## SITRANS LH300 Transmitter for hydrostatic level

### Overview

The pressure transmitter SITRANS LH300 is a submersible sensor for hydrostatic level measurement with cap made of PPE (left), stainless steel (mid) and ETFE (right).

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH300 pressure transmitters are available for various measuring ranges and with explosion protection as an option.

A junction box and a cable hanger are available as accessories for simple installation.

### Benefits

- Compact design
- Simple installation
- Small error in measurement (0.15 % typical)
- Degree of protection IP68

### Application

SITRANS LH300 pressure transmitters are used in the following branches, for example:

- Shipbuilding
- Water/waste water supply
- Drinking water facilities
- For use in unpressurized/open vessels and wells
- Desalination plants

### Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

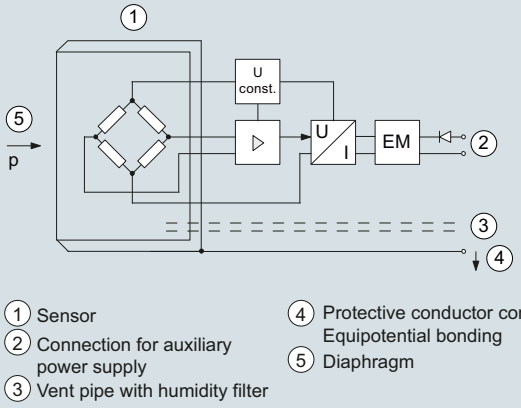
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel enclosure. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

The diaphragm is protected against external influences by a protective cap.

The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

### Function




SITRANS LH300 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

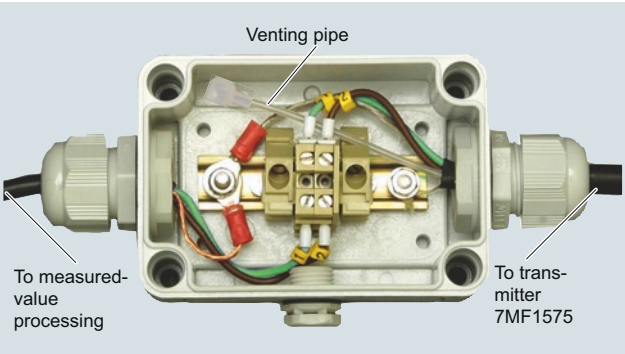
The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

### Integration

It is generally recommended that the connecting cable of the SITRANS LH300 transmitter is connected to the cable box, which can be ordered separately, and secured with an anchoring clamp, also available separately. The cable plug is to be installed near the measuring point, but outside the medium.

Likewise, in the case of media other than water the compatibility with the specified materials of the transmitter, cable and seal must be checked.




Junction box 7MF1575-8AA, open, schematic diagram

Measuring point setup, generally with junction box 7MF1575-8AA and 7MF1575-8AB cable hanger

## Technical specifications

| **Pressure transmitter SITRANS LH300 (submersible sensor)** | |
|---|---|
| **Mode of operation** | |
| Measuring principle | Piezo-resistive |
| **Input** | |
| Measured variable | Hydrostatic level |
| Measuring range | Max. permissible operating pressure |
| • 0 ... 1 $mH_2O$ (0 ... 3 $ftH_2O$) | • 1.5 bar (21.8 psi) (corresponds to 15 $mH_2O$ (45 $ftH_2O$)) |
| • 0 ... 2 $mH_2O$ (0 ... 6 $ftH_2O$) | • 1.5 bar (21.8 psi) (corresponds to 15 $mH_2O$ (45 $ftH_2O$)) |
| • 0 ... 3 $mH_2O$ (0 ... 9 $ftH_2O$) | • 1.5 bar (21.8 psi) (corresponds to 15 $mH_2O$ (45 $ftH_2O$)) |
| • 0 ... 4 $mH_2O$ (0 ... 12 $ftH_2O$) | • 2 bar (29 psi) (corresponds to 20 $mH_2O$ (60 $ftH_2O$)) |
| • 0 ... 5 $mH_2O$ (0 ... 15 $ftH_2O$) | • 2 bar (29 psi) (corresponds to 20 $mH_2O$ (60 $ftH_2O$)) |
| • 0 ... 6 $mH_2O$ (0 ... 18 $ftH_2O$) | • 2 bar (29 psi) (corresponds to 20 $mH_2O$ (60 $ftH_2O$)) |
| • 0 ... 10 $mH_2O$ (0 ... 30 $ftH_2O$) | • 5 bar (72.5 psi) (corresponds to 50 mH2O (150 $ftH_2O$)) |
| • 0 ... 20 $mH_2O$ (0 ... 60 $ftH_2O$) | • 10 bar (145 psi) (corresponds to 100 $mH_2O$ (300 $ftH_2O$)) |
| • 0 ... 40 $mH_2O$ (0 ... 120 $ftH_2O$) | • 20 bar (290 psi) (corresponds to 200 $mH_2O$ (600 $ftH_2O$)) |
| Special measuring ranges | |
| • Up to 100 $mH_2O$ (300 $ftH_2O$) | • 20 bar (290 psi) (corresponds to 200 $mH_2O$ (600 $ftH_2O$)) |
| • Up to 160 $mH_2O$ (480 $ftH_2O$) | • 24 bar (348 psi) (corresponds to 240 $mH_2O$ (720 $ftH_2O$)) |
| Measuring range | |
| • 0 ... 0.1 bar | • 1.5 bar |
| • 0 ... 0.2 bar | • 1.5 bar |
| • 0 ... 0.3 bar | • 1.5 bar |
| • 0 ... 0.4 bar | • 2 bar |
| • 0 ... 0.5 bar | • 2 bar |
| • 0 ... 0.6 bar | • 2 bar |
| • 0 ... 1 bar | • 5 bar |
| • 0 ... 2 bar | • 10 bar |
| • 0 ... 4 bar | • 20 bar |
| Special measuring range | |
| • Up to 10 bar | • 20 bar |
| • Up to 16 bar | • 24 bar |
| **Output** | |
| Output signal | 4 ... 20 mA |
| **Measuring accuracy** | According to IEC 60770-1 |
| Error in measurement at limit setting including hysteresis and reproducibility | ≤ 0.15 % of upper range value (typical) |
| | ≤ 0.3 % of upper range value (maximum) |
| Influence of ambient temperature | ≤ 0.05 %/10 K of upper range value (zero and span) |
| Long-term stability | ≤ 0.15 % of upper range value/year (zero and span) |
| **Operating conditions** | |
| Ambient conditions | |
| • Process temperature | -10 ... +80 °C (14 ... 176 °F) |
| • Storage temperature | -20 ... +80 °C (-4 ... +176 °F) |
| Degree of protection according to IEC 60529 | IP68 |

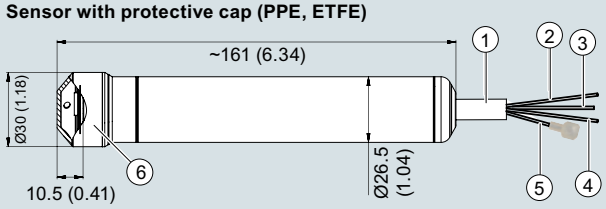
## SITRANS LH300 Transmitter for hydrostatic level

| | |
|---|---|
| **Design** | |
| Weight | |
| • Pressure transmitter | ≈ 0.4 kg ( ≈ 0.88 lb) |
| • Cable | 0.08 kg/m (≈ 0.059 lb/ft) |
| Maximal freely suspended length | 300 m (990 ft) |
| Electrical connection | Cable with 2 conductors, vent pipe and integrated humidity filters |
| Material | |
| • Seal diaphragm | $Al_2O_3$ ceramic, 99.6 % |
| • Enclosure | Stainless steel, mat. no. 1.4404/316L and 1.4539/904L (sea water applications) respectively |
| • Gasket | FPM (standard) |
| | EPDM (optional) |
| • Connecting cable | PE (standard/drinking water applications) |
| | FEP (for aggressive media) |
| • Cap | Stainless steel, PPE or ETFE |
| **Auxiliary power** | |
| Terminal voltage on pressure transmitter $U_B$ | 10 ... 33 V DC for transmitter without explosion protection |
| | 10 ... 30 V DC for transmitter with intrinsic safety explosion protection |
| **Certificates and approvals** | |
| Drinking water approval (ACS) | 17 ACC NY 055 |
| EAC | TC N RU Д-DE.ГА02.B.05092 |
| Underwriters Laboratories (UL) | ML File No. E344532, issued 2017-08-17 |
| Shipbuilding approval (LR) | LR_18/20074 |
| Shipbuilding approval (DNV/GL) | TAA00000CE |
| Shipbuilding approval (BV) | 56926/A0 BV |
| Shipbuilding approval (ABS) | HG1881314_P |
| Shipbuilding approval (RINA) | ELE067319XG |
| Pressure equipment directive | The transmitter is not subject to the pressure equipment directive (PED 2014/68/EU) |
| Explosion protection | |
| • ATEX | SEV 16 ATEX 0121 |
| • IEC Ex | IEC Ex SEV 16.0003 |
| • EAC Ex | TC RU C-DE.AA87.B.00324 |
| • Intrinsic safety "i" | |
| - Marking | II 1 G Ex ia IIC T4 Ga |

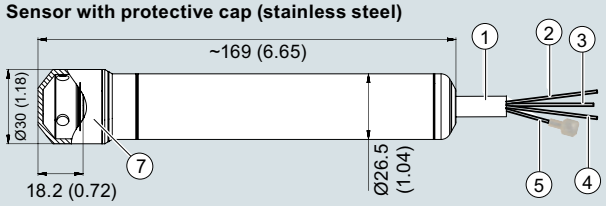
| | |
|---|---|
| **Junction box** | |
| **Application** | For connecting the transmitter cable |
| **Design** | |
| Weight | 0.2 kg (0.44 lb) |
| Electrical connection | 2 x 3-way (28 to 18 AWG) |
| Cable entry | 2 x PG 13.5 |
| Enclosure material | Polycarbonate |
| Vent valve for atmospheric pressure | |
| **Operating conditions** | |
| Degree of protection according to IEC 60529 | IP65 |
| **Cable hanger** | |
| **Application** | For mounting the transmitter |
| **Design** | |
| Weight | 0.16 kg (0.35 lb) |
| Material | Galvanized steel, polyamide |
| Terminal area | For cable with a diameter of 5.5 ... 9.5 mm |

## Dimensional drawings

**Sensor with protective cap (PPE, ETFE)**

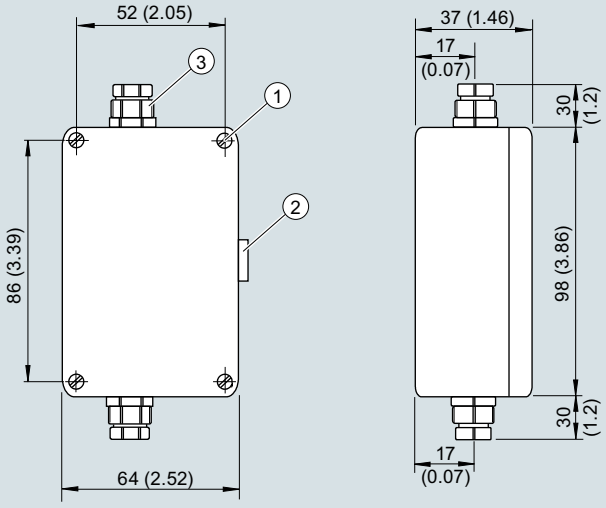



**Sensor with protective cap (stainless steel)**



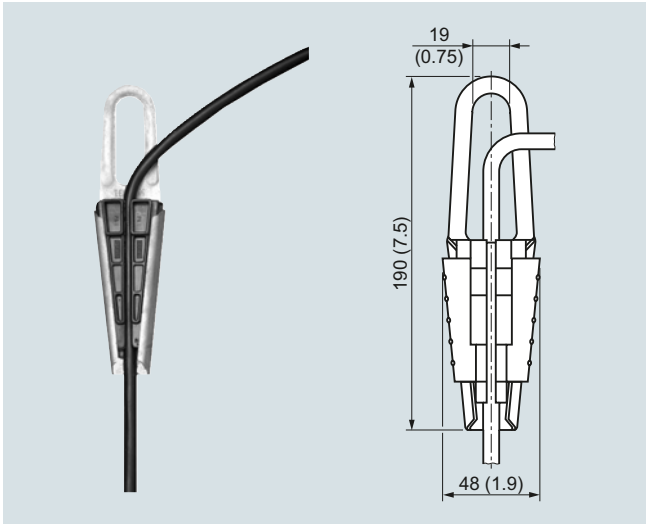

1. Cable, sheat Ø 8.3 (0.33)
2. - (blue)
3. + (brown)
4. Protective conductor connection/Equipotential bonding (black)
5. Vent pipe with humidity filter Ø 1 (0.04) (inner diameter)
6. Protective cap (PPE or PTFE) with 4 x Ø 2.5 (0.10) holes
7. Protective cap (stainless steel) with 4 x Ø 5 (0.20) holes

SITRANS LH300 pressure transmitter, dimensions in mm (inch)




1. Fastening hole
2. Vent valve
3. Cable gland Pg 13.5, cable diameter 6 ... 12 (0.23 ... 0.47)

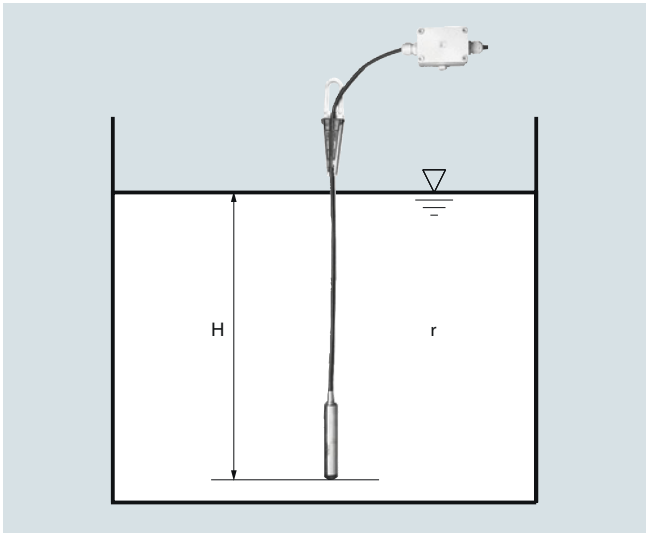
Junction box, dimensions in mm (inch)




Cable hanger, dimensions in mm (inch)

## More information

***Determination of the measuring range for medium water***




Calculation of the measuring range:

**p = ρ x g x H**

with:
ρ = density of medium
g = local acceleration due to gravity
H = maximum level

Example:

Medium: Water, ρ = 1 000 kg/m$^3$
Acceleration due to gravity: 9.81 m/s$^2$
Lower range value: 0 m
Maximum level: 6.0 m
Cable length: 10 m

Calculation:

p = 1 000 kg/m$^3$ x 9.81 m/s$^2$ x 6.0 m
p = 58 860 N/m$^2$
p = 589 mbar

Transmitter to be ordered:
**7MF1575-1FA10**
Plus, if required, junction box 7MF1575-8AA and cable hanger 7MF1575-8AB