

## Temperature Controller PID Controller, Auto-tuning Model CF1M

WIKA Data Sheet AC 85.20

### Applications

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

### Special Features

- Control characteristic adjustable (PID, PI, PD, P, ON/OFF)
- Integrated auto-tuning function
- Control output optionally relay, logic level or 4 ... 20 mA
- Multi-function input for Pt100 and thermocouples Type K, J, E, N PL-II
- Optionally with heater burnout alarm, serial interface or parameter memory for a 2nd setting value



Temperature Controller Model CF1M

### Description

Model CF1M is a very compact digital temperature controller for displaying, controlling and monitoring temperatures.

The controller has a multi-function input, i.e. the input configuration is adjustable. Thereby the flexibility of the controller is significantly increased, stock-keeping is simplified.

The control parameters can be set over wide ranges. An auto-tuning function can be activated, which makes it easier to find the ideal control parameters.

The controllers are designed for panel mounting.

The control output is alternatively equipped with a relay (for slow controls), with a logic level to drive a solid state relay (for fast controls and high current loads) or with an analogue current signal 4 ... 20 mA.

Optionally available are either a heater burnout alarm for process value and control loop monitoring, a serial interface RS-485 or a parameter memory for a 2nd setting value. The parameter memory is externally selectable via terminals.

Specifications	Model CF1M
Indication	
- Display	7-segment LED, 4-digit, red, character size 8 mm
- Indication range	-1999 ... 9999
Input	
- Number and type	1 multi-function input for resistance thermometers and thermocouples
- Input configuration	selectable via terminal configuration and menu-driven programming
- Resistance thermometers	Pt100, JPt100, 3-wire      max. permissible resistance per wire: 10 Ω
- Thermocouples	type K, J, E, PL-II, N      max. permissible external resistance: 100 Ω
- Measuring time	250 ms
Control output	3 different versions are possible
- Relay contact	load: AC 250 V, 3 A (resistive load) AC 250 V, 1 A (inductive load, $\cos \varphi = 0.4$ )
- Logic level	DC 0/12 V max. 40 mA (short-circuit proof) To actuate a solid state relay
{ - analogue current signal }	DC 4 ... 20 mA, load max. 550 Ω
Control characteristic	PID, PD, PI, P, ON/OFF (adjustable)
Control parameters	An auto-tuning function can be activated to find suitable control parameters.
- Proportional band	0 °C (0.0 °C) up to end of measuring range
- Integral time	0 ... 3600 s
- Differential time	0 ... 3600 s
- Cycle time	1 ... 120 s, not available with control output analogue current signal
- Hysteresis	0.1 ... 100 °C (°F), only available at ON/OFF control characteristic
{Parameter memory} <sup>1)</sup>	memory for a 2nd setting value activated by short-circuiting of two connection terminals at the back of the controller
Alarm outputs	Only one of the different alarm types can be activated at the same time.
- Alarm output 1	for process value monitoring or control loop monitoring alarm type, switching mode, hysteresis and delay adjustable
{-Heater burnout alarm} <sup>1)</sup>	for 1 phase heating systems (not available with control output analogue current signal), alternatively for max. 5 A, 10 A, 20 A or 50 A, current transformer is supplied with controller
- Output <sup>2)</sup>	open collector load: DC 24 V, max. 0.1 A
{Serial interface} <sup>1)</sup>	RS-485 The transfer rate is adjustable (2400 bps, 4800 bps, 9600 bps or 19200 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. 5 VA
Ambient conditions	
- Ambient temperature	0 ... 50 °C
- Storage temperature	-20 ... +50 °C
- Humidity	35 ... 85 % relative humidity (non-condensing)
CE-conformity	conformity in accordance with 89/336/EWG Interference emission and immunity see EN 61 326
Case	
- Material	polycarbonate
- Colour	black
- Ingress protection	front: IP65, back: IP00 (per IEC 60 529/EN 60 529)
- Mass	approx. 100 g
- Mounting	plastic mounting frame to slide on for wall thickness from 1 up to 10 mm

{ } Items in curved brackets are optional extras for an additional price.

1) From the options heater burnout alarm, serial interface and parameter memory only one option can be selected. Combinations are not possible.

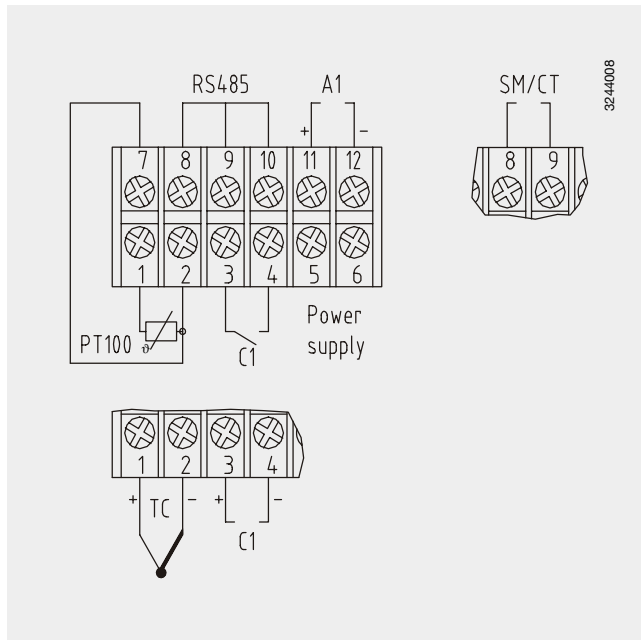
2) The data are valid for all alarm outputs.

Input signals	Measuring span	Measuring error in % of the span
<b>Thermocouples</b>		
Type K, NiCr-Ni	0 ... 1370 °C	0 ... 2500 °F
Type J, Fe-CuNi	0 ... 1000 °C	0 ... 1800 °F
Type E, NiCr-CuNi	0 ... 800 °C	0 ... 1500 °F
Type PL-II	0 ... 1390 °C	0 ... 2500 °F
Type N, NiCrSi-NiSi	0 ... 1300 °C	0 ... 2300 °F
<b>Resistance thermometers</b>		
Pt100 (3-wire)	-199.9 ... +850.0 °C	-199.9 ... +999.9 °F
	-200 ... +850 °C	-300 ... +1500 °F
JPt100 (3-wire)	-199.9 ... +500.0 °C	-199.9 ... +900.0 °F
	-200 ... +500 °C	-300 ... +900 °F

## Other features

- Sensor offset correction can be set
- Integrated cold junction compensation
- Sensor monitoring via visual indication of sensor burnout and sensor short circuiting
- Automatic self-test on power-up.
- Monitoring for internal malfunction
- Control output can be disabled via front panel button
- Optional terminal cover available for protection

## Terminal arrangement



### Legend:

- Power supply
- C1
- TC
- Pt100
- A1

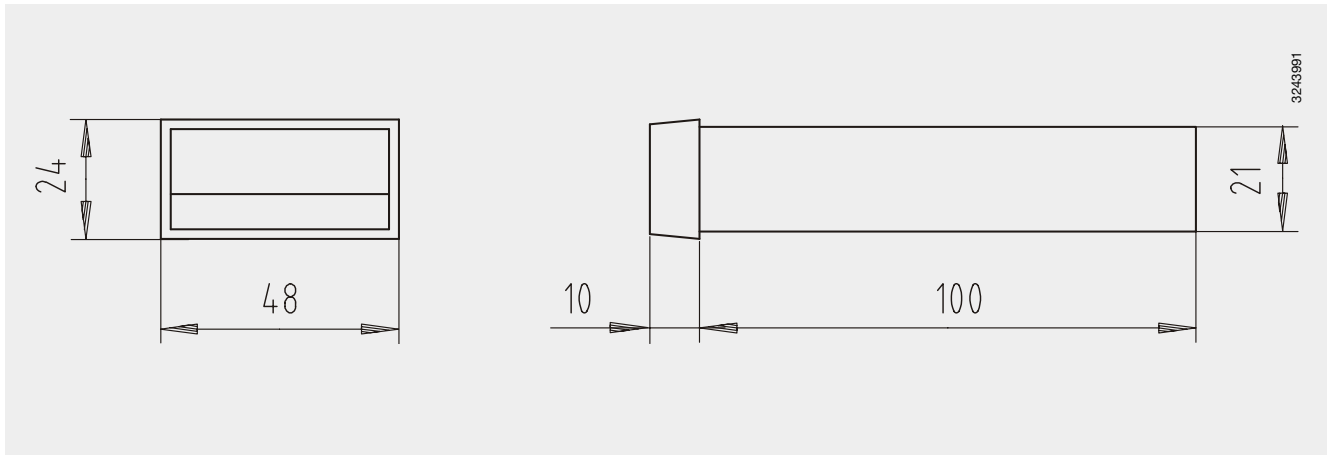
- Power supply
- Control output
- Input thermocouple
- Input resistance thermometer
- Alarm output 1

### Optional:

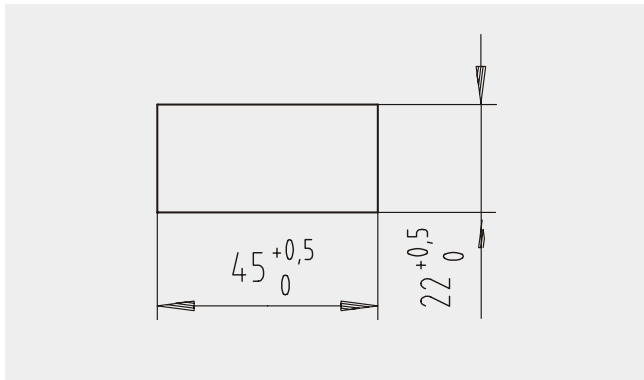
- SM
- CT
- RS-485

- Parameter memory
- Connection of current transformer
- Serial Interface RS-485

**Dimensions in mm**



**Panel cutout in mm**



Modifications may take place and materials specified may be replaced by others without prior notice.  
Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.

