

Pressure measurement

Pressure transmitters

Single-range transmitters / SITRANS P200

Overview



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

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

Benefits

- High measurement accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For corrosive and non-corrosive 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 connected electrically with a device plug to EN 175301-803-A (IP65), an M12 device plug (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67). The output signal is 4 to 20 mA, 0 to 10 V or is available as an IO-Link signal.

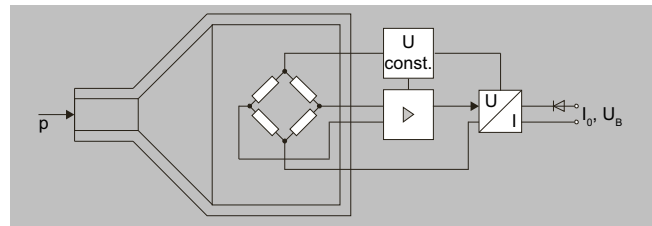
Device structure with explosion protection

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

Function

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

Mode of operation



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

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

The measuring cell output voltage is fed to the amplifier and converted into a 4 to 20 mA output current, a DC 0 to 10 V output voltage or an IO-Link output signal.

Output current, output voltage or IO-Link signal are linearly proportional to the input pressure.

Single-range transmitters / SITRANS P200

Selection and ordering data

								Article No.			Order code			
SITRANS P200 pressure transmitter, for pressure and absolute pressure for general applications								7MF1565-						
								● ● ● ● ● - ● ● ● ● ● ● ● ●						
Typical characteristic curve deviation 0.25 %, material of wetted parts: Ceramic and stainless steel + gasket material Material of non-wetted parts: Stainless steel														
Click the article number for online configuration in the PIA Life Cycle Portal.														
Measuring range		Minimum overload limit		Maximum overload limit		Burst pressure								
For gauge pressure														
0 ... 1 bar	(0 ... 14.5 psi)	-1 bar	(-14.5 psi)	3 bar	(43.5 psi)	> 3 bar	(> 43.5 psi)	3 B A						
0 ... 1.6 bar	(0 ... 23.2 psi)	-1 bar	(-14.5 psi)	4.8 bar	(69.06 psi)	> 4.8 bar	(> 69.6 psi)	3 B B						
0 ... 2.5 bar	(0 ... 36.3 psi)	-1 bar	(-14.5 psi)	7.5 bar	(108.75 psi)	> 7.5 bar	(> 108.75 psi)	3 B D						
0 ... 4 bar	(0 ... 58.0 psi)	-1 bar	(-14.5 psi)	12 bar	(174 psi)	> 12 bar	(> 174 psi)	3 B E						
0 ... 6 bar	(0 ... 87.0 psi)	-1 bar	(-14.5 psi)	15 bar	(217 psi)	> 15 bar	(> 217 psi)	3 B G						
0 ... 10 bar	(0 ... 145 psi)	-1 bar	(-14.5 psi)	25 bar	(362 psi)	> 25 bar	(> 362 psi)	3 C A						
0 ... 16 bar	(0 ... 232 psi)	-1 bar	(-14.5 psi)	40 bar	(580 psi)	> 40 bar	(> 580 psi)	3 C B						
0 ... 25 bar	(0 ... 363 psi)	-1 bar	(-14.5 psi)	62.5 bar	(906 psi)	> 62.5 bar	(> 906 psi)	3 C D						
0 ... 40 bar	(0 ... 580 psi)	-1 bar	(-14.5 psi)	100 bar	(1450 psi)	> 100 bar	(> 1450 psi)	3 C E						
0 ... 60 bar	(0 ... 870 psi)	-1 bar	(-14.5 psi)	150 bar	(2175 psi)	> 150 bar	(> 2175 psi)	3 C G						
Note: For transmitters with IO-Link output signal, no different version of the measuring range is possible. Other version; Add order code and plain text: Measuring range: ... to ... bar (psi)								9 A A					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 A G						
0 ... 1 bar a	(0 ... 14.5 psi a)	0 bar a	(0 psi a)	3 bar a	(43.5 psi a)	> 3 bar a	(> 43.5 psi a)	5 B A						
0 ... 1.6 bar a	(0 ... 23.2 psi a)	0 bar a	(0 psi a)	4.8 bar a	(69.6 psi a)	> 4.8 bar a	(> 69.6 psi a)	5 B B						
0 ... 2.5 bar a	(0 ... 36.3 psi a)	0 bar a	(0 psi a)	7.5 bar a	(108.75 psi a)	> 7.5 bar a	(> 108.75 psi a)	5 B D						
0 ... 4 bar a	(0 ... 58.0 psi a)	0 bar a	(0 psi a)	12 bar a	(174 psi a)	> 12 bar a	(> 174 psi a)	5 B E						
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 B G						
0 ... 10 bar a	(0 ... 145 psi)	0 bar a	(0 psi a)	25 bar a	(362 psi a)	> 25 bar a	(> 362 psi a)	5 C A						
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 C B						
Note: For transmitters with IO-Link output signal, no different version of the measuring range is possible. Other version; Add order code and plain text: Measuring range: ... to ... mbar a (psi a)								9 A A					H 2	Y
Measuring ranges for gauge pressure														
0 ... 15 psi		-14.5 psi		45 psi a		> 45 psi a		4 B B						
3 ... 15 psi		-14.5 psi		35 psi a		> 35 psi a		4 B C						
0 ... 20 psi		-14.5 psi		60 psi a		> 60 psi a		4 B D						
0 ... 30 psi		-14.5 psi		90 psi a		> 90 psi a		4 B E						
0 ... 60 psi		-14.5 psi		150 psi a		> 150 psi a		4 B F						
0 ... 100 psi		-14.5 psi		250 psi a		> 250 psi a		4 B G						
0 ... 150 psi		-14.5 psi		375 psi a		> 375 psi a		4 C A						
0 ... 200 psi		-14.5 psi		500 psi		> 500 psi		4 C B						
0 ... 300 psi		-14.5 psi		750 psi		> 750 psi		4 C D						
0 ... 500 psi		-14.5 psi		1250 psi		> 1250 psi		4 C E						
0 ... 750 psi		-14.5 psi		1875 psi		> 1875 psi		4 C F						
0 ... 1 000 psi		-14.5 psi		2 000 psi		> 2 000 psi		4 C G						
Note: For transmitters with IO-Link output signal, no different version of the measuring range in the unit psi is possible. Other version; Add order code and plain text: Measuring range: ... to ... psi								9 A A					H 1	Y
Measuring ranges for absolute pressure														
0 ... 10 psi a		0 psi a		35 psi a		> 35 psi a		6 A G						
0 ... 15 psi a		0 psi a		45 psi a		> 45 psi a		6 B A						
0 ... 20 psi a		0 psi a		60 psi a		> 60 psi a		6 B B						
0 ... 30 psi a		0 psi a		90 psi a		> 90 psi a		6 B D						
0 ... 60 psi a		0 psi a		150 psi a		> 150 psi a		6 B E						
0 ... 100 psi a		0 psi a		250 psi a		> 250 psi a		6 B G						
0 ... 150 psi a		0 psi a		375 psi a		> 375 psi a		6 C A						
0 ... 200 psi a		0 psi a		500 psi a		> 500 psi a		6 C B						
0 ... 300 psi a		0 psi a		800 psi a		> 800 psi a		6 C C						
Note: For transmitters with IO-Link output signal, no different version of the measuring range in the unit psi is possible. Other version; Add order code and plain text: Measuring range: ... to ... psi a								9 A A					H 2	Y
Output signal														
4 ... 20 mA; 2-wire system; auxiliary power DC 7 ... 33 V (DC 10 ... 30 V for explosion protection)										0				
0 ... 10 V; 3-wire system; auxiliary power 12 ... 33 V DC										1 0				

Single-range transmitters / SITRANS P200

Selection and ordering data (continued)

	Article No.										Order code			
SITRANS P200 pressure transmitter, for pressure and absolute pressure for general applications	7MF1565-													
	●	●	●	●	●	●	-	●	●	●	●	●	●	●
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC							2	0						
Ratiometric 10 ... 90%; 3-wire system; auxiliary power 5 V DC ± 10%							3	0						
IO-Link interface (only with M12 plug, measuring range bar and without explosion protection)							7	0						
Explosion protection (only 4 ... 20 mA)														
None							0							
With explosion protection Ex ia IIC T4							1							
Electrical connection														
Plug according to EN 175301-803-A, stuffing box thread M16 (with coupling)									1					
M12 device plug according to IEC 61076-2-101									2					
Connection via permanently installed cable, 2 m (6.6 ft); not for "Intrinsic safety" type of protection							0		3					
Quick-screw cable gland Quickon PG9; not for "Intrinsic safety" type of protection							0		4					
Plug according to EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)									5					
Plug according to EN 175301-803-A, stuffing box thread PG11 (with coupling)									6					
Permanently installed cable, length 5 m (16.4 ft)							0		7					
Process connection														
G½" male according to EN 837-1 (½" BSP male): Standard for metric pressure ranges mbar, bar										A				
G½" male and G1/8" female										B				
G¼" male according to EN 837-1 (¼" BSP male)										C				
7/16"-20 UNF male										D				
¼"-18 NPT male: Standard for pressure ranges inH ₂ O and psi										E				
¼"-18 NPT female										F				
½"-14 NPT male										G				
½"-14 NPT female										H				
7/16"-20 UNF female										J				
M20×1.5 male										P				
G¼" according to EN ISO 1179-2 (formerly DIN 3852 form E)										Q				
G½" according to EN ISO 1179-2 (formerly DIN 3852 form E)										R				
Schrader nipple										U				
Gasket material between sensor and enclosure														
Viton (FPM, standard)										A				
MVQ										B				
Perbunan (NBR)										C				
EPDM										D				
Version														
Standard version											1			

Options	Order code
Add "-Z" to article number and specify order code.	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2	C11
Oxygen version, free of oil and degreased, max. operating pressure 60 bar (870.2 psi), max. medium temperature +85 °C (185 °F)	E10
Notice	
Only with Viton gasket material between sensor and enclosure, and not with explosion protection version!	

Technical specifications

SITRANS P200 for gauge and absolute pressure	
Application	
Gauge and absolute pressure measurement	Liquids, gases and vapors
Mode of operation	
Measuring principle	Piezo-resistive measuring cell (ceramic diaphragm)
Measured variable	Gauge and absolute pressure
Input	
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 (10 ... 232 psi a)
- US measuring range	10 ... 300 psi a
Note: For transmitters with IO-Link output signal, no different version of the measuring range in the unit psi is possible	
Output	
Current signal	4 ... 20 mA
• Load	(U _B - 10 V)/0.02 A
• Auxiliary power U _B	7 ... 33 V DC (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	≥ 10 kΩ
• Auxiliary power U _B	12 ... 33 V DC
• Current consumption	< 7 mA at 10 kΩ
Radiometric output	10 ... 90%
• Load	≥ 10 kΩ
• Auxiliary power U _B	DC 5 V ± 10%
• Current consumption	< 7 mA at 10 Ω
• Characteristic curve	Linear rising
IO-Link interface	L+: 18 ... 33 V DC L-: GND C/Q: IO-Link / Switching output D/I/DQ: Switching output Pressure transmitter is only approved for port class A
• Auxiliary power	UB 18-33 V
• Port class	A
• Characteristic curve	Linear rising
Measuring accuracy	
Measurement deviation at limit setting including 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
Effect of ambient temperature	
• Lower range value and measuring span	0.2%/10 K of measuring span
• Influence of power supply	0.005%/V
Operating conditions	
Process temperature with gasket made of:	
• FPM (standard)	-15 ... +125 °C (5 ... 257 °F)

Technical specifications (continued)

SITRANS P200 for gauge and absolute pressure	
• MVQ	-40 ... +125 °C (-40 ... +257 °F) Explosion protection: -30 ... +120 °C (-22 ... +248 °F)
• Perbunan	-20 ... +100 °C (-4 ... +212 °F)
• EPDM	-40 ... +125 °C (-40 ... +257 °F), usable for drinking water
Ambient temperature	-30 ... +85 °C (-22 ... +185 °F)
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
Degree of protection according to IEC 60529	• IP00 with RAST 2.5 plug • IP65 with plug according to EN 175301-803-A • IP67 with M12 device plug • IP67 with cable • IP67 with cable quick screw connection
Electromagnetic compatibility	• According to IEC 61326-1/-2/-3 • According to NAMUR NE21 for ATEX devices only, and with a max. measurement error of ≤ 1% • CE-compliant in accordance with EN 61326-2-3
Structural design	
Weight	Approx. 0.090 kg (0.198 lbs)
Process connections	See dimension drawings
Electrical connections	• Plug according to EN 175301-803-A Form A with cable entry M16x1.5 or ½-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm ²) cable (Ø ± 5.4 mm) • Quickon cable quick screw connection
Material of wetted parts	
• Measuring cell	Al ₂ O ₃ - 96%
• Process connection	Stainless steel, mat. no. 1.4404 (SST 316 L)
• Gasket	• FPM (standard) • MVQ • Perbunan • EPDM
Material of non-wetted parts	
• Enclosure	Stainless steel, mat. no. 1.4404 (SST 316 L)
• Connector housing	Plastic
• Cable	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⁾	NSF/ANSI 61/372 according to MH60087
EAC ¹⁾	Nº TC RU C-DE.ГБ05.В.00732 ОС НАННО «ЦБ3»
Underwriters Laboratories (UL) ¹⁾	
• For the USA and Canada	UL 20110217 - E34453
• Worldwide	IEC UL DK 21845

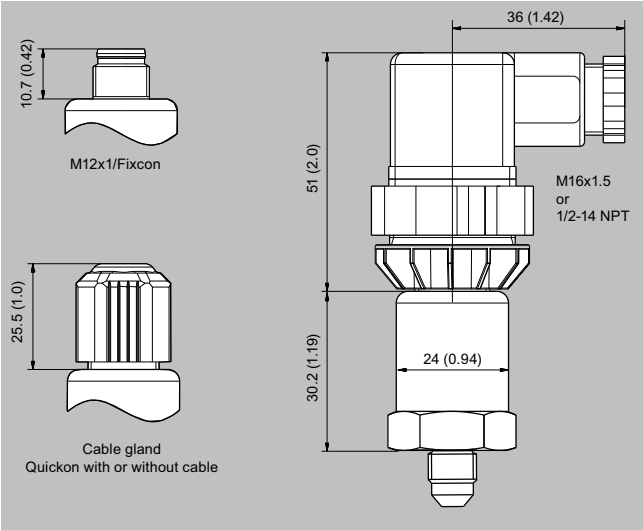
Technical specifications (continued)

SITRANS P200 for gauge and absolute pressure

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 IIIIC T125 °C Da/Db
EC type-examination certificate	SEV 15 ATEX 0173
Connection to certified intrinsically safe ohmic circuits with maximum values	For ratiometric 10 ... 90%: $U_i < 15\text{ V DC}$; $I_i < 200\text{ mA}$; $P_i < 750\text{ mW}$
Effective internal inductance and capacity for versions with plugs according to EN 175301-803-A and M12	For ratiometric 10 ... 90%: $L_i = 0\text{ nH}$; $C_i < 150\text{ nF}$

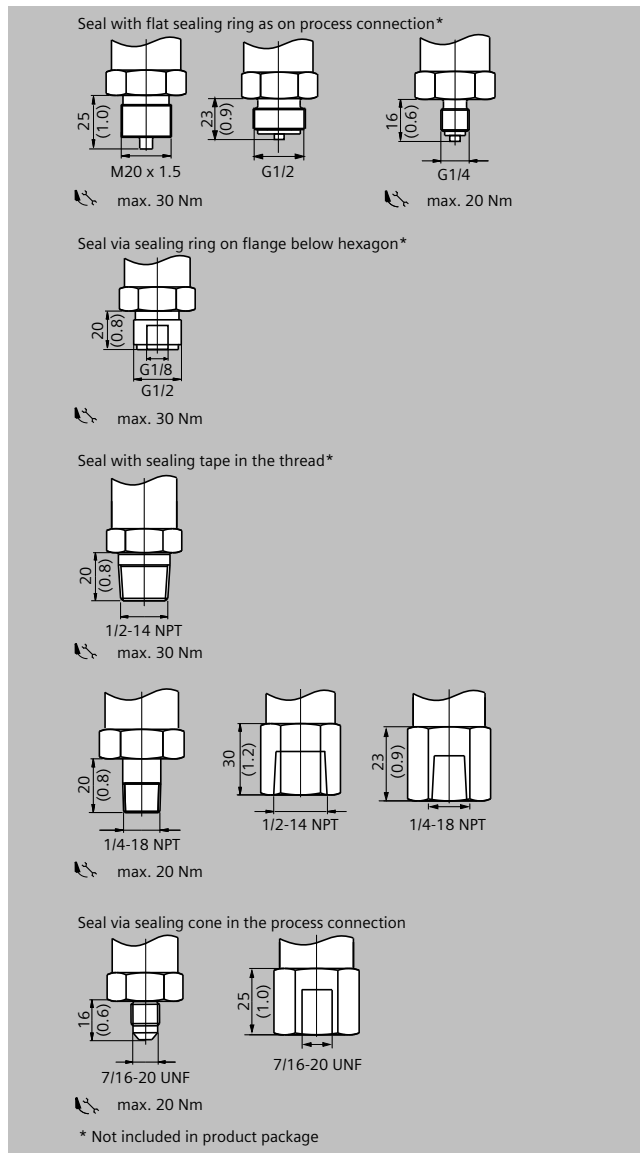
1) For variants with output signal 0 ... 5 V and radiometric output available soon.

Dimensional drawings



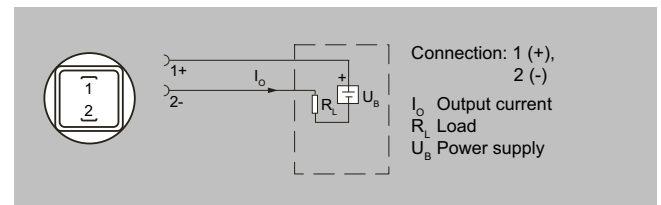
SITRANS P200, electrical connections, dimensions in mm (inch)

Dimensional drawings (continued)

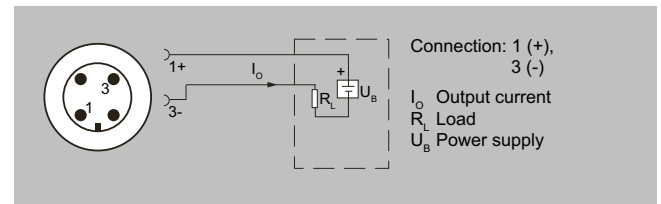


SITRANS P200, process connections, dimensions in mm (inch)

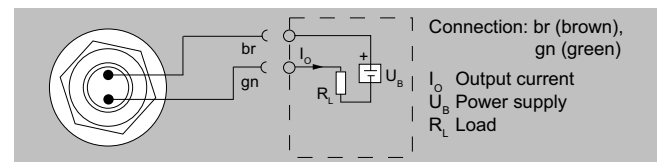
Circuit diagrams



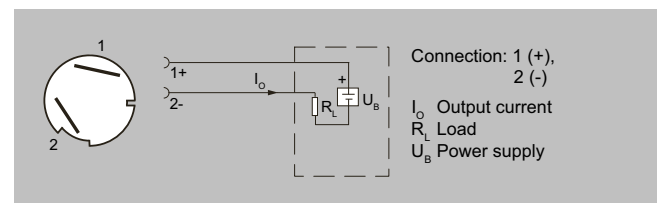
Connection with current output and plug according to EN 175301



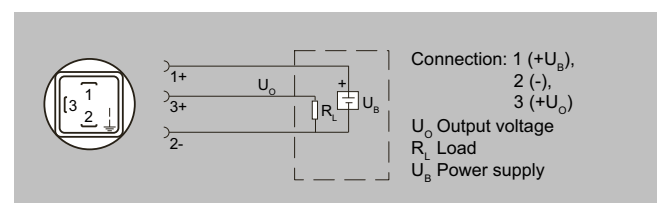
Connection with current output and M12x1 device plug



Connection with current output and cable

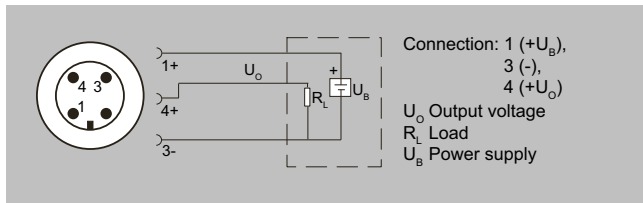


Connection with current output and Quickon cable quick screw connection

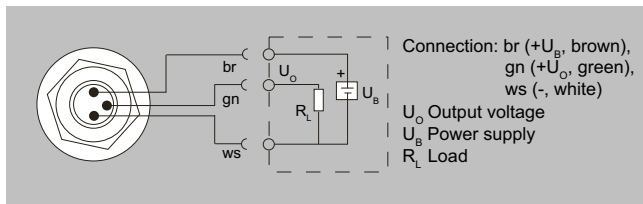


Connection with voltage output, ratiometric output and plug according to EN 175301

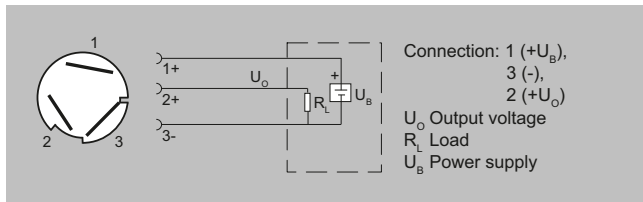
Circuit diagrams (continued)



Connection with voltage output, ratiometric output and M12x1 device plug



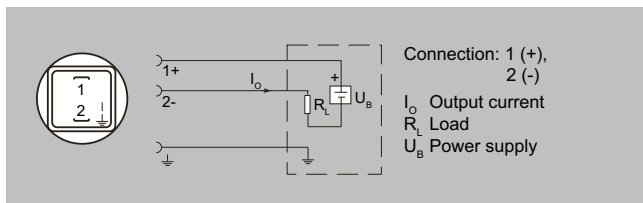
Connection with voltage output, ratiometric output and cable



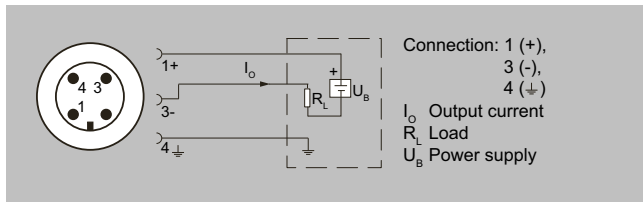
Connection with voltage output, ratiometric output and Quickon fast cable termination

Device design with explosion protection: 4 to 20 mA

The grounding connection is conductively bonded to the transmitter enclosure.

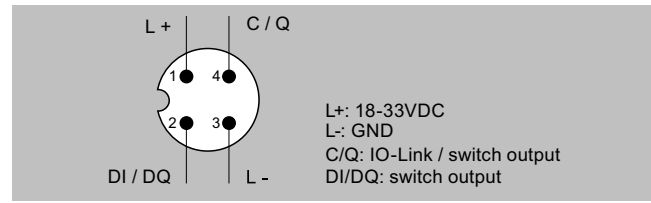


Connection with current output and plug according to EN 175301 (Ex)



Connection with current output and M12x1 (Ex) device plug

Circuit diagrams (continued)



Connection with IO-Link interface, only possible with M12 plug