Continuous Level Transmitters

**XM-800/XMP-800 Analog Output (Proportional Voltage)**

**XT-800/XTP-800 Signal Conditioned Output (4-20mA, 0-5 VDC, 0-12 VDC)**

**Instruction Bulletin No. 179685**

**Operating Principle**

The XM/XT-800 utilizes reed switch/magnet technology. A magnet-equipped float rises or lowers with corresponding liquid level. The magnetic field generated from the float actuates a series of reed switches mounted within a sealed hollow tube. The series of reed switches is combined with resistors to form a voltage divider.

When a regulated DC voltage is applied to an XM-800, the resulting voltage output is directly proportional to liquid level. An XT-800 is an XM-800 with a signal conditioned output, for use in applications that require unregulated input voltage or current output.

**Installation / Mounting**

Units operate normally in any attitude, from vertical to a 30° inclination, up or down.

**Thread Treatment**

- **Sealing:** When threading metal threads into a metal coupling, pipe sealant or Teflon tape is recommended. Due to potential compatibility problems, when sealing plastic threaded units, a compatible pipe sealant such as "No More Leaks" from Permatex is recommended.

- **Tightening (Plastic to Metal):** When threading a plastic sensor into a metal coupling, the installer should use a suitable wrench and tighten the threads 1 to 1-1/2 additional turns past hand-tight. Over-torquing of the threads will result in damage to the plastic mounting plug.

- **Tightening (Metal to Metal):** When threading a metal sensor into a metal coupling, the installer should use a suitable wrench and tighten the threads 1-1/2 turns past hand-tight.
**Wiring Diagrams**

**Note:** For hazardous area applications, use an appropriate intrinsically safe interface device.

**XM-800 Wiring Diagram**  
Analog Output (Proportional Voltage)

<table>
<thead>
<tr>
<th>Red</th>
<th>Black</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input: 10 - 30 VDC</td>
<td>Output: Proportional Voltage</td>
<td></td>
</tr>
</tbody>
</table>

**XT-800 Wiring Diagram**  
(4-20mA Output)

**Transmitter or Simulator**

<table>
<thead>
<tr>
<th>Red</th>
<th>Whi</th>
<th>Blk</th>
</tr>
</thead>
<tbody>
<tr>
<td>+24V Voltage Source</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Junction Box Signal Conditioner**  
0 - 5 VDC Output

+8 to 24 VDC

<table>
<thead>
<tr>
<th>#1</th>
<th>#2 Rm</th>
</tr>
</thead>
<tbody>
<tr>
<td>White/Black</td>
<td>Red</td>
</tr>
<tr>
<td>Transmission</td>
<td></td>
</tr>
</tbody>
</table>

**Junction Box Signal Conditioner**  
0 - 12 VDC Output

+15 to 30 VDC

<table>
<thead>
<tr>
<th>#1</th>
<th>#2 Rm</th>
</tr>
</thead>
<tbody>
<tr>
<td>White/Black</td>
<td>Red</td>
</tr>
<tr>
<td>Transmission</td>
<td></td>
</tr>
</tbody>
</table>

**Stem-Mounted Signal Conditioner**  
0 - 5 VDC Output

White/Red

| Input: 8 - 24 VDC |
| Output: 0 - 5 VDC |

**Stem-Mounted Signal Conditioner**  
0 - 12 VDC Output

White/Red

| Input: 14 - 30 VDC |
| Output: 0 - 12 VDC |

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**Calibration**

The signal conditioner on your XT-800 has been Factory-set. You do not need to calibrate.

**Steps:**

A. Calibration should be performed with the probe disconnected from the signal conditioner. Turn off power to loop. Disconnect the red, black and white wires from terminals 1, 2, and 3.

B. Adjust both the null and span potentiometers at approximately mid-range.  
(Figure 1)

C. Wire as shown per Figure 2, connecting a jumper wire in place of the black and white probe wires. Connect an ammeter in series to monitor loop current. Apply power to loop. Adjust null pot for 4mA.

D. Remove power from loop. Reposition the jumper wire in place of red and white probe wires. Reapply power and with the span pot, set the output current to 20mA.

E. Repeat Steps C and D for final adjustment.

F. If power is maintained during jumper connections, current level may increase to 36mA. This is normal. Current will return to regular readings when connections are made.

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**Troubleshooting**

Verify proper wiring, power supply, and loop resistance. If transmitter is not functioning properly, isolate the transmitter from the system and wire per Figure 3. Meter should read 4mA with float at bottom and 20mA with float on top of transmitter. If unit is still not operating properly, please consult Factory for further troubleshooting details.

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**Excitation Required for Transmitters Using 4-20 mA Signal Conditioners**

The minimum excitation required for operation of transmitters with 4-20 mA, DC signal converters (See Chart) can be determined for a given total loop resistance from the graph shown. (Total loop resistance = the sum of the DC termination resistance plus loop resistance.) For optimum operation, which is a function of source voltage (+V_s) and total loop resistance, the source voltage value used should be above the minimum load line for the related loop resistance.

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**Figure 1**

Customer Wiring (See Wiring Diagram)

**Figure 2**

Using 300 Ohm Resistor

Place Jumper Here for 4 mA Output

**Figure 3**

Choose loop resistance (RL) to match application

**Minimum Excitation Required For Loop Resistance**

![Graph showing minimum excitation required for loop resistance]