

## Pressure Measurement

Pressure transmitters

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 device plug M12 (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.

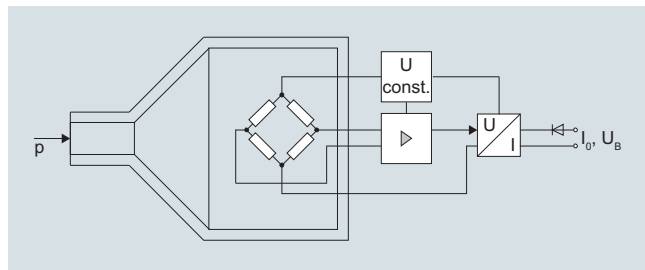
##### **Device structure with explosion protection**

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 device plug M12 (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 thick-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.

## Technical specifications

<b>Application</b> Gauge and absolute pressure measurement		Liquids, gases and vapors	Electromagnetic compatibility	<ul style="list-style-type: none"> <li>• acc. IEC 61326-1/-2/-3</li> <li>• acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation <math>\leq 1\%</math></li> </ul>
<b>Mode of operation</b> Measuring principle		Piezo-resistive measuring cell (ceramic diaphragm)	<b>Design</b> Weight	Approx. 0.090 kg (0.198 lb)
Measured variable		Gauge and absolute pressure	Process connections	See dimension drawings
<b>Inputs</b> Measuring range		<ul style="list-style-type: none"> <li>• Gauge pressure               <ul style="list-style-type: none"> <li>- Metric: 1 ... 60 bar (15 ... 870 psi)</li> <li>- US measuring range: 15 ... 1000 psi</li> </ul> </li> <li>• Absolute pressure               <ul style="list-style-type: none"> <li>- Metric: 0.6 ... 16 bar a (10 ... 232 psi abs a)</li> <li>- US measuring range: 10 ... 300 psi a</li> </ul> </li> </ul>	Electrical connections	<ul style="list-style-type: none"> <li>• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11</li> <li>• Device plug M12</li> <li>• 2 or 3-wire (0.5 mm<sup>2</sup>) cable (<math>\varnothing \pm 5.4</math> mm)</li> <li>• Quickon cable quick screw connection</li> </ul>
<b>Output</b> Current signal		4 ... 20 mA	Wetted parts materials	<ul style="list-style-type: none"> <li>• Measuring cell: Al<sub>2</sub>O<sub>3</sub> - 96 %</li> <li>• Process connection: Stainless steel, mat. No. 1.4404 (SST 316 L)</li> <li>• Gasket:               <ul style="list-style-type: none"> <li>• FPM (Standard)</li> <li>• Neoprene</li> <li>• Perbunan</li> <li>• EPDM</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Load</li> <li>• Auxiliary power U<sub>B</sub></li> </ul> Voltage signal		(U <sub>B</sub> - 10 V)/0.02 A DC 7 ... 33 V (10 ... 30 V for Ex)	Non-wetted parts materials	<ul style="list-style-type: none"> <li>• Enclosure: Stainless steel, mat. No. 1.4404 (SST 316 L)</li> <li>• Rack: Plastic</li> <li>• Cables: PVC</li> </ul>
<ul style="list-style-type: none"> <li>• Load</li> <li>• Auxiliary power U<sub>B</sub></li> <li>• Power consumption</li> </ul> Ratiometric output		$\geq 10$ k $\Omega$ 12 ... 33 V DC < 7 mA at 10 k $\Omega$	<b>Certificates and approvals</b>	Classification according to pressure equipment directive (PED 2014/68/EU)
<ul style="list-style-type: none"> <li>• Load</li> <li>• Auxiliary power U<sub>B</sub></li> <li>• Power consumption</li> </ul> Characteristic curve		0 ... 90 % $\geq 10$ k $\Omega$ 5 V DC $\pm 10\%$ < 7 mA at 10 k $\Omega$ Linear rising	Lloyd's Register of Shipping (LR) <sup>1)</sup> Germanischer Lloyd (GL) <sup>1)</sup> American Bureau of Shipping (ABS) <sup>1)</sup> Bureau Veritas (BV) <sup>1)</sup> Det Norske Veritas (DNV) <sup>1)</sup> Drinking water approval (ACS) <sup>1)</sup> EAC <sup>1)</sup> Underwriters Laboratories (UL) <sup>1)</sup>	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) 12/20010 GL19740 11 HH00 ABS_11_HG 789392_PDA BV 271007A0 BV A 12553 ACS 15 ACC NY 360 № TC RU C-DE.ГБ05.B.00732 OC НАННО «ЦБЭ»
<b>Measuring accuracy</b> Error in measurement at limit setting incl. hysteresis and reproducibility		<ul style="list-style-type: none"> <li>• Typical: 0.25 % of measuring span</li> <li>• Maximum: 0.5 % of measuring span</li> </ul>	• for USA and Canada • worldwide	UL 20110217 - E34453 IEC UL DK 21845
Step response time T <sub>99</sub>		< 5 ms	<b>Explosion protection</b>	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
Long-term stability		0.25 % of measuring span/year span	EC type-examination certificate	SEV 10 ATEX 0146
<ul style="list-style-type: none"> <li>• Lower range value and measuring span</li> </ul> Influence of ambient temperature		0.25 % of measuring span/year span	Connection to certified intrinsically-safe resistive circuits with maximum values:	U <sub>i</sub> $\leq 30$ V DC; I <sub>i</sub> $\leq 100$ mA; P <sub>i</sub> $\leq 0.75$ W
<ul style="list-style-type: none"> <li>• Lower range value and measuring span</li> <li>• Influence of power supply</li> </ul>		0.25 %/10 K of measuring span 0.005 %/V	Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	L <sub>i</sub> = 0 nH; C <sub>i</sub> = 0 nF
<b>Conditions of use</b> Process temperature with gasket made of:		<ul style="list-style-type: none"> <li>• FPM (Standard): -15 ... +125 °C (+5 ... +257 °F)</li> <li>• Neoprene: -35 ... +100 °C (-31 ... +212 °F)</li> <li>• Perbunan: -20 ... +100 °C (-4 ... +212 °F)</li> <li>• EPDM: -40 ... +125 °C (-40 ... +257 °F), usable for drinking water</li> </ul>		
<ul style="list-style-type: none"> <li>• FPM (Standard)</li> <li>• Neoprene</li> <li>• Perbunan</li> <li>• EPDM</li> </ul> Ambient temperature		-25 ... +85 °C (-13 ... +185 °F)		
Storage temperature		-50 ... +100 °C (-58 ... +212 °F)		
Degree of protection (to EN 60529)		<ul style="list-style-type: none"> <li>• IP 65 with connector per EN 175301-803-A</li> <li>• IP 67 with device plug M12</li> <li>• IP 67 with cable</li> <li>• IP 67 with cable quick screw connection</li> </ul>		

<sup>1)</sup> For variants with output signal 0 ... 5 V and ratiometric output available soon.

# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

1

#### SITRANS P200 for gauge and absolute pressure

##### Selection and ordering data

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

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.

Article No.

Order code

7MF1565 -

Measuring range	Overload limit		Burst pressure
	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)
0 ... 1.6 bar (0 ... 23.2 psi)	-1 bar (-14.5 psi)	4 bar (58.02 psi)	> 4 bar (> 58.0 psi)
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)
0 ... 4 bar (0 ... 58.0 psi)	-1 bar (-14.5 psi)	10 bar (145 psi)	> 10 bar (> 145 psi)
0 ... 6 bar (0 ... 87.0 psi)	-1 bar (-14.5 psi)	15 bar (217 psi)	> 15 bar (> 217 psi)
0 ... 10 bar (0 ... 145 psi)	-1 bar (-14.5 psi)	25 bar (362 psi)	> 25 bar (> 362 psi)
0 ... 16 bar (0 ... 232 psi)	-1 bar (-14.5 psi)	40 bar (580 psi)	> 40 bar (> 580 psi)
0 ... 25 bar (0 ... 363 psi)	-1 bar (-14.5 psi)	62.5 bar (906 psi)	> 62.5 bar (> 906 psi)
0 ... 40 bar (0 ... 580 psi)	-1 bar (-14.5 psi)	100 bar (1450 psi)	> 100 bar (> 1450 psi)
0 ... 60 bar (0 ... 870 psi)	-1 bar (-14.5 psi)	150 bar (2175 psi)	> 150 bar (> 2175 psi)

Other version, add Order code and plain text: Measuring range: ... up to ... bar (psi)

##### 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)
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)
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)
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)
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)
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)
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)
0 ... 16 bar a (0 ... 232 psi a)	0 bar a (0 psi a)	40 bar a (580 psi a)	> 40 bar a (> 580 psi a)

Other version, add Order code and plain text: Measuring range: ... up to ... mbar a (psi a)

##### Measuring ranges for gauge pressure

0 ... 15 psi	-14.5 psi	35 psi	> 35 psi
3 ... 15 psi	-14.5 psi	35 psi	> 35 psi
0 ... 20 psi	-14.5 psi	50 psi	> 50 psi
0 ... 30 psi	-14.5 psi	80 psi	> 80 psi
0 ... 60 psi	-14.5 psi	140 psi	> 140 psi
0 ... 100 psi	-14.5 psi	200 psi	> 200 psi
0 ... 150 psi	-14.5 psi	350 psi	> 350 psi
0 ... 200 psi	-14.5 psi	550 psi	> 550 psi
0 ... 300 psi	-14.5 psi	800 psi	> 800 psi
0 ... 500 psi	-14.5 psi	1400 psi	> 1400 psi
0 ... 750 psi	-14.5 psi	2000 psi	> 2000 psi
0 ... 1000 psi	-14.5 psi	2000 psi	> 2000 psi

Other version, add Order code and plain text: Measuring range: ... up to ... psi

##### Measuring ranges for absolute pressure

0 ... 10 psi a	0 psi a	35 psi a	> 35 psi a
0 ... 15 psi a	0 psi a	35 psi a	> 35 psi a
0 ... 20 psi a	0 psi a	50 psi a	> 50 psi a
0 ... 30 psi a	0 psi a	80 psi a	> 80 psi a
0 ... 60 psi a	0 psi a	140 psi a	> 140 psi a
0 ... 100 psi a	0 psi a	200 psi a	> 200 psi a
0 ... 150 psi a	0 psi a	350 psi a	> 350 psi a
0 ... 200 psi a	0 psi a	550 psi a	> 550 psi a
0 ... 300 psi a	0 psi a	800 psi a	> 800 psi a

Other version, add Order code and plain text: Measuring range: ... up to ... psi a

3 BA  
3 BB  
3 BD  
3 BE  
3 BG  
3 CA  
3 CB  
3 CD  
3 CE  
3 CG  
9 AA

H1 Y

5 AG  
5 BA  
5 BB  
5 BD  
5 BE  
5 BG  
5 CA  
5 CB

9 AA

H2 Y

4 BB  
4 BC  
4 BD  
4 BE  
4 BF  
4 BG  
4 CA  
4 CB  
4 CD  
4 CE  
4 CF  
4 CG

9 AA

H1 Y

6 AG  
6 BA  
6 BB  
6 BD  
6 BE  
6 BG  
6 CA  
6 CB  
6 CC

9 AA

H2 Y

# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

#### SITRANS P200 for gauge and absolute pressure

1

Selection and ordering data	Article No.	Order code
<b>SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications</b> Accuracy typ. 0.25 % Wetted parts materials: Ceramic and stainless steel + sealing material Non-wetted parts materials: stainless steel	7MF1565-	
<b>Output signal</b> 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
<b>Explosion protection (only 4 ... 20 mA)</b> None With explosion protection Ex ia IIC T4		0 1
<b>Electrical connection</b> Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling) Device plug M12 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
<b>Process connection</b> 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 <sub>2</sub> 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
<b>Sealing material between sensor and enclosure</b> Viton (FPM, standard) Neoprene (CR) Perbunan (NBR) EPDM Special version		A B C D Z Q1Y
<b>Version</b> Standard version		1
<b>Further designs</b> 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)	<b>C11</b> <b>E10</b>	

# Pressure Measurement

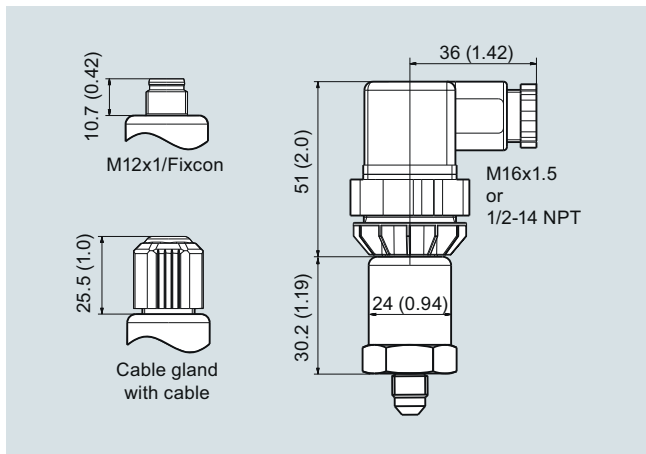
Pressure transmitters

Single-range transmitters for general applications

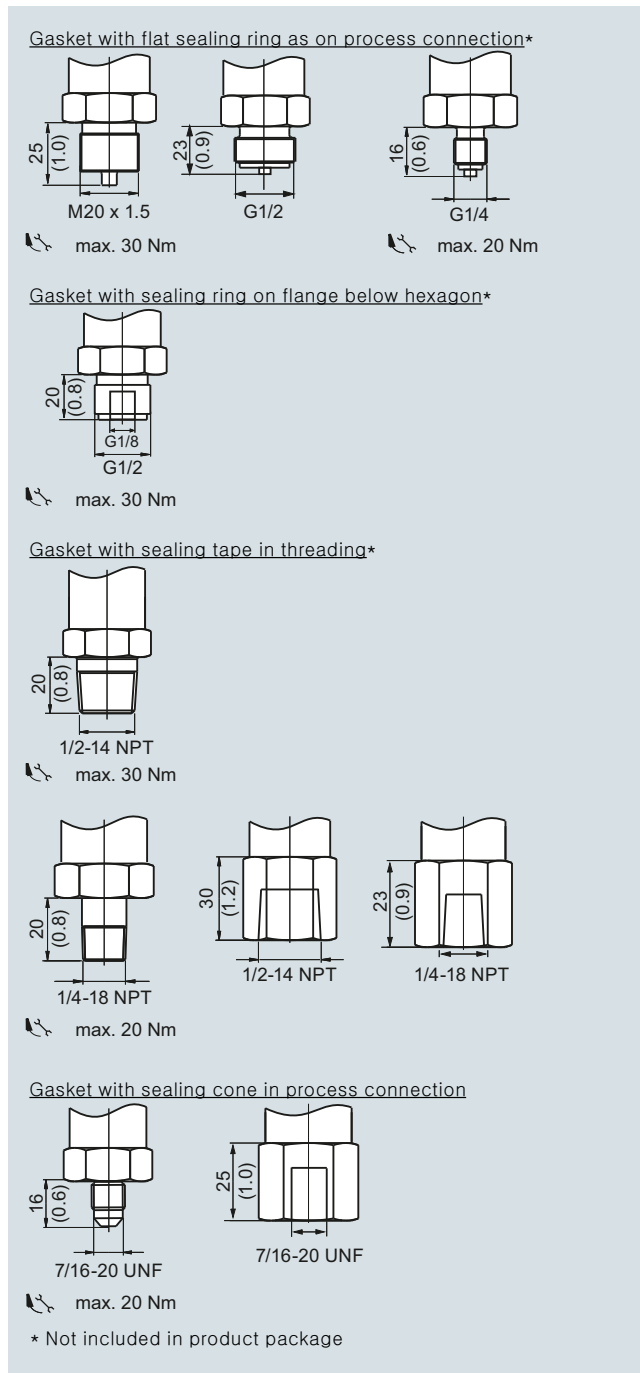
## SITRANS P200 for gauge and absolute pressure

1

### Dimensional drawings



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



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

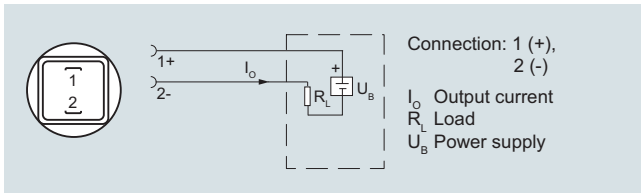
# Pressure Measurement

## Pressure transmitters

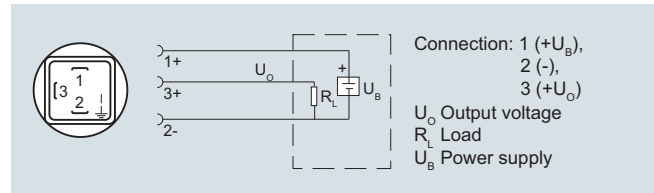
### Single-range transmitters for general applications

#### SITRANS P200 for gauge and absolute pressure

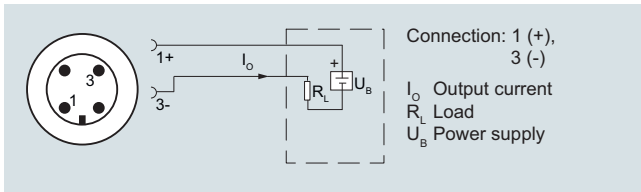
#### Schematics



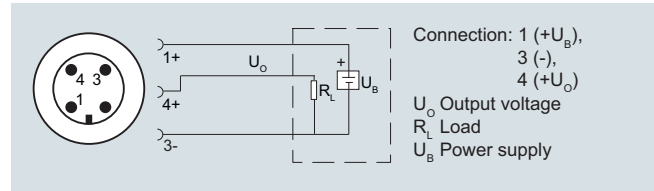
Connection with current output and connector per EN 175301



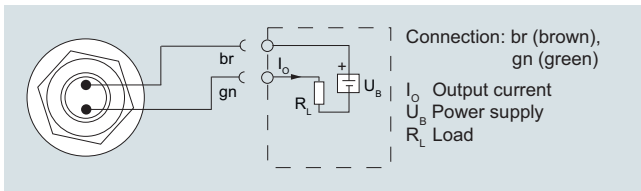
Connection with voltage output, ratiometric output and plug according to EN 175301



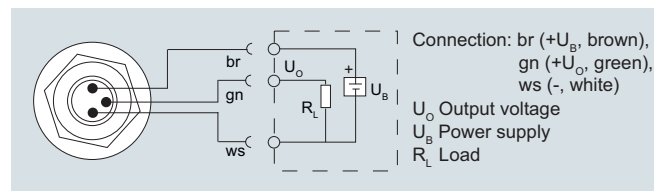
Connection with current output and device plug M12x1



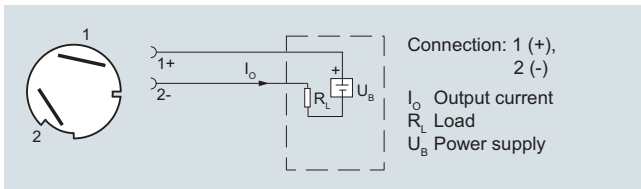
Connection with voltage output, ratiometric output and device plug M12x1



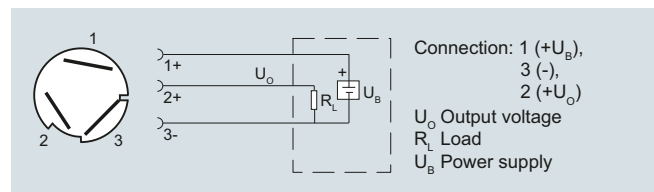
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



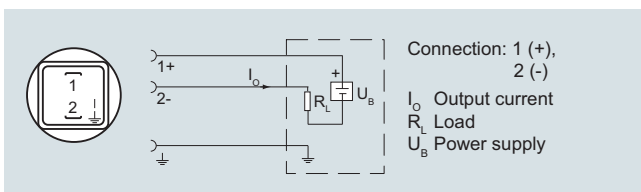
Connection with current output and Quickon cable quick screw connection



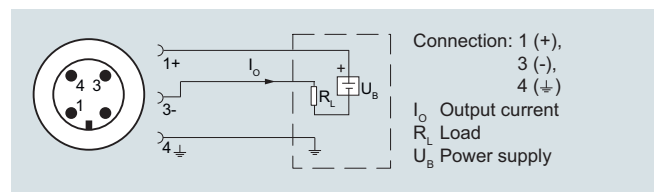
Connection with voltage output, ratiometric output and Quickon fast cable termination

#### 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 device plug M12x1 (Ex)