

# Ultrasonic Liquid Level Sensor (USLS)

Indian Space Research Organisation (ISRO) at its Liquid Propulsion Systems Centre has developed a novel level sensor, which will find wide industrial and commercial applications.

## Principle of Operation

USLS does the function of sensing the presence of liquid medium between its sensing gap. The Standard sensor is typically integrated with the sensing element called the “SENSOR HEAD” and electrically connected to a 5 pin Lemo electrical connector. The sensor is constructed using AISI 304L stainless steel.

One Ceramic disc the “TRANSMIT TRANSDUCER” is used to convert electrical signal to an ultrasonic signal which is then transmitted across the sensing gap. The other Disk “RECEIVE TRANSDUCER” receives the ultrasonic signal and converts it into an electrical signal. The attenuation of ultrasound signals between the transmitter and receiver varies with the medium.

## Specifications

|                       |  |
|-----------------------|--|
| Immersion Length      | 125mm (Approx)                               |
| Level detection       | 75 mm below mounting flange                  |
| Working liquids       | N <sub>2</sub> O <sub>4</sub> , UDMH & water |
| Fluids pressure       | 10 bar (Abs)                                 |
| Test pressure         | 15 bar (Abs)                                 |
| Operating Temperature | 0 to 70°C                                    |
| Material              | SS 304 L                                     |
| Vibration Resistant   | 13.5g, 20-2000 Hz Random                     |
| Electrical interface  | Multipin electrical connector                |

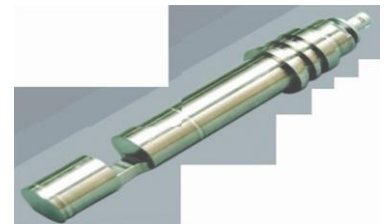
The attenuation is high for air and low for liquids. This change in signal level enables the electric control unit (separate unit) to sense the presence or absence of liquid.

## Advantages & Salient Features

- Miniature/low cost
- Less Weight
- High output
- Low hysteresis
- Shock and vibration resistant
- High dynamic response

## Application

- Automotive
- Defense
- Oceanography
- Vacuum pressure measurement
- Process and chemical Industries
- Automatic weather stations
- Space applications



## Technology Transfer from ISRO

ISRO is willing to offer the knowhow of this technology to suitable entrepreneurs / industries in India. Capable manufacturing industries interested in acquiring this knowhow may write with details of their present activities, requirements and plans for implementation, infrastructure and technical expertise available with them, their own market assessment, if any, and plans for diversification to the address given below: