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.

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 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 238 ft (100 m). DO NOT INSTALL PROBE CABLE NEAR POWER CABLES).
- Replace cover once wiring is complete.

SPECIFICATIONS

Probe Range: 0 to 700°C (32 to 999°F) for thermocouple J. 0 to 999°C (32 to 999°F) for thermocouples K, S.
Input: Type J, K or S thermocouple.
Output: 16A SPDT relay @ 250 VAC resistive.
Horsepower Rating (HP): 1 HP.
Control Type: ON/OFF.
Power Requirements: 110 VAC, 230 VAC, 12 VAC/VDC or 24 VAC/VDC (depending on model).
Accuracy: ±1% FS.
Display: 3-digit, red, 1/2” (12.7 mm) digits, plus sign.
Resolution: 1°.
Memory Backup: Nonvolatile memory.
Temperature Limits: Ambient: 32 to 158°F (0 to 70°C).
Storage Temperature: -4 to 176°F (-20 to 80°C).
Weight: 2.3 oz (65 g).
Front Panel Rating: IP64.
Agency Approvals: CE, UL, ULc.

WIRING DIAGRAM
### PARAMETERS

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>Degrees</td>
<td>r1 to r2</td>
</tr>
<tr>
<td>r0</td>
<td>Degrees</td>
<td>1 to 99°</td>
</tr>
<tr>
<td>r1</td>
<td>Degrees</td>
<td>0 to 999°</td>
</tr>
<tr>
<td>r2</td>
<td>Degrees</td>
<td>0 to 999°</td>
</tr>
<tr>
<td>d0</td>
<td>Option</td>
<td>Hi/Co</td>
</tr>
<tr>
<td>c0</td>
<td>Minutes</td>
<td>0 to 59</td>
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<tr>
<td>c2</td>
<td>0/1</td>
<td>On/Off</td>
</tr>
<tr>
<td>P1</td>
<td>Degrees</td>
<td>-10 to 10°</td>
</tr>
<tr>
<td>P5</td>
<td>Option</td>
<td>J, K, S</td>
</tr>
<tr>
<td>H5</td>
<td>Numeric</td>
<td>0 to 255</td>
</tr>
<tr>
<td>A0</td>
<td>Degrees</td>
<td>1 to 999°</td>
</tr>
<tr>
<td>A1</td>
<td>Degrees</td>
<td>0 to 999°</td>
</tr>
<tr>
<td>A2</td>
<td>Seconds</td>
<td>0 to 999</td>
</tr>
<tr>
<td>A3</td>
<td>Option</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>A4</td>
<td>Degrees</td>
<td>1 to 999°</td>
</tr>
<tr>
<td>A5</td>
<td>Degrees</td>
<td>0 to 999°</td>
</tr>
<tr>
<td>A6</td>
<td>Seconds</td>
<td>0 to 999</td>
</tr>
<tr>
<td>A7</td>
<td>Option</td>
<td>0, 1, 2</td>
</tr>
</tbody>
</table>

### 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 performed, neither defrosting nor continuous cycles exist.
- **c0** = Minimum Time Between Start to 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. Select between J, K, or S Type Thermocouple.
- **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 of 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 of 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
- **Er** = Short-Circuit Probe Error (output determined by c2).
- **Er** = Open Probe Error (output determined by c2).

### MAINTENANCE/REPAIR

After final installation of the TCS Series Digital Thermocouple 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.