

# LST300

## Compact ultrasonic level transmitter

The most powerful ultrasonic level transmitter in a compact form

Measurement made easy



### Features

- 2-wire instrument with HART digital communication
- Up to 10 m measurement range
- Wide temperature range of -40 to 85 °C
- Accuracy of  $\pm 2$  mm or 0.2 % of full span (the larger one)
- Beam angle as low as 5° with false echo filtering for narrow spaces
- Easy installation with graphic echo display, advanced diagnostic and easy setup menu
- Unique GAP technology ensures the best performance under any condition
- IP66/67 and NEMA 4X (can submerge to 1 m depth for 30 minutes)
- ATEX, IEC & FM Intrinsic safe and non sparking approved

# LST300 ultrasonic level transmitter

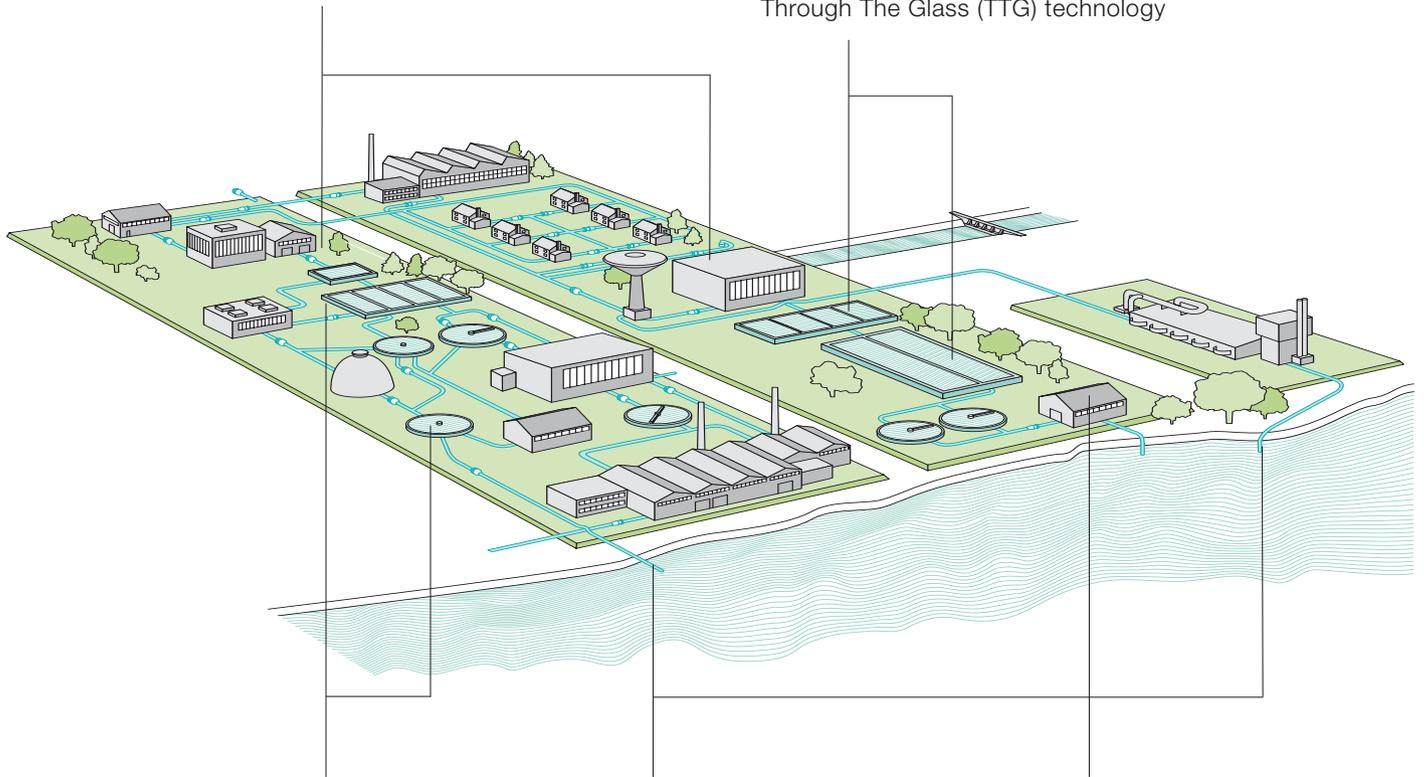
## The perfect fit for all water and waste water applications

### Chemical storage

- Made from metal and PVDF, LST300 is resistant to corrosion, even if the whole instrument gets in contact with chemicals.
- LST300 automatically adapts to process conditions using unique GAP technology. It's the only product that simply works even in the presence of some vapor.

### Storage, lagoons & settling ponds

- Easy setup of functional level measurement using the quick start menu
- Familiar and easy-to-learn menu structure for anyone who has used other ABB instruments
- Direct interaction with the instrument without opening the front window cover, using ABB's innovative and unique Through The Glass (TTG) technology



### Process basins including aeration, chlorine contact, skimmer tanks, sedimentation and flotation thickeners

- With advanced diagnostic functions such as detailed signal quality tracking and noise level diagnostics, LST300 replaces remote instruments as the most easy-to-install level transmitter.
- Works easily in the presence of turbulence and foam using unique GAP technology.

### Irrigation, plant inlet and final discharge

- The built-in equations and supporting software for open channel flow saves you from doing the math manually.
- Class leading 2 mm accuracy with temperature compensation ensures accuracy at all temperature ranges.
- Totalizer counts up to 10 million, keeping accurate track of the total flow over the device lifetime or the flow over an interval for your channel.

### Wet wells, lift stations and pumping stations

- Immune to noise caused by the presence of heavy equipment like variable speed drives, LST300 is the perfect choice in pumping stations.
- Market leading beam angle of 5° ensures easy installation and effective operation in narrow spaces.
- LST300 false echo filtering algorithm filters false echoes from agitators or submerged pumps in direct sight of the instrument.
- The entire LST300 is submersible in water, thus it can survive the flooding conditions.

# LST300 ultrasonic level transmitter

## Serving your industry



### Chemical industry

- With the highest temperature ratings, LST300 is the perfect choice at higher-than-ambient temperatures.
- LST300 is made from metal and PVDF, so it's corrosion resistant even if it gets in contact with chemicals.
- Automatic adjustment process conditions using GAP unique technology makes LST300 the only product that works even in the presence of some vapor.
- LST300 can handle any hazardous area with full FM, IEC, ATEX and NEPSI approvals.

### Power industry

- LST300 quick start menu guides you through the most important steps to easily configure a functional level measurement.
- LST300 applies a menu structure similar to other ABB devices. Learning curve is drastically reduced.
- ABB Through The Glass (TTG) technology ensures direct operation without opening the front window cover.



### Mining & metals industry

- With ABB unique GAP technology, LST300 can work in dust and noise environments and constantly select the optimal settings for changing conditions.
- LST300 can be configured without opening the front window cover, avoiding potential splashes getting into the instrument in environments like sumps.
- Designed for rough, industrial conditions such as a mine, LST300 can measure reliably for many years.

### Pulp & paper industry

- Class leading 2 mm accuracy ensures accurate billing on water usage for this highly water intensive process.
- LST300 has the easiest setup for your inlet and discharge channels; no math work for you due to its built-in equations and supporting software.
- No sensitive electronics ensure stable measurement even in harsh environments like a paper mill.

# LST300 produced by evolution

## Discover all the innovative features

### The most powerful ultrasonic level transmitter in compact form

LST300 is the most powerful compact ultrasonic level instrument in the market, which removed many limitations that existed before.

Most ultrasonic level transmitters have serious limitations, forcing you to compromise on accuracy, power consumption, ingress protection, chemical resistance, HMI capabilities and measurement range. LST300 changed this, as the first product that provides all the benefits of the most advanced technology without the need to compromise.

### The world's first compact ultrasonic instrument designed for the industrial environment

The IP66/67 rated (as standard) LST300 easily survives tough outdoor environment and can be fully submerged in flood conditions. Many other devices in the market only provide high IP ratings on the sensor (wetted parts), while their main electronics have only IP65 protection. However, LST300 is an integrated, yet fully protected device and its IP rating applies to the whole of the instrument. IP68 is a special degree of protection, and can be tested on special request for your special requirements.

Metal at the top, and PVDF at the bottom. LST300 is the first instrument that can be installed in the rough, corrosive conditions where only remote sensor instruments were previously used. All other compact ultrasonic instruments provide corrosion resistance only on the sensor, and require you to separate the transmitter from the environment.

### Class leading accuracy

The leading 2 mm accuracy of LST300 includes temperature compensation to ensure accuracy at all temperature ranges. The sonic speed changes when the temperature changes. LST300 measures temperature and automatically compensates for a change of conditions.

Easy-to-use two point calibration helps you to quickly get the best possible accuracy in your application. Calibrate the measurement to two known points and make sure you get the most out of your instrument. There is no need of complicated calibration procedures to achieve the optimal performance.

### Easy installation and configuration

Configuration is easy with the quick start menu where LST300 guides you through the most important steps to set up a functional level measurement. The familiar menu structure is easy to use for anyone who has used other ABB instruments before, drastically reducing the learning curve when moving to the new device.

LST300 is the first to have full graphic capability and allows you to visualize the process on the instrument, while other compact instruments have simple character display systems only. Detailed tracking of signal quality, noise levels and many other important diagnostics make LST300 the easiest level transmitter to install.

LST300 is also unique with its Through The Glass (TTG) buttons. This exclusive and innovative option enables direct interaction with the instrument without opening the front window cover. This means you can maintain ingress protection rating of IP67 even during configuration. Protection against splashes during configuration is just another way that LST300 makes installation easier.



# LST300 produced by evolution

## Discover all the innovative features

### Measure in the most constrained spaces

LST300 has a beam angle of as low as only 5° full angle (or only 2.5° half angle), which means the measurement is much more directional than most instruments in the market. Easily aim the instrument at the target and watch as it avoids all obstructions. This allows LST300 to measure effectively in narrow spaces, not even requiring false echo filtering for obstructions outside the 5° window.

LST300 contains a false echo filtering algorithm, which allows you to easily inform the instrument which echoes to ignore. It's no problem for LST300 even in case of obstructions within the 5° space. This function is especially useful in applications with agitators or submerged pumps.



### Automatically adapts to process conditions using GAP unique technology

LST300 contains an improved version of the already powerful GAP technology found in LST400. The LST300 constantly monitors measurement data and optimizes the system for the best signal to noise at any tank size. This function ensures the LST300 always runs at the highest accuracy. LST300 is easy to install in both small areas like stilling wells, and large tanks in difficult conditions.

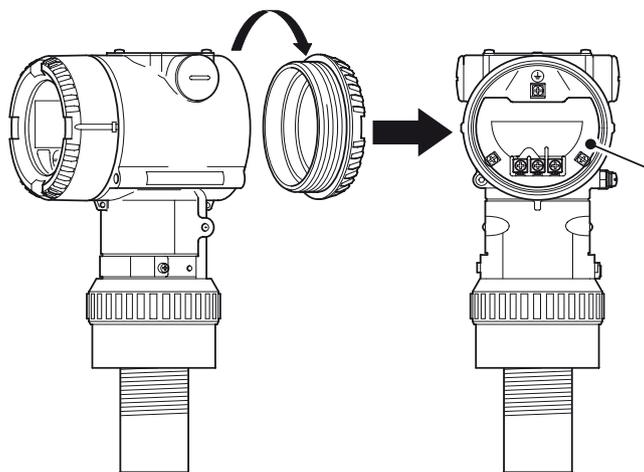
### Non-Contact measurement means no maintenance

As is the case with all the other ABB ultrasonic and laser level instruments, there are no moving parts, so nothing ever wears out. LST300 is a maintenance-free device that delivers the highest level of reliability throughout its operational life. The advanced sensor design has leading beam angle and sensitivity which also results in the most reliable level instrument. LST300 never lets you down during changing seasons, humidity conditions and even flooding.

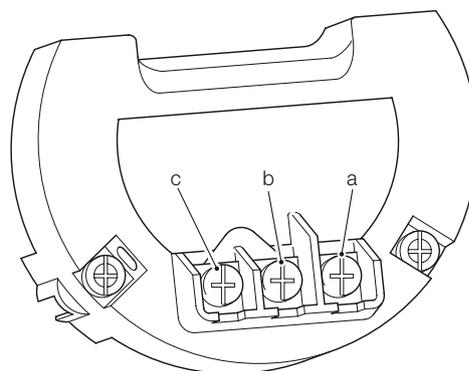
# LST300

## Ultrasonic level transmitter

### Terminal connections

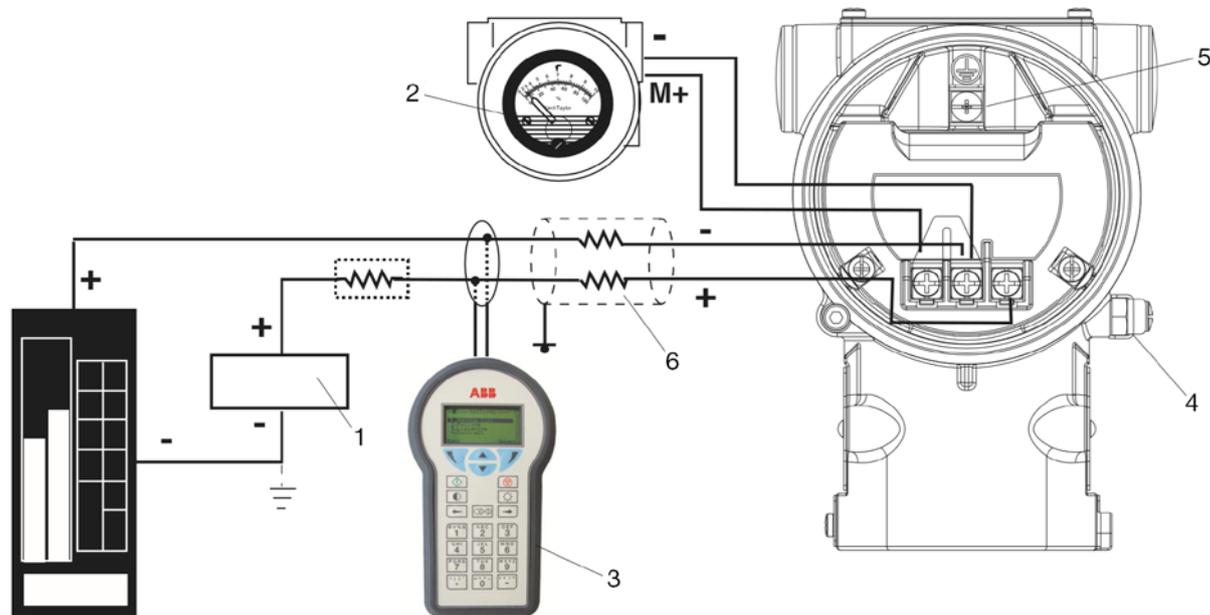


Cable connection area



#### Termination introduction

- a Positive polarity of power supply (+)
- b Negative polarity of power supply (-)
- c External meter



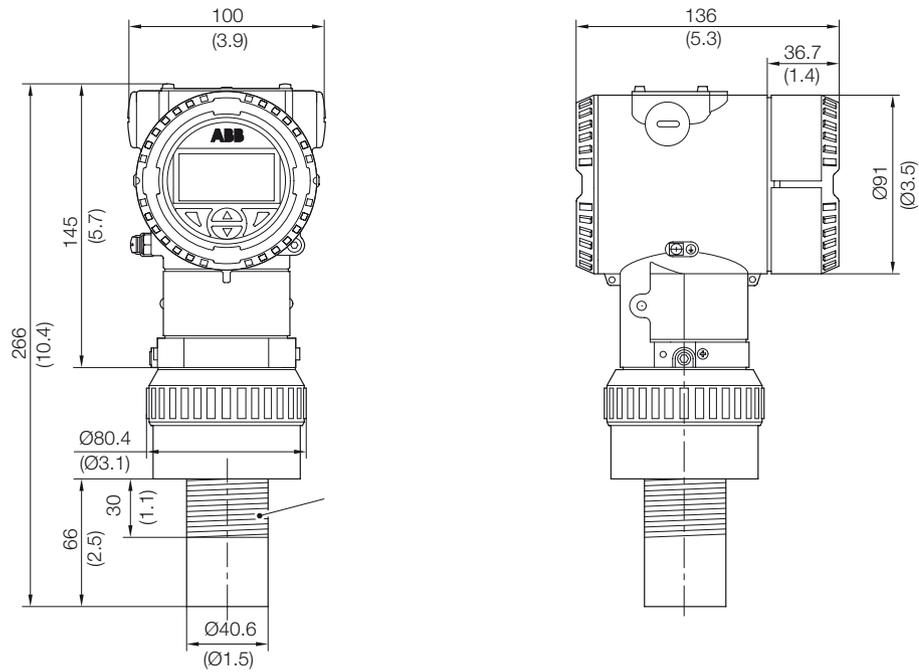
#### Electrical connection – HART version

1. Power supply
2. Remote display
3. Handheld terminal
4. External ground connection
5. Internal ground connection
6. Cable entry

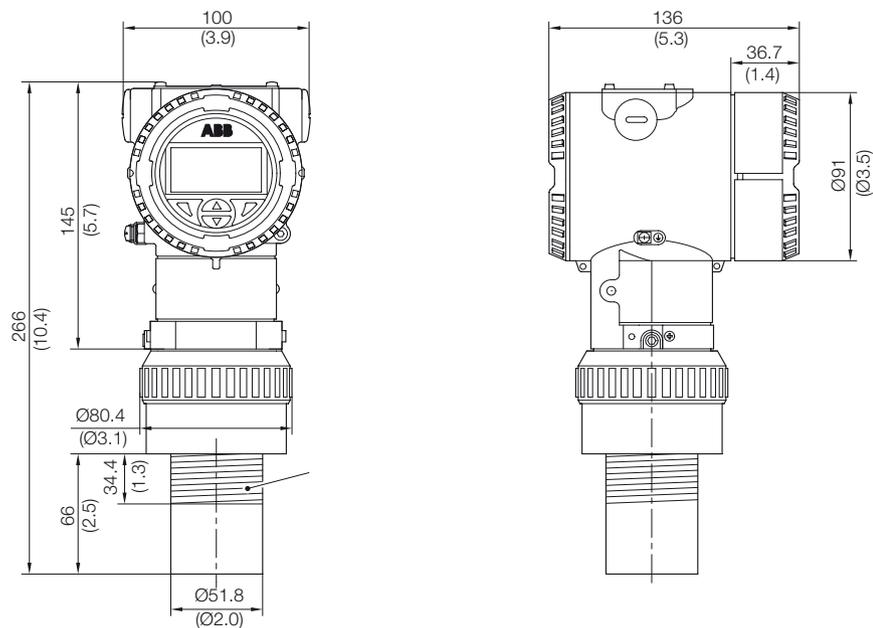
# LST300

## Ultrasonic level transmitter

### Dimensions



Transmitter with 1.5 inch thread



Transmitter with 2 inch thread

# LST300

## Ultrasonic level transmitter

### Measurement

#### Measurement range

C06 sensor: 0.25 to 6 m (10" to 20 ft)

C10 sensor: 0.35 to 10 m (14" to 32 ft)

#### Beam angle (@ -3dB, full angle)

C06 sensor: 7°

C10 sensor: 5°

#### Accuracy

±2 mm (0.08") or 0.2 % of full span (the larger of the two)

#### Repeatability

±0.2 % of measurement range

### Mechanical Data

#### Housing material

Metal parts: Aluminum alloy

Plastic parts: PVDF

#### Dimensions

Length: 136 mm (5.3")

Width: 100 mm (3.9") (excluding glands)

Height: 266 mm (10.4")

#### Weight

2 kg (4.4 lbs)

#### Cable entry type

Two options:

1/2 in. threaded bore for cable gland, directly on housing:

Supplied with 1 x 1/2 in. NPT cable gland

M20 x 1.5 threaded bore for cable gland, directly on housing:

Supplied with M20 x 1.5 cable gland

### Electrical Data

#### Terminals

Three connections for wire cross sections of up to 2.5 mm<sup>2</sup> (14 AWG) as connection points for power supply and communication purposes

#### Grounding

Internal and external ground terminals are provided for 6 mm<sup>2</sup> (10 AWG) wire cross sections

#### Power supply

The transmitter operates from 16 to 42 V DC with no load and is protected against reversed polarity (additional loads enable operation above 42 V DC).

During use in Exia zones and in other intrinsically safe applications, the power supply must not exceed 30 V DC.

#### Ripple

Max. 2.2 mV RMS over a 500 Ω load as per HART specifications

#### Load limitations

Total measurement circuit resistance at 4 to 20 mA and HART:

$$R(k\Omega) = \frac{\text{Voltage supply} - \text{Minimum operating voltage (V DC)}}{22 \text{ mA}}$$

A minimum resistance of 250 Ω is required for HART communication.

#### Analog output

Two-Wire output: 4 to 20 mA related to level / volume / flow, full compensation for temperature effects

### Displays (Optional)

#### Integrated LCD display (code L7)

Widescreen LCD display, 128 x 64 pixels, 52.5 x 27.2 mm (2.06 x 1.07 in.) dot matrix

Four keys for device configuration and management

Easy setup for quick commissioning

Customized visualizations which users can select

Totalized and actual value flow indication

Temperature and diagnostics message display, and configuration settings

#### Integrated LCD display with TTG operation (code L2)

Same specifications as the integrated LCD display (code L7)

An innovative Through-The-Glass (TTG) keypad which can be used to activate the device configuration and management menus without having to remove the transmitter housing cover

TTG keys protected against accidental activation

# LST300

## Ultrasonic level transmitter

### Hazardous Area Approvals

#### **cFMus**

Intrinsic Safety type of protection:

Approval according to FM US and Canada IS Class 1 Div 1/  
GP ABCD- CL II/ DIV 1/ GP EFG, Zone 0 AEx/Ex ia IIC T6...T4  
IS Control Drawing number: 3KXL065035U0009

Non Incendive type of protection:

Approval according to FM US and Canada NI Class 1 Div 2/GP  
ABCD- DIP CL II/ DIV 2/ GP EFG, Zone 2, AEx/Ex nA IIC T6...T4

#### **ATEX/IECEX**

Intrinsic Safety type of protection:

II 1 G Ex ia IIC T6...T4 Ga - II 1 D Ex ia IIIC T85° C  
For electrical parameters, refer to cert, FM15ATEX0063X  
Ex ia IIC T6...T4 Ga - Ex ia IIIC T85° C  
For electrical parameters, refer to cert, IECEX FME 15.0010X

Non Incendive type of protection:

II 3 G Ex nA IIC T6...T4 Gc - II 3 D Ex tc IIIC T85° C  
For electrical parameters, refer to cert, FM15ATEX0064X  
Ex nA IIC T6...T4 Gc - Ex tc IIIC T85° C  
For electrical parameters, refer to cert, IECEX FME 15.0010X

#### **NEPSI**

Intrinsic Safety type of protection:

Ex ia IIC T6...T4 Ga - Ex iaD 20 T85° C  
For electrical parameters, refer to cert, GYJXXXXXX

Non Incendive type of protection:

Ex nA IIC T6...T4 Gc - DIP A22 TA85° C  
For electrical parameters, refer to cert, GYJXX.XXXX

### Environmental Data

#### **Electromagnetic compatibility (EMC)**

Meets requirements of EN 61326

Overvoltage strength (with surge protection): 2 kV (according to IEC 61000-4-5)

#### **Temperature**

-40 to 85 °C (-40 to 185 °F), according to EN 60068-2-14, 1 K/  
min, 100 cycles

#### **Humidity**

Relative humidity: Up to 100 %  
Condensation, icing: Not permissible

#### **Pressure**

Measurement functional from -4 to 44 psi (-0.25 to 3.0 bar)

#### **Vibration resistance**

Acceleration up to 1 g at frequencies of up to 2,000 Hz (according to EN 60068-2-64)

#### **Climate class**

DIN EN 60068-2-38 (Test Z/AD) DIN/IEC 68 T2-30Db

# LST300

## Ultrasonic level transmitter

### Ordering information

#### Basic ordering information for LST300

Ultrasonic level transmitter	ab	cd	efg	hi	jk	lm	no
<b>LST300</b>							
<b>Explosion Protection Certification</b>							
General Purpose		Y0					
NEPSI non sparking Zone 2 (n)		C5					
NEPSI intrinsic safety		C6					
NEPSI combined C5 + C6 (Ex n + Ex ia)		C7					
ATEX / IECEx energy limited (Zone 2 / 22)		E5					
ATEX / IECEx intrinsic safety (Zone 0 / 20)		E6					
ATEX / IECEx combined E5 + E6 (Ex n + Ex ia)		E7					
cFMus energy limited C11 Div 2		F3					
cFMus intrinsic safety C11 Div 1 incl. energy limited (Div 2)		F4					
cFMus combined F3 + F4 (Ex n + Ex ia)		F8					
<b>Sensor Type and Range</b>							
Corrosion resistant transducer, range 10 m (approx. 30 ft)			C10				
Corrosion resistant transducer, range 6 m (approx. 20 ft)			C06				
<b>Process Connection Type</b>							
1.5 in. Universal thread (NPT & BSP compatible) (only available with sensor C06)				U5			
2 in. Universal thread (NPT & BSP compatible) (only available with sensor C10)				U2			
<b>Housing Material / Cable Glands</b>							
Aluminium / 2 pcs. metric, M20 x 1.5, 2 x plugs mounted and 1 x cable gland included					A1		
Aluminium / 2 pcs. 1/2 in. NPT threads, 2 x plugs mounted and 1 x cable gland included					B1		
<b>Power Supply</b>							
Loop powered						L1	
<b>Output Signal</b>							
HART digital communication and 4 ... 20 mA							H1

Note: When only basic ordering information is selected LST300 will be shipped with LCD Option L7, Push Buttons and Display and Glass Cover.

# LST300

## Ultrasonic level transmitter

### Ordering information

#### Additional ordering information for LST300

Add one or more codes after basic ordering information to select all required options.

Ultrasonic level transmitter	xx	xx	xxx	xxx	xx	xx	xx	xxx
<b>Mounting Bracket Shape / Material</b>								
Extendable bracket (floor mounted)	BE							
L-shape bracket (floor mounted)	BF							
Extendable bracket (wall mounted)	BU							
L-shape bracket (wall mounted)	BV							
<b>Certificates</b>								
Inspection certificate 3.1 acc. EN 10204 for calibration, with test report		CE						
<b>Flange Options</b>								
Flange, 3 in. ANSI / ASME connection, PVC			FA3					
Flange, 4 in. ANSI / ASME connection, PVC			FA4					
Flange, 6 in. ANSI / ASME connection, PVC			FA6					
Flange, 80 mm connection, PVC			FD3					
Flange, 100 mm connection, PVC			FD4					
Flange, 150 mm connection, PVC			FD6					
<b>Shipping certificates</b>								
Certificate of origin				GS1				
Certificate of origin notarized by Local Chamber of Commerce				GS2				
<b>Integrated Digital Display (LCD)</b>								
No Display, with Blind Cover					L0			
With Push Buttons (TTG) and Display and Glass Cover					L2			
With Push Buttons and Display and Glass Cover					L7			
<b>Documentation Language</b>								
German						M1		
Italian						M2		
Spanish						M3		
French						M4		
English						M5		
Chinese						M6		
<b>Surge Protector</b>								
Surge / Transient Protector 1x							S1	
<b>Device Identification Plate</b>								
Stainless steel plate with TAG no.								TC1
Adhesive label with TAG no.								TCC
Supplemental wired-on stainless steel plate								TCS

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