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## Overview

The pressure transmitter SITRANS LH300 is a submersible sensor for hydrostatic level measurement with a protective capability made of PPE (left), stainless steel (center) 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 cable box and an anchoring clamp are available as accessories for simple installation.

## Benefits

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

## Application

SITRANS LH300 pressure transmitters are used in the following fields of industry, for example:

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

## Design

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

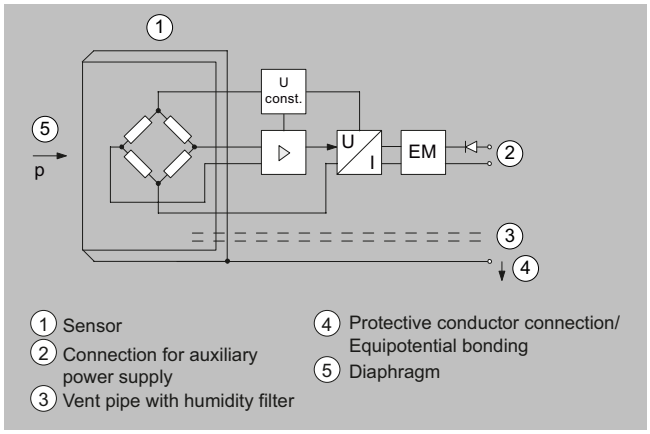
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel enclosure. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

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

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

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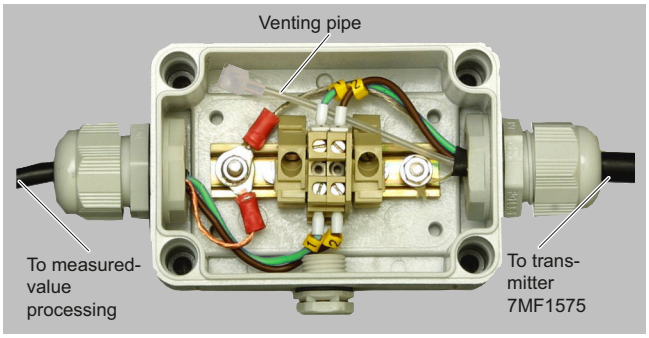
## Integration

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 box is to be installed near the measuring point, but outside the process medium.

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




Cable box 7MF1575-8AA, opened, schematic representation

Measurement location setup, in principle with cable box 7MF1575-8AA and anchoring clamp 7MF1575-8AB

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## Selection and ordering data

| SITRANS LH300 pressure transmitter | | Article No. 7MF1575- ● ● ● ● ● | | | | | Order code ● ● ● | | |
|---|---|---|---|---|---|---|---|---|---|
| For the measurement of the hydrostatic level, immersion probe, 2-wire system, 4 ... 20 mA, for enclosure material see ordering option, measuring cell $Al_2O_3$ ceramic (99.6% purity), with permanently mounted cable.<br>Material of protective cap for PE cable: PPE (color: black).<br>Material of protective cap for FEP cable: PPE (color: white)<br>Note: Cable box and cable hanger must be ordered separately. | | | | | | | | | |
| **Click the article number for online configuration in the PIA Life Cycle Portal.** | | | | | | | | | |
| **Measuring range** | **Cable length (PE cable)** | | | | | | | | |
| 0 ... 1 $mH_2O$ | 5 m (≈ 15 ft) | 1 | A | | | | | | |
| 0 ... 2 $mH_2O$ | 5 m (≈ 15 ft) | 1 | B | | | | | | |
| 0 ... 3 $mH_2O$ | 10 m (≈ 30 ft) | 1 | C | | | | | | |
| 0 ... 4 $mH_2O$ | 10 m (≈ 30 ft) | 1 | D | | | | | | |
| 0 ... 5 $mH_2O$ | 10 m (≈ 30 ft) | 1 | E | | | | | | |
| 0 ... 6 $mH_2O$ | 10 m (≈ 30 ft) | 1 | F | | | | | | |
| 0 ... 10 $mH_2O$ | 20 m (≈ 60 ft) | 1 | H | | | | | | |
| 0 ... 20 $mH_2O$ | 30 m (≈ 90 ft) | 1 | K | | | | | | |
| 0 ... 40 $mH_2O$ | 50 m (≈ 150 ft) | 1 | L | | | | | | |
| 0 ... 3 $ftH_2O$ | 5 m (≈ 15 ft) | 2 | A | | | | | | |
| 0 ... 6 $ftH_2O$ | 5 m (≈ 15 ft) | 2 | B | | | | | | |
| 0 ... 9 $ftH_2O$ | 10 m (≈ 30 ft) | 2 | C | | | | | | |
| 0 ... 12 $ftH_2O$ | 10 m (≈ 30 ft) | 2 | D | | | | | | |
| 0 ... 15 $ftH_2O$ | 10 m (≈ 30 ft) | 2 | E | | | | | | |
| 0 ... 18 $ftH_2O$ | 10 m (≈ 30 ft) | 2 | F | | | | | | |
| 0 ... 30 $ftH_2O$ | 20 m (≈ 60 ft) | 2 | H | | | | | | |
| 0 ... 60 $ftH_2O$ | 30 m (≈ 90 ft) | 2 | K | | | | | | |
| 0 ... 120 $ftH_2O$ | 50 m (≈ 150 ft) | 2 | L | | | | | | |
| 0 ... 0.1 bar | 5 m (≈ 15 ft) | 3 | A | | | | | | |
| 0 ... 0.2 bar | 5 m (≈ 15 ft) | 3 | B | | | | | | |
| 0 ... 0.3 bar | 10 m (≈ 30 ft) | 3 | C | | | | | | |
| 0 ... 0.4 bar | 10 m (≈ 30 ft) | 3 | D | | | | | | |
| 0 ... 0.5 bar | 10 m (≈ 30 ft) | 3 | E | | | | | | |
| 0 ... 0.6 bar | 10 m (≈ 30 ft) | 3 | F | | | | | | |
| 0 ... 1 bar | 20 m (≈ 60 ft) | 3 | H | | | | | | |
| 0 ... 2 bar | 30 m (≈ 90 ft) | 3 | K | | | | | | |
| 0 ... 4 bar | 50 m (≈ 150 ft) | 3 | L | | | | | | |
| ***Special designs*** | | | | | | | | | |
| Measuring ranges for special designs between:<br>0 ... 1 $mH_2O$ and 0 ... 160 $mH_2O$ or<br>0 ... 3 $ftH_2O$ and 0 ... 530 $ftH_2O$ or<br>0 ... 0.1 bar and 0 ... 16 bar possible. | | | | | | | | | |
| **PE cable for general applications and drinking water applications** | | | | | | | | | |
| ***Special cable length*** | | 9 | X | | | | H | . | . |
| Add **"-Z"** to article number, specify order code and plain text:<br>Y01: Cable length ..... | | | | | | | + | | |
| | | | | | | | Y | 0 | 1 |
| 3 m (≈ 10 ft) | | | | | | | H | 1 | A |
| 5 m (≈ 16 ft) | | | | | | | H | 1 | B |
| 7 m (≈ 23 ft) | | | | | | | H | 1 | C |
| 10 m (≈ 33 ft) | | | | | | | H | 1 | D |
| 15 m (≈ 50 ft) | | | | | | | H | 1 | E |
| 20 m (≈ 65 ft) | | | | | | | H | 1 | F |
| 25 m (≈ 80 ft) | | | | | | | H | 1 | G |
| 30 m (≈ 100 ft) | | | | | | | H | 1 | H |
| 40 m (≈ 130 ft) | | | | | | | H | 1 | J |
| 50 m (≈ 160 ft) | | | | | | | H | 1 | K |
| 60 m (≈ 200 ft) | | | | | | | H | 1 | L |
| 70 m (≈ 230 ft) | | | | | | | H | 1 | M |
| 80 m (≈ 265 ft) | | | | | | | H | 1 | N |
| 90 m (≈ 295 ft) | | | | | | | H | 1 | P |
| 100 m (≈ 330 ft) | | | | | | | H | 1 | Q |
| 125 m (≈ 410 ft) | | | | | | | H | 1 | R |
| 150 m (≈ 495 ft) | | | | | | | H | 1 | S |

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## Selection and ordering data (continued)

| SITRANS LH300 pressure transmitter | Article No. 7MF1575- ● ● ● ● ● | Order code ● ● ● |
|---|---|---|
| 175 m (≈ 575 ft) | | H 1 T |
| 200 m (≈ 650 ft) | | H 1 U |
| 225 m (≈ 740 ft) | | H 1 V |
| 250 m (≈ 820 ft) | | H 1 W |
| 275 m (≈ 900 ft) | | H 1 X |
| 300 m (≈ 990 ft) | | H 2 A |
| 350 m (≈ 1150 ft) | | H 2 B |
| 400 m (≈ 1320 ft) | | H 2 C |
| 450 m (≈ 1480 ft) | | H 2 D |
| 500 m (≈ 1650 ft) | | H 2 E |
| 550 m (≈ 1815 ft) | | H 2 F |
| 600 m (≈ 1980 ft) | | H 2 G |
| 650 m (≈ 2145 ft) | | H 2 H |
| 700 m (≈ 2310 ft) | | H 2 J |
| 750 m (≈ 2475 ft) | | H 2 K |
| 800 m (≈ 2640 ft) | | H 2 L |
| 850 m (≈ 2800 ft) | | H 2 M |
| 900 m (≈ 2970 ft) | | H 2 N |
| 950 m (≈ 3135 ft) | | H 2 P |
| 1 000 m (≈ 3300 ft) | | H 2 Q |
| ***Additional special cable lengths*** | 9 X | H 1 Y |
| Add **"-Z"** to article number, specify order code and plain text:<br>H1Y: Cable length .....<br>Y01: Measuring range ..... | | + Y 0 1 |
| **FEP cable for corrosive process media** | | |
| ***Special cable length*** | 9 X | H . . |
| Add **"-Z"** to article number, specify order code and plain text:<br>Y01: Cable length ..... | | + Y 0 1 |
| 3 m (≈ 10 ft) | | H 5 A |
| 5 m (≈ 16 ft) | | H 5 B |
| 7 m (≈ 23 ft) | | H 5 C |
| 10 m (≈ 33 ft) | | H 5 D |
| 15 m (≈ 50 ft) | | H 5 E |
| 20 m (≈ 65 ft) | | H 5 F |
| 25 m (≈ 80 ft) | | H 5 G |
| 30 m (≈ 100 ft) | | H 5 H |
| 40 m (≈ 130 ft) | | H 5 J |
| 50 m (≈ 160 ft) | | H 5 K |
| 60 m (≈ 200 ft) | | H 5 L |
| 70 m (≈ 230 ft) | | H 5 M |
| 80 m (≈ 265 ft) | | H 5 N |
| 90 m (≈ 295 ft) | | H 5 P |
| 100 m (≈ 330 ft) | | H 5 Q |
| 125 m (≈ 410 ft) | | H 5 R |
| 150 m (≈ 495 ft) | | H 5 S |
| 175 m (≈ 575 ft) | | H 5 T |
| 200 m (≈ 650 ft) | | H 5 U |
| 225 m (≈ 740 ft) | | H 5 V |
| 250 m (≈ 820 ft) | | H 5 W |
| 275 m (≈ 900 ft) | | H 5 X |
| 300 m (≈ 990 ft) | | H 6 A |
| 350 m (≈ 1150 ft) | | H 6 B |
| 400 m (≈ 1320 ft) | | H 6 C |
| 450 m (≈ 1480 ft) | | H 6 D |
| 500 m (≈ 1650 ft) | | H 6 E |
| 550 m (≈ 1815 ft) | | H 6 F |
| 600 m (≈ 1980 ft) | | H 6 G |

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## Selection and ordering data (continued)

| SITRANS LH300 pressure transmitter | | Article No. 7MF1575- | | | | | | Order code | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ● | ● | ● | ● | ● | | ● | ● | ● |
| 650 m (≈ 2145 ft) | | | | | | | | H | 6 | H |
| 700 m (≈ 2310 ft) | | | | | | | | H | 6 | J |
| 750 m (≈ 2475 ft) | | | | | | | | H | 6 | K |
| 800 m (≈ 2640 ft) | | | | | | | | H | 6 | L |
| 850 m (≈ 2800 ft) | | | | | | | | H | 6 | M |
| 900 m (≈ 2970 ft) | | | | | | | | H | 6 | N |
| 950 m (≈ 3135 ft) | | | | | | | | H | 6 | P |
| 1000 m (≈ 3300 ft) | | | | | | | | H | 6 | Q |
| ***Additional special cable lengths*** | | 9 | X | | | | | H | 5 | Y |
| Add **"-Z"** to article number, specify order code and plain text:<br>H1Y: Cable length .....<br>Y01: Measuring range ..... | | | | | | | | +<br>Y | <br>0 | <br>1 |
| **Material of the enclosure** | **Protective cap material** | | | | | | | | | |
| Stainless steel 316L (1.4404) | Protective cap made of PPE (recommended for PE cable) | | | A | | | | | | |
| Stainless steel 316L (1.4404) | Protective cap made of ETFE (standard with FEP cable) | | | B | | | | | | |
| Stainless steel 316L (1.4404) | Stainless steel 316L (1.4404) | | | C | | | | | | |
| Stainless steel 904L (1.4539) for seawater applications | Protective cap made of PPE | | | D | | | | | | |
| Stainless steel 904L (1.4539) for seawater applications | Protective cap made of ETFE | | | E | | | | | | |
| Stainless steel 904L (1.4539) for seawater applications | Stainless steel 904L (1.4539) for seawater applications | | | F | | | | | | |
| **Gasket material between sensor and enclosure** | | | | | | | | | | |
| FPM (standard) | | | | | 1 | | | | | |
| EPDM (for drinking water applications) | | | | | 2 | | | | | |
| **Explosion protection** | | | | | | | | | | |
| None | | | | | | 0 | | | | |
| With ATEX II1 G Ex ia IIC T4 Ga, IECEx Ex ia IIC T4 Ga and EAC Ex explosion protection (only possible for cable length ≤ 300 m (990 ft)) | | | | | | 1 | | | | |

| Options | Order code |
|---|---|
| Quality test certificate (factory calibration) according to IEC 62828-2 (6 points upward) | **C11** |

### *Accessories/spare parts*

| | Article No. |
|---|---|
| Cable box | **7MF1575-8AA** |
| Anchoring clamp | **7MF1575-8AB** |
| Protective cap, PPE<br>As spare part (pack of 10) | **7MF1575-8AD** |
| Protective cap, ETFE<br>As spare part (pack of 10) | **7MF1575-8AE** |
| Humidity filter<br>As spare part (pack of 10) | **7MF1575-8AF** |
| Protective cap, stainless steel 316L (1.4404)<br>For wastewater applications | **7MF1575-8AG** |
| Protective cap, stainless steel 904L (1.4539)<br>For seawater applications | **7MF1575-8AH** |

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## 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 $mH_2O$ (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 $mH_2O$ (0 ... 300 $ftH_2O$) | • 20 bar (290 psi) (corresponds to 200 $mH_2O$ (600 $ftH_2O$)) |
| • Up to 160 $mH_2O$ (0 ... 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 ranges | |
| • Up to 10 bar | • 20 bar |
| • Up to 20 bar | • 24 bar |
| **Output** | |
| Output signal | 4 ... 20 mA |
| **Measuring accuracy** | According to IEC 62828-1 |
| Measurement deviation at limit setting including hysteresis and reproducibility | • ≤ 0.15% of the measuring range end value (typical)<br>• ≤ 0.3% of the measuring range end value (max.) |
| Effect of ambient temperature | ≤ 0.05%/10 K of the measuring range end value (zero point and span) |
| Long-term stability | ≤ 0.15% of the measuring range end value/year (zero point 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 |
| **Structural design** | |
| Weight | |
| • Pressure transmitter | ≈ 0.4 kg (≈ 0.88 lb) |

## Technical specifications (continued)

| Pressure transmitter SITRANS LH300 (submersible sensor) | |
|---|---|
| • Cable | 0.08 kg/m (≈ 0.059 lb/ft) |
| Maximum of freely hanging length | 300 m (990 ft) |
| Electrical connection | Cable with 2 wires, vent pipe and integrated humidity filters |
| Material | |
| • Seal diaphragm | $Al_2O_3$ ceramic, 96% |
| • Enclosure | Stainless steel, mat. no. 1.4404/316L or 1.4539/904L for seawater applications |
| • Gasket | • FPM (standard)<br>• EPDM (optional) |
| • Connecting cable | • PE (standard/drinking water applications)<br>• FEP (for corrosive process media) |
| • Protective cap | Stainless steel, PPE or ETFE |
| **Auxiliary power** | |
| Terminal voltage on pressure transmitter $U_B$ | • 10 ... 33 V DC for transmitter without explosion protection<br>• 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 |
| Marine approval (LR) | LR_18/20074 |
| Marine approval (DNV/GL) | TAA00000CE |
| Marine approval (BV) | 56926/A0 BV |
| Marine approval (ABS) | HG1881314_P |
| Marine approval (RINA) | ELE067319XG |
| Pressure Equipment Directive | The transmitter is not subject to the pressure equipment directive (DGRL 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 |

| Cable box | |
|---|---|
| **Area of application** | For connecting the transmitter cable |
| **Structural 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 |

| Anchoring clamp | |
|---|---|
| **Area of application** | For mounting the transmitter |
| **Structural design** | |
| Weight | 0.16 kg (0.35 lb) |
| Material | Zinc-plated steel, polyamide |
| Terminal area | For cable with a diameter of 5.5 ... 9.5 mm |

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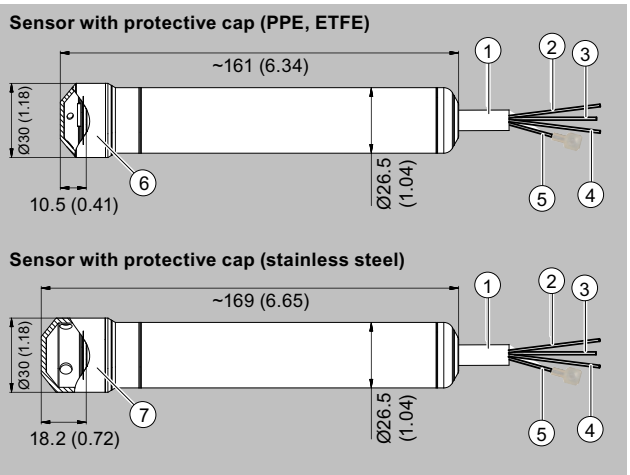
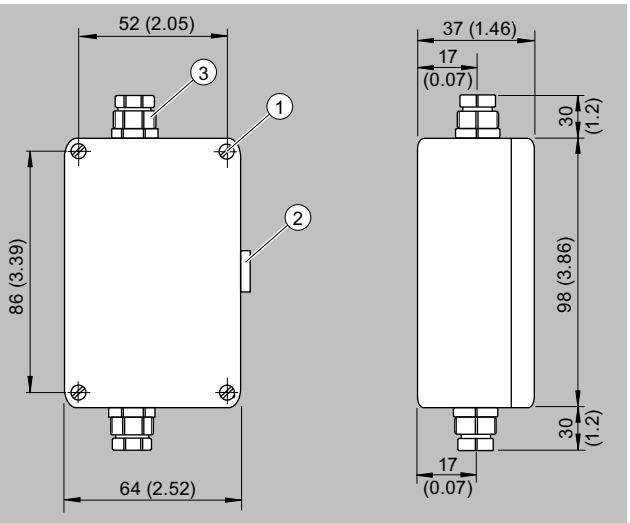
## Dimensional drawings




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

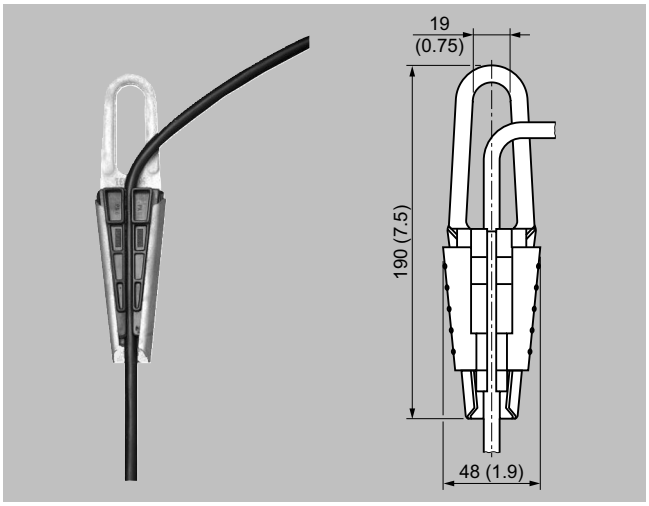
SITRANS LH300 pressure transmitter, dimensions in mm (inch)




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

Cable box, dimensions in mm (inch)

## Dimensional drawings (continued)




Anchoring clamp, dimensions in mm (inch)

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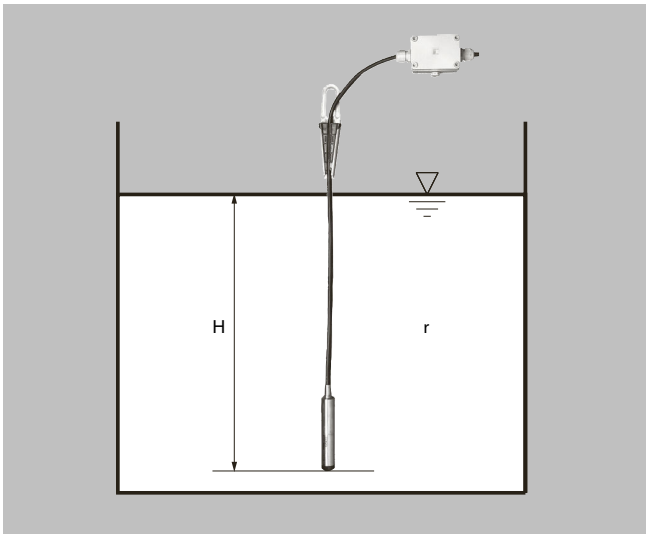
## More information

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




Calculation of the measuring range:

***p = ρ x g x H***

with:

ρ = density of medium
g = local gravitational acceleration
H = maximum level

Example:

Medium: Water, ρ = 1 000 kg/m$^3$
Gravitational acceleration: 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, cable box 7MF1575-8AA and anchoring clamp 7MF1575-8AB