

# Technical Datasheet

## Precont KS

### Standard transmitter



- two-wire technology 4 ... 20 mA
- three-wire technology 0 ... 10 V
- measuring element with poly-silicon thin-film strain gauge, hence:
  - no moving mechanical parts
  - good long-term stability
  - high reproducibility
- pressure range finely-radiated according to DIN 16 128
- overload limit of 4 x measuring range (max.600 bar)
- version with damping device
- diaphragm and couplings of stainless steel
- stainless steel housing with IP 65 protection (cable outlet with IP 68 protection)

# Application

The transmitters of the KS series detect and convert the applied pressure ranges of 0... 1 bar to 0... 400 bar into a pressure-proportional standard signal of 4... 20mA or 0... 10V.

The pressure-sensitive element of the transmitter of the KS series is a silicon substrate with a vacuum-deposited thin-film strain gauge bridge of poly-silicon.

Due to the small dimensions of the sensor, good behaviour with pulsating pressure media and vibrations is ensured. The elasticity of silicon ensures very good reproducibility and hysteresis as well as an overload limit of 4x range (max. 800 bar). Because of their high natural frequency, silicon sensors are also suitable for measuring fast pressure changes.

The transmitter KS has a stainless steel process coupling with an internal separating diaphragm. The KS transmitter has a stainless steel diaphragm even at the front which enables installation almost free of dead area.

The process coupling by KS is threaded G1/2 A or M 20 x 1,5 or G1/4 A according to DIN 16 288 and has a key width of 27. There are two versions of the coupling available: with or without a built-in damping device. The damping is provided by a screw installed in the process coupling.

For the KS, the process coupling is threaded in G1/2A or M20 x 1.5 for an elastomer FPM-seal or metal seal according to DIN 3852. There are also two different versions: with or without a built-in damping device. The damping is provided by a choke installed in the filling side. Pressures  $\geq 40$  bar also have a protective plate in front of the separating diaphragm.

The damped version is recommended for applications involving incompressible media in which pressure peaks exceeding the maximum pressure range are likely. Such peaks can be caused for example by pumps, quick shut-off valves, magnetic valves or hydraulic actuators, etc.

The transmitter of the KS series are designed for rough environments and the very compact stainless steel housing has protection type IP65.

The electronics of the transmitters work on the two-wire or three-wire principle and form a single entity together with the pressure sensor. The specified measuring range (see ordering data) is factory set for an output signal of 4... 20 mA or 0... 10 V.

A DC-voltage supply is used for supplying energy.

Electrical connections are made via a connector according to DIN 43 650/C or with cable entry and terminals.

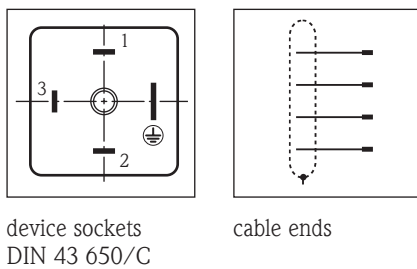
# Principle of operation

The process pressure is applied to the sensor where it acts on a semi-conductor strain gauge bridge. The resistance change of the bridge results in a pressure-proportional output signal from the bridge. The bridge draws its power supply from a constant voltage source.

The output signal of the bridge is connected to the output terminals via the amplifier and the output stage. Two different electronic versions are available: the two-wire 4... 20 mA and three-wire 0... 10 V. The output signals are factory-set with a tolerance for the initial value and end value (see technical data).

A diode provides protection against reversed polarity of the supply, whereas diode clips protect against smaller voltage peaks. The two-wire electrical system is supplied with 12... 30 V DC, the three-wire with 15... 30 V DC.

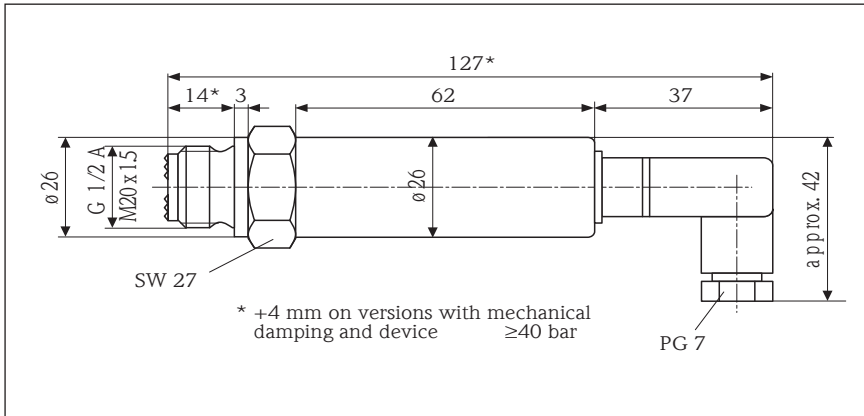
Fig. 1: Electrical connections



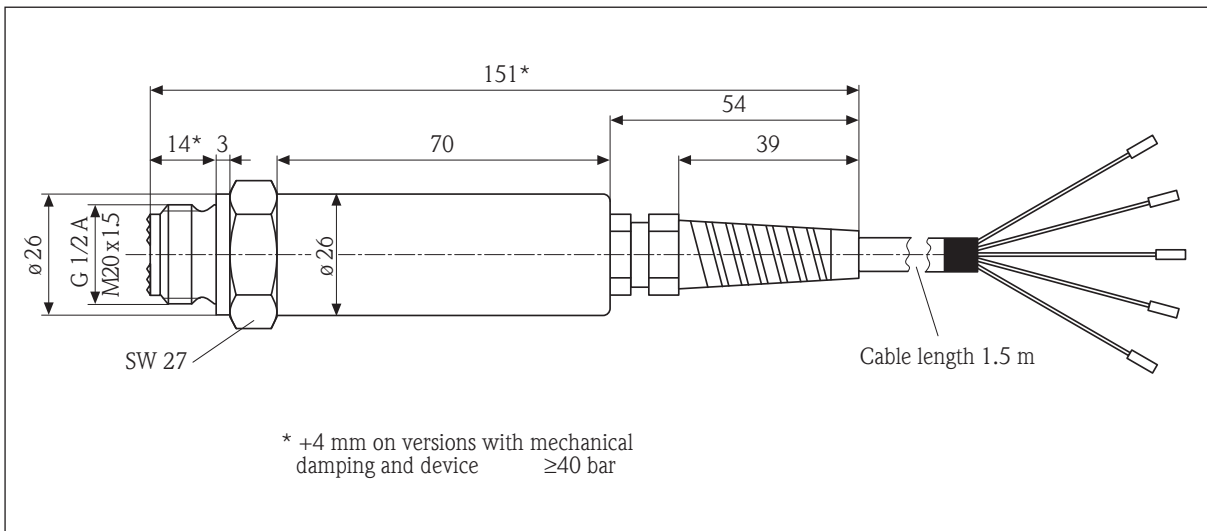
two-wire	1	output (+)	(red) output (+)
	2	output (-)	(black) unused
	⊕	measurement ground	(white) output (-)
three-wire			(blue) unused
			(green) measurement ground
	1	output (+)	(red) output (+)
	2	supply and output (-)	(black) supply (+)
	3	supply (+)	(white) supply and output (-)
	⊕	measurement ground	(blue) unused
			(green) measurement ground



Fig. 3: Dimensions KS (mm)



electrical connection with connector  
DIN 43 650/C



electrical connection with cable outlet

# Technical data

## Input

Measuring ranges  
 Gauge pressure  
 0... 1 bar to 0... 400 bar  
 Zero point  
 preset  
 Span  
 preset  
 Overload limit  
 4 x range, max. pressure 600 bar (static overload)  
 Overload effect  
 ≤0.1% of range  
 Process media  
 gases and liquids  
 Materials wetted by process  
 stainless steel  
 diaphragm: 1.4435 (X2 CrNiMo 1812)  
 coupling: 1.4301 (X5 CrNi 189)  
 Filling medium  
 silicone oil

## Output

Output signal  
 4... 20 mA (two-wire)  
 0... 10 V (three-wire)  
 (0 ≅ 20 mV)  
 Characteristic  
 linear  
 Conformity  
 (terminal based)  
 ≤0.5% of range  
 Tolerance  
 start/end value ≤0.2% of range  
 Load  
 two-wire 4... 20 mA  

$$R_B = \frac{U_s - 12 \text{ V}}{0.02 \text{ A}} \quad U_s = \text{supply voltage}$$
 three-wire 0... 10 V  
 >5 kΩ  
 Settling time  
 approx. 2 ms without mech. damping  
 approx. 5 ms with mech. damping

## Power supply

D.C.  
 12... 30 V DC (two-wire)  
 15... 30 V DC (three-wire)  
 Effect of supply voltage  
 ≤0.3% 12... 30 V DC (two-wire)  
 ≤0.3% 15... 30 V DC (three-wire)  
 Permissible ripple  
 $U_{ss} \leq 4 \text{ V}$   
 Power consumption  
 ≤6 mA three-wire (load 5 kΩ)

## Environmental conditions

Ambient temperature limits  
 -25 °C... +70 °C  
 Process temperature limits  
 -25 °C... +70 °C  
 Temperature effect on zero point  
 typically 0.2% / 10 K,  
 max. 0.5% / 10 K of range  
 with measuring ranges ≤6 bar, the values  
 are 0.1% / 10 K higher  
 Temperature effect on range  
 typically 0.2% / 10 K, max. 0.4% / 10 K  
 of range  
 Storage temperature  
 -40 °C... +80 °C  
 Climate category  
 class 4 Z (with Z = 70 °C) according to  
 VDI/VDE 3540 (corresponds with HSC  
 according to DIN 40 040)  
 Interference suppression  
 RF-interference  
 IEC 801-3 level 2; <1% effect at  
 10 V/m, 27... 500 MHz and  
 shielded cable  
 Interference on leads  
 IEC 801-4 level 3; 2 kV CM burst  
 IEC 801-5 level 2; 1 kV CM, 0.5 kV DM  
 Elektrostatic discharge  
 IEC 801-2 level 3; 6 kV housing  
 Shock and vibration  
 shock test Eb:  
 according to DIN IEC 68-2-29  
 vibration test Fc:  
 according to DIN IEC 68-2-6

## General

Materials  
 housing: stainless steel 1.4301  
 socket: polyamide  
 Mode of protection  
 Housing with DIN-plug  
 IP 65 according to DIN 40 050  
 Cable  
 IP 68 (1 m water depth) according  
 to DIN 40 050  
 Process connection  
 P-30: G 1/2 A; M 20 x 1.5 or G 1/4 A  
 according to DIN 16 288 form B  
 sealing ring B, DIN 16 258  
 P-31: G 1/2 A or M 20 x 1.5 metal seal:  
 according to DIN 3852, form A;  
 sealing ring A21 x 26 mm ø according to  
 DIN 7603 not included in  
 scope of supply  
 elastomer seal:  
 based on DIN 3852, part 11  
 elastomer seal made of FPM  
 (Viton) included in scope of supply  
 Electrical connection  
 device plug according to DIN 43 650/C  
 or cable end  
 Mounting position  
 not critical  
 Mounting method  
 threaded coupling G 1/2 A;  
 M 20 x 1.5 or G 1/4 A  
 Mounting torque error  
 P-30: <0.2% P-31: typical <0.3%  
 Weight:  
 P-30: approx. 0.22 kg  
 P-31: approx. 0.18 kg  
 Operating instruction  
 P-30: 5600 14 00  
 P-31: 5600 14 01  
 Accessories  
 1 operating instruction

# Precont KS

Analoger Drucktransmitter mit Metallmembrane von 0...400 bar  
Genauigkeit bis 0,15%; 2-Leiter 4...20mA oder 3-Leiter 0...10V Technologie



## Ausführung

KS Standard

### Prozessanschluss

- 0 G1/2" A nach DIN 16288
- 1 M20x1,5 A nach DIN 16288
- 2 G1/2" A mit Metalldichtung und frontbündiger Membrane (bei Ex 0) (ab 1 bar)
- 3 M20x1,5 A mit Metalldichtung und frontbündiger Membrane (ab 1 bar)
- 4 G 1/2" A mit FPM-Dichtung und frontbündiger Membrane (ab 1 bar)
- 5 M20x1,5 A mit FPM-Dichtung und frontbündiger Membrane (ab 1 bar)
- 6 G 1/4" A

### Transmitterelektronik

- A Ausgang 4...20mA - Zweidrahtelektronik
- B Ausgang 0...10V - Drei-Leitertechnik
- X Ausgang 4...20mA - Zweidrahtelektronik, Ex-Schutz  
II 2 G EEx ib IIC T6, ATEX
- Y Ausgang 4...20mA - Zweidrahtelektronik, Ex-Schutz  
Zone 0 mit Dämpfung (nur G1/2" A möglich, KS2); II 1/2 G EEx ib IIC T6, ATEX

### Anschlusswerkstoff

- V Edelstahl 1.4435

### Dämpfung

- 0 ohne Dämpfung
- D eingebaute Dämpfung ab 6 bar lieferbar

### Druckbereiche

- 02 250mbar (0,3% Gen.)
- 03 400mbar (0,3% Gen.)
- 05 0...1bar
- 06 0...1,6bar
- 07 0...2,5bar
- 08 0...4bar
- 09 0...6bar
- 10 0...10bar
- 11 0...16bar
- 12 0...25bar
- 13 0...40bar
- 14 0...60bar
- 15 0...100bar
- 16 0...160bar
- 17 0...250bar
- 18 0...320bar
- 19 0...400bar

0

0

### Druckvariante

- R Relativdruck
- A Absolutdruck

### Genauigkeit - Messsystem

- 0 0,5 % Genauigkeit (nicht bei 250mbar und 400mbar) und bei Ex-Version
- 1 0,3 % Genauigkeit
- 2 0,15% Genauigkeit

### Anschluss

- S Stecker nach DIN 43650
- T Stecker nach DIN 43650/A  
bei Druckschalter PNP-Version + Ex-Version
- K Kabel 1,5m IP68

Bestellschlüssel

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