

# TEMPERATURE CONTROLLERS

## 7SF 1/16 DIN 4-Digit Dual Display Temperature Controller with Heat/Cool Output

### Features:

- Universal Input (6 T/C, RTD, mV, V, mA)
- PID and Smart AT Autotuning
- NEMA 4X, IP65
- Heat/Alarm or Heat/Cool Control
- Up to 2 Independent Alarms
- Optional RS-485 Communications
- Optional Heater Breakdown Alarm



The compact Model 7SF is a dual display general purpose 1/16 DIN PID controller with autotuning and 3 configurable outputs. OP1 (logic or relay) and OP2 (relay) are for heating + alarm or heating + cooling (air, oil or water) control and OP3 (relay) is an optional second alarm. Alarms can be process, band or deviation type, direct or reverse, with masking and automatic or manual reset. A logic input is fitted as standard, allowing remote selection of an auxiliary setpoint. The externally selected transfer between SP1 and SP2 can be a step or a ramp with two configurable rates of change (ramp

up/ramp down). Bumpless Auto/Manual control can be selected from the front panel. Detection of an out of range or sensor break forces the output to a safe value (Auto Comp™ sensor break). The 7SF is available with optically isolated RS-485 communications in three protocols for use with supervisory systems. This easy to use instrument comes from the factory with its inputs already calibrated and it can be configured either from the front panel or via the communications port. NEMA 4X sealing allows it to be used in washdown or dust conditions.

### Specifications:

<b>Control Modes:</b>	PID with Smart AT Autotuning, Manual Mode
<b>Supply Voltage:</b>	100-240 Vac (+10%, -15%), 50/60 Hz
<b>Operating Ambient:</b>	0-50°C, 20-85% RH non-condensing
<b>Inputs:</b>	T/C Types J, K, L, N, R & S (°C, °F); Pt 100 3W RTD (°C, °F) Ranges: See Table C, page 1-21; mAdc, mVdc, Vdc
<b>Logic Input:</b>	for setpoint select (SP1 or SP2), requires contact rated at 0.5 mA, 5 Vdc minimum
<b>or</b>	
<b>Current Transformer Input:</b>	(Heater Breakdown Detection) 10 Ω impedance, 50 mA ac max.

<b>Output Ratings:</b>	
Output 1:	Time Proportioning Relay, 3A/250V, SPDT, Resistive (NO/NC Jumper Selectable)
(Control)	Time Proportioning Logic SSR (unisolated)
Logic Level 1:	14 Vdc ±20% @ 20 mA max. (700 Ω min.)
Logic Level 0:	24 Vdc max. ±20% @ 1mA
Logic Level 0:	Less than 0.5 Vdc
Output 2:	Time Proportioning Relay (Cooling) or or Alarm 1 Relay, 2A/250V, SPST, Resistive
Output 3:	Optional Alarm 2 Relay, 2A/250V, SPST, Resistive

**Serial Communications:** EIA RS-485 Modbus®, JBUS

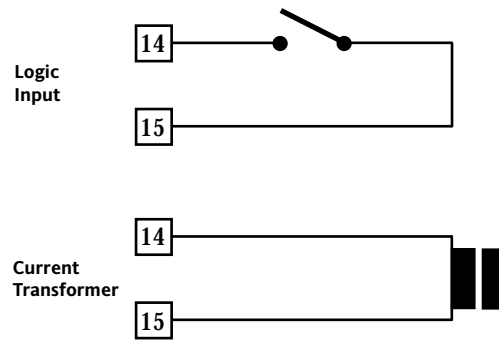
**Mounting:** Panel Mount or DIN Rail/Wall Mount

### Heater Breakdown Detection

The 7SF has an option for displaying load current and generating a heater breakdown alarm when current falls below a specified threshold. With this option, a current transformer input replaces the standard logic input.

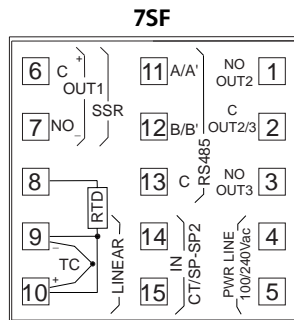
### Output Off Function

The 7SF also has an “output off” function, allowing the instrument to disable control and act as an indicator.



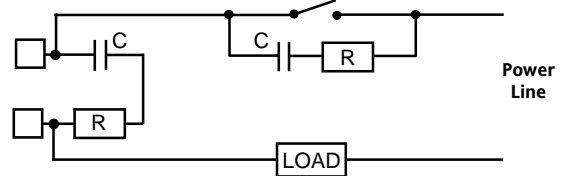
CT Part Number: 7ER-Rx000-0000  
 x = 1 (10A); x = 2 (25A); x = 4 (50A); x = 5 (100A)

## Terminal Connections and Mounting:



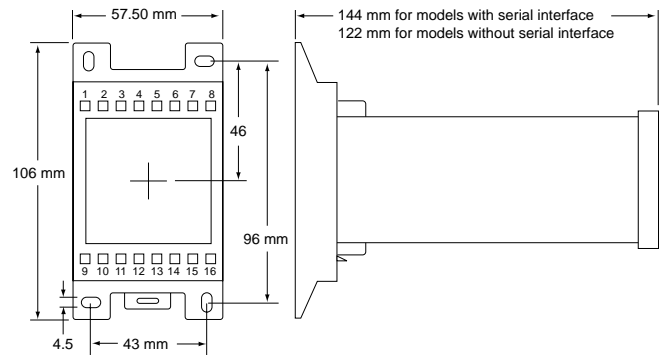
### Wiring

Do not run input wires with power cabling. Ground shields at one point only. Use compensating cable for thermocouple wiring. Non-isolated logic outputs depend on the SSR for isolation. Relay outputs are internally protected by a varistor. When inductive loads (such as mercury contactors) are used, or external switches are connected in series with internal contacts, high voltage transients may affect performance of the instrument. In this case it is recommended to install an additional RC snubber network across the contacts as shown. Contact Barber-Colman.



External Switch in Series with the Internal Contact  
 Snubber Part Number: CZ140398

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DIN Rail or Wall Mounting

### Mounting (Panel)

Dimensions: 48W x 48H x 122D mm  
 Cutout: 45W x 45H mm (-0, +0.6 mm)  
 60 mm min. center-to-center vertical spacing  
 75 mm min. center-to-center horizontal spacing  
 Weight: 250 gm

## Ordering Codes:

Model	Input	Control	Output 1	Output 2	Options	Power Supply	Mounting	Reserved
7SF	9	3		1		3		00

Input	Control	Output 1	Output 2	Options
9 T/C Type J, K, L, N, R & S (°C, °F) Pt100 3W RTD (°C, °F)* 0 to 20 mAdc & 4 to 20 mAdc 0 to 60 mVdc & 12 to 60 mVdc 0 to 5 Vdc & 1 to 5 Vdc 0 to 10 Vdc & 2 to 10 Vdc	3 PID & Smart AT	1 Relay 6 SSR Drive	1 Relay (Cooling/Alarm)	0 None 1 Relay (Alarm) 2 Relay (Alarm) plus Hbd Input* 3 Relay (Alarm) plus RS-485 4 Relay (Alarm) plus RS-485 & Hbd Input*
	Power Supply	Mounting		
	3 100 to 240 Vac	0 R Panel Mount DIN Rail/Wall Mount		

\* Ranges - See Table C, page 1-21

\* Order current transformer separately. Logic Input for Aux Setpoint Selection is Disabled.