SITRANS P Z
for gauge pressure

Overview

The SITRANS P Z pressure transmitter, (7MF1562-...) measures the gauge 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 gauge pressure of liquids, gases and vapor
- Temperature-compensated measuring cell
- Compact design

Application

The SITRANS P Z pressure transmitter for gauge 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 gauge 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 G½B or a female thread $G^1/_8B$.

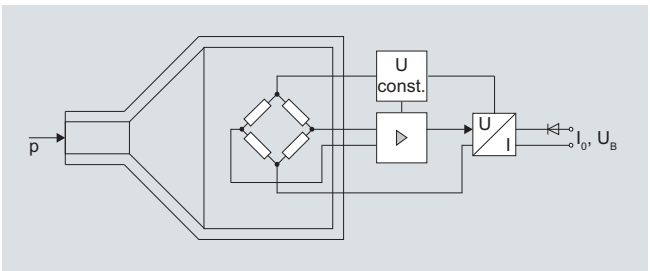
The electrical connection is made using a plug to DIN 43650 with a M16 x 1.5 cable inlet.

Function

The pressure transmitters of the SITRANS P Z for gauge pressure measure the gauge pressure of aggressive and non-aggressive gases, liquids and vapors.

The measuring cell is temperature-compensated.

Mode of operation



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

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

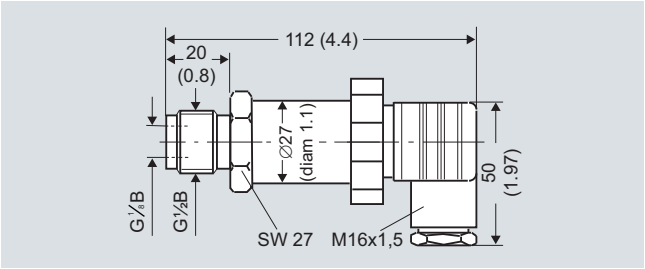
The measuring cell output voltage is fed to an amplifier and converted into an output current of 4 to 20 mA. The output current is linearly proportional to the input pressure.

Technical specifications

SITRANS P Z pressure transmitters for gauge pressure	
Mode of operation	
Measuring principle	Thin-film strain gauge
Input	
Measured variable	Gauge pressure
Measuring range	0 ... 16 bar g (0 ... 232 psi g) or 0 ... 25 bar g (0 ... 363 psi g)
Output	
Current output signal	4 ... 20 mA
Measuring accuracy	as per 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	0.3 % of full-scale value/year - typical
Influence of ambient temperature	
• Start of scale	0.3 %/10 K of full-scale value - typical
• Measuring span	0.3 %/10 K of full-scale value - typical
Rated conditions	
Medium conditions	
• Temperature of medium	-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)

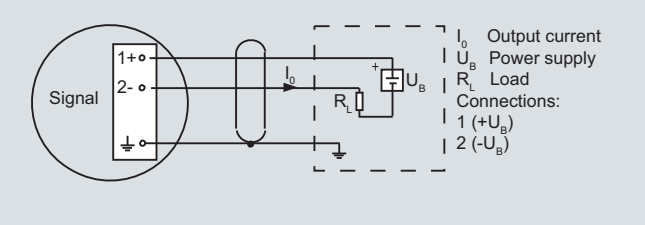
Design	
Weight	≈ 0.2 kg (≈ 0.44 lb)
Wetted parts materials	
• Measuring cell	Al_2O_3 – 96 %
• Process connection	Brass, mat. no. 2.0402
• Gasket	Viton
Process connection	Male thread G½B female thread $G^1/_8B$
Power supply	
Terminal voltage on pressure transmitter	
• For current output	10 ... 36 V DC
Certificates and approvals	
Classification according to PED 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 Z pressure transmitters (7MF1562-...), dimensions in mm (inch)

Schematics



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

Selection and Ordering data

			Order No.	Order code
SITRANS P Z pressure transmitters for gauge pressure 2-wire system, characteristic rising			D) **7MF1562 -** ■■■ **0 0**	■■■
Measured range		**Max. working pressure**		
0 ... 16 bar g	(0 ... 232 psi g)	32 bar g (464 psi g)	**3 C B**	
0 ... 25 bar g	(0 ... 363 psi g)	64 bar g (928 psi g)	**3 C D**	
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)			**9 A A**	**H 1 Y**

D) Subject to export regulations AL: N, ECCN: EAR99H.

SITRANS P Z
for gauge and absolute pressure

Overview

SITRANS P Z pressure transmitters (7MF1564-...), measure the gauge 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 SITRANS P Z pressure transmitter for gauge 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, ½-14 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:

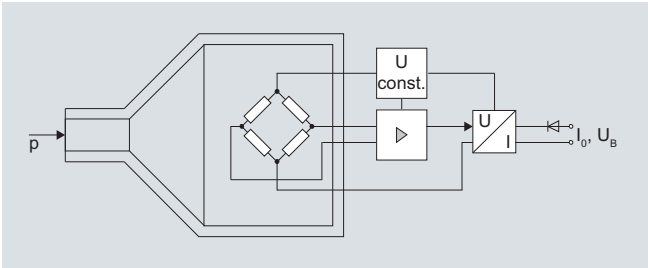
- Stainless steel housing with ceramic measuring cell and electronics module. The temperature-compensated ceramic measuring cell has a thin-film strain gauge which is mounted on a ceramic diaphragm. The ceramic diaphragm can also be used for aggressive media.
- Process connection made of stainless steel 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, ½-14 NPT or round plug connector M12.

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

Function

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

Mode of operation



SITRANS P Z pressure transmitters (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 p 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 of 4 to 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 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.

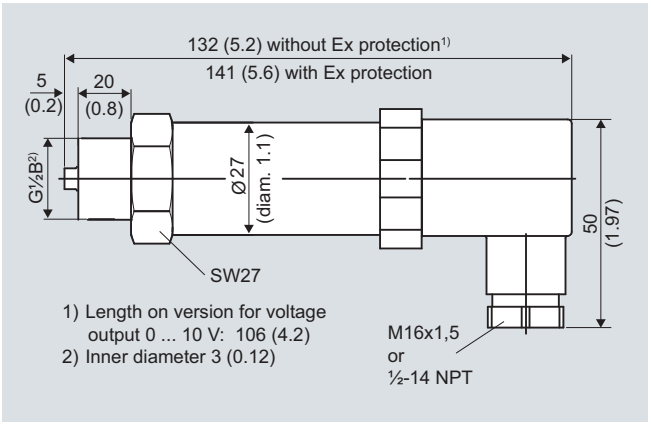
Technical specifications

SITRANS P Z pressure transmitters for gauge 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 gauge
Input	
Measured variable	Gauge and absolute pressure
Measuring range	
• Gauge 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
Measuring accuracy	Acc. 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	0.25 % of full-scale value/year
Influence of ambient temperature	
• Start of scale	0.25 %/10 K of full-scale value/year 0.7 %/10 K of full-scale value for measuring cells < 600 mbar (8.7 psi)
• Full-scale value	0.25 %/10 K of full-scale value
Rated conditions	
Temperature of medium	-30 °C ... +120 °C (-22 … +248 °F)
Ambient temperature	-25 °C ... +85 °C (-13 … +185 °F)
Storage temperature	-50 °C ... +100 °C (-58 … +212 °F)
Degree of protection acc. 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, mat. no. 1.4404/316L
- Measuring range ≥ 1 bar (≥14,5 psi)	Al_2O_3 – 96 %
• Process connection	Stainless steel, mat. no. 1.4404/316L
• Gasket	Viton
Process connection	See "Selection and Ordering Data"

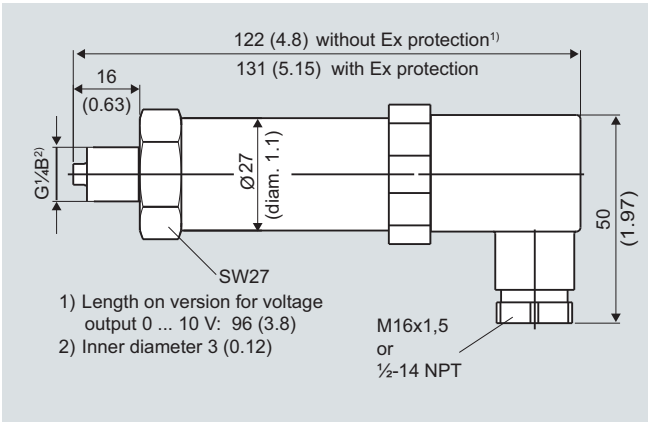
Power supply U_H	
Terminal voltage on pressure transmitter	
• For current output	10 ... 36 V DC (10 ... 30 V DC for Ex)
• For voltage output signal (only measuring range 1 bar (14.5 psi))	15 ... 36 V DC
Certificates and approvals	
Classification according to PED 97/23/EC	For gases of fluid group 1 and 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
- Marking	Ex II 1/2G EEx ia IIC T4
• Intrinsic safety "T.I.I.S." (only with current output)	applied
Lloyd's Register of Shipping	Certificate no. 05/20049 (EZ)
Germanischer Lloyd	33229-06 H
American Bureau of Shipping (ABS)	06-HG205130-PDA
Bureau Veritas (BV)	19113/AO BV
Det Norske Veritas	A-10351
Drinking water approval (ACS)	ACS 07 ACC NY 195
Underwriters Laboritories	File E194458

SITRANS P Z
for gauge and absolute pressure

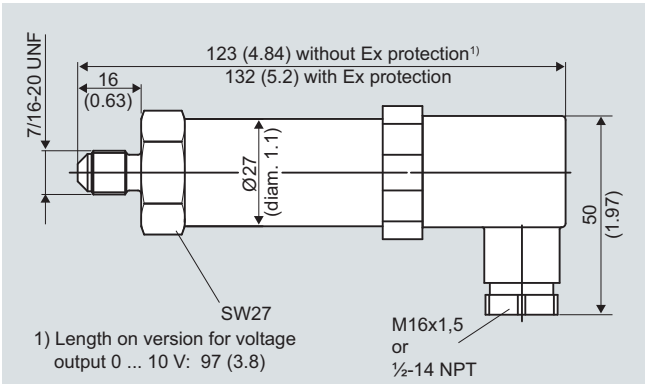
Dimensional drawings



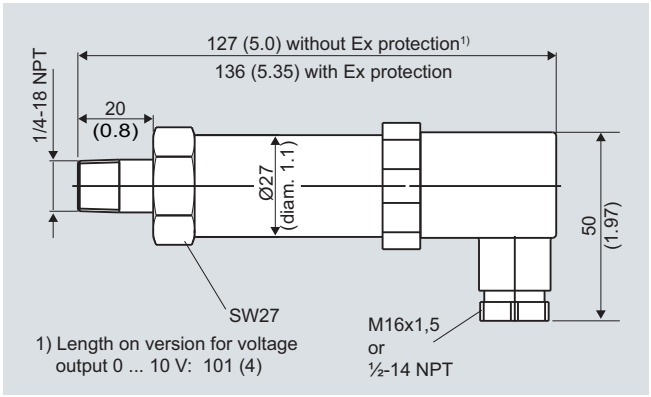
Pressure transmitter 7MF1564-... with process connection G½" male, dimensions in mm (inch)



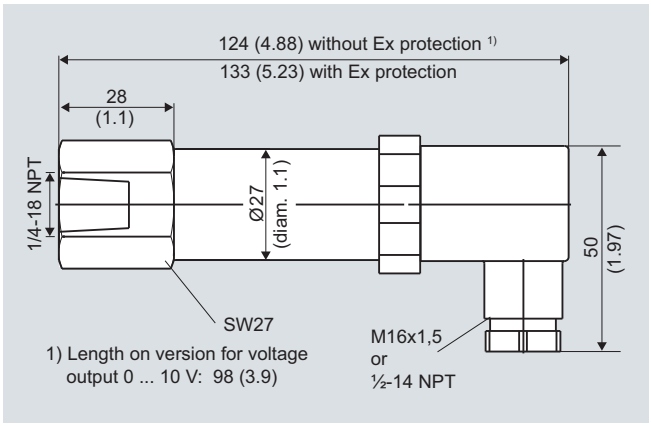
Pressure transmitter 7MF1564-... with process connection G¼" male, dimensions in mm (inch)



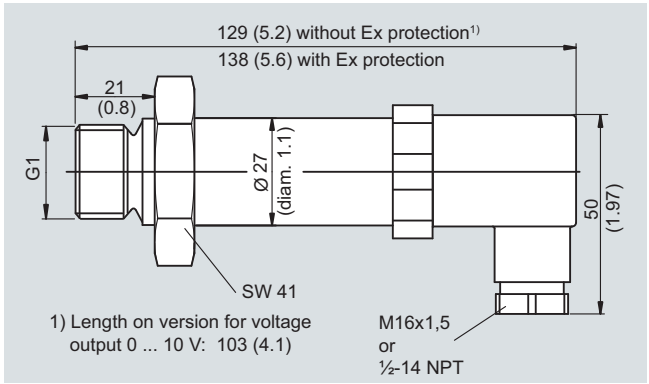
Pressure transmitter 7MF1564-... with process connection 7/16-20 UNF male, dimensions in mm (inch)



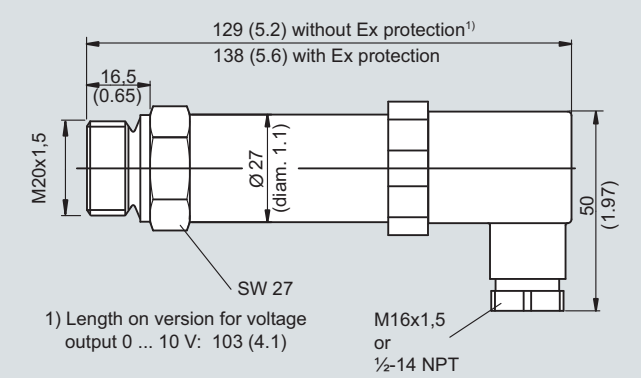
Pressure transmitter 7MF1564-... with process connection ¼"-18 NPT male, dimensions in mm (inch)



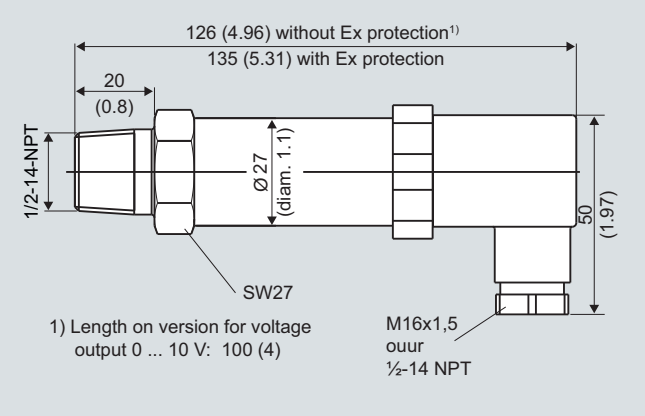
Pressure transmitter 7MF1564-... with process connection ¼"-18 NPT female, dimensions in mm (inch)



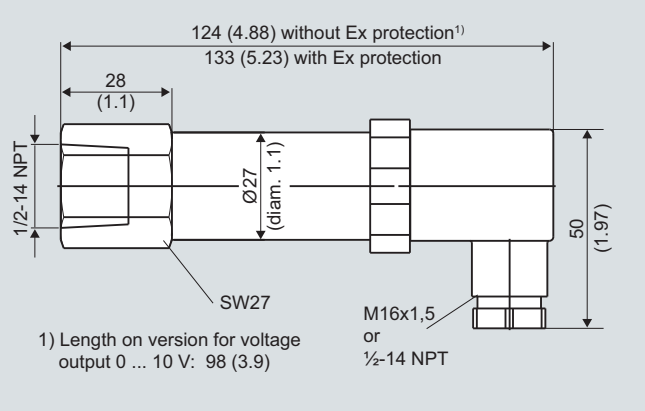
Pressure transmitter 7MF1564-... with process connection G1" male, dimensions in mm (inch)



Pressure transmitter 7MF1564-... with process connection M20 x 1.5 male, dimensions in mm (inch)

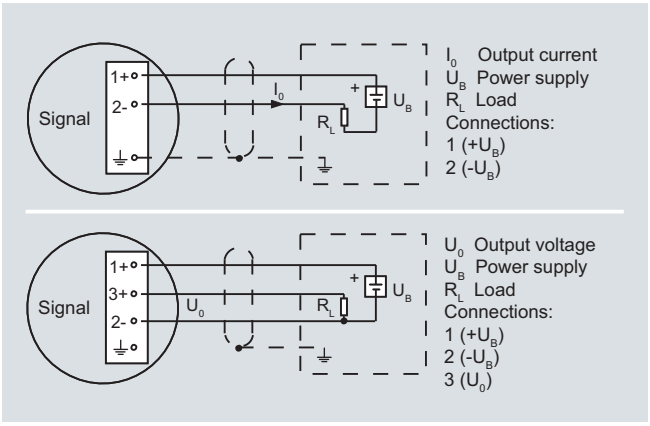


Pressure transmitter 7MF1564-... with process connection ½"-14 NPT male, dimensions in mm (inch)



Pressure transmitter 7MF1564-... with process connection ½"-14 NPT female, dimensions in mm (inch)

Schematics



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

SITRANS P Z
for gauge and absolute pressure

Selection and Ordering data

Order No. 7MF1564-□□□□□-□□□1 Order code □□□

SITRANS P Z pressure transmitters for gauge and absolute pressure D)
2 or 3-wire system, rising characteristic curve

Measuring range	perm. working pressure Min.	perm. working pressure Max.	Burst pressure			Order code
For gauge pressure						
with metal measuring cell						
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)	►	3AA0
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) J)	►	3AB0
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) J)	►	3AC0
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) J)	►	3AD0
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) J)	►	3AG0
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]						9AC0 H1Y
with ceramic measuring cell						
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)	►	3BA
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)	►	3BB
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)	►	3BD
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)	►	3BE
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)	►	3BG
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)	►	3CA
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)	►	3CB
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)	►	3CD
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)	►	3CE
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)	►	3CG
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)	►	3DA
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)	►	3DB
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)	►	3DD
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)	►	3DE
Other version for measuring range ≥ 1 bar g (≥ 14.5 psi g), add Order code and plain text: measuring range: ... up to... bar (psi g)[1]						9AA H1Y
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)	►	5AG0
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)	►	5BA
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)	►	5BB
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)	►	5BD
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)	►	5BE
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)	►	5BG
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)	►	5CA
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)	►	5CB
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)	9AB0 H1Y

► Available ex stock

D) Subject to export regulations AL: N, ECCN: EAR99H.
J) Subject to export regulations AL: 9I999, ECCN: EAR99.

[1] The transmitters can also be ordered with special measuring ranges, e.g. the transmitter with the 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 ..., however start-of-scale value not under -0.4 bar g (-5.8 psi g), also see column "min. perm. operating pressure"

Please note:

- It is not possible to have a smaller span than the smallest span of the device of the entire device range.
- The value must not fall below the minimum permissible operating pressure of the special measuring range of the selected measuringcell.
- The required span of the device must lie between the smallest and the largest possible span of the entire device range.

Selection and Ordering data

Order No. 7MF1564- ▪▪▪▪▪-▪▪▪1 ▪▪▪ Order code

SITRANS P Z pressure transmitters for gauge and absolute pressure
2 or 3-wire system, rising characteristic curve

Measuring range	Perm. working pressure min.	Perm. working pressure max.	Burst pressure		Order code
Measuring ranges for gauge pressure (only for US market)					
(0 ... 10 psi g)	(-3 psi g)	(20 psi g)	(60 psi g)		4BA
(0 ... 15 psi g)	(-6 psi g)	(30 psi g)	(72 psi g)		4BB
(3 ... 15 psi g)	(-6 psi g)	(30 psi g)	(72 psi g)		4BC
(0 ... 20 psi g)	(-6 psi g)	(40 psi g)	(72 psi g)		4BD
(0 ... 30 psi g)	(-6 psi g)	(60 psi g)	(72 psi g)		4BE
(0 ... 60 psi g)	(-11.5 psi g)	(120 psi g)	(175 psi g)		4BF
(0 ... 100 psi g)	(-14.5 psi g)	(200 psi g)	(360 psi g)		4BG
(0 ... 150 psi g)	(-14.5 psi g)	(300 psi g)	(725 psi g)		4CA
(0 ... 200 psi g)	(-14.5 psi g)	(400 psi g)	(725 psi g)		4CB
(0 ... 300 psi g)	(-14.5 psi g)	(600 psi g)	(1750 psi g)		4CD
(0 ... 500 psi g)	(-14.5 psi g)	(1000 psi g)	(1750 psi g)		4CE
(0 ... 750 psi g)	(-14.5 psi g)	(1500 psi g)	(3600 psi g)		4CF
(0 ... 1000 psi g)	(-14.5 psi g)	(2000 psi g)	(3600 psi g)		4CG
(0 ... 1500 psi g)	(-14.5 psi g)	(3000 psi g)	(6525 psi g)		4DA
(0 ... 2000 psi g)	(-14.5 psi g)	(4000 psi g)	(6525 psi g)		4DB
(0 ... 3000 psi g)	(-14.5 psi g)	(6000 psi g)	(9425 psi g)		4DD
(0 ... 5000 psi g)	(-14.5 psi g)	(8700 psi g)	(9425 psi g)		4DE
(0 ... 6000 psi g)	(-14.5 psi g)	(8700 psi g)	(9425 psi g)		4DF
Other version, add Order code and plain text: Measuring range: ... up to ... psi g					9BA H1Y
Measuring ranges for absolute pressure (only for US market)					
(0 ... 10 psi a)	(0 psi a)	(20 psi a)	(60 psi a)	J)	6AG
(0 ... 15 psi a)	(0 psi a)	(30 psi a)	(72 psi a)	J)	6BA
(0 ... 20 psi a)	(0 psi a)	(40 psi a)	(72 psi a)	J)	6BB
(0 ... 30 psi a)	(0 psi a)	(60 psi a)	(72 psi a)	J)	6BD
(0 ... 60 psi a)	(0 psi a)	(120 psi a)	(175 psi a)	J)	6BE
(0 ... 100 psi a)	(0 psi a)	(200 psi a)	(360 psi a)	J)	6BG
(0 ... 150 psi a)	(0 psi a)	(300 psi a)	(725 psi a)	J)	6CA
(0 ... 200 psi a)	(0 psi a)	(400 psi a)	(725 psi a)	J)	6CB
(0 ... 300 psi a)	(0 psi a)	(600 psi a)	(1725 psi a)	J)	6CC
Other version, add Order code and plain text: Measuring range: ... up to ... psi a				J)	9BB H1Y
Output signal					
4 ... 20 mA; 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
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 ½-14 NPT					3
Plug to DIN 43650, cable inlet Pg9					4
Cable gland Pg11 with 2 m PE cable, IP68					6
Special version (specify Order code and plain text)					9 N1Y

► Available ex stock

D) Subject to export regulations AL: N, ECCN: EAR99H.
J) Subject to export regulations AL: 9I999, ECCN: EAR99.

SITRANS P Z
for gauge and absolute pressure

Selection and Ordering data		Order No.	Order code
SITRANS P Z pressure transmitters gauge and absolute pressure 2 or 3-wire system, rising characteristic curve	D)	**7 MF 1 5 6 4 -** ▢▢▢▢▢ **-** ▢▢▢ **1**	▢▢▢
Process connection			
G½" male to EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar)	►		**A**
G½" male thread and G1/8" female thread			**B**
G¼" male to EN 837-1 (¼" BSP male)			**C**
7/16"-20 UNF male			**D**
¼"-18 NPT male (standard for pressure ranges psi)			**E**
¼"-18 NPT female			**F**
½"-14 NPT male			**G**
½"-14 NPT female			**H**
RC ½" male to JIS B 7505			**K**
G1" male (only for measuring ranges ≥ 1 bar g (14.5 psi g)) and max. permissible working pressure 100 bar g (1450 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		Order code	
Quality inspection certificate (Factory calibration) to IEC 60770-2, add "**-Z**" to Order No. and Order code.		**C11**	
Accessories		Order No.	
Quality inspection certificate (Factory calibration) to IEC 60770-2 supplied later, specify factory no. of transmitter.	D)	**7MF1564-8CC11**	

► Available ex stock

D) Subject to export regulations AL: N, ECCN: EAR99H.