Shipping

Precautions are taken to ensure safe arrival of all shipments. Should you receive goods damaged in transport, you must file a claim with the carrier within 90 days or the claim is waived. Gems Sensors Inc. shall not be liable for any damage in case of late delivery or lost shipments.

Warranty

Gems Sensors Inc., 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 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. Gems Sensors Inc. makes no warranty of merchantability or fitness for a part or purpose.

Limits of Liability

In no circumstances shall Gems Sensors Inc. 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 Inc. is not intended for use in a nuclear installation, nor shall it be used as a "Basic Component" as same as 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.

Return Policv

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

Important Points:

- Gems products must be maintained and installed in strict accordance with the National Electrical Code and the applicable Gems product instruction Bulletin that covers installation, operation and proper maintenance. Failure to observe this information may result in serious injury or damages.
- The supply voltage to the sensor should not exceed 30 VDC, Max. for DC unit or 120 VAC for AC unit.
- Please adhere to the pressure and temperature limitations shown throughout this catalog for our level and flow sensors. These limitations 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 products. Take care in the proper selection of materials of construction, testing is required.

- Avoid overtightening when mounting.
- Life expectancy of switch contacts varies with application. Contact Gems if life cycle testing is required.
- Ambient temperature changes do affect switch set points, since the gravity of a liquid can vary with temperature.
- Our sensors have been designed to resist shock and vibration. However, shock and vibration should be minimized.
- Electrical entries and mounting points in an enclosed tank may require liquid/vapor sealing.
- Our sensors must not be field-repaired.
- Physical damage sustained by product may render it unserviceable.



Gems Sensors Inc. One Cowles Road Plainville, CT 06062-1198 Toll-Free: 1-800-378-1600



Principle of Operation

An ultrasonic sound wave is transmitted from the base of the transducer. This sound wave is reflected off the process medium and returned to the transducer. The sensor's electronics calculate the travel time the sound wave requires and determines the distance between the transducer and the medium.

Specifications		
Operating Temperature	-40°F to 140°F	
Operating Pressure	30 psi @ 25°C (See	
Input Voltage	18 to 30 VDC or 120 \	
Relay	(2) SPDT, 10A, 250 V/	
Range	3.6" to 72" (6´) - 6" to 1	
Accuracy	± 0.25% of span in air	
Resolution	0.125" (3 mm)	
Beam Width	8° Conical	
Enclosure Rating	NEMA 4X (IP65)	
Enclosure Material	Polypropylene	
Transducer Material	PVDF	
Conduit connection	1/2" NPT	
Mounting	3/4" NPT (6´) - 2" NPT	

Mounting

The unit must be mounted vertically above the process medium (liquid).

- 1. The maximum sensing distance is 72" or 144".
- 2. There is a "dead zone" less than [3.6"(6' range) or 6"(12' range)] from the end of the transducer. The transducer cannot sense less than [3.6"(6' range) or 6"(12' range)] from its tip.
- 3. The transducer's ultrasonic signal is cone-shaped with an 8° beam angle. Care must be taken to ensure that there are no obstructions to the beam (wall of tank, ladder, etc.). See Figure 2.

Important Notes

- 1. Avoid interference with the beam from the side tank and obstructions in the tank.
- 2. Do not install the transducer at an angle.
- 3. The transducer will not operate in a vacuum.
- 4. The transducer will not operate properly with th presence of vapors or foam.
- 5. Use proper sealant on threads.
- 6. Do not thread more than 1-2 turns past hand-tigh

Instruction Bulletin No. 197935 Rev E **ULS-60 Ultrasonic Multi-Point Level Controller** (6' and 12' Ranges)



Figure 1







of the	D Depth Range (In Feet)	R Beam Radius (In Inches)	
	1	1.2	
e	2	2.1	
	4	3.7	
	6	5.4	
	8	7.1	ייין
it.	10	8.8	$ - - \rangle$
	12	10.4	$\left\langle \frac{ \mathbf{R} }{ \mathbf{R} }\right\rangle$

Each relay can be configured for differential service OR for a single level alarm





Setting HI or LO alarm

The following procedure should be followed for both HI and LO alarm settings.

- 1. Connect power supply as shown in Figure 3. Do not connect load.
- 2. Turn the HI & LO potentiometer screws all the way clockwise (about 20 turns) on chosen relay. Verify relay LED is off.
- 3. Bring the liquid level to the trip point.
- 4. Set the selector switch to HI (even if it is a LO alarm being calibrated.)
- 5. Adjust the HI potentiometer counterclockwise until the LED just turns on.
- 6. Turn the LO potentiometer all the way counterclockwise. (about 20 turns)
- 7. Set the selector switch to LO.
- 8. Adjust the LO pot screw clockwise until the LO relay LED just turns OFF
- 9.Turn LO pot screw counterclockwise to the point where the LED just turns back on.
- 10. Set selector switch to OP
- 11. Repeat steps for other relay if required.
- 12. Connect load per Figure 3.



Setting Pump-Up or Pump-Down

The following procedure should be followed for both Pump-Up and Pump-Down settings. 1. Connect power supply as shown in Figure 4. Do not connect load. 2. Turn the HI & LO potentiometer screws all the way counterclockwise (about 20 turns) on the chosen relay. Verify relay LED is on.

- 3. Bring liquid to the low level point.
- 4. Set the selector switch to LO.
- 5. Turn the LO pot screw clockwise until the relay LED just turns off.
- 6. Turn the HI pot screw all the way clockwise. (about 20 turns)
- 7. Bring the liquid to the high level point.
- 8. Set the selector switch to HI.
- 9. Turn the HI pot screw counterclockwise until the relay LED just turns ON.
- 10.Set selector switch to OP.
- 11. Connect load per Figure 4.