Temperature controller for panel mounting
PID controller, dimensions 48 x 48 mm
Model CS4S

WIKA data sheet AC 85.02

Applications

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

Special features

- Control characteristic configurable (PID, PI, PD, ON/OFF)
- Integrated auto-tuning
- Selectable control output - relay, logic or 4 ... 20 mA
- Multi-function input for Pt100, thermocouple and standard industrial signals
- Optional with 2nd alarm output, heater break alarm, 2nd control output, serial interface or parameter memory for a 2nd set point

Temperature controller model CS4S

Description

The model CS4S 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 stock-holding 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 designed for installation in a control panel. The control output can be set either as relay (for slow control), as logic for the control of electronic solid-state relays (for fast control and high current loads) or as a continuous 4 ... 20 mA output.

As options, there is a 2nd alarm output available for the monitoring of the actual value and the control loop, and a heater break alarm for monitoring the control output, or, alternatively, a 2nd relay output. Likewise, an RS-485 serial interface or a parameter memory for a 2nd set point is available. The parameter memory can be selected via an external connection terminal.

Specifications

Display

Actual value	7-segment LED, 4-digit, red, digit height 10.2 mm
Set point	7-segment LED, 4-digit, green, digit height 8.8 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 connection line: 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 instrument shunt) 0 ... 1 V — Input impedance > 1 MΩ 0 ... 5 V, 1 ... 5 V, 0 ... 10 V — Input impedance > 100 kΩ
Measuring time	250 ms

Control outputs

Control output 1	3 different versions are possible
Relay contact	Loading: 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
Control output 2 [1]	For "three-step control"
Output	Contact-free relay, loading: AC 230 V, 0.3 A (resistive load)
Proportional band	0.0 to 10.0 times the proportional band of control output 1
Integral time	Identical to the integral time of control output 1 (see "Control characteristic")
Derivative time	Identical to the derivative time of control output 1 (see "Control characteristic")
Cycle time	1 ... 120 s
Overlap band/Deadband	Resistance thermometers and thermocouples: -100.0 ... 100.0 °C Standard signals: -1,000 ... 1,000 (with a scaling of the input with one decimal point, this is taken over by the hysteresis).
Control characteristic	PID, PI, PD, P, ON/OFF (configurable) To determine the control parameters for PID control, auto-tuning can be activated.
Proportional band	Thermocouples: 0 ... 1,000 °C Resistance thermometers: 0.0 ... 999.9 °C Standard signals: 0.0 ... 100.0 %
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 characteristic Resistance thermometers and thermocouples: 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 outputs   max. 2 (common contact root)

Alarm output 1	For actual-value monitoring Alarm type, switch behaviour, hysteresis and time delay can be set
{Alarm output 2} [1] [2]	Selectable as actual-value monitoring or control-loop monitoring, or as actual-value and control-loop monitoring with combined output.
{Heater break alarm} [1] [2]	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
Relay contact [3]	Loading: AC 250 V, 3 A (resistive load), AC 250 V, 1 A (inductive load, cos φ = 0.4)

{ } Items in curved brackets are optional extras for an additional price.
1) A combination of alarm output 2 or heater break alarm with relay output 2 is not possible.
2) When alarm output 2 and the heater break alarm are both available simultaneously, both alarms work off a single relay.
3) Is valid for alarm output 1 and alarm output 2 or heater break alarm.

Options and performance data

{Parameter memory} [4]	Memory for a 2nd set point, can be activated through the short-circuit of 2 connection terminals on the rear of the controller.
{Serial interface} [4]	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. 8 VA

Ambient conditions

Ambient temperature	0 ... 50 °C
Storage temperature	-20 ... +50 °C
Humidity	35 ... 85 % relative humidity without condensation

Case

Material	Polycarbonate
Colour	Black
Ingress protection	Front: IP 66; Rear: IP 00 (per IEC 60529/EN 60529)
Weight	approx. 200 g
Mounting	Screw type mounting brackets for wall thicknesses from 1 to 15 mm

{ } Items in curved brackets are optional extras for an additional price.
4) From the options of the serial interface and the parameter memory, only one option can be selected at any one time.

Inputs of the temperature controllers

Input signals	Measuring span		Measuring error of the span in %	
			Standard	Exceptions
Current signals				
0 ... 20 mA	-1999 ... 9999 [5]		±0.2 % ± 1 digit	-
4 ... 20 mA	-1999 ... 9999 [5]		±0.2 % ± 1 digit	-
Voltage signals				
0 ... 1 V	-1999 ... 9999 [5]		±0.2 % ± 1 digit	-
0 ... 5 V	-1999 ... 9999 [5]		±0.2 % ± 1 digit	-
1 ... 5 V	-1999 ... 9999 [5]		±0.2 % ± 1 digit	-
0 ... 10 V	-1999 ... 9999 [5]		±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 [6] ±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 [6]	≤ 0 °C: ±0.4 % ±1 digit
Type R, PtRh-Pt	0 ... 1,760 °C	0 ... 3,200 °F	±0.2 % ± 1 digit [6]	≤ 200 °C: ±6 K
Type S, PtRh-Pt	0 ... 1,760 °C	0 ... 3,200 °F	±0.2 % ± 1 digit [6]	≤ 200 °C: ±6 K
Type B, PtRh-PtRh	0 ... 1,820 °C	0 ... 3,300 °F	±0.2 % ± 1 digit [6]	≤ 300 °C: without details
Type E, NiCr-CuNi	-200 ... +800 °C	-320 ... +1,500 °F	±0.2 % ± 1 digit [6]	≤ 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 [6]	≤ 0 °C: ±0.4 % ±1 digit
Type PL-II	0 ... 1,390 °C	0 ... 2,500 °F	±0.2 % ± 1 digit [6]	-
Type C (W/Re5-26)	0 ... 2,315 °C	0 ... 4,200 °F	±0.2 % ± 1 digit [6]	-
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 [6] ±0.1 % ± 1 digit [6]	
JPt 100 (3-wire)	-200 ... +500 °C -199.9 ... +500.0 °C	-300 ... +900 °F -199.9 ... +900.0 °F	±0.1 % ± 1 digit [6] ±1 K	

5) Adjustable decimal point.
6) With respect to the measuring span in °C.

Designation of terminal connectors
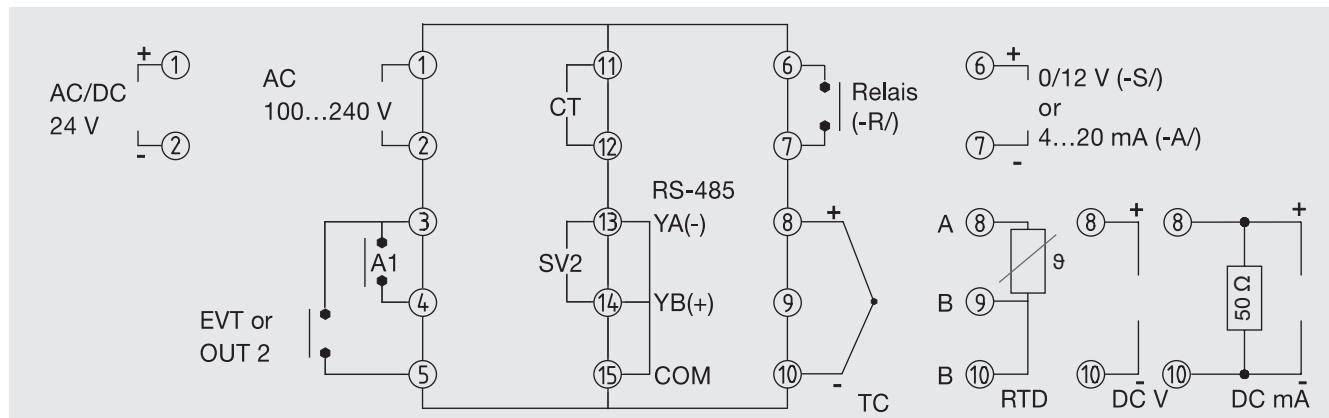
Legend:
A1	Alarm output 1
EVT	Output for alarm output 2 and heater break alarm
OUT 2	2nd control output
CT	Current transformer for heater break alarm
SV2	Parameter memory for 2nd set point
RS-485	Serial interface RS-485
(-R/)	Control output, relay
(-S/)	Control output, logic level 0/12 V
(-A/)	Control output, 4 ... 20 mA analogue current signal
TC	Input thermocouple
RTD	Input resistance thermometer
DC V	Input voltage signal
DC mA	Input current signal

Dimensions in mm
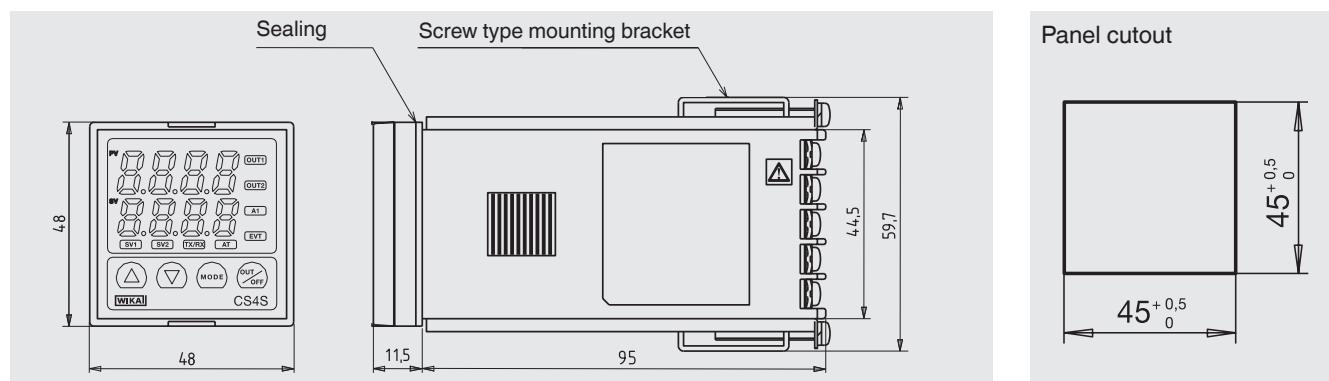
CE conformity

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

Approvals (option)

■ **GOST,** metrology/measurement technology, Russia

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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