

## SureSite® Magnet Liquid Level Indicator Installation, Operation and Maintenance

### Section 3: Transmitters

#### Operating Principle

The Gems SureSite Transmitter is a 3-wire device, externally mounted on the Gems SureSite Magnetic Level Indicator. The maximum and minimum level indication position is marked on the transmitter housing. The **maximum** indicator mark is **red**; the **minimum** indicator mark is **blue**.

The SureSite Transmitter is a voltage divider which extends the full length of visual indication, consisting of magnetic reed switches tapped in at regular intervals. As the SureSite float moves with the liquid level, it magnetically closes a series of staggered reed switches in a sequence that varies the resistance. A regulated DC voltage applied to this voltage divider network will result in a proportional voltage output.

**Note:** Do not use external magnet to test switch Transmitters. Only use a Gems SureSite float assembly.

	Standard Transmitter	High Temp EP Transmitter	2-Pc. High Temp EP Transmitter	Mini Transmitter
Body Material	Black Polysulfone Plastic	316 SS		
Rated Temperature (Process Media)	300°F, 148°C	750°F, 398°C		300°F 148°C
Max. Ind. Length	276" (701 cm)	120" (305 cm)	240" (610 cm)	180" (457 cm)
Input Voltage	10 - 30 VDC			
Resolution	3/8"			
Mounting Location / Position (From Flag Ass'y)	Standard Tubing / 90°	Standard Pipe / Adjacent		180°
	Standard Pipe / 125°	Standard Pipe / Adjacent		
	Plastic / 90°	[Hatched Area]		

- Figure A -

#### Installation

Gems SureSite transmitter is typically installed on the SureSite Magnetic Level Indicator at the factory; however, if you purchased your transmitter separately, refer to **Figure A** above. Read all information carefully, before beginning installation.

**\*\*\* Warning:** To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

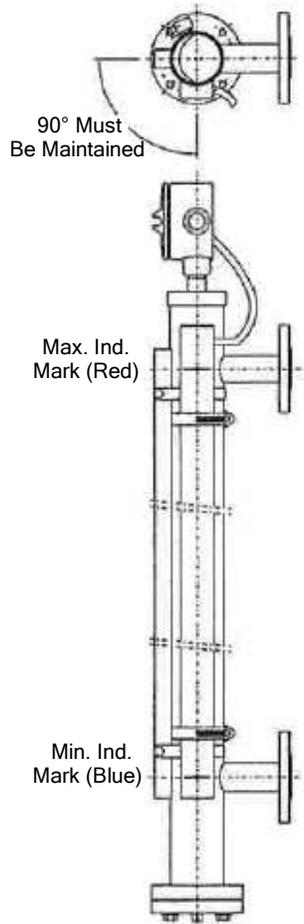
#### Standard Transmitter

#### Rotational Positioning

1. The SureSite transmitter is externally mounted and positioned either to the left or right of the flag assembly, per **Figure A**.

**Rotational Positioning** (Cont.)

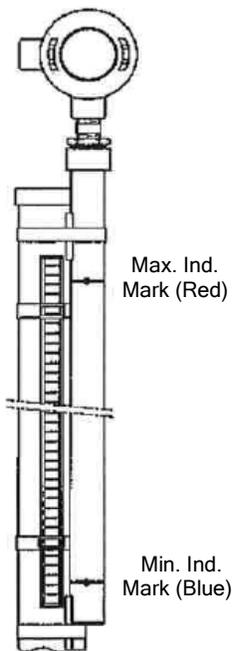
2. Using the alignment guide (supplied), determine if the existing flag assembly position can be used or if the flag assembly needs to be rotated to accommodate the transmitter. **(See Figure B)**
3. Using the flag assembly as a reference, position the SureSite transmitter using the red (maximum) and blue (minimum) indication marks. Each indication mark should be placed approximately the same distance from the top and bottom of the flag assembly.
4. Outline the location of the transmitter and flag assembly on the SureSite housing.
5. Loosen the clamps around the flag assembly to allow for installation of the transmitter clamps. The flag assembly clamps should only be loosened enough to permit the transmitter clamps to be inserted between the flag assembly and the SureSite housing.
6. Install the transmitter and loosely clamp it in the location outlined in step 4.
7. Tighten flag assembly clamps. Do not exceed 5 lb-inches.
8. Verify that the red (maximum) and blue (minimum) indication marks are centrally located between the ends of the flag assembly.
9. Using the alignment guide, verify that the SureSite transmitter is positioned correctly in relation to the flag assembly. Reposition if necessary.
10. Tighten the transmitter clamps securely. Do not exceed 5 lb-inches.
11. Wire to appropriate signal conditioner/converter or controller.



- Figure B -

**Note**

To ensure continuous electrical output, the transmitter must lay flat against the SureSite housing over the entire length.



- Figure C -

**High Temp/explosion-proof Transmitter**

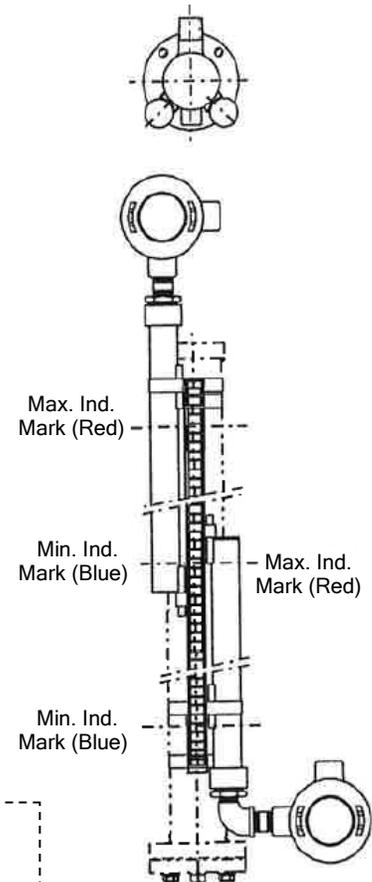
**Rotational Positioning**

1. The high temperature/explosion-proof SureSite transmitter is externally mounted and positioned either to the left or right of the flag assembly, per **Figure A**.
2. Using the flag assembly as a reference, position the high temperature/explosion-proof SureSite transmitter using the red (maximum) and blue (minimum) indication marks. Each indication mark should be placed approximately the same distance from the top and bottom of the flag assembly.
3. The high temperature/explosion-proof SureSite transmitter is secured to the SureSite Magnetic Level Indicator housing using two mounting clamps. One clamp is positioned at the top of the high temperature/explosion-proof transmitter and the other clamp is positioned at the bottom. Position clamps as shown in the **Figure C**.
4. Tighten clamps securely.

## 2-Piece Transmitter - High Temperature/Explosion-Proof

### Rotational Positioning

1. The 2-section high temperature/explosion-proof SureSite transmitter is externally mounted to the left or right of (and adjacent to) the flag assembly and is positioned with the transmitter standoffs against the SureSite weldment or housing. The lower section mounts to the right of the flag assembly - the upper section mounts to the left; as indicated in **Figure D**.
2. Taking the upper section of the high temperature/explosion-proof SureSite transmitter and using the flag assembly as a reference, position the transmitter section so that the red (maximum) indication mark is one 1" **below** and **to the left** of the top of the SureSite flag assembly.
3. Loosely clamp the upper section of the high temperature/explosion-proof SureSite transmitter by placing one clamp around the top and bottom of the transmitter section at the same location as the transmitter standoffs. (**See Figure D**)
4. Taking the lower section of the high temperature/explosion-proof SureSite transmitter and using the flag assembly as a reference, position the transmitter section so that the blue (minimum) indication mark is 1" above and to right of the bottom of the SureSite flag assembly.
5. Loosely clamp the lower section of the high temperature/explosion-proof SureSite transmitter by placing one clamp around the top and bottom of the transmitter section at the same locations as the transmitter stand-offs. (**See Figure D**)
6. If the blue (minimum) indication mark of the upper section and the red (maximum) indication mark of the lower section (the centered indication marks) are not aligned as shown in **Figure D**, reposition both sections by sliding each section of the transmitter up or down equally.
7. With the centered indication marks aligned, verify that the red (maximum) indication mark of the upper section and the blue (minimum) indication mark of the lower section are centrally located between the top and bottom of the SureSite flag assembly.



- Figure D -

#### Note

If the red (maximum) and blue (minimum) indication marks are not centrally located between the top and bottom of the SureSite flag assembly, reposition the transmitter accordingly.

#### \*Reminder\*

The centered indication marks must remain aligned as shown for continuous indication.

8. Tighten clamps securely.
9. Wire per supplied diagram. Due to many different wiring combinations for the 2-piece high temperature/explosion-proof SureSite transmitter, **the wiring diagram is supplied with the unit**. If using a Gems explosion-proof SureSite transmitter, use the appropriate wiring method (per N.E.C. Article 500).

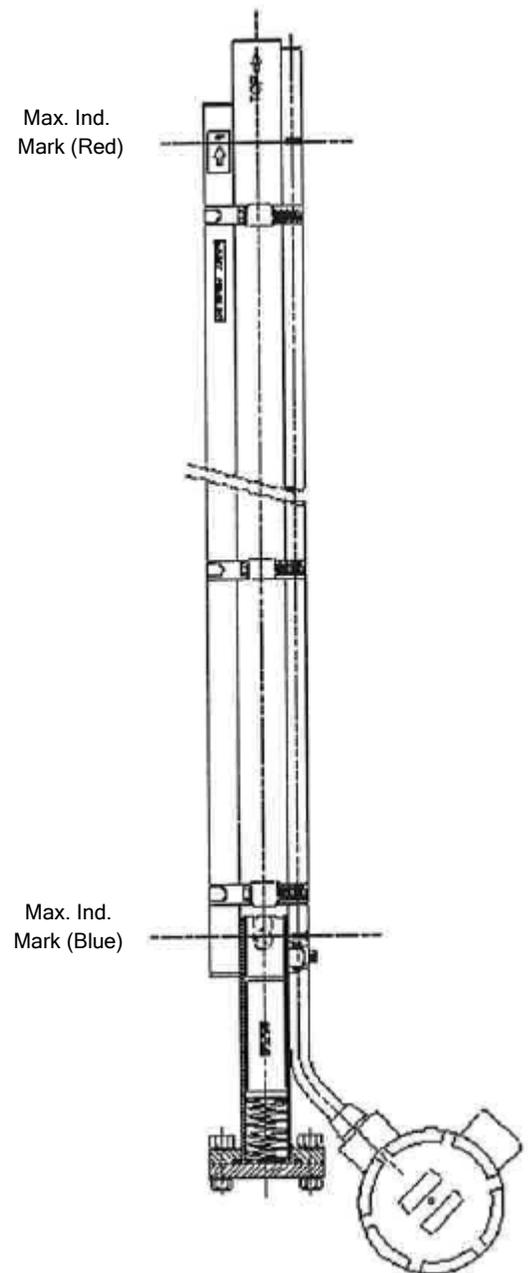
## Mini-Transmitter

### Rotational Positioning

1. The Mini-SureSite transmitter is externally mounted and positioned 180° from the SureSite flag assembly, per **Figure E**.
2. Before installing the Mini-SureSite transmitter on your SureSite Magnetic Level Indicator, outline the location of the flag assembly on the indicator housing.
3. Remove the existing flag assembly clamps from the flag assembly, one at a time. Replace these clamps with the new flag assembly/transmitter clamps provided. When replacing the old flag assembly clamps with the new flag assembly/transmitter clamps, the Mini-Transmitter should be loosely clamped 180° from the flag assembly. The new clamp secures both the Mini-SureSite transmitter and the SureSite flag assembly.
4. With all the clamps replaced, reposition the flag assembly to the previously outlined location. Also, vertically position the Mini-SureSite transmitter so that the red (maximum) and blue (minimum) indication marks are centrally located between the top and bottom of the SureSite flag assembly.
5. Verify that the Mini-SureSite transmitter is 180° from the flag assembly. Reposition as necessary.
6. Tighten the flag assembly/transmitter clamps securely. Do not exceed 5 lb-inches.

### Service

Because the transmitter is not field-serviceable, the unit must be returned for repair or replacement.



- Figure E -

## Transmitter Troubleshooting

Condition	Possible Cause	Solution
No Output or Loss of Signal	Positioned Incorrectly	Reposition Transmitter (See appropriate Installation section)
	Incorrect Wiring Between Transmitter & Load	Correct Wiring (See wiring diagrams)
	Transmitter Faulty*	Repair or Replace Transmitter

### **\* To Determine if Your Transmitter is Faulty:**

1. Disconnect the transmitter from the signal conditioner/converter or controller.
2. With an ohmmeter, check the total resistance between the red and black wire of the high temperature/explosion-proof SureSite transmitter. The resistance should read typically between 1200Ω and 1600Ω.
  - If the resistance between the red and black wires reads as an open, contact Gems Sensors for further assistance.
  - If the resistance total between the red and black wires is verified, the **SureSite float must be removed** from the SureSite magnetic level indicator. If you are unable to remove the float from your SureSite, **you must remove the transmitter from the SureSite housing.**
3. With an ohmmeter, check the resistance between the red and white & the black and white wires of the high temperature/explosion-proof SureSite transmitter. The resistance between both sets of wires should read ∞Ω. If you are reading any resistance across either set of wires other than ∞Ω, contact Gems Sensors for further assistance.
4. If all of the resistance readings and the transmitter's position are verified as correct, but the SureSite transmitter is still not operating correctly, contact Gems Sensors for the further assistance.

### **If Your 2-Piece Transmitter is Faulty, Follow the Steps Below to Determine Which Section to Replace:**

1. Disconnect the upper section from the lower section of the 2-piece high temperature/explosion-proof SureSite transmitter.
2. With an ohmmeter, check the total resistance between the red and black wires of the upper section of the 2-piece high temperature/explosion-proof SureSite transmitter. The resistance should read typically between 600Ω and 800Ω. If the resistance between the red and black wires reads as an open, contact Gems Sensors for further assistance.

### **If the resistance total between the red and black wires on the upper section is verified:**

3. With an ohmmeter, check the total resistance between the red and black wires of the lower section of the 2-piece high temperature/explosion-proof SureSite transmitter. The resistance should read typically between 600Ω and 800Ω. If the resistance between the red and black wires reads as an open, contact Gems Sensors for further assistance.

If the resistance total between the red and black wires on the lower section is verified:

4. The SureSite float **must be removed from the SureSite magnetic level indicator**. If you are unable to remove the float from your SureSite, **you must remove the transmitter from the SureSite housing**.
5. With an ohmmeter, check the resistance between the red & white and the black & white wires of the upper section of the 2-piece transmitter. The resistance between both sets of wires should read  $\infty\Omega$ . If you are reading any resistance across either set of wires other than  $\infty\Omega$ , contact Gems Sensors for further assistance.

If the resistance total between the red and black wires on the upper section is verified:

6. With an ohmmeter, check the resistance between the red & white and the black & white wires of the lower section of the 2-piece transmitter. The resistance between both sets of wires should read  $\infty\Omega$ . If you are reading any resistance across either set of wires other than  $\infty\Omega$ , contact Gems Sensors for further assistance.
7. **If all of the resistance readings and the transmitter's position are verified as correct, but the SureSite transmitter is still not operating correctly, contact Gems Sensors for further assistance.**