

# TURCK

## Industrial Automation

### INTELLIGENT PRESSURE SENSORS



## THE COMPANY

TURCK is one of the leading companies in the field of industrial automation. The family enterprise with more than 2500 employees in 25 countries and representations in further 60 states, achieves a turnover of nearly 300 million euros. Over 40 years TURCK has set benchmarks time and again with superior products and tailor-made solutions for factory and process automation. The international orientation started already in 1975 with the foundation of TURCK Inc. in Minneapolis, USA.

With production sites in Germany, Switzerland, USA, Mexico and China, today TURCK has succeeded in adapting to the conditions of local markets. Despite international orientation, the company's core competence and the main production sites equipped with the latest machinery, will remain in Germany





# ESSENTIALLY USER-FRIENDLY

## The perfect solution for your application

The PS series leaves nothing to be desired.

- **Maximum operating comfort**

All versions will of course feature excellent operability. For highest operational comfort the sensor features three buttons, whereby the ENTER button is recessed in order to confirm changed parameters.

- **Highest flexibility in the process**

Apart from the already known types PS400/500 the new version PS600 provides maximum flexibility concerning the connection to the process. With a compact pressure membrane various connection possibilities are implementable. Whether front flush mounting for industrial solutions or neutral zone control in the food industry, the series PS600 is the perfect solution.

- **Highest level of standardization**

You want to use one sensor type for all applications? No problem! Further electrical output versions are available for PS400/500/600. The Multiselect version is our highlight. The second output of this type can be programmed either as a switching or as an analog output. The switching logic is also programmable according to the purpose. Additionally to the standard units for all versions, further 10 user-defined units are available.

- **Highest accuracy**

With an accuracy rating of 0.5 % of the full scale, a wide range of applications can be covered by only a few sensor variants.



# ACCURATE PRESSURE MEASUREMENT ALIGNED TO CUSTOMER NEEDS

The pressure sensor series PS combines high accuracy and excellent performance with simple but safe mounting and operation. The sensors offer flexible application possibilities and are easy to configure. Based on all these factors, they provide the machine engineer with a first-class tool, which makes his machines even better and more service-friendly.



## Excellent system availability

The sensors feature a high level of EMC immunity and IP67 protection rating. By using stainless steel for the sensor body, for pressure and electrical connections, this sensor series guarantees high operational reliability. Should the measuring cell burst, depending on the medium temperature, the patented medium stop system prevents leakage up to 2400 bar.

- Excellent interference immunity due to a high level of EMC immunity
- Robust design
- Short down-times based on high availability of spare parts and short replacement lead times



## Absolutely service-friendly

Due to extremely flexible mounting options, user-friendly operation and high accuracy, the sensor offers distinct and calculable advantages:

- Upper sensor part rotatable by 360° (sensor series PS500)
- Minimum maintenance due to an intelligently streamlined product range
- Simple operation via two manual push buttons
- Safe operation via a recessed button for protected storage of sensor settings

## Rotatable display

Of course, horizontal mounting is possible, since the read-out can be rotated by 180° degrees using the correspondent software.





# HIGHEST FLEXIBILITY WITH A LEAN PRODUCT LINE

## Efficient standardisation

Good to know that many conventional sensors can be replaced by a single sensor. The reduction of a large number of sensor inventories quickly pays off for you.

Your advantages:

- Only a few sensor versions need to cover a large range of applications
- Reduced training requirements due to simple and fail-safe sensor operation
- High system safety because of a robust design



## A maximum degree of freedom

Based on the multitude of solutions achievable with only a few device versions, the new sensors offer maximum planning freedom, while minimising mounting requirements.

- Upper sensor part rotatable by 360°
- Display read-out rotatable by 180°
- Display tilted by 45°
- Excellent legibility of display from a larger distance due to bright and large LED indications
- Highest accuracy with a rating of 0.5 % of the full scale
- Two switching outputs or a combination of switching and analog output

## Simple mounting

After having assembled the pressure connection, the actual pressure measuring unit is mounted and fixed with a coupling nut. During this procedure, the sensor can be rotated in all directions and aligned according to the specific needs.



## MAXIMUM EASE OF OPERATION AND SIMPLE

Convenient and simple programming is one of the most important aspects when selecting an intelligent pressure sensor. Due to the clear menu structure, it takes only a few steps to configure the following parameters: the switching and release point, the output function, the analogue range and a choice of special functions, such as a switching delay, rotation of the display direction or a modification of the peak pressure memory.

The use of additional external devices, such as a lap-top or a special programming device, is thus superfluous.

The pressure sensor series PS can be programmed conveniently via three push-buttons. The two buttons “Mode” and “Set” are used to select and adjust various parameters manually without any tool.

It is possible to scroll a list of values from top to bottom to simplify value selection. If you want to store the adjusted value and thus modify the original programming, then the “Enter” button must be pressed. This button is recessed and can only be pushed via a simple tool, such as a ballpoint pen.

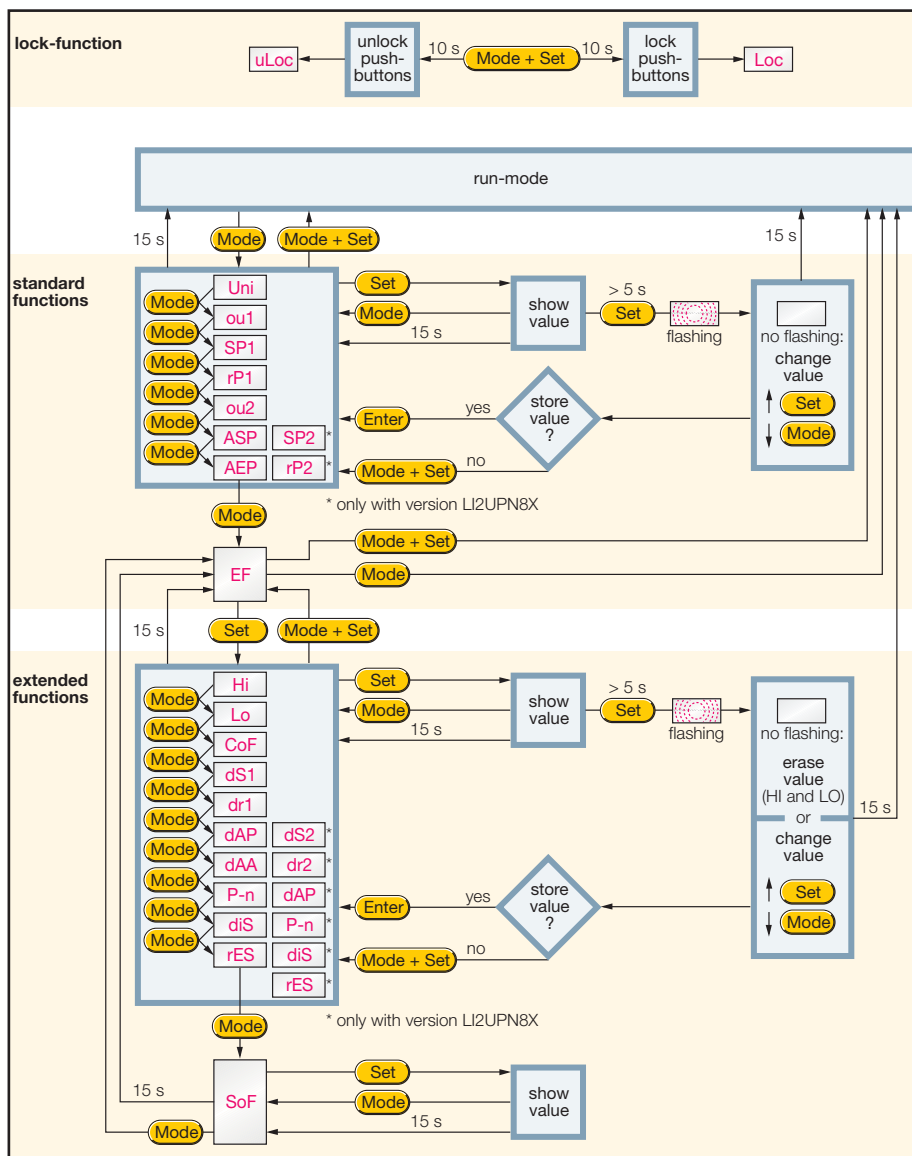
As long as the user does not use such a tool, he can conveniently view and even modify all values after the elapse of a certain time window, without having to be afraid of changing programmed settings unintentionally. Only if the user presses the "Enter" button via the tool, the sensor settings are modified permanently.

## Fail-safe operation

The "Enter" button has been recessed in order to prevent tampering of stored sensor settings. The button can only be pressed by a pointed item, such as a ballpoint pen.



# PROGRAMMING



Dimension drawing of the menu navigation:  
Example above: pressure sensor, 2 switching outputs and 1 analog current output (LI2UPN8X)

## Maximum ease of operation

The "Mode" and "Set" buttons are operated manually. There are no tools needed to view the parameter values. In the user-friendly programming menu, the two buttons can be used as "up" and "down" keys. Thus the required parameters can be precisely set.



# TECHNICAL DATA

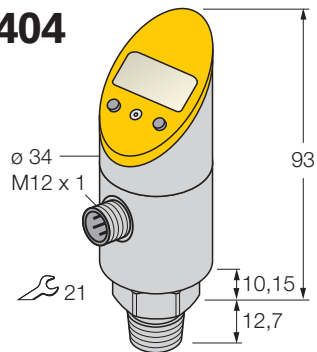
| Power supply                   |                                                                                     |
|--------------------------------|-------------------------------------------------------------------------------------|
| Operating voltage              | 15 ... 30 VDC (switch. outputs)<br>18 ... 30 VDC<br>(switching and analogue output) |
| No-load current                | ≤ 50 mA                                                                             |
| SELV, PELV                     | according to EN 50178                                                               |
| Short-circuit protection       | yes                                                                                 |
| Reverse polarity protection    | yes                                                                                 |
| Protection class               | III                                                                                 |
| Switching output               |                                                                                     |
| Switching frequency            | ≤ 180 Hz                                                                            |
| Output function                | 2 x PNP/NPN, N.C./N.O.,<br>programmable                                             |
| Voltage drop at I <sub>e</sub> | ≤ 2 V                                                                               |
| Rated operating current        | 0.2 A                                                                               |
| Switching point distance       | ≥ 0.5 %                                                                             |
| Switching points               | 1...100 % of final value                                                            |
| Release positions              | 0.5...99.5 % of final value                                                         |
| Analogue current output        |                                                                                     |
| Current output                 | 4... 20 mA, 0...20 mA<br>20...4 mA<br>20...0 mA, programmable                       |
| Response time                  | < 3 ms                                                                              |
| Load                           | ≤ 0.5 kΩ                                                                            |
| Voltage output                 |                                                                                     |
| Voltage output                 | 0...10 V, 0...5 V, 1...6 V, 10...0 V,<br>5...0 V, 6...1 V, programmable             |
| Response time                  | < 3 ms                                                                              |
| Load                           | ≥ 2 kΩ                                                                              |
| Accuracy ratings               |                                                                                     |
| <b>Switching output</b>        |                                                                                     |
| Switch-point accuracy          | ≤ ± 0.5 % of final value                                                            |
| Repeat accuracy                | ≤ ± 0.1 % of final value                                                            |
| <b>Analogue output</b>         |                                                                                     |
| Accuracy (Lin.+Hys.+Rep.)      | ≤ ± 0.5 % of final value                                                            |
| <b>Temperaturverhalten</b>     |                                                                                     |
| Temperature coefficient        |                                                                                     |
| Zero point (Tk0)*              | ≤ ± 0.15 % of final value/10 K                                                      |
| Temperature coefficient        |                                                                                     |
| Span (TkS)*                    | ≤ ± 0.15 % of final value/10 K                                                      |
| *based on T <sub>amb</sub>     |                                                                                     |

| Housing                                                     |                                                                                                                        |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Housing material                                            | stainless steel/plastic, 1.4305<br>(AISI 303) / PC                                                                     |
| Material pressure connection                                | stainless steel A2 1.4305 (AISI 303)                                                                                   |
| Material pressure pick-up                                   | ceramics Al <sub>2</sub> O <sub>3</sub>                                                                                |
| Sealing                                                     | FPM                                                                                                                    |
| Mechanical connection                                       | see type code                                                                                                          |
| Pressure connection - width<br>across flats & fixing torque | SW 21 (max. 50 Nm)                                                                                                     |
| Coupling nut - width<br>across flats & fixing torque        | SW 30 (max. 35 Nm)                                                                                                     |
| Connection                                                  | Connectors, M12 x 1                                                                                                    |
| Display                                                     |                                                                                                                        |
| Pressure display                                            | 4-digit 7-segment display,<br>rotatable by 180° degrees,<br>can be disabled                                            |
| Switching status indication                                 | 2 x LED yellow                                                                                                         |
| Measuring values/programming                                | switch/release points;<br>Hysteresis/window mode;<br>N.O./N.C.; dampening;<br>unit of display;<br>peak pressure memory |
| Display of pressure unit                                    | 5 x LEDs, green (bar, psi,<br>kPa/MPa, misc)                                                                           |
| EMC                                                         |                                                                                                                        |
| EN 61000-4-2                                                | ESD 4 kV CD / 8 kV AD                                                                                                  |
| EN 61000-4-3                                                | HF irradiated: 15 V/m <sup>2</sup>                                                                                     |
| EN 61000-4-4                                                | Burst 2 kV                                                                                                             |
| EN 61000-4-5                                                | Surge 500 V, 12 Ω                                                                                                      |
| EN 61000-4-6                                                | HF conducted: 10 V                                                                                                     |
| Ambient conditions                                          |                                                                                                                        |
| Medium temperature                                          | -40 ... 85 °C                                                                                                          |
| Ambient temperature                                         | -40 ... 80 °C                                                                                                          |
| Storage temperature                                         | -40 ... 80 °C                                                                                                          |
| Degree of protection                                        | IP67                                                                                                                   |
| Vibration resistance                                        | 20 g (9...2000 Hz)<br>according to IEC 68-2-6                                                                          |
| Shock resistance                                            | 50 g (11 ms) to<br>IEC 68-2-27                                                                                         |

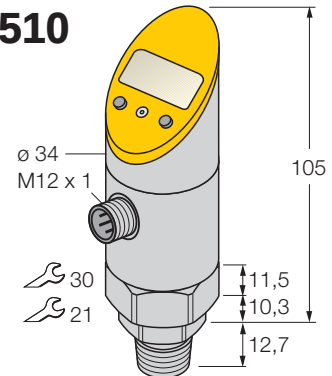


# DIMENSION DRAWINGS OF THE VARIOUS TYPES

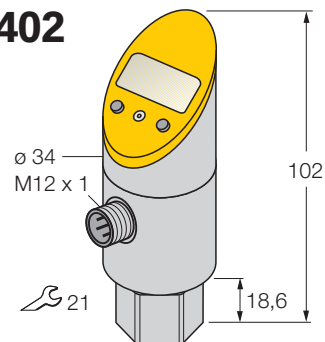
## PS...-403/404



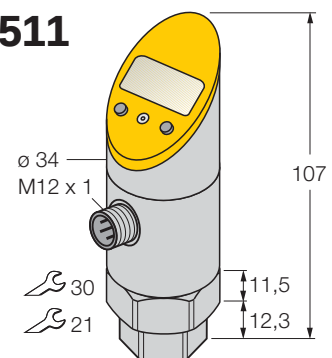
## PS...-503/504/510



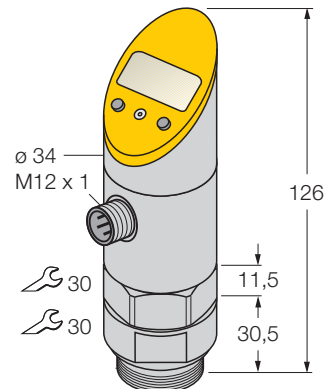
## PS...-401/402



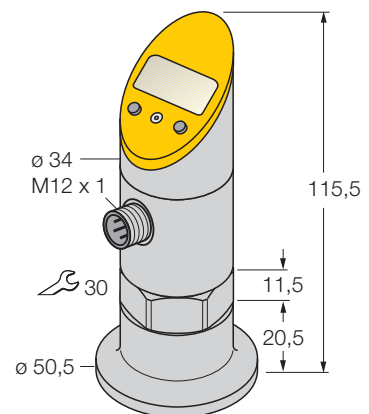
## PS...-501/502/511



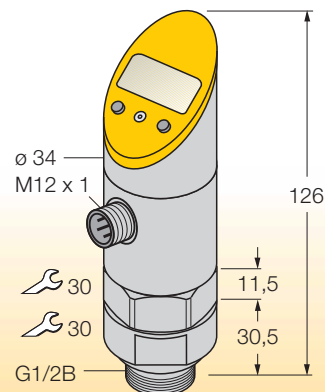
## PS...-606



## PS...-607



## PS...-609



| Housing/pressure connection |                                                      |      |                                                                                |
|-----------------------------|------------------------------------------------------|------|--------------------------------------------------------------------------------|
| 4...                        | adjustable, with display, fixed pressure connection  | 6... | adjustable, with display, fixed pressure connection, pressure membrane fitting |
| 401                         | G1/4" female thread                                  | 606  | G3/4" male thread front flush                                                  |
| 402                         | 1/4"-18NPT female thread                             | 607  | 1 1/2" tri-clamp                                                               |
| 403                         | 1/4"-18NPT male thread                               | 609  | G1/2" male thread front flush                                                  |
| 404                         | G1/4" male thread                                    |      |                                                                                |
| 5...                        | adjustable, with display, rotatable pres. connection |      |                                                                                |
| 501                         | G1/4" female thread                                  |      |                                                                                |
| 502                         | 1/4"-18NPT female thread                             |      |                                                                                |
| 503                         | 1/4"-18NPT male thread                               |      |                                                                                |
| 504                         | G1/4" male thread                                    |      |                                                                                |
| 505                         | 7/16" UNF male thread                                |      |                                                                                |
| 508                         | G1/2" male thread manometer connection               |      |                                                                                |
| 510                         | R1/4" male thread                                    |      |                                                                                |
| 511                         | R1/4" female thread                                  |      |                                                                                |

# TYPE CODE

Benefit from maximum variation freedom!

**PS 010V - 4 01 - LI 2U PN 8 X - H1141**

**Connection**  
**H1141** 4-pin  
M12-connection

**with LED displays**

**Operating voltage**  
**8** 15(18)...30 VDC

| Output function | Output 1         | Output 2                  |
|-----------------|------------------|---------------------------|
| <b>2UPN</b>     | Switching output | Switching output          |
| <b>LUUPN</b>    | Switching output | Voltage output            |
| <b>LI2UPN</b>   | Switching output | Current-/Switching output |

## Pressure connection

- |           |                                                                   |
|-----------|-------------------------------------------------------------------|
| <b>01</b> | G1/4"-female thread                                               |
| <b>02</b> | 1/4"-18NPT-female thread                                          |
| <b>03</b> | 1/4"-18NPT-male thread                                            |
| <b>04</b> | G1/4"-male thread                                                 |
| <b>05</b> | 7/16"-UNF-male thread (only for housing 5)                        |
| <b>06</b> | G3/4"-male thread, face flush (only for housing 6)                |
| <b>07</b> | 1 1/2"-Tri-Clamp (only for housing 6)                             |
| <b>08</b> | G1/2"-male thread, pressure gauge connection (only for housing 5) |
| <b>09</b> | G1/2"-male thread, face flush (only for housing 6)                |
| <b>10</b> | RT 1/4"-male thread                                               |
| <b>11</b> | RT 1/4"-female thread                                             |

## Housing

- |          |                                                                        |
|----------|------------------------------------------------------------------------|
| <b>4</b> | adjustable, with indication, non-rotatable body                        |
| <b>5</b> | adjustable, with indication, rotatable body                            |
| <b>6</b> | adjustable, with indication, non-rotatable body, remote seal flush fan |

## Pressure range

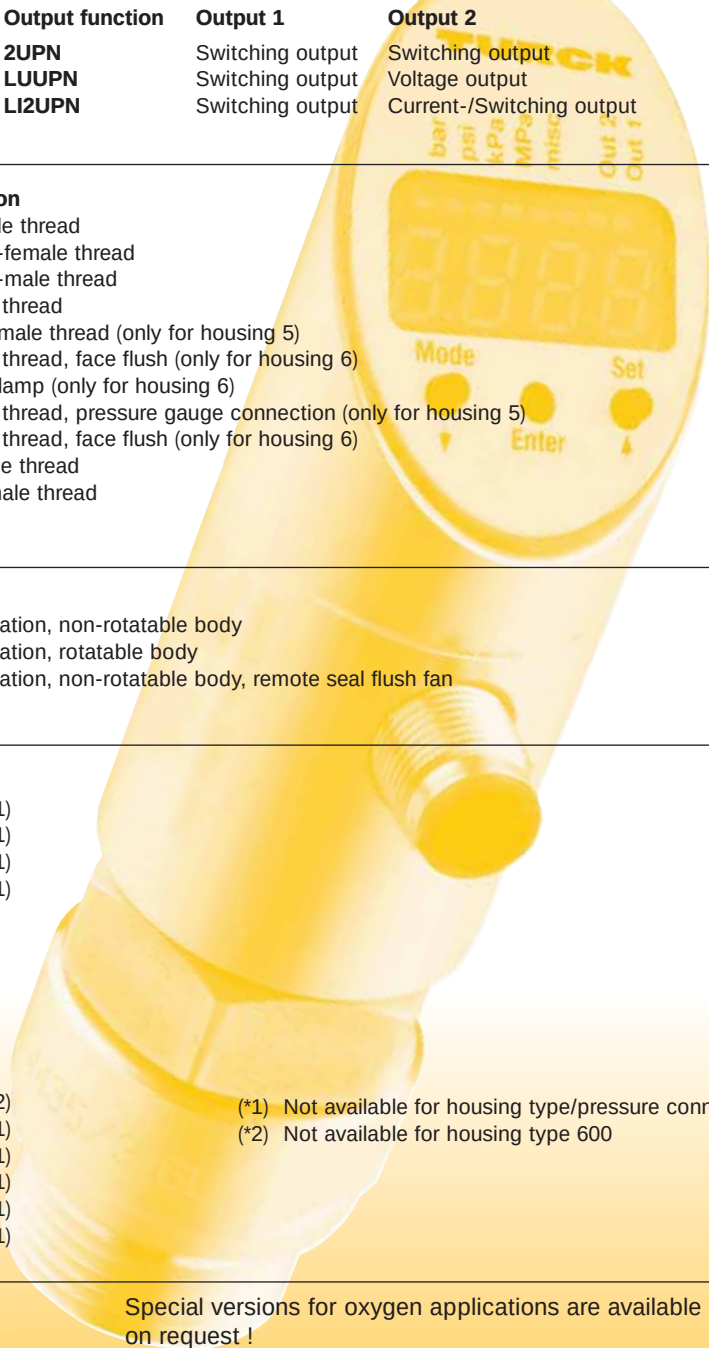
- |             |                 |                     |
|-------------|-----------------|---------------------|
| <b>01VR</b> | Measuring range | -1...0 bar g (*1)   |
| <b>001R</b> | Measuring range | 0...1 bar g (*1)    |
| <b>001V</b> | Measuring range | -1...1 bar g (*1)   |
| <b>003V</b> | Measuring range | -1...2,5 bar g (*1) |
| <b>010V</b> | Measuring range | -1...10 bar g       |
| <b>016V</b> | Measuring range | -1...16 bar g       |
| <b>025V</b> | Measuring range | -1...25 bar g       |
| <b>040V</b> | Measuring range | -1...40 bar g       |
| <b>100R</b> | Measuring range | 0...100 bar g       |
| <b>250R</b> | Measuring range | 0...250 bar g       |
| <b>400R</b> | Measuring range | 0...400 bar g       |
| <b>600R</b> | Measuring range | 0...600 bar g (*2)  |
| <b>001A</b> | Measuring range | 0...1 bar a (*1)    |
| <b>003A</b> | Measuring range | 0...2,5 bar a (*1)  |
| <b>010A</b> | Measuring range | 0...10 bar a (*1)   |
| <b>016A</b> | Measuring range | 0...16 bar a (*1)   |
| <b>025A</b> | Measuring range | 0...25 bar a (*1)   |

(\*1) Not available for housing type/pressure connection 609

(\*2) Not available for housing type 600

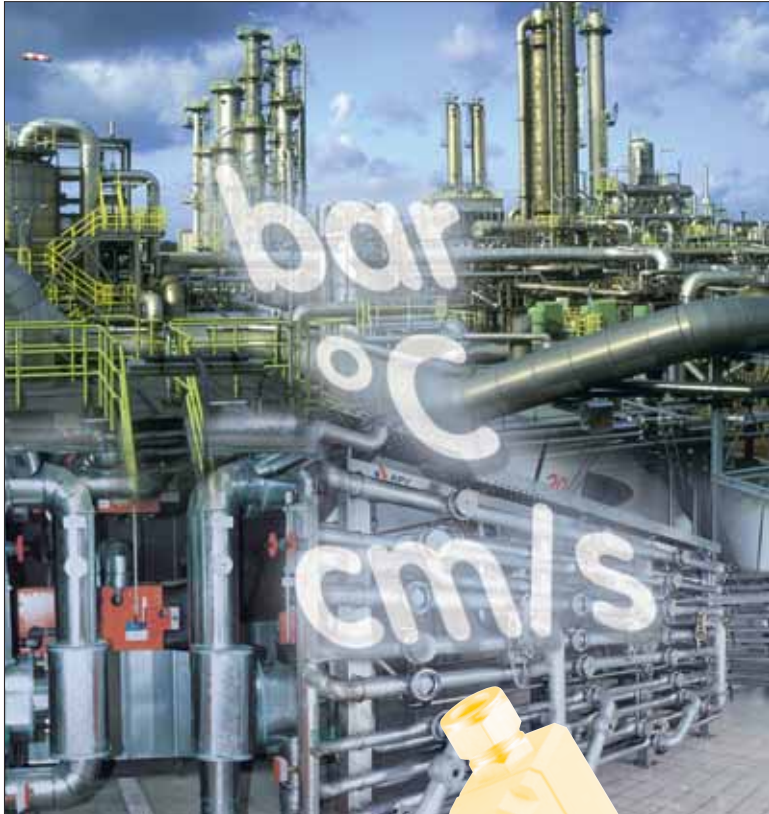
Pressure sensor

Special versions for oxygen applications are available on request !



# INFORMATION

More information about our flow sensor product range is provided in the catalog .

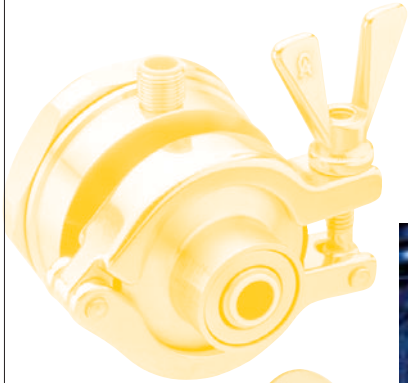


**TURCK**

Industrielle  
Automation

SENSOREN FÜR  
STRÖMUNG  
DRUCK  
FÜLLSTAND  
TEMPERATUR

SENSORS FOR  
FLOW  
PRESSURE  
FILLING LEVEL  
TEMPERATURE



S 1479/03



**TURCK**

Industrial  
Automation

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