TECHNICAL BULLETIN

TOROIDAL CONDUCTIVITY LOOP POWERED SENSOR Rev M

Models TC10/TC100 non-contact sensor

The TC10 and TC100 toroidal conductivity monitoring system consists of a loop powered transmitter and an electrodeless conductivity sensor in a single package. Temperature compensation is accomplished with an RTD Pt100 built-in to the sensor. Application includes water treatment, cooling tower and water monitoring.
PRINCIPLE OF OPERATION:

When the electrodeless conductivity sensor is immersed in the solution to be measured, a conductive loop is created through the two toroidally wound coils. An alternating current is applied to one of the coils, which includes a current in the conductive loop. The second coil is used to measure the conductivity, which is proportional to the induced current in the solution. The advantages of the electrodeless method are more apparent in measurement applications in which electrode contamination and polarization of a conventional system can lead to erroneous readings.

SPECIFICATIONS:

<table>
<thead>
<tr>
<th></th>
<th>TC10</th>
<th>TC100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>0/10,000uS</td>
<td>0/100,000uS</td>
</tr>
<tr>
<td>Part number</td>
<td>7760318</td>
<td>7760317</td>
</tr>
<tr>
<td>Kit with sensor entry</td>
<td>7760743</td>
<td>7760744</td>
</tr>
<tr>
<td>Sensor Entry for either sensor</td>
<td>7760030</td>
<td></td>
</tr>
</tbody>
</table>

Common Attributes:

Temperature Coefficient: TC of the liquid + 0.3%/° C
Installation: In-Line or submersible
Cell: Non-contact - Toroidal
Temperature Sensor: Pt100, Internal compensation
Length: 207mm (Overall), 86mm (Insertion)
Thread: 1½” MNPT on either end
Body: CPVC
Maximum Temperature: 122° F (50° C)
Maximum Pressure: 10 Bar at 25° C (145 psi @ 75F)
Power supply: 11 to 24VDC
Cable length: Standard length, 3 meters
Max Loop Load 600 ohm max @ 24VDC
Input card (See page 5) Driver CI 7760250
Driver CII 7760707
Aegis input ‘G’
Calibration

Set the gain and offset: The sensor can connect as shown above. The Gain and Offset are different when using the Aegis G input than the driver card inputs.

<table>
<thead>
<tr>
<th>DRIVER CARD</th>
<th>TC10</th>
<th>TC100</th>
<th>AEGIS 'G' INPUT</th>
<th>TC10</th>
<th>TC100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain Multiplier</td>
<td>12.5</td>
<td>125</td>
<td>Gain Multiplier</td>
<td>6.25</td>
<td>62.5</td>
</tr>
<tr>
<td>Offset Adjust</td>
<td>-2,500</td>
<td>-25,000</td>
<td>Offset Adjust</td>
<td>-2,500</td>
<td>-25,000</td>
</tr>
</tbody>
</table>
If the reading is within ±100uS, adjust the offset until calibrated. If the reading is not close, call technical support. 412/787-2484.

METRIC VERSION/PART NUMBERS

**METRIC ADAPTER PART NUMBER 1043752**

The Tee is DN40 with one leg and the middle reduced to DN20 socket. The other leg has a threaded insert to accommodate the probe.

DN40 to DN20 socket; 1 leg and center

Threaded leg

The 0 to 10,000 uS Metric Kit is PN 7500812 and includes the 0 – 10.000 uS sensor (7760318) and the metric adapter, above (1043752).

The 0 – 100,000 uS sensor Metric kit is PN 1048440 and includes the 0 – 100,000 uS sensor (7760317) and the metric adapter (1043752).
Cable Description

<table>
<thead>
<tr>
<th>Controller Terminal</th>
<th>Sensor Wire Color</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 VDC</td>
<td>White</td>
<td>4-20mA Loop Power, 15VDC</td>
</tr>
<tr>
<td>1+</td>
<td>Black</td>
<td>4-20mA Loop Return</td>
</tr>
<tr>
<td>Clear/Shield</td>
<td></td>
<td>Shield, controller and electrical ground</td>
</tr>
</tbody>
</table>

Termination (Shield not used)

On a driver CI card: 7760250

On a driver CII card: 7760707

On the Aegis ‘G’ input: