

For Solids

performs well in heavily dusty environment

SERIES: LTU400

- LEVEL, VOLUME OR WEIGHT MEASUREMENTS
- SENSOR FOCUSING OF 5° BEAM ANGLE
- HIGHLY EFFICIENT FOAM-FACED SENSOR
- BUILT-IN TEMPERATURE COMPENSATION
- BUILT-IN AIMER
- 4-20 mA AND RELAY OUTPUTS
- BUILT-IN SECONDARY LIGHTNING PROTECTION
- MODBUS RS485 COMMUNICATION (OPTION)
- ON-LINE PROGRAMMING/DISPLAY MODULE (OPTION)
- HART COMMUNICATION AND PROGRAMMING SOFTWARE (OPTION)
- SUPPRESSES THE INTERFACE OF AN ECHO FROM A FIXED OBJECT
- OVER 10 PRE-PROGRAMMED SHAPES FOR VOLUME CALCULATIONS



DESCRIPTION

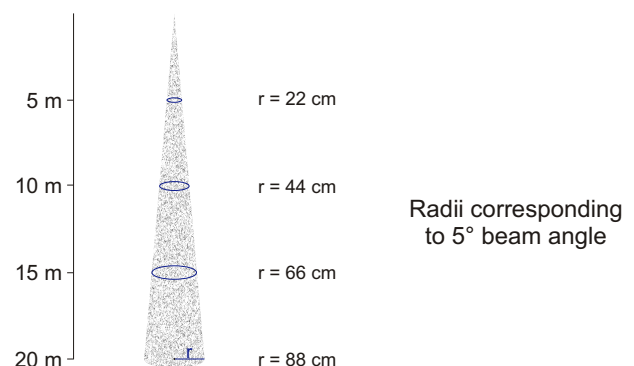
Ultrasonic level measurement is based on the principle of measuring the time required for the ultrasonic pulse and its reflected echo to make a complete return trip between the non-contacting transducer and the sensed material level. Then, the transceiver converts this signal electrically into distance/level and present it as an analogue and/or digital signal.

Indumart *LTU400 Series* Ultrasonic Level Transmitter is capable of monitoring virtually any short to medium range non-contact ultrasonic level and volume/weight measurements of most free flowing solids (granules and powders). In applications characterized by dust, the instrument demonstrates notable stability by adjusting itself to the severity of the process.

A definite advantage of the *LTU400 Series* is its narrow total beam angle of 5° at -3 dB. As a result of narrow beam angle, the emitted ultrasonic signal ensures outstanding focusing and good penetration through dust, and furthermore, provides reliable measurements in narrow silos with uneven side walls and protruding objects.

The transducer is virtually immune to buildups as condensation is atomized on contact with its highly active closed cell foam face. It operates in extremely hostile environment such as cement or sugar silos, stone crushers, gravel bins, etc.

The transceiver provides damping to control the maximum changing rate of the reported level and fluctuation of the output signal. Damping slows down the rate of response of the display especially when liquid surfaces are in agitation or material falls into the sound path during filling.



The *LTU400 Series* incorporates current output directly or inversely proportional to the span (no current output for units with RS485 protocol), and a fully programmable power relay for various alarm and control functions. Optional HART® communication provides both remote programming of and acquiring information from the field devices. The LTU400 with HART and the configuration software (HS400), which runs under Windows®, enables remote programming of up to 15 field devices and viewing of the primary measurement values on a PC. The optional RS485 with MODBUS® protocol may also be acquired for monitoring, data acquisition and remote programming of up to 30 field instruments.

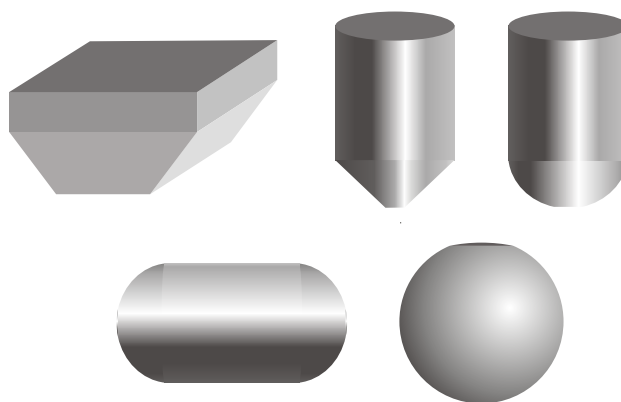
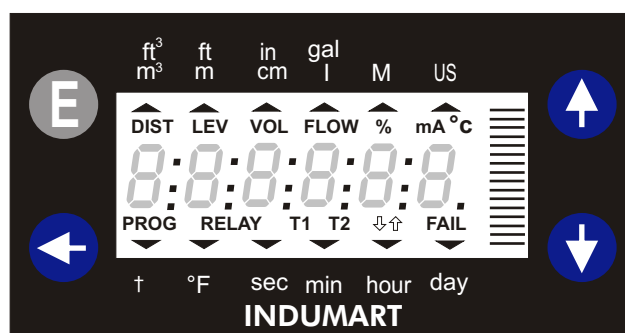
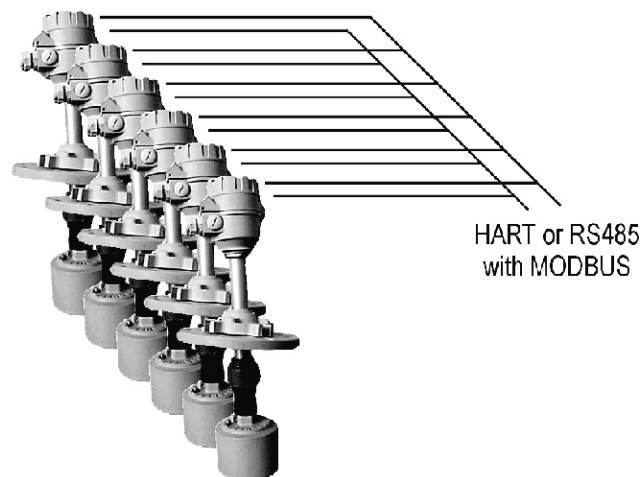
To avoid problems caused by repose formation of the solids, in most cases aiming (tilting) of the device is required. The *LTU400 Series* has an integrated aiming device for carrying out the most appropriate level measurement in tanks/silos.

The optional on-site programmer/display module (D400) may also be added to your level/volume measurement system to indicate the process value on its 6-digit display and be used to enable full parameter programming with access to all features of the *LTU400 Series*. The bargraph display of this programmer provides visual information on the signal strength or the measurement value.

The compact *LTU400 Series* features 32 point linearisation, over 10 pre-programmed tank shapes for calculation of volume/weight, as well as the ability to suppress the interface of an echo from a fixed object inside the container.

The speed of the ultrasonic signals is a function of the traveling environment temperature. For precise level measurements, the *LTU400 Series* is provided with the temperature compensation feature to account for uniform temperature variances of the sound medium.

Other features of the *LTU400 Series* include: (1) access lock by secret code to prevent unauthorized access and programming; (2) fully self diagnostic system with individual error message for appropriate action; (3) service and test parameters read out, which reports on the operating conditions such as sensor gain, echo amplitude, noise level and more to facilitate the installation and troubleshooting of the system; (4) simulation mode, which is used for checking the instrument's output by simulating static or continuous change of level with selectable



parameters such as low level, high level and cycle time; (5) revealing the device history such as total operating hours, operation after last switch-on, number of switching actions for each relay, minimum and maximum temperatures registered, etc.

Applying *LTU400 Series* for level measurements has proven reliable with little maintenance, where other high maintenance level detectors such as cable probes, paddle wheels and plumb bombs are not preferred because of their negative field experience.

SPECIFICATIONS

Accuracy	0.1% of range + 0.2% of measurement
Housing Material	Power paint coated aluminum
Total Beam Angle	5°
Resolution	10 mm
Transducer Material	Closed cell polyurethane foam sensor face, polypropylene sensor housing, aluminum mounting base
Analogue Output	4...20 mA; 600Ω; Isolated
Relay Output	SPDT, 250 VAC, 3A, AC1
Digital Output	HART with configuration software
Linearisation	32-point linearisation of output
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.	-30°C...+75°C (-22°F...+167°F)
Ambient Temp.	-30°C...+60°C (-22°F...+140°F)
Pressure	70... 110 kPa (absolute)
Elec. Housing Protec.	IP67 (NEMA 6)
Sensor Protection	IP65 (NEMA 5)

Calculations

Access Lock

Self Diagnostic

Device History

Service & Tests

Metric or US, °C or °F

4-digit secret code to prevent program tampering

Fully self diagnostic system with individual error message

Displays data such as total operating hours, operation after the last switch-on, number of switching action for each relay, min. and max. temperatures registered, etc.

Reporting on the operating conditions such as gain, echo amplitude, noise level, etc

DISPLAY/PROGRAMMER MODULE

Field Indication

Ambient Temp.

Housing Material

Display

6-digit LCD, icons & bargraph

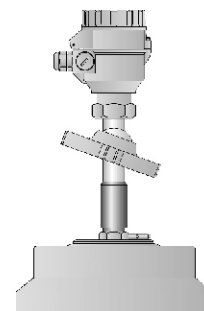
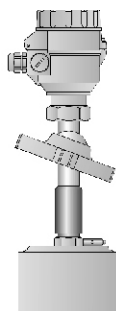
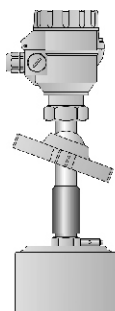
-25°C...+60°C (-13°F...+140°F)

PBT fiber-glass; flame retardant

Can be assigned to any of the measured or calculated values

The device has been tested according to the following standards:

IEC 801-2, IEC 801-3, IEC801-4, CEI/IEC 61326-1, CEI/IEC 1000-4-5
EN50081-1, EN50081-2, EN50082-1, EN50082-2, EN55022:1987

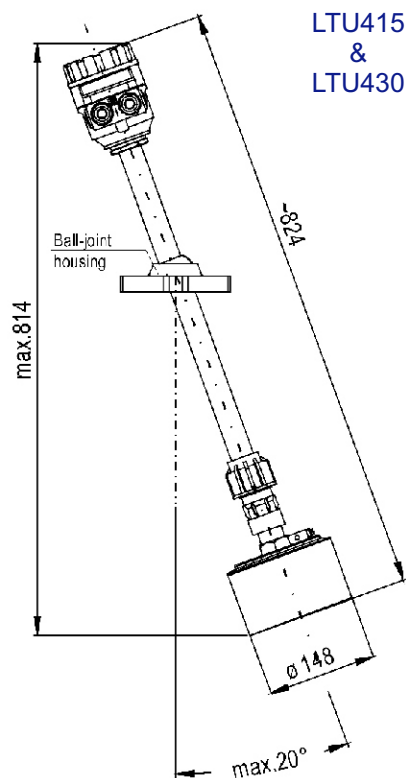
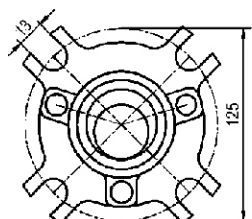


Type	LTU415	LTU430	LTU460
Mounting (min. flange)	ANSI 6" / DN150	ANSI 6" / DN150	ANSI 12" / DN300
Max. Measuring Distance*	15 m (49 ft)	30 m (98 ft)	60 m (196 ft)
Min. Measuring Distance	0.6 m (2 ft)	0.6 m (2 ft)	1 m (3.33 ft)
Suggested Applications	Recommended for short range monitoring of up to 8 m	Up to 25 m for powder and heavy dusty granules; higher range for non-dusting granules	Up to 50 m for powder and heavy dusty granules; higher range for non-dusting granules
Frequency	30 kHz	30 kHz	15 kHz

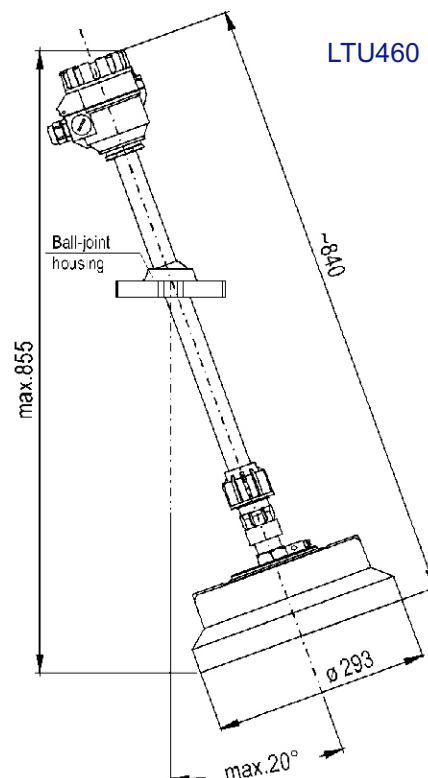
* from transducer's face - under optimal conditions

DIMENSIONS (mm)

BALL-JOINT HOUSING (overhead view)



LTU460



ORDER CODE

ULTRASONIC LEVEL TRANSMITTER FOR SOLIDS

Model: LTU4 - - - -

RANGE

15 m
30 m
60 m

15
30
60

POWER SUPPLY

85...255 VAC / 120...375 VDC
11...28 VAC / 11...40 VDC

A
D

OUTPUT

4...20 mA + Relay
4...20 mA + Relay + HART
RS485 + Relay

0
1
2

APPLICATION

Normal
Dust Ex

N
X

PROGRAMMER/DISPLAY

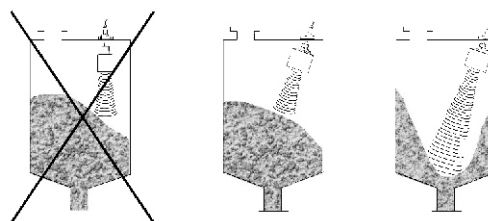
Programmer/Display is required
Not Required

D
X

The Hart® Modem and Software must be ordered separately.

AIMING

To avoid problems caused by repose formation, in most cases aiming (tilting) of the device is required, which can easily be carried out with *LTU400 Series* when the tank/silo is almost empty. In most cases, the sensor should be aimed towards the silo outlet. On applications where repose formation is not present or typically in tall or narrow silos, where the height is more than 5 times of the diameter, aiming is not necessary and the sensor should face straight downward.



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