

SITRANS P measuring instruments for pressure

Transmitters for gage and absolute pressure

Z series for gage pressure

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Overview



SITRANS P pressure transmitters, Z series for gage pressure (7MF1562-...)

The SITRANS P pressure transmitter, Z series (7MF1562-...), measures the gage pressure of aggressive and non-aggressive gases, liquids and vapors.

Benefits

- High measuring accuracy
- Sturdy brass housing
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapor
- Temperature-compensated measuring cell
- Compact design

Application

The pressure transmitter of the Z series for gage pressure (7MF1562-...) is used above all in the following industrial areas:

- Power engineering
- Mechanical engineering
- Shipbuilding
- Water supply etc.

A concrete application example is the measurement of compressed air containing oil in compressors or compressor stations.

Design

The main components of the pressure transmitter are:

- Brass housing with silicon measuring cell and electronics plate
- Process connection
- Electrical connection

The silicon measuring cell has a thin-film strain gage which is mounted on a ceramic diaphragm. The ceramic diaphragm can also be used for aggressive media.

The process connection to DIN EN 837-1 is made of brass and has a male thread $G\frac{1}{2}B$ or a female thread $G\frac{1}{8}B$.

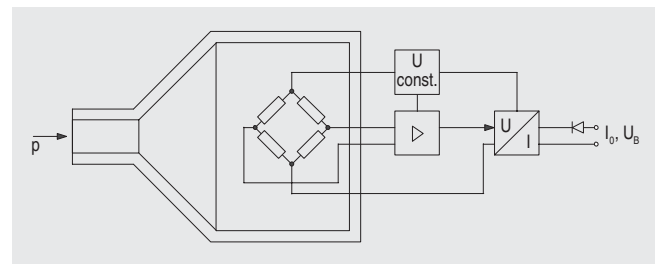
The electrical connection is made using a plug to DIN 43650 with a M16x1.5 cable inlet.

Function

The pressure transmitters of the Z series for gage pressure measure the pressure of aggressive and non-aggressive gases, liquids and vapors.

The measuring cell is temperature-compensated.

Mode of operation



SITRANS P pressure transmitters, Z series (7MF1562-...), functional diagram

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

The measuring cell output voltage is fed to an amplifier and converted into an output current of 4 to 20 mA. The output current is linearly proportional to the input pressure.

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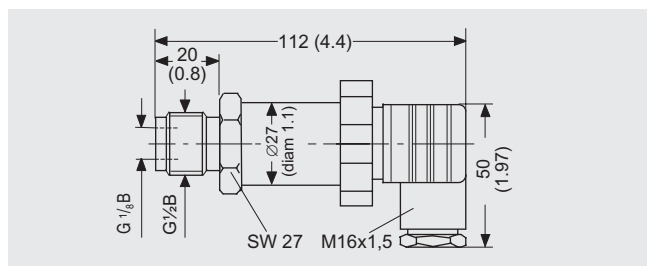
Technical specifications	
SITRANS P pressure transmitter, Z series for gage pressure	
Mode of operation	
Measuring principle	Thin-film strain gage
Input	
Measured variable	Relative pressure
Measured range	0 to 16 bar g (0 to 232 psi g) or 0 to 25 bar g (0 to 363 psi g)
Output	
Current output signal	4 ... 20 mA
Measuring accuracy	
	To EN 60770-1
Error in measurement (at 25 °C (77 °F), including conformity error, hysteresis and repeatability)	0.5% of full-scale value-typical
Response time T_{99}	< 0.1 s
Long-term drift	
• Start of scale	0.3% of full-scale value/year - typical
• Measured span	0.3% of full-scale value/year - typical
Influence of ambient temperature	
• Start of scale	0.3%/10 K (0.3%/10 K) of full-scale value - typical
• Measured span	0.3%/10 K (0.3%/10 K) of full-scale value - typical
Rated conditions	
Medium conditions	
• Process temperature	-30 ... +120 °C (-22 ... +248 °F)
Degree of protection to EN 60529	IP65
Ambient conditions	
• Ambient temperature	-25 ... 85 °C (-13 ... +185 °F)
• Storage temperature	-50 ... 100 °C (-58 ... +212 °F)

Design	
Weight	≈ 0.2 kg (≈ 0.44 lb)
Wetted parts materials	
• Measuring cell	Al ₂ O ₃ - 96%
• Process connection	Brass, mat. No. 2.0402
• Gasket	Viton
Process connection	Male thread G ¹ / ₂ B female thread G ¹ / ₈ B

Power supply	
Terminal voltage on pressure transmitter	
• For current output	10 to 36 V DC

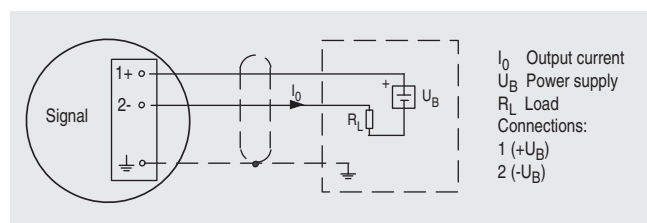
Certificate and approvals	
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)

Dimensional drawings



SITRANS P pressure transmitters, Z series (7MF1562-...), dimensions in mm (inch)

Schematics



SITRANS P pressure transmitters, Z series (7MF1562-...), connection diagram

Selection and Ordering data		Order No.	Order code
SITRANS P pressure transmitters, Z series for pressure 2-wire system, characteristic rising		C) 7MF1562 - 00	
Measured range	Max. working pressure	3CB	
0 ... 16 bar g (0 ... 232 psi g)	32 bar g (464 psi g)	3CD	
0 ... 25 bar g (0 ... 363 psi g)	64 bar g (928 psi g)	9AA	H1Y
Other version for measuring range ≥ 1 bar g (≥ 14.5 psi g), add Order code and plain text: Measuring range: ... to ... bar g (psi g)			

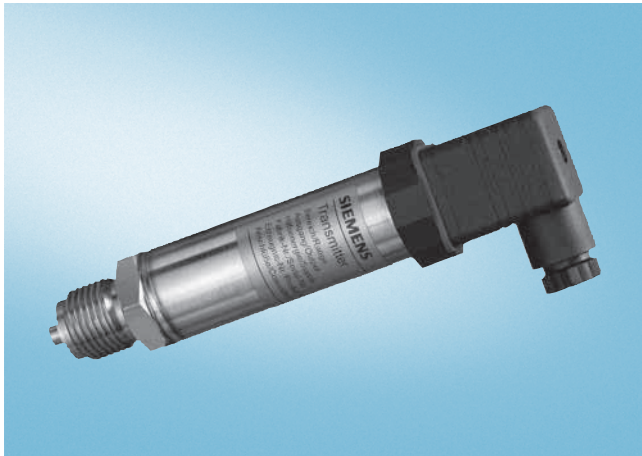
C) Subject to export regulations AL: N, ECCN: EAR99.

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Transmitters for gage and absolute pressure

Z series for gage and absolute pressure

Overview



SITRANS P pressure transmitters, Z series for pressure and absolute pressure (7MF1564-...)

SITRANS P pressure transmitters, Z series (7MF1564-...), measure the gage and absolute pressure as well as the level of liquids and gases.

Benefits

- High measuring accuracy
- Sturdy stainless steel housing
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapor
- Temperature-compensated measuring cell
- Compact design

Application

The pressure transmitter of the Z series for gage pressure and absolute pressure (7MF1564-...) is used above all in the following industrial areas:

- Chemical industry
- Pharmaceutical industry
- Food industry
- Mechanical engineering
- Shipbuilding
- Water supply

Design

The design of the pressure transmitter is dependent on the measuring range.

Measuring range <1 bar (<14.5 psi)

Main components:

- Stainless steel housing with piezo-resistive silicon measuring cell (with stainless steel diaphragm, temperature-compensated) and electronics module
- Process connection made of stainless steel in diverse designs (see Selection and Ordering data)
- Electrical connection made using a plug to DIN 43650 with the cable inlet M16 x 1.5, 1/2-14 NPT or round plug connector M12.

The pressure transmitters with a nominal range < 1 bar g (< 14.5 psi g) are optionally available with or without explosion protection.

Measuring range ≥ 1 bar (≥ 14.5 psi)

Main components:

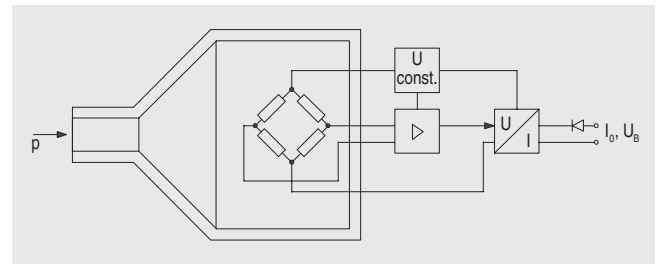
- Stainless steel housing with ceramic measuring cell and electronics module. The temperature-compensated ceramic measuring cell has a thin-film strain gage which is mounted on a ceramic diaphragm. The ceramic diaphragm can also be used for aggressive media.
- Process connection made of stainless steel in diverse designs (see Selection and Ordering data)
- Electrical connection made using a plug to DIN 43650 with the cable inlet M16 x 1.5, 1/2-14 NPT or round plug connector M12.

The pressure transmitters with a nominal range ≥ 1 bar g (≥ 14.5 psi g) are optionally available with or without explosion protection.

Function

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

Mode of operation



SITRANS P pressure transmitters, Z series (7MF1564-...), functional diagram

The mode of operation of the pressure transmitter is dependent on the measuring range.

Measuring range <1 bar (<14.5 psi)

The silicon measuring cell of the pressure transmitter has a piezo-resistive bridge to which the operating pressure is transmitted through silicone oil and a stainless steel diaphragm.

The measuring cell output voltage is fed to an amplifier and converted into an output current 4 ... 20 mA. The output current is linearly proportional to the input pressure

Measuring range ≥ 1 bar (≥ 14.5 psi)

The thin-film 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 4 ... 20 mA or an output voltage of 0 ... 10 V DC.

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

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Technical specifications

SITRANS P pressure transmitters, Z series for gage pressure, absolute pressure and level

Mode of operation

• Measuring range <1 bar (<14.5 psi)	Piezo-resistive
• Measuring range ≥1 bar (≥14.5 psi)	Thin-film strain gage

Input

Measured variable	Gage and absolute pressure
Measured range	
• Pressure	
- Metric	0 ... 400 bar g (0 ... 5802 psi g)
- US measuring range	0 ... 6000 psi g
• Absolute pressure	
- Metric	0 ... 16 bar a (0 ... 232 psi a)
- US measuring range	0 ... 300 psi a

Output

Output signal	
• Current output signal	4 ... 20 mA
• Voltage output signal (only measuring range ≥ 1 bar (14.5 psi))	0 ... 10 V DC

Accuracy

To EN 60770-1	
Error in measurement (at 25 °C (77 °F), including conformity error, hysteresis and repeatability)	0.25% of full-scale value – typical
Response time T_{99}	< 0.1 s
Long-term drift	
• Start of scale	0.25% of full scale value/year
• Full-scale value	0.25% of full scale value/year
Influence of ambient temperature	
• Start of scale	0.25%/10 K (0.25%/10 K) of full-scale value
• Full-scale value	0.25%/10 K (0.25%/10 K) of full-scale value

Rated operating conditions

Process temperature	-30 ... +120 °C (-22 ... +248 °F)
Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
Degree of protection to EN 60529	IP65

Design

Weight	≈ 0.25 kg (≈ 0.55 lb)
Wetted parts materials	
• Measuring cell	
- Measuring range <1 bar (<14.5 psi)	Stainless steel, 1.4571/316Ti
- Measuring range ≥1 bar (≥14.5 psi)	Al ₂ O ₃ – 96%
• Process connection	Stainless steel, mat. No. 1.4571/316Ti
• Gasket	Viton
Process connection	See Selection and Ordering data

Power supply U_H

Terminal voltage on pressure transmitter

• For current output	10 ... 36 V DC
• For voltage output signal (only measuring range ≥ 1 bar (14.5 psi))	15 ... 36 V DC

Certificate and approvals

Classification according to pressure equipment directive (DRGL 97/23/EC) For gases of fluid group 1 and liquids of fluid 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)

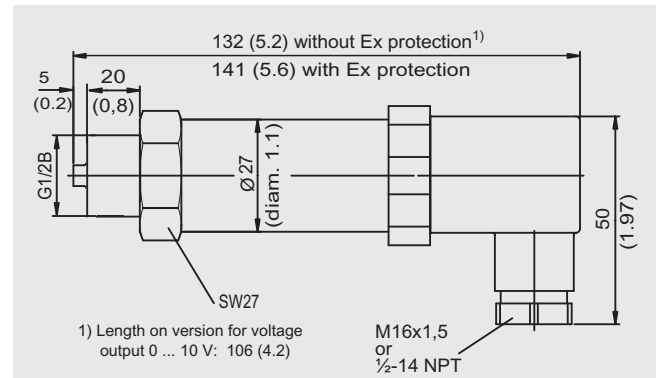
Explosion protection

• Intrinsic safety "i" (only with current output)	TÜV 02 ATEX 1953X
- Identification	Ex II 1/2G EEx ia IIC T4
• Intrinsic safety "T.I.I.S." (only with current output)	applied

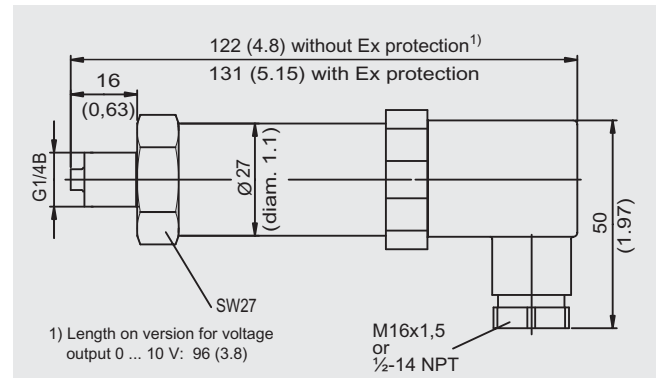
Lloyds Register of Shipping

Certificate No. 03/30003

Dimensional drawings



Pressure transmitter 7MF1564-... with process connection G $\frac{1}{2}$ " male, dimensions in mm (inch)



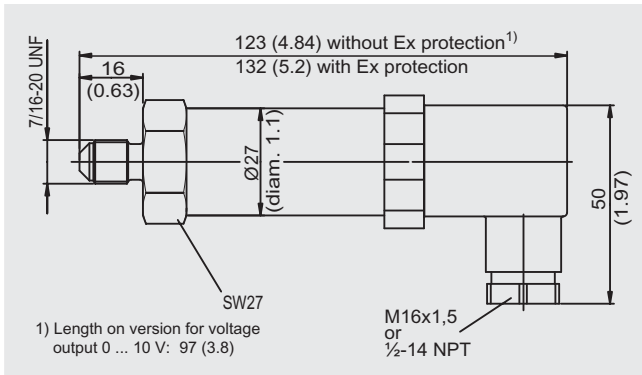
Pressure transmitter 7MF1564-... with process connection G $\frac{1}{4}$ " male, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

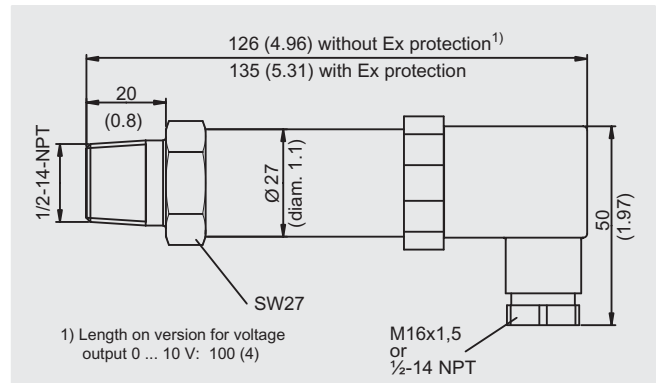
Transmitters for gage and absolute pressure

Z series for gage and absolute pressure

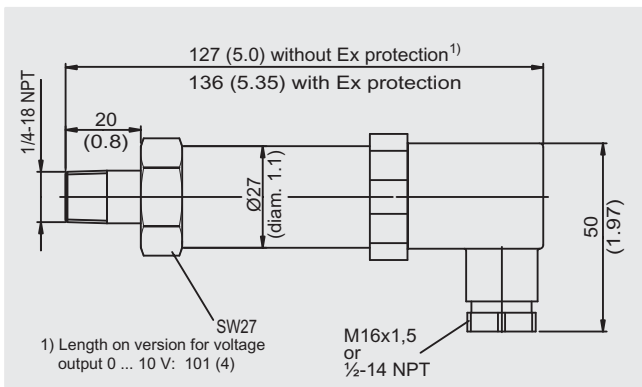
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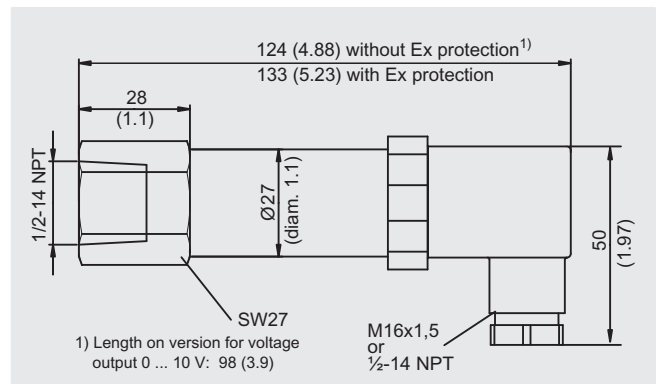
Pressure transmitter 7MF1564... with process connection 7/16-20 UNF male, dimensions in mm (inch)



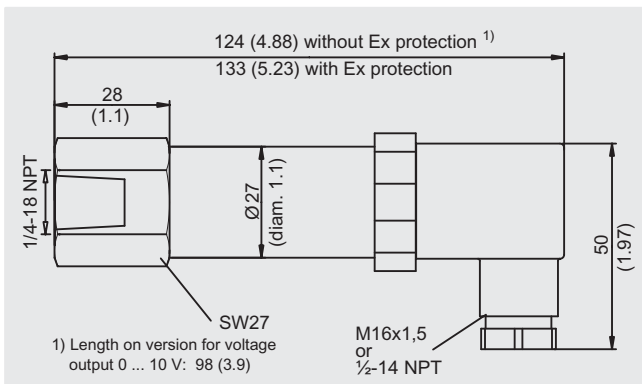
Pressure transmitter 7MF1564... with process connection 1/2-14 NPT male, dimensions in mm (inch)



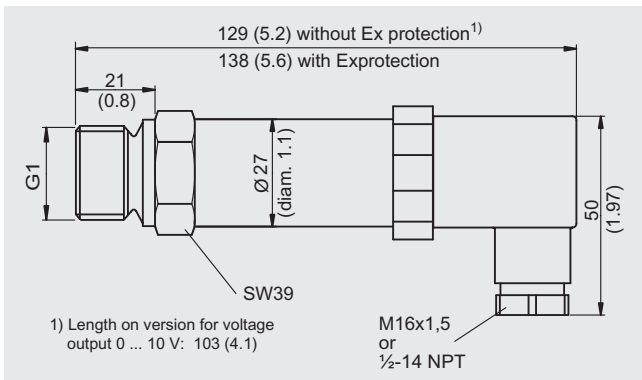
Pressure transmitter 7MF1564... with process connection 1/4-18 NPT male, dimensions in mm (inch)



Pressure transmitter 7MF1564... with process connection 1/2-14 NPT female, dimensions in mm (inch)

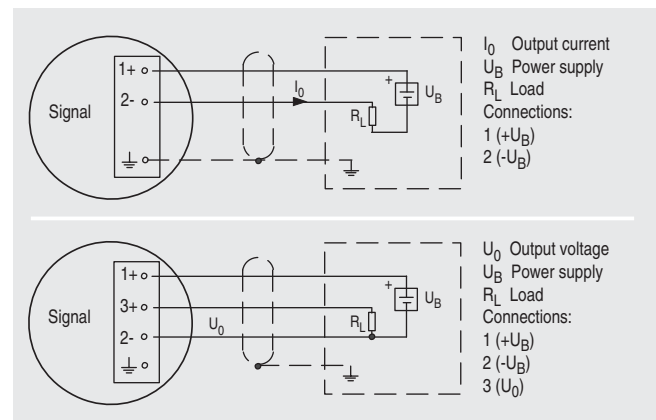


Pressure transmitter 7MF1564... with process connection 1/4-18 NPT female, dimensions in mm (inch)



Pressure transmitter 7MF1564... with process connection G1 male, flush-mounted, dimensions in mm (inch)

Schematics



SITRANS P pressure transmitters, Z series (7MF1564...), connection diagram, with current output (top) and voltage output (bottom)

SITRANS P measuring instruments for pressure

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Z series for gage and absolute pressure

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Selection and Ordering data					Order No.	Order code	
SITRANS P pressure transmitters for pressure, series Z for gage and absolute pressure					C) 7 MF 1 5 6 4 -	1	
2 or 3-wire system, rising characteristic curve							
Measuring range	perm. working pressure		Burst pressure				
	Min.	Max.					
For gage pressure							
0 ... 100 mbar g (0 ... 1.45 psi g)	-0,6 bar g (-8.7 psi g)	0,6 bar g (8.7 psi g)	1 bar g (14.5 psi g)	▶	3 AA 0		
0 ... 160 mbar g (0 ... 2.32 psi g)	-0,6 bar g (-8.7 psi g)	0,6 bar g (8.7 psi g)	1 bar g (14.5 psi g)	▶	3 AB 0		
0 ... 250 mbar g (0 ... 3.63 psi g)	-1 bar g (-14.5 psi g)	1 bar g (14.5 psi g)	1.7 bar g (25 psi g)	▶	3 AC 0		
0 ... 400 mbar g (0 ... 5.80 psi g)	-1 bar g (-14.5 psi g)	1 bar g (14.5 psi g)	1.7 bar g (25 psi g)	▶	3 AD 0		
0 ... 600 mbar g (0 ... 8.70 psi g)	-1 bar g (-14.5 psi g)	3 bar g (43.5 psi g)	5 bar g (72 psi g)	▶	3 AG 0		
Other version for measuring range < 1 bar (< 14.5 psi g), add Order code and plain text: measuring range: ... up to ... mbar g (psi g) ¹⁾					9 AC 0	H 1 Y	
0 ... 1 bar g (0 ... 14.5 psi g)	-0,4 bar g (-5.8 psi g)	2 bar g (30 psi g)	5 bar g (72 psi g)	▶	3 BA		
0 ... 1.6 bar g (0 ... 23.2 psi g)	-0,4 bar g (-5.8 psi g)	3,2 bar g (45 psi g)	5 bar g (72 psi g)	▶	3 BB		
0 ... 2.5 bar g (0 ... 36.3 psi g)	-0,8 bar g (-11.6 psi g)	5 bar g (72 psi g)	12 bar g (175 psi g)	▶	3 BD		
0 ... 4 bar g (0 ... 58.0 psi g)	-0,8 bar g (-11.6 psi g)	8 bar g (115 psi g)	12 bar g (175 psi g)	▶	3 BE		
0 ... 6 bar g (0 ... 87.0 psi g)	-1 bar g (-14.5 psi g)	12 bar g (175 psi g)	25 bar g (360 psi g)	▶	3 BG		
0 ... 10 bar g (0 ... 145 psi g)	-1 bar g (-14.5 psi g)	20 bar g (290 psi g)	50 bar g (725 psi g)	▶	3 CA		
0 ... 16 bar g (0 ... 232 psi g)	-1 bar g (-14.5 psi g)	32 bar g (460 psi g)	50 bar g (725 psi g)	▶	3 CB		
0 ... 25 bar g (0 ... 363 psi g)	-1 bar g (-14.5 psi g)	50 bar g (725 psi g)	120 bar g (1750 psi g)	▶	3 CD		
0 ... 40 bar g (0 ... 580 psi g)	-1 bar g (-14.5 psi g)	80 bar g (1150 psi g)	120 bar g (1750 psi g)	▶	3 CE		
0 ... 60 bar g (0 ... 870 psi g)	-1 bar g (-14.5 psi g)	120 bar g (1750 psi g)	250 bar g (3600 psi g)	▶	3 CG		
0 ... 100 bar g (0 ... 1450 psi g)	-1 bar g (-14.5 psi g)	200 bar g (2900 psi g)	450 bar g (6525 psi g)	▶	3 DA		
0 ... 160 bar g (0 ... 2320 psi g)	-1 bar g (-14.5 psi g)	320 bar g (4640 psi g)	450 bar g (6525 psi g)	▶	3 DB		
0 ... 250 bar g (0 ... 3626 psi g)	-1 bar g (-14.5 psi g)	500 bar g (7250 psi g)	650 bar g (9425 psi g)	▶	3 DD		
0 ... 400 bar g (0 ... 5802 psi g)	-1 bar g (-14.5 psi g)	600 bar g (8700 psi g)	650 bar g (9425 psi g)	▶	3 DE		
Other version for measuring range ≥ 1 bar (≥ 14.5 psi g), add Order code and plain text: measuring range: ... up to ... bar (psi g) ¹⁾					9 AA	H 1 Y	
For absolute pressure							
0 ... 600 mbar a (0 ... 8.7 psi a)	0 bar a (0 psi a)	3 bar a (43.5 psi a)	5 bar a (72 psi a)	▶ J)	5 AG 0		
0 ... 1 bar a (0 ... 14.5 psi a)	0 bar a (0 psi a)	2 bar a (30 psi a)	5 bar a (72 psi a)	▶ J)	5 BA		
0 ... 1.6 bar a (0 ... 23.2 psi a)	0 bar a (0 psi a)	3,2 bar a (45 psi a)	5 bar a (72 psi a)	▶ J)	5 BB		
0 ... 2.5 bar a (0 ... 36.3 psi a)	0 bar a (0 psi a)	5 bar a (72 psi a)	12 bar a (175 psi a)	▶ J)	5 BD		
0 ... 4 bar a (0 ... 58.0 psi a)	0 bar a (0 psi a)	8 bar a (115 psi a)	12 bar a (175 psi a)	▶ J)	5 BE		
0 ... 6 bar a (0 ... 87.0 psi a)	0 bar a (0 psi a)	12 bar a (175 psi a)	25 bar a (360 psi a)	▶ J)	5 BG		
0 ... 10 bar a (0 ... 145 psi)	0 bar a (0 psi a)	20 bar a (290 psi a)	50 bar a (725 psi a)	▶ J)	5 CA		
0 ... 16 bar a (0 ... 232 psi)	0 bar a (0 psi a)	32 bar a (460 psi a)	50 bar a (725 psi a)	▶ J)	5 CB		
Other version for measuring range < 1 bar (< 14.5 psi a), add Order code and plain text: measuring range: ... up to ... mbar a (psi a)					J)	9 AB 0	H 1 Y
Measuring ranges for gage pressure (only for US market)							
(0 ... 10 psi g)	(-3 psi g)	(20 psi g)	(60 psi g)		4 BA		
(0 ... 15 psi g)	(-6 psi g)	(30 psi g)	(72 psi g)		4 BB		
(3 ... 15 psi g)	(-6 psi g)	(30 psi g)	(72 psi g)		4 BC		
(0 ... 20 psi g)	(-6 psi g)	(40 psi g)	(72 psi g)		4 BD		
(0 ... 30 psi g)	(-6 psi g)	(60 psi g)	(72 psi g)		4 BE		
(0 ... 60 psi g)	(-11.5 psi g)	(120 psi g)	(175 psi g)		4 BF		
(0 ... 100 psi g)	(-14.5 psi g)	(200 psi g)	(360 psi g)		4 BG		
(0 ... 150 psi g)	(-14.5 psi g)	(300 psi g)	(725 psi g)		4 CA		
(0 ... 200 psi g)	(-14.5 psi g)	(400 psi g)	(725 psi g)		4 CB		
(0 ... 300 psi g)	(-14.5 psi g)	(600 psi g)	(1750 psi g)		4 CD		
(0 ... 500 psi g)	(-14.5 psi g)	(1000 psi g)	(1750 psi g)		4 CE		
(0 ... 750 psi g)	(-14.5 psi g)	(1500 psi g)	(3600 psi g)		4 CF		
(0 ... 1000 psi g)	(-14.5 psi g)	(2000 psi g)	(3600 psi g)		4 CG		
(0 ... 1500 psi g)	(-14.5 psi g)	(3000 psi g)	(6525 psi g)		4 DA		
(0 ... 2000 psi g)	(-14.5 psi g)	(4000 psi g)	(6525 psi g)		4 DB		
(0 ... 3000 psi g)	(-14.5 psi g)	(6000 psi g)	(9425 psi g)		4 DD		
(0 ... 5000 psi g)	(-14.5 psi g)	(8700 psi g)	(9425 psi g)		4 DE		
(0 ... 6000 psi g)	(-14.5 psi g)	(8700 psi g)	(9425 psi g)		4 DF		
Other version, add Order code and plain text: Measuring range: ... up to ... psi g					9 BA	H 1 Y	

▶ Available ex stock

C) Subject to export regulations AL: N, ECCN: EAR99.

J) Subject to export regulations AL: 91999, ECCN: EAR99.

¹⁾ The transmitters can also be ordered with special measuring ranges, e.g. transmitters with a 1-bar measuring cell (14.5 psi measuring cell):
-0.2 ... +0.8 bar g (-2.9 ... +11.6 psi g) or -0.4 ... +0.6 bar g (-5.8 ... +8.7 psi g) or ...

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Selection and Ordering data				Order No.	Order code
SITRANS P pressure transmitters for pressure, series Z for pressure and absolute pressure 2 or 3-wire system, rising characteristic curve				C) 7 MF 1 5 6 4 -	- - - - - 1
Measuring range	Perm. working pressure		Burst pressure		
	min.	max.			
Measuring ranges for absolute pressure (only for US market)					
(0 ... 10 psi a)	(0 psi a)	(20 psi a)	(60 psi a)	J)	6 A G
(0 ... 15 psi a)	(0 psi a)	(30 psi a)	(72 psi a)	J)	6 B A
(0 ... 20 psi a)	(0 psi a)	(40 psi a)	(72 psi a)	J)	6 B B
(0 ... 30 psi a)	(0 psi a)	(60 psi a)	(72 psi a)	J)	6 B D
(0 ... 60 psi a)	(0 psi a)	(120 psi a)	(175 psi a)	J)	6 B E
(0 ... 100 psi a)	(0 psi a)	(200 psi a)	(360 psi a)	J)	6 B G
(0 ... 150 psi a)	(0 psi a)	(300 psi a)	(725 psi a)	J)	6 C A
(0 ... 200 psi a)	(0 psi a)	(400 psi a)	(725 psi a)	J)	6 C B
(0 ... 300 psi a)	(0 psi a)	(600 psi a)	(1725 psi a)	J)	6 C C
Other version, add Order code and plain text: Measuring range: ... up to ... psi a				J)	9 B B H 1 Y
Output signal					
4 ... 20 mA; C 2-wire system; power supply 10 ... 36 V DC				▶	0
0 ... 10 V; 3-wire system; power supply 15 ... 36 V DC					10
Explosion protection					
Without				▶	0
With explosion protection Ex II 1/2 G EEx ia IIC T4 (only for version 4 ... 20 mA; 2-wire system; power supply 10 ... 30 V DC)					1
With explosion protection "Intrinsic safety T.I.I.S." (available soon)					2
Electrical connection					
Plug to DIN 43650, Form A, cable inlet M16 x 1.5				▶	1
Round connector M12, IP67					2
Plug to DIN 43650, cable inlet 1/2-14 NPT					3
Plug to DIN 43650, cable inlet Pg11					4
Cable gland Pg11 with 2 m cable, IP68					6
Special version (specify Order code and plain text)					9 N 1 Y
Process connection					
G1/2" male to EN 837-1 (1/2" BSP male) (standard for metric pressure ranges mbar, bar)				▶	A
G1/2" male thread and G1/8" female thread					B
G1/4" male to EN837-1 (1/4" BSP male)					C
7/16"-20 UNF male					D
1/4"-18 NPT male (standard for pressure ranges psi)					E
1/4"-18 NPT female					F
1/2"-14 NPT male					G
1/2"-14 NPT female					H
RC 1/2" male to JIS B 7505					K
G1" male (only for measuring ranges ≥ 1 bar g (14.5 psi g))					M
Special version (specify Order code and plain text)					Z P 1 Y
Sealing material between sensor and housing					
Viton (standard)				▶	A
Neoprene					B
Perbunan					C
Special version (specify Order code and plain text)					Z Q 1 Y
Further designs					
Manufacturer's test certificate M to DIN 55340, Part 18 and ISO 8402 (calibration certificate), add "-Z" to Order No. and Order code.					C11
Oxygen version, oil and grease-free cleaning (only if the sealing material between sensor and housing is Viton and only for measuring ranges ≥ 1 bar g (≥ 14.5 psi g) and ≥ 1 bar a (≥ 14.5 psi a))					E10
Manufacturer's test certificate M to DIN 55340, Part 18 and ISO 8402 (calibration certificate) supplied later, specify factory no. of transmitter.					7MF1564-8CC11

▶ Available ex stock C) Subject to export regulations AL: N, ECCN: EAR99.
J) Subject to export regulations AL: 91999, ECCN: EAR99.