

Precont® PU4SC

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 50 mbar up to 20 bar
- Wide variety of process connections
- Robust ceramic front-flush or internal diaphragm
- Precise dry capacitive sensor
- Process temperature range -40°C to +125°C
- Fully welded robust steel enclosure
- High protection class IP69K/IP67
- Highest accuracy to $\leq 0,05\%$
- 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 viscose or also frequently changing media.

The high precise, long term stable and robust capacitive ceramic measuring cell 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										
Process connection 1/3/4/5/6/8/9 – ISO 228-1, R – DIN 11851 DN25										
Nom. pressure PN rel.	[bar]	-0,1...0	-0,1,0,1	-1...0	-1...1	0...0,05	0...0,1	0...0,2	0...0,4	0...0,6
Process connection N/M – DIN 11851, P – Varivent®, L – DRD, S/T – Clamp ISO 2852										
Nom. pressure PN rel.	[bar]	-0,1...0	-0,1,0,1	-1...0	-1...1	0...0,05	0...0,1	0...0,2	0...0,4	0...0,6
Output type A – Current 4...20mA FSK										
Analogue output 4...20mA	3,9...20,5mA, Measuring range [08] = 4...20mA, error $\leq 3,9\text{mA} / \geq 20,5\text{mA}$									
Time behavior	$\leq 8\text{ms}$ (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	112k Ω									
Time behavior	$\leq 2\text{ms}$ (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 $\leq 3,6\text{mA} / \geq 21\text{mA}$ 0...20,5mA, measuring range [08] = 0...20mA, error $\leq 0,05\text{mA} / \geq 21\text{mA}$									
Time behavior	$\leq 2\text{ms}$ (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 / $\geq 10,25\text{V}$									
Time behaviour t90-min	$\leq 8\text{ms}$ (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 $\leq 2\text{Vpp} / \leq 20,5\text{mA} / \leq 0,1\text{s}$ (td = 0s) Type A – 4...20mA FSK Ex: 9...30VDC / $\leq 2\text{Vpp} / \leq 22\text{mA}$ Type B – 0...10V: 14...35VDC reverse polarity protected / Ripple voltage $\leq 2\text{Vpp} / \leq 25\text{mA}$ (Iuo = 0mA) / $\leq 0,1\text{s}$ (td = 0s) Type V – RS485 Modbus®-RTU: 6...35VDC reverse polarity protected / Ripple voltage $\leq 2\text{Vpp} / \leq 10\text{mA}$ (Co = 0mA) / $\leq 0,1\text{s}$ (td = 0s) Type L – IO-Link® inactive: 9...35VDC reverse polarity protected / Ripple voltage $\leq 2\text{Vpp} / \leq 20\text{mA}$ (Co / So / Io = 0mA) / $\leq 0,1\text{s}$ (td = 0s) Type L – IO-Link® active: 18...30VDC reverse polarity protected / Ripple voltage $\leq 2\text{Vpp} / \leq 20\text{mA}$ (Co / So / Io = 0mA) / $\leq 0,1\text{s}$ (td = 0s)									
Measuring accuracy										
Characteristic deviation	$\leq \pm 0,05\%\text{FSI} / \pm 0,1\%\text{FSI} / \pm 0,2\%\text{FSI}$									
Long term drift zero	$\leq \pm 0,15\%\text{FSI}/\text{year}$									
Temperature deviation	Tk zero $\leq \pm 0,015\%\text{FSI}/\text{K}$, $\leq \pm 0,75\%\text{FSI}$ (-20°C...+80°C) Tk span $\leq \pm 0,015\%\text{FSI}/\text{K}$ Tk span $\leq \pm 0,5\%\text{FSI}$ (-20°C...+80°C/ $\geq 0,4\text{bar}$) / $\pm 0,8\%\text{FSI}$ (-20°C...+80°C/ $< 0,4\text{bar}$)									
Process conditions										
Process temperature	Standard: -40°C...+100°C Extended: -40°C...+125°C (+140°C – 1h) Gasket FPM: max. -25°C...+140°C Gasket EPDM: max. -40°C...+140°C Gasket FFKM: max. -15°C...+140°C ATEX/IECEX: see 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)									
MTTF	4...20mA: 745 years / 0-10V: 610 years / RS485 Modbus®-RTU: 561 years / IO-Link®: 601 years									

Electrical connection

Electronic output type A Current 4...20mA FSK Connection plug M12 – FSK interface Device within Ex-free area	Electronic output type V RS485 Modbus®-RTU	Electronic output type L IO-Link®	Electronic output type B 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 top thread, 10mm top height, 26mm diameter, 27mm hexagonal body, 13mm bottom height, 16,5x11,6x1,5 ISO 1179-2 E connector, and G 1/4" A thread. Internal diameters are 3,5, 5, and 9,5 mm.</p>	<p>Technical drawing of Plug EN 175-301-803-C [14-C] showing dimensions: 28mm top diameter, 50mm total height, 26mm diameter, 27mm hexagonal body, 13mm bottom height, 16,5x11,6x1,5 ISO 1179-2 E connector, and G 1/4" A thread. Internal diameters are 3,5, 5, and 9,5 mm.</p>	<p>Technical drawing of Plug EN 175-301-803-A [14-A] showing dimensions: 36mm top diameter, 49mm total height, 26mm diameter, 27mm hexagonal body, 13mm bottom height, 16,5x11,6x1,5 ISO 1179-2 E connector, and G 1/4" A thread. Internal diameters are 3,5, 5, and 9,5 mm.</p>

Thread ISO 228-1 - G1/2' [04-9]	Thread ISO 228-1 - G3/4', ISO 1179-2 E [04-8]
Process pressure P _{max} = 20 bar Torque M _{max} = 20 Nm	Process pressure P _{max} = 100 bar Torque M _{max} = 50Nm
<p>Technical drawing of Plug G1/2' [04-9] showing dimensions: M12x1 top thread, 10mm top height, 26mm diameter, 27mm hexagonal body, 14mm bottom height, 21x2 connector, and G 1/2" A thread.</p>	<p>Technical drawing of Plug G3/4' [04-8] showing dimensions: M12x1 top thread, 10mm top height, 26mm diameter, 32mm hexagonal body, 16mm bottom height, 29,2x23,9x1,5 ISO 1179-2 E connector, and G 3/4" A thread.</p>

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

Order code

Type
PU4S Standard

C **Measuring system – material diaphragm (process wetted) / sensor type**
Ceramic Al2O3 96%/99,7%/99,9% / capacitive

S **Approval**
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)

Process connection

- 3 Thread ISO 228-1 – G¼"A, ISO 1179-2 E
- 6 Thread ISO 228-1 – G¼"A, EN 837 (Manometer)
- 4 Thread ISO 228-1 – G¼"I, internal thread
- 9 Thread ISO 228-1 – G½"A, front-flush
- 1 Thread ISO 228-1 – G½"A, EN 837 (Manometer)
- 2 Thread ISO 228-1 – G½"A, ISO 1179-2 E, internal drill
- 8 Thread ISO 228-1 – G¾"A, ISO 1179-2 E, front-flush
- 5 Thread ISO 228-1 – G1"A, ISO 1179-2 E, front-flush
- 7 Thread ISO 228-1 – G1½"B, front-flush
- E Thread ANSI – NPT ¼"
- C Thread ANSI – NPT ½"
- R Diary coupling DIN 11851 – DN25
- N Diary coupling DIN 11851 – DN40
- M Diary coupling DIN 11851 – DN50
- P Varivent N – DN40...162 (1½"...6"), Ø 68mm
- L DRD – DN50, Ø 65mm
- U Clamp DIN 32676-A – DN20
- S Clamp DIN 32676-A/-C – DN25...40/1"...1½", ISO 2852 – DN25...38
- T Clamp DIN 32676-A/-C – DN50/2", ISO 2852 – DN40...51
- Y others

Material process gaskets (process wetted)

- 1 FPM – fluorelastomere (e.g. Viton®)
- 3 EPDM – ethylene-propylene-dienmonomere, FDA-listed
- 4 FFKM – perfluorelastomere (e.g. Kalrez®)
- 6 FFKM hd – perfluorelastomere high density - gas applications
- Y others

V **Material process connection (process wetted)**

CrNi-steel

C **Material terminal enclosure**

CrNi-steel

Measuring range

- 26 0...50 mbar
- 01 0...100 mbar
- 02 0...200 mbar
- 03 0...400 mbar
- 04 0...600 mbar
- 05 0...1 bar
- 06 0...1,6 bar
- 07 0...2,5 bar
- 08 0...4 bar
- 09 0...6 bar
- 10 0...10 bar
- 11 0...16 bar
- 12 0...20 bar
- 13 0...40 bar
- 14 0...60 bar
- 19 0...100 bar
- 15 -100...0 mbar
- 16 -1...0 bar
- 17 -1...+1 bar
- 18 -100...+100 mbar
- YY Special measuring range

Electronic – output

- A 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 **Electronic – function**

Standard

Process temperature

- 0 Standard -40°C...+100°C
- 1 Extended -40°C...+125°C, temperature decoupler

Pressure type

- R Gauge pressure
- A Absolute pressure (FS ≥ 100mbar)

Measuring system – accuracy

- 1 0,2%
- 3 0,1% (FS ≥ 100mbar), linearization protocol
- 6 Xcellence – 0,05% (FS ≥ 200mbar), linearization protocol

Electrical connection

- S Plug M12x1
- C Plug EN 175-301-803-C (DIN 43650-C)
- A Plug EN 175-301-803-A (DIN 43650-A)

Additional options

- SF LABS-free, silicone-free / paint compatible version
- ML Measurement point designation / TAG – Laser marking
- MZ Material test certificate – EN10204 3.1
- WT Factory certification – drink water suitability
- KF Configuration / Preset

Precont® PU4S

C

V

C

S