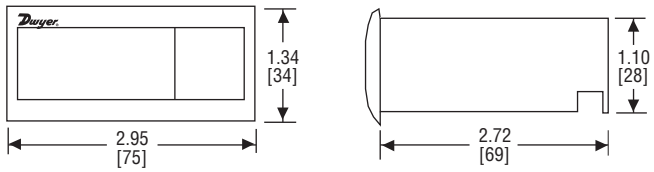
Series TSF Thermocouple Limit Control

Specifications - Installation and Operating Instructions



The Series TSF Thermocouple FM Approved Limit Control provides audible alarm status along with a robust 16 amp relay output. Unit allows the user to easily select automatic or manual reset along with 13 other parameters. The TSF series has a built in reset button on the front panel or can accept an external reset.

The ease of programming and low price make the TSF series the best value limit control on the market.

INSTALLATION

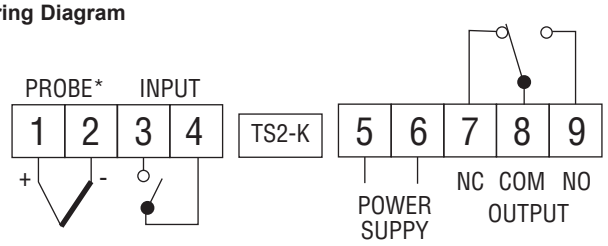
Note: Unit must be mounted away from vibration, impacts, water and corrosive gases.

- Cut hole in panel 2.80 x 1.14 inches (71 X 29 mm).
- Use the included gasket, or apply silicone around the perimeter of the hole to prevent leakage.
- Insert unit into the hole in panel, and secure using the included mounting clips.
- Wire the unit per the wiring diagram on the product label or in IOM.

SPECIFICATIONS

Probe Range: 32 to 999°F (0 to 700°C) for Type J thermocouple; 32 to 999°F (0 to 999°C) for Type K or S thermocouples.
Input: Type J, K, or S thermocouple.
Output: SPDT relay rated 16A @ 240 VAC resistive.
Horsepower Rating (HP): 1 HP.
Control Type: ON/OFF; manual/automatic reset.
Power Requirements: 115 VAC, 230 VAC, 12 VAC/VDC or 24 VAC/VDC (depending on model).
Power Consumption: 4 VA.
Accuracy: ±1% FS.
Display: 3-digit, red, 1/2″ (12.7 mm) digits and sign.
Resolution: 1°.
Memory Backup: Nonvolatile memory.
Ambient Operating Temperature: 32 to 150°F (0 to 65°C).
Storage Temperature: -4 to 176°F (-20 to 80°C).
Weight: 2.3 oz (65 g).
Front Panel Rating: IP64.
Agency Approvals: CE, FM, cUR, UR.

Wiring Diagram



* Use ungrounded thermocouples only with 12 VAC/VDC and 24 VAC/VDC models.

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List of Parameters

	Description	Units	Range
SP	Set Point	Degrees	r1 to r2
r0	Differential or Hysteresis	Degrees	1 to 99
r1	Lower Limit for SP	Degrees	0 to r2
r2	Higher Limit for SP	Degrees	r1 to 999
r3	Control Reset	Option	Aut/hoL/PuP
d0	High or low limit control	Option	Hi/Lo
c0	Minimum stopping time	Seconds	0 to 999
c2	Output status with probe error	Option	Off/On
c3	Alarm energize condition	Option	No/Yes
P1	Probe Adjustment	Degrees	-30 yp 30
P5	Probe Type	Option	tcJ, tch, tcS
P6	Probe Response	Numeric	0 to 3
H1	Display Reading	Option	PU/SP
H5	Access code to parameters	Numeric	0 to 255

Parameter Descriptions

SP = Set Point. Temperature we wish to activate relay output.
r0 = Differential or hysteresis.
r1 = Lower value for SP.
r2 = Higher value for SP.
r3 = Alarm reset.
Aut = Automatic
hoL = Manual
PuP = Reset on Power Up
d0 = High or low limit control.
Where TS is the probe input temperature.
If d0 = Hi, r3 = Aut, c3 = No:
If TS ≥ SP relay output OFF, buzzer ON, AL displayed.
If TS ≤ SP-r0 relay output ON, buzzer OFF, TS displayed.
If d0 = Hi, r3 = hoL, c3 = No:
If TS ≥ SP relay output OFF, buzzer ON, AL displayed.
If TS ≤ SP-r0 it waits for reset to turn relay output ON, buzzer OFF, TS displayed.
If d0 = Hi, r3 = PuP, c3 = No:
When the device is powered up relay output OFF, buzzer ON, AL displayed.
If TS ≥ SP relay output OFF, buzzer ON, AL displayed.
If TS ≤ SP-r0 it waits for reset to turn relay output ON, buzzer OFF, TS displayed.
If d0 = Lo, r3 = Aut, c3 = No:
If TS ≤ SP relay output OFF, buzzer ON, AL displayed.
If TS ≥ SP+r0 relay output ON, buzzer OFF, TS displayed.
If d0 = Lo, r3 = hoL, c3 = No:
If TS ≤ SP relay output OFF, buzzer ON, AL displayed.
If TS ≥ SP+r0 it waits for reset to turn relay output ON, buzzer OFF, TS displayed.
If d0 = Lo, r3 = PuP, c3 = No:
When the device is powered up relay output OFF, buzzer ON, AL displayed.
If TS ≤ SP relay output OFF, buzzer ON, AL displayed.
If TS ≥ SP+r0 it waits for reset to turn relay output ON, buzzer OFF, TS displayed.
c0 = Minimum stopping time of the load.
c2 = Output status with probe error.
c3 = Energize relay on alarm condition (Determines fail state during power loss).
Yes = Relay energized during alarm condition,
No = Relay de-energized during alarm condition.
P1 = Ambient probe adjustment.
P5 = Ambient probe type (tcJ = Type J, tch = Type K, tcS = Type S).
P6 = Probe response rate (0 = 8 sec, 1 = 4 sec, 2 = 2 sec, 3 = 1 sec).
H1 = Display reading during normal operation (PU = process temp, SP = set point).
H5 = Access code to protected parameters (factory set at 0).

PARAMETER PROGRAMMING

Set Point (SP) is the only parameter the user can access with code protection.

- Press SET. SP text will appear on the display.
- Press SET again. The set point value is shown on the display.
- Use the UP and DOWN arrows to modify set point value.
- Press SET to save any new values.
- Press SET and DOWN at the same time to quit programming or wait one minute and the display will automatically exit the programming mode.

Access to all code protected parameters:

- Press SET and hold for 8 seconds. The access code value 0 is shown on the display. With the UP and DOWN arrows, enter the access code (unit comes with access code set at 0 from the factory).
- Press SET to enter the code. If the code is correct, the first parameter label is shown on the display (SP).
- Move to the desired parameter with the UP and DOWN arrows.
- Press SET to view the value on the display.
- Use the UP and DOWN arrows to modify the parameter value.
- Press SET to save the value and exit the parameter.
- Repeat until all necessary parameters are modified.
- Press SET and DOWN at the same time to quit programming, or wait one minute and the display will automatically exit programming mode.

NOTICE The keyboard security code can be reset to ZERO by turning off the controller and turning it on again while keeping the SET key depressed.

Reset an alarm:

When the parameter r3 = Aut, the alarm condition will automatically reset once the probe temperature reading returns to non-alarm conditions. When the parameter r3 = hoL, the alarm condition will remain activated until a reset signal is received either by pressing the RST key on the front face of the control or by closing contact to the rear input.

- When d0 = Hi
  The reset is accepted when the probe temperature TS ≤ SP - r0.
- When d0 = Lo
  The reset is accepted when the probe temperature TS ≥ SP + r0.

LED indication, buzzer and display messages:

The LED ***Alarm*** indicates if the relay output is connected or not. When the relay output is connected the message AL is displayed alternated with the temperature ambient of the probe.
In normal operation the probe temperature will be shown on the display.
In case of alarm or error, the following messages can be shown:

Erl = memory error
ooo = open probe error
--- = ambient temperature out to range

In case of alarm or error the internal buzzer is activated. The buzzer can be silenced by pressing the SET and DOWN arrows at the same time (when a new alarm or error occurs the buzzer will sound again).

MAINTENANCE

Upon final installation of the Series TSF Thermocouple Limit Control, no routine maintenance is required. A periodic check of the system calibration is recommended. The Series TSF is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.

Cleaning and Repair:

Clean the surface of the display controller with a soft damp cloth. Never use abrasive detergents, petrol, alcohol or solvents.

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