting cable: 10 Ω
Thermocouples	Types K, J, R, S, E, T, N, PL-II, C (W/Re5-26): max. permissible external resistance: 100 Ω Type B: max. permissible external resistance: 40 Ω
Standard signals	0 ... 20 mA, 4 ... 20 mA: Input impedance 50 Ω {external measurement shunt} max. permissible input current: 100 mA 0 ... 1 V: Input impedance > 1 MΩ max. permissible input voltage: 5 V 0 ... 5 V, 1 ... 5 V, 0 ... 10 V: Input impedance > 100 kΩ max. permissible input voltage: 15 V
Measuring time	250 ms

Control output	
Number and type	3 different versions are possible
Relay contact	Load: AC 250 V, 3 A (resistive load) AC 250 V, 1 A (inductive load, cos φ = 0.4)
Logic level	DC 0 ... 12 V max. 40 mA (short-circuit proof) For the control of an electronic switch relay (solid-state relay, SSR)
{Analogue current signal}	4 ... 20 mA, max. load 550 Ω The control output 4 ... 20 mA can be reconfigured to a transmitter output 4 ... 20 mA
Control mode	PID, PI, PD, P, $^{ON}/_{OFF}$ (configurable) To determine the control parameters for PID control, auto-tuning can be activated.
Proportional band	0 ... 110 %
Integral time	0 ... 1,000 s
Derivative time	0 ... 300 s
Cycle time	1 ... 120 s (not available with analogue current signal control output)
Hysteresis	Only available with $^{ON}/_{OFF}$ control mode Thermocouples and resistance thermometers: 0.1 ... 100.0 °C Standard signals: 1 ... 1,000 (with a scaling of the input with one decimal point, this is taken over by the hysteresis)

Alarm output	
Alarm output	Open-collector Load: DC 24 V, max. 0.1 A
Alarm output 1	For the actual value and control loop monitoring Alarm type, switch behaviour, hysteresis and time delay can be set
{Heater burnout alarm} [1)]	For single-phase heating systems (not possible with analogue current signal control output), optionally configured up to max. 5 A, 10 A, 20 A or 50 A, the current transformer is included in the delivery

{ } Items in curved brackets are optional extras for an additional price.
1) If alarm output 1 and the heater burnout alarm are active simultaneously, both alarms affect the Open-collector output.

Options and performance data	
{Serial interface}	RS-485 The transmission rate can be set (2,400 bps, 4,800 bps, 9,600 bps or 19,200 bps).
Power supply	AC 100 ... 240 V, 50/60 Hz (max. permissible 85 ... 264 V) or AC/DC 24 V, 50/60 Hz (max. permissible 20 ... 28 V)
Power consumption	approx. 6 VA

Ambient conditions	
Ambient temperature	0 ... 50 °C
Storage temperature	-20 ... +50 °C
Humidity	35 ... 85 % r. h. (non-condensing)

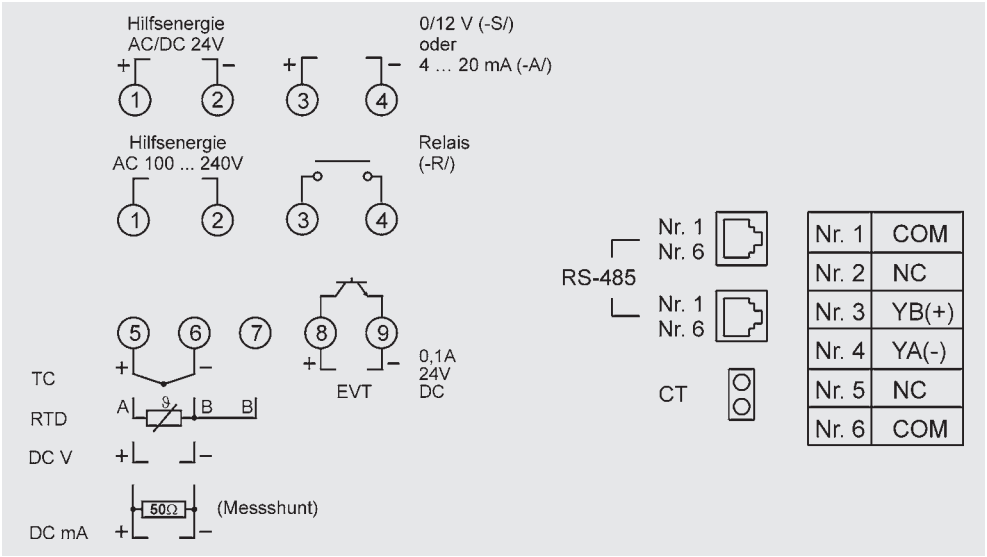
Case	
Material	Polycarbonate
Colour	Light grey
Weight	approx. 150 g
Mounting	Snap-in mechanism for mounting on DIN rails

Inputs of the temperature controller

Input signals	Measuring span		Measuring error of the span in %	
			Standard	Exceptions
Current signals				
0 ... 20 mA, 4 ... 20 mA	-1999 ... 9999 [1]		±0.2 % ±1 digit	-
Voltage signals				
0 ... 1 V, 0 ... 5 V, 0 ... 10 V	-1999 ... 9999 [1]		±0.2 % ±1 digit	-
1 ... 5 V	-1999 ... 9999 [1]		±0.2 % ±1 digit	-
Thermocouples				
Type K (NiCr-Ni)	-200 ... +1,370 °C -199.9 ... +400.0 °C	-320 ... +2,500 °F -199.9 ... +750.0 °F	±0.2 % ±1 digit [2] ±2 K	≤ 0 °C: ±0.4 % ±1 digit ≤ 0 °C: ±0.4 % ±1 digit
Type J (Fe-CuNi)	-200 ... +1,000 °C	-320 ... +1,800 °F	±0.2 % ±1 digit [2]	≤ 0 °C: ±0.4 % ±1 digit
Type R (PtRh-Pt)	0 ... 1,760 °C	0 ... 3,200 °F	±0.2 % ±1 digit [2]	≤ 200 °C: ±6 K
Type S (PtRh-Pt)	0 ... 1,760 °C	0 ... 3,200 °F	±0.2 % ±1 digit [2]	≤ 200 °C: ±6 K
Type B (PtRh-PtRh)	0 ... 1,820 °C	0 ... 3,300 °F	±0.2 % ±1 digit [2]	≤ 300 °C: without details
Type E (NiCr-CuNi)	-200 ... +800 °C	-320 ... +1,500 °F	±0.2 % ±1 digit [2]	≤ 0 °C: ±0.4 % ±1 digit
Type T (Cu-CuNi)	-199.9 ... +400.0 °C	-199.9 ... +750.0 °F	±2 K	≤ 0 °C: ±0.4 % ±1 digit
Type N (NiCrSi-NiSi)	-200 ... +1,300 °C	-320 ... +2,300 °F	±0.2 % ±1 digit [2]	≤ 0 °C: ±0.4 % ±1 digit
Type PL-II	0 ... 1,390 °C	0 ... 2,500 °F	±0.2 % ±1 digit [2]	-
Type C (W/Re5-26)	0 ... 2,315 °C	0 ... 4,200 °F	±0.2 % ±1 digit [2]	-
Resistance thermometer				
Pt100 (3-wire)	-200 ... +850 °C -199.9 ... +850.0 °C	-300 ... +1,500 °F -199.9 ... +999.9 °F	±0.1 % ±1 digit [2] ±0.1 % ±1 digit [2]	-
JPt100 (3-wire)	-200 ... +500 °C -199.9 ... +500.0 °C	-300 ... +900 °F -199.9 ... +900.0 °F	±0.1 % ±1 digit [2] ±1 K	-

1) Adjustable decimal point
2) Referred to the measuring span in °C

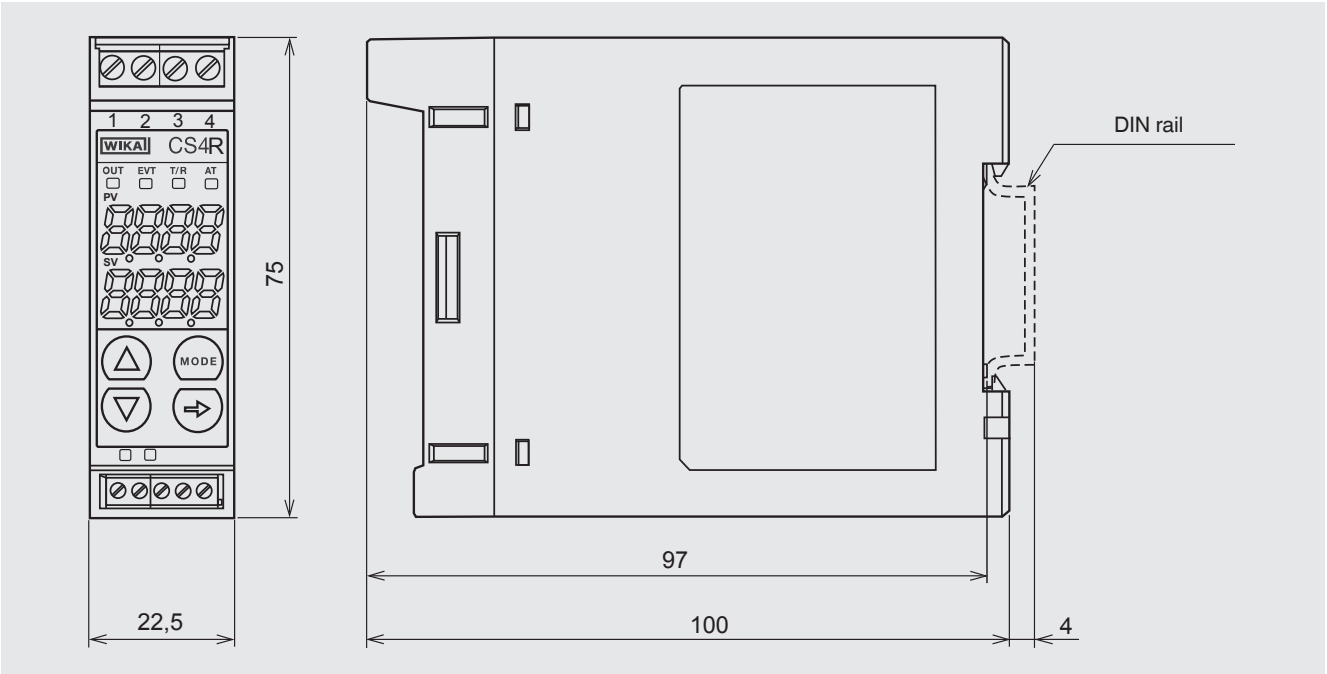
Designation of connection terminals



Legend:

CT	Input current transformer for heater burnout alarm
EVT	Output for alarm output 1 and heater burnout alarm
(-R/)	Control output, relay
(-S/)	Control output, logic level 0/12 V
(-A/)	Control output, 4 ... 20 mA analogue current signal
TC	Input thermocouple
RTD	Input resistance thermometer
DC V	Input voltage signal
DC mA	Input current signal
RS-485	Serial interface RS-485

Dimensions in mm



Approvals

Logo	Description	Country
CE	**EC declaration of conformity** ■ EMC directive 2004/108/EC EN 61326 emission (group 1, class B) and interference immunity (industrial application) ■ Low voltage directive 2006/95/EC EN 61010-1:2010	European Community
EAC	**EAC** ■ Electromagnetic compatibility ■ Low voltage directive	Eurasian Economic Community
	GOST Metrology, measurement technology	Russia
	BelGIM Metrology, measurement technology	Belarus

Certificates (option)

- 2.2 test report
- 3.1 inspection certificate
- DKD/DAkkS calibration certificate

Approvals and certificates, see website

Ordering information
Model / Control output / Power supply / Instrument configuration / Options

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