The Series TSX are designed for refrigerating or cooling applications. It has two inputs for temperature probes type PTC or NTC (selectable by parameter). The probe temperature is displayed on the bright 3-digit display. The user is able to program 23 different parameters including set point, hysteresis, defrosting time and ambient probe adjustment using the silicone front keypad. The configuration key input allows easy programming of the parameters. The unit features error warning and password protection. Select between red or green display color, temperature display in °C or °F and 115 VAC, 230 VAC, 24 VAC/DC or 12 VAC/DC power supplies.

**INSTALLATION**

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

- Cut hold in panel 71 x 29 mm (2.80 x 1.14 inches)
- Apply silicone (or rubber gasket) around the perimeter of the hold to prevent leakage.
- Insert unit into hole of panel.
- Slide removable fitting clips onto unit from the back until secure to panel.
- Wiring diagram is displayed on the top of the unit.
- Note: DO NOT INSTALL PROBE CABLE NEAR POWER CABLES.

**MAINTENANCE, CLEANING, AND REPAIR**

After final installation of the unit, no routine maintenance is required. Clean the surface of the display controller with a soft and damp cloth. Never use abrasive detergents, petrol, alcohol or solvents.

Upon final installation of the Series TSX Temperature Digital Controller, no routine maintenance is required. A periodic check of the system calibration is recommended. The Series TSX 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.

**SPECIFICATIONS**

**Probe Range:**
- PTC: -58 to 302°F (-50 to 150°C);
- NTC: -58 to 230°F (-50 to 110°C).

**Input:**
- PTC/NTC thermistor 1000Ω @ 25°C.

**Output:**
- 16A SPST relay @ 250 VAC resistive, 5A inductive; Dual output units also have one 8A SPDT relay @ 250 VAC resistive, 3A inductive.

**Horsepower Rating (HP):**
- 16A: 1HP 240 VAC - 10FLA, 60LRA 250 VAC.

**Control Type:**
- ON/OFF.

**Power Requirements:**
- 110 VAC; 230 VAC; 24 VAC/DC; 12 VAC/DC (depending on model).

**Accuracy:** ±1% FS.

**Display:** 3-digit, red, 1/2” (12.7 mm) digits.

**Resolution:**
- 0.1° (<100°);
- 1° (≥100°).

**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:** UR pending.

Configuration Key TS2-K Compatible
### PARAMETER DESCRIPTIONS

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Range</th>
</tr>
</thead>
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<tr>
<td><strong>SP</strong> Set Point</td>
<td>Degrees</td>
<td>r1 to r2</td>
</tr>
<tr>
<td><strong>r0</strong> Differential or Hysteresis</td>
<td>Degrees</td>
<td>1 to 20</td>
</tr>
<tr>
<td><strong>r1</strong> Lower Value for SP</td>
<td>Degrees</td>
<td>-58 to r2</td>
</tr>
<tr>
<td><strong>r2</strong> Higher Value for SP</td>
<td>Degrees</td>
<td>r1 to 302</td>
</tr>
<tr>
<td><strong>d0</strong> Type of Defrosting</td>
<td>Option</td>
<td>rE/In</td>
</tr>
<tr>
<td><strong>d1</strong> Temperature Defrosting Stop</td>
<td>Degrees</td>
<td>-58 to 302</td>
</tr>
<tr>
<td><strong>d2</strong> Defrosting Duration</td>
<td>Minutes</td>
<td>0 to 59</td>
</tr>
<tr>
<td><strong>d3</strong> Delay of First Defrosting</td>
<td>Minutes</td>
<td>0 to 999</td>
</tr>
<tr>
<td><strong>d4</strong> Display on Defrosting</td>
<td>Option</td>
<td>off/on/-d-</td>
</tr>
<tr>
<td><strong>d7</strong> Compressor Drip Time</td>
<td>Minutes</td>
<td>0 to 999</td>
</tr>
<tr>
<td><strong>d8</strong> Defrosting Interval Time</td>
<td>Hours</td>
<td>0 to 24</td>
</tr>
<tr>
<td><strong>d14</strong> Defrost Counting Mode</td>
<td>Option</td>
<td>ct/rt</td>
</tr>
<tr>
<td><strong>c0</strong> Minimum Stopping Time</td>
<td>Minutes</td>
<td>0 to 59</td>
</tr>
<tr>
<td><strong>c2</strong> ON Time of Fault Cycle</td>
<td>Minutes</td>
<td>0 to 999</td>
</tr>
<tr>
<td><strong>c3</strong> OFF Time of Fault Cycle</td>
<td>Minutes</td>
<td>0 to 999</td>
</tr>
<tr>
<td><strong>c4</strong> Minimum ON Time</td>
<td>Minutes</td>
<td>0 to 999</td>
</tr>
<tr>
<td><strong>c5</strong> Minimum Time Between 2 Activations</td>
<td>Minutes</td>
<td>0 to 999</td>
</tr>
<tr>
<td><strong>P1</strong> Ambient Probe Adjustment</td>
<td>Degrees</td>
<td>-10 to 10</td>
</tr>
<tr>
<td><strong>P2</strong> Defrosting Probe Adjustment</td>
<td>Degrees</td>
<td>-10 to 10</td>
</tr>
<tr>
<td><strong>P4</strong> Number of Probes</td>
<td>Option</td>
<td>1/2</td>
</tr>
<tr>
<td><strong>H1</strong> Keyboard Protection</td>
<td>Option</td>
<td>yes/no</td>
</tr>
<tr>
<td><strong>H5</strong> Access Code to Parameters</td>
<td>Numeric</td>
<td>0 to 255</td>
</tr>
<tr>
<td><strong>H6</strong> Probe Type</td>
<td>Option</td>
<td>Ptc/ntc</td>
</tr>
</tbody>
</table>

**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.

**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 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 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.
- 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.

**Activating/Deactivating Defrosting**

Holding the UP arrow pressed for 8 seconds the defrosting is activated. Repeating this operation the defrosting is stopped. If a cool cycle is activated the defrosting is disabled.

**Default Working**

In case of probe error, the control performs a continuous regulation, C2 min. load connected - C3 min. load disconnected. In case of memory error, the control performs a continuous regulation, 5 min. load connected - 5 min. load disconnected.

**LED Indication and Display Messages**

The LED OUT indicates if the load is connected or not. The LED DEF indicates if the control is performing defrosting. In normal operation, the probe temperature will be shown on the display. In case of alarm or error, the following messages can be shown:

- Er = Memory Error
- Ep2 = Defrosting Probe Error
- oo = Open Probe Error
- * = Short Circuit Probe Error

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