

# Precont® PU4SM

Universal pressure transmitter / pressure switch  
for general industrial applications

Technical information TI06.25



## Application

- Machinery and plant engineering
- Air-conditioning and refrigeration plant engineering
- Hydraulic and pneumatic systems
- Process industry
- Environmental technology
- Facility and building automation

## Main features

- Measuring ranges from 400 mbar up to 1000 bar
- Wide variety of process connections
- Metallic front-flush or internal diaphragm
- Process temperature range -40°C to +125°C
- Fully welded robust steel enclosure
- High protection class IP69K/IP67
- Highest accuracy to  $\leq 0,15\%$
- Electronic 4...20mA FSK / RS485 Modbus®-RTU / IO-Link® / 0...10V
- Certification ATEX / IECEx: Ex ia IIC Ga / Ex ia IIIC Da
- Electrical connection M12 plug or angled plug



## Description

The device is an electronic pressure sensor for monitoring, control and continuous measurement of pressures in gases, vapors, liquids and dusts.

A high variety of versions of process connections and electronic types allows the use for a wide range of applications, also for demanding measuring requirements.

Due to its high accuracy and the digital adjustability by FSK, RS485 Modbus®-RTU or IO-Link® the device can be suited to a wide variety of applications.

The front-flush process connection enables the cleanability of the wetted diaphragm to be integrated into the process, also by CIP/SIP cleaning processes. Low-maintenance and trouble-free pressure measurement is thus also guaranteed in critical applications with viscous or also frequently changing media.

The robust design ensures reliable precise measuring values and allows the operation also at demanding environmental conditions, e.g. low temperatures, high shock and vibration loads or at problematic media.



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## Technical Data

| Measuring range                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| Nom. pressure PN rel.                                  | [bar]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0..0,4 | 0..1   | 0..4   | 0..6   | 0..10  | 0...16 | 0..20  | 0..40 | 0..60 |
|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0..100 | 0..160 | 0..250 | 0..320 | 0..400 | 0..600 | 0..100 | -1..0 | -1..1 |
| Output type A – Current 4...20mA FSK                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Analogue output 4...20mA                               | 3,9...20,5mA, Measuring range [08] = 4...20mA, error ≤ 3,9mA / ≥ 20,5mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |        |        |        |        |        |        |       |       |
| Time behavior                                          | ≤ 5ms (td = 0s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Interface                                              | FSK / 1200 Bit/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |        |        |        |        |        |        |       |       |
| Output type V – RS485 Modbus®-RTU                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Interface                                              | RS485, bidirektional / Modbus-RTU / 4,8...38,4 kBaud                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |        |        |        |        |        |        |       |       |
| Input resistance                                       | 112kΩ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |        |        |        |        |        |        |       |       |
| Time behavior                                          | ≤ 2ms (td = 0s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Output type L – IO-Link®                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Interface                                              | IO-Link V1.1 / Port Class A / Com2 (38,4 kBaud), Com3 (230,4 kBaud)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |        |        |        |        |        |        |       |       |
| Analogue output                                        | 3,8...20,5mA, measuring range [08] = 4...20mA, error ≤ 3,6mA / ≥ 21mA<br>0...20,5mA, measuring range [08] = 0...20mA, error ≤ 0,05mA / ≥ 21mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |        |        |        |        |        |        |       |       |
| Time behavior                                          | ≤ 2ms (td = 0s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Switch output                                          | 2x PP (Push-Pull), switch to +L/-L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |        |        |        |        |        |        |       |       |
| Output type B - 0...10V                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Signal range                                           | 0...10,25V, Measuring range [08] = 0...10V, error 0V / ≥ 10,25V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Time behaviour t90-min                                 | ≤ 5ms (td = 0s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Auxiliary power                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Supply voltage Us /Input current Is / Ready delay time | Type A – 4...20mA FSK: 9...35VDC reverse polarity protected / Ripple voltage ≤ 2Vpp / ≤ 20,5mA / ≤ 0,1s (td = 0s)<br>Type A – 4...20mA FSK Ex: 9...30VDC / ≤ 2Vpp / ≤ 22mA<br>Type B - 0...10V: 14...35VDC reverse polarity protected / Ripple voltage ≤ 2Vpp / ≤ 25mA (Iuo = 0mA) / ≤ 0,1s (td = 0s)<br>Type V – RS485 Modbus®-RTU: 6...35VDC reverse polarity protected / Ripple voltage ≤ 2Vpp / ≤ 10mA (Co = 0mA) / ≤ 0,1s (td = 0s)<br>Type L – IO-Link® inactive: 9...35VDC reverse polarity protected / Ripple voltage ≤ 2Vpp / ≤ 20mA (Co / So / Io = 0mA) / ≤ 0,1s (td = 0s)<br>Type L – IO-Link® active: 18...30VDC reverse polarity protected / Ripple voltage ≤ 2Vpp / ≤ 20mA (Co / So / Io = 0mA) / ≤ 0,1s (td = 0s) |        |        |        |        |        |        |        |       |       |
| Measuring accuracy                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Characteristic deviation                               | ≤ ±0,05%FSI / ±0,1%FSI / ±0,2%FSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |        |        |        |        |        |        |       |       |
| Long term drift zero                                   | ≤ ±0,15%FSI/year                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |        |        |        |        |        |        |       |       |
| Influence temperature                                  | Tk ≤ ±0,05%FSI/K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |        |        |        |        |        |        |       |       |
| Process conditions                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Process temperature                                    | Standard: -40...+100°C (-40°F...+212°F)<br>Extended: -40...+135°C (-40°F...+275°F) / +140°C (+284°F) – 1h<br>NBR: -25...+140°C (-4°F...+284°F)<br>FKM/FPM: -20...+100°C (-13°F...+212°F)<br>EPDM: -40...+140°C (-40°F...+284°F)<br>ATEX/IECEX: according to ATEX/IECEX certificate                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |        |        |        |        |        |        |       |       |
| Pressure cycles                                        | ≥ 100 Mio. (1,2xPN)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |        |        |        |        |        |        |       |       |
| Environmental conditions                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |        |        |        |        |        |        |       |       |
| Environmental temperature                              | -40°C...+100°C / ATEX/IECEX: see certificate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |        |        |        |        |        |        |       |       |
| Protection level                                       | IP69K/IP67 (EN/IEC 60529)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |        |        |        |        |        |        |       |       |

## Electrical connection

| Electronic output type A<br>Current 4...20mA FSK<br>Connection plug M12 – FSK<br>interface<br>Device within Ex-free area | Electronic output type V<br>RS485 Modbus®-RTU | Electronic output type L<br>IO-Link® | Electronic output type B<br>Voltage 0...10V |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------|---------------------------------------------|
|                                                                                                                          |                                               |                                      |                                             |

# Dimensions (mm)

| Plug M12 [14-S]                                                                                                                                      | Plug EN 175-301-803-C [14-C]                                                                                                                                   | Plug EN 175-301-803-A [14-A]                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Technical drawing of Plug M12 [14-S] showing dimensions: M12x1, 10, 26, 27, 16,5x11,6x1,5 ISO 1179-2 E, 3,5, 5, 9,5, G 1/4" A, 13, 35, 57, 2.</p> | <p>Technical drawing of Plug EN 175-301-803-C [14-C] showing dimensions: 28, 50, 26, 27, 16,5x11,6x1,5 ISO 1179-2 E, 3,5, 5, 9,5, G 1/4" A, 13, 35, 57, 2.</p> | <p>Technical drawing of Plug EN 175-301-803-A [14-A] showing dimensions: 36, 49, 26, 27, 16,5x11,6x1,5 ISO 1179-2 E, 3,5, 5, 9,5, G 1/4" A, 13, 35, 57, 2.</p> |

| Thread ISO 228-1 – G1/4", EN 837 [04-6]                                                                                                              | Thread ISO 228-1 – G1/2", EN 837 [04-1]                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process pressure P <sub>max</sub> = 1000 bar<br>Torque M <sub>max</sub> = 50Nm                                                                       | Process pressure P <sub>max</sub> = 1000 bar<br>Torque M <sub>max</sub> = 50Nm                                                                                                 |
| <p>Technical drawing of Plug M12 [14-S] showing dimensions: M12x1, 10, 26, 27, 16,5x11,6x1,5 ISO 1179-2 E, 3,5, 5, 9,5, G 1/4" A, 13, 35, 57, 2.</p> | <p>Technical drawing of Plug M12 [14-S] showing dimensions: M12x1, 10, 26, 27, 23,9x18,5x1,5 ISO 1179-2 E PN &lt; 40 bar, 17, 20, 3, 3,5, 5, 9,5, G 1/2" A, 13, 35, 57, 2.</p> |

Further terminal assignment and dimensional drawings can be found in the operating instructions or in the technical information.

# Order code

Type  
PU4S Standard

|     |                                                                                                                                      |
|-----|--------------------------------------------------------------------------------------------------------------------------------------|
| M   | <b>Measuring system – material diaphragm (process wetted) / sensor type</b><br>CrNi-steel / strain gauge                             |
| S   | <b>Approval</b><br>Standard                                                                                                          |
| X   | ATEX II 1 G / IECEx Ex ia IIC Ga resp. ATEX II 1 D / IECEx Ex ia IIIC Da (only Output type – A and Electrical connection – S)        |
| 6   | <b>Process connection</b><br>Thread ISO 228-1 – G¼"B, EN 837 manometer (without process gasket)                                      |
| 1   | Thread ISO 228-1 – G½"B, EN 837 manometer (≥ 40 bar without process gasket)                                                          |
| 0   | Thread ISO 228-1 – G½"B, front-flush, O-ring gasket<br>not for measuring ranges 0...400 mbar / 0...1 bar / -1...0 bar / 0...1000 bar |
| 5   | Thread ISO 228-1 – G1"B, front-flush, O-ring gasket<br>for measuring ranges 0...400 mbar / 0...1 bar / -1...0 bar                    |
| Y   | others                                                                                                                               |
| 0   | <b>Material process gaskets (process wetted)</b><br>without / NBR – nitrile-butadiene-rubber                                         |
| 1   | FPM – fluorelastomere (e.g. Viton®)                                                                                                  |
| 3   | EPDM – ethylene-propylene-dienmonomere, FDA-listed                                                                                   |
| Y   | others                                                                                                                               |
| V   | <b>Material process connection (process wetted)</b><br>CrNi-steel                                                                    |
| C   | <b>Material terminal enclosure</b><br>CrNi-steel                                                                                     |
| 03  | <b>Measuring range</b><br>0...400 mbar                                                                                               |
| 05  | 0...1 bar                                                                                                                            |
| 08  | 0...4 bar                                                                                                                            |
| 09  | 0...6 bar                                                                                                                            |
| 10  | 0...10 bar                                                                                                                           |
| 11  | 0...16 bar                                                                                                                           |
| 12  | 0...25 bar                                                                                                                           |
| 13  | 0...40 bar                                                                                                                           |
| 14  | 0...60 bar                                                                                                                           |
| 19  | 0...100 bar                                                                                                                          |
| 20  | 0...160 bar                                                                                                                          |
| 21  | 0...250 bar                                                                                                                          |
| 22  | 0...320 bar                                                                                                                          |
| 23  | 0...400 bar                                                                                                                          |
| 24  | 0...600 bar                                                                                                                          |
| 25  | 0...1000 bar, only for process connection type 1, 6 – G½"B, G¼"B (EN 837)                                                            |
| 16  | -1...0 bar                                                                                                                           |
| 17  | -1...+1 bar                                                                                                                          |
| YY  | Special measuring range                                                                                                              |
| A   | <b>Electronic – output</b><br>Current 4...20mA, FSK, 2-wire                                                                          |
| B   | Voltage 0-10V, 3-wire (only with Electrical connection – C or A)                                                                     |
| V   | RS485 Modbus®-RTU, 4-wire (only with Electrical connection – S)                                                                      |
| L   | IO-Link®, 1x current 0/4...20mA / 2x switch, 4-wire (only with Electrical connection – S)                                            |
| S   | <b>Electronic – function</b><br>Standard                                                                                             |
| 0   | <b>Process temperature</b><br>Standard -40°C...+100°C                                                                                |
| 1   | Extended -40°C...+125°C, temperature decoupler                                                                                       |
| R   | <b>Pressure type</b><br>Gauge pressure                                                                                               |
| A   | Absolute pressure (≤ 25 bar)                                                                                                         |
| 4   | <b>Measuring system – accuracy</b><br>0,5%                                                                                           |
| 8   | Xcellence – 0,15%, linearization protocol                                                                                            |
| S   | <b>Electrical connection</b><br>Plug M12x1                                                                                           |
| C   | Plug EN 175-301-803-C (DIN 43650-C)                                                                                                  |
| A   | Plug EN 175-301-803-A (DIN 43650-A)                                                                                                  |
| -SF | <b>Additional options</b><br>LABS-free, silicone-free / paint compatible version                                                     |
| -ML | Measurement point designation / TAG – Laser marking                                                                                  |
| -WT | Factory certification – drink water suitability                                                                                      |
| -KF | Configuration / Preset                                                                                                               |
| -WK | Factory calibration – calibration certificate                                                                                        |

Precont® PU4S

M V C

S