

### **Important Points!**

- Product must be maintained and installed in strict accordance with the National Electrical Codes, Gems technical brochure, instruction bulletin, and any applicable electrical code in the country in which the product is installed. Failure to observe this warning could result in serious injuries or damages.
- For hazardous area applications involving such things as (but not limited to) ignitable mixtures, combustible dust and flammable materials, use an appropriate intrinsically safe interface device.
- Warning: To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.
- The pressure and temperature limitations shown on the individual catalog pages and drawings for the specified level sensors must not be exceeded. These pressures and temperatures take into consideration possible system surge pressures/temperatures and their frequencies.
- Selection of materials for compatibility with the media is critical to the life and operation of GEMS level sensors. Take care in the proper selection of materials of construction, particularly wetted materials.
- Electrical entries and mounting points in an enclosed tank may require liquid/vapor sealing.
- Physical damage sustained by the product may render it unserviceable.

### **Return Policy**

Cancellations and returns are accepted up to 30 days from date of order. You must contact our Returns Department for a Return Authorization (RA) number. Then return goods, freight prepaid, in the original container and include original packing slip. C.O.D. returns are not accepted. Gems Sensors reserves the right to apply restocking or cancellation charges.

### **Warranty**

Gems Sensors, the seller, warrants its products to be free from defects in material and workmanship in normal use and service for a period of one year from date of shipment. Gems Sensors reserves the right and option to refund the purchase price in lieu of repair or replacement upon evaluation of the returned original part. Modification, misuse, attempted repair by others, improper installation or operation shall render this guarantee null and void. Imo Industries Inc., Gems Sensors, makes no warranty of merchantability or fitness for a part or purpose.

**Limits of Liability:** In no circumstances shall Gems Sensors be liable for special, consequential or exemplary damages of any kind or character, including contract, tort, and strict liability in tort and contract. Equipment sold by Gems Sensors is not intended for use in a nuclear installation, nor shall it be used as a "Basic Component" as same is defined under Part 21, Title 10 of the Code of Federal Regulations. In the event of such use, you agree to indemnify and hold us harmless from any and all subsequent liabilities and responsibilities which might arise in connection with such use.



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## **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**

#### **Note**

XM-800 Series includes models XM-800, XMP-800, XM-850, XM-820

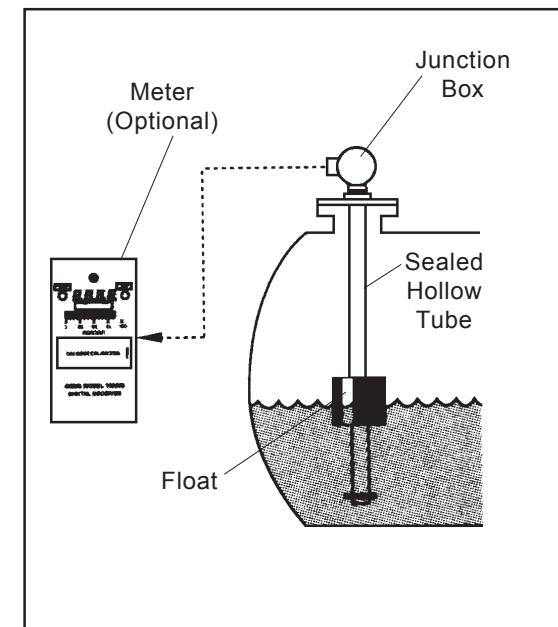
XT-800 Series includes models XT-800, XTP-800, XT-850, XT-820

**Designed for continuous liquid level sensing, GEMS transmitters are considered "components".**

### **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.

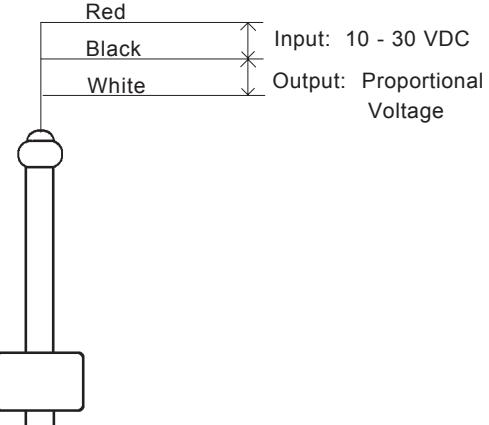
**Tightening (Plastic to Metal):** When threading a plastic sensor into a metal coupling, the installer should use a suitable wrench and tighten the threads 1 to 1-1/2 additional turns past hand-tight. Over-torquing of the threads will result in damage to the plastic mounting plug.

**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.

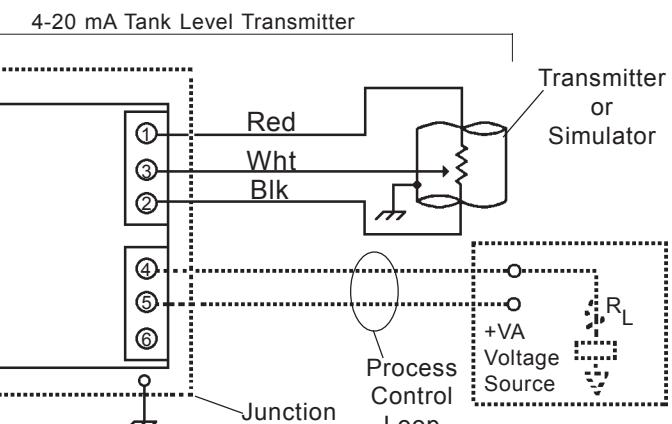
## Wiring Diagrams

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

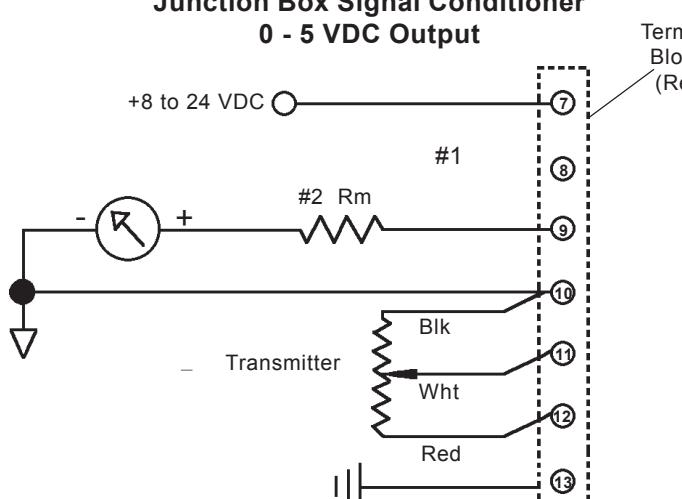
### XM-800 Wiring Diagram Analog Output (Proportional Voltage)



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



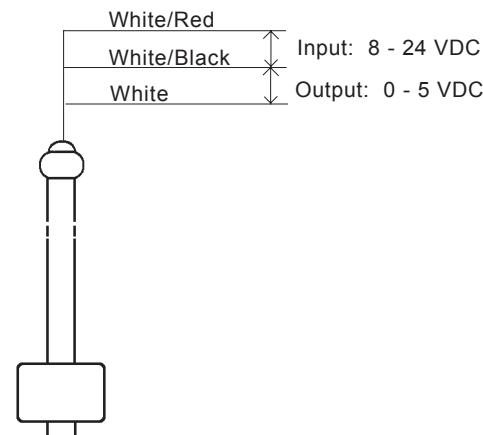
### Junction Box Signal Conditioner 0 - 5 VDC Output



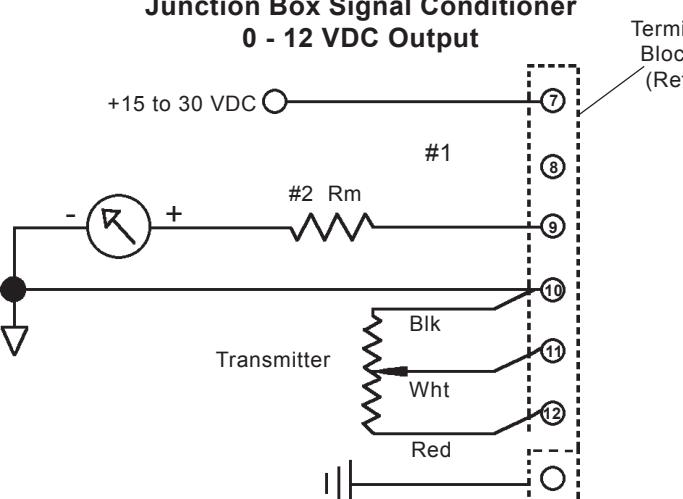
#1: Remove wire from terminal 9 and connect it to terminal 8 to provide "full" reference of the system.

#2: Output signal loading (Rm): 4K Ohms/V Max (.25 mA)

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



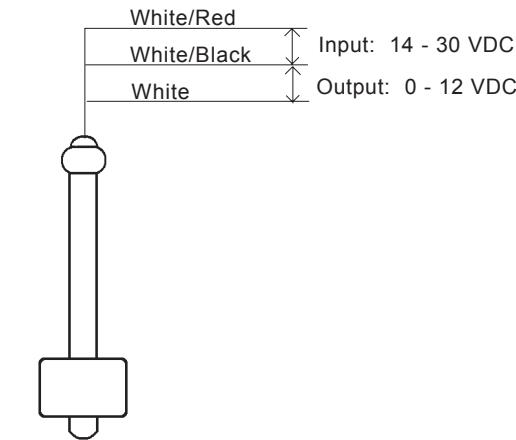
### Junction Box Signal Conditioner 0 - 12 VDC Output



#1: Remove wire from terminal 9 and connect it to terminal 8 to provide "full" reference of the system.

#2: Output signal loading (Rm): 2K Ohms/V Max (.5 mA)

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



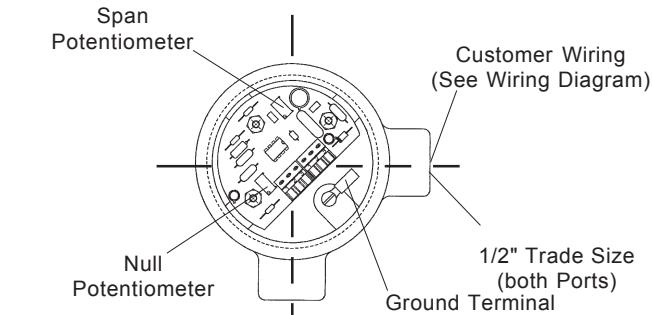
## Calibration

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

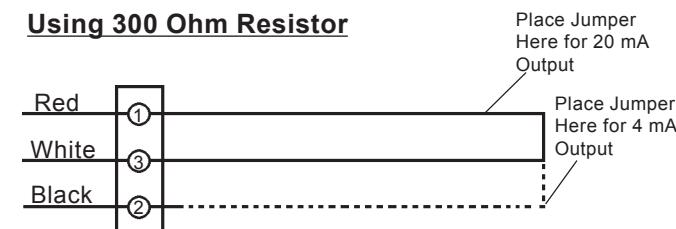
### Steps:

- 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.
- Adjust both the null and span potentiometers at approximately mid-range. (**Figure 1**)
- 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.
- 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.
- Repeat Steps C and D for final adjustment.
- 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.

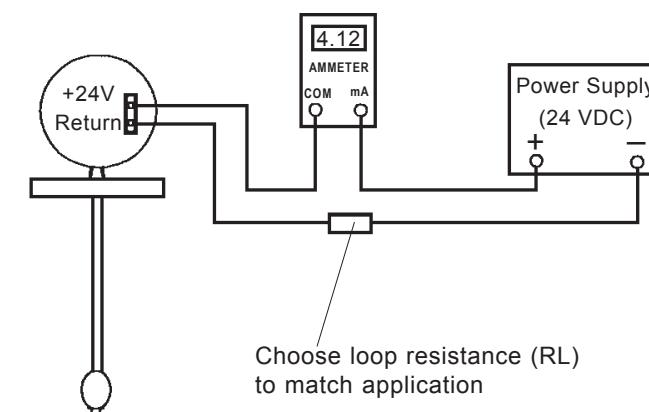
**Figure 1**



**Figure 2**



**Figure 3**



## 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.

### 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 ( $+V_A$ ) and total loop resistance, the source voltage value used should be above the minimum load line for the related loop resistance.

### Minimum Excitation Required For Loop Resistance

