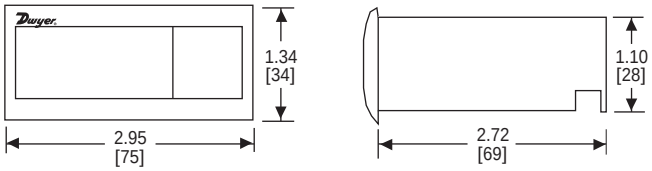
Series TSF Thermocouple Limit Control

Specifications - Installation and Operating Instructions



The Series TSF Thermocouple FM Approved Limit Control provides audible alarm status along with a robust 15 amp relay output. Unit allows the user to easily select automatic or manual reset along with 10 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.

Model References:
The model reference is given by TSF-WXYZ. Where each suffix can take the following values:

W	Thermocouple Type	4=J
X	Display Color	0=Red, 1=Green
Y	Supply Voltage	1=115 VAC
		2=230 VAC
		3=12 VAC
		4=24 VAC
Z	Units	0˚F, 1=˚C

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

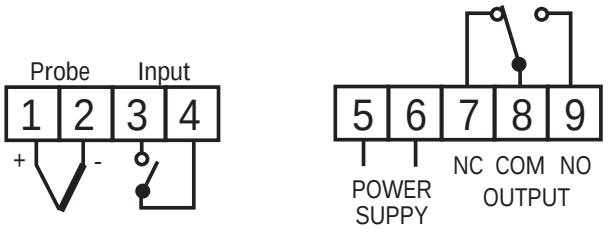
Cut hole in panel 2.80 x 1.14 inches (71 X 29 mm).

Apply silicone (or rubber gasket) around the perimeter of the hole to prevent leakage.

Insert unit into the hole of panel.

SPECIFICATIONS
Probe Range: 0 to 700°C (32 to 999°F) for thermocouple J type. 0 to 999°C (32 to 999°F) for thermocouples K or S type.
Input: J, K, or S type thermocouple.
Output: 15 A SPDT relay @ 250 VAC resistive.
Horsepower Rating (HP): 3/4 HP.
Control Type: ON/OFF; manual/automatic reset.
Power Requirements: 110 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, plus sign.
Resolution: 1°.
Memory Backup: Nonvolatile memory.
Ambient Operating Temperature: 14 to 131°F (-10 to 55°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, UL.

Wiring Diagram:



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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 Value for SP	Degrees	0 to r2
r2	Higher Value for SP	Degrees	r1 to 999
r3	Reset of Control	Option	Aut/hoL
d0	High or low limit temperature	Option	Hi/Lo
c0	Minimum stopping time	Seconds	0 to 999
c2	Output status with probe	Range	Off/On
c3	Alarm energize condition	Option	No/Yes
P1	Ambient Probe Adjustment	Degrees	-30 yp 30
P5	Ambient Probe Type	Range	tcJ, tch, tcS
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.
d0 = High or low temperature control.
Where TS is the temperature ambient of the probe.
If d0 = Hi and r3 = Aut:
If TS ≥ SP relay output ON, Buzzer ON, *AL* displayed.
If TS ≤ SP - r0 relay output OFF, buzzer OFF, *TS* displayed.
If d0 = Hi and r3 = hoL:
If TS ≥ SP relay output ON, buzzer ON, *AL* displayed.
If TS ≤ SP - r0 it waits for reset of relay output OFF, buzzer, *TS* displayed.
If d0 = Lo and r3 = Aut:
If TS ≤ SP relay output ON, buzzer ON, *AL* displayed.
If TS ≥ SP + r0 relay output OFF, buzzer OFF, *TS* displayed.
If d0 = Lo and r3 = hoL:
If TS ≤ SP relay ON, buzzer ON, *AL* displayed.
If TS ≥ SP + r0 it waits for reset to relay output OFF, 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.
P5 = tcJ (J Type), **P5** = tch (K Type), **P5** = tcS (S Type).
H5 = Access code to parameters (it is set to 0 from factory).

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 real value is shown on the display.

The value can be modified with the UP and DOWN arrows.

Press SET to enter 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 for 8 seconds. The access code value 0 is shown on the display (unit comes with code set at 0 from the factory).

With the UP and DOWN arrows, code can be set to user needs.

Press SET to enter the code. If the code is correct, the first parameter label is shown on the display (SP).

Move the desired parameter with the UP and DOWN arrows.

Press SET to view the value on the display.

The value can be modified with the UP and DOWN arrows.

Press SET to enter the value and exit.

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.

*The keyboard 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 = hoL, once the relay output and alarm are activated (because of temperature ambient TS), these remain activated until a reset is received (by pressing the reset key or by closing contact in rear input). When d0 = Hi the reset is accepted if temperature ambient is below TS ≤ SP - r0. When d0 = Lo the reset is accepted if temperature ambient TS is over 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

°°° = 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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