Partner For Level & Flow Measurement

# Ultrasonic Level Transmitter for Liquids

## ULTRAMATE 136ULT

## PRINCIPLE OF OPERATION

Ultrasonic level metering is based on the principle of measuring the time required for the ultrasonic pulse to travel from sensor to the surface of the liquid and then back. The ultrasonic sensor emits an ultrasonic pulse train and receives the echos reflected from the liquid surface. The received signal is processed by selecting the echo reflected by the liquid surface and calculating the time of flight, the distance to the liquid surface is measured.

## APPLICATION

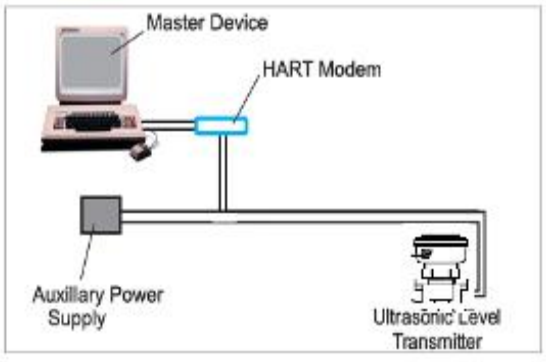
The Model 136 Ultrasonic Level Indicator Transmitter is specially designed to provide convenience of non-contact measurement of Level. Open channel Flow,Volume,percentage level/volume can be derived from level by using optional indicators as detailed below. Sophisticated design and rugged construction guarantees no maintenance. Graphical Display visible in bright sunlight.

## OPTIONS

- Optional Remote Indicator (96X96), Model 176 suitable for panel mounting may be added with up to 4 set points for control purpose and MODBUS output for real time field information at control room.
- Optional Tank Side Indicator, Model 103 HTL suitable for field mounting in weatherproof enclosure. Other similar features as per Model 176.
- Optional Remote Flow Indicator - Totalizer (96X96), Model 191 suitable for panel mounting for Open channel flow metering applications.

*24 VDC supply can be made available through 176/ 103 HTL/ 191

## SINGLE CHANNEL APPLICATION WITH PC AND MODEM




## FEATURES

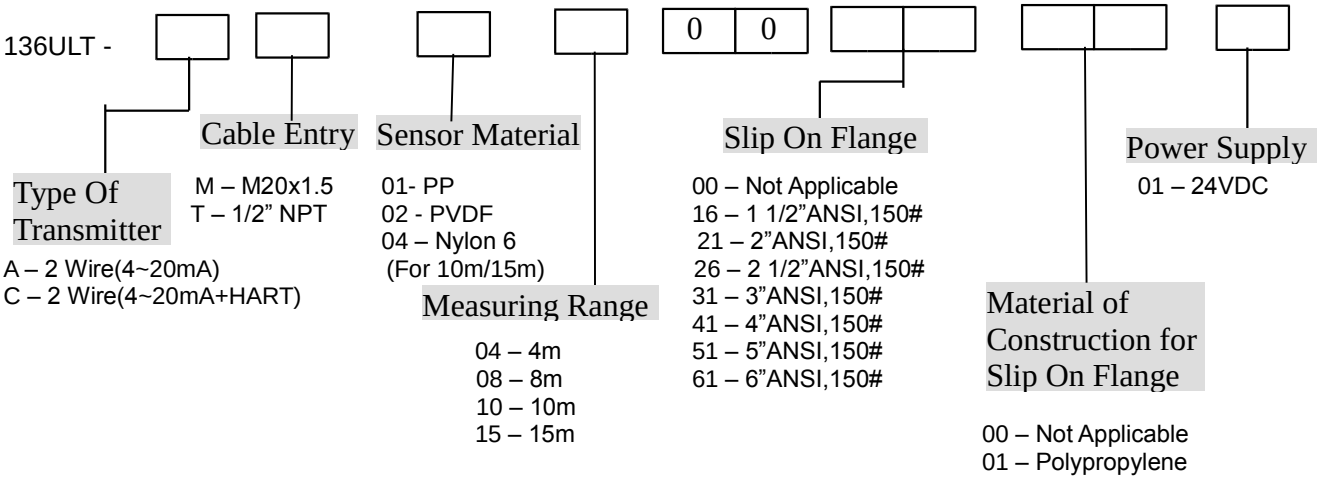
- Micro-processor based Instrument
- HART compatible
- Rugged Construction - Weatherproof
- Graphical Display
- Self diagnostic functions i.e. error messages on display provided to ease setting up
- Automatic Temperature Compensation
- Unaffected by product properties
- No site calibration required
- Echo-wave Display

## SPECIFICATIONS

| | | | |
|---|---|---|---|
| Instrument Range | 4m | 8m | 10m/15m |
| Dead Band(m) | 0.25 | 0.4 | 0.5 |
| Beam Angle(α) | 9° | 9° | 9° |
| Process Connection | 1 1/2"BSP Threaded | 2"BSP Threaded | 6"ANSI 150 #PP Flanged |
| Measuring Frequency(KHz) | 55 | 55 | 35 |
| Sensor Material | PP/PVDF | PP/PVDF | Nylon 6 |
| Housing Material | Aluminum,PU Painted | Aluminum,PU Painted | Aluminum,PU Painted |
| Ingress Protection | IP67 | IP67 | IP67 |
| Process Temperature | (-10~60) ºC | (-10~60) ºC | (-10~60) ºC |
| Ambient Temperature | (-10~55) ºC | (-10~55) ºC | (-10~55) ºC |
| Operating Pressure | Atmospheric | Atmospheric | Atmospheric |
| Power Supply | 16 to 36VDC | 16 to 36VDC | 16 to 36VDC |
| Accuracy** | ±0.2% of (Full Measurement Range) | ±0.2% of (Full Measurement Range) | ±0.2% of (Full Measurement Range) |
| Resolution | 1mm | 1mm | 1mm |
| Output | 4~20mA/HART* | 4~20mA/HART* | 4~20mA/HART* |
| Keyboard/Display | Yes | Yes | Yes |
| No.of cable entries | 1(M20x1.5) / 1/2" NPT | 1(M20x1.5) / 1/2" NPT | 1(M20x1.5) / 1/2" NPT |
| Display parameters | Distance,%Level,Level | Distance,%Level,Level | Distance,%Level,Level |
| Mounting | Top | Top | Top |
| Display formats for measuring range | xxx.x(cm) | xxx.x(cm) | xxx.x(cm) |

Not recommended for pressurized tanks, tanks under vacuum, fuming and foaming liquids
* HART compatible
** Under optimal circumstances of reflection, stabilized & uniform temperature throughout the measuring zone

## ORDER CODE

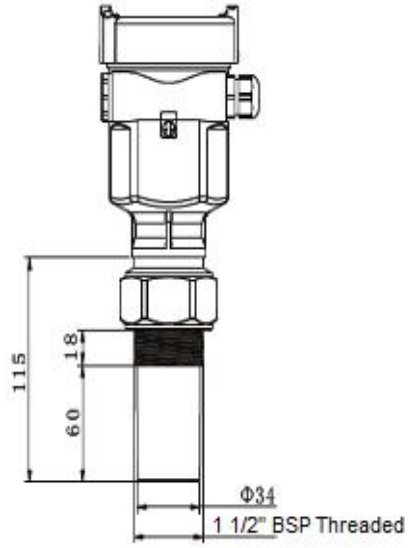



Notes:

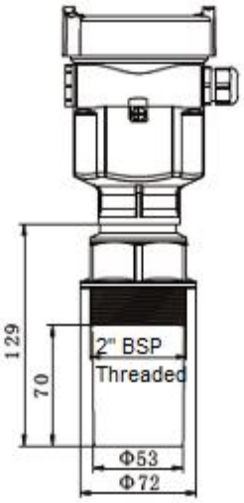
1. Slip on flanges are applicable for transmitters up to 8m range.
2. Please refer specification table for selection of process connection.
3. 10m/15m swiveling holder if required, please contact head office(H.O.)

## MECHANICAL DETAILS

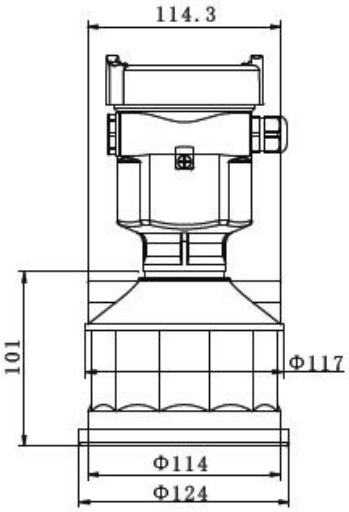
4m Range-2 Wire



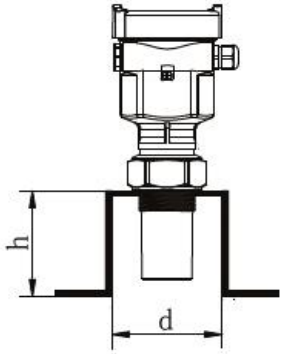

8m Range-2 Wire



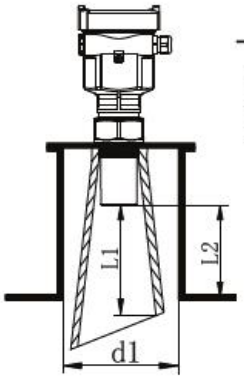

10m/15m-2 Wire




## MAXIMUM NOZZLE HEIGHT




(Fig 1)



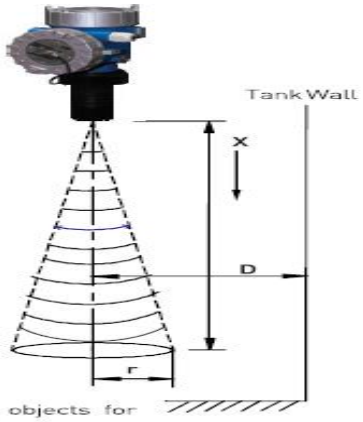

(Fig 2)

| d | h |
|---|---|
| 50mm (2″) | 200m m |
| 80mm (3″) | 250m m |
| 100mm (4″) | 300m m |
| 150mm (6″) | 500m m |

d1>150mm
L2<400mm
L1>L2

## SONIC CONE

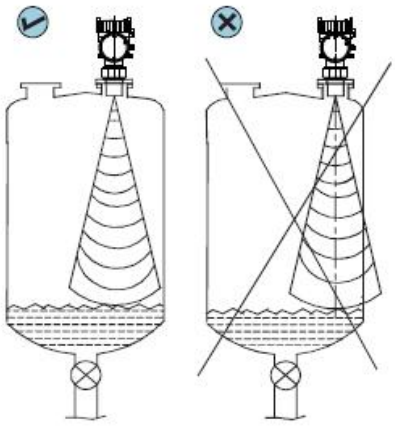
| Tank Height (m) | r (mm) |
|---|---|
| 1 | 158 |
| 2 | 317 |
| 3 | 475 |
| 4 | 634 |
| 5 | 792 |
| 6 | 950 |
| 7 | 1109 |
| 8 | 1267 |
| 9 | 1425 |
| 10 | 1584 |




A clear path with no interfering objects for various heights are required as shown.
'D' MUST BE > 'r'

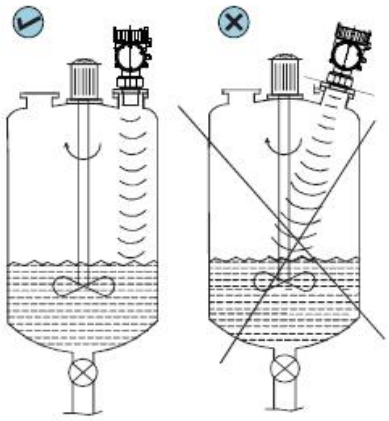
## INSTALLATION GUIDELINES

### Position



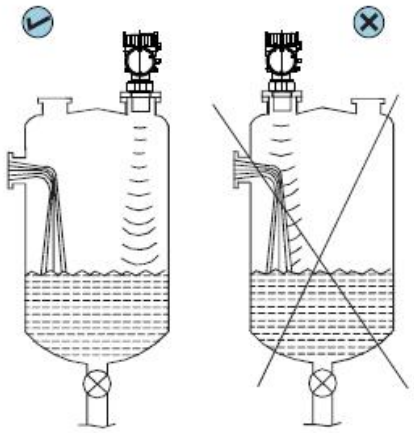
The ultrasonic beam should not touch the tank wall.

### Sensor Alignment



Sensor should be aligned in such a way that its face must be parallel to the surface of liquid.

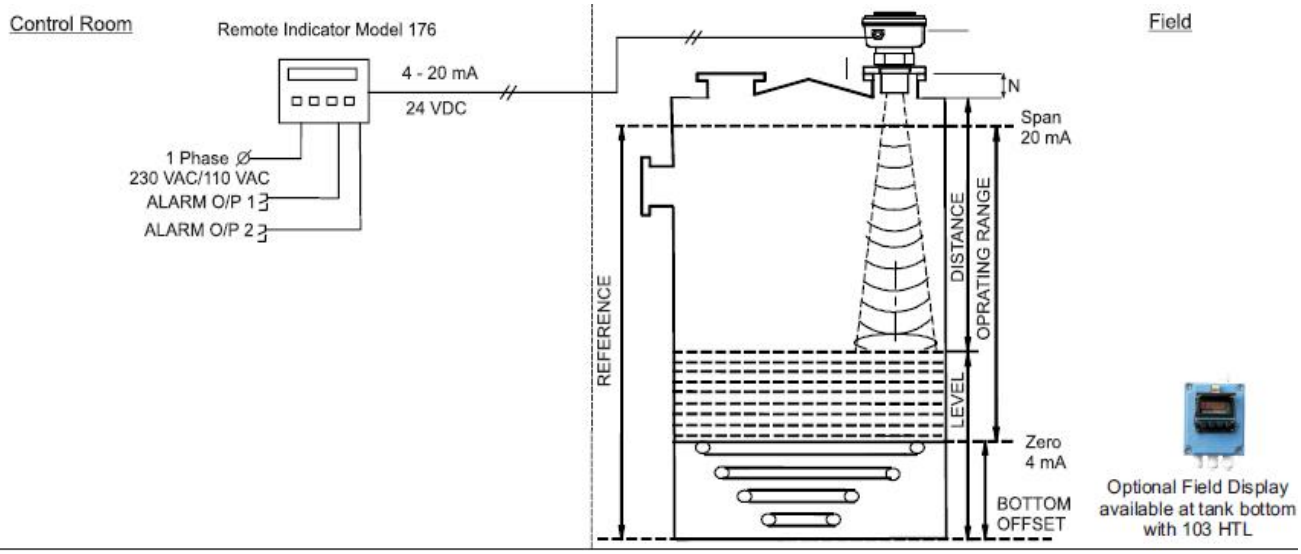
### Obstructions



Inflow path, objects or uneven tank wall surfaces should not protrude into sensing cone of ultrasonic beam.

**In case of dome shaped or horizontal cylindrical tanks, the unit must NOT be mounted at the centre of the tank.**

## APPLICATION DRAWING

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