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TURCK

PS+ Programmable Pressure Sensors



A Global Leader in Industrial Automation

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PS+ Programmable Pressure Sensor

The PS+ series pressure sensor is a fully programmable pressure sensor that offers a local display as well as electrical outputs to provide critical feedback to a control system.

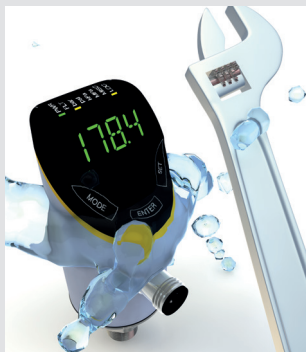
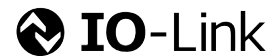
Features

- Stainless steel measuring cell for pressure ranges >10 bar
- Up to 600 bar relative pressure
- Accuracy up to 0.25%
- IO-Link 1.1
- Automatic output detection
- Up to seven-fold overpressure resistance
- High protection class (IP6K6K, IP6K7, IP6K9K)
- Rotatable sensor body



Award-winning industrial design

The sensors of the PS+ series won the iF DESIGN AWARD in the Industry/Tools category. The prize has been awarded every year since 1954 for outstanding achievements in product design. The innovative cross-platform operating concept particularly impressed the jury.



Maximum robustness

The IP protection classes 6K6K, 6K7 and 6K9K, excellent resistance to shock and vibration, as well as a high pressure resistance ensure increased system availability. The design without mechanical pushbuttons also minimizes the number of sealing surfaces required.



Variable data mapping

IO-Link process data profiles enable the flexible connection of the sensor with a large degree of freedom. This allows convenient adaption to existing systems with a 1:1 replacement of existing devices – even from third party manufacturers. This eliminates the need for complex adaptations to the controller environment.

PS+ Programmable Pressure Sensor

Switch point LEDs

Two LEDs visible from all sides indicate the state of the two switching outputs

Process value display

The 4-digit 12-segment display can show process values clearly in red or green

Inscription

The laser inscription of the translucent front cap and the stainless steel housing is abrasion resistant and offers a high contrast

Adjustability

The sensor head is freely rotatable by 340° and the display can be inverted 180°, thus simplifying the positioning of the electrical connection and user interface after mounting



Sloped display

The 45° angle of the user interface offers greater visibility from a wider range of viewing angles

Status LEDs

Additional LEDs indicate the status of the power supply, errors, the locking state as well as IO-Link communication

Translucent front cap

The front cap consists of a high quality UV resistant plastic that is also scratch-proof, temperature, and impact resistant.

MODE, ENTER and SET

Capacitive touchpads with a large surface area ensure straightforward menu navigation, even with gloves



Capacitive touchpads

The sensor is operated using capacitive touchpads. These do not require any moving parts and are therefore abrasion and wear-free. An additional seal, as required with conventional mechanical operating elements, is unnecessary, thereby eliminating a potential moisture ingress point.



NPN/PNP auto output

The sensor output is automatically set according to the connected electrical input. A massive reduction in variants and an intelligent concept saves time and costs because of the reduced effort required for configuration and error prevention.

Conventional applications

The PS+ programmable pressure sensors enable the reliable and repeatable measurement of process pressures in industrial applications. The wide range of different pressure ranges and process connections result in a large number of variants, ensuring an ideal sensor for every application. Pressure sensors are very frequently used in the following application fields:

- Hydraulic applications
- Cooling circuits
- Lubricant applications

Higher system availability

The stainless steel housing in conjunction with the single-piece cover is an extremely robust design. The absence of mechanical operating elements ensures a high wear resistance. The reduced number of sealing surfaces offers maximum protection from humidity and dust penetrating inside the device – even outdoors thanks to the materials resistant to UV radiation and salt spray. The new sealing concepts enable protection classes IP6K7K, IP6K7 and IP6K9K. The PS+ series also offers exceptional resistance to vibration and shock. The measuring cells of the PS310 series have a burst pressure of at least four

times the maximum nominal pressure, while the PS510 series features up to 7 times maximum nominal pressure. The minimum/maximum pressure memory forms a digital “drag pointer”, making an even better analysis of processes possible.

Simple operation

The pressure switch points can be set in a few steps in the usual way, either according to the Turck or VDMA standard. The 12-segment display offers users optimal support in navigating the menus. The display can show process values in red or green giving operators a quick and easy way of determining whether the pressure is within the normal operating range. In addition, the color can be programmed to conditionally change based on output status.

Advanced functions

The advanced functions enable the sensor to be reset to its previous settings (Undo function) as well as to the factory settings. The switching behavior of the outputs can be set to “Normally Open” (NO) and “Normally Closed” (NC). Additional filter functions enable the optimum adaptation of the sensor for complex applications.

Simple mounting and commissioning

The PS+ programmable pressure sensor offers a variety of useful features to make mounting, connection and commissioning of the sensors as simple and straightforward as possible.

- The large selection of different process connections ensures a simple connection to the process environment.
- The freely rotatable sensor housing allows the display and plug connector to be aligned after mounting.
- The automatic detection of output signals simplifies the connection to the controller environment.
- The option of either Turck standard or VDMA menu guidance ensures intuitive operation of the sensor.
- The different IO-Link process data profiles enable the sensor to be adapted to existing systems and thus reduce the programming effort required.



Multicolor display

The display can be programmed as red or green. This makes it possible to optimally adapt the device to the particular lighting conditions of the application. Several setting options also allow the display color to be linked to the status of the sensor switching outputs.



Automatic signal detection

Devices with an analog output automatically detect whether the connected interface expects a current or voltage signal. This automatic setting of the analog output reduces configuration time and helps to prevent errors.

PS+ Programmable Pressure Sensors



Performance Data

| | |
|------------------------------------|---|
| Programmable Output Type 2UPN8 | 2X PNP/NPN N.O./N.C |
| Programmable Output Type LI2UPN8 | **4 -20 mA, 0 - 20 mA, 0 - 10 V, 1 - 6 V, 0 - 5 V and 1X PNP/NPN N.O./N.C or 2X PNP/NPN N.O./N.C. |
| Analog Accuracy (including LHR) | (1) +/- 0.5% Full Scale, (2) ± 0.25% full scale |
| Set Point Accuracy | (1) +/- 0.5% Full Scale, (2) ± 0.25% full scale |
| Set Point Range | (min + 0.005 x range) up to 100% of full scale |
| Reset Point Range | Min up to (SP - 0.005 x Range) |
| Set Point Hysteresis | ≥ 0.5% |
| Temperature Coefficient Zero Point | (1) +/-0.15% of full scale/10K (2) +/-0.1% of full scale/10K |
| Temperature Coefficient Span | (1) +/-0.15% of full scale/10K (2) +/-0.1% of full scale/10K |

Electrical Data

| | |
|---|-------------|
| Operating Voltage | 18 - 33 VDC |
| Switching Current | ≤ 250 mA |
| Voltage Drop | ≤ 2 V |
| Switching Frequency | ≤ 300 Hz |
| Response Time | ≤ 500 ms |
| Short Circuit/Reverse Polarity Protection | Yes/Yes |
| IO-Link | Version 1.1 |

Environmental Data

| | |
|---------------------|--|
| Ambient Temperature | -40 to 80 °C |
| Storage Temperature | -40 to 100 °C |
| Medium Temperature | -30 to 80 °C |
| Housing Materials | 316L Stainless Steel/Polyarylamide 50%GF UL 94-V-0 |
| Wetted Materials | (1) 316L Stainless Steel/AL2O3/FKM (2) 316L / 17-4 Stainless Steel |
| Protection Type | ***IP6K6K/6K7/6K9K |
| LED Measuring Value | 4 digit, 12 segment, rotatable, red or green |

(1) PS310

(2) PS510

** Inverse analog outputs are programmable: example, 4-20mA or 20-4mA

*** Per ISO 20653 for electrical equipment mounted on road vehicles which offers more stringent wash-down requirements than the typical IEC 60529; IP66, IP67, and IP69K

Part Number Key

PS 510 - 10V - 01 - LI2UPN8 - H1141 /X

Pressure Sensor

310 = Programmable Sensor with Ceramic Measuring Cell

510 = Programmable Sensor with Stainless Steel Measuring Cell

Pressure Range and Scale

PS310

0V = -1 to 0 Bar

1V = -1 to 1 Bar

1 = 0 to 1 Bar

2.5V = -1 to 2.5 Bar

1A = 0 to 1 Bar Absolute

1.6A = 0 to 1.6 Bar Absolute

2.5A = 0 to 2.5 Bar Absolute

PS510

10V = -1 to 10 Bar

16V = -1 to 16 Bar

25V = -1 to 25 Bar

40V = -1 to 40 Bar

100 = 0 to 100 Bar

250 = 0 to 250 Bar

400 = 0 to 400 Bar

600 = 0 to 600 Bar

10A = 0 to 10 Bar Absolute

Option Codes

X = Orifice Snubber

Electrical Connection

H1141 = M12

Electrical Output

2UPN8 = Dual Switch Point

LI2UPN8 = Analog Voltage/Current+Switch Point or Dual Switch Point

Process Connection

01 = Female G 1/4

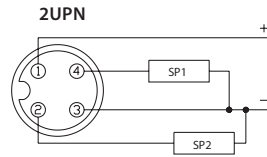
02 = Female NPT 1/4

03 = Male NPT 1/4

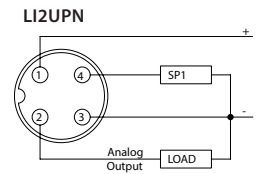
04 = Male G 1/4

05 = Male 7/16-20 UNF (SAE-ORB)

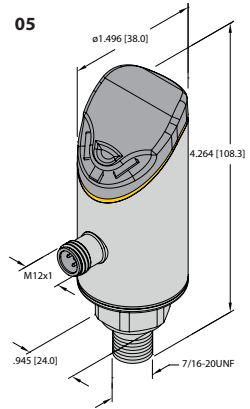
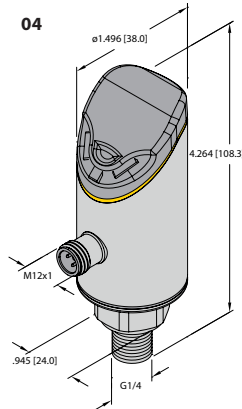
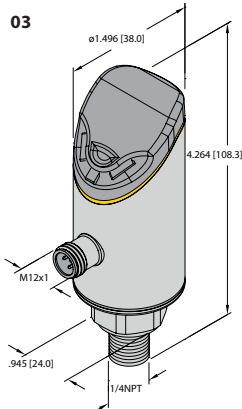
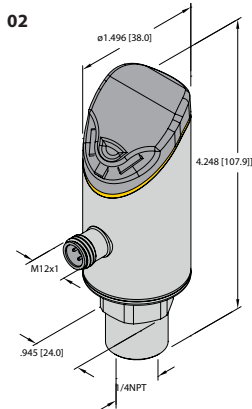
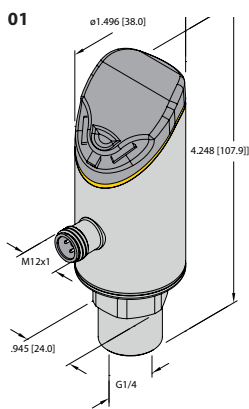
Consult factory for additional pressure ranges and process connections; note that above pressure ranges can be programmed and displayed in PSI, Kpa, Mpa, and additional user defined scales.



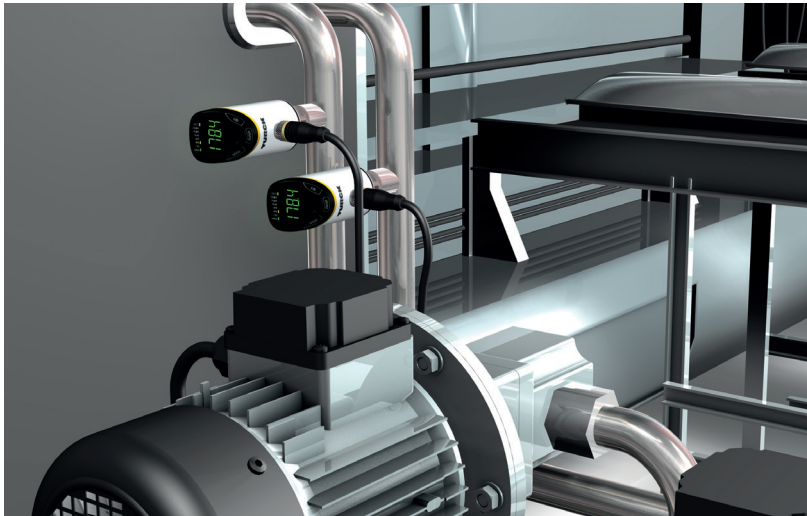
Mating Cordset: EKRT-A4.400-GC2K-*



Mating Cordset: EKRT-A4.400-DC2K-*

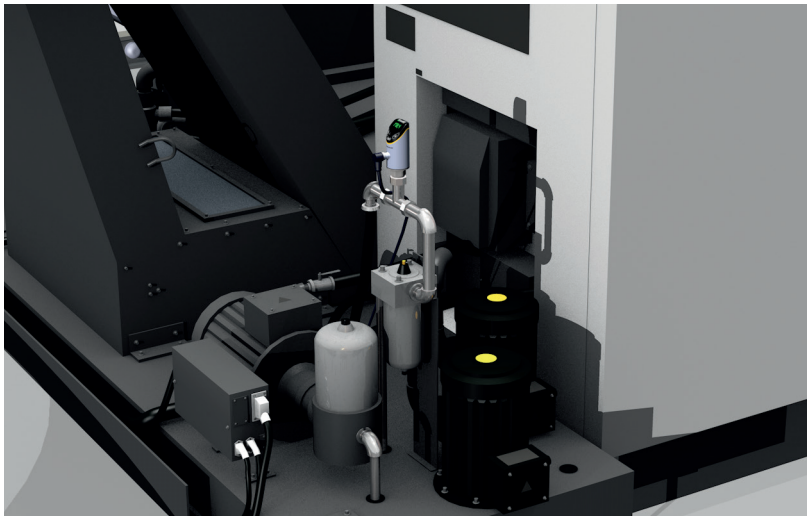


Typical Applications



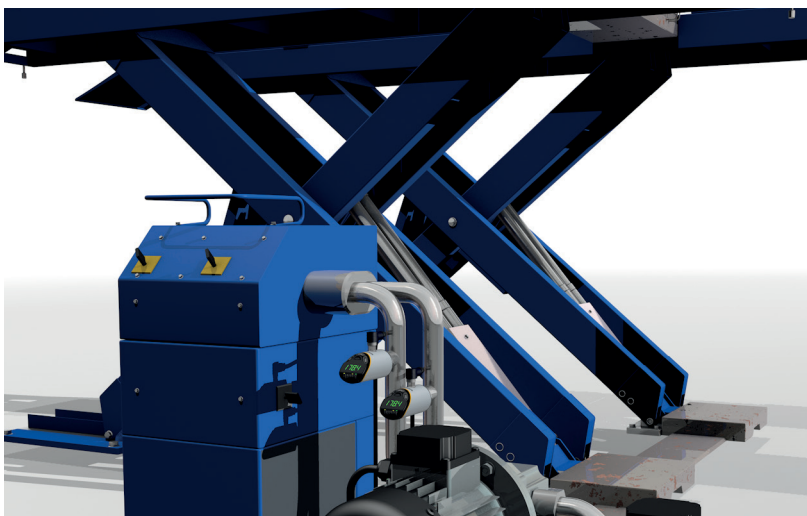
Controlling hydraulic pressure

Pressure sensors monitor the hydraulic pressure in presses. If an overpressure occurs due to a forming defect, this is detected immediately and reported to the controller. The PS+ series of intuitively operable sensors not only features high overpressure resistance but can also withstand the vibrations in machine tools applications.



Monitoring the supply of cooling lubricant

To ensure minimum wear on machine tool equipment, the cooling lubricant supply pressure must be properly monitored. One of the challenges in this application is the heavy shock and vibrations potential that can impact the reliability of the pressure sensor. Turck has taken these kinds of stresses into account in the development of the PS+ series and offers the pressure sensors of the PS510 series with a fully welded metal measuring cell as well as an optional pressure peak aperture. The multi-color display provides optimum indication of any deviations from the set pressure value.



Measuring process pressure on scissor lifts

Hydraulic scissor lifts for lifting and positioning heavy workpieces place demanding requirements on the pressure sensors of the hydraulic cylinders: Pressures of up to 400 bar can occur at the beginning of the lift. Turck's robust pressure sensors of the PS+ series come with a metal measuring cell (PS510), offering an overpressure resistance of up to seven times the working pressure. The sensors also offer protection from accidental operating errors. This is implemented with the locking mechanism and password function.

TURCK



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