

Pressure Measurement

Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

1

Overview



The SITRANS P200 pressure transmitter measures the gauge and absolute pressure of liquids, gases and vapors.

- Ceramic measuring cell
- Gauge and absolute measuring ranges 1 to 60 bar (15 to 1000 psi)
- For general applications

Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

Application

The SITRANS P200 pressure transmitter for gauge and absolute pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

Design

Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

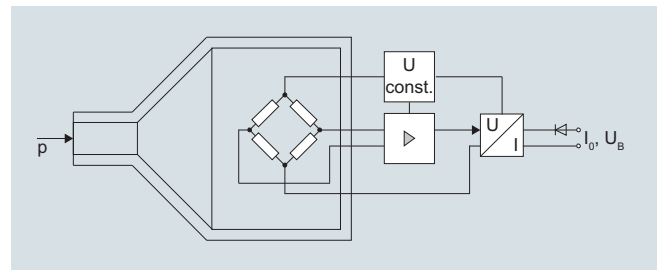
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a M12 device plug (IP67) connected electrically. The output signal is between 4 and 20 mA.

Function

The pressure transmitter measures the gauge and absolute pressure of liquids and gases as well as the level of liquids.

Mode of operation



SITRANS P200 pressure transmitters (7MF1565-...), functional diagram

The ceramic measuring cell has a thin-film resistance bridge to which the operating pressure p is transmitted through a ceramic diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

Pressure Measurement

Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

1

Technical specifications

Application	Liquids, gases and vapors
Gauge and absolute pressure measurement	
Mode of operation	
Measuring principle	Piezo-resistive measuring cell (ceramic diaphragm)
Measured variable	Gauge and absolute pressure
Inputs	
Measuring range	
• Gauge pressure	
- Metric	1 ... 60 bar (15 ... 870 psi)
- US measuring range	15 ... 1000 psi
• Absolute pressure	
- Metric	0.6 ... 16 bar a
- US measuring range	(10 ... 232 psi abs a) 10 ... 300 psi a
Output	
Current signal	4 ... 20 mA
• Load	($U_B - 10$ V)/0.02 A
• Auxiliary power U_B	DC 7 ... 33 V (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	≥ 10 k Ω
• Auxiliary power U_B	12 ... 33 V DC
• Power consumption	< 7 mA at 10 k Ω
Ratiometric output	0 ... 90 %
• Load	≥ 10 k Ω
• Auxiliary power U_B	5 V DC \pm 10 %
• Power consumption	< 7 mA at 10 k Ω
Characteristic curve	Linear rising
Measuring accuracy	
Error in measurement at limit setting incl. hysteresis and reproducibility	• Typical: 0.25 % of measuring span • Maximum: 0.5 % of measuring span
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25 % of measuring span/year
Influence of ambient temperature	
• Lower range value and measuring span	0.25 %/10 K of measuring span
• Influence of power supply	0.005 %/V
Conditions of use	
Process temperature with gasket made of:	
• FPM (Standard)	-15 ... +125 °C (+5 ... +257 °F)
• Neoprene	-35 ... +100 °C (-31 ... +212 °F)
• Perbunan	-20 ... +100 °C (-4 ... +212 °F)
• EPDM	-40 ... +125 °C (-40 ... +257 °F), usable for drinking water
Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
Degree of protection (to EN 60529)	• IP 65 with connector per EN 175301-803-A • IP 67 with M12 device plug • IP 67 with cable • IP 67 with cable quick screw connection

Electromagnetic compatibility	• acc. IEC 61326-1/-2/-3 • acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation ≤ 1 %
Design	
Weight	Approx. 0.090 kg (0.198 lb)
Process connections	See dimension drawings
Electrical connections	• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11 • M12 device plug • 2 or 3-wire (0.5 mm ²) cable ($\varnothing \pm 5.4$ mm) • Quickon cable quick screw connection
Wetted parts materials	
• Measuring cell	Al ₂ O ₃ - 96 %
• Process connection	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Gasket	• FPM (Standard) • Neoprene • Perbunan • EPDM
Non-wetted parts materials	
• Enclosure	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Rack	Plastic
• Cables	PVC
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Lloyd's Register of Shipping (LR) ¹⁾	12/20010
Germanischer Lloyd (GL) ¹⁾	GL19740 11 HH00
American Bureau of Shipping (ABS) ¹⁾	ABS_11_HG 789392_PDA
Bureau Veritas (BV) ¹⁾	BV 271007A0 BV
Det Norske Veritas (DNV) ¹⁾	A 12553
Drinking water approval (ACS) ¹⁾	ACS 15 ACC NY 360
EAC ¹⁾	№ TC RU C-DE.ГБ05.B.00732 OC НАННО «ЦБЭ»
Underwriters Laboratories (UL) ¹⁾	
• for USA and Canada	UL 20110217 - E34453
• worldwide	IEC UL DK 21845
Explosion protection	
Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
EC type-examination certificate	SEV 10 ATEX 0146
Connection to certified intrinsically-safe resistive circuits with maximum values:	$U_i \leq 30$ V DC; $I_i \leq 100$ mA; $P_i \leq 0.75$ W
Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	$L_i = 0$ nH; $C_i = 0$ nF

¹⁾ For variants with output signal 0 ... 5 V and ratiometric output available soon.

Pressure Measurement

Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

1

Selection and ordering data

Article No.

Order code

SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications ↗

7MF1565-

Characteristic curve deviation typ. 0.25 %

Wetted parts materials: Ceramic and stainless steel + sealing material

Non-wetted parts materials: stainless steel

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Measuring range		Overload limit		Burst pressure		Article No.	Order code		
		Min.	Max.						
For gauge pressure									
0 ... 1 bar	(0 ... 14.5 psi)	-1 bar	(-14.5 psi)	2.5 bar	(36.26 psi)	> 2.5 bar	(> 36.3 psi)	3 BA	
0 ... 1.6 bar	(0 ... 23.2 psi)	-1 bar	(-14.5 psi)	4 bar	(58.02 psi)	> 4 bar	(> 58.0 psi)	3 BB	
0 ... 2.5 bar	(0 ... 36.3 psi)	-1 bar	(-14.5 psi)	6.25 bar	(90.65 psi)	> 6.25 bar	(> 90.7 psi)	3 BD	
0 ... 4 bar	(0 ... 58.0 psi)	-1 bar	(-14.5 psi)	10 bar	(145 psi)	> 10 bar	(> 145 psi)	3 BE	
0 ... 6 bar	(0 ... 87.0 psi)	-1 bar	(-14.5 psi)	15 bar	(217 psi)	> 15 bar	(> 217 psi)	3 BG	
0 ... 10 bar	(0 ... 145 psi)	-1 bar	(-14.5 psi)	25 bar	(362 psi)	> 25 bar	(> 362 psi)	3 CA	
0 ... 16 bar	(0 ... 232 psi)	-1 bar	(-14.5 psi)	40 bar	(580 psi)	> 40 bar	(> 580 psi)	3 CB	
0 ... 25 bar	(0 ... 363 psi)	-1 bar	(-14.5 psi)	62.5 bar	(906 psi)	> 62.5 bar	(> 906 psi)	3 CD	
0 ... 40 bar	(0 ... 580 psi)	-1 bar	(-14.5 psi)	100 bar	(1450 psi)	> 100 bar	(> 1450 psi)	3 CE	
0 ... 60 bar	(0 ... 870 psi)	-1 bar	(-14.5 psi)	150 bar	(2175 psi)	> 150 bar	(> 2175 psi)	3 CG	
Other version, add Order code and plain text: Measuring range: ... up to ... bar (psi)								9 AA	H 1 Y
For absolute pressure									
0 ... 0.6 bar a	(0 ... 8.7 psi a)	0 bar a	(0 psi a)	2.5 bar a	(36.26 psi a)	> 2.5 bar a	(> 36.3 psi a)	5 AG	
0 ... 1 bar a	(0 ... 14.5 psi a)	0 bar a	(0 psi a)	2.5 bar a	(36.26 psi a)	> 2.5 bar a	(> 36.3 psi a)	5 BA	
0 ... 1.6 bar a	(0 ... 23.2 psi a)	0 bar a	(0 psi a)	4 bar a	(58.02 psi a)	> 4 bar a	(> 58.0 psi a)	5 BB	
0 ... 2.5 bar a	(0 ... 36.3 psi a)	0 bar a	(0 psi a)	6.25 bar a	(90.65 psi a)	> 6.25 bar a	(> 90.7 psi a)	5 BD	
0 ... 4 bar a	(0 ... 58.0 psi a)	0 bar a	(0 psi a)	10 bar a	(145 psi a)	> 10 bar a	(> 145 psi a)	5 BE	
0 ... 6 bar a	(0 ... 87.0 psi a)	0 bar a	(0 psi a)	15 bar a	(217 psi a)	> 15 bar a	(> 217 psi a)	5 BG	
0 ... 10 bar a	(0 ... 145 psi a)	0 bar a	(0 psi a)	25 bar a	(362 psi a)	> 25 bar a	(> 362 psi a)	5 CA	
0 ... 16 bar a	(0 ... 232 psi)	0 bar a	(0 psi a)	40 bar a	(580 psi a)	> 40 bar a	(> 580 psi a)	5 CB	
Other version, add Order code and plain text: Measuring range: ... up to ... mbar a (psi a)								9 AA	H 2 Y
Measuring ranges for gauge pressure									
0 ... 15 psi		-14.5 psi		35 psi		> 35 psi		4 BB	
3 ... 15 psi		-14.5 psi		35 psi		> 35 psi		4 BC	
0 ... 20 psi		-14.5 psi		50 psi		> 50 psi		4 BD	
0 ... 30 psi		-14.5 psi		80 psi		> 80 psi		4 BE	
0 ... 60 psi		-14.5 psi		140 psi		> 140 psi		4 BF	
0 ... 100 psi		-14.5 psi		200 psi		> 200 psi		4 BG	
0 ... 150 psi		-14.5 psi		350 psi		> 350 psi		4 CA	
0 ... 200 psi		-14.5 psi		550 psi		> 550 psi		4 CB	
0 ... 300 psi		-14.5 psi		800 psi		> 800 psi		4 CD	
0 ... 500 psi		-14.5 psi		1400 psi		> 1400 psi		4 CE	
0 ... 750 psi		-14.5 psi		2000 psi		> 2000 psi		4 CF	
0 ... 1000 psi		-14.5 psi		2000 psi		> 2000 psi		4 CG	
Other version, add Order code and plain text: Measuring range: ... up to ... psi								9 AA	H 1 Y
Measuring ranges for absolute pressure									
0 ... 10 psi a		0 psi a		35 psi a		> 35 psi a		6 AG	
0 ... 15 psi a		0 psi a		35 psi a		> 35 psi a		6 BA	
0 ... 20 psi a		0 psi a		50 psi a		> 50 psi a		6 BB	
0 ... 30 psi a		0 psi a		80 psi a		> 80 psi a		6 BD	
0 ... 60 psi a		0 psi a		140 psi a		> 140 psi a		6 BE	
0 ... 100 psi a		0 psi a		200 psi a		> 200 psi a		6 BG	
0 ... 150 psi a		0 psi a		350 psi a		> 350 psi a		6 CA	
0 ... 200 psi a		0 psi a		550 psi a		> 550 psi a		6 CB	
0 ... 300 psi a		0 psi a		800 psi a		> 800 psi a		6 CC	
Other version, add Order code and plain text: Measuring range: ... up to ... psi a								9 AA	H 2 Y

Pressure Measurement

Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

1

Selection and ordering data	Article No.	Order code
SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications Accuracy typ. 0.25 % Wetted parts materials: Ceramic and stainless steel + sealing material Non-wetted parts materials: stainless steel	7MF1565-	
Output signal 4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions) 0 ... 10 V; three-wire system; power supply 12 ... 33 V DC 0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 %		0 10 20 30
Explosion protection (only 4 ... 20 mA) None With explosion protection Ex ia IIC T4		0 1
Electrical connection Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling) M12 device plug per IEC 61076-2-101 Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i") Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i") Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling) Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling) Fixed mounted cable, length 5 m Special version		1 2 03 04 5 6 07 9 N1Y
Process connection G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar) G½" male thread and G1/8" female thread G¼" male per EN 837-1 (¼" BSP male) 7/16"-20 UNF male ¼"-18 NPT male (standard for pressure ranges inH ₂ O and psi) ¼"-18 NPT female ½"-14 NPT male ½"-14 NPT female 7/16"-20 UNF female M20x1.5 male G1/4" to DIN 3852 Form E G1/2" to DIN 3852 Form E Special version		A B C D E F G H J P Q R Z P1Y
Sealing material between sensor and enclosure Viton (FPM, standard) Neoprene (CR) Perbunan (NBR) EPDM Special version		A B C D Z Q1Y
Version Standard version		1
Further designs Supplement the Article No. with "-Z" and add Order code. Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2 Oxygen version, free of oil and degreased, max. operating pressure 60 bar, max. process temperature +85 °C (only in conjunction with the sealing material Viton between sensor and enclosure and not with explosion protection version)	C11 E10	

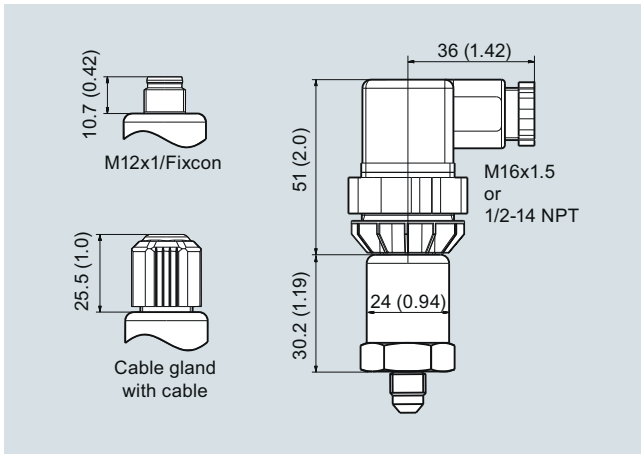
Pressure Measurement

Single-range transmitters for general applications

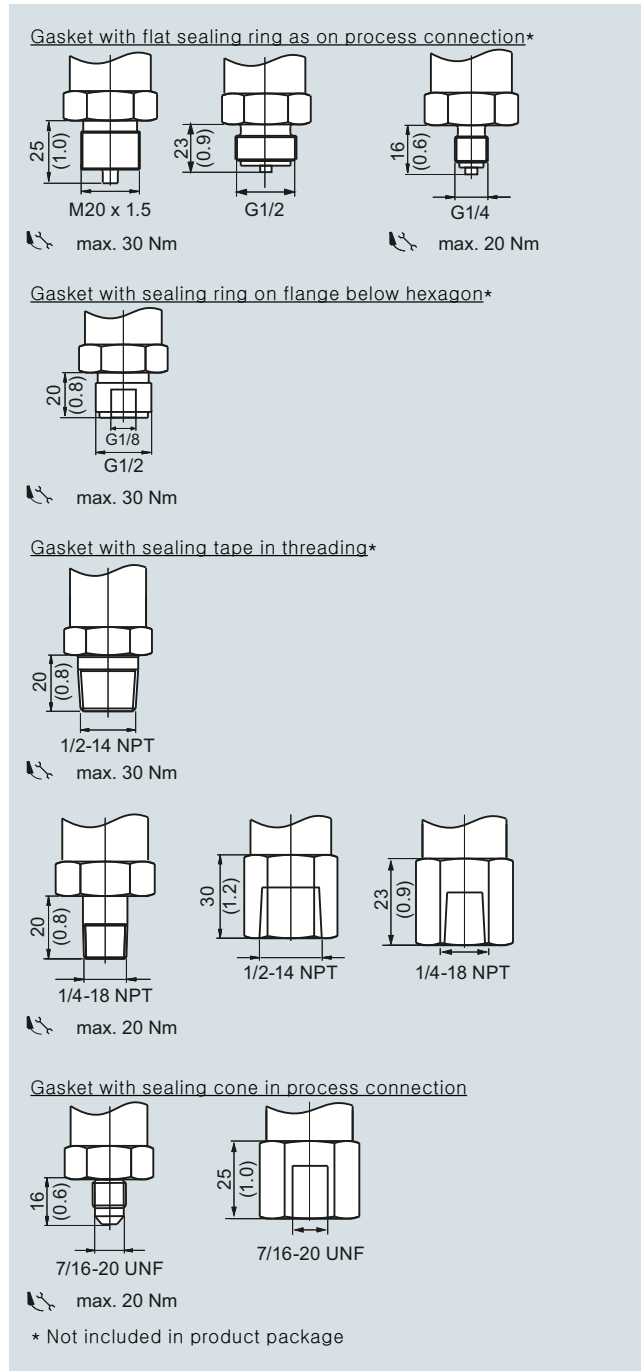
SITRANS P200 for gauge and absolute pressure

1

Dimensional drawings



SITRANS P200, electrical connections, dimensions in mm (inch)



SITRANS P200, process connections, dimensions in mm (inch)

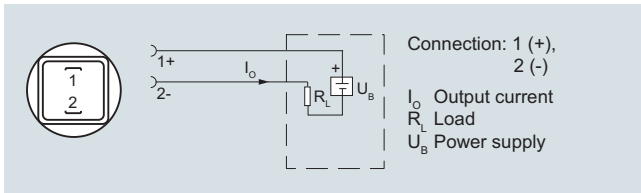
Pressure Measurement

Single-range transmitters for general applications

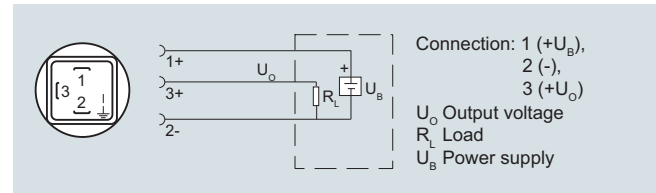
SITRANS P200 for gauge and absolute pressure

1

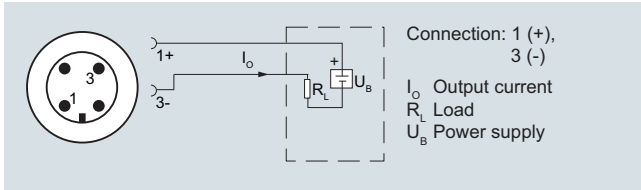
Schematics



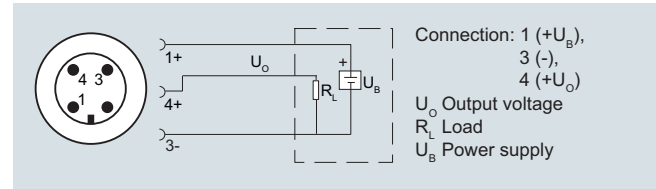
Connection with current output and connector per EN 175301



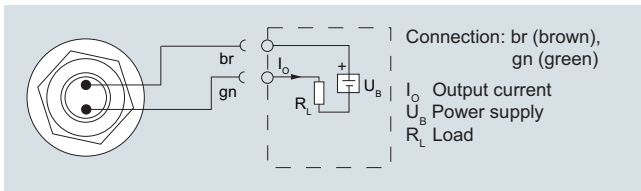
Connection with voltage output, ratiometric output and plug according to EN 175301



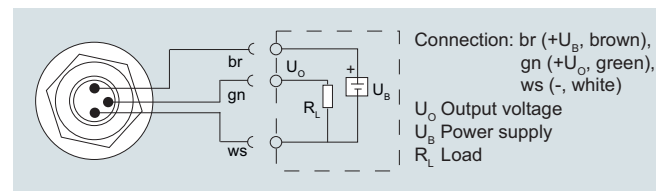
Connection with current output and M12x1 device plug



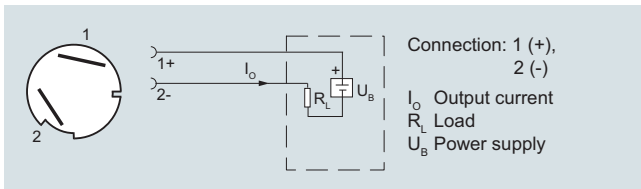
Connection with voltage output, ratiometric output and M12x1 device plug



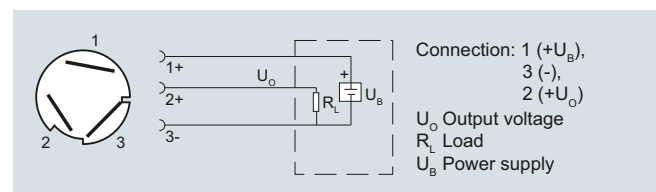
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



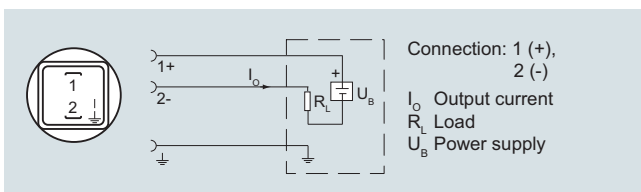
Connection with current output and Quickon cable quick screw connection



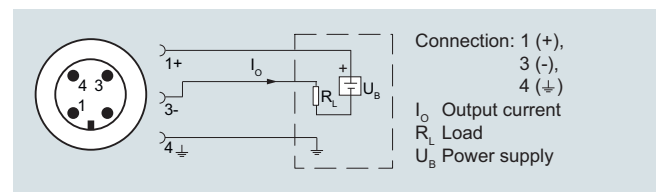
Connection with voltage output, ratiometric output and Quickon fast cable termination

Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and M12x1 device plug (Ex)