LOVE®

Series TCS Thermocouple Switch

CE ℝ

Specifications - Installation and Operating Instructions

BUTTON COLORS:
TYPE J = SILVER/GREY
TYPE K = YELLOW
TYPE S = GREEN
PTC1000 = RED
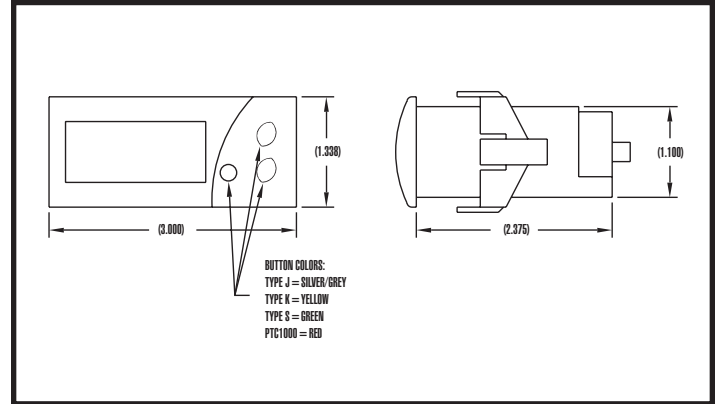
DESCRIPTION

Monitor and control temperature in heating and cooling applications with the Series TCS Thermocouple Switch. the Series TCS offers a wide temperature range, two selectable alarm sets, and an internal buzzer indicating alarm condition or error. The user can define set point, heating/cooling regulation, cycle time, alarm configuration, load status, and ambient probe adjustment. The thermocouple switch features password protection and error/alarm messaging. Temperature and output status is indicated on the bright red LED display. Use the configuration key (sold separately) to quickly program multiple units. The Series TCS includes a fitting clip for panel mounting, gasket, rear terminal cover, and instruction manual.

SPECIFICATIONS

Probe range: 0 to 999°
Input: Type J, K, or S thermocouple depending on model.
Output: 15 A relay @ 250 VAC resistive.
Horsepower Rating (HP): 3/4 HP.
Control Type: ON/OFF.
Power Requirements: 110 VAC, 230 VAC or 12 VDC (Depending on model).
Accuracy: ±1°.
Display: 3-Digit, Red, 1/2" (12.7 mm) digits, plus sign.

Resolution: ±1 digit.
Memory Backup: Nonvolatile memory.
Ambient Operating Temperature: 14 to 158°F (-10 to 70°C).
Storage Temperature: -4 to 176°F (-20 to 80°C).
**Weight:** 2.3oz. (65g.).
Front Panel Rating IP64.
Agency Approvals: CE, UL.

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 29mm).
- Apply silicone (or rubber gasket) around the perimeter of the hole to prevent leakage.
- Insert unit into hole of panel.
- Slide removable fitting clips onto unit from the back until secure to panel.
- Remove back cover to wire unit.
- Wiring diagram is displayed on the top of the unit.
- *(Note: PROBE CABLE LENGTH MUST NOT EXCEED 328 ft (100 m). DO NOT INSTALL PROBE CABLE NEAR POWER CABLES)*
- Replace cover once wiring is completed.

WIRING DIAGRAM
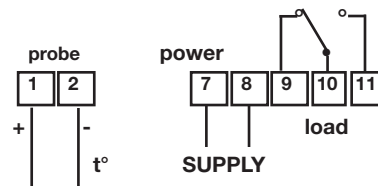
PARAMETERS

MOD-TRONIC INSTRUMENTS LIMITED

	Description	Units	Range
SP	Set point	Degrees	r1 to r2
r0	Differential or Hysteresis	Degrees	1 to 99°
r1	Lower Value Set Point	Degrees	0 to 999°
r2	Higher Value Set Point	Degrees	0 to 999°
d0	Heating or Cooling Control	Option	Ht/Co
c0	Min. stop time for Load	Minutes	0 to 59 min.
c2	Load Status during Probe Error	0/1	Off/On
P1	Ambient Probe Adjustment	Degrees	-10 to 10°
P5	Ambient Probe Type	Do NOT Adjust	J, K S
H5	Parameter Access code	Numeric	0 to 255 (SET AT 0 FROM FACTORY)
A0	Alarm 1 Hysteresis	Degrees	1 to 999°
A1	Alarm 1 Threshold	Degrees	0 to 999°
A2	Alarm 1 Exclusion Time	Seconds	0 to 999
A3	Alarm 1 Configuration	Option	Off, 1 or 2
A4	Alarm 2 Hysteresis	Degrees	1 to 999°
A5	Alarm 2 Threshold	Degrees	0 to 999°
A6	Alarm 2 Exclusion Time	Seconds	0 to 999
A7	Alarm 2 Configuration	Option	Off, 1 or 2

PARAMETER DESCRIPTIONS

SP= Set Point- Desired Regulation Temperature

r0= Differential or Hysteresis

r1= Lower Set Point Limit

r2= Higher Set Point Limit

d0= Heating or Cooling Control-Regulation cycles only per formed, neither defrosting nor continuous cycles exist.
Heating: To choose Heating Control: Set d0=Ht (The output is activated when TS1 (temperature of ambient probe) is less than or equal to Set Point.) TS1<=SP. It then disconnects when TS1>=SP-r0.
Cooling: To choose Cooling Control: Set d0=Co (The output is activated when TS1>=SP+r0.) The display will switch off when TS1<=SP.

c0= Minimum Time Between Start and Stop.

c2= Load Status during Probe Error. In the event of an open or short circuited probe, the unit will connect or disconnect the load as defined by this parameter.

P1= Ambient Probe Calibration. Offset degrees to adjust ambient probe. If the probe is not placed in the exact point that is to be measured, use a standard thermometer and adjust the difference with parameter.

P5= Ambient Probe Type. (Set from the factory.) **DO NOT ADJUST.**

H5= Access to Probe Parameters. (The code is set to 0 from the factory.)

A0= Alarm 1 Hysteresis. The differential associated with A1 parameter.

A1= Alarm 1 Threshold. Number of degrees to the working set point that initiates an alarm condition.

A2= Alarm 1 Exclusion Time. The amount f time the alarm is disabled from instrument activation.

A3= Alarm 1 Configuration. Determines the alarm type: A3=0 alarm is disabled; A3=1 alarm is activated if the ambient temperature >=SP+A1 and deactivated if <+SP+A1-A0; A3=2 alarm is activated if the ambient temperature <=SP+A1 and deactivated if >+SP+A1-A0.

A4= Alarm 2 Hysteresis. The differential associated with A5 parameter.

A5= Alarm 2 Threshold. Number of degrees to the working set point that initiates an alarm condition.

A6= Alarm 2 Exclusion Time. The amount f time the alarm is disabled from instrument activation.

A7= Alarm 2 Configuration. Determines the alarm type: A7=0 alarm is disabled; A7=1 alarm is activated if the ambient temperature >=SP+A5 and deactivated if <+SP+A5-A4;
A7=2 alarm is activated if the ambient temperature <=SP+A5

and deactivated if >+SP+A5-A4.

PARAMETER PROGRAMMING

**Set Point (SP) is the only parameter the user can access without 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 programming mode.

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

**Access to all code protected parameters.**
- Press SET for 8 seconds. The access code value 00 is shown on the display. (Unit comes with code set at 00 from factory).
- With the UP and DOWN arrows, code can be set to user needs.
- Press SET to enter the code. If code is correct, the first parameter label is shown on the display (SP).
- Move to the desired parameter with the UP and DOWN keys.
- 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 to text 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.

BUZZER

In the event of alarm or error condition, the internal buzzer is activated. To silence the buzzer, press and hold the SET and Down keys.

LED INDICATIONS

OUT This indicates the load is connected. The system waits for the programmed minimum stop time of the load.

DISPLAY MESSAGES

In normal operation, the probe temperature will be shown on the display. In case of alarm or error, the following messages will be shown:
- **Er** = Memory Error
- **--** = Short-Circuit Probe Error (output determined by c2).
- **oo** = Open Probe Error (output determined by c2).

MAINTENANCE/REPAIR

After final installation of the TS Series Digital Temperature Switch, no routine maintenance is required. A periodic check of system calibration is recommended. The devices are not field repairable and should be returned to the factory if recalibration or other service is required. After first obtaining a Returned Goods Authorization (RGA) number, send the material, freight prepaid, to the following address. Please include a clear description of the problem plus any application information available.

Dwyer Instruments
Attn: Repair Department
102 Highway 212
Michigan City, IN 46360 U.S.A