

UCL-200 - I.S. Ultrasonic Continuous Level Transmitter

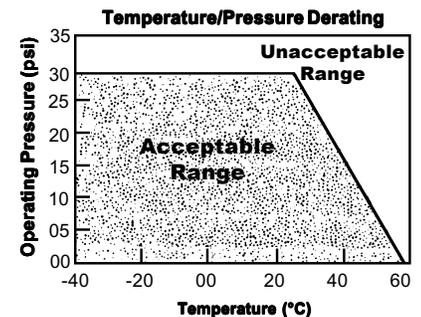
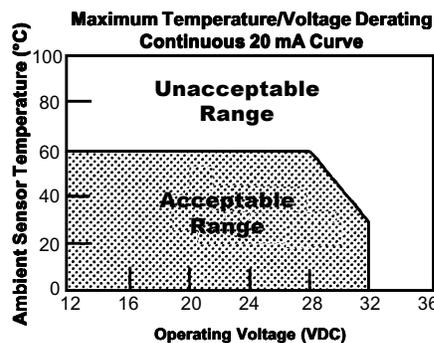
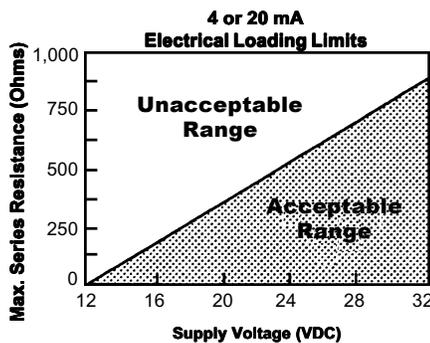
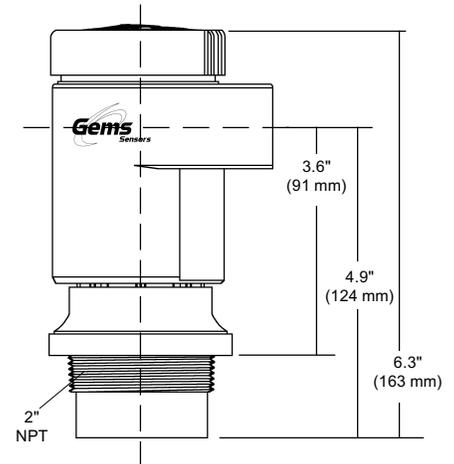
Principle of Operation

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 <i>(See chart below)</i>
Input Voltage	12 to 32 VDC
Output	4-20 mA (2-Wire)
Range	6" to 216"
Accuracy	± 0.25% of span in air
Resolution	0.125" (3 mm)
Beam Width	8° Conical
Deadband Max Loop Resistance	900 ohms @ 32 VDC <i>(See chart)</i>
Enclosure Rating	NEMA 4X (IP65)
Enclosure Material	Polypropylene
Transducer Material	PVDF
Conduit connection	1/2" NPT
Mounting	2" NPT
Approval	CSA Intrinsically Safe

Dimensions



Mounting

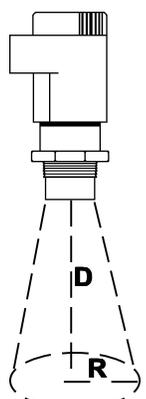
The unit must be mounted vertically above the process medium (liquid) to be measured.

- The maximum measurable distance is 216" (18 Ft.).
- There is a "dead zone" less than 6" from the end of the transducer.
The transducer cannot measure less than 6" from its tip. This dead zone can also be set to a distance greater than 6".
- 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 diagrams.*

Important Notes

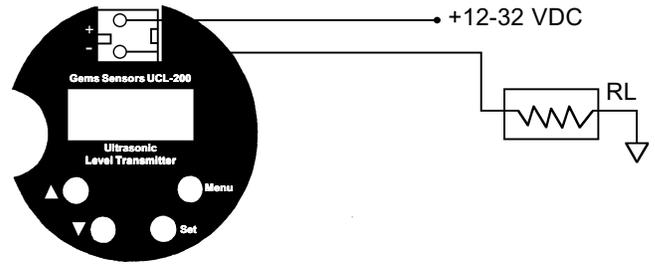
- Avoid interference with the beam from the side of the tank and obstructions in the tank.
- Do not install the transducer at an angle.
- The transducer will not operate in a vacuum.
- The transducer will not operate properly with the presence of vapors or foam.
- Do not thread more than 1-2 turns past hand-tight.

Depth Range (In Feet)	Beam Radius (In Inches)
1	1.2
2	2.1
4	3.7
6	5.4
8	7.1
10	8.8
12	10.4
14	12.1
16	13.8
18	15.5

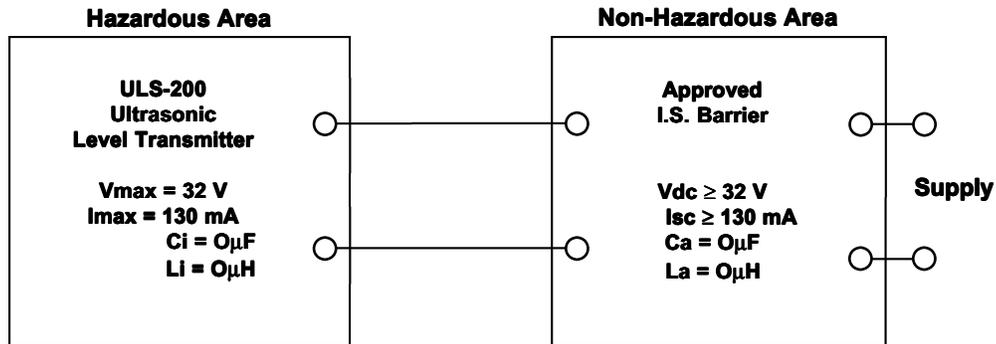


Wiring (Non-Intrinsically Safe)

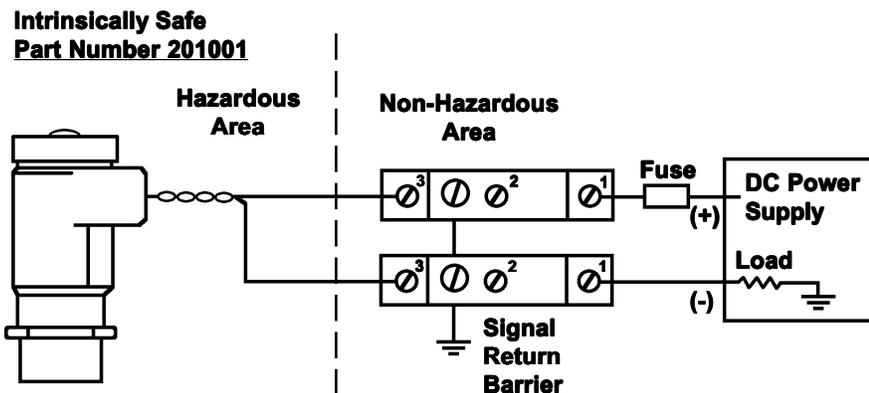
1. Remove junction box cap
2. Remove terminal block (pulls off)
3. Wire positive supply (12-32 VDC) to right screw terminal (+) and negative to left terminal (-)
4. Reattach terminal block
5. Replace cover once calibration is complete (*See "Programming"*)



Wiring (Intrinsically Safe)



With Gems Zener Barriers . . .



CSA-Approved Intrinsically Safe for use in Hazardous Locations: Class I, Groups A, B, C, and D - Class II, Groups E, F, and G - Class III. intrinsically safe when used with an approved I.S. barrier(s). Entity parameters listed above.

Programming

Only the EC4 and EC20 values need to be set for operation. Setting the MAXR and MINR values is highly recommended for more accurate operation. The ALIN mode is only used to determine signal strength, which may be needed when mounting or for troubleshooting the transmitter.

A. Setting EC4 Value (This is the 4 mA setting which equates to the lowest measure point in the tank)

1. Hold "MENU" key until "EC4" appears in the display
2. Wait until a value appears which will be the current measured level
3. Press the up or down arrow keys once to display the current EC4 value
4. Press the up or down arrow keys to change the EC4 value to your desired setting (the longer you hold these buttons, the faster the value will change). 216" is the maximum measurable value.
5. Press "SET" key to lock in this value
6. The display will show "ENTER" to indicate the value is set and then "LEVEL" as it returns to measuring the level.

B. Setting the EC20 Value (This is the 20 mA setting which will be the highest measure point in the tank)

1. Hold "MENU" key until "EC20" appears in the display
2. Wait until a value appears which will be the current measured level
3. Press the up or down arrow keys once to display the current EC20 value
4. Press the up or down arrow keys to change the EC20 value to your desired setting (6" is the absolute min. value, but 8" is the recommended min.)
5. Press "SET" key to lock in this value

C. Setting the Fail-Safe Mode (default setting is SAF1)

SAF1 = The output will go to 22 mA if the ultrasonic signal is lost

SAF2 = The output will go to 4 mA if the signal is lost

SAF3 = The output will hold the current (last measured value) if the signal is lost

1. Hold the "MENU" key until "SAF1", "SAF2" or "SAF3" appears in the display
2. Release the "MENU" key and hold the "SET" key to toggle from SAF1 to SAF2 to SAF3
3. When the desired mode is reached, release the "SET" key to lock in that setting

D. Setting the MAXR Value (default setting is 216")

This is the maximum range for the transmitter. The maximum measurable value for the transmitter is 216 inches. If your max measurement range will be less than that, the MAXR value should be set accordingly. This will serve to let the electronics filter out any greater values; i.e., if your maximum tank height is 120", then the MAXR value should be set to 120, as any greater measured values would be erroneous.

1. Hold "MENU" key until "MAXR" appears in the display
2. Continue to hold the "MENU" key until a value appears and then release. This is the current MAXR value (default is 216).
3. Press the up or down arrow keys to change this value
4. Press "SET" key to lock in this new value

E. Setting the MINR Value (default setting is 8")

This is the minimum range for the transmitter. The minimum measurable value for the transmitter is 6 inches from the end of the transmitter. It is recommended that the MINR value be set to no less than 8" to leave some room between the measurement range and the dead zone (6" or less).

1. Hold "MENU" key until "MINR" appears in the display
2. Continue to hold the "MENU" key until a value appears and then release. This is the current MINR value (default is 8).
3. Press the up or down arrow keys to change this value
4. Press "SET" key to lock in this new value

F. Setting the FAST/SLOW Mode (default is FAST)

This determines the averaging rate at which the signal is processed. The **FAST mode** is typical and will have 2 signals per second and update once a second. The **SLOW mode** is generally used in turbulent applications. The signal returns are averaged every 10 seconds in the SLOW mode.

1. Hold the "MENU" key until "FAST" or "SLOW" appears in the display
2. Release the "MENU" key and hold the "SET" key to switch between "FAST" and "SLOW" modes
3. Release the "SET" key when the desired mode is displayed to lock in the setting.

G. Using the ALIN Mode (default is OFF)

The ALIN mode is used when mounting or troubleshooting the transmitter. When the transmitter is in the ALIN mode, the signal return strength will be displayed in dB. This mode can be used when mounting the transmitter to determine optimal alignment. It can also be used to check signal strength when troubleshooting the transmitter.

1. Hold the "MENU" key until "ALIN" appears in the display
2. Continue to hold "MENU" until "OFF" appears in the display
3. Release the "MENU" key and hold the "SET" key to switch from "OFF" to "ON"
4. Release the "SET" key and the transmitter is now in the ALIN mode.
5. To exit the ALIN mode, repeat Steps 1 through 4 to switch from "ON" to "OFF". The ALIN mode must be turned off in order for the transmitter to start measuring level again **and it will not turn off by itself like the other programming modes.**

Factory Settings

EC4	216"
EC20	8"
SAF1/2/3	Saf1
Fast/Slow	Fast
ALIN	N/A
MAXR	216"
MINR	6"

To return to factory settings, remove power to the transducer for at least 10 seconds, then reapply power while pressing the "Set" and "Menu" buttons.

To change the unit of measurement from inches to centimeters, remove power to the transmitter for at least 10 seconds, then reapply power while simultaneously pressing the "▲" and "Set" buttons.

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. 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 Policy

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.

Tel: 860-793-4357

Fax: 860-793-4563

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 36 VDC, Max.
- 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