



SERIES: *LTU200*

- INDICATION AND TRANSMISSION OF:
LEVEL, SPACE, FLOW, VOLUME & WEIGHT
- NARROW BEAM ANGLE OF 5° TO 7°
- CORROSIVE RESISTANT SENSOR
- MEASURES OPEN CHANNEL FLOW RATES
- MEASURES 0.2 TO 15 METERS OF DISTANCE
- GALVANICALLY ISOLATED OUTPUT & SUPPLY
- EXTREMELY LOW POWER CONSUMPTION
- TOTALIZATION & SCALE UP/DOWN
- TEMPERATURE COMPENSATION
- HART COMMUNICATION (OPTION)

**2-WIRE
Transmitter**



INTRODUCTION

Indumart *LTU200 Series* 2-Wire Ultrasonic Liquid Level Transmitters are ideal for any short to medium range non-contact liquid level, volume and weight measurements in reservoirs and flow measurements in open channels. It can provide a galvanically isolated output of 4-20 mA directly or inversely proportional to the span.

The operating principle of ultrasonic level measurement is that the sensor installed above the liquid surface emits ultrasonic pulses and determines the time for receiving the reflected echo to make a complete return trip between the non-contacting transducer and the sensed liquid level. The instrument converts this signal electrically into distance/level and present it as a current output signal.

The transducer housing material of the *LTU200 Series* can be selected among polypropylene (PP), PVDF, Teflon (PTFE) and stainless steel to suit a wide range of applications, such as neutral, acidic, basic and hygienic solvents.

One important advantage of the *LTU200 Series* is its narrow beam angle (5° to 7°) at 3-dB. As a result of the narrow beam angle, the emitted ultrasonic signals have outstanding focus and excellent penetration through gases, vapour and foams. This feature is also ideal for reliable level measurements in narrow vessels.

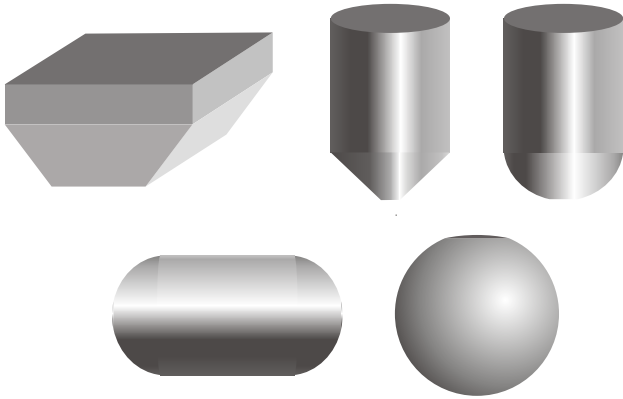
The instrument provides damping to control the maximum changing rate of the displayed liquid level and fluctuation of the mA output signal. Damping slows down the rate of response of the display especially when liquid surface is in agitation or material falls into the sound path during filling. The *LTU200 Series* demonstrates notable stability by adjusting itself to the severity of the process.

In closed tank, containing chemicals or other liquids which create fumes/gases above the liquid surface, especially outdoor tanks exposed to the sun, a reduction of the nominal measuring range of the unit must be taken into consideration. For the above cases or where the foam above the liquid exceeds 1-2 cm, ultrasonic devices with lower measuring frequency (20 or 40 kHz) are recommended.

The blanking feature is also available for ignoring the zones in front of the transducer or below zero point, where false echos may appear at levels that interfere with the processing of the true echo. If a fixed obstacle exists in the path of the echos, it may be introduced to the transmitter at the time of configuration to be ignored in measurements.

Temperature compensation is provided to account for uniform temperature variances of the sound medium.

Automatic volume conversion is available for ten preprogrammed vessel configurations, providing a precise readout selectable either as percentage of volume or in any standard engineering unit. A 32-point linearisation is available for irregular vessels.



The LTU200 Series is equipped with 20 preprogrammed flume and weir formulas which enable the user to measure flow in open channel applications.

OTHER FEATURES

Totalizer

- Two independent volume flow totalisers; one of them is resettable.

Trend & Monitoring

- Trend monitoring and rate of level changing
- Temperature monitoring

Digital Communication

- HART (Eview configuration software) as option

Fully Self-diagnostic System

- Individually coded error messages

Device History

- Indication of the device history, such as: total operating hours, time of operation after the last switch-on, min. and max. temperatures, etc.

Service & Test Parameters

- To facilitate commissioning or troubleshooting of the system, operating conditions such as sensor gain, echo amplitude & noise level are reported.

Access Lock

- A 4-digit access code to prevent tampering

Failure Mode

- Indication of echo failure, and the output can be either below 4mA, above 20 mA or hold the last.

PROGRAMMING

The LTU200 transmitters can be programmed in three ways:

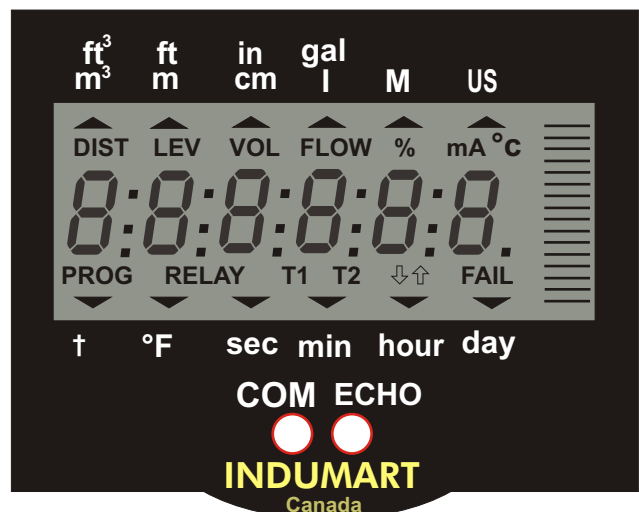
◆ Without Additional Programmer:

This method is used for basic programming of the instrument. The followings can be programmed when the transmitter is in the level measuring mode.

- Assigning 4 mA to min. or max. level / distance
- Assigning 20 mA to max. or min. level / distance
- Current output in case of error (hold, 3.8 mA or 22 mA)
- Damping (10, 30 or 60 sec. only)
- Reset to factory default

◆ With Display Module (ULP200):

All features of the instrument can be set using this optional module. It incorporates a large size, high contrast, 6-digit LCD display and a bargraph indicator. By using this module, both quick and full parameter programming menus are available for configuration, and process values are displayed during measurement. The display module may be placed on the transmitter for process values indication, or be utilized for programming of other LTU200 transmitters, as the unit does not require this optional module for its operation.



◆ HART® Communication:

The LTU200 with HART communication (option) and the configuration software Eview (running under Windows) enables remote programming of up to 15 field devices and viewing of the primary measurement values on the PC.

SPECIFICATIONS

Model	LTU203	LTU204	LTU205	LTU206	LTU207	LTU208	LTU210	LTU212	LTU215
Transducer Material	PTFE	PP, PVFD	PTFE	PP, PVFD PTFE	316 St. St.	PP, PVFD	PP, PVFD	316 St. St.	PP, PVFD
Max. Distance (m)	3	4	5	6	7	8	10	12	15
Min. Distance (m)	0.2	0.2	0.25	0.25	0.35	0.4	0.35	0.35	0.45
Total Beam Angle	6°	6°	5°	5°	7°	5°	7°	5°	5°
Frequency (kHz)	80	80	80	80	50	60	50	60	40
Process Connection	1½" Thread	1½" Thread	2" Thread	2" Thread	Flush Flange	2" Thread	Flange	Flush Flange	Flange

Accuracy ±(0.05% of range + 0.2% of reading)

Housing Material Power paint coated aluminum

Resolution Depends on the measured distance;
Less than 2 m: 1 mm
2...5 m distance: 2 mm
5...10 m distance: 5 mm
Over 10 m distance: 10 mm

Transducer Material One of Polypropylene, PVDF, Teflon or 316 stainless steel
PP version: EPDM

Seals Other versions: FPM (Viton)

Outputs 4...20 mA; 600Ω; Isolation;
Secondary lightning protection
Loop-powered test connector:
2 mm socket for ampermeter,
200 mV, 0.5%

Optional serial communication:
HART interface (resistor 250Ω)
Display Module (ULP200): 6-digit indication, icons and bargraph

Power Supply 12...36 VDC; Galvanic isolation

Power Consumption 48...720 mW

Linearisation 32-point linearisation curve

Fixed Target Supp. Blocking out echo from a fixed object

Electrical Connection 2 x pg 16 and 2 x ½" NPT

Electrical Protection Class I

Process Temp. PP, PVDF & PTFE versions:
-30°C...+90°C
St. st. version: -30°C...+100°C
120°C for maximum 2 hours

Ambient Temp. -30°C...+60°C

Pressure PP, PVDF & PTFE versions:

50...300 kPa (abs)
St. st. version: 90...110 kPa (abs)

Elec. Housing Protec. IP67 (NEMA 6)

Sensor Protection IP68 (immersible)

Intrinsically Safe EEx ia IIB T6 (Option)

DISPLAY / PROGRAMMER MODULE (ULP200)

Field Indication 6-digit LCD, icons & bargraph

Engineering Unit Metric or US, °C or °F

Ambient Temp. -25°C...+60°C (-13°F...+140°F)

Housing Material PBT fiber-glass; flame retardant

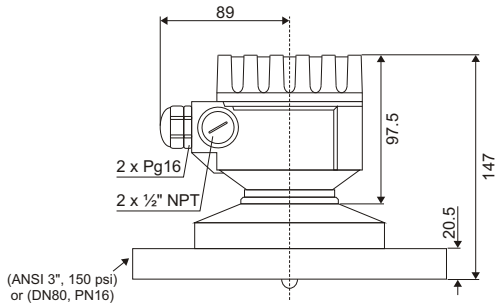
Display Can be assigned to any of the measured or calculated values

The device has been tested according to the following standards: IEC801-2, IEC801-3, IEC801-4, IEC 61326-1, IEC 1000-4-5, EN50081-1, EN50081-2, EN50082-1, EN50082-2, EN55022.

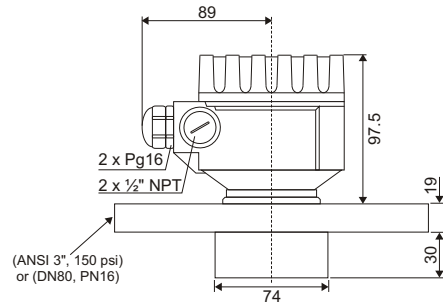
DIMENSIONS (mm)

LTU203 & LTU204	LTU205 & LTU206-P & LTU206-V	LTU206-T & LTU208
<p>89</p> <p>97.5</p> <p>2 x Pg16</p> <p>2 x ½" NPT</p> <p>60</p> <p>1½" NPT or BSP</p> <p>NPT length: 22 BSP length: 15</p>	<p>89</p> <p>97.5</p> <p>2 x Pg16</p> <p>2 x ½" NPT</p> <p>60</p> <p>2" NPT or BSP</p> <p>NPT length: 22 BSP length: 15</p>	<p>89</p> <p>97.5</p> <p>2 x Pg16</p> <p>2 x ½" NPT</p> <p>80</p> <p>2" NPT or BSP</p> <p>NPT length: 22 BSP length: 15</p>

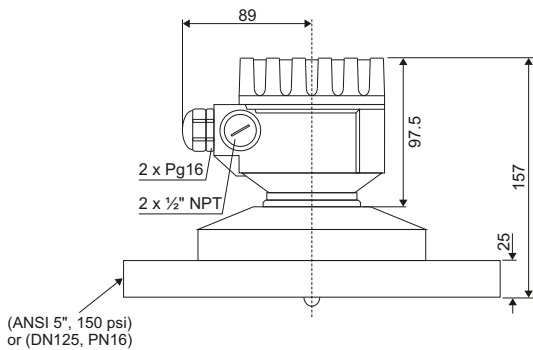
LTU207



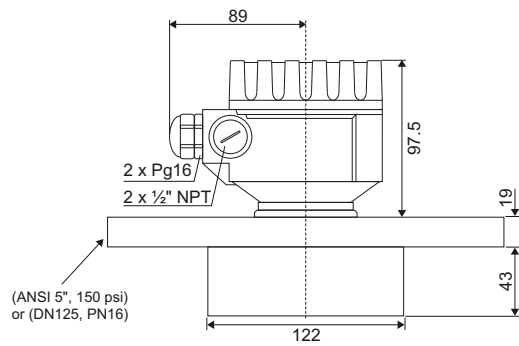
LTU210



LTU212



LTU215



Specifications may change without prior notice.

ORDER CODE

2-WIRE ULTRASONIC LIQUID LEVEL TRANSMITTER (LTU200 SERIES)

Model: LTU2 - -

RANGE

- 3 m (PTFE transducer only)
- 4 m (PP or PVDF transducers only)
- 5 m (PTFE transducer only)
- 6 m (PP, PVDF or PTFE transducers)
- 7 m (St. steel transducer only)
- 8 m (PP or PVDF transducers only)
- 10 m (PP or PVDF transducers only)
- 12 m (St. steel transducer only)
- 15 m (PP or PVDF transducers only)

- 03
- 04
- 05
- 06
- 07
- 08
- 10
- 12
- 15

TRANSDUCER'S HOUSING

- Polypropylene (PP)
- PVDF (solef)
- Teflon (PTFE)
- 316 Stainless Steel

- P
- V
- T
- S

MOUNTING

- NPT Thread (3, 4, 5, 6 & 8 m transducers only)
- BSP Thread (3, 4, 5, 6 & 8 m transducers only)
- ANSI 3" Flange (7 & 10 m transducers only)
- DN80 Flange (7 & 10 m transducers only)
- ANSI 5" Flange (12 & 15 m transducers only)
- DN125 Flange (12 & 15 m transducers only)

- 1
- 2
- 3
- 4
- 5
- 6

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

- D
- X

OUTPUT

- 4-20 mA
- 4-20 mA / Hart
- 4-20 mA / Logger
- 4-20 mA / Hart / Logger
- 4-20 mA / Ex
- 4-20 mA / Hart / Ex
- 4-20 mA / Logger / Ex
- 4-20 mA / Hart / Logger / Ex

PROGRAMMING SUPPORT

- Display Module (ULP200) Required
- No Display

The Hart® Modem, Eview Software and Mounting Brackets must be ordered separately.

For level measurement of solids, please refer to LTU400 series.

**4-20 mA and Relay Outputs
For up to 60 Meters Distance
performs well in heavily dusty environment**



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